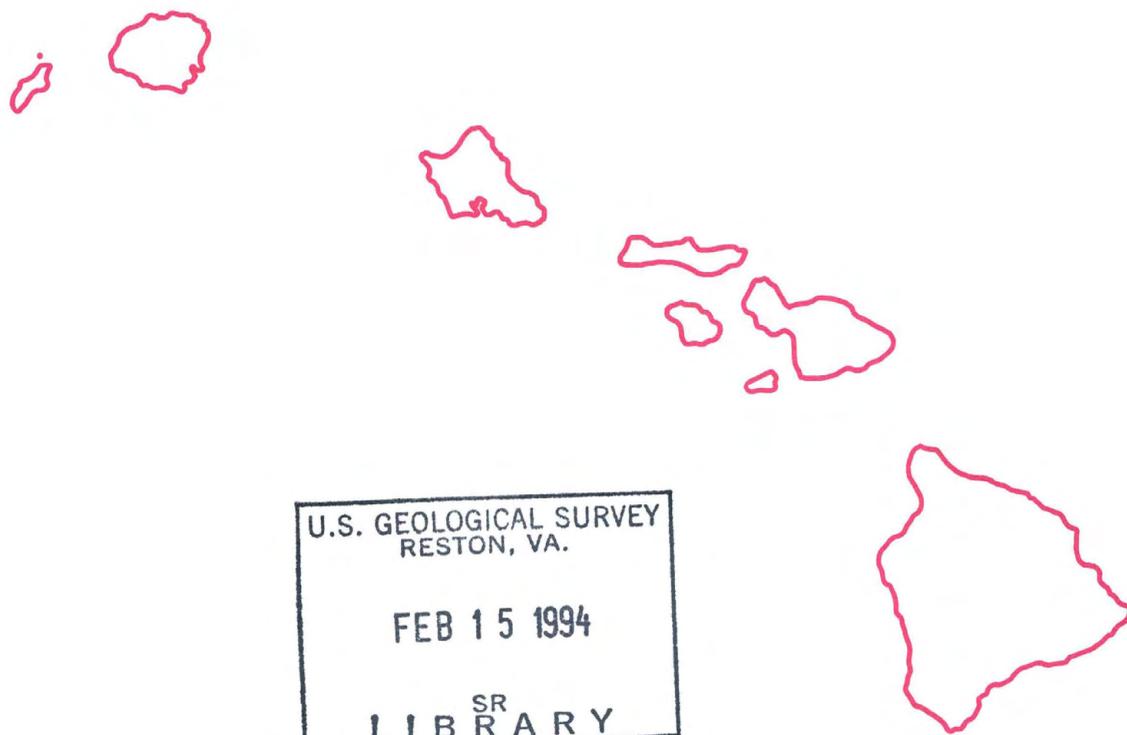




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Water Resources Data Hawaii and other Pacific Areas Water Year 1992

Volume 1. Hawaii



U.S. GEOLOGICAL SURVEY WATER-DATA REPORT HI-92-1
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 1992

1991

OCTOBER

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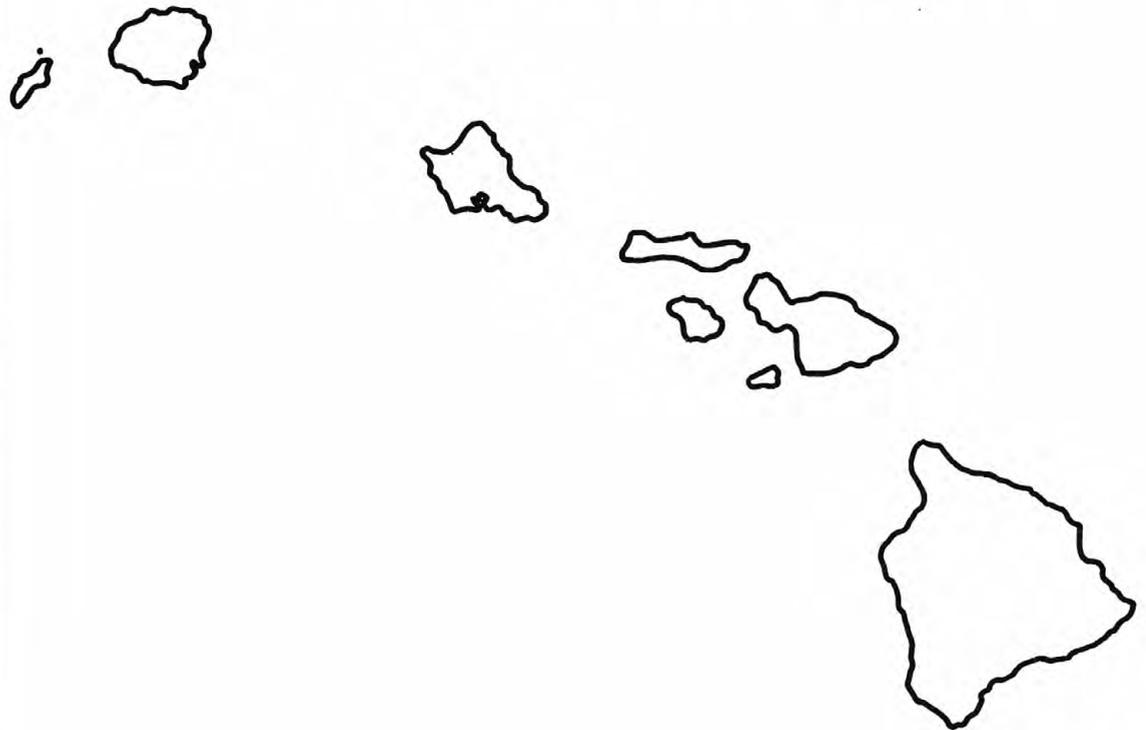
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Water Resources Data Hawaii and other Pacific Areas Water Year 1992

Volume 1. Hawaii

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



U.S. GEOLOGICAL SURVEY WATER-DATA REPORT HI-92-1

Prepared in cooperation with the State of Hawaii

Department of Land and Natural Resources,

Division of Water Resource Management

and with other agencies

U.S DEPARTMENT OF THE INTERIOR

BRUCE BABBITT, Secretary

U.S. GEOLOGICAL SURVEY

ROBERT M. HIRSCH, Acting Director

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and other Pacific Areas write to
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677 Ala Moana Boulevard, Suite 415
Honolulu, Hawaii 96813

1993

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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16. Abstract (Limit: 200 words) Water resources data for the 1992 water year for Hawaii and other Pacific Areas consist of records of stage, discharge, and water quality of streams and springs; and water levels and water quality in wells. This report, volume 1, contains discharge records for 87 gaging stations; water quality for 16 gaging stations, 20 partial-record flow stations, and 126 wells; and water levels for 63 observation wells. Also included are - 107 crest-stage partial record stations, 4 miscellaneous partial-record stations, and 6 low-flow partial-record stations. These data represent that part of the National Water Data System operated by the U.S. Geological Survey and cooperating State, Federal, and other agencies in Hawaii.			
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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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Letters after well number designate type of data:
(c) chemical, (t) water temperature, (w) water level

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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 Puhī	--	1963-71
16053600	Lower Haiku Ditch nr Puhī	--	1963-71
16053800	Kamooloa Str nr Puhī	5.79	1963-70
16054000	Kuia Str nr Puhī	0.40	1939-41
16054200	Koloa Ditch nr Koloa	--	1964-71
16054400	Koloa tunnel nr Koloa	--	1966-71
16054500	Kuia Str nr Puhī	5.09	1963-66
16056000	Hanamaulu Str at Kapaia nr Lihue	6.41	1911-13
16056800	Waiahi-Kuia aqueduct nr Puhī	--	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 Wainamu 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	Lumaha'i River nr Hanalei	6.95	1914-33
16109000	Wainiha River above intake nr Hanalei	11.6	1914-16
16110000	Wainiha Canal at intake nr Wainiha	--	1910-16
16111000	Wainiha Canal at tunnel 18 nr Wainiha	--	1911
16113000	Wainiha River nr Wainiha	20.6	1912-16
16115000	Hanakapiai Str nr Hanalei	2.73	1931-52
16116000	Hanakoa Str nr Hanalei	0.50	1931-52
16117000	Kalalau Str nr Hanalei	1.55	1931-55
ISLAND OF OAHU			
16201000	RB of NF Kaukonahua Str nr Wahiawa	1.17	1913-53
16203000	Mauka Ditch nr Wahiawa	--	1947-68
16204000	North Fork Kaukonahua Str nr Wahiawa	4.86	1946-68
16206000	South Fork Kaukonahua Str nr Wahiawa	1.93	1913-14, 1915-16, 1944-50
16206500	Koolau Ditch at reservoir nr Wahiawa	4.00	1914-15
16207000	SF Kaukonahua Str bl U.S. Army res nr Wahiawa	0.86	1914-17
16208500	RB of South Fork Kaukonahua Str nr Wahiawa	5.26	1957-72
16209000	SF Kaukonahua Str ab Wahiawa res nr Wahiawa	--	1946-58
16210900	Poamoho Tunnel nr Wahiawa	1.79	1958-79
16211000	Poamoho Str nr Wahiawa	--	1947-73
16211850	Puea Mauka Ditch nr Waianae	4.39	1960-67
16211900	Kaupuni Str nr Waianae	0.60	1957-60
16212000	Puhawai Str at Lualualei nr Waianae	1.16	1930-44
16212400	Awanui Gulch nr Barbers Point NAS	13.80	1957-58
16212900	Kipapa Str nr Waipahu	--	1966-68
16217000	Pearl Harbor Spr at Puukapu nr Pearl City	--	1931-35
16218000	Pearl Harbor Springs at Loko Kukona	--	1931-35, 1936-45
16218500	Pearl Harbor Spr at Kaluaooopu nr Pearl City	--	1931-37
16219000	Hawn Elec. Co. tunnel at Waiau nr Pearl City	--	1939-42
16220000	Hawn Elec. Co. wasteway at Waiau nr Pearl City	--	1953-59
16222000	Pearl Harbor Springs at Waiau	--	1913-39, 1942-47
16224000	Pearl Harbor Springs at Kalauao	--	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, 1976, 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 Nailiilihale Str at Haiku-uka	0.20	1932-33
16570000	Nailiilihale Str nr Huelo	3.49	1910-11, 1913-18, 1919-24, 1925-75
16571000	Nailiilihale Str bl new Hamakua Dt nr Huelo	3.60	1912
16572000	New Hamakua Ditch at Nailiilihale 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	Hoolawaliili 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 Kahalulua 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	Kapaloo Str at weir 1 nr Lahaina	1.00	1901
16628000	Kapaloo 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 Piionua 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	Paaau 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

WATER RESOURCES DATA FOR HAWAII AND OTHER PACIFIC AREAS, 1992

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 87 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 16 streamflow-gaging stations, and 20 partial-record streamflow stations; (3) water-level records for 63 observation wells; and (4) water-quality records for 126 observation wells. Records included for stream stages and for ground-water levels 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 water year (fiscal year for Hawaii) with a report that contained only data relating to the quantities of surface water. For the 1964 water 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, Books and Open-File Reports, Federal Center, Building 41, Box 25425, Denver, Co 80225. 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-92-1." 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 Trust 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) 541-2655. 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.

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 for Water Resources Management.

Hawaii Department of Transportation, Rex Johnson, Director.

City and County of Honolulu, Board of Water Supply, Kazu Hayashida, Manager and Chief Engineer.

City and County of Honolulu, Department of Public Works, Michael Street, 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 1992 year was normal at the index stations on the islands of Oahu, and Maui, and deficient (lower 25 percent of record) at the index station on the island of Kauai. The monthly mean flow for all index stations was normal for the months of January and February, deficient for the months of April and May, and excessive for the month of September. The data for the index station (Waiakea Stream near Mountain View, Hawaii) on the island of Hawaii is being reviewed and was not included in the summary.

The annual mean discharge at East Branch of North Fork Wailua River near Lihue, Kauai was 74 percent of the 1961-90 median, 75 percent at Kalihi Stream near Honolulu, Oahu, and 104 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. A comparison of 1992 peak discharge to peaks for period of record at the index stations are shown in Table 1.

Table 1. Comparison of peak discharge for 1992 water year with the peak discharge for the period of record at three representative stations

Station Number	Station name	Water year 1992		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	Dec. 14	9,070	Nov. 12, 1955	18,400
16229000	Kalihi Stream near Honolulu, Oahu	Sep. 11	926	Nov. 18, 1930	12,400
16587000	Honopou Stream near Huelo, Maui	Jan. 14	823	Nov. 18, 1930	5,710

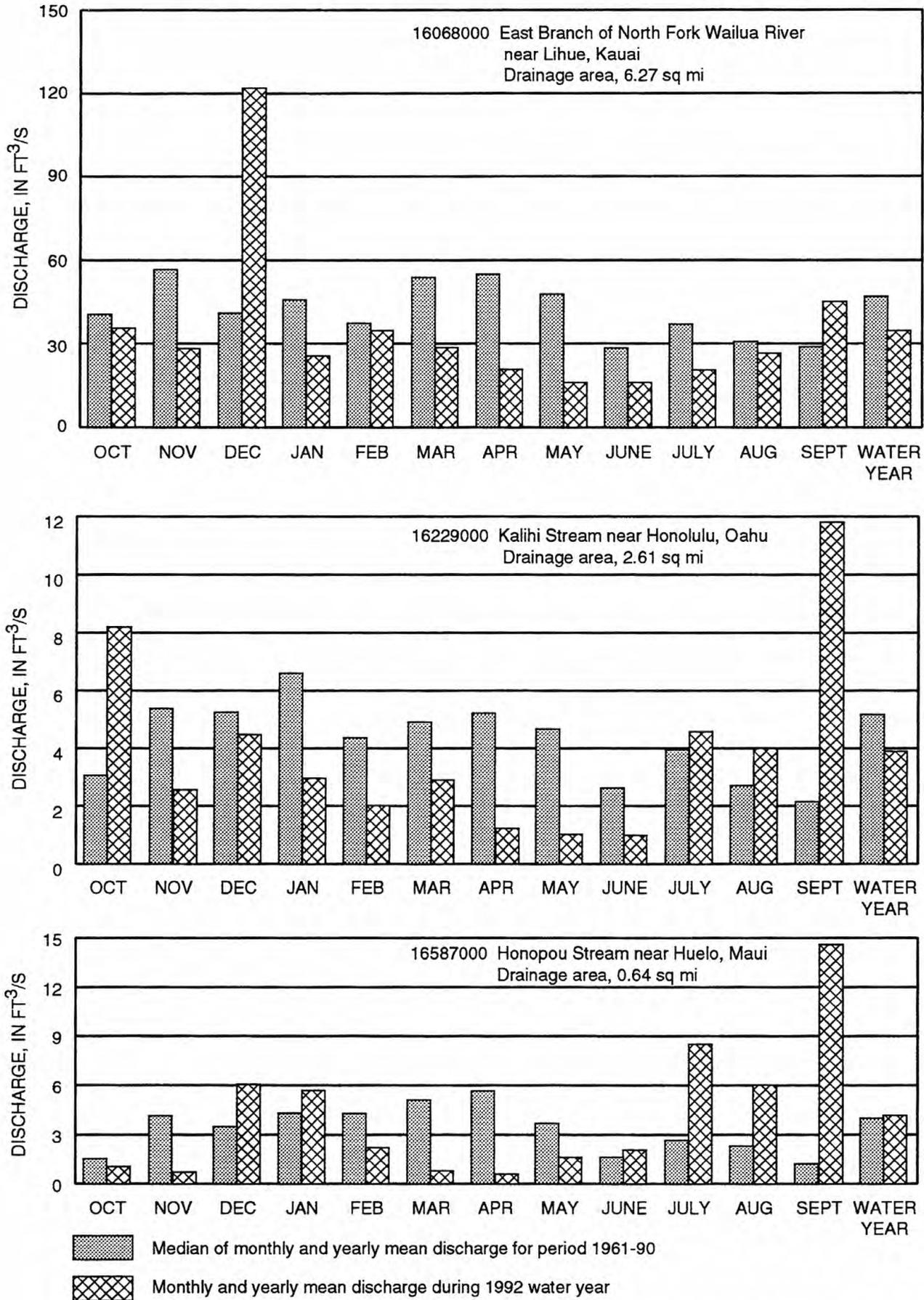


Figure 1.--Discharge during 1992 water year compared with median discharge for period 1961-90 for three representative gaging stations.

Water Quality

Dissolved-solids concentrations at the five NASQAN (National Stream Quality Accounting Network) stations showed no significant change during the 1992 water year. Samples collected bi-monthly showed dissolved-solids concentrations ranged from 21 to 340 mg/L (milligrams per liter) during 1992. Waikele Stream at Waipahu, Oahu, had the highest concentration values and Halawa Stream at Halawa, Molokai, had the lowest concentration values. Records for stations on the island of Hawaii are being reviewed for later publication.

Average dissolved-oxygen for all samples ranged from 86 to 102 percent saturation. Waikele Stream at Waipahu, Oahu, was lowest at 80 percent and Waimea River at Waimea, Kauai, was highest at 102 percent.

Concentrations of trace metals were less than the maximum contaminant levels established by EPA (Environmental Protection Agency). Fecal coliform densities decreased at three of the NASQAN stations in Hawaii and increased at the other two. The geometric-mean values were:

<u>NASQAN Station</u>	<u>Fecal Coliform</u> <u>(colonies per 100 milliliters)</u>	
	<u>1991</u>	<u>1992</u>
Waimea River at Waimea, Kauai	450	160
Waikele Stream at Waipahu, Oahu	8,200	3,900
Kalihi Stream at Kalihi, Oahu	10,000	2,700
Halawa Stream at Halawa, Molokai	500	650
Kahakuloa Stream at Kahakuloa, Maui	17	37

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

EXPLANATION OF THE RECORDS

The surface-water and ground-water records published in this report are for the 1992 water year that began October 1, 1991, and ended September 30, 1992. 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, and ground-water level 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 or well, 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.

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 indentation in the "List of Stations" in the front of this report. Each indentation represents one rank. This downstream order and system of indentation 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 and miscellaneous surface-water sites 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 localational 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 and the other Pacific Areas 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 dug within the grid as 01 and increase chronologically, with few exceptions, to the latest dug.

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

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, 10.

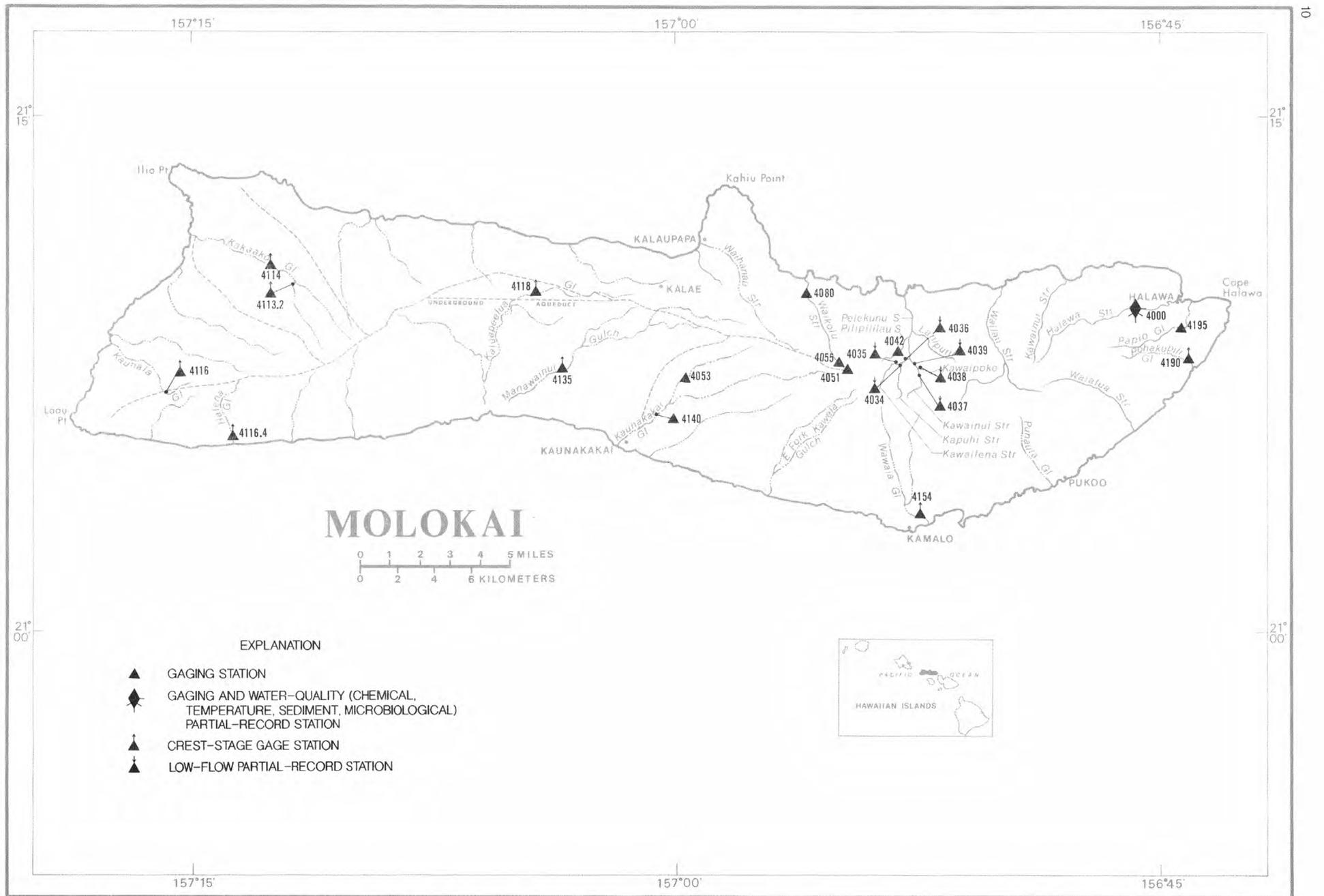


Figure 6.--Locations of gaging, water-quality, and partial-record stations on Molokai.

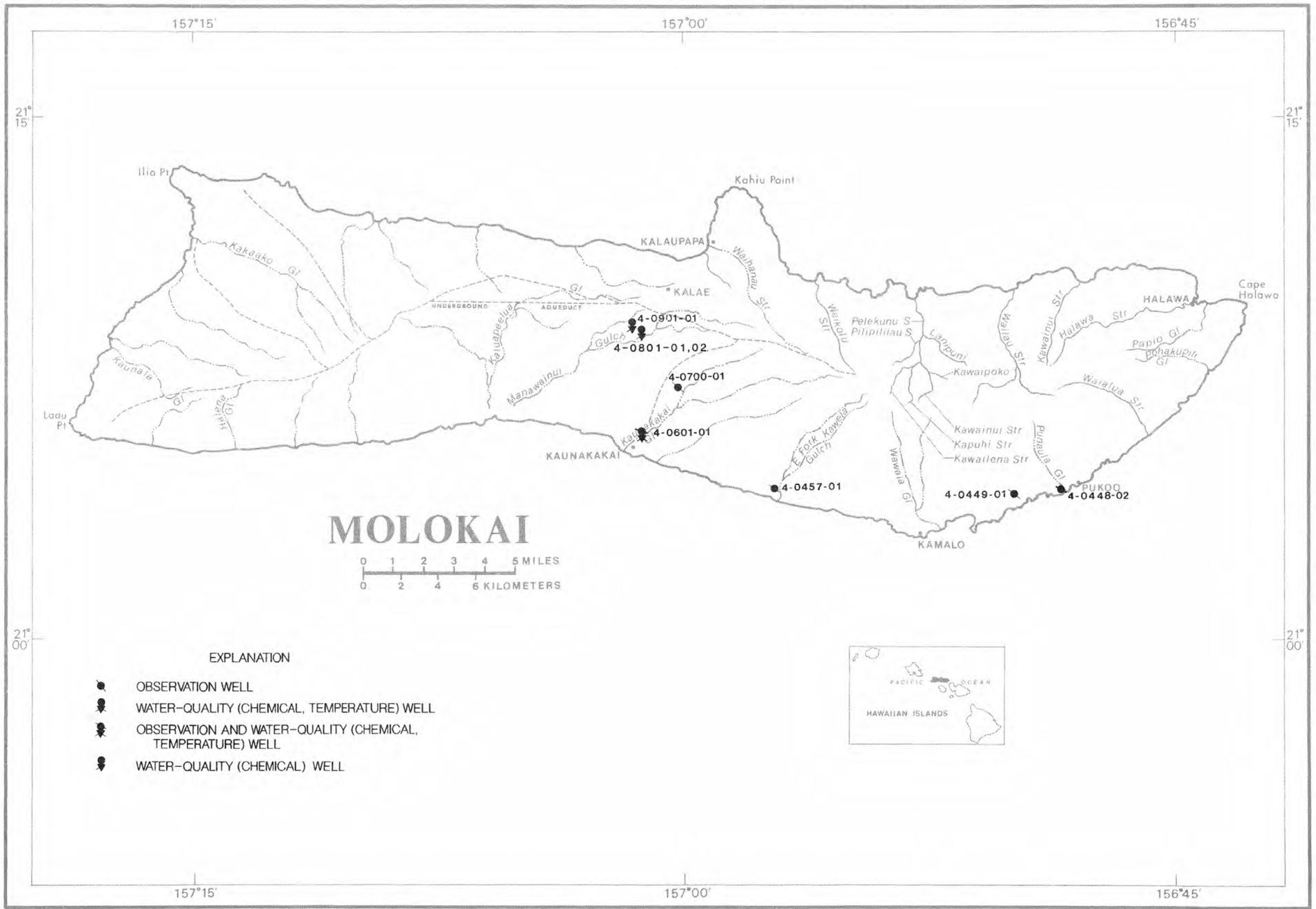
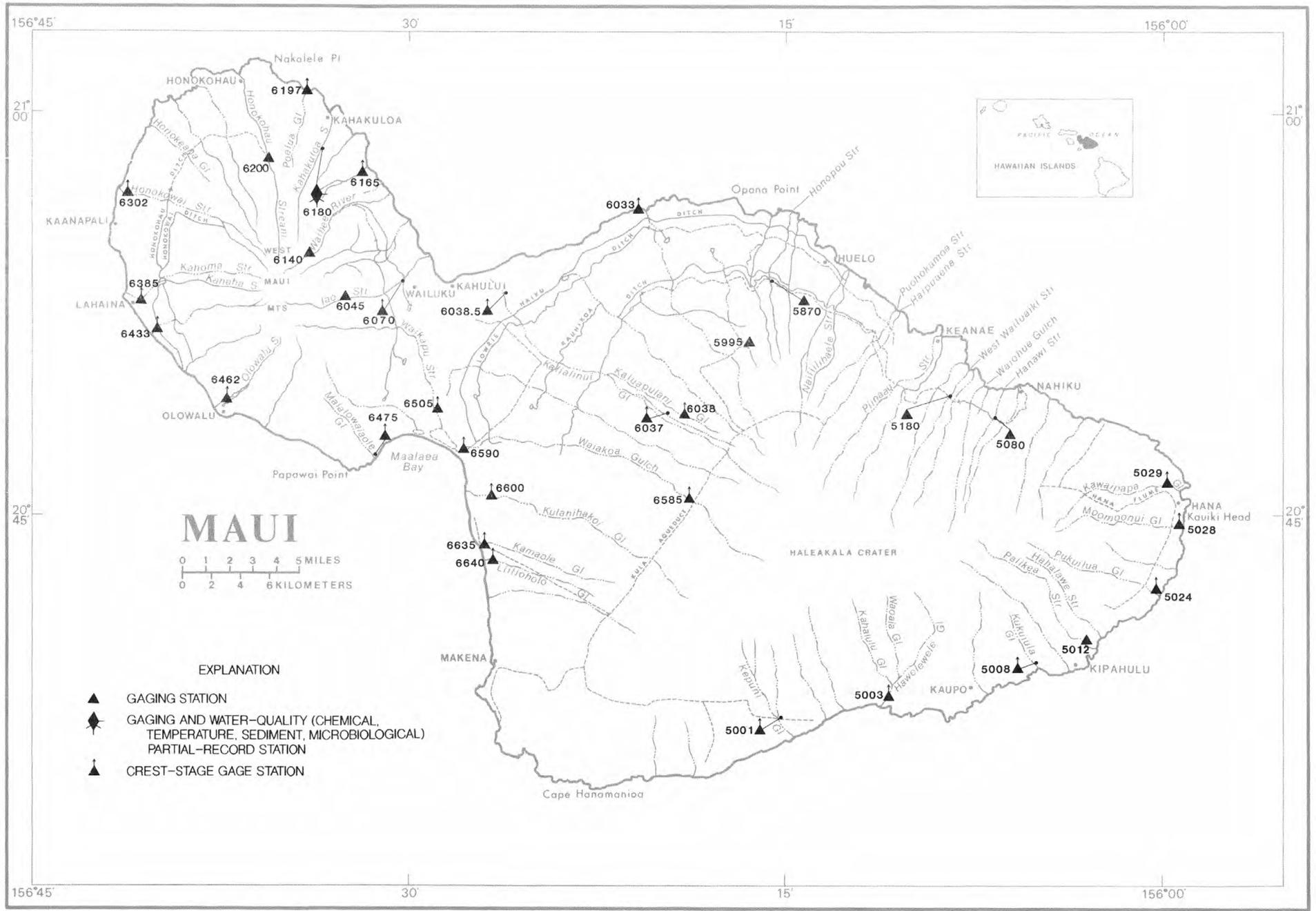


Figure 7.--Locations of observation wells and ground-water quality sampling sites on Molokai.



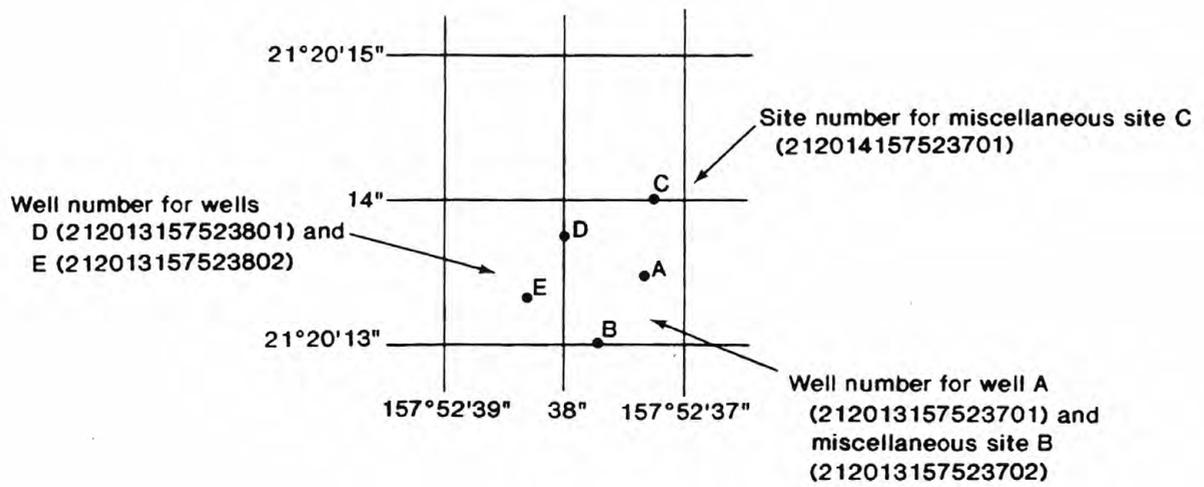


Figure 12.--Sketch showing system for numbering wells and miscellaneous sites.

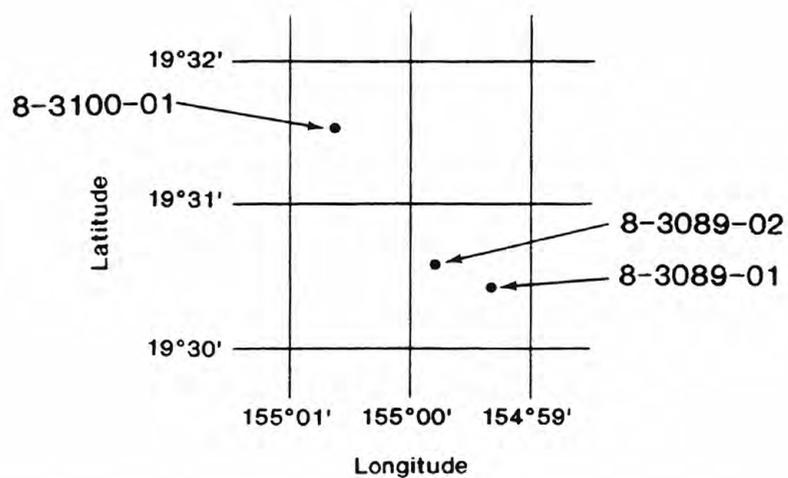


Figure 13.--Sketch showing local well numbering system.

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, in U.S. Geological Survey Water-Supply Paper 2125, and in U.S. Geological Survey Techniques of Water Resources Investigations (TWRI), Book 3, Chapter A6.

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.

The records published for each continuous-record surface-water discharge station (gaging station) now consist of four 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; and 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. 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 present gage above 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 contents 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 contents, 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 peak discharges 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. 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. At some stations monthly and (or) yearly observed discharges are adjusted for reservoir storage or diversion, or diversion data or reservoir contents are given. These figures are identified by a symbol and corresponding footnote.

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 and daily 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 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. 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 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 data 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. At some stations the annual total discharge is adjusted for reservoir storage or diversion. The adjusted figures are identified by a symbol and corresponding footnotes.

ANNUAL MEAN.--The arithmetic mean of the individual daily mean discharges for the year noted or for the designated period. At some stations the yearly mean discharge is adjusted for reservoir storage or diversion. The adjusted figures are identified by a symbol and corresponding footnotes. At least 5 complete years of record must be available before this statistic is published 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.)

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 equal 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 is exceeded by 10 percent of the flow for the designated period.

50 PERCENT EXCEEDS.--The discharge that is exceeded by 50 percent of the flow for the designated period.

90 PERCENT EXCEEDS.--The discharge that is exceeded by 90 percent of the flow for the designated period.

Data collected at partial-record stations follow the information for continuous-record sites. Data for partial-record discharge stations are presented in two tables. The first is a table of discharge measurements at low-flow partial-record stations, and the second is a table of annual maximum stage and discharge at crest-stage stations. The tables of partial-record stations are followed by a listing of discharge measurements made at sites other than continuous-record or partial-record stations. These measurements are generally made in times of drought or flood to give better areal coverage to those events. Those measurements and others collected for some special reason are called measurements at miscellaneous sites.

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 the "REMARKS" paragraph. "Excellent" means that about 95 percent of the daily discharges are within 5 percent of the true; "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 discharges of less than 1 ft³/s; the nearest tenths between 1.0 and 10 ft³/s; whole numbers between 10 and 1,000 ft³/s; and 3 significant figures for more than 1,000 ft³/s. The number of significant figures used is based solely on the magnitude of the discharge figure. The same rounding rules apply to discharges listed for partial-record stations and miscellaneous sites.

Discharge at many stations, as indicated by the monthly mean, may not reflect natural runoff because of the effects of diversion, consumption, regulation by storage, increase or decrease in evaporation, or 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, changes in contents of reservoirs, or 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

For most gaging stations, unpublished, detailed information, on file in the Hawaii office, includes discharge measurements, gage-height records, and rating tables. Many gaging-station records in Hawaii through 1979 have been analyzed to determine several statistical summaries: (1) The number of days in each year that the daily discharge was between selected limits (duration tables); (2) the lowest mean discharge for selected numbers of consecutive days in each year; and (3) the highest mean discharge for selected numbers of consecutive days in each year.

Other Federal and State agencies have collected discharge data at other sites in Hawaii during the current water year. Although these records have not been published by the U.S. Geological Survey, the National Water Data Exchange, NAWDEX, Water Resources Division, U.S. Geological Survey, National Center, Reston, VA 22092, maintains an index of these sites and will furnish information about them.

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 Measurement 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 given in publications on "Techniques of Water-Resources Investigations," (TWRI), Book 1, Chapter D2; Book 3, Chapter C2; Book 5, Chapter A1, A3, and A4. All of these references are listed under "PUBLICATIONS ON TECHNIQUES OF WATER-RESOURCES INVESTIGATIONS" in this report. 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.

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 in analyzing sediment samples and computing sediment records are given in TWRI, Book 5, Chapter C1. Methods used by the Geological Survey laboratory are given in TWRI, Book 1, Chapter D2; Book 3, Chapter C2; Book 5, Chapter A1, A3, and A4.

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:

<u>PRINTED OUTPUT</u>	<u>REMARK</u>
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
A	Laboratory conductance
J	Collected by non - USGS agency
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 ($\mu\text{g/L}$) 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). Present data above the $\mu\text{g/L}$ 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 in water year 1994.

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.

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

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

Data Presentation

Each well record consists of two parts, the station description and the data table of water levels observed during the water year. 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 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 requestor 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-Endoagar (nutrient medium for bacterial growth). Their concentrations are expressed as number of colonies per 100 mL of sample.

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

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

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/m³ (grams per cubic meter), and periphyton and benthic organisms in g/m² (grams per square meter).

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

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

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

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

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

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

Cells/volume refers to the number of cells of any organism which is counted by using a microscope and grid or counting cell. Many planktonic organisms are multicelled and are counted according to the number of contained cells per sample, usually milliliters or 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 , 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 [$(\text{FT}^3/\text{s})/\text{d}$, $(\text{ft}^3/\text{s})/\text{d}$] 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 more than 50 sites in small drainage basins around the country whose purpose is to provide consistent data on the hydrology, including water quality, and related factors in representative undeveloped watersheds nationwide, and to provide analyses on a continuing basis to compare and contrast conditions observed in basins more obviously affected by 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 ($\mu\text{g}/\text{g}$) is a unit expressing the concentration of a chemical element as the mass (micrograms) of the element sorbed per unit mass (gram) of sediment.

Microgram per liter ($\mu\text{G}/\text{L}$, $\mu\text{g}/\text{L}$) 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 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 several hundred 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.

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

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

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

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

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

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

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

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

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

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

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

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

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

Suspended recoverable is the amount of a given constituent that is 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 day.

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 diggerent 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).

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

- 1-D1. *Water temperature--influential factors, field measurement, and data presentation*, by H. H. Stevens, Jr., J. F. Ficken, 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. McCary: 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 measurements at gaging stations*, by T. J. Buchanan and W. P. Somers: USGS--TWRI Book 3, Chapter A7. 1968. 28 pages.
- 3-A8. *Discharge measurements at gaging stations*, by T. J. Buchanan and W. P. Somers: USGS--TWRI Book 3, Chapter A8. 1969. 65 pages.
- 3-A9. *Measurement of time of travel in streams by dye tracing*, by F. A. Kilpatrick and J. F. Wilson, Jr.: USGS--TWRI Book 3, Chapter A9. 1989. 27 pages.

PUBLICATIONS ON TECHNIQUES OF WATER-RESOURCES INVESTIGATIONS--Continued

- 3-A10. *Discharge ratings at gaging stations*, by E. J. Kennedy: USGS--TWRI Book 3, Chapter A10. 1984. 59 pages.
- 3-A11. *Measurement of discharge by moving-boat method*, by G. F. Smoot and C. E. Novak: USGS--TWRI Book 3, Chapter A11. 1969. 22 pages.
- 3-A12. *Fluorometric procedures for dye tracing*, by J. F. Wilson, Jr., E. D. Cobb, and F. A. Kilpatrick: USGS--TWRI Book 3, Chapter A12. 1986. 41 pages.
- 3-A13. *Computation of continuous records of streamflow*, by E. J. Kennedy: USGS--TWRI Book 3, Chapter A13. 1983. 53 pages.
- 3-A14. *Use of flumes in measuring discharge*, by F. A. Kilpatrick and V. R. Schneider: USGS--TWRI Book 3, Chapter A14. 1983. 46 pages.
- 3-A15. *Computation of water-surface profiles in open channels*, by Jacob Davidian: USGS--TWRI Book 3, Chapter A15. 1984. 48 pages.
- 3-A16. *Measurement of discharge using tracers*, by F. A. Kilpatrick and E. D. Cobb: USGS--TWRI Book 3, Chapter A16. 1985. 52 pages.
- 3-A17. *Acoustic velocity meter systems*, by Antonius Laenen: USGS--TWRI Book 3, Chapter A17. 1985. 38 pages.
- 3-A18. *Determination of stream reaeration coefficients by use of tracers*, by F. A. Kilpatrick, R. E. Rathburn, Nobuhiro Yotsukura, G. W. Parker, and L. L. DeLong: USGS--TWRI Book 3, Chapter A18. 1989. 52 pages.
- 3-A19. *Levels of streamflow gaging stations*, by E. J. Kennedy: USGS--TWRI Book 3, Chapter A19. 1990. 27 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 programmed 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-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. 90 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.

PUBLICATIONS ON TECHNIQUES OF WATER-RESOURCES INVESTIGATIONS--Continued

- 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: 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.
- 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.

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 mi².

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.--75 years (water years 1912, 1914, 1920-92), 34.5 ft³/s (25,000 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 11,300 ft³/s, Jan. 13, 1967, gage height, 15.33 ft, from rating curve extended above 470 ft³/s on basis of slope-area measurements at gage heights 12.12 ft and 13.43 ft; minimum, 1.14 ft³/s, Sept. 21, 22, 1953.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 2,100 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Dec. 14	0830	3,060	8.95	Sep. 11	1530	*8,240	*13.60

Minimum discharge, 2.9 ft³/s, Oct. 12-14.

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	3.8	5.6	50	54	8.5	11	7.5	4.3	5.8	4.4	6.3	4.5
2	3.6	5.1	25	94	7.2	10	7.4	4.0	5.2	4.2	5.5	15
3	3.5	4.8	11	25	15	42	7.7	3.9	5.4	4.1	5.0	10
4	3.3	4.6	8.0	18	36	62	7.6	61	5.5	3.9	8.3	13
5	3.2	4.5	46	15	146	19	7.0	17	5.0	3.9	98	13
6	3.5	4.8	45	13	177	12	6.9	12	4.8	4.0	60	8.3
7	3.6	13	24	12	40	10	6.6	19	5.5	3.9	30	5.6
8	3.3	8.8	11	20	20	9.0	6.3	34	9.1	63	21	4.5
9	3.1	6.1	8.2	25	14	8.4	6.9	28	13	72	13	4.0
10	3.4	4.9	7.3	15	12	8.1	7.4	14	74	15	8.8	3.7
11	3.3	4.4	7.0	19	11	203	6.5	8.0	19	7.4	7.1	1190
12	3.1	4.3	7.2	15	16	196	6.0	5.9	23	5.8	6.3	133
13	2.9	4.4	63	14	132	101	5.4	4.9	11	6.1	5.8	27
14	8.5	4.8	372	30	66	38	5.0	4.4	13	5.2	5.4	73
15	151	5.3	32	42	22	22	4.9	16	45	5.2	5.1	37
16	66	5.3	18	16	18	16	4.7	19	23	7.8	7.8	20
17	238	4.4	14	11	16	58	4.6	38	83	11	34	22
18	24	4.6	25	45	58	31	4.4	26	27	7.1	10	15
19	14	15	155	17	25	16	4.3	25	13	20	6.3	12
20	11	16	21	11	16	26	4.3	41	9.0	49	7.4	11
21	8.8	8.4	15	9.6	42	67	4.2	27	7.6	25	11	11
22	7.8	17	43	9.1	34	20	8.1	51	6.8	14	7.5	10
23	7.1	18	25	20	17	14	5.1	21	6.4	95	8.6	25
24	7.6	7.9	15	11	32	14	4.3	12	6.0	29	6.0	24
25	7.7	5.5	180	8.7	33	19	4.1	8.4	6.1	11	4.9	12
26	6.8	4.6	50	7.9	20	14	4.9	7.2	6.9	8.2	4.3	9.2
27	8.1	6.1	20	8.1	14	12	5.1	6.5	5.7	7.8	4.1	8.2
28	8.9	5.3	24	7.8	12	10	4.7	6.1	5.3	49	4.3	7.5
29	6.8	144	76	7.6	11	9.0	5.3	5.7	5.6	37	5.6	7.4
30	6.0	54	43	9.7	---	8.3	5.1	5.5	4.8	11	5.0	7.2
31	5.7	---	28	15	---	7.9	---	6.9	---	7.6	4.3	---
TOTAL	637.4	401.5	1468.7	625.5	1070.7	1093.7	172.3	542.7	460.5	597.6	416.7	1743.1
MEAN	20.6	13.4	47.4	20.2	36.9	35.3	5.74	17.5	15.3	19.3	13.4	58.1
MAX	238	144	372	94	177	203	8.1	61	83	95	98	1190
MIN	2.9	4.3	7.0	7.6	7.2	7.9	4.1	3.9	4.8	3.9	4.1	3.7
AC-FT	1260	796	2910	1240	2120	2170	342	1080	913	1190	827	3460

16010000 KAWAIKOI STREAM NEAR WAIMEA--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1911 - 1992, BY WATER YEAR (WY)

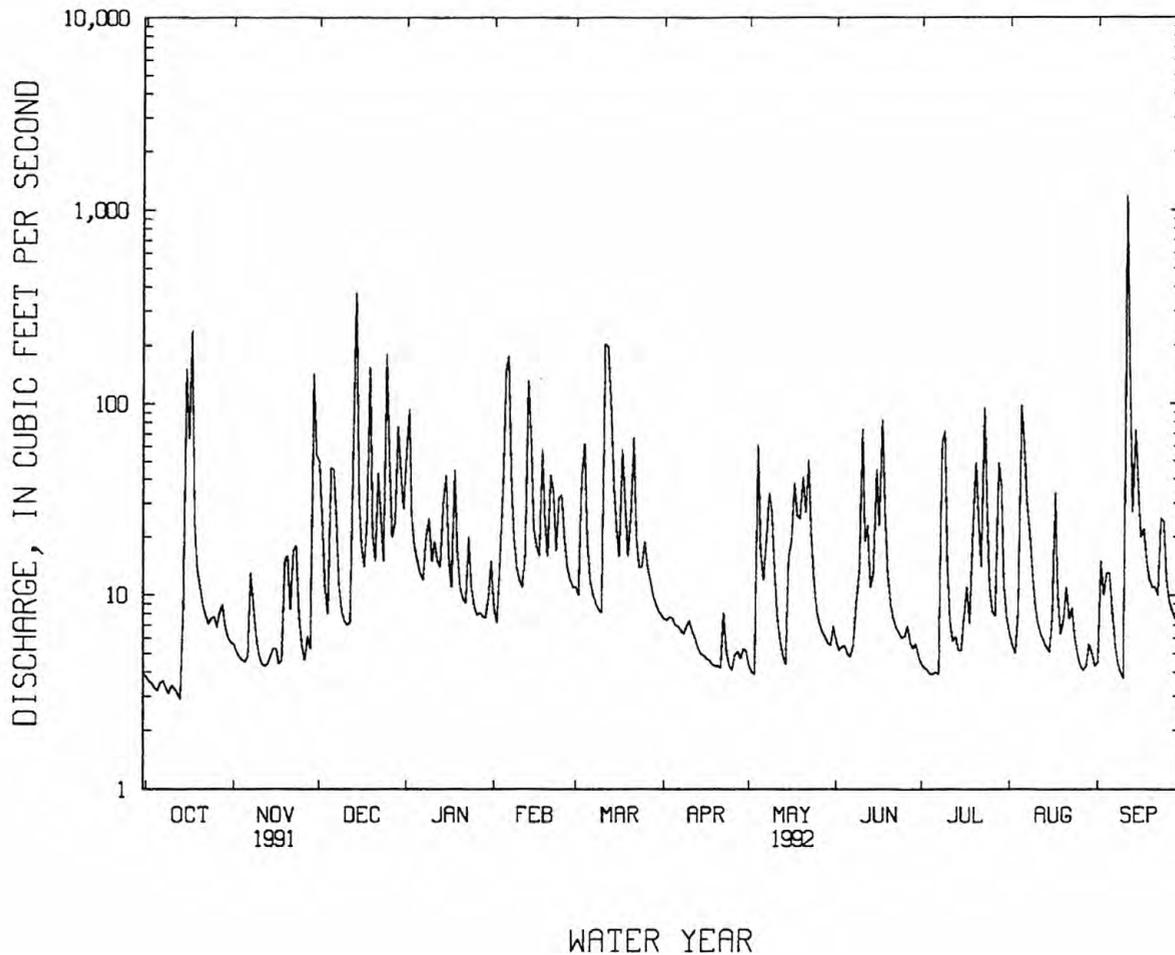
MEAN	20.9	43.5	53.5	54.6	42.5	50.5	45.4	27.7	16.3	23.8	22.1	14.5
MAX	60.3	170	176	343	165	152	115	86.2	68.7	94.7	195	58.1
(WY)	1917	1929	1968	1921	1956	1951	1980	1927	1978	1989	1950	1992
MIN	3.34	4.16	11.9	3.23	4.26	6.15	5.74	3.38	3.58	5.18	2.54	1.86
(WY)	1985	1964	1923	1945	1945	1926	1992	1966	1951	1922	1984	1953

SUMMARY STATISTICS FOR 1991 CALENDAR YEAR

FOR 1992 WATER YEAR

WATER YEARS 1911 - 1992

ANNUAL TOTAL	12371.4			9230.4								
ANNUAL MEAN	33.9			25.2								
HIGHEST ANNUAL MEAN									34.5			
LOWEST ANNUAL MEAN									60.7			1982
HIGHEST DAILY MEAN	680	Mar 12		1190	Sep 11				15.3			1945
LOWEST DAILY MEAN	2.9	Oct 13		2.9	Oct 13				2620			Jan 15 1921
ANNUAL SEVEN-DAY MINIMUM	3.2	Oct 7		3.2	Oct 7				1.1			Sep 21 1953
ANNUAL RUNOFF (AC-FT)	24540			18310					1.2			Sep 17 1953
10 PERCENT EXCEEDS	75			50					25000			
50 PERCENT EXCEEDS	13			9.9					74			
90 PERCENT EXCEEDS	5.1			4.4					13			
									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 mi².

WATER-DISCHARGE RECORDS

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

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

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

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

AVERAGE DISCHARGE.--51 years (water years 1921-31, 1953-92), 21.7 ft³/s (15,720 acre-ft/yr).

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

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 3,690 ft³/s, Sept. 11, gage height 7.60 ft, no other peak above base of 1,300 ft³/s, Oct. 13, 14; minimum, 1.8 ft³/s, Oct. 13, 14.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1991 TO SEPTEMBER 1992
DAILY MEAN VALUES

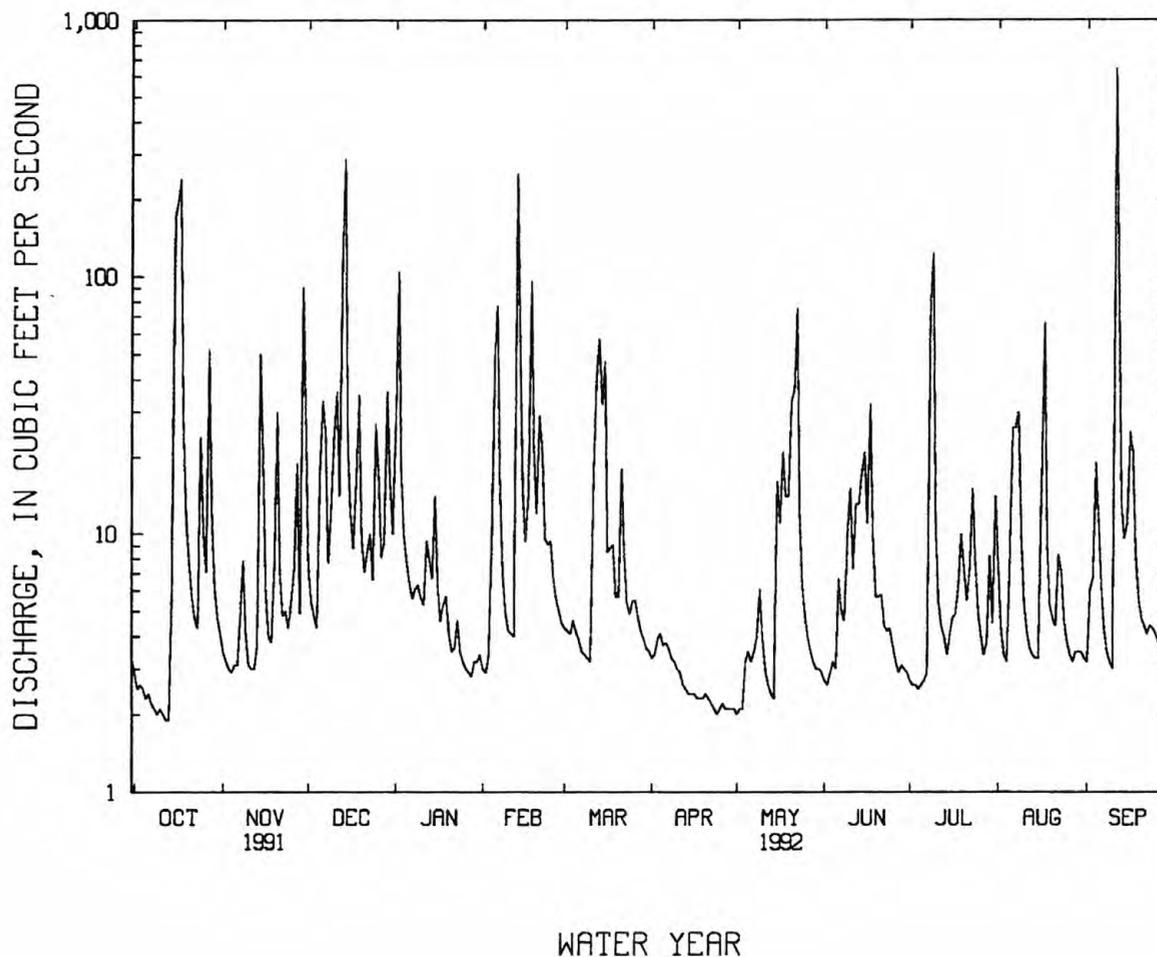
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.9	3.5	7.6	28	3.0	4.3	3.3	2.0	2.7	2.7	7.6	3.2
2	2.5	3.2	5.5	104	2.9	4.2	3.4	2.1	2.6	2.6	4.3	6.1
3	2.6	3.0	4.8	17	3.4	4.1	3.9	2.1	2.9	2.6	3.4	6.8
4	2.5	2.9	4.3	10	9.2	4.6	4.1	3.2	3.2	2.5	3.2	19
5	2.3	3.1	18	7.8	50	4.2	3.7	3.5	3.0	2.6	7.9	11
6	2.4	3.1	33	6.4	77	3.9	3.8	3.2	6.7	2.7	26	6.3
7	2.2	4.9	25	5.6	16	3.5	3.6	3.5	5.0	2.9	26	4.3
8	2.1	7.9	7.7	6.1	7.1	3.4	3.3	4.0	4.6	77	30	3.5
9	2.0	4.1	12	6.3	5.0	3.3	3.2	6.1	10	123	10	3.2
10	2.1	3.1	24	5.6	4.2	3.2	3.0	4.0	15	11	5.4	3.0
11	2.0	3.0	36	5.3	4.1	15	2.9	3.0	7.3	5.5	4.2	642
12	1.9	3.0	14	9.4	4.0	40	2.6	2.6	13	4.4	3.6	93
13	1.9	3.7	130	8.0	251	57	2.5	2.4	13	4.0	3.4	13
14	5.2	50	288	6.7	59	32	2.4	2.3	17	3.4	3.3	9.6
15	170	20	22	14	15	47	2.4	16	21	4.1	3.3	11
16	197	6.1	12	6.4	9.3	8.5	2.4	11	11	4.7	16	25
17	240	4.0	8.8	4.6	14	8.8	2.3	21	32	4.9	66	21
18	29	3.8	16	5.3	96	9.1	2.3	14	9.7	6.1	9.2	8.2
19	12	7.5	35	5.7	21	5.7	2.3	14	5.7	10	5.3	5.6
20	7.9	30	9.6	4.1	12	5.7	2.4	33	5.7	7.4	4.7	4.7
21	5.8	7.0	7.1	3.5	29	18	2.3	37	5.8	5.5	4.4	4.4
22	4.7	4.8	8.5	3.6	21	8.3	2.2	75	4.4	7.4	8.3	4.1
23	4.3	5.0	10	4.6	9.6	5.4	2.1	12	4.2	15	7.1	4.4
24	24	4.3	6.6	3.5	9.1	4.9	2.0	6.4	4.3	7.6	4.6	4.3
25	10	5.4	27	3.2	9.4	5.5	2.1	4.8	3.7	5.0	3.8	4.1
26	7.1	7.3	17	3.0	6.8	5.5	2.2	4.0	3.2	4.0	3.4	3.8
27	52	19	8.1	2.9	5.6	4.7	2.1	3.5	2.9	3.4	3.2	3.4
28	12	4.9	9.3	2.8	5.0	4.2	2.1	3.2	3.1	3.8	3.5	3.2
29	6.2	91	36	3.2	4.5	3.9	2.1	3.0	3.0	8.2	3.5	3.2
30	4.7	29	16	3.2	---	3.6	2.1	3.0	2.9	4.5	3.5	3.0
31	4.1	---	10	3.4	---	3.5	---	2.9	---	14	3.3	---
TOTAL	825.4	347.6	868.9	303.2	763.2	335.0	81.1	307.8	228.6	362.5	291.4	937.4
MEAN	26.6	11.6	28.0	9.78	26.3	10.8	2.70	9.93	7.62	11.7	9.40	31.2
MAX	240	91	288	104	251	57	4.1	75	32	123	66	642
MIN	1.9	2.9	4.3	2.8	2.9	3.2	2.0	2.0	2.6	2.5	3.2	3.0
AC-FT	1640	689	1720	601	1510	664	161	611	453	719	578	1860

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

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1920 - 1992, BY WATER YEAR (WY)

MEAN	15.0	32.3	33.7	34.7	28.0	29.4	25.0	13.8	9.56	15.3	12.8	10.8
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 1991 CALENDAR YEAR			FOR 1992 WATER YEAR			WATER YEARS 1920 - 1992		
ANNUAL TOTAL	7264.1		5652.1			21.7		
ANNUAL MEAN	19.9		15.4			40.9		
HIGHEST ANNUAL MEAN						8.94		
LOWEST ANNUAL MEAN						1926		
HIGHEST DAILY MEAN	288	Dec 14	642	Sep 11	1440	Dec 1	1957	
LOWEST DAILY MEAN	1.9	Oct 12	1.9	Oct 12	.99	May 17	1966	
ANNUAL SEVEN-DAY MINIMUM	2.0	Oct 7	2.0	Oct 7	1.1	May 26	1966	
ANNUAL RUNOFF (AC-FT)	14410		11210		15720			
10 PERCENT EXCEEDS	48		28		46			
50 PERCENT EXCEEDS	6.4		4.8		6.6			
90 PERCENT EXCEEDS	2.8		2.6		2.5			



HAWAII, ISLAND OF KAUAI

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 1991 TO SEPTEMBER 1992

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 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
DEC 1991 06...	1030	26	26	6.1	14.0	6	0.97	0.93	3.2	52
FEB 1992 26...	1100	6.9	26	6.8	12.0	5	0.83	0.77	3.3	57
MAY 27...	1100	3.5	33	7.2	16.5	6	0.93	0.92	4.3	59

DATE	SODIUM AD- SORP- TION RATIO	POTAS- SIUM, DIS- SOLVED (MG/L AS K)	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 DAY)	IRON, DIS- SOLVED (UG/L AS FE)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)
DEC 1991 06...	0.6	0.20	0.50	3.8	<0.10	2.1	15	1.09	650	7
FEB 1992 26...	0.6	0.20	0.60	5.5	<0.10	5.5	19	0.36	180	<1
MAY 27...	0.8	0.40	0.50	6.4	<0.10	4.9	21	0.20	220	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 mi².

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 discharge which are fair. Several upstream diversions for power and irrigation.

AVERAGE DISCHARGE.--51 years (water years 1911-17, 1945-68, 1970-72, 1976-92), 126 ft³/s (91,290 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 37,100 ft³/s, Feb. 7, 1949, gage height, 19.3 ft, from rating curve extended above 5,200 ft³/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 ft³/s, from rating curve extended above 2,200 ft³/s on basis of slope-area measurement at gage height 19.05 ft.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 31,020 ft³/s, Sep. 11, gage height 19.45 ft, no other peak greater than base discharge of 8,700 ft³/s; minimum, 4.9 ft³/s, Apr. 23-25.

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	14	57	79	76	9.3	32	8.1	6.0	9.1	7.5	33	7.9
2	13	55	77	355	8.6	29	7.6	5.7	8.7	7.5	11	7.7
3	13	53	38	123	8.1	27	7.1	5.7	8.7	7.4	8.1	13
4	13	51	23	64	9.8	77	9.3	7.3	9.2	7.3	7.8	25
5	13	48	24	48	150	46	8.5	23	9.7	7.2	10	31
6	13	36	124	37	530	29	8.3	8.5	8.7	7.1	134	21
7	13	48	130	18	164	23	8.1	6.6	12	7.5	76	11
8	13	68	53	23	47	20	14	7.4	10	65	84	8.4
9	14	52	29	41	24	16	9.7	16	11	318	57	7.7
10	13	40	40	32	15	14	7.4	16	28	80	16	7.3
11	22	37	77	24	9.7	98	6.9	8.1	65	19	10	4400
12	15	41	55	24	12	424	6.7	6.1	19	10	12	1440
13	14	44	222	31	452	256	6.5	5.6	28	8.3	9.9	e250
14	21	79	2170	23	742	146	6.3	6.4	38	8.2	8.0	e140
15	742	136	334	57	229	133	6.2	13	44	7.8	8.1	e160
16	796	71	142	42	153	54	6.4	79	53	7.9	8.3	e250
17	2210	56	90	20	130	36	7.0	56	124	9.2	131	e100
18	391	48	89	17	456	96	7.2	109	68	9.6	49	e60
19	208	50	442	39	282	37	6.9	44	23	11	12	e40
20	133	84	124	17	162	24	6.7	158	12	19	8.4	e35
21	100	50	77	12	155	70	5.8	172	11	29	7.9	e40
22	83	40	64	10	282	62	5.5	414	10	11	8.5	e32
23	73	42	87	15	135	27	5.5	146	8.4	45	11	e30
24	92	42	59	15	101	19	5.1	67	8.0	64	11	e29
25	94	21	182	9.5	115	17	5.7	39	8.0	17	8.3	e30
26	73	13	234	8.7	73	20	6.2	27	7.7	11	7.5	e25
27	131	47	76	8.4	54	17	6.0	21	7.5	8.5	7.3	e20
28	131	33	52	8.0	42	12	5.6	21	7.4	9.1	7.3	e17
29	76	353	155	9.3	36	10	5.4	12	7.4	39	7.4	e16
30	65	404	141	9.2	---	8.6	5.6	9.9	7.6	20	7.5	e15
31	60	---	85	8.7	---	8.0	---	9.5	---	10	7.8	---
TOTAL	5662	2199	5574	1224.8	4586.5	1887.6	211.3	1525.8	672.1	888.1	785.1	7269.0
MEAN	183	73.3	180	39.5	158	60.9	7.04	49.2	22.4	28.6	25.3	242
MAX	2210	404	2170	355	742	424	14	414	124	318	134	4400
MIN	13	13	23	8.0	8.1	8.0	5.1	5.6	7.4	7.1	7.3	7.3
AC-FT	11230	4360	11060	2430	9100	3740	419	3030	1330	1760	1560	14420

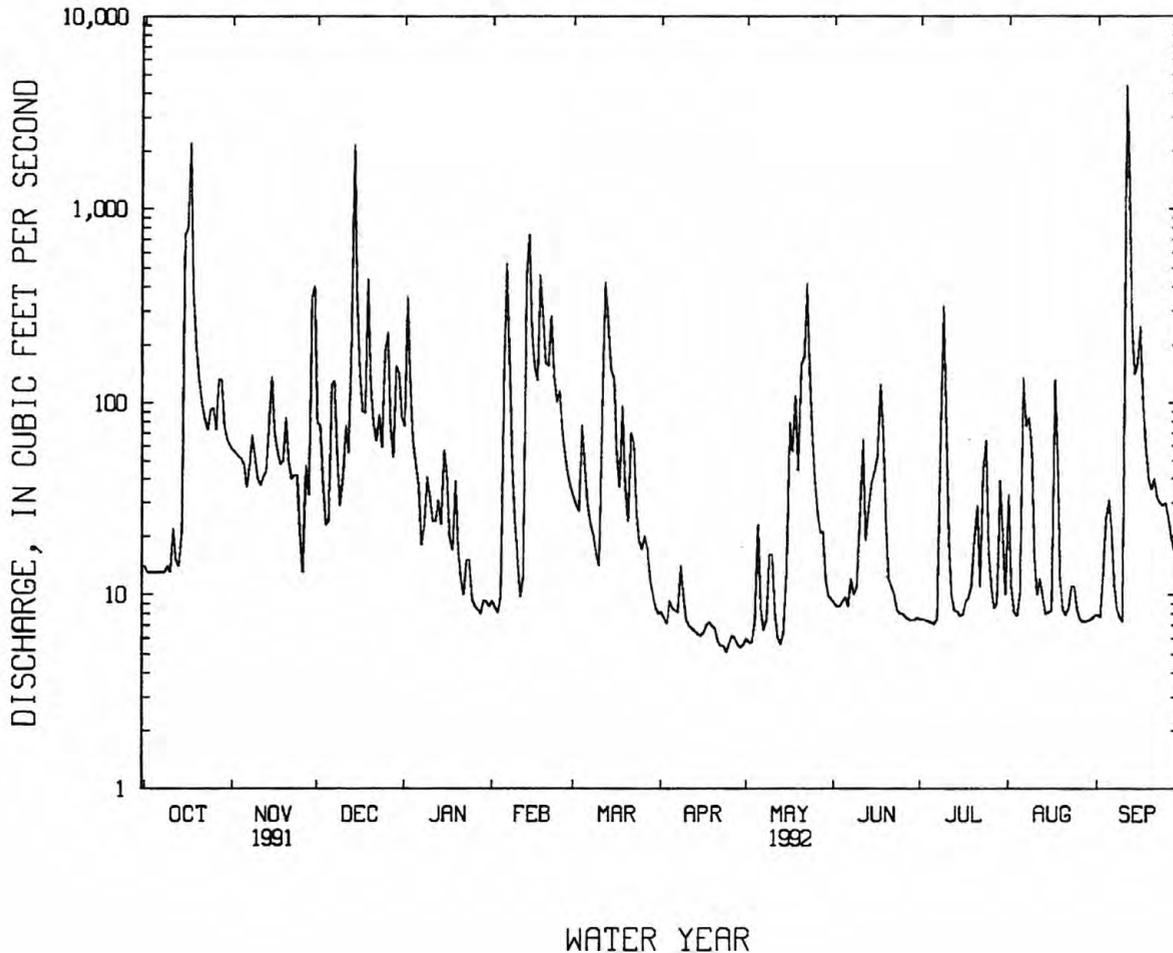
e Estimated

16031000 WAIMEA RIVER NEAR WAIMEA--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1910 - 1992, BY WATER YEAR (WY)

MEAN	59.4	184	217	264	198	221	145	65.8	25.5	43.0	60.3	33.0
MAX (WY)	352	1632	1285	1639	996	1113	589	244	125	423	1453	294
MIN (WY)	2.79	8.94	8.39	2.28	2.97	4.91	1.60	.95	1.02	2.54	.000	1.13
	1950	1945	1977	1945	1978	1959	1966	1966	1912	1953	1911	1949

SUMMARY STATISTICS FOR 1991 CALENDAR YEAR		FOR 1992 WATER YEAR		WATER YEARS 1910 - 1992	
ANNUAL TOTAL	41262.5	32485.3		126	
ANNUAL MEAN	113	88.8		297	1982
HIGHEST ANNUAL MEAN				24.1	1984
LOWEST ANNUAL MEAN				17300	Aug 16 1950
HIGHEST DAILY MEAN	2210	4400	Sep 11	.00	Jun 12 1911
LOWEST DAILY MEAN	9.6	5.1	Apr 24	.00	Jun 16 1911
ANNUAL SEVEN-DAY MINIMUM	10	5.6	Apr 23		
ANNUAL RUNOFF (AC-FT)	81840	64430		91510	
10 PERCENT EXCEEDS	236	154		252	
50 PERCENT EXCEEDS	38	23		15	
90 PERCENT EXCEEDS	13	7.4		2.1	



HAWAII, ISLAND OF KAUAI

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 1991 TO SEPTEMBER 1992

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 WATER (DEG C)	TUR-BID-ITY (NTU)	BARO-METRIC PRES-SURE (MM OF HG)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, (PER-CENT SATUR-ATION)	COLI-FORM, FECAL, UM-MF (COLS./100 ML)	STREP-TOCOCCI, FECAL, KF AGAR (COLS. PER 100 ML)
OCT 1991	08...	14	140	8.1	23.5	1.0	763	8.4	99	210	1500
DEC	10...	41	118	8.2	20.0	1.6	761	9.6	106	190	5600
FEB 1992	11...	9.1	128	8.1	18.0	1.5	763	9.6	101	94	1000
APR	21...	6.1	165	8.3	23.0	0.60	760	8.6	101	91	420
JUN	09...	12	154	8.4	24.5	1.5	762	8.4	101	210	330
AUG	11...	10	111	8.2	24.0	2.0	761	8.7	104	190	610

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)
OCT 1991	54	2	7.0	8.9	8.3	25	0.5	0.70	64	0	53
DEC	40	0	5.3	6.5	6.5	26	0.4	0.60	51	0	42
FEB 1992	43	0	5.8	7.0	7.0	26	0.5	0.50	56	0	46
APR	62	0	8.4	10	9.4	25	0.5	0.70	77	0	63
JUN	57	0	7.5	9.4	9.4	26	0.5	0.70	67	2	59
AUG	41	0	5.2	6.8	6.7	26	0.5	0.50	53	0	43

DATE	SULFATE DIS-SOLVED (MG/L AS SO4)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)	FLUO-RIDE, DIS-SOLVED (MG/L AS F)	SILICA, DIS-SOLVED (MG/L AS SiO2)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L)	SOLIDS, DIS-SOLVED (TONS PER DAY)	NITRO-GEN, NITRITE TOTAL (MG/L AS N)	NITRO-GEN, NITRITE DIS-SOLVED (MG/L AS N)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N)
OCT 1991	1.3	9.3	0.20	25	84	92	3.24	<0.010	<0.010	<0.050
DEC	1.5	9.0	0.20	20	76	75	8.39	<0.010	<0.010	<0.050
FEB 1992	1.5	12	0.10	19	77	81	1.89	<0.010	<0.010	<0.050
APR	2.0	15	0.20	23	107	107	1.76	<0.010	<0.010	<0.050
JUN	1.5	14	<0.10	23	99	100	3.13	<0.010	<0.010	<0.050
AUG	1.0	8.9	<0.10	20	75	75	2.11	<0.010	<0.010	<0.050

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

16031000 WAIMEA RIVER NEAR WAIMEA--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1991 TO SEPTEMBER 1992

DATE	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N)	NITRO-GEN, AMMONIA TOTAL (MG/L AS N)	NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS NH4)	NITRO-GEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)	PHOS-PHORUS TOTAL (MG/L AS P)	PHOS-PHORUS DIS-SOLVED (MG/L AS P)	PHOS-PHORUS ORTHO TOTAL (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)
OCT 1991 08...	<0.050	0.010	0.01	0.30	0.030	0.010	0.020	<0.010	10	<2
DEC 10...	0.080	<0.010	--	<0.20	<0.010	<0.010	0.010	<0.010	--	--
FEB 1992 11...	<0.050	0.010	--	<0.20	<0.010	<0.010	<0.010	<0.010	30	<2
APR 21...	<0.050	<0.010	--	<0.20	<0.010	0.010	<0.010	<0.010	<10	<2
JUN 09...	<0.050	0.010	0.01	<0.20	0.020	0.030	0.010	<0.010	--	--
AUG 11...	<0.050	0.020	0.04	<0.20	0.010	0.010	<0.010	<0.010	20	<2

DATE	TIME	COBALT, DIS-SOLVED (UG/L AS CO)	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 1991 08...	1000	<3	75	<4	7	<10	2	<1	<1.0	43	<6
FEB 1992 11...	1000	<3	85	<4	10	<10	1	<1	<1.0	36	<6
APR 21...	1000	<3	110	<4	14	<10	1	<1	<1.0	53	<6
AUG 11...	1000	<3	150	<4	10	<10	2	<1	<1.0	34	<6

CROSS SECTION ANALYSES, WATER YEAR OCTOBER 1991 TO SEPTEMBER 1992

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 HG)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, (PER-CENT SATUR-ATION)	
DEC 1991 10...	1000		0.5	118	8.2	20.0	761	9.4	104
10...	1005		2.2	118	8.2	20.0	761	9.6	106
10...	1010		3.8	118	8.2	20.0	761	9.6	106
10...	1015		5.4	118	8.2	20.0	761	9.6	106
10...	1020		7.0	118	8.2	20.0	761	9.5	105
10...	1025		1.0	118	8.2	20.0	761	9.5	105

PARTICLE-SIZE DISTRIBUTION OF SUSPENDED SEDIMENT, WATER YEAR OCTOBER 1991 TO SEPTEMBER 1992

DATE	TIME	SEDI-MENT, DIS-SOLVED (MG/L)	SEDI-MENT, CHARGE, SUS-PENDED (T/DAY)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM	DATE	TIME	SEDI-MENT, DIS-SOLVED (MG/L)	SEDI-MENT, CHARGE, SUS-PENDED (T/DAY)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM
OCT 1991 08...	1000	2	0.08	100	APR 1992 21...	1000	2	0.03	100
DEC 10...	1030	1	0.11	100	JUN 09...	1000	3	0.09	100
FEB 1992 11...	1000	3	0.07	100	AUG 11...	1000	13	0.37	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 mi².

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. Olokele ditch diverts all low flow from the headwaters of the Olokele River 9 mi upstream for irrigation in vicinity of Makaweli. A 5 ft³/s capacity ditch diverts water from upstream of the station for irrigation of taro in the vicinity of the station.

AVERAGE DISCHARGE.--49 years, 87.5 ft³/s (63,420 acre-ft/yr).

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

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 4,700 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Oct. 17	0430	7,910	10.10	Feb. 13	1530	5,220	8.55
Dec. 14	0230	5,690	8.86	Sep. 11	1600	*13,850	*12.55

Minimum discharge, 9.8 ft³/s, Aug. 26-29, Sep. 9-11

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1991 TO SEPTEMBER 1992
DAILY MEAN VALUES

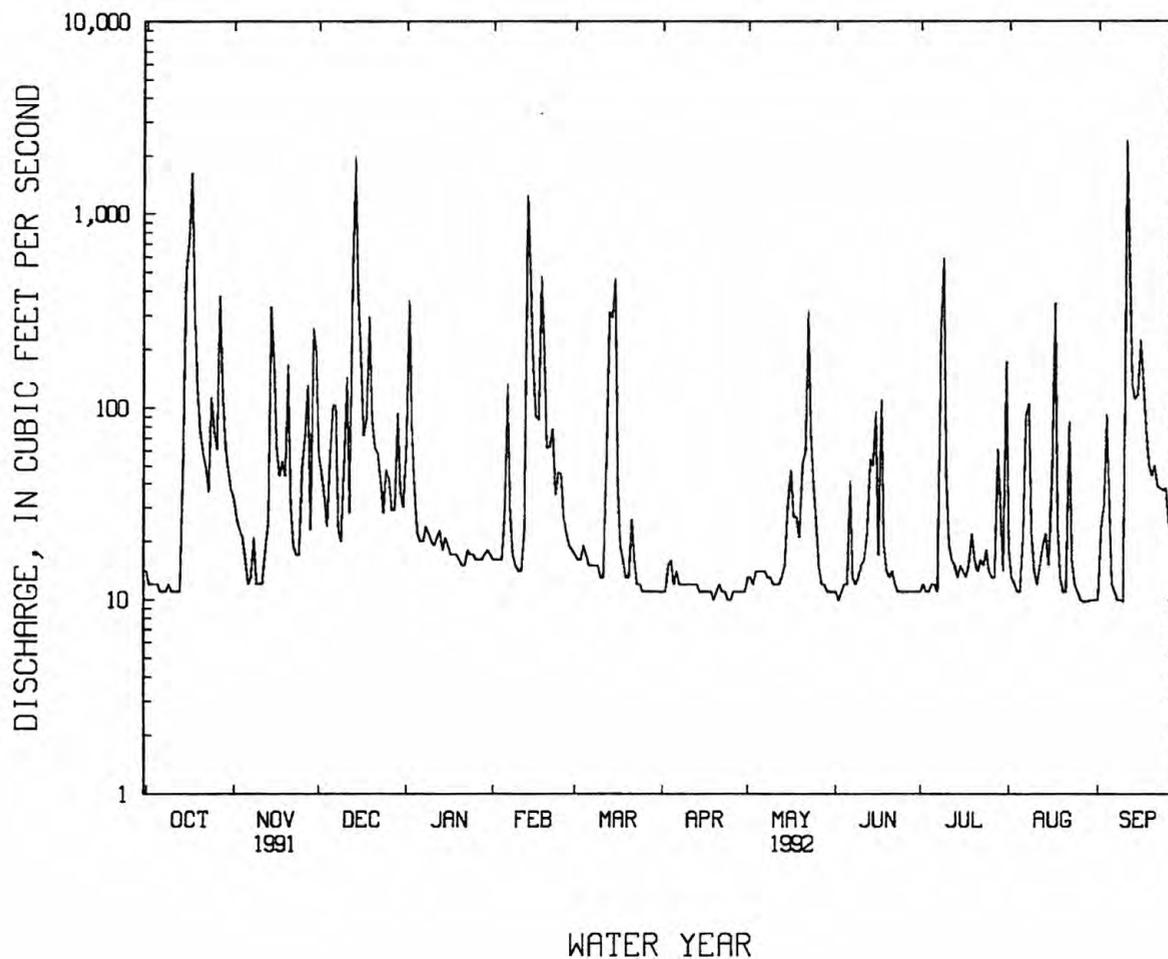
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	14	33	58	67	16	17	11	13	11	11	18	10
2	12	26	46	359	16	16	11	13	10	12	13	24
3	12	23	34	73	16	16	15	12	11	11	12	31
4	12	21	24	37	16	19	16	14	12	11	11	92
5	12	16	59	22	29	17	12	14	12	12	11	31
6	11	12	103	20	132	15	14	14	41	12	21	12
7	11	13	103	20	29	15	12	14	13	11	92	11
8	11	21	23	24	17	15	12	13	12	241	105	10
9	12	12	20	22	15	15	12	13	13	587	22	10
10	11	12	53	20	14	13	12	12	15	43	14	9.8
11	11	12	144	19	14	13	12	12	16	19	12	2400
12	11	18	28	21	23	55	12	12	22	16	15	581
13	11	25	466	23	1230	312	12	13	54	15	19	130
14	50	331	1960	18	510	291	11	15	50	13	22	111
15	501	175	399	21	166	460	11	32	95	15	15	117
16	730	62	183	19	91	39	11	47	17	14	45	223
17	1630	44	72	17	87	19	11	27	110	13	347	138
18	351	53	88	17	476	16	11	27	19	15	24	77
19	135	44	296	17	201	13	10	21	14	22	13	50
20	77	167	88	16	62	13	11	51	13	16	11	44
21	58	32	62	15	63	26	12	60	14	14	11	50
22	49	19	58	15	78	16	11	315	12	16	85	39
23	36	17	42	18	35	12	11	72	11	15	16	38
24	113	17	28	17	46	12	10	40	11	18	12	37
25	76	49	48	17	45	11	10	25	11	14	11	38
26	61	73	42	16	27	11	11	15	11	13	10	25
27	389	131	29	16	22	11	11	12	11	13	9.8	21
28	125	23	29	16	19	11	11	12	11	61	9.8	21
29	63	258	94	17	18	11	11	11	11	30	9.9	19
30	47	200	36	18	---	11	11	11	11	14	10	17
31	37	---	30	17	---	11	---	11	---	172	10	---
TOTAL	4679	1939	4745	1034	3513	1532	348	973	674	1489	1036.5	4416.8
MEAN	151	64.6	153	33.4	121	49.4	11.6	31.4	22.5	48.0	33.4	147
MAX	1630	331	1960	359	1230	460	16	315	110	587	347	2400
MIN	11	12	20	15	14	11	10	11	10	11	9.8	9.8
AC-FT	9280	3850	9410	2050	6970	3040	690	1930	1340	2950	2060	8760

16036000 MAKAWELI RIVER NEAR WAIMEA--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1943 - 1992, BY WATER YEAR (WY)

MEAN	54.2	123	139	136	118	138	101	60.2	37.5	53.0	54.5	33.9
MAX	265	491	444	441	774	609	419	283	101	222	328	147
(WY)	1983	1991	1958	1989	1956	1982	1963	1965	1980	1989	1950	1992
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 1991 CALENDAR YEAR			FOR 1992 WATER YEAR		WATER YEARS 1943 - 1992	
ANNUAL TOTAL	37996		26379.3		87.2	
ANNUAL MEAN	104		72.1		204	1982
HIGHEST ANNUAL MEAN					31.1	1984
LOWEST ANNUAL MEAN					5170	Dec 1 1957
HIGHEST DAILY MEAN	1960	Dec 14	2400	Sep 11	4.3	Jul 19 1951
LOWEST DAILY MEAN	11	Sep 11	9.8	Aug 27	5.7	Oct 21 1944
ANNUAL SEVEN-DAY MINIMUM	11	Oct 6	9.9	Aug 26		
ANNUAL RUNOFF (AC-FT)	75370		52320		63190	
10 PERCENT EXCEEDS	249		131		173	
50 PERCENT EXCEEDS	29		17		27	
90 PERCENT EXCEEDS	14		11		12	



16049000 HANAPEPE RIVER BELOW MANUAHI STREAM, NEAR ELEELE

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

DRAINAGE AREA.--18.5 mi².

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

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

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

REMARKS.--Records good. Koula ditch diverts 3.0 mi upstream for irrigation in vicinity of Makaweli.

AVERAGE DISCHARGE.--68 years (water years 1918-20, 1928-92), 85.3 ft³/s (61,780 acre-ft/yr).

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

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 3,600 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Oct. 17	0330	5,900	7.50	Feb. 13	1400	4,290	6.64
Dec. 14	0200	*6,300	*7.70	Sep. 11	1600	5,540	7.32

Minimum discharge, 12 ft³/s, Jun. 7

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1991 TO SEPTEMBER 1992
DAILY MEAN VALUES

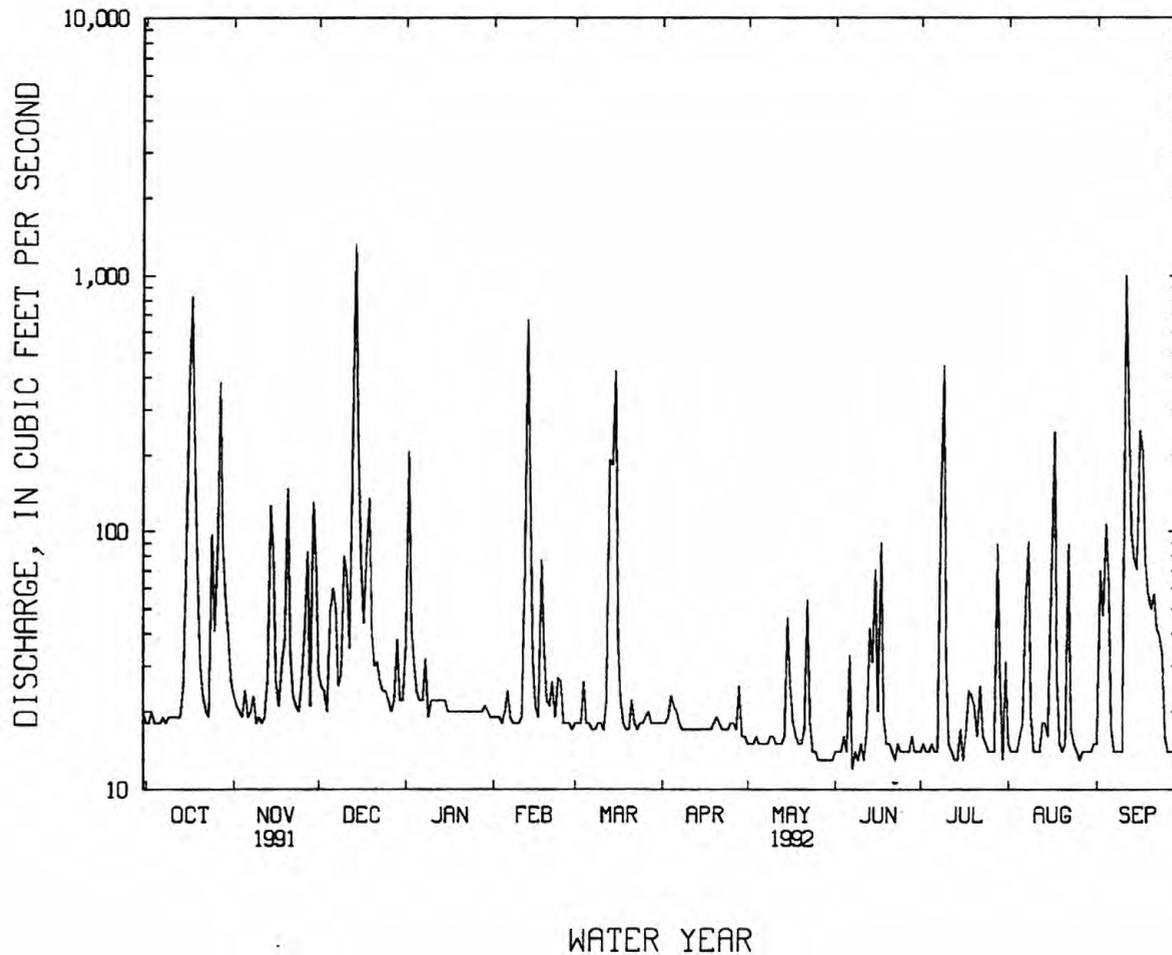
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	18	23	28	36	19	18	18	15	14	14	15	15
2	18	21	25	208	19	18	18	15	14	15	14	70
3	20	20	24	43	19	18	19	15	14	14	14	47
4	18	19	20	31	18	26	23	16	16	14	14	107
5	18	24	49	24	20	18	21	15	14	15	16	64
6	18	19	60	22	24	18	20	15	33	14	18	17
7	19	20	51	22	19	17	18	15	12	14	55	14
8	18	23	25	32	18	17	17	15	14	135	91	14
9	19	18	28	19	18	18	17	16	13	444	19	14
10	19	19	80	22	18	18	17	16	15	32	14	14
11	19	18	66	22	19	17	17	15	13	15	14	1000
12	19	19	35	22	65	22	17	15	17	14	14	341
13	19	27	234	22	669	192	17	15	42	13	18	99
14	25	126	1320	22	136	183	17	16	31	13	18	78
15	83	85	221	22	32	424	17	46	71	17	16	71
16	371	26	76	20	21	38	17	25	20	13	67	250
17	830	21	44	20	19	22	17	18	90	17	247	207
18	188	30	86	20	77	18	17	16	19	24	27	75
19	66	38	135	20	36	17	18	15	15	23	15	57
20	30	147	40	20	22	17	19	15	15	21	14	50
21	23	33	30	20	21	22	18	17	14	16	15	57
22	20	23	31	20	26	18	17	54	13	25	89	42
23	19	21	26	20	19	17	17	18	15	16	17	39
24	97	20	24	20	27	18	17	14	14	15	15	33
25	41	26	24	20	26	18	18	14	14	14	14	16
26	85	41	22	20	18	19	18	13	14	14	13	14
27	383	83	20	20	18	20	17	13	14	14	14	14
28	88	21	22	20	18	18	25	13	16	89	14	14
29	54	130	38	21	17	18	16	13	14	27	14	14
30	39	74	22	20	---	18	16	13	14	13	14	15
31	26	---	22	19	---	18	---	13	---	31	15	---
TOTAL	2710	1215	2928	889	1478	1340	540	544	634	1155	954	2862
MEAN	87.4	40.5	94.5	28.7	51.0	43.2	18.0	17.5	21.1	37.3	30.8	95.4
MAX	830	147	1320	208	669	424	25	54	90	444	247	1000
MIN	18	18	20	19	17	17	16	13	12	13	13	14
AC-FT	5380	2410	5810	1760	2930	2660	1070	1080	1260	2290	1890	5680

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

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1917 - 1992, BY WATER YEAR (WY)

MEAN	59.1	105	114	113	100	120	94.0	68.6	52.0	73.0	75.1	52.2
MAX	192	430	720	578	657	803	470	201	175	202	222	174
(WY)	1983	1991	1920	1920	1932	1918	1963	1965	1978	1989	1931	1935
MIN	11.5	15.3	13.0	11.7	15.0	8.84	13.2	12.9	12.1	13.6	18.4	11.7
(WY)	1954	1977	1986	1986	1986	1959	1941	1958	1959	1953	1953	1953

SUMMARY STATISTICS FOR 1991 CALENDAR YEAR	FOR 1992 WATER YEAR		WATER YEARS 1917 - 1992	
ANNUAL TOTAL	28074	17249		
ANNUAL MEAN	76.9	47.1	85.3	
HIGHEST ANNUAL MEAN			182	1918
LOWEST ANNUAL MEAN			30.6	1953
HIGHEST DAILY MEAN	2070	1320	10900	Dec 3 1919
LOWEST DAILY MEAN	17	12	5.3	May 21 1954
ANNUAL SEVEN-DAY MINIMUM	18	13	6.4	May 10 1954
ANNUAL RUNOFF (AC-FT)	55680	34210	61780	
10 PERCENT EXCEEDS	152	83	176	
50 PERCENT EXCEEDS	28	19	30	
90 PERCENT EXCEEDS	19	14	15	



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 mi².

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.--75 years (water years 1913-18, 1920, 1922-24, 1926-56, 1959-92), 117 ft³/s (84,770 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 87,300 ft³/s, Apr. 15, 1963, gage height, 22.90 ft, from rating curve extended above 13,000 ft³/s on basis of slope-area measurement of peak flow; minimum, 1.5 ft³/s, Aug. 21, 1984.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 5,800 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Dec. 14	0230	*28,780	*18.92	Sep. 11	2000	6,230	14.68
Feb. 13	1530	6,880	14.95				

Minimum discharge, 2.5 ft³/s, Jul. 7, 8.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1991 TO SEPTEMBER 1992
DAILY MEAN VALUES

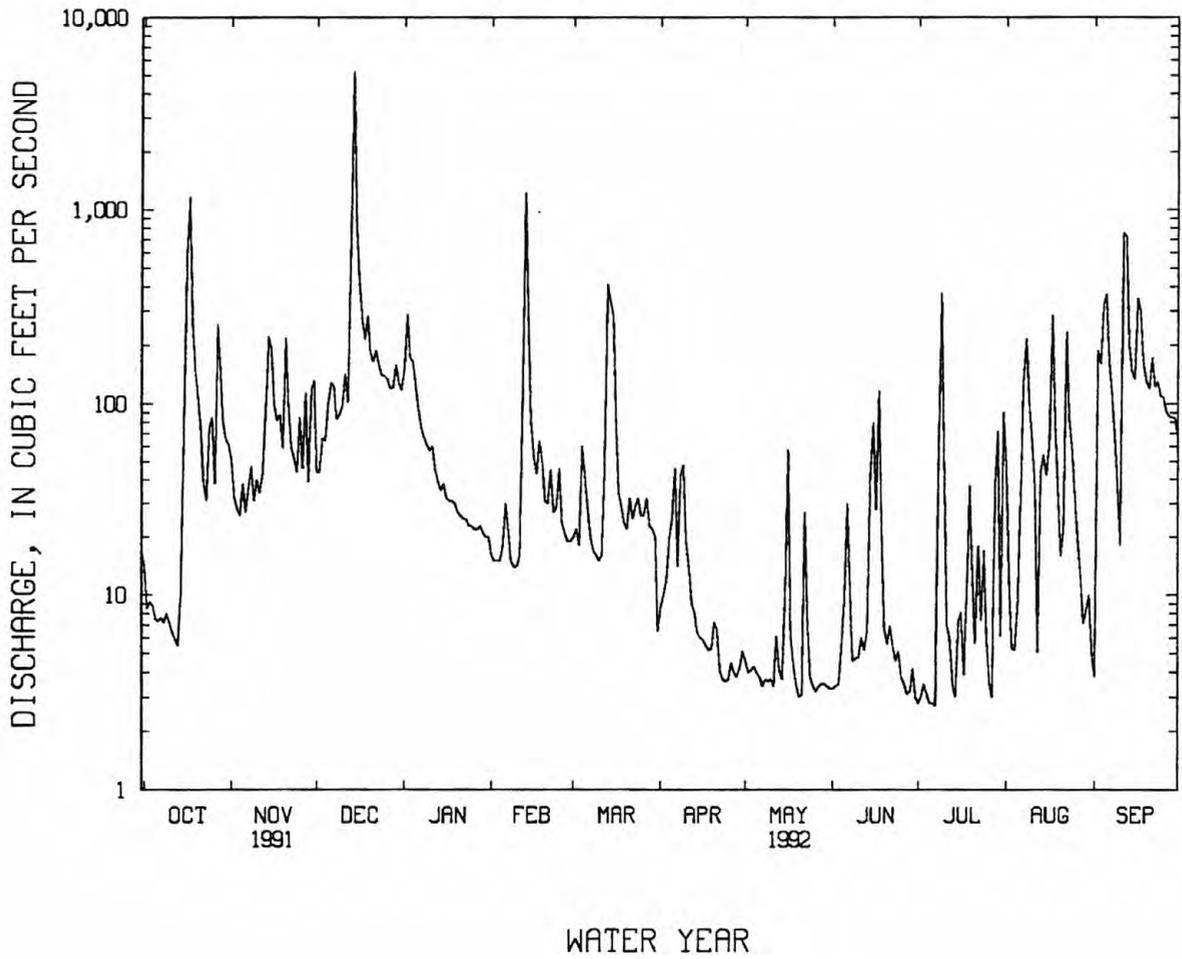
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	14	51	44	152	16	20	8.6	4.6	3.3	2.8	48	3.8
2	8.5	32	44	288	15	22	10	4.0	3.4	3.0	12	187
3	9.2	28	66	173	15	18	12	4.1	3.5	3.5	5.3	161
4	8.8	26	64	164	15	60	20	4.3	5.4	3.1	5.2	325
5	7.5	38	100	126	18	43	25	4.0	9.1	2.8	9.1	363
6	7.3	27	129	95	30	29	46	3.8	30	2.8	33	162
7	7.6	36	123	75	22	20	14	3.4	11	2.7	134	112
8	7.2	47	83	67	15	17	42	3.7	4.6	56	216	69
9	8.0	31	88	61	14	16	48	3.6	4.7	369	103	35
10	7.2	40	97	57	14	15	19	3.7	4.8	46	64	18
11	6.4	34	142	60	16	16	14	3.4	6.0	7.1	36	758
12	5.9	43	102	45	102	43	9.1	6.1	5.2	5.9	5.1	724
13	5.5	92	682	39	1220	410	8.1	4.1	6.6	3.5	44	199
14	10	221	5250	35	279	332	6.4	3.7	43	3.0	54	147
15	66	191	843	38	83	282	6.0	9.1	80	7.3	42	134
16	596	98	429	32	54	80	5.9	58	28	8.1	61	348
17	1160	82	274	31	43	34	5.5	6.2	117	3.9	285	300
18	266	88	216	31	64	29	5.2	4.4	21	10	79	164
19	149	59	283	30	50	24	5.3	3.5	6.7	37	34	131
20	113	219	185	27	31	22	7.2	3.0	5.6	13	16	120
21	76	98	165	26	30	32	6.6	3.1	6.9	5.6	22	172
22	38	60	188	25	45	25	4.1	27	5.4	18	234	123
23	31	52	157	25	27	29	3.7	7.6	4.6	7.4	83	130
24	74	44	140	23	29	32	3.6	3.8	5.1	17	57	110
25	85	85	139	23	46	26	3.7	3.4	3.8	5.9	32	108
26	38	46	134	22	24	26	4.5	3.2	3.5	3.5	19	91
27	257	113	120	22	21	32	4.0	3.4	3.1	3.0	12	86
28	156	39	121	23	19	23	3.8	3.5	3.2	38	7.1	85
29	80	118	159	21	19	22	4.2	3.5	4.2	72	8.3	84
30	65	132	128	20	---	20	5.1	3.4	3.0	6.1	10	67
31	61	---	118	20	---	6.5	---	3.3	---	90	4.9	---
TOTAL	3424.1	2270	10813	1876	2376	1805.5	360.6	205.9	441.7	857.0	1775.0	5516.8
MEAN	110	75.7	349	60.5	81.9	58.2	12.0	6.64	14.7	27.6	57.3	184
MAX	1160	221	5250	288	1220	410	48	58	117	369	285	758
MIN	5.5	26	44	20	14	6.5	3.6	3.0	3.0	2.7	4.9	3.8
AC-FT	6790	4500	21450	3720	4710	3580	715	408	876	1700	3520	10940

16060000 SOUTH FORK WAILUA RIVER NEAR LIHUE--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1912 - 1992, BY WATER YEAR (WY)

MEAN	88.3	172	169	180	129	154	136	102	54.7	73.0	85.7	71.9
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 1991 CALENDAR YEAR			FOR 1992 WATER YEAR			WATER YEARS 1912 - 1992		
ANNUAL TOTAL	51464.4		31721.6			117		
ANNUAL MEAN	141		86.7			284		
HIGHEST ANNUAL MEAN						1982		
LOWEST ANNUAL MEAN						17.3		
HIGHEST DAILY MEAN	5250	Dec 14	5250	Dec 14	13800	Jan 16	1921	
LOWEST DAILY MEAN	5.5	Oct 13	2.7	Jul 7	1.8	Sep 17	1953	
ANNUAL SEVEN-DAY MINIMUM	6.8	Oct 7	3.0	Jul 1	1.8	Sep 16	1953	
ANNUAL RUNOFF (AC-FT)	102100		62920			84480		
10 PERCENT EXCEEDS	273		167			266		
50 PERCENT EXCEEDS	58		28			37		
90 PERCENT EXCEEDS	11		3.7			4.6		



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.--27 years, 22.5 ft³/s (16,300 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 58 ft³/s, Oct. 11, 1966; no flow for many days.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 37 ft³/s, Dec. 14; minimum daily, 3.1 ft³/s, Mar. 31, Apr. 1.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1991 TO SEPTEMBER 1992
DAILY MEAN VALUES

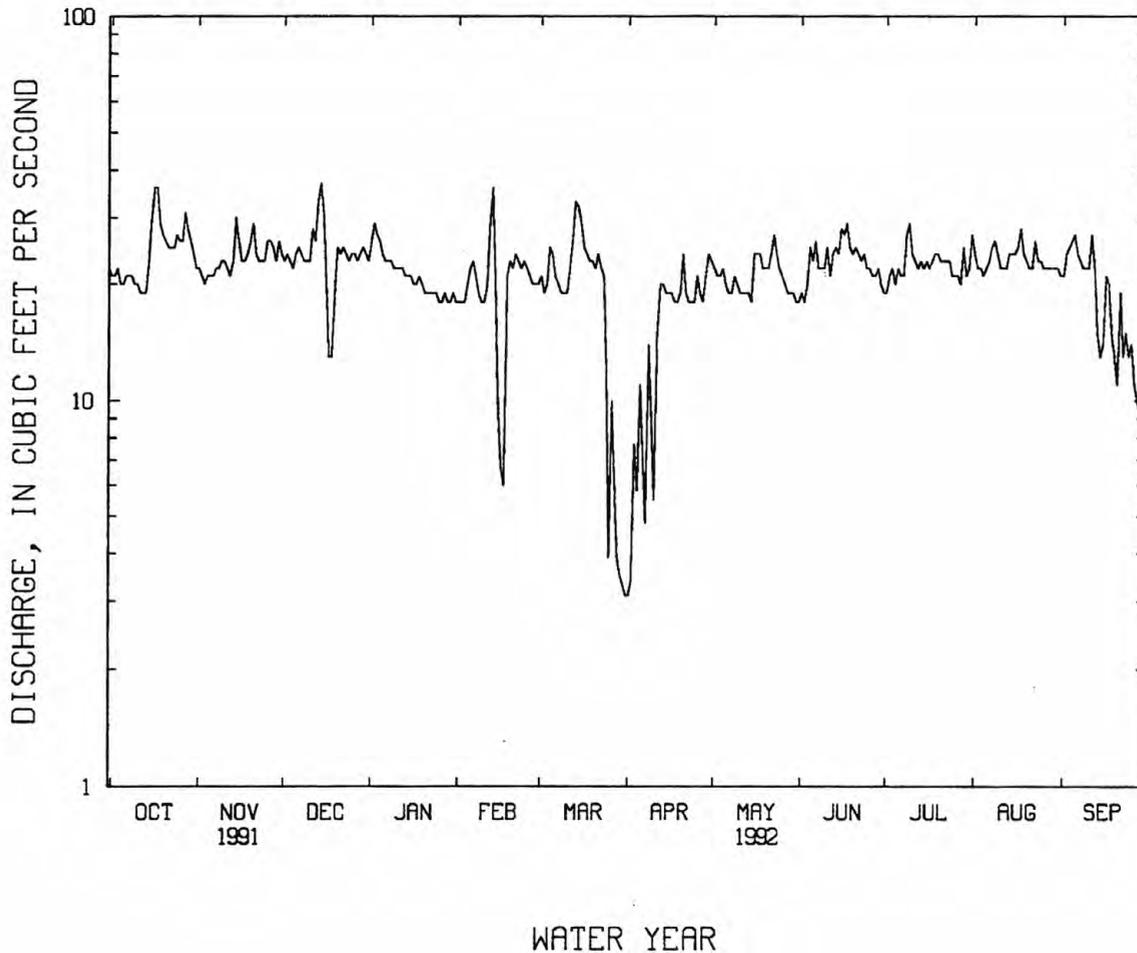
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	21	22	23	26	18	21	3.1	22	19	19	24	21
2	21	21	24	29	18	19	3.4	21	18	21	22	24
3	22	20	23	27	18	20	7.7	21	20	22	22	25
4	20	21	22	26	20	25	5.8	22	25	20	21	26
5	20	21	24	24	22	24	11	20	23	22	22	27
6	21	21	25	23	23	21	7.1	19	26	21	23	24
7	21	22	24	23	21	20	4.8	19	22	21	25	23
8	21	22	23	23	19	19	14	21	22	27	26	22
9	20	23	23	22	18	19	9.1	20	22	29	24	22
10	20	23	23	22	18	19	5.5	19	25	24	22	22
11	19	22	28	22	20	22	15	19	21	23	22	27
12	19	21	26	22	29	26	20	19	24	22	22	22
13	19	23	33	21	36	33	20	19	25	23	24	15
14	23	30	37	21	19	32	19	18	24	22	24	13
15	30	26	31	21	9.4	29	19	24	28	23	24	14
16	36	23	20	20	6.7	25	19	24	27	22	25	21
17	36	23	13	20	6.0	24	18	24	29	23	28	20
18	29	24	13	21	21	23	18	22	25	24	24	15
19	27	26	19	20	23	23	19	22	24	24	23	13
20	26	29	25	19	22	22	24	22	25	23	22	11
21	25	24	24	19	24	24	19	24	24	23	22	19
22	25	23	25	19	23	22	18	27	23	23	26	13
23	25	23	24	19	22	21	18	24	24	23	23	15
24	27	23	23	19	23	12	18	22	22	21	23	13
25	26	26	24	18	22	3.9	21	21	22	21	22	14
26	26	26	24	18	21	10	19	20	21	21	22	11
27	31	25	23	19	20	6.1	18	19	21	20	22	10
28	28	23	24	18	20	3.9	21	19	22	25	22	9.2
29	26	26	25	18	20	3.5	24	19	20	21	22	8.6
30	24	24	24	19	---	3.3	23	18	19	22	22	8.2
31	22	---	23	18	---	3.1	---	18	---	27	21	---
TOTAL	756	706	742	656	582.1	578.8	461.5	648	692	702	716	528.0
MEAN	24.4	23.5	23.9	21.2	20.1	18.7	15.4	20.9	23.1	22.6	23.1	17.6
MAX	36	30	37	29	36	33	24	27	29	29	28	27
MIN	19	20	13	18	6.0	3.1	3.1	18	18	19	21	8.2
AC-FT	1500	1400	1470	1300	1150	1150	915	1290	1370	1390	1420	1050

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

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1965 - 1992, BY WATER YEAR (WY)

MEAN	23.4	23.7	22.0	21.0	21.3	22.3	23.1	22.9	22.2	22.9	22.8	22.0
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	12.0	12.3	2.94	.70	.065	.21	.14	.097	.16	3.89	19.4	13.7
(WY)	1981	1983	1991	1991	1991	1991	1991	1991	1991	1991	1980	1991

SUMMARY STATISTICS FOR 1991 CALENDAR YEAR	FOR 1992 WATER YEAR		WATER YEARS 1965 - 1992	
ANNUAL TOTAL	3436.55	7768.4		
ANNUAL MEAN	9.42	21.2	22.4	
HIGHEST ANNUAL MEAN			30.3	1969
LOWEST ANNUAL MEAN			6.64	1991
HIGHEST DAILY MEAN	38	37	58	Oct 11 1966
LOWEST DAILY MEAN	.00	3.1	.00	Jan 1 1965
ANNUAL SEVEN-DAY MINIMUM	.00	3.8	.00	Jan 1 1965
ANNUAL RUNOFF (AC-FT)	6820	15410	16240	
10 PERCENT EXCEEDS	25	26	30	
50 PERCENT EXCEEDS	.64	22	22	
90 PERCENT EXCEEDS	.02	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 except for periods of estimated discharge which are poor. Ditch diverts from North Fork Wailua River for irrigation of sugarcane in vicinity of Lihue.

AVERAGE DISCHARGE.--55 years (water years 1938-92), 10.2 ft³/s (7,390 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 71 ft³/s, Apr. 3, 1948; no flow on many days.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 37 ft³/s, Jul. 9, no flow on many days.

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	2.1	e.03	.00	.00	.00	3.4	26	7.5	4.7	4.4	5.1	.15
2	.50	e.03	.00	.00	.00	3.4	27	8.7	4.3	2.9	3.8	.39
3	.50	e.03	.00	.00	.00	3.4	28	8.3	4.6	2.8	12	.41
4	.43	e.03	.00	.00	.00	2.8	28	13	8.2	3.7	15	.51
5	.39	e.03	.05	.00	.00	.91	32	9.4	5.9	5.8	4.5	.48
6	.39	e.03	.07	.00	.21	.74	29	8.5	12	5.9	1.1	.39
7	.37	e.03	.05	.00	.00	.74	27	8.4	6.4	6.5	1.1	.39
8	.31	e.03	e.03	.00	.00	.74	34	9.3	5.6	28	.90	.36
9	.22	e.03	e.03	.00	.00	.62	33	8.6	5.5	37	.50	.33
10	.15	e.03	e.03	.00	.68	.62	30	8.4	6.7	14	.50	.31
11	.15	e.03	.22	.00	3.2	.51	20	8.1	5.8	10	.39	.61
12	.15	e.03	.15	.00	7.4	.50	12	7.5	6.7	9.0	.39	.21
13	.17	e.08	.79	.00	7.3	.50	10	7.6	12	8.4	.39	.15
14	.37	e.22	3.5	.00	4.5	.44	10	7.3	8.9	8.1	.46	.04
15	.45	e.22	.22	.00	3.9	.39	9.9	15	16	12	.50	.00
16	.47	e.08	.08	.00	3.9	.39	9.4	8.4	6.0	8.4	.43	.00
17	.39	e.03	.00	.00	3.9	.38	9.2	6.3	13	9.7	.53	.00
18	.21	e.22	.00	.00	3.7	.30	9.0	5.2	4.3	12	.33	.00
19	.12	e.22	.00	.00	3.7	.30	9.3	4.8	3.5	12	.30	.00
20	.08	.23	.00	.00	3.7	.26	13	4.6	5.6	8.4	.30	.00
21	.06	.11	.00	.00	3.7	.22	10	4.4	6.3	7.1	.26	.00
22	.03	.05	.00	.00	3.7	.22	9.7	8.9	6.7	14	.39	.00
23	.03	e.08	.00	.00	3.6	.22	9.2	4.6	7.2	30	e.22	.00
24	.09	e.08	.00	.00	3.4	.22	9.1	4.0	6.7	25	e.22	.00
25	e.22	e.08	.00	.00	3.4	.22	9.7	4.0	5.2	8.3	e.22	.00
26	e.22	.09	.00	.00	3.4	.18	7.6	5.1	2.8	4.5	.15	.00
27	.14	.10	.00	.00	3.4	.15	5.6	5.1	2.7	5.3	.15	.00
28	e.03	e.03	.00	.00	3.4	.15	7.4	4.7	2.4	20	.15	.00
29	e.03	e.08	.00	.00	3.4	.15	7.4	4.5	2.6	8.7	.20	.00
30	e.03	.05	.00	.00	---	.15	6.5	3.9	4.9	2.7	.23	.00
31	e.03	---	.00	.00	---	15	---	3.1	---	25	.15	---
TOTAL	8.83	2.41	5.22	0.00	77.49	38.22	488.0	217.2	193.2	359.6	50.86	4.73
MEAN	.28	.080	.17	.000	2.67	1.23	16.3	7.01	6.44	11.6	1.64	.16
MAX	2.1	.23	3.5	.00	7.4	15	34	15	16	37	15	.61
MIN	.03	.03	.00	.00	.00	.15	5.6	3.1	2.4	2.7	.15	.00
AC-FT	18	4.8	10	.00	154	76	968	431	383	713	101	9.4

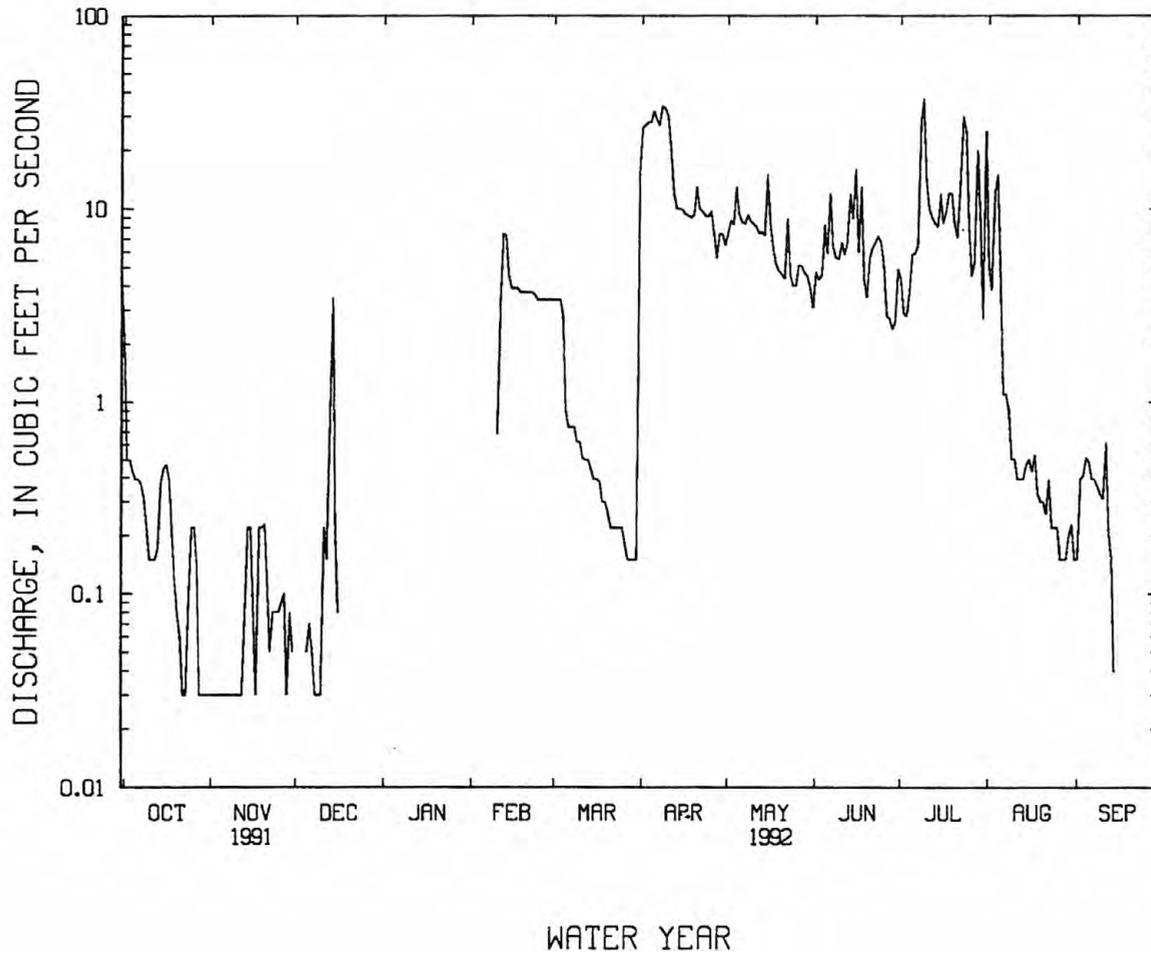
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16062000 STABLE STORM DITCH NEAR LIHUE--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1938 - 1992, BY WATER YEAR (WY)

MEAN	13.6	6.50	4.78	6.68	9.20	7.96	8.73	9.82	15.9	12.0	12.2	15.4
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 1991 CALENDAR YEAR	FOR 1992 WATER YEAR		WATER YEARS 1938 - 1992	
ANNUAL TOTAL	1862.02		1445.76	
ANNUAL MEAN	5.10		3.95	
HIGHEST ANNUAL MEAN			10.2	
LOWEST ANNUAL MEAN			22.1	
HIGHEST DAILY MEAN	52 Feb 21		.59 1984	
LOWEST DAILY MEAN	.00 Jan 1		71 Apr 3 1948	
ANNUAL SEVEN-DAY MINIMUM	.00 Jan 1		.00 Oct 1 1937	
ANNUAL RUNOFF (AC-FT)	3690		.00 Oct 1 1937	
10 PERCENT EXCEEDS	27		7400	
50 PERCENT EXCEEDS	.39		34	
90 PERCENT EXCEEDS	.00		.33	
			.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 mi².

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.--77 years (water years 1913-14, 1916-17, 1920-92), 48.6 ft³/s (35,220 acre-ft/yr).

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

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 1,900 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Dec. 14	0800	*9,070	*10.84	No other peak greater than base discharge.			

Minimum discharge, 11 ft³/s, May. 31.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1991 TO SEPTEMBER 1992
DAILY MEAN VALUES

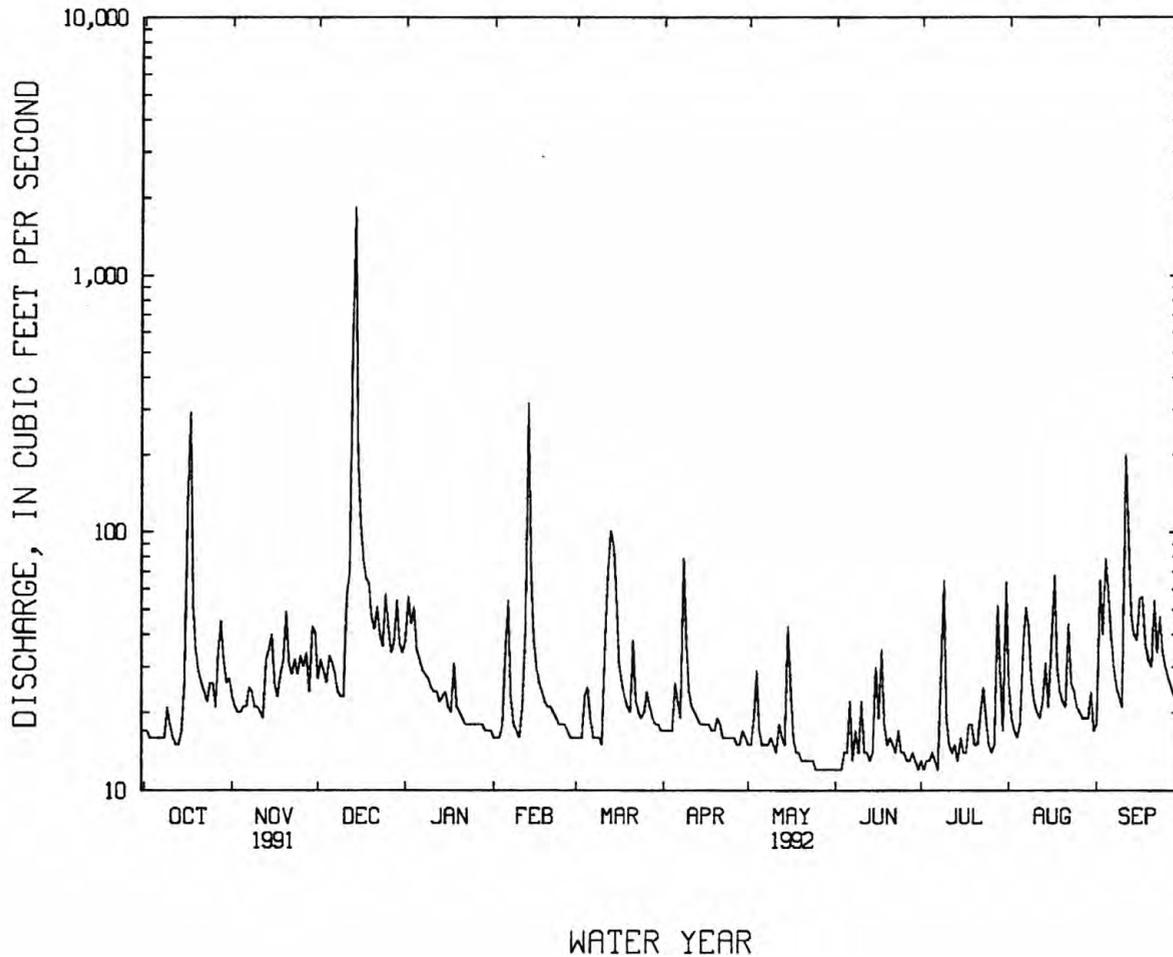
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	17	23	27	38	16	16	17	15	12	13	26	18
2	17	21	32	56	16	16	17	15	12	12	19	65
3	16	20	29	44	16	16	17	19	12	13	17	40
4	16	20	26	51	18	23	17	29	14	13	16	79
5	16	21	33	35	34	25	26	17	14	14	18	58
6	16	21	31	32	54	19	22	15	22	13	35	39
7	16	25	28	29	23	16	19	15	13	12	51	30
8	16	24	24	28	18	16	79	15	17	28	43	25
9	21	21	23	27	17	16	38	16	14	65	27	23
10	18	21	23	25	16	15	24	15	22	19	22	21
11	16	20	57	24	21	35	21	14	14	15	20	200
12	15	19	69	24	40	69	20	18	14	14	19	99
13	15	32	514	22	319	101	19	16	13	15	22	48
14	17	35	1840	23	73	88	18	15	14	13	31	40
15	26	40	194	24	39	56	18	43	30	16	21	38
16	130	26	107	21	30	31	18	25	19	14	38	55
17	292	23	78	20	26	26	18	16	35	14	68	56
18	52	28	66	31	24	23	17	14	18	18	30	37
19	35	32	63	21	22	21	17	14	15	18	24	32
20	29	49	47	20	21	20	19	13	16	15	22	30
21	26	31	42	19	21	38	18	13	15	15	21	54
22	24	28	51	18	20	22	16	13	14	20	44	34
23	22	32	40	18	19	20	16	13	17	25	26	47
24	26	28	36	18	18	19	16	13	14	19	24	34
25	26	33	58	18	18	20	16	12	14	15	21	30
26	21	30	43	18	18	24	16	12	13	14	20	27
27	34	34	34	18	17	21	15	12	13	15	19	25
28	45	24	37	18	16	19	15	12	14	52	19	23
29	32	43	54	17	16	18	17	12	13	28	19	22
30	26	41	37	17	---	18	16	12	12	17	24	21
31	27	---	34	17	---	17	---	12	---	64	17	---
TOTAL	1105	845	3777	791	1006	884	622	495	479	638	823	1350
MEAN	35.6	28.2	122	25.5	34.7	28.5	20.7	16.0	16.0	20.6	26.5	45.0
MAX	292	49	1840	56	319	101	79	43	35	65	68	200
MIN	15	19	23	17	16	15	15	12	12	12	16	18
AC-FT	2190	1680	7490	1570	2000	1750	1230	982	950	1270	1630	2680

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

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1912 - 1992, BY WATER YEAR (WY)

MEAN	40.6	60.2	59.7	60.4	47.6	57.8	57.7	48.0	33.1	38.5	40.6	35.9
MAX	94.6	226	157	392	163	270	173	144	84.9	78.4	111	106
(WY)	1983	1991	1988	1921	1979	1982	1927	1967	1978	1980	1948	1922
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 1991 CALENDAR YEAR			FOR 1992 WATER YEAR			WATER YEARS 1912 - 1992		
ANNUAL TOTAL	18429		12815					
ANNUAL MEAN	50.5		35.0			48.4		
HIGHEST ANNUAL MEAN						95.5		
LOWEST ANNUAL MEAN						21.3		
HIGHEST DAILY MEAN	1840	Dec 14	1840	Dec 14	2210	Jan 16	1921	
LOWEST DAILY MEAN	13	Mar 2	12	May 25	7.0	Jul 8	1926	
ANNUAL SEVEN-DAY MINIMUM	13	Feb 28	12	May 25	8.2	Mar 5	1986	
ANNUAL RUNOFF (AC-FT)	36550		25420			35100		
10 PERCENT EXCEEDS	78		51			84		
50 PERCENT EXCEEDS	30		21			31		
90 PERCENT EXCEEDS	16		14			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. 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.--55 years (water years 1938-92), 16.0 ft³/s (11,590 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 63 ft³/s, June 4, 1937; no flow on many days.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 32 ft³/s, Feb. 7; minimum daily, no flow Aug. 12-17.

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	20	13	20	2.5	19	23	24	13	21	18	22	20
2	20	13	20	2.5	20	23	24	13	21	11	22	20
3	21	13	20	2.3	20	23	23	13	20	4.1	22	20
4	21	13	20	2.2	21	21	23	13	20	4.1	22	21
5	21	18	20	2.2	22	19	23	15	20	4.1	22	21
6	21	24	12	2.2	28	19	23	15	20	4.1	22	21
7	21	24	7.4	2.0	32	19	23	15	20	4.2	15	21
8	22	24	7.6	1.8	31	20	23	15	19	4.3	11	21
9	22	24	17	1.8	31	20	23	15	19	4.3	10	20
10	22	24	22	2.1	31	20	23	15	19	4.3	9.8	19
11	22	24	22	2.5	30	20	23	15	19	4.2	3.5	e17
12	22	23	22	2.8	30	21	23	15	19	4.1	.00	e14
13	22	23	23	3.0	22	22	23	15	18	4.2	.00	e14
14	22	21	20	2.9	8.3	22	23	12	18	8.7	.00	e14
15	23	20	.42	15	7.6	23	23	10	18	15	.00	e14
16	24	19	.33	25	6.8	23	17	10	18	15	.00	e14
17	25	17	4.2	25	4.9	23	13	10	19	15	.00	e14
18	25	8.2	7.0	25	12	23	13	10	19	15	8.4	e14
19	25	.75	6.4	25	22	23	13	11	19	15	15	e14
20	25	.72	6.0	16	22	23	13	11	19	18	16	e14
21	25	9.3	6.0	6.2	22	23	13	11	19	22	16	e14
22	24	20	6.0	6.0	23	24	19	11	19	22	17	e14
23	25	20	5.7	13	23	24	24	11	19	22	18	e14
24	25	20	18	21	23	24	23	11	19	22	18	e14
25	25	20	24	19	23	24	23	11	19	22	19	e14
26	25	20	22	17	23	24	23	11	19	22	19	e13
27	25	20	17	13	23	24	22	10	19	22	19	e13
28	25	20	6.7	16	23	24	17	11	19	22	19	e13
29	25	20	4.8	17	23	24	13	16	19	22	20	e13
30	20	20	3.7	18	---	24	13	22	18	22	20	e13
31	13	---	2.9	19	---	24	---	21	---	22	20	---
TOTAL	703	535.97	394.15	329.0	626.6	693	606	407	574	418.7	425.70	482
MEAN	22.7	17.9	12.7	10.6	21.6	22.4	20.2	13.1	19.1	13.5	13.7	16.1
MAX	25	24	24	25	32	24	24	22	21	22	22	21
MIN	13	.72	.33	1.8	4.9	19	13	10	18	4.1	.00	13
AC-FT	1390	1060	782	653	1240	1370	1200	807	1140	830	844	956

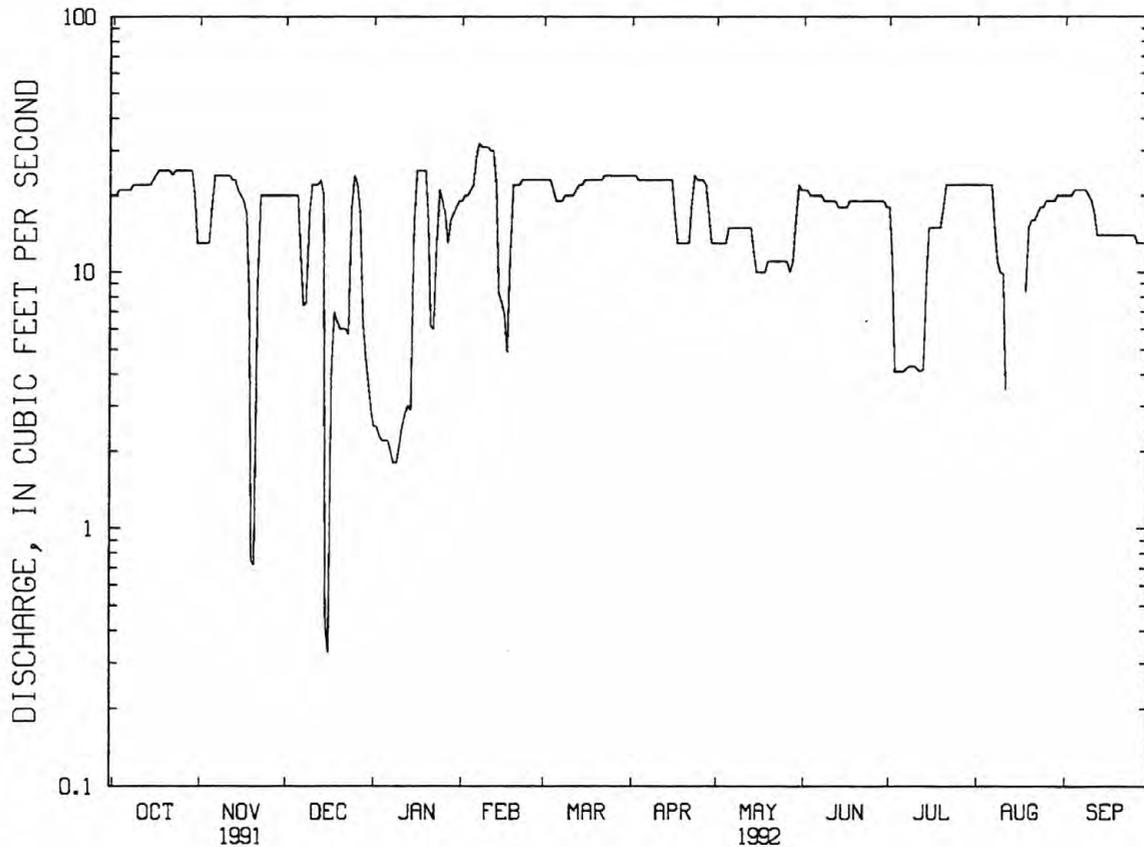
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16069000 WAILUA DITCH NEAR KAPAA--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1937 - 1992, BY WATER YEAR (WY)

MEAN	19.0	12.1	8.95	10.4	11.7	12.4	13.3	16.5	21.5	22.3	22.1	22.6
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 1991 CALENDAR YEAR	FOR 1992 WATER YEAR	WATER YEARS 1937 - 1992
ANNUAL TOTAL	6566.14	6195.12
ANNUAL MEAN	18.0	16.9
HIGHEST ANNUAL MEAN		16.0
LOWEST ANNUAL MEAN		32.9
HIGHEST DAILY MEAN	25 Jan 16	6.52
LOWEST DAILY MEAN	.17 Aug 9	63 Jun 4 1937
ANNUAL SEVEN-DAY MINIMUM	4.3 Dec 15	.00 May 15 1940
ANNUAL RUNOFF (AC-FT)	13020	.00 May 15 1940
10 PERCENT EXCEEDS	23	11590
50 PERCENT EXCEEDS	20	31
90 PERCENT EXCEEDS	12	16
		.79



WATER YEAR

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 mi².

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 except for periods of no gage height record which is poor. Wailua ditch (station 16069000) diverts upstream for irrigation of sugarcane in vicinities of Kapaa and Wailua.

AVERAGE DISCHARGE.--40 years, 124 ft³/s (90,030 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 53,200 ft³/s, Nov. 12, 1955, gage height, 19.88 ft in gage well, 20.8 ft, from floodmarks, from rating curve extended above 3,700 ft³/s on basis of slope-area measurement of peak flow; minimum, 2.1 ft³/s, Oct. 28, 1953.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 4,100 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Dec. 14	0900	*30,090	*16.02	Sep. 11	1900	4,870	7.88

Minimum discharge, 7.5 ft³/s, Jun. 26-29, Jul. 27, 28.

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	e10	42	47	137	11	e16	e10	12	8.8	9.5	38	43
2	e10	39	53	189	10	e16	e11	9.5	8.7	9.3	21	135
3	e10	36	52	157	10	e16	e11	9.0	8.7	9.3	13	102
4	10	34	43	167	10	e27	e14	17	8.8	9.3	14	233
5	10	38	55	129	11	e35	e28	13	8.8	9.2	32	183
6	10	31	63	113	43	e25	e30	8.7	16	9.5	88	110
7	9.9	37	59	104	27	e19	e20	8.3	11	8.5	166	80
8	9.8	39	43	99	26	e17	e110	8.4	9.8	30	174	76
9	12	30	41	88	20	e16	e40	8.4	9.6	121	105	83
10	13	29	42	42	13	e16	e21	8.2	12	19	81	76
11	9.7	27	207	39	14	e37	15	7.9	11	10	72	656
12	9.4	30	158	38	106	e110	10	11	9.0	10	70	327
13	9.4	69	979	36	956	e270	9.0	10	8.9	11	85	167
14	14	139	4720	e34	244	e260	9.0	9.9	11	11	107	153
15	53	109	784	e31	142	e170	8.7	28	33	13	87	135
16	251	66	392	e29	118	e70	9.0	36	17	12	115	176
17	792	57	267	e28	108	e45	10	17	55	9.9	279	155
18	120	65	226	e42	98	e38	8.5	13	19	11	114	93
19	67	56	231	33	34	e30	8.6	11	11	17	70	80
20	48	137	134	41	27	e28	9.3	10	11	12	53	74
21	39	67	123	67	28	e60	10	10	12	9.6	49	128
22	33	50	151	67	30	e35	8.6	14	8.8	14	139	87
23	29	55	125	66	20	e32	8.3	12	8.3	18	68	105
24	37	47	115	66	19	e30	8.1	9.7	9.0	24	61	88
25	45	73	159	65	18	e30	10	9.5	7.8	10	45	88
26	29	60	146	62	16	e36	9.5	9.3	7.5	8.4	38	75
27	88	98	115	42	e16	e30	8.9	8.7	7.8	8.4	35	72
28	94	47	113	14	e16	e18	8.7	8.4	7.7	75	39	66
29	59	84	163	14	e16	e15	12	10	8.6	53	43	62
30	47	94	129	13	---	e14	9.2	9.6	11	18	52	59
31	50	---	117	12	---	e10	---	9.1	---	99	38	---
TOTAL	2028.2	1785	10052	2064	2207	1571	485.4	366.6	376.6	688.9	2391	3967
MEAN	65.4	59.5	324	66.6	76.1	50.7	16.2	11.8	12.6	22.2	77.1	132
MAX	792	139	4720	189	956	270	110	36	55	121	279	656
MIN	9.4	27	41	12	10	10	8.1	7.9	7.5	8.4	13	43
AC-FT	4020	3540	19940	4090	4380	3120	963	727	747	1370	4740	7870

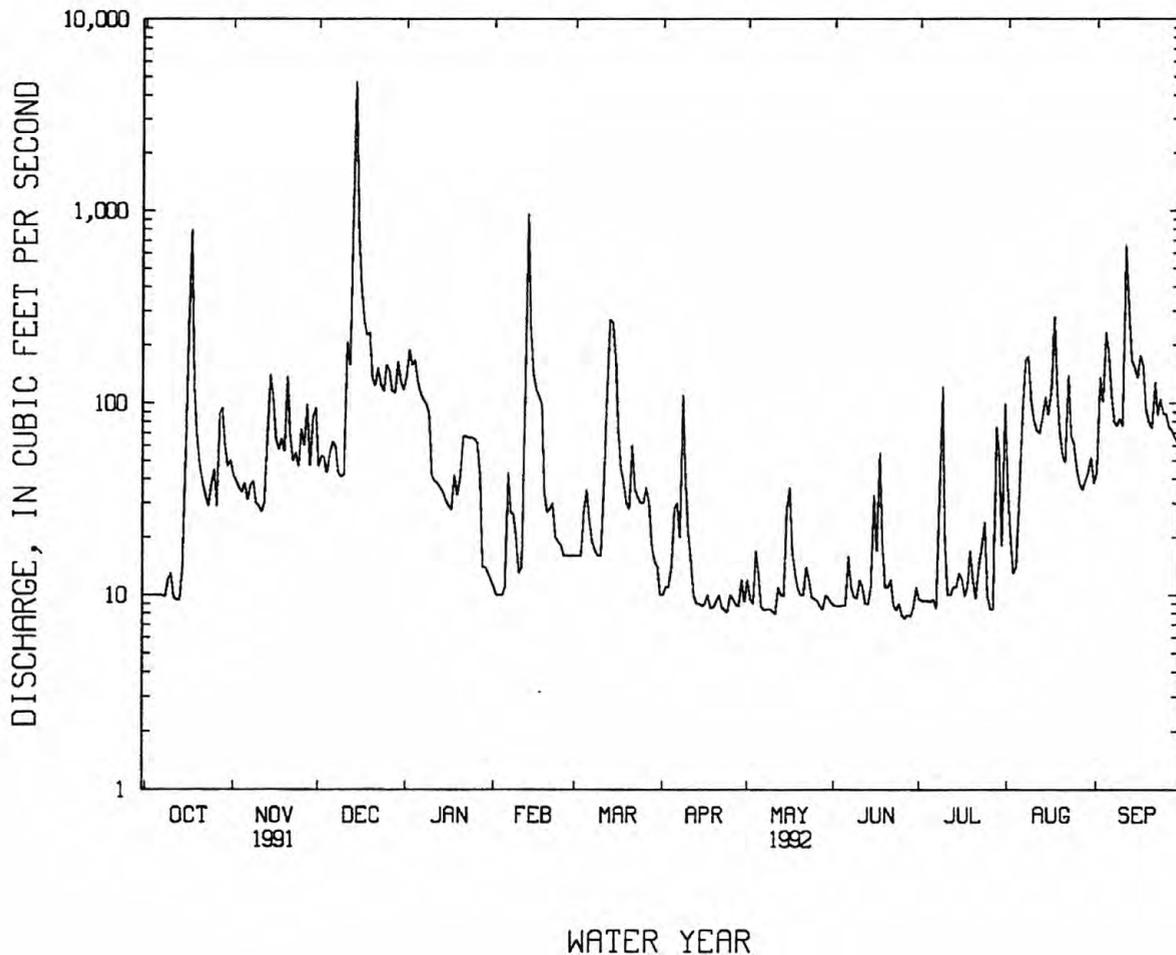
e Estimated

16071000 NORTH FORK WAILUA RIVER NEAR KAPAA--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1952 - 1992, BY WATER YEAR (WY)

MEAN	94.7	188	167	153	134	153	158	125	62.7	90.0	91.2	57.9
MAX	255	591	456	529	522	730	474	418	247	230	223	161
(WY)	1983	1991	1968	1956	1979	1982	1971	1967	1980	1980	1958	1982
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 1991 CALENDAR YEAR			FOR 1992 WATER YEAR			WATER YEARS 1952 - 1992		
ANNUAL TOTAL	44371.0		27982.7		123			
ANNUAL MEAN	122		76.5		262			
HIGHEST ANNUAL MEAN					25.7			
LOWEST ANNUAL MEAN					1982			
HIGHEST DAILY MEAN	4720	Dec 14	4720	Dec 14	7350	Jan 25	1956	
LOWEST DAILY MEAN	9.4	Oct 12	7.5	Jun 26	2.2	Oct 21	1953	
ANNUAL SEVEN-DAY MINIMUM	10	Oct 2	8.1	Jun 23	2.4	Oct 20	1953	
ANNUAL RUNOFF (AC-FT)	88010		55500		89180			
10 PERCENT EXCEEDS	200		139		260			
50 PERCENT EXCEEDS	67		32		68			
90 PERCENT EXCEEDS	14		9.0		8.0			



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 mi².

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

REVISED RECORDS.--WSP 2137: Drainage area.

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

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

AVERAGE DISCHARGE.--32 years, 2.67 ft³/s (1,930 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,060 ft³/s, Dec. 14, 1991, gage height, 6.60 ft, from rating curve extended above 415 ft³/s on basis of slope-area measurement at gage height 5.01 ft; minimum, 0.09 ft³/s, Sept. 27-30, 1968.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 70 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Dec. 14	0200	*1,060	*6.60	Feb. 13	1430	72	2.32

Minimum discharge, 0.46 ft³/s, Aug. 2-7, 9-16, Aug. 28 to Sep. 2

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1991 TO SEPTEMBER 1992
DAILY MEAN VALUES

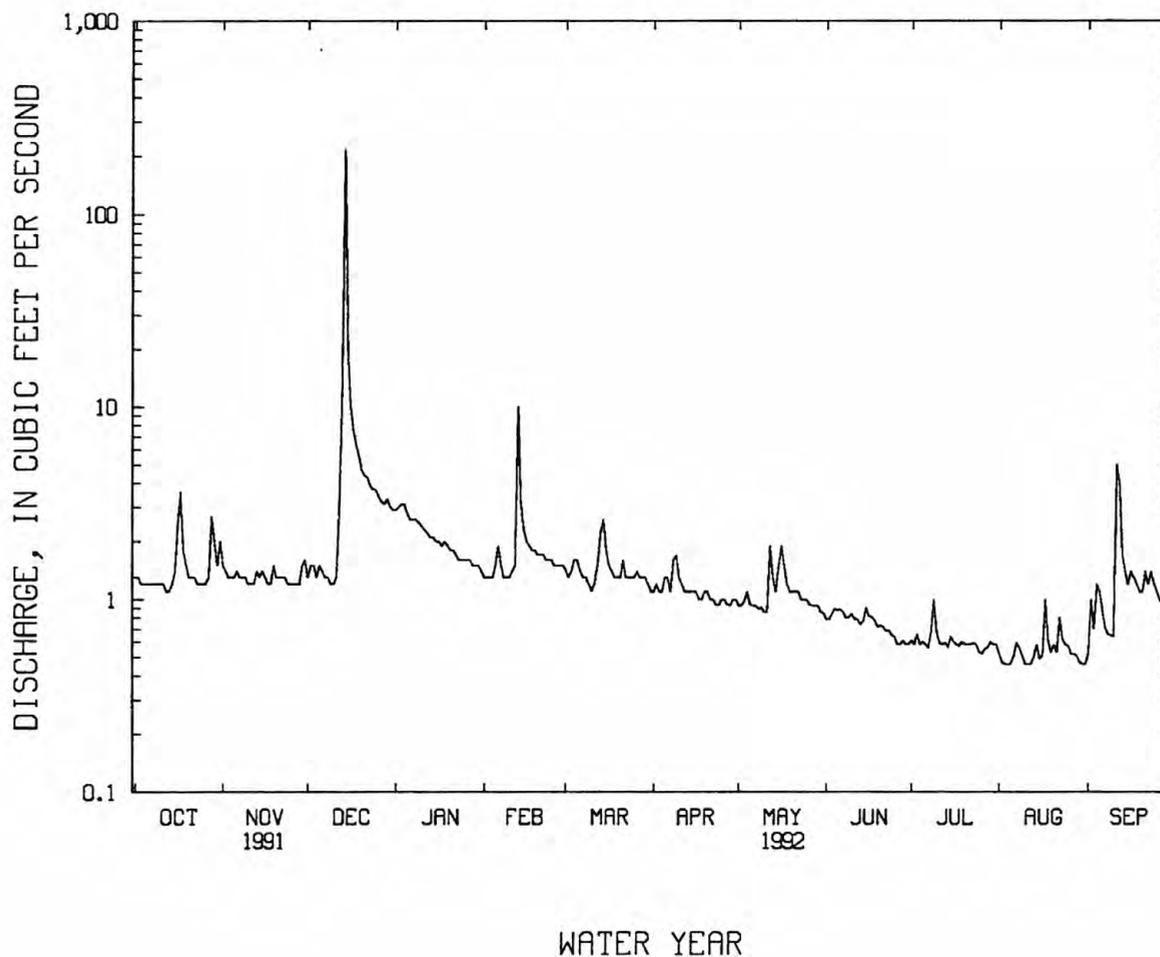
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.3	1.5	1.3	2.9	1.3	1.4	1.1	.93	.79	.61	.52	.52
2	1.3	1.4	1.5	3.0	1.3	1.3	1.2	.93	.79	.58	.47	1.0
3	1.2	1.3	1.5	3.1	1.3	1.4	1.1	.98	.84	.66	.46	1.70
4	1.2	1.3	1.3	3.1	1.3	1.6	1.1	1.1	.90	.58	.46	1.2
5	1.2	1.3	1.5	2.8	1.5	1.6	1.3	.94	.88	.60	.46	1.1
6	1.2	1.4	1.4	2.6	1.9	1.4	1.3	.93	.89	.58	.50	.89
7	1.2	1.3	1.3	2.6	1.5	1.3	1.1	.93	.86	.56	.59	.72
8	1.2	1.3	1.3	2.6	1.3	1.3	1.6	.89	.80	.68	.56	.66
9	1.2	1.3	1.2	2.5	1.3	1.2	1.7	.91	.81	1.0	.51	.65
10	1.2	1.2	1.2	2.4	1.3	1.1	1.3	.86	.84	.68	.46	.64
11	1.2	1.2	1.3	2.3	1.4	1.2	1.2	.86	.79	.59	.46	5.0
12	1.1	1.2	3.0	2.2	1.5	1.5	1.1	1.9	.79	.58	.46	3.9
13	1.1	1.4	13	2.1	10	2.2	1.1	1.3	.74	.59	.50	1.7
14	1.2	1.3	218	2.1	3.2	2.6	1.1	1.1	.77	.56	.58	1.4
15	1.4	1.4	19	2.0	2.3	1.8	1.1	1.5	.91	.64	.49	1.2
16	2.5	1.3	10	2.0	2.0	1.5	1.1	1.9	.82	.60	.51	1.4
17	3.6	1.2	7.6	1.9	1.9	1.4	1.0	1.5	.81	.58	1.0	1.3
18	1.8	1.2	6.4	2.0	1.8	1.3	1.0	1.2	.78	.57	.61	1.2
19	1.5	1.5	5.6	1.9	1.8	1.3	1.1	1.1	.72	.60	.53	1.1
20	1.3	1.3	4.7	1.8	1.7	1.3	1.1	1.1	.73	.58	.58	1.1
21	1.3	1.3	4.4	1.8	1.7	1.6	1.0	1.1	.72	.58	.53	1.4
22	1.3	1.3	4.3	1.7	1.7	1.3	1.0	1.1	.68	.58	.81	1.2
23	1.2	1.3	3.9	1.6	1.6	1.3	.94	1.0	.69	.59	.62	1.4
24	1.2	1.2	3.7	1.6	1.6	1.3	.93	1.0	.65	.58	.58	1.2
25	1.2	1.2	3.7	1.6	1.6	1.3	1.0	1.0	.64	.53	.57	1.1
26	1.2	1.2	3.4	1.6	1.5	1.4	1.0	.94	.58	.52	.52	1.0
27	1.3	1.2	3.2	1.6	1.5	1.3	.94	.93	.58	.55	.52	.94
28	2.7	1.2	3.1	1.5	1.5	1.3	.93	.93	.61	.56	.51	.93
29	2.0	1.5	3.3	1.5	1.5	1.3	1.0	.93	.58	.60	.47	.93
30	1.5	1.6	3.0	1.5	---	1.2	1.0	.86	.58	.58	.46	.93
31	2.0	---	2.9	1.4	---	1.1	---	.85	---	.58	.46	---
TOTAL	45.8	39.3	341.0	65.3	55.8	44.1	33.44	33.50	22.57	18.67	16.76	38.41
MEAN	1.48	1.31	11.0	2.11	1.92	1.42	1.11	1.08	.75	.60	.54	1.28
MAX	3.6	1.6	218	3.1	10	2.6	1.7	1.9	.91	1.0	1.0	5.0
MIN	1.1	1.2	1.2	1.4	1.3	1.1	.93	.85	.58	.52	.46	.52
AC-FT	91	78	676	130	111	87	66	66	45	37	33	76

16071500 LEFT BRANCH OPAEKAA STREAM NEAR KAPAA--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1960 - 1992, BY WATER YEAR (WY)

MEAN	2.21	3.92	3.86	3.25	2.46	2.98	3.42	2.98	1.92	1.73	1.71	1.55
MAX	8.29	14.3	11.0	12.4	7.93	14.7	11.8	9.66	5.68	3.80	4.24	4.67
(WY)	1961	1966	1992	1989	1979	1982	1982	1965	1980	1989	1982	1980
MIN	.42	.59	.56	.58	.50	.50	.86	.62	.29	.59	.36	.38
(WY)	1985	1964	1963	1977	1986	1978	1978	1966	1968	1968	1984	1975

SUMMARY STATISTICS FOR 1991 CALENDAR YEAR	FOR 1992 WATER YEAR	WATER YEARS 1960 - 1992
ANNUAL TOTAL	1084.11	754.65
ANNUAL MEAN	2.97	2.06
HIGHEST ANNUAL MEAN		2.67
LOWEST ANNUAL MEAN		5.72
HIGHEST DAILY MEAN	218 Dec 14	218 Dec 14
LOWEST DAILY MEAN	.91 Mar 7	.46 Aug 3
ANNUAL SEVEN-DAY MINIMUM	.94 Mar 1	.49 Jul 31
ANNUAL RUNOFF (AC-FT)	2150	1930
10 PERCENT EXCEEDS	3.5	2.5
50 PERCENT EXCEEDS	1.9	1.2
90 PERCENT EXCEEDS	1.2	.58



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

AVERAGE DISCHARGE.--55 years (water years 1938-92), 6.55 ft³/s (4,740 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 31 ft³/s, Aug. 1, 1961, June 30, 1982; no flow at times.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 23 ft³/s, Dec. 14; minimum daily, no flow for many days.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1991 TO SEPTEMBER 1992
DAILY MEAN VALUES

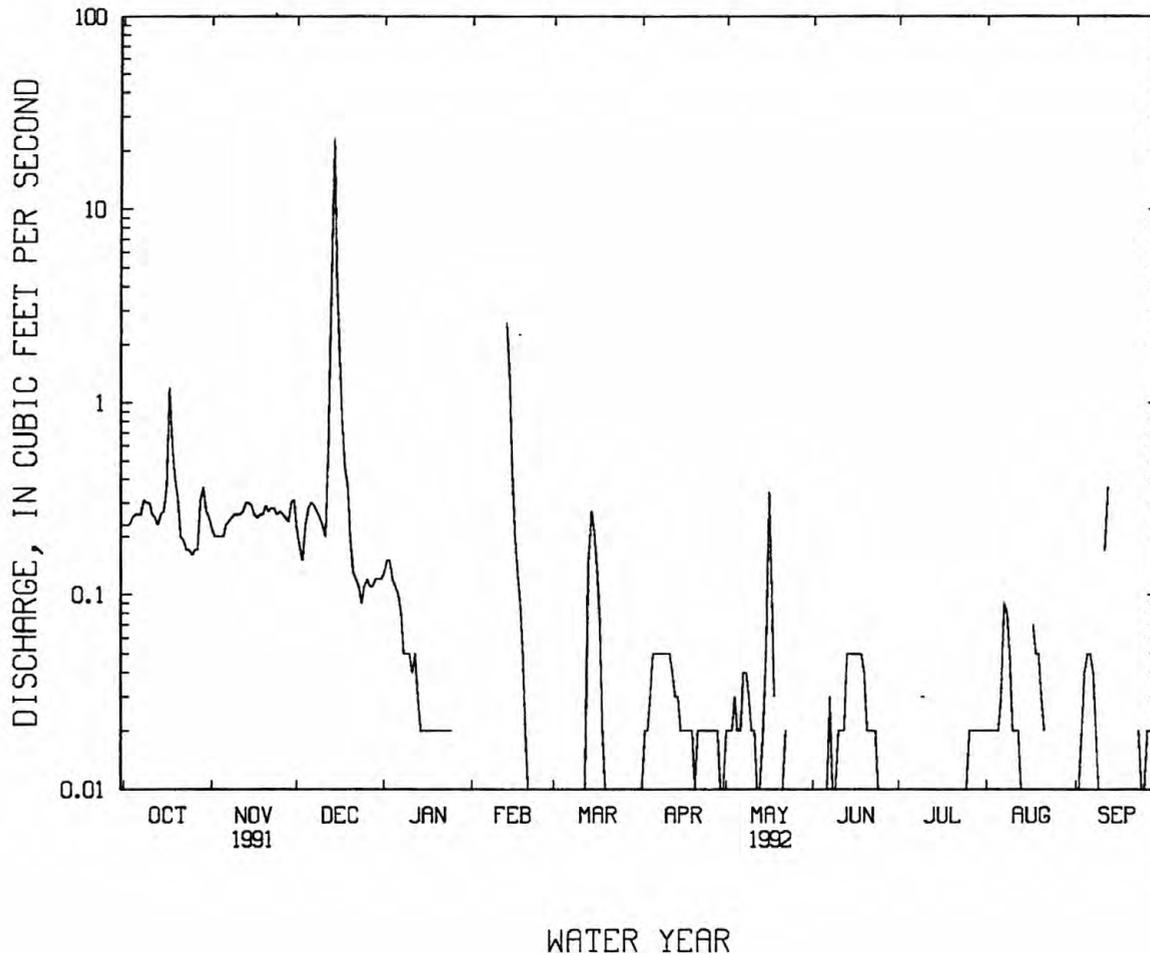
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.23	.22	.22	.13	.00	.00	.01	.02	.00	.00	.02	.00
2	.23	.20	.18	.15	.00	.00	.02	.02	.00	.00	.02	.01
3	.23	.20	.15	.15	.00	.00	.02	.02	.00	.00	.02	.02
4	.25	.20	.23	.12	.00	.00	.03	.03	.00	.00	.02	.04
5	.26	.20	.28	.11	.00	.00	.05	.02	.00	.00	.02	.05
6	.26	.23	.30	.10	.00	.00	.05	.02	.01	.00	.03	.05
7	.26	.24	.29	.08	.00	.00	.05	.04	.03	.00	.09	.04
8	.31	.25	.27	.05	.00	.00	.05	.04	.01	.00	.08	.02
9	.30	.26	.25	.05	.00	.00	.05	.03	.01	.03	.05	.01
10	.30	.26	.23	.05	.00	.00	.05	.02	.02	.03	.02	.00
11	.26	.26	.20	.04	.00	.00	.05	.02	.02	.00	.02	.17
12	.25	.27	.58	.05	.00	.01	.04	.01	.02	.00	.02	.36
13	.23	.30	3.8	.03	2.6	.15	.03	.01	.05	.00	.01	.00
14	.26	.30	23	.02	1.4	.27	.03	.02	.05	.00	.01	.00
15	.27	.29	4.3	.02	.44	.21	.02	.05	.05	.00	.01	.00
16	.36	.26	1.7	.02	.21	.13	.02	.34	.05	.00	.00	.00
17	1.2	.25	.78	.02	.13	.07	.02	.11	.05	.00	.07	.00
18	.61	.26	.46	.02	.09	.02	.02	.03	.05	.00	.05	.00
19	.41	.26	.37	.02	.05	.01	.02	.00	.04	.00	.05	.00
20	.32	.29	.20	.02	.02	.00	.01	.00	.02	.00	.03	.00
21	.20	.27	.13	.02	.01	.00	.02	.01	.02	.00	.02	.00
22	.19	.28	.12	.02	.00	.00	.02	.02	.02	.00	.00	.00
23	.17	.28	.11	.02	.00	.00	.02	.00	.02	.00	.00	.02
24	.17	.26	.09	.02	.00	.00	.02	.00	.01	.00	.01	.01
25	.16	.27	.11	.02	.00	.00	.02	.00	.00	.01	.00	.01
26	.17	.26	.12	.00	.00	.00	.02	.01	.00	.02	.00	.02
27	.17	.25	.11	.00	.00	.00	.02	.01	.00	.02	.00	.02
28	.31	.24	.11	.00	.00	.00	.02	.01	.00	.02	.00	.02
29	.36	.30	.12	.00	.00	.00	.01	.01	.00	.02	.00	.02
30	.27	.31	.12	.00	---	.00	.01	.00	.00	.02	.00	.02
31	.25	---	.12	.00	---	.00	---	.01	---	.02	.00	---
TOTAL	9.22	7.72	39.05	1.35	4.95	0.87	0.82	0.93	0.55	0.19	0.67	0.91
MEAN	.30	.26	1.26	.044	.17	.028	.027	.030	.018	.006	.022	.030
MAX	1.2	.31	23	.15	2.6	.27	.05	.34	.05	.03	.09	.36
MIN	.16	.20	.09	.00	.00	.00	.01	.00	.00	.00	.00	.00
AC-FT	18	15	77	2.7	9.8	1.7	1.6	1.8	1.1	.4	1.3	1.8

16077000 MAKALEHA DITCH NEAR KEALIA--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1937 - 1992, BY WATER YEAR (WY)

MEAN	8.33	5.24	3.58	3.58	4.54	4.77	5.56	6.66	8.70	9.32	9.11	8.67
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	.12	.11	.052	.044	.15	.028	.027	.030	.018	.006	.022	.030
(WY)	1947	1947	1966	1992	1937	1992	1992	1992	1992	1992	1992	1992

SUMMARY STATISTICS FOR 1991 CALENDAR YEAR	FOR 1992 WATER YEAR		WATER YEARS 1937 - 1992	
ANNUAL TOTAL	457.84	67.23		
ANNUAL MEAN	1.25	.18	6.55	
HIGHEST ANNUAL MEAN			10.0	1961
LOWEST ANNUAL MEAN			.18	1992
HIGHEST DAILY MEAN	23	23	31	Aug 1 1961
LOWEST DAILY MEAN	.09	.00	.00	Jan 11 1958
ANNUAL SEVEN-DAY MINIMUM	.11	.00	.00	Dec 6 1959
ANNUAL RUNOFF (AC-FT)	908	133	4740	
10 PERCENT EXCEEDS	3.7	.27	14	
50 PERCENT EXCEEDS	.38	.02	6.9	
90 PERCENT EXCEEDS	.20	.00	.15	



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.--74 years (water years 1918-20, 1922-92), 6.19 ft³/s (4,490 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 138 ft³/s, Feb. 6, 1913; no flow at times.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 25 ft³/s, Dec. 14; minimum daily, 0.03 ft³/s, Sep. 17-20

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1991 TO SEPTEMBER 1992
DAILY MEAN VALUES

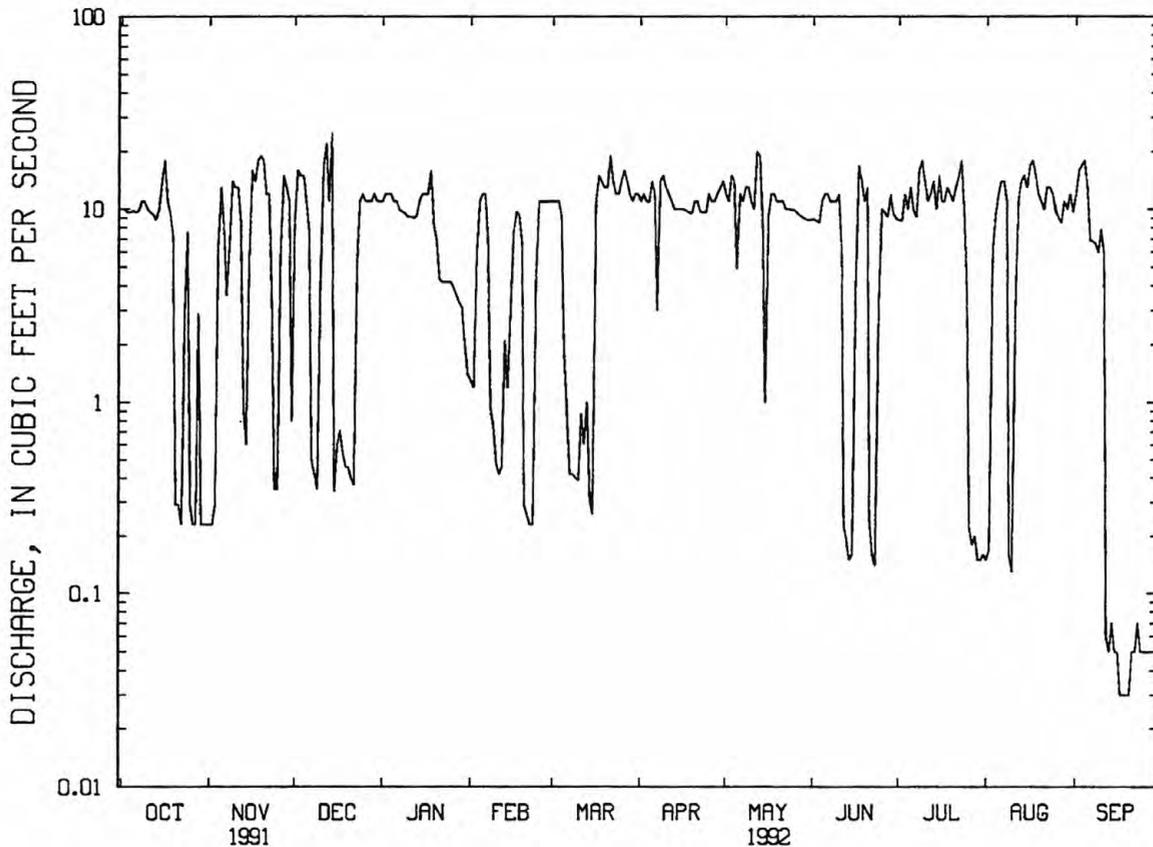
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	10	.23	8.6	11	1.3	11	11	12	8.9	8.8	.15	12
2	10	.23	16	12	1.2	11	12	11	8.7	8.7	.17	16
3	9.6	.29	15	12	5.8	11	11	15	8.5	12	6.1	17
4	9.6	6.5	15	12	11	9.3	11	14	11	10	9.3	18
5	9.8	13	11	11	12	1.9	14	4.9	12	13	12	13
6	9.6	8.0	7.7	11	12	.90	12	12	12	9.9	14	6.9
7	9.8	3.6	.50	9.9	7.1	.42	3.0	11	11	9.1	14	6.8
8	11	6.5	.42	9.7	.94	.42	14	13	11	16	11	6.6
9	11	14	.35	9.5	.75	.40	15	13	11	18	.16	6.0
10	10	13	4.1	9.1	.48	.39	13	11	12	14	.13	7.8
11	9.6	13	17	9.1	.42	.87	12	10	6.1	11	2.9	5.7
12	9.4	8.6	22	9.0	.46	.60	11	20	.23	12	11	.06
13	8.8	.90	11	9.2	2.1	1.0	10	19	.19	14	14	.05
14	10	.60	25	11	1.2	.31	10	8.4	.15	10	15	.07
15	14	5.2	.34	12	3.0	.26	10	1.0	.16	15	13	.05
16	18	16	.60	12	7.6	11	10	9.3	4.0	11	17	.05
17	11	14	.71	12	9.7	15	9.8	12	17	11	18	.03
18	9.4	18	.54	16	9.3	14	9.6	12	14	13	15	.03
19	7.2	19	.46	8.4	6.7	13	9.5	11	11	12	12	.03
20	.29	18	.46	6.9	.29	13	11	11	13	11	11	.03
21	.29	12	.40	4.4	.26	19	11	11	.24	13	10	.05
22	.23	12	.37	4.2	.23	14	9.7	10	.16	15	13	.05
23	3.0	3.5	5.4	4.2	.23	12	9.6	10	.14	18	13	.07
24	7.6	.35	11	4.2	4.4	12	9.6	9.9	3.0	9.3	12	.05
25	.29	.35	12	4.2	11	14	12	9.9	10	3.8	9.8	.05
26	.23	6.0	11	3.9	11	16	11	9.6	9.6	.22	9.0	.05
27	.23	15	11	3.6	11	14	11	9.3	9.1	.18	8.5	.05
28	2.9	13	11	3.3	11	12	12	9.1	12	.20	11	.05
29	.23	11	12	3.1	11	11	13	8.9	9.5	.15	10	.05
30	.23	.80	11	2.0	---	12	14	8.8	8.9	.15	12	.05
31	.23	---	11	1.4	---	12	---	8.8	---	.16	9.7	---
TOTAL	213.55	252.65	252.95	251.3	153.46	263.77	331.8	335.9	234.57	299.66	313.91	116.72
MEAN	6.89	8.42	8.16	8.11	5.29	8.51	11.1	10.8	7.82	9.67	10.1	3.89
MAX	18	19	25	16	12	19	15	20	17	18	18	18
MIN	.23	.23	.34	1.4	.23	.26	3.0	1.0	.14	.15	.13	.03
AC-FT	424	501	502	498	304	523	658	666	465	594	623	232

16079000 KAPAHI DITCH NEAR KEALIA--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1918 - 1992, BY WATER YEAR (WY)

MEAN	6.06	5.10	4.53	4.37	4.79	5.56	6.44	7.66	7.55	8.29	8.58	7.08
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 1991 CALENDAR YEAR	FOR 1992 WATER YEAR	WATER YEARS 1918 - 1992	
ANNUAL TOTAL	2261.16	3020.24	
ANNUAL MEAN	6.19	8.25	6.19
HIGHEST ANNUAL MEAN			21.0 1918
LOWEST ANNUAL MEAN			2.23 1965
HIGHEST DAILY MEAN	25 Dec 14	25 Dec 14	94 Oct 25 1926
LOWEST DAILY MEAN	.23 Mar 21	.03 Sep 17	.00 Jun 4 1922
ANNUAL SEVEN-DAY MINIMUM	.47 Jun 23	.04 Sep 15	.00 Nov 13 1925
ANNUAL RUNOFF (AC-FT)	4490	5990	4490
10 PERCENT EXCEEDS	15	14	15
50 PERCENT EXCEEDS	4.1	9.8	4.4
90 PERCENT EXCEEDS	.44	.23	.25



WATER YEAR

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.--68 years (water years, 1923-25, 1928-92), 4.38 ft³/s (3,180 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 62 ft³/s, Nov. 12, 1947; no flow at times.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 41 ft³/s, Dec. 14; minimum daily, no flow for many days.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1991 TO SEPTEMBER 1992
DAILY MEAN VALUES

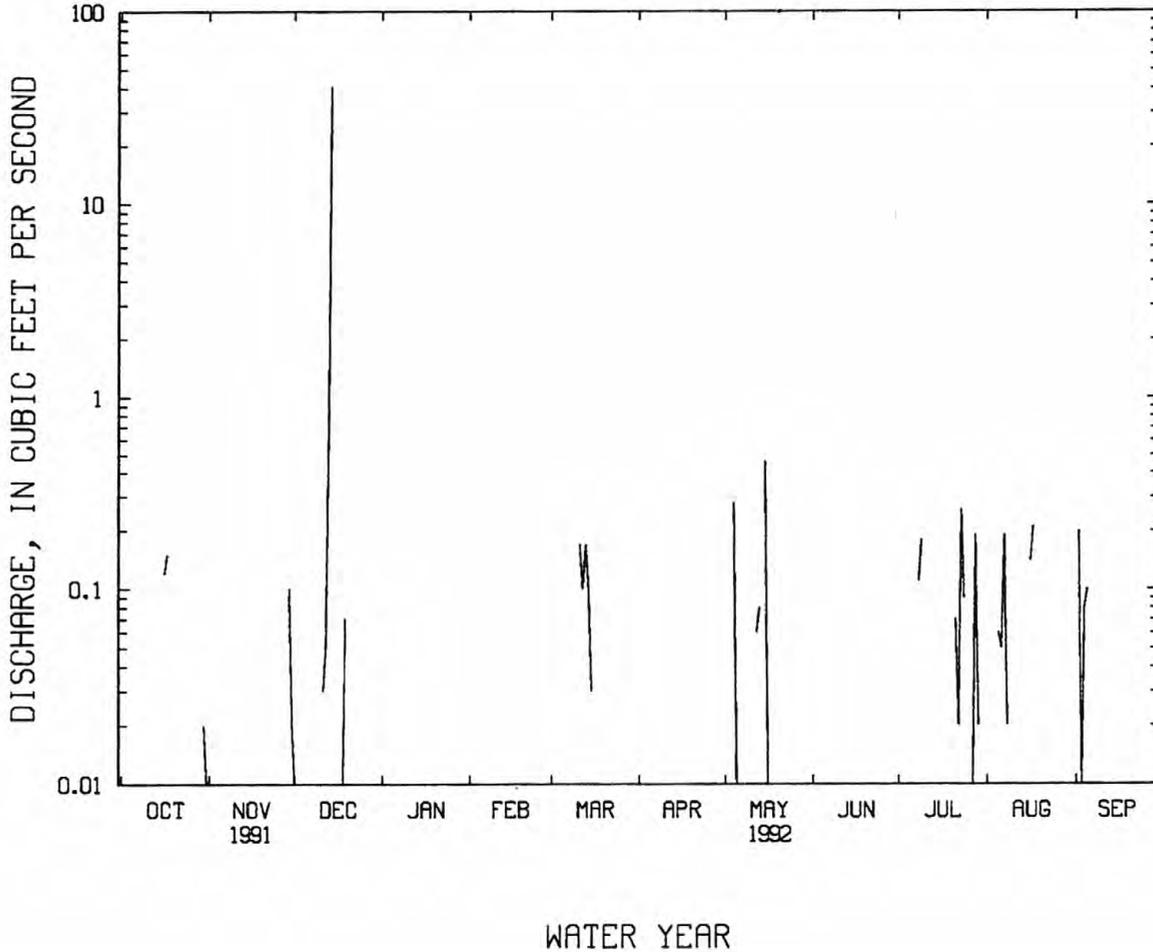
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.00	.01	.00	.00	.00	.00	.00	.00	.00	.00	.00
2	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.20
3	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.01
4	.00	.00	.00	.00	.00	.00	.00	.28	.00	.00	.00	.08
5	.00	.00	.00	.00	.05	.00	.05	.01	.00	.00	.06	.10
6	.00	.00	.00	.00	.00	.00	.00	.00	.04	.00	.05	.00
7	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.19	.00
8	.01	.00	.00	.00	.00	.00	.10	.00	.00	.11	.02	.00
9	.00	.00	.00	.00	.00	.00	.00	.00	.00	.18	.00	.00
10	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
11	.00	.00	.03	.00	.00	.17	.00	.00	.00	.00	.00	.30
12	.00	.00	.05	.00	.00	.10	.00	.06	.00	.00	.00	.00
13	.00	.00	.69	.00	.65	.17	.00	.08	.00	.01	.00	.00
14	.00	.00	41	.13	.00	.10	.00	.00	.00	.00	.06	.00
15	.00	.00	.00	.00	.00	.03	.00	.46	.14	.01	.00	.00
16	.12	.00	.00	.00	.00	.00	.00	.01	.00	.00	.14	.00
17	.15	.00	.00	.00	.00	.00	.00	.00	.08	.00	.21	.00
18	.00	.00	.01	.00	.00	.00	.00	.00	.00	.00	.00	.00
19	.00	.00	.07	.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	.05	.00	.00	.00	.07	.00	.00
22	.00	.00	.02	.00	.00	.00	.00	.00	.00	.02	.01	.00
23	.00	.00	.00	.00	.00	.00	.00	.00	.00	.26	.00	.00
24	.00	.00	.00	.00	.00	.00	.00	.00	.00	.09	.00	.00
25	.00	.01	.04	.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	.01	.00	.00
28	.03	.00	.01	.00	.00	.00	.00	.00	.00	.19	.00	.00
29	.00	.10	.01	.00	.00	.00	.00	.00	.00	.02	.00	.00
30	.02	.02	.00	.00	---	.00	.00	.00	.00	.00	.00	.00
31	.01	---	.00	.00	---	.00	---	.00	---	.13	.00	---
TOTAL	0.34	0.13	41.94	0.13	0.70	0.62	0.15	0.90	0.26	1.10	0.74	0.69
MEAN	.011	.004	1.35	.004	.024	.020	.005	.029	.009	.035	.024	.023
MAX	.15	.10	41	.13	.65	.17	.10	.46	.14	.26	.21	.30
MIN	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
AC-FT	.7	.3	83	.3	1.4	1.2	.3	1.8	.5	2.2	1.5	1.4

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

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1937 - 1992, BY WATER YEAR (WY)

MEAN	4.78	3.71	2.41	2.22	3.23	3.70	4.65	5.16	4.94	6.48	5.54	4.80
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	.004	.004	.020	.005	.029	.009	.035	.024	.002
(WY)	1992	1992	1961	1992	1969	1992	1992	1992	1992	1992	1992	1991

SUMMARY STATISTICS FOR 1991 CALENDAR YEAR		FOR 1992 WATER YEAR		WATER YEARS 1937 - 1992	
ANNUAL TOTAL	1356.28		47.70		
ANNUAL MEAN	3.72		.13		4.31
HIGHEST ANNUAL MEAN					8.00
LOWEST ANNUAL MEAN					.13
HIGHEST DAILY MEAN	41	Dec 14	41	Dec 14	
LOWEST DAILY MEAN	.00	Jan 1	.00	Oct 1	62
ANNUAL SEVEN-DAY MINIMUM	.00	Aug 14	.00	Oct 1	.00
ANNUAL RUNOFF (AC-FT)	2690		95		3120
10 PERCENT EXCEEDS	10		.05		11
50 PERCENT EXCEEDS	2.2		.00		2.9
90 PERCENT EXCEEDS	.00		.00		.06



16091000 LOWER ANAHOLA DITCH NEAR KEALIA--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1937 - 1992, BY WATER YEAR (WY)

MEAN	2.88	1.89	1.27	1.36	2.08	1.79	2.24	2.80	3.33	3.47	3.35	3.45
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 1991 CALENDAR YEAR	FOR 1992 WATER YEAR	WATER YEARS 1937 - 1992
ANNUAL TOTAL	3.40	3.40
ANNUAL MEAN	.009	.009
HIGHEST ANNUAL MEAN		2.48
LOWEST ANNUAL MEAN		6.06
HIGHEST DAILY MEAN	3.4 Dec 14	.000
LOWEST DAILY MEAN	.00 Jan 1	19
ANNUAL SEVEN-DAY MINIMUM	.00 Jan 1	.00 Jun 1 1938
ANNUAL RUNOFF (AC-FT)	6.7	.00 Jan 1 1937
10 PERCENT EXCEEDS	.00	.00 Jan 1 1937
50 PERCENT EXCEEDS	.00	1790
90 PERCENT EXCEEDS	.00	7.1
		.30
		.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 confluence with Pohakuhono Stream and 2.3 mi south of Kilauea.

DRAINAGE AREA.-- 1.9 mi²

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. No diversion upstream.

AVERAGE DISCHARGE.-- 34 years (water years 1959-92), 12.1 ft³/s(8,750 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 4,030 ft³/s, Dec. 14 1991, gage height, 9.64 ft; minimum, 1.8 ft³/s, Sept. 6-8,1968.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 580 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Dec. 14	0130	*4,030	*9.64	Sep. 11	1900	592	4.45

Minimum discharge, 4.0 ft³/s, May 31 to June 5.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1991 TO SEPTEMBER 1992
DAILY MEAN VALUES

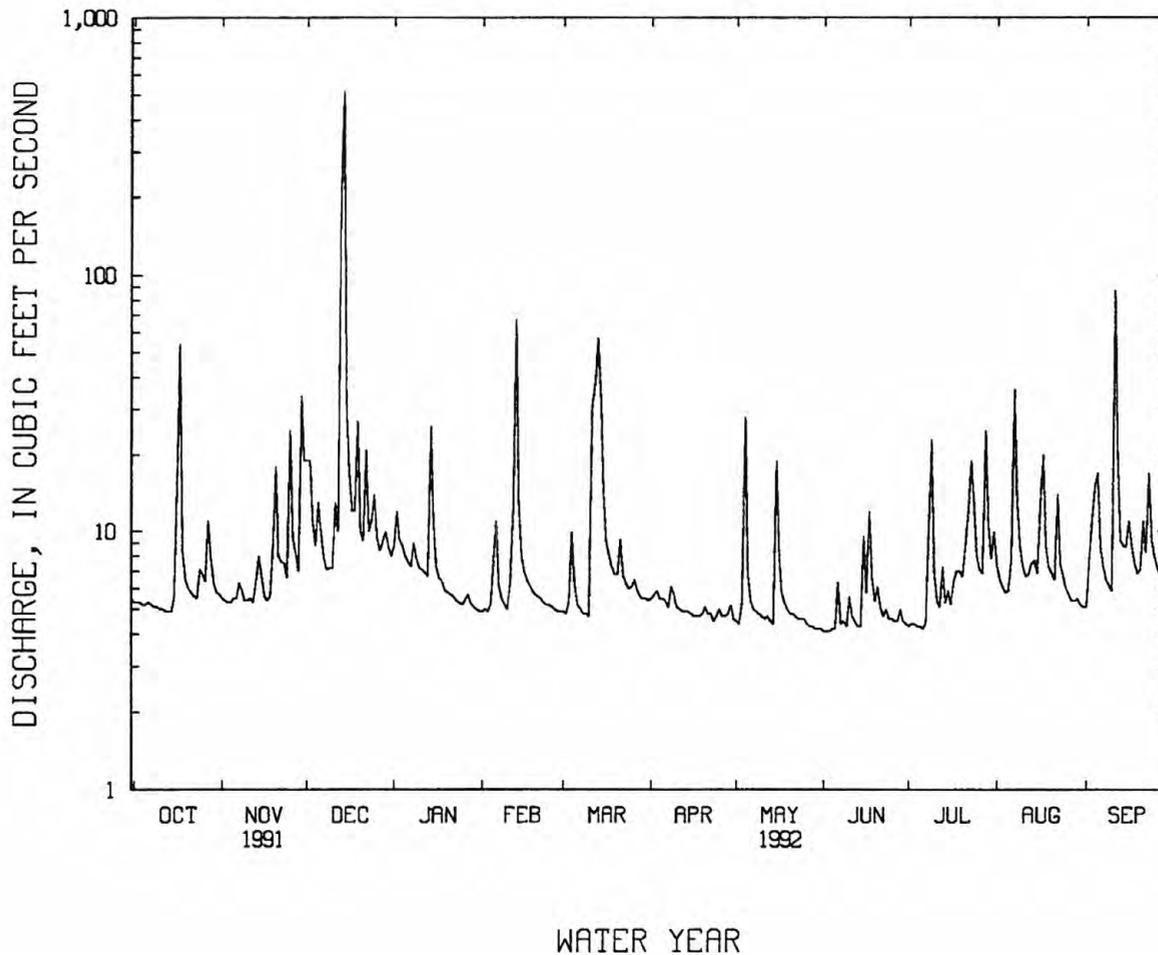
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	5.3	5.5	19	8.8	4.9	4.9	5.5	4.5	4.1	4.3	7.4	5.1
2	5.3	5.4	19	12	5.0	4.8	5.7	4.4	4.1	4.4	6.5	7.8
3	5.3	5.3	11	9.3	4.9	5.3	5.9	5.3	4.1	4.4	6.1	11
4	5.2	5.3	8.8	8.8	5.2	9.9	5.5	28	4.2	4.3	5.8	15
5	5.2	5.5	13	8.0	7.4	6.2	5.5	6.9	4.2	4.3	5.9	17
6	5.3	5.5	9.9	7.6	11	5.2	5.4	5.4	6.4	4.2	7.7	8.7
7	5.2	6.3	7.9	7.3	6.2	5.0	5.1	5.0	4.4	4.4	36	7.3
8	5.1	5.9	7.1	9.0	5.5	4.8	6.1	4.9	4.5	9.9	13	6.5
9	5.1	5.4	7.2	7.8	5.2	4.8	5.7	4.8	4.3	23	8.8	6.2
10	5.0	5.4	7.2	7.2	5.0	4.7	5.1	4.7	5.6	6.9	7.3	5.9
11	5.0	5.5	13	7.1	6.4	31	5.0	4.6	4.7	5.4	6.7	87
12	4.9	5.3	10	6.9	12	38	4.9	4.7	4.5	5.1	6.8	19
13	4.9	6.4	202	6.7	67	57	4.9	4.5	4.3	7.3	7.5	9.2
14	4.9	8.0	521	26	13	33	4.9	4.4	4.3	5.3	7.7	8.8
15	5.6	6.7	30	11	8.1	14	4.8	19	9.6	5.9	6.9	8.7
16	16	5.6	17	7.3	7.0	9.2	4.7	8.5	5.8	5.2	13	11
17	54	5.4	12	6.6	6.5	8.1	4.7	5.8	12	6.4	20	8.8
18	8.4	5.6	12	6.4	6.2	7.3	4.7	5.3	6.6	7.0	8.8	7.5
19	6.5	8.9	27	5.9	5.9	6.8	4.8	5.0	5.4	7.0	7.3	6.9
20	6.0	18	10	5.8	5.7	6.8	5.1	4.8	6.1	6.7	6.9	7.1
21	5.8	8.0	9.2	5.7	5.6	9.3	4.8	4.8	5.1	8.8	6.5	11
22	5.6	7.6	21	5.6	5.5	6.7	4.8	4.7	4.7	12	14	8.3
23	5.5	7.5	10	5.4	5.3	6.3	4.5	4.6	5.0	19	7.5	17
24	7.1	6.6	11	5.3	5.2	6.0	4.7	4.6	4.6	13	6.7	9.3
25	6.8	25	14	5.2	5.2	6.1	5.0	4.6	4.6	8.1	6.0	8.0
26	6.4	9.4	9.4	5.4	5.1	6.5	4.7	4.4	4.5	7.1	5.7	7.2
27	11	8.2	8.4	5.7	5.0	5.9	4.7	4.3	4.5	6.9	5.4	6.8
28	7.8	7.0	9.2	5.3	4.9	5.6	4.8	4.3	5.0	25	5.4	6.4
29	6.3	34	10	5.1	4.9	5.5	5.2	4.2	4.5	11	5.5	6.2
30	5.8	19	8.7	5.0	---	5.5	4.6	4.2	4.4	7.8	5.2	5.9
31	5.7	---	8.0	4.9	---	5.4	---	4.2	---	10	5.1	---
TOTAL	242.0	263.2	1083.0	234.1	244.8	335.6	151.8	189.4	156.1	260.1	269.1	350.6
MEAN	7.81	8.77	34.9	7.55	8.44	10.8	5.06	6.11	5.20	8.39	8.68	11.7
MAX	54	34	521	26	67	57	6.1	28	12	25	36	87
MIN	4.9	5.3	7.1	4.9	4.9	4.7	4.5	4.2	4.1	4.2	5.1	5.1
AC-FT	480	522	2150	464	486	666	301	376	310	516	534	695

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

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1958 - 1992, BY WATER YEAR (WY)

MEAN	10.2	16.5	13.9	11.7	10.8	14.6	15.6	12.4	8.58	11.7	10.7	8.12
MAX (WY)	24.6	42.4	43.1	28.4	29.4	42.7	35.1	22.5	29.1	27.1	23.7	15.0
	1983	1991	1988	1989	1979	1982	1971	1965	1978	1989	1991	1980
MIN (WY)	4.40	5.73	3.79	3.45	3.20	4.59	5.06	6.11	4.27	5.05	3.95	3.93
	1985	1977	1986	1986	1986	1970	1992	1992	1959	1975	1973	1975

SUMMARY STATISTICS FOR 1991 CALENDAR YEAR			FOR 1992 WATER YEAR			WATER YEARS 1958 - 1992		
ANNUAL TOTAL	4943.7		3779.8					
ANNUAL MEAN	13.5		10.3			12.1		
HIGHEST ANNUAL MEAN						19.6		
LOWEST ANNUAL MEAN						7.01		
HIGHEST DAILY MEAN	521	Dec 14	521	Dec 14	521	Dec 14	1991	1984
LOWEST DAILY MEAN	4.9	Oct 12	4.1	Jun 1	1.9	Sep 5	1968	
ANNUAL SEVEN-DAY MINIMUM	5.0	Oct 8	4.2	May 29	2.4	Sep 2	1968	
ANNUAL RUNOFF (AC-FT)	9810		7500			8750		
10 PERCENT EXCEEDS	22		13			21		
50 PERCENT EXCEEDS	7.6		6.0			7.6		
90 PERCENT EXCEEDS	5.5		4.6			4.6		



16103000 HANAIEI RIVER NEAR HANAIEI

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 mi².

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 fair 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).--29 years (water years 1964-92), 216 ft³/s (156,490 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 25,750 ft³/s, Dec. 14, 1991, gage height, 14.45 ft, from rating curve extended above 9,600 ft³/s; minimum, 31 ft³/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 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Dec. 14	0830	*25,750	*14.45	Sep. 11	unknown	12,240	11.18

Minimum discharge, 71 ft³/s, May 29, 30, Jun. 2, 3.

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	e90	e92	e190	166	84	82	89	81	73	78	212	79
2	e90	e88	e160	312	87	81	93	83	72	77	146	216
3	e106	e87	136	188	89	95	103	83	80	78	123	203
4	e92	e86	117	197	95	185	95	303	94	78	95	397
5	e88	e111	159	142	289	102	113	115	87	83	153	236
6	e100	e110	160	129	337	88	102	91	139	78	204	142
7	e95	e152	153	121	141	82	93	87	83	76	387	112
8	e93	e133	115	132	105	80	182	92	91	209	305	96
9	e92	e109	113	125	94	80	118	98	87	482	162	89
10	e90	e98	134	111	91	79	107	89	153	130	121	84
11	e90	e103	645	108	110	407	91	85	94	99	104	e1340
12	e88	e91	240	107	267	572	86	84	109	94	99	e692
13	e88	e109	1660	101	1200	730	86	83	104	97	117	e372
14	e106	e299	4550	187	264	482	84	82	114	87	143	e325
15	e429	e142	503	144	153	320	83	212	216	102	122	e325
16	e474	e102	267	108	126	161	83	125	149	92	299	e426
17	e651	e102	201	101	114	166	81	92	264	95	478	e312
18	e191	e140	178	212	125	131	80	85	138	119	155	e260
19	e121	e171	318	112	105	116	80	80	108	122	114	e227
20	e105	e309	157	101	98	114	96	80	119	125	106	e195
21	e98	e131	143	96	98	197	84	80	100	155	100	e160
22	e95	e132	249	94	97	119	80	91	92	181	234	e138
23	e93	e145	162	91	90	107	78	80	99	284	118	e137
24	e183	e128	145	88	89	103	79	78	88	181	104	e154
25	e131	e219	349	88	87	107	88	77	87	130	89	e169
26	e145	e312	195	87	85	116	85	75	84	117	83	e155
27	e348	e254	142	95	83	106	83	74	82	115	79	e135
28	e167	e117	155	92	83	96	81	74	92	346	81	e123
29	e112	e276	240	86	82	93	93	73	83	196	81	e117
30	e100	e234	168	100	---	91	89	74	79	127	79	e112
31	e98	---	145	93	---	90	---	74	---	793	73	---
TOTAL	4849	4582	12249	3914	4768	5378	2785	2980	3260	5026	4766	7528
MEAN	156	153	395	126	164	173	92.8	96.1	109	162	154	251
MAX	651	312	4550	312	1200	730	182	303	264	793	478	1340
MIN	88	86	113	86	82	79	78	73	72	76	73	79
AC-FT	9620	9090	24300	7760	9460	10670	5520	5910	6470	9970	9450	14930

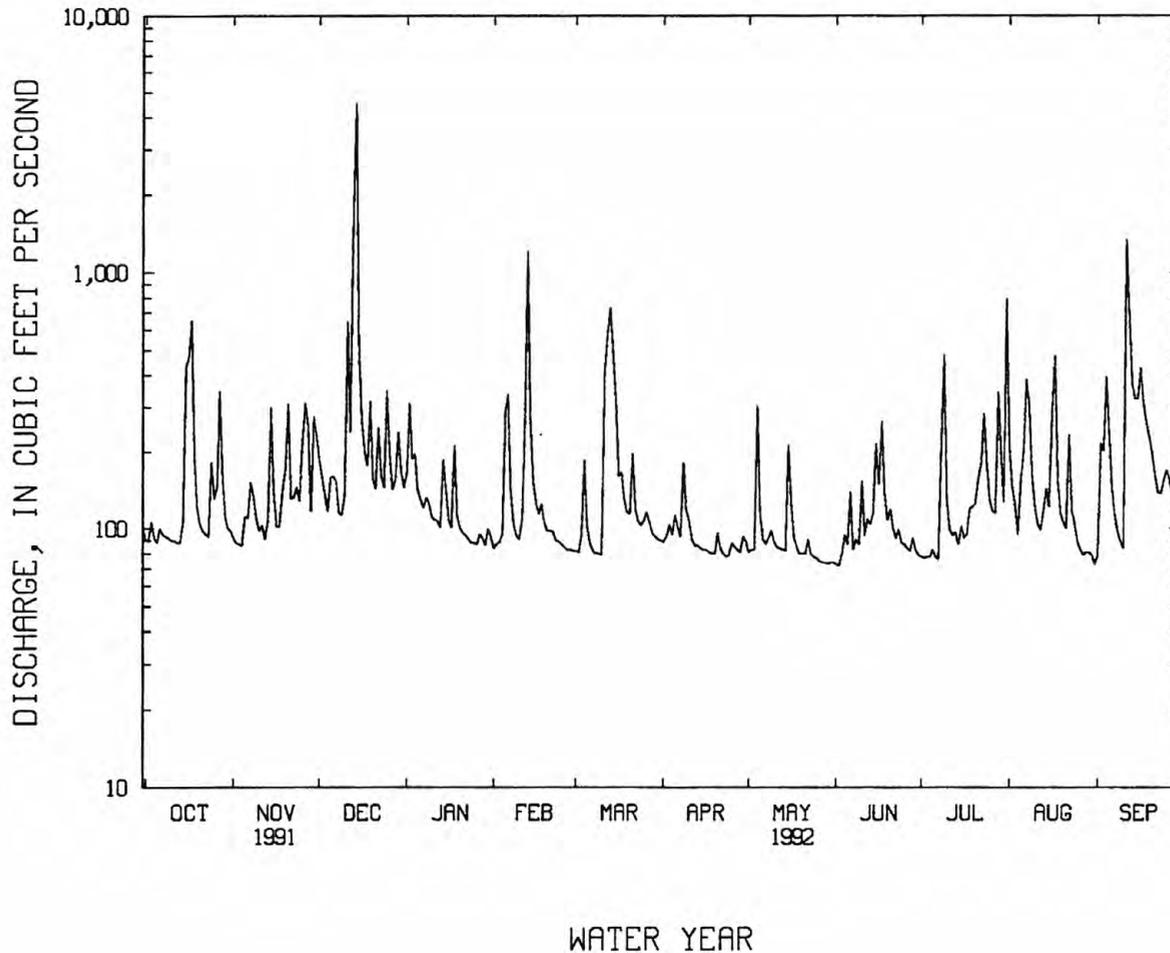
e Estimated

16103000 HANAIEI RIVER NEAR HANAIEI--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1962 - 1992, BY WATER YEAR (WY)

MEAN	173	311	242	221	228	291	304	225	142	186	159	125
MAX	466	793	596	614	616	1096	781	626	567	418	413	280
(WY)	1983	1991	1968	1989	1989	1982	1974	1967	1978	1989	1982	1982
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 1991 CALENDAR YEAR			FOR 1992 WATER YEAR			WATER YEARS 1962 - 1992		
ANNUAL TOTAL	85671		62085			216		
ANNUAL MEAN	235		170			408		1982
HIGHEST ANNUAL MEAN						92.7		1984
LOWEST ANNUAL MEAN						8340		May 22 1967
HIGHEST DAILY MEAN	4550	Dec 14	4550	Dec 14		31		Nov 3 1975
LOWEST DAILY MEAN	86	Nov 4	72	Jun 2		33		Sep 19 1975
ANNUAL SEVEN-DAY MINIMUM	91	Oct 7	73	May 27				
ANNUAL RUNOFF (AC-FT)	169900		123100			156400		
10 PERCENT EXCEEDS	410		299			426		
50 PERCENT EXCEEDS	140		107			118		
90 PERCENT EXCEEDS	103		81			57		



16108000 WAINIHA RIVER NEAR HANAIEI

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 mi².

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 those above 120 cfs which are fair. No diversion upstream.

AVERAGE DISCHARGE.--37 years (water years 1953-55, 1959-92), 139 ft³/s (101,000 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 28,100 ft³/s, Apr. 19, 1974, gage height, 9.47 ft, from rating curve extended above 1,100 ft³/s on basis of slope-area measurement at gage height 7.72 ft; minimum, 32 ft³/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 ft³/s, from unit-discharge study.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 3,600 ft³/s: and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Dec. 14	0830	5,420	5.82	Sep. 11	1830	*9,000	*6.64

Minimum, 42 ft³/s, May 31 to Jun. 3

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1991 TO SEPTEMBER 1992
DAILY MEAN VALUES

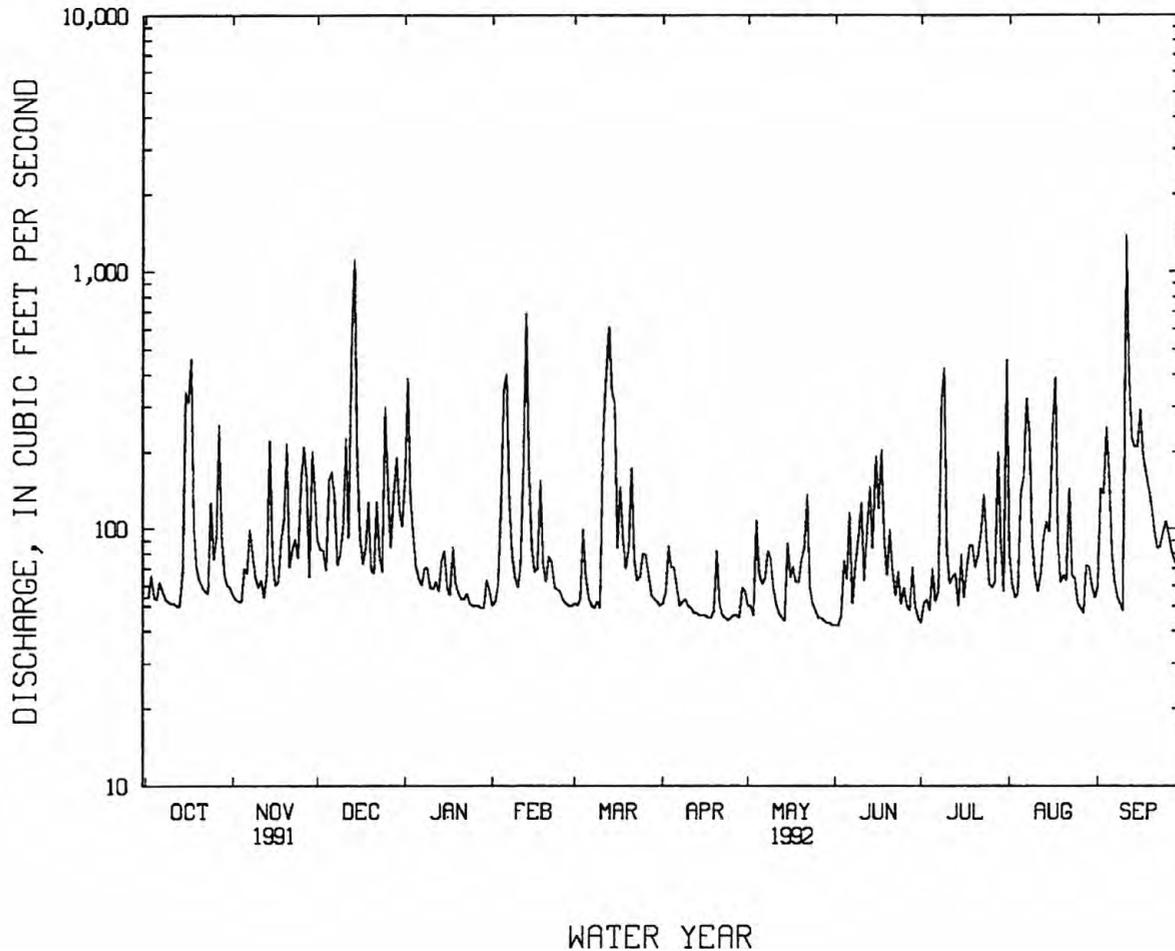
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	54	55	90	162	50	51	51	50	42	43	80	59
2	54	53	83	388	52	50	57	50	42	51	61	143
3	66	52	82	133	61	53	86	46	46	53	54	137
4	54	52	69	96	122	99	71	108	75	48	56	250
5	53	70	154	71	353	65	71	67	64	70	137	157
6	62	67	167	64	402	54	59	61	116	52	160	81
7	57	99	132	60	133	50	50	64	51	57	322	62
8	53	80	72	70	80	49	52	82	73	313	237	54
9	52	65	79	70	65	52	53	77	94	425	91	51
10	51	59	101	59	59	49	50	59	126	84	66	48
11	51	63	226	58	70	222	49	51	63	61	57	1380
12	50	54	92	62	170	396	47	47	98	65	67	408
13	50	68	563	57	685	612	47	45	146	67	93	228
14	67	221	1110	75	175	343	46	44	84	50	106	209
15	341	78	187	82	85	307	46	88	193	80	97	211
16	311	60	92	59	68	84	46	65	120	54	249	292
17	460	62	73	55	70	146	45	71	204	70	389	193
18	101	90	84	85	155	93	45	62	93	86	90	164
19	71	109	127	61	73	70	48	62	66	86	62	142
20	63	216	69	56	62	83	82	76	99	71	66	121
21	59	71	67	53	78	173	51	85	69	80	63	97
22	57	83	127	53	74	76	46	136	55	98	143	84
23	56	91	79	56	59	63	45	59	68	136	66	85
24	126	77	68	51	58	65	44	51	51	89	64	97
25	76	150	299	50	57	80	45	48	59	61	51	107
26	92	210	146	50	53	79	46	45	50	59	49	95
27	255	157	84	50	51	66	46	45	48	62	47	82
28	93	65	135	49	50	55	45	44	71	200	72	75
29	66	202	191	49	50	53	59	43	50	88	71	71
30	60	143	118	63	---	52	57	43	45	57	60	68
31	59	---	102	57	---	50	---	42	---	456	54	---
TOTAL	3120	2922	5068	2404	3520	3740	1585	1916	2461	3272	3280	5251
MEAN	101	97.4	163	77.5	121	121	52.8	61.8	82.0	106	106	175
MAX	460	221	1110	388	685	612	86	136	204	456	389	1380
MIN	50	52	67	49	50	49	44	42	42	43	47	48
AC-FT	6190	5800	10050	4770	6980	7420	3140	3800	4880	6490	6510	10420

16108000 WAINIHA RIVER NEAR HANAIEI--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1952 - 1992, BY WATER YEAR (WY)

MEAN	110	186	166	146	146	179	180	126	99.2	132	116	91.8
MAX	228	414	384	371	492	611	504	238	187	315	272	175
(WY)	1983	1991	1968	1989	1969	1982	1971	1967	1978	1989	1982	1992
MIN	42.8	72.7	54.1	44.6	36.5	52.2	52.8	51.9	56.0	50.4	54.6	42.3
(WY)	1985	1964	1984	1986	1978	1970	1992	1966	1985	1984	1965	1965

SUMMARY STATISTICS FOR 1991 CALENDAR YEAR			FOR 1992 WATER YEAR			WATER YEARS 1952 - 1992		
ANNUAL TOTAL	51413		38539			139		
ANNUAL MEAN	141		105			243		1982
HIGHEST ANNUAL MEAN						84.7		1984
LOWEST ANNUAL MEAN						3650		Nov 21 1974
HIGHEST DAILY MEAN	1340	Mar 19	1380	Sep 11		31		Sep 29 1965
LOWEST DAILY MEAN	50	Oct 12	42	May 31		33		Sep 24 1965
ANNUAL SEVEN-DAY MINIMUM	52	Oct 7	43	May 27				
ANNUAL RUNOFF (AC-FT)	102000		76440			101000		
10 PERCENT EXCEEDS	259		201			265		
50 PERCENT EXCEEDS	83		67			79		
90 PERCENT EXCEEDS	59		49			49		



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 mi².

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.--69 years (water years 1914-24, 1927-52, 1961-92), 16.4 ft³/s (11,890 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 5,640 ft³/s, Oct. 28, 1981, gage height, 13.2 ft, from rating curve extended above 68 ft³/s on basis of slope-area measurement at gage height, 12.46 ft; minimum, 0.12 ft³/s, Mar. 2, 13, 1941.

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

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Oct. 16	0900	1,810	7.19	Sept. 3	1030	*2,230	*7.89
July 31	1030	1,360	6.37				

Minimum discharge, 0.15 ft³/s, June 2-3.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1991 TO SEPTEMBER 1992
DAILY MEAN VALUES

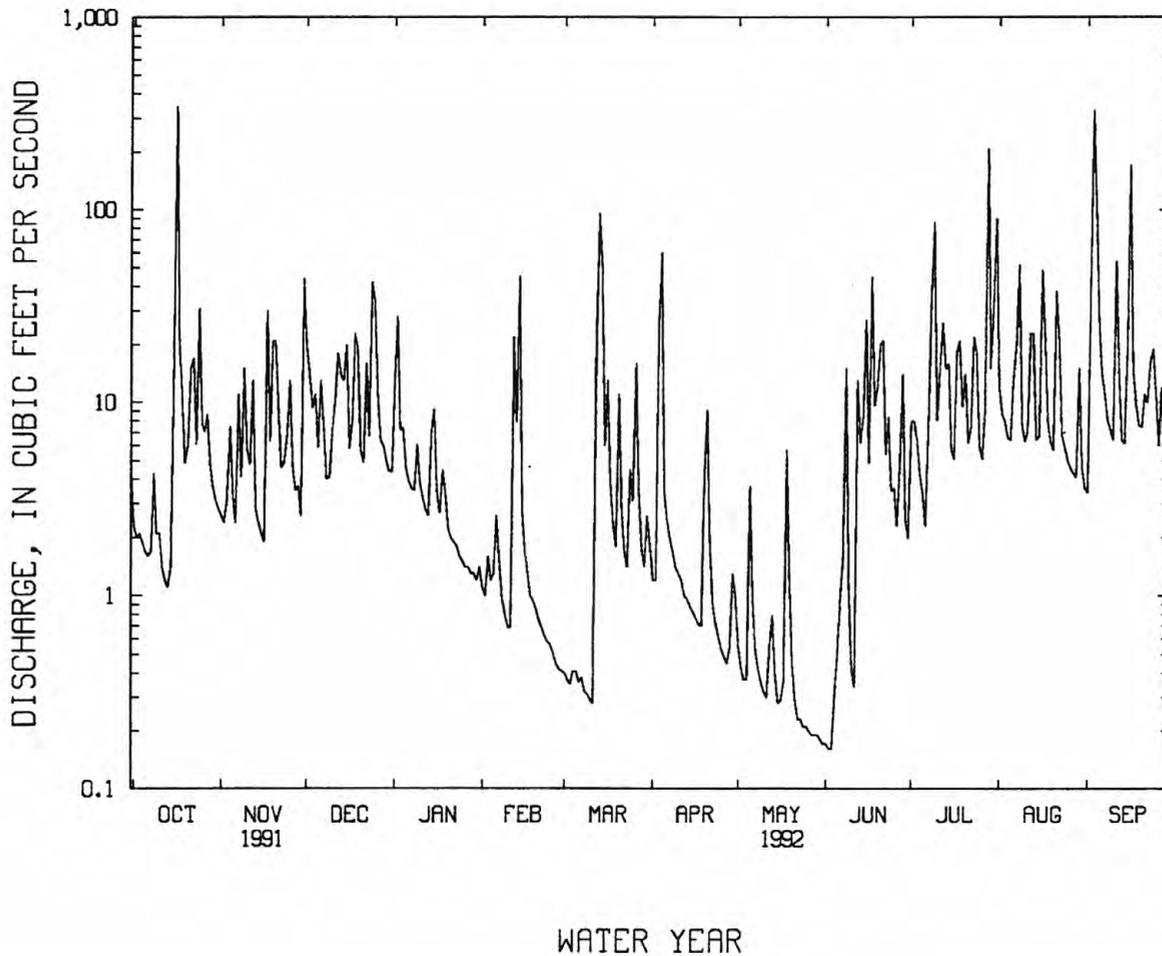
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.3	2.6	20	13	1.1	.40	1.2	.56	.17	8.0	12	3.4
2	2.0	2.4	14	28	1.0	.37	1.2	.43	.16	8.0	8.7	41
3	2.1	3.2	9.4	7.2	1.6	.35	26	.37	.16	6.5	7.9	330
4	1.9	7.5	11	7.4	1.2	.41	60	.37	.30	4.3	6.6	100
5	1.7	3.3	5.9	4.6	1.3	.41	3.5	3.7	.48	3.4	6.4	26
6	1.6	2.4	13	3.9	2.6	.36	2.5	.95	.91	2.3	13	14
7	1.7	11	7.5	3.6	1.5	.38	2.0	.53	1.6	7.8	20	11
8	4.3	4.1	4.0	3.5	.96	.32	1.7	.42	15	34	52	8.2
9	2.1	15	4.1	6.1	.80	.31	1.4	.36	1.1	86	7.8	7.2
10	2.1	5.8	7.3	3.8	.69	.29	1.3	.32	.42	8.1	6.3	6.4
11	1.4	4.8	10	3.2	.69	.28	1.2	.30	.34	15	7.1	54
12	1.2	13	18	2.8	22	21	1.0	.56	13	26	23	14
13	1.1	2.9	14	2.6	7.9	96	.96	.79	6.2	15	23	6.4
14	1.4	2.4	13	7.0	45	50	.89	.39	8.3	16	6.4	6.2
15	17	2.1	20	9.2	2.8	6.0	.83	.28	27	5.7	6.7	19
16	346	1.9	5.8	3.5	1.7	13	.77	.29	4.9	5.1	49	172
17	20	30	8.2	2.7	1.3	3.9	.71	.36	45	18	22	15
18	11	6.3	23	4.5	1.0	2.4	.70	5.7	9.6	21	8.1	9.6
19	4.9	21	19	3.3	.94	1.8	4.2	1.2	12	9.5	6.3	7.6
20	6.0	21	5.7	2.2	.86	11	9.1	.45	20	14	5.7	7.5
21	15	9.2	4.9	2.0	.75	2.8	1.8	.29	21	6.2	38	11
22	17	4.6	16	1.9	.68	1.7	.93	.23	5.4	7.4	21	10
23	6.1	4.9	6.7	1.8	.62	1.4	.72	.23	8.4	22	6.8	16
24	31	6.8	42	1.6	.58	4.5	.62	.21	3.5	18	5.9	19
25	7.7	13	34	1.5	.56	3.1	.54	.21	3.6	6.0	5.0	11
26	7.1	4.6	11	1.4	.51	16	.49	.20	2.3	5.1	4.6	6.0
27	8.6	3.5	6.4	1.4	.45	3.5	.45	.19	4.8	9.1	4.3	12
28	4.8	3.7	6.0	1.3	.42	1.8	.54	.19	14	210	4.1	5.3
29	3.6	2.6	5.0	1.3	.41	1.4	1.3	.19	2.5	15	15	4.8
30	3.1	44	4.4	1.2	---	2.6	.98	.18	2.0	31	4.6	4.3
31	2.8	---	4.4	1.4	---	1.8	---	.17	---	90	3.6	---
TOTAL	538.6	259.6	373.7	138.9	101.92	249.58	129.53	20.62	234.14	733.5	410.9	957.9
MEAN	17.4	8.65	12.1	4.48	3.51	8.05	4.32	.67	7.80	23.7	13.3	31.9
MAX	346	44	42	28	45	96	60	5.7	45	210	52	330
MIN	1.1	1.9	4.0	1.2	.41	.28	.45	.17	.16	2.3	3.6	3.4
AC-FT	1070	515	741	276	202	495	257	41	464	1450	815	1900

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

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1913 - 1992, BY WATER YEAR (WY)

MEAN	12.6	17.1	14.7	15.1	12.6	19.9	20.2	16.6	13.4	18.2	18.4	15.4
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 1991 CALENDAR YEAR	FOR 1992 WATER YEAR	WATER YEARS 1913 - 1992
ANNUAL TOTAL	6036.27	4148.89	
ANNUAL MEAN	16.5	11.3	16.4
HIGHEST ANNUAL MEAN			29.5
LOWEST ANNUAL MEAN			9.11
HIGHEST DAILY MEAN	346	346	975
LOWEST DAILY MEAN	.85	.16	.12
ANNUAL SEVEN-DAY MINIMUM	1.0	.17	.13
ANNUAL RUNOFF (AC-FT)	11970	8230	11890
10 PERCENT EXCEEDS	36	21	36
50 PERCENT EXCEEDS	6.3	4.3	7.1
90 PERCENT EXCEEDS	2.1	.41	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 mi².

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.--30 years (water years, 1961-62, 1965-92), 21.6 ft³/s (15,680 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 5,460 ft³/s, Apr. 15, 1963, gage height, 11.33 ft, from rating curve extended above 1,100 ft³/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 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Oct. 16	1500	*1,530	*5.83	Sept. 3	1215	1,190	5.27

Minimum discharge, No flow, May 25 to June 7.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1991 TO SEPTEMBER 1992
DAILY MEAN VALUES

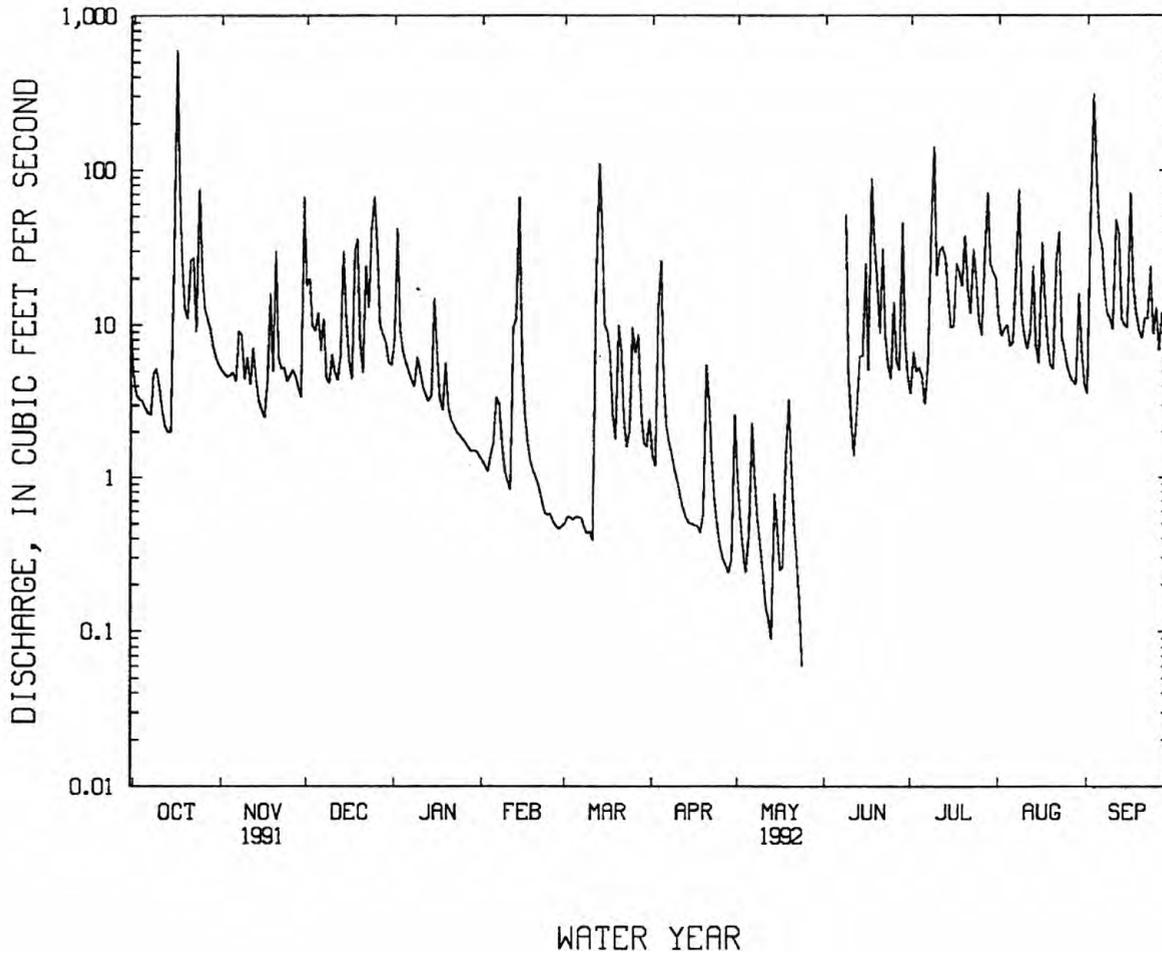
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4.8	5.1	18	8.2	1.3	.50	1.4	1.0	.00	3.6	11	3.6
2	3.5	4.8	20	42	1.2	.55	1.2	.54	.00	6.7	8.5	51
3	3.3	4.6	9.9	9.5	1.1	.55	13	.35	.00	5.0	9.4	312
4	3.2	4.7	9.2	6.8	1.4	.53	26	.24	.00	5.3	10	103
5	2.9	4.9	12	5.7	1.7	.55	4.4	.41	.00	4.6	7.3	39
6	2.7	4.3	6.8	5.0	3.4	.55	2.2	2.3	.00	3.1	7.7	33
7	2.6	9.1	11	4.4	3.1	.54	1.7	.99	.00	5.4	22	17
8	4.8	8.6	4.5	4.0	1.7	.47	1.4	.54	52	40	75	12
9	5.2	4.5	4.2	6.2	1.1	.43	1.1	.37	4.9	141	12	11
10	4.0	6.1	6.4	5.1	.94	.44	.93	.25	2.3	21	8.3	9.4
11	2.8	4.1	4.9	4.0	.83	.39	.74	.15	1.4	30	7.0	48
12	2.2	7.1	4.4	3.5	9.7	20	.62	.12	2.7	32	9.1	39
13	2.0	4.4	6.3	3.2	11	111	.55	.09	6.2	27	24	11
14	2.0	3.2	30	3.5	67	41	.51	.78	6.3	15	7.4	10
15	24	2.8	11	15	6.3	10	.50	.46	25	9.6	5.7	9.6
16	595	2.5	5.8	6.9	2.7	9.0	.49	.25	5.1	9.9	34	71
17	82	4.4	4.5	3.4	1.7	6.5	.48	.26	88	25	15	18
18	26	16	30	2.8	1.3	2.6	.44	1.4	34	22	7.7	12
19	13	5.0	36	5.7	1.1	1.8	.58	3.3	19	18	5.5	9.2
20	11	30	7.6	2.9	1.0	10	5.5	1.1	8.9	38	5.2	8.2
21	26	6.1	4.9	2.4	.86	6.7	3.3	.49	31	17	26	11
22	27	5.2	24	2.2	.71	2.4	1.3	.29	8.6	12	40	11
23	9.1	5.3	13	2.0	.59	1.6	.71	.15	5.5	31	8.3	24
24	75	4.3	42	1.9	.57	2.0	.48	.06	4.5	20	6.8	8.7
25	22	4.7	67	1.8	.58	9.6	.36	.00	14	11	5.3	13
26	13	5.1	31	1.7	.52	6.6	.30	.00	5.8	8.6	4.6	6.9
27	11	4.6	10	1.6	.48	8.7	.27	.00	5.1	27	4.3	12
28	9.5	3.9	8.7	1.5	.46	2.9	.24	.00	46	72	4.1	7.1
29	7.2	3.4	7.6	1.5	.48	1.7	.29	.00	8.0	25	16	5.8
30	6.1	67	5.7	1.5	---	1.6	2.6	.00	4.6	22	6.9	5.0
31	5.5	---	5.5	1.4	---	2.4	---	.00	---	20	4.1	---
TOTAL	1008.4	245.8	461.9	167.3	124.82	263.60	73.59	15.89	388.90	727.8	418.2	931.5
MEAN	32.5	8.19	14.9	5.40	4.30	8.50	2.45	.51	13.0	23.5	13.5	31.0
MAX	595	67	67	42	67	111	26	3.3	88	141	75	312
MIN	2.0	2.5	4.2	1.4	.46	.39	.24	.00	.00	3.1	4.1	3.6
AC-FT	2000	488	916	332	248	523	146	32	771	1440	829	1850

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

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1961 - 1992, BY WATER YEAR (WY)

MEAN	17.4	28.6	21.4	20.6	16.9	28.7	32.4	21.6	16.9	24.6	18.4	14.1
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 1991 CALENDAR YEAR			FOR 1992 WATER YEAR		WATER YEARS 1961 - 1992	
ANNUAL TOTAL	8689.3		4827.70		21.6	
ANNUAL MEAN	23.8		13.2		37.2	
HIGHEST ANNUAL MEAN					11.1	
LOWEST ANNUAL MEAN					1982	
HIGHEST DAILY MEAN	615	Mar 19	595	Oct 16	1050	Feb 1 1969
LOWEST DAILY MEAN	1.9	Mar 5	.00	May 25	.00	Dec 24 1960
ANNUAL SEVEN-DAY MINIMUM	2.3	Feb 6	.00	May 25	.00	Jan 19 1977
ANNUAL RUNOFF (AC-FT)	17240		9580		15680	
10 PERCENT EXCEEDS	45		30		50	
50 PERCENT EXCEEDS	10		5.0		8.9	
90 PERCENT EXCEEDS	3.4		.45		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 mi².

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

REVISED RECORDS.--WSP 1937: Drainage area.

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

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

AVERAGE DISCHARGE.--33 years, 1.94 ft³/s (1,410 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,450 ft³/s, Jan. 6, 1982, gage height, 7.40 ft, from floodmarks, from rating curve extended above 51 ft³/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 ft³/s.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 200 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Oct. 16	1630	*428	*4.26	Feb. 14	0430	250	3.60

Minimum discharge, No flow on many days.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1991 TO SEPTEMBER 1992
DAILY MEAN VALUES

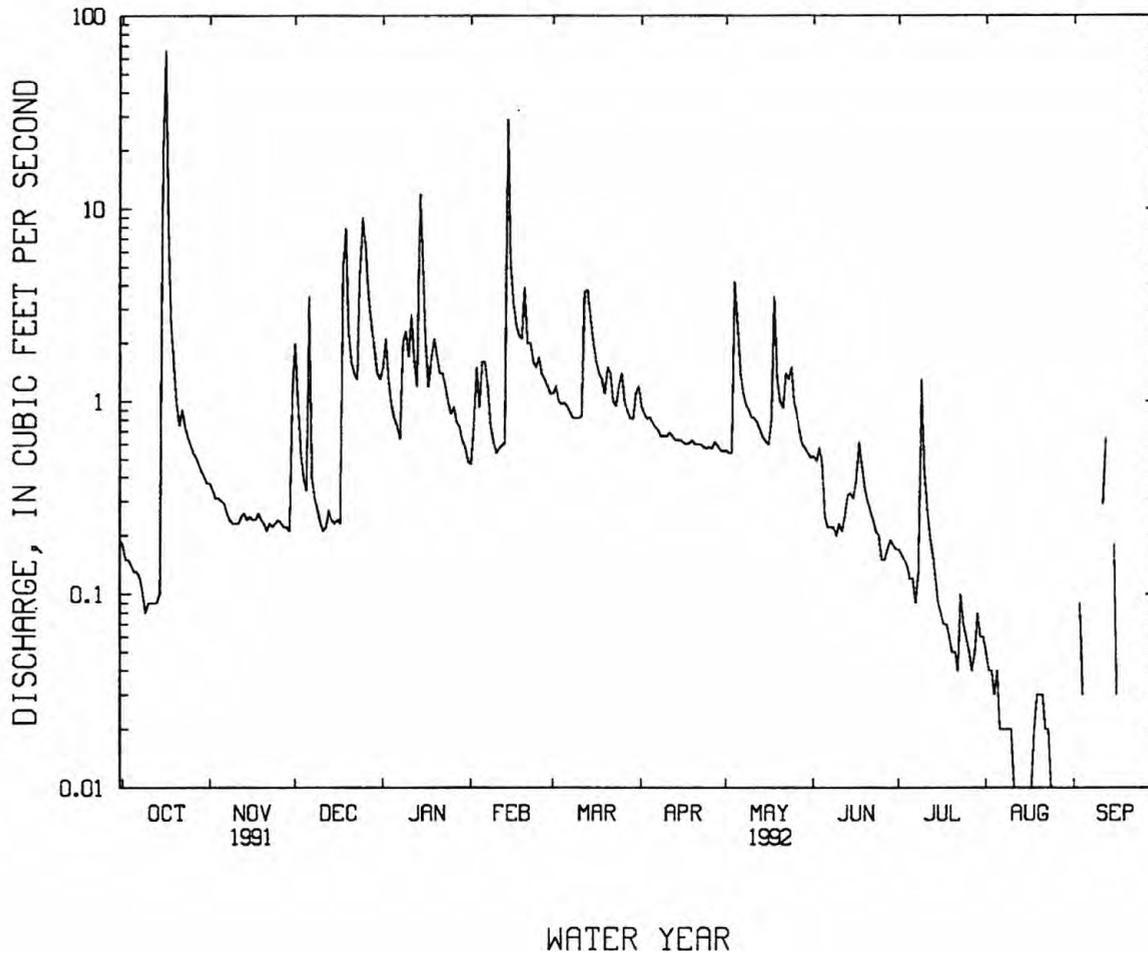
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.18	.37	2.0	1.5	.47	1.1	.94	.56	.52	.17	.05	.00
2	.15	.34	1.0	2.1	.79	1.2	.86	.54	.49	.16	.04	.00
3	.15	.31	.54	1.3	1.5	1.0	.81	.54	.58	.15	.04	.09
4	.14	.31	.40	.97	.93	.97	.83	4.2	.47	.14	.03	.03
5	.13	.30	.34	.82	1.6	.98	.78	2.5	.25	.12	.04	.00
6	.13	.29	3.5	.74	1.6	.94	.74	1.4	.22	.12	.02	.00
7	.12	.26	.40	.64	1.2	.87	.71	1.1	.22	.09	.02	.00
8	.10	.24	.31	2.0	.74	.82	.66	.96	.22	.13	.02	.00
9	.08	.23	.27	2.3	.61	.82	.66	.91	.20	1.3	.02	.00
10	.09	.23	.23	1.7	.54	.82	.66	.83	.23	.44	.02	.00
11	.09	.23	.21	2.8	.57	.84	.69	.82	.21	.28	.01	.29
12	.09	.25	.22	1.6	.59	3.7	.66	.78	.25	.20	.01	.64
13	.09	.26	.27	1.2	.61	3.8	.63	.71	.32	.16	.01	.00
14	.10	.24	.24	12	29	2.7	.63	.65	.33	.12	.01	.00
15	18	.25	.23	5.5	5.3	2.0	.63	.62	.31	.09	.00	.18
16	66	.24	.24	2.0	3.3	1.6	.61	.60	.39	.08	.01	.03
17	9.0	.24	.23	1.2	2.5	1.4	.60	.80	.62	.07	.01	.00
18	2.7	.26	5.0	1.7	2.2	1.3	.61	3.5	.46	.07	.02	.00
19	1.6	.24	7.9	2.1	2.1	1.1	.63	1.3	.35	.06	.03	.00
20	.98	.23	2.3	1.7	3.9	1.5	.60	1.0	.30	.05	.03	.00
21	.75	.21	1.6	1.4	2.0	1.4	.60	.93	.27	.05	.03	.00
22	.91	.23	1.4	1.4	2.0	1.0	.60	1.4	.24	.04	.02	.00
23	.74	.22	1.3	1.2	1.6	.95	.58	1.3	.21	.10	.02	.00
24	.65	.23	4.7	.99	1.5	1.2	.57	1.5	.20	.07	.01	.00
25	.59	.24	9.0	.86	1.7	1.4	.58	.99	.15	.06	.00	.00
26	.54	.23	6.3	.94	1.4	1.0	.57	.86	.15	.05	.00	.00
27	.51	.22	3.6	.78	1.3	.89	.62	.70	.17	.04	.00	.00
28	.47	.22	2.5	.74	1.2	.82	.59	.60	.19	.05	.00	.00
29	.43	.21	1.9	.63	1.1	.81	.56	.57	.18	.08	.00	.00
30	.40	1.1	1.4	.58	---	1.1	.55	.54	.17	.06	.00	.00
31	.37	---	1.3	.49	---	1.2	---	.51	---	.06	.00	---
TOTAL	106.28	8.43	60.83	55.88	73.85	41.23	19.76	34.22	8.87	4.66	0.52	1.26
MEAN	3.43	.28	1.96	1.80	2.55	1.33	.66	1.10	.30	.15	.017	.042
MAX	66	1.1	9.0	12	29	3.8	.94	4.2	.62	1.3	.05	.64
MIN	.08	.21	.21	.49	.47	.81	.55	.51	.15	.04	.00	.00
AC-FT	211	17	121	111	146	82	39	68	18	9.2	1.0	2.5

16211600 MAKAHA STREAM NEAR MAKAHA--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1959 - 1992, BY WATER YEAR (WY)

MEAN	.81	1.64	3.14	4.54	3.68	3.18	2.82	1.57	.67	.53	.40	.41
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	.45	.66	.20	.11	.059	.002	.000
(WY)	1976	1978	1960	1977	1978	1981	1992	1984	1984	1975	1975	1961

SUMMARY STATISTICS FOR 1991 CALENDAR YEAR	FOR 1992 WATER YEAR	WATER YEARS 1959 - 1992
ANNUAL TOTAL	501.70	415.79
ANNUAL MEAN	1.37	1.14
HIGHEST ANNUAL MEAN		1.94
LOWEST ANNUAL MEAN		3.80
HIGHEST DAILY MEAN	66 Oct 16	283 Feb 7 1976
LOWEST DAILY MEAN	.07 Aug 23	.00 Sep 25 1960
ANNUAL SEVEN-DAY MINIMUM	.09 Oct 8	.00 Aug 28 1961
ANNUAL RUNOFF (AC-FT)	995	825
10 PERCENT EXCEEDS	2.6	2.0
50 PERCENT EXCEEDS	.50	.54
90 PERCENT EXCEEDS	.15	.01



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 mi².

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.--35 years, 11.1 ft³/s (8,010 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 6,370 ft³/s, Mar. 21, 1991, revised, gage height, 12.67 ft, from rating curve extended above 5,680 ft³/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 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Oct. 16	1045	1,220	7.54	Sept. 3	1130	*2,630	9.72
Aug. 8	0330	1,135	7.37				

Minimum discharge, No flow for many days April - June.

REVISIONS.--The date for the maximum for the period of record has been revised to Mar. 21, 1991. The previously published date was entered erroneously.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1991 TO SEPTEMBER 1992
DAILY MEAN VALUES

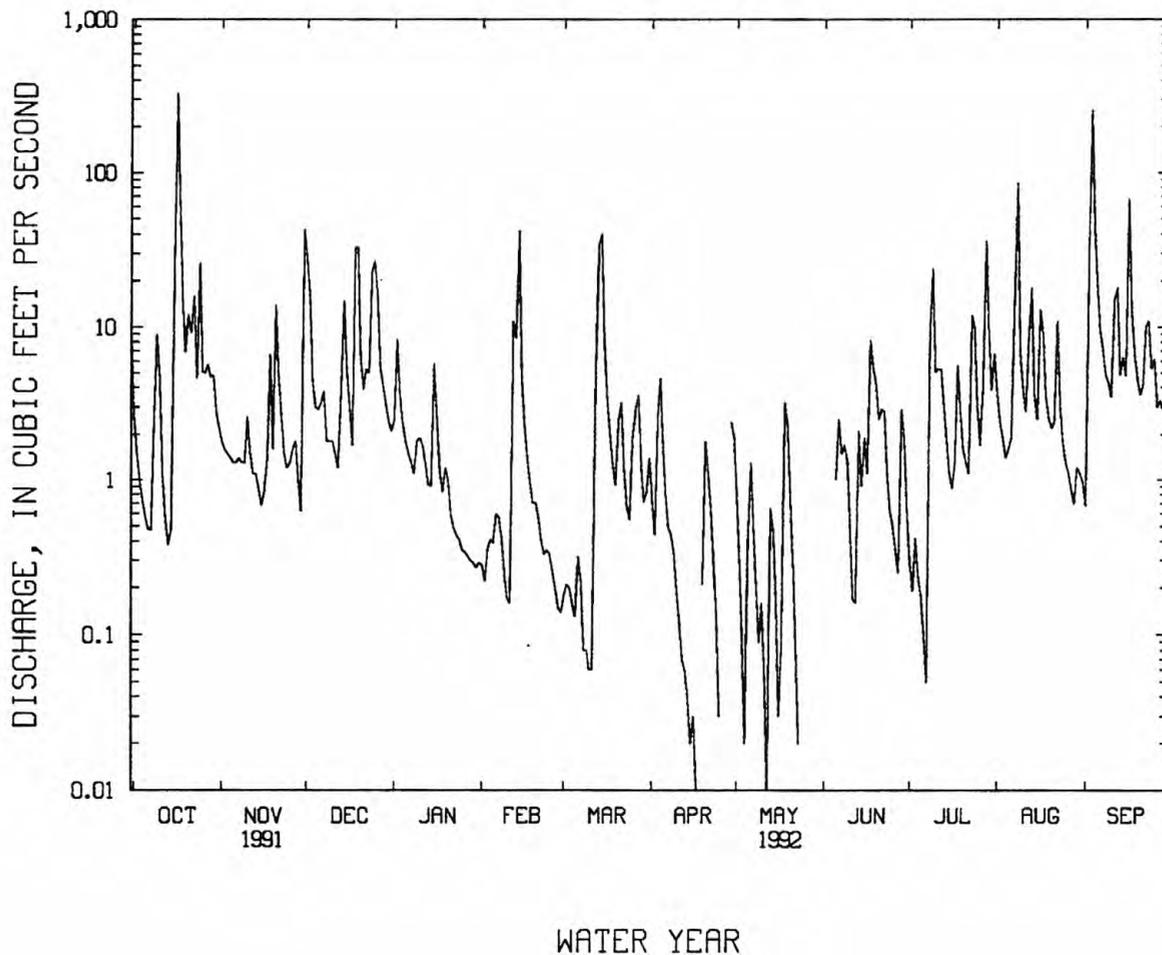
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.7	1.8	29	2.5	.28	.18	.73	.80	.00	.30	3.7	.68
2	1.5	1.6	16	8.3	.22	.21	.44	.30	.00	.19	2.4	35
3	.97	1.5	4.4	3.6	.36	.20	2.6	.10	.00	.42	1.9	258
4	.73	1.4	3.0	2.4	.41	.16	4.6	.02	.00	.24	1.4	42
5	.58	1.3	2.9	1.8	.39	.13	1.6	.43	1.0	.18	1.6	18
6	.48	1.3	3.2	1.5	.60	.32	.79	1.3	2.5	.10	1.9	9.4
7	.47	1.4	3.8	1.3	.57	.22	.49	.47	1.5	.05	14	7.0
8	2.5	1.3	1.8	1.1	.42	.08	.44	.20	1.7	9.3	86	4.9
9	9.0	1.3	1.8	1.8	.24	.08	.33	.09	1.3	24	6.7	4.3
10	4.6	2.6	1.8	1.9	.17	.06	.19	.16	.46	5.1	3.9	3.5
11	1.1	1.5	1.5	1.7	.16	.06	.12	.06	.17	5.3	2.8	15
12	.57	1.1	1.2	1.3	11	4.8	.07	.01	.16	5.3	8.5	18
13	.38	1.1	3.7	.93	8.5	34	.06	.65	2.1	3.0	18	4.9
14	.47	.88	15	.91	42	40	.04	.48	.91	1.8	3.6	6.3
15	21	.68	5.2	5.8	4.6	7.7	.02	.17	1.9	1.1	2.5	4.8
16	329	.83	3.0	2.7	2.3	3.4	.03	.03	1.1	.88	13	67
17	59	1.4	1.7	1.2	1.4	2.1	.01	.08	8.2	1.3	9.1	13
18	16	6.6	33	.83	.96	1.3	.00	3.2	5.4	5.6	3.5	6.7
19	6.9	1.6	33	1.2	.71	.92	.21	2.3	4.2	2.8	2.6	4.6
20	12	14	6.2	.97	.71	2.5	1.8	.74	2.5	1.6	2.2	3.6
21	9.2	4.8	3.9	.59	.57	3.2	1.1	.28	2.9	1.3	2.4	4.1
22	16	2.6	5.3	.49	.40	1.2	.63	.09	2.8	1.1	11	10
23	4.6	1.5	5.0	.44	.33	.68	.28	.02	1.1	12	3.0	11
24	26	1.2	23	.41	.35	.55	.13	.00	.63	10	1.8	5.3
25	5.1	1.3	27	.35	.33	1.9	.03	.00	.50	3.1	1.3	6.2
26	5.0	1.6	16	.34	.26	2.9	.00	.00	.35	1.7	1.1	3.0
27	5.7	1.8	5.4	.32	.20	3.6	.00	.00	.25	3.9	.86	3.3
28	4.7	.97	4.1	.30	.15	1.3	.00	.00	2.9	36	.70	2.9
29	4.8	.62	3.1	.29	.14	.72	2.4	.00	1.9	9.7	1.2	2.3
30	2.8	43	2.4	.27	---	.82	1.9	.00	.65	3.9	1.1	1.9
31	2.2	---	2.1	.29	---	1.4	---	.00	---	6.7	.96	---
TOTAL	556.05	104.58	268.5	47.83	78.73	116.69	21.04	11.98	49.08	157.96	214.72	576.68
MEAN	17.9	3.49	8.66	1.54	2.71	3.76	.70	.39	1.64	5.10	6.93	19.2
MAX	329	43	33	8.3	42	40	4.6	3.2	8.2	36	86	258
MIN	.38	.62	1.2	.27	.14	.06	.00	.00	.00	.05	.70	.68
AC-FT	1100	207	533	95	156	231	42	24	97	313	426	1140

16212800 KIPAPA STREAM NEAR WAHIAWA--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1957 - 1992, BY WATER YEAR (WY)

MEAN	10.4	15.1	12.4	11.4	10.3	17.2	16.0	9.87	5.50	9.68	8.49	5.49
MAX	49.6	61.8	42.2	32.1	54.4	98.4	60.9	34.0	21.9	28.1	37.5	19.2
(WY)	1982	1966	1988	1989	1969	1991	1963	1965	1978	1989	1958	1992
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 1991 CALENDAR YEAR	FOR 1992 WATER YEAR	WATER YEARS 1957 - 1992
ANNUAL TOTAL	5859.78	2203.84
ANNUAL MEAN	16.1	6.02
HIGHEST ANNUAL MEAN		11.1
LOWEST ANNUAL MEAN		25.2
HIGHEST DAILY MEAN	781 Mar 21	329 Oct 16
LOWEST DAILY MEAN	.34 Mar 5	.00 Apr 18
ANNUAL SEVEN-DAY MINIMUM	.50 Feb 6	.00 May 24
ANNUAL RUNOFF (AC-FT)	11620	4370
10 PERCENT EXCEEDS	23	11
50 PERCENT EXCEEDS	3.5	1.5
90 PERCENT EXCEEDS	.82	.10



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 mi².

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.--39 years (water years 1953-59, 1961-92), 41.2 ft³/s (29,850 acre-ft/yr). The figure published in the water year 1991 report was in error; the correct figure is 38 years (water years 1953-59, 1961-91), 41.4 ft³/s (29,990 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 13,600 ft³/s, Nov. 28, 1954, gage height, 14.82 ft, site and datum then in use, from rating curve extended above 730 ft³/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 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Oct. 16	1730	*7,140	9.59	Sep. 3	1300	2,150	*5.65
Feb. 14	0500	1,500	4.97				

Minimum discharge, 13 ft³/s, July 27.

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	27	24	56	26	22	22	22	18	e15	14	20	14
2	23	23	68	32	21	23	21	19	e16	14	16	39
3	21	23	42	34	21	22	20	20	e16	14	16	452
4	20	22	29	29	22	22	21	20	e16	14	16	113
5	20	22	28	26	22	23	25	18	e17	14	16	57
6	19	21	28	29	23	23	23	18	e17	14	16	36
7	19	21	28	28	23	23	19	18	e17	14	22	28
8	19	21	25	26	23	24	19	18	e16	14	127	25
9	20	22	26	26	22	23	20	18	16	36	34	21
10	28	23	26	26	22	21	19	17	16	29	21	19
11	21	23	26	26	21	21	19	17	16	18	17	47
12	20	25	26	24	22	21	19	17	15	19	17	80
13	19	24	24	25	33	61	19	17	16	20	32	34
14	20	22	37	26	206	73	19	17	18	17	26	28
15	29	21	32	30	39	51	18	17	17	15	19	28
16	1780	21	29	30	27	28	18	19	15	14	25	120
17	305	20	26	28	24	23	18	19	15	14	34	51
18	81	32	81	25	23	22	21	20	20	14	24	30
19	49	24	151	24	23	21	25	18	18	16	19	24
20	47	34	47	23	26	21	25	18	17	15	17	21
21	38	32	33	24	24	22	26	17	16	14	17	19
22	63	26	30	23	23	22	23	e17	16	14	22	21
23	39	24	35	23	22	21	19	e17	16	17	24	36
24	78	23	55	23	23	20	18	e17	16	30	18	29
25	43	21	60	22	23	20	18	e17	16	22	16	24
26	33	21	105	22	23	20	24	e17	15	15	15	20
27	33	21	44	22	25	22	37	e17	15	14	15	18
28	32	30	33	23	23	22	17	e16	15	37	14	18
29	31	33	30	22	22	21	17	e16	15	58	14	17
30	28	132	28	22	---	22	17	e15	15	23	14	16
31	26	---	27	22	---	24	---	e15	---	19	14	---
TOTAL	3031	831	1315	791	873	804	626	544	484	602	717	1485
MEAN	97.8	27.7	42.4	25.5	30.1	25.9	20.9	17.5	16.1	19.4	23.1	49.5
MAX	1780	132	151	34	206	73	37	20	20	58	127	452
MIN	19	20	24	22	21	20	17	15	15	14	14	14
AC-FT	6010	1650	2610	1570	1730	1590	1240	1080	960	1190	1420	2950

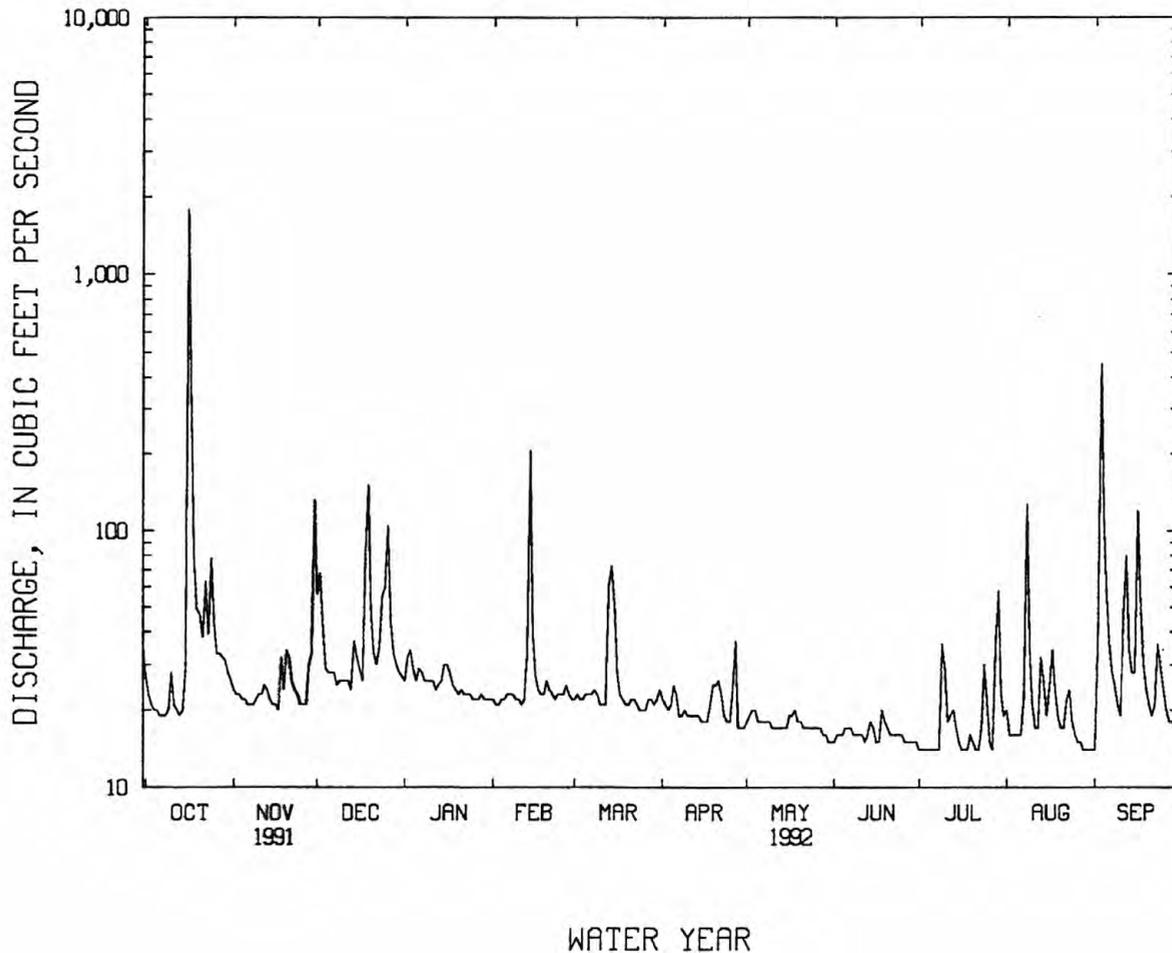
e Estimated

16213000 WAIKELE STREAM AT WAIPAHO--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1953 - 1992, BY WATER YEAR (WY)

MEAN	33.0	48.8	50.9	63.3	57.4	55.9	51.9	34.0	23.4	28.7	26.0	20.9
MAX	97.8	198	146	222	179	195	235	99.3	51.5	76.8	90.0	49.9
(WY)	1992	1966	1966	1969	1955	1991	1963	1965	1980	1989	1958	1974
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 1991 CALENDAR YEAR	FOR 1992 WATER YEAR		WATER YEARS 1953 - 1992	
ANNUAL TOTAL	19636	12103		
ANNUAL MEAN	53.8	33.1	41.2	
HIGHEST ANNUAL MEAN			77.3	1969
LOWEST ANNUAL MEAN			18.5	1954
HIGHEST DAILY MEAN	2590	1780	2590	Mar 21 1991
LOWEST DAILY MEAN	19	14	.61	Feb 25 1978
ANNUAL SEVEN-DAY MINIMUM	20	14	2.5	Feb 24 1978
ANNUAL RUNOFF (AC-FT)	38950	24010	29830	
10 PERCENT EXCEEDS	63	37	65	
50 PERCENT EXCEEDS	28	22	24	
90 PERCENT EXCEEDS	22	16	12	



16213000 WAIKELE STREAM AT WAIPAHO--Continued

WATER-QUALITY RECORDS

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

PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: April 1973 to September 1981.

WATER TEMPERATURE: April 1973 to September 1981.

SUSPENDED SEDIMENT DISCHARGE: July 1972 to current year.

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

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

EXTREMES FOR PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: Maximum, 796 micromhos/cm, Dec. 1, 1980; minimum, 30 micromhos/cm, Apr. 19, 1974.

WATER TEMPERATURES: Maximum, 30.0°C, May 6, 1973; minimum, 16.0°C, Mar. 16, 1976.

SEDIMENT CONCENTRATIONS: Maximum daily mean, 3,420 mg/L, Feb. 7, 1976; minimum daily mean, 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.

EXTREMES FOR CURRENT YEAR.--

SEDIMENT CONCENTRATIONS: Maximum daily mean, 2,260 mg/L (estimated), Oct. 16; minimum daily mean, 4 mg/L on several days.

SEDIMENT DISCHARGE: Maximum daily, 32,500 tons (estimated), Oct. 16; minimum daily, less than 0.01 ton, Aug. 29, 30.

WATER QUALITY DATA, WATER YEAR OCTOBER 1991 TO SEPTEMBER 1992

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 WATER (DEG C)	TUR- BID- ITY (NTU)	BARO- METRIC PRES- SURE (MM OF HG)	OXYGEN, DIS- SOLVED (MG/L)	OXYGEN, (PER- CENT SATUR- ATION)	COLI- FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)	STREP- TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML)
OCT 1991											
30...	1445	26	365	7.4	24.0	5.4	763	8.1	96	5000	K520
DEC											
09...	1330	24	480	7.3	22.5	3.4	762	8.1	94	1100	740
FEB 1992											
21...	1135	24	468	6.9	22.5	3.1	765	7.6	88	7800	1500
APR											
22...	1055	24	550	7.3	25.5	4.1	761	7.0	86	17000	2000
JUN											
15...	1025	18	541	7.3	24.5	1.4	764	6.8	82	K76	K130
AUG											
17...	1025	29	260	7.0	24.0	2.0	764	6.0	71	>60000	5400

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- LITY WAT DIS TOT IT FIELD MG/L AS CACO3
OCT 1991											
30...	65	7	12	8.6	47	60	3	2.1	71	0	58
DEC											
09...	84	25	14	12	59	59	3	2.6	72	0	59
FEB 1992											
21...	87	25	15	12	61	60	3	2.7	75	0	62
APR											
22...	95	36	15	14	69	60	3	2.9	72	0	59
JUN											
15...	91	31	15	13	64	60	3	2.6	73	0	60
AUG											
17...	45	5	8.0	6.1	32	60	2	1.7	49	0	40

> Actual value is known to be greater than the value shown.

K Results based on colony count outside acceptance range.

16213000 WAIKELE STREAM AT WAIPAHO--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1991 TO SEPTEMBER 1992

DATE	SULFATE DIS- SOLVED (MG/L AS SO4)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	FLUO- RIDE, DIS- SOLVED (MG/L AS F)	SILICA, DIS- SOLVED (MG/L AS SIO2)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L)	SOLIDS, SUM OF CONSTI- TUENTS, DIS- SOLVED (MG/L)	SOLIDS, DIS- SOLVED (TONS PER DAY)	NITRO- GEN, NITRITE TOTAL (MG/L AS N)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N)	NITRO- GEN, NO2+NO3 TOTAL (MG/L AS N)
OCT 1991 30...	17	73	0.20	48	227	248	16.2	<0.010	<0.010	1.10
DEC 09...	21	95	0.20	56	300	302	19.3	<0.010	0.010	1.30
FEB 1992 21...	20	95	0.20	58	302	308	19.9	<0.010	<0.010	1.50
APR 22...	22	110	<0.10	55	340	330	22.4	<0.010	<0.010	1.40
JUN 15...	23	110	0.20	61	326	332	15.5	<0.010	<0.010	1.40
AUG 17...	10	49	0.10	33	160	168	12.5	<0.010	<0.010	0.690

DATE	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA TOTAL (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS NH4)	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 TOTAL (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)
OCT 1991 30...	1.10	0.040	0.04	<0.20	0.180	0.170	0.150	0.150	20	7
DEC 09...	1.40	0.030	0.05	<0.20	0.240	0.180	0.170	0.170	--	--
FEB 1992 21...	1.50	0.050	0.06	<0.20	0.210	0.200	0.200	0.180	<10	6
APR 22...	1.40	0.050	0.08	<0.20	0.230	0.190	0.180	0.180	20	7
JUN 15...	1.40	0.030	0.04	<0.20	0.180	0.190	0.190	0.190	--	--
AUG 17...	0.680	0.020	0.03	<0.20	0.130	0.090	0.090	0.090	50	5

DATE	TIME	COBALT, DIS- SOLVED (UG/L AS CO)	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 1991 30...	1445	<3	55	<4	78	<10	<1	<1	<1.0	81	27
FEB 1992 21...	1135	<3	29	<4	73	<10	<1	<1	<1.0	100	30
APR 22...	1055	<3	21	<4	39	<10	<1	<1	<1.0	110	35
AUG 17...	1025	<3	77	<4	70	<10	1	7	<1.0	57	19

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

HAWAII, ISLAND OF OAHU

16213000 WAIKELE STREAM AT WAIPAHO--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1991 TO SEPTEMBER 1992

CROSS SECTION ANALYSES, WATER YEAR OCTOBER 1991 TO SEPTEMBER 1992

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 (PER- CENT SATUR- ATION)	OXYGEN, DIS- SOLVED (MG/L)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)
OCT 1991									
30...	1415	6.0	365	7.4	23.5	763	8.0	94	
30...	1420	16.0	361	7.4	24.0	763	8.0	95	
30...	1425	26.0	365	7.4	24.0	763	8.1	96	
30...	1430	36.0	365	7.4	24.0	763	8.0	95	
30...	1435	47.0	375	7.4	24.0	763	8.1	96	
FEB 1992									
21...	1045	5.0	468	6.9	22.5	765	7.4	85	
21...	1050	15.0	468	6.9	22.5	765	7.5	86	
21...	1055	25.0	468	6.9	22.5	765	7.6	88	
21...	1100	35.0	462	6.9	22.5	765	7.6	87	
21...	1105	45.0	468	6.9	22.5	765	7.6	87	

PARTICLE-SIZE DISTRIBUTION OF SUSPENDED SEDIMENT, WATER YEAR OCTOBER 1991 TO SEPTEMBER 1992

DATE	TIME	SEDI- MENT, SUS- PENDED (MG/L)	SEDI- MENT, DIS- CHARGE, SUS- PENDED (T/DAY)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM	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 1991					APR 1992				
30...	1445	6	0.43	100	22...	1055	3	0.20	100
DEC 09...	1330	7	0.45	100	JUN 15...	1025	4	0.19	100
FEB 1992					AUG 17...	1025	9	0.70	100
21...	1135	13	0.86	89					

16213000 WAIKELE STREAM AT WAIPAHU--Continued

SEDIMENT DISCHARGE, SUSPENDED (TONS/DAY), WATER YEAR OCTOBER 1991 TO SEPTEMBER 1992

DAY	MEAN DISCHARGE (CFS)	MEAN CONCEN- TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	OCTOBER			NOVEMBER			DECEMBER		
				MEAN DISCHARGE (CFS)	MEAN CONCEN- TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN- TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN- TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)
1	27	538	37	24	10	.66	56	58	11			
2	23	447	28	23	7	.46	68	54	10			
3	21	67	3.8	23	7	.40	42	36	4.1			
4	20	14	.77	22	7	.40	29	22	1.7			
5	20	12	.66	22	7	.38	28	14	1.1			
6	19	13	.65	21	7	.40	28	11	.83			
7	19	14	.74	21	7	.40	28	16	1.2			
8	19	18	.91	21	6	.34	25	18	1.2			
9	20	15	.79	22	6	.36	26	13	.93			
10	28	20	1.5	23	6	.36	26	27	1.9			
11	21	11	.64	23	6	.38	26	45	3.1			
12	20	10	.56	25	13	.96	26	24	1.8			
13	19	12	.61	24	7	.48	24	12	.75			
14	20	12	.66	22	6	.38	37	38	4.2			
15	29	19	1.6	21	7	.37	32	24	2.2			
16	1780	e2260	32500	21	8	.42	29	13	1.0			
17	305	e1500	2010	20	8	.44	26	9	.67			
18	81	163	37	32	13	1.1	81	64	20			
19	49	67	9.0	24	9	.60	151	e252	126			
20	47	57	7.4	34	19	2.0	47	e45	6.2			
21	38	63	6.4	32	21	1.9	33	e22	1.9			
22	63	90	15	26	7	.47	30	e19	1.5			
23	39	65	6.8	24	7	.43	35	e27	2.6			
24	78	102	28	23	7	.42	55	e61	12			
25	43	59	6.8	21	5	.31	60	e75	14			
26	33	49	4.4	21	7	.36	105	e139	48			
27	33	43	3.9	21	6	.35	44	e39	4.8			
28	32	46	3.9	30	4	.35	33	e25	2.3			
29	31	34	2.8	33	10	.85	30	e18	1.5			
30	28	17	1.3	132	271	142	28	e15	1.1			
31	26	10	.69	---	---	---	27	e17	1.2			
TOTAL	3031	---	34722.28	831	---	158.73	1315	---	290.78			
				JANUARY			FEBRUARY			MARCH		
1	26	e20	1.4	22	14	.80	22	6	.38			
2	32	e34	3.2	21	13	.74	23	6	.37			
3	34	e35	3.3	21	10	.59	22	6	.36			
4	29	e24	1.9	22	13	.80	22	6	.36			
5	26	e25	1.8	22	14	.86	23	5	.30			
6	29	e26	2.0	23	11	.69	23	7	.42			
7	28	e20	1.5	23	11	.66	23	6	.40			
8	26	e21	1.5	23	14	.87	24	6	.36			
9	26	e21	1.5	22	21	1.3	23	5	.33			
10	26	e22	1.5	22	11	.66	21	6	.32			
11	26	e23	1.6	21	10	.53	21	8	.44			
12	24	e24	1.6	22	8	.47	21	7	.41			
13	25	e25	1.7	33	11	.99	61	24	5.7			
14	26	e26	1.9	206	449	588	73	30	7.2			
15	30	31	2.5	39	58	6.6	51	28	4.1			
16	30	19	1.6	27	31	2.3	28	16	1.2			
17	28	17	1.3	24	29	1.9	23	14	.90			
18	25	9	.62	23	22	1.4	22	14	.85			
19	24	14	.92	23	24	1.5	21	11	.64			
20	23	17	1.1	26	21	1.5	21	8	.45			
21	24	15	1.0	24	14	.93	22	11	.65			
22	23	8	.49	23	14	.88	22	16	.91			
23	23	17	1.0	22	11	.67	21	9	.52			
24	23	19	1.2	23	15	.92	20	6	.33			
25	22	11	.65	23	11	.68	20	6	.32			
26	22	11	.65	23	7	.45	20	10	.55			
27	22	10	.58	25	9	.67	22	36	2.2			
28	23	10	.58	23	8	.50	22	22	1.3			
29	22	7	.45	22	7	.44	21	11	.65			
30	22	8	.46	---	---	---	22	18	1.1			
31	22	10	.58	---	---	---	24	24	1.5			
TOTAL	791	---	42.08	873	---	619.30	804	---	35.52			

e Estimated

16213000 WAIKELE STREAM AT WAIPAHO--Continued

SEDIMENT DISCHARGE, SUSPENDED (TONS/DAY), WATER YEAR OCTOBER 1991 TO SEPTEMBER 1992

DAY	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	
	APRIL			MAY			JUNE			
1	22	18	1.0	18	e6	.27	e15	e6	.27	
2	21	13	.71	19	e6	.32	e16	e6	.25	
3	20	16	.87	20	e6	.36	e16	e6	.25	
4	21	17	.92	20	e7	.37	e16	e6	.25	
5	25	20	1.3	18	e7	.34	e17	e6	.27	
6	23	18	1.1	18	e7	.33	e17	e6	.27	
7	19	18	.95	18	e7	.32	e17	e6	.27	
8	19	20	1.0	18	e7	.32	e16	e7	.28	
9	20	e11	.62	18	e7	.31	16	e6	.27	
10	19	e8	.41	17	e6	.30	16	e6	.27	
11	19	e8	.41	17	e6	.30	16	e6	.26	
12	19	e8	.41	17	e6	.30	15	e6	.25	
13	19	e8	.42	17	e6	.29	16	e6	.28	
14	19	e8	.44	17	e6	.28	18	e8	.37	
15	18	e9	.43	17	e7	.31	17	e4	.20	
16	18	e9	.44	19	e8	.39	15	e4	.17	
17	18	e10	.47	19	e8	.43	15	e4	.17	
18	21	e10	.58	20	e8	.42	20	e10	.57	
19	25	e10	.70	18	e7	.36	18	e9	.44	
20	25	e11	.71	18	e7	.34	17	e8	.35	
21	26	e13	.93	17	e6	.27	16	e6	.27	
22	23	e4	.28	e17	e6	.27	16	e7	.29	
23	19	e4	.23	e17	e6	.27	16	e9	.38	
24	18	e5	.24	e17	e6	.27	16	e8	.34	
25	18	e5	.24	e17	e6	.27	16	e8	.32	
26	24	e6	.44	e17	e6	.27	15	e7	.30	
27	37	e14	1.5	e17	e6	.27	15	e8	.33	
28	17	e5	.24	e16	e6	.25	15	e10	.42	
29	17	e5	.25	e16	e6	.25	15	e11	.44	
30	17	e6	.26	e15	e6	.24	15	e11	.44	
31	---	---	---	e15	e6	.24	---	---	---	
TOTAL	626	---	18.50	544	---	9.53	484	---	9.24	
		JULY			AUGUST			SEPTEMBER		
1	14	e11	.43	20	e10	.57	14	e14	.52	
2	14	e11	.43	16	e5	.22	39	e45	6.5	
3	14	e11	.43	16	e5	.21	452	e1410	3600	
4	14	e11	.42	16	e5	.21	113	e201	78	
5	14	e11	.41	16	e5	.22	57	e70	11	
6	14	e11	.41	16	e5	.21	36	e35	3.4	
7	14	e11	.40	22	e15	1.3	28	e27	2.0	
8	14	e10	.38	127	e244	156	25	e23	1.5	
9	36	e40	5.1	34	e34	3.3	21	e22	1.2	
10	29	e30	2.5	21	e17	.96	19	e21	1.1	
11	18	e16	.78	17	e14	.64	47	e68	22	
12	19	e17	.90	17	e15	.66	80	e117	30	
13	20	e15	.81	32	e39	3.5	34	e70	6.3	
14	17	e14	.64	26	e21	1.5	28	e68	5.1	
15	15	e13	.54	19	e14	.75	28	e66	5.1	
16	14	e12	.48	25	e25	2.0	120	e319	204	
17	14	e12	.44	34	e24	2.3	51	e58	8.8	
18	14	e11	.42	24	e21	1.3	30	e27	2.2	
19	16	e13	.58	19	e16	.83	24	e23	1.5	
20	15	e11	.47	17	e14	.66	21	e20	1.1	
21	14	e11	.42	17	e14	.66	19	e17	.88	
22	14	e11	.41	22	e18	1.2	21	e18	.99	
23	17	e13	.70	24	e23	1.5	36	e37	3.7	
24	30	e27	2.3	18	e16	.77	29	e29	2.3	
25	22	e19	1.1	16	e14	.59	24	e23	1.5	
26	15	e11	.45	15	e14	.57	20	e18	1.0	
27	14	e10	.38	15	e14	.54	18	e17	.85	
28	37	e41	7.9	14	e11	.44	18	e17	.81	
29	58	e98	17	14	e11	<.01	17	e17	.77	
30	23	e35	2.2	14	e11	<.01	16	e17	.74	
31	19	e18	.93	14	e11	.42	---	---	---	
TOTAL YEAR	602 12103	---	50.76 40145.63	717	---	184.05	1485	---	4004.86	

e Estimated

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

HAWAII, ISLAND OF OAHU

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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 mi².

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 fair. Low flow affected by effluent from sewage treatment plant and occasional small irrigation diversion and return flow upstream.

AVERAGE DISCHARGE.--40 years, 34.4 ft³/s (24,920 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 27,900 ft³/s, Oct. 28, 1981, gage height, 22.46 ft, from rating curve extended above 1,100 ft³/s on basis of slope-area measurements at gage heights 17.1 ft and 20.56 ft; minimum, 1.1 ft³/s on several days in 1984 and 1985.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 2,300 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Oct. 16	1730	6,220	12.77	Sep. 3	1130	*14,200	*17.27
Aug. 8	0500	3,350	10.10	Sep. 16	0900	2,450	9.00

Minimum discharge, 1.4 ft³/s, May 22, 23, 30, 31, June 3, 5, 6, 9-19, June 24 to July 9, July 16-24, 27, 28, Aug. 5-7.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1991 TO SEPTEMBER 1992
DAILY MEAN VALUES

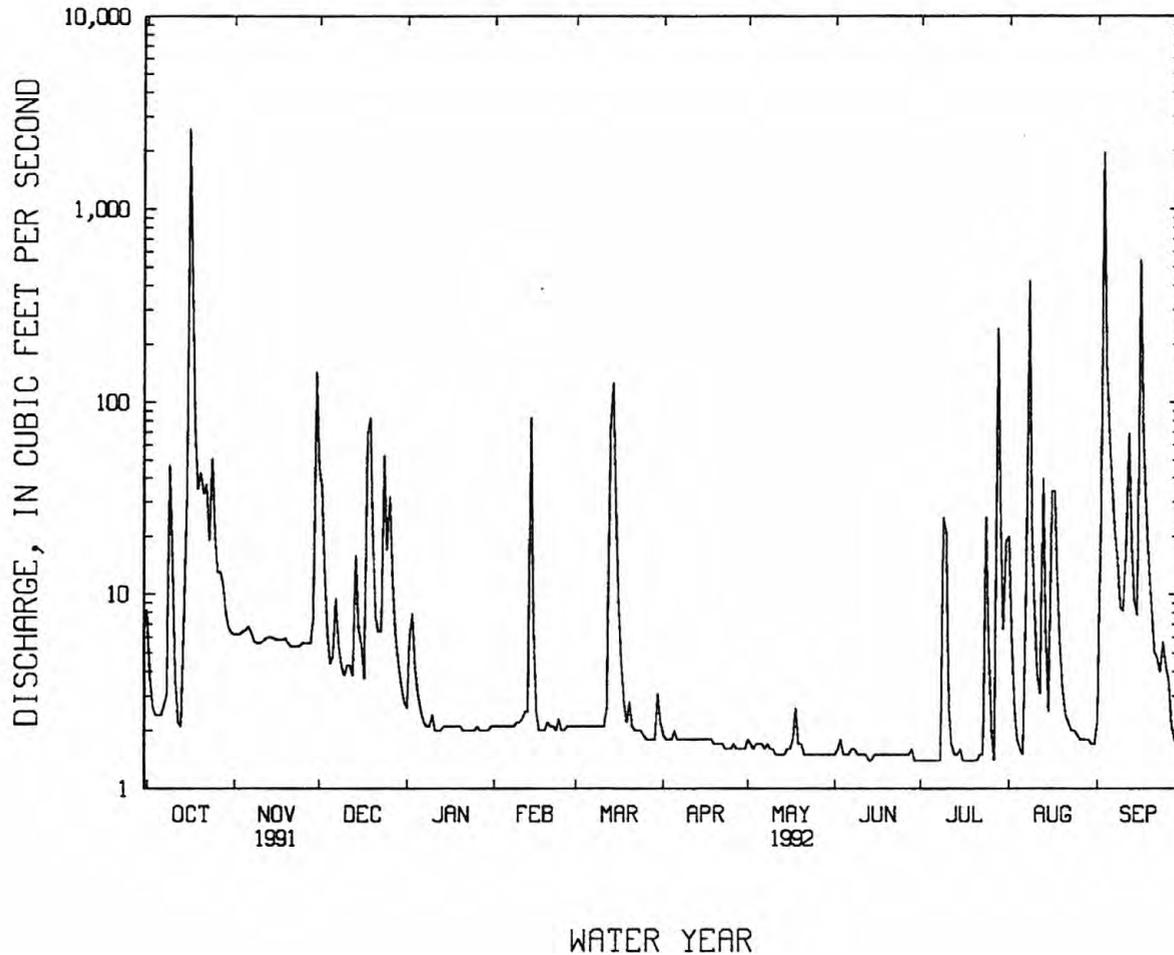
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	8.3	6.2	47	2.6	2.1	2.1	1.9	1.8	1.5	1.4	20	2.2
2	3.7	6.2	35	6.1	2.1	2.1	1.8	1.7	1.6	1.4	6.0	19
3	2.6	6.2	13	7.9	2.1	2.1	1.8	1.6	1.8	1.4	2.6	1970
4	2.4	6.4	6.3	4.1	2.1	2.1	1.8	1.7	1.5	1.4	1.8	158
5	2.4	6.5	4.4	3.0	2.1	2.1	2.0	1.7	1.5	1.4	1.6	69
6	2.4	6.8	4.8	2.5	2.1	2.1	1.8	1.7	1.5	1.4	1.5	36
7	2.7	6.3	9.5	2.2	2.1	2.1	1.8	1.6	1.6	1.4	8.8	21
8	3.1	5.7	5.5	2.1	2.1	2.1	1.8	1.7	1.6	1.4	426	15
9	47	5.6	4.3	2.1	2.2	2.1	1.8	1.6	1.5	25	23	8.5
10	15	5.6	3.8	2.4	2.2	2.1	1.8	1.6	1.5	21	8.7	8.2
11	3.6	5.7	4.3	2.0	2.3	2.1	1.8	1.5	1.5	2.6	3.9	17
12	2.2	5.9	4.3	2.0	2.5	2.6	1.8	1.5	1.5	1.7	3.1	69
13	2.1	6.0	3.8	2.0	2.5	73	1.8	1.5	1.4	1.5	40	18
14	7.3	6.0	16	2.1	83	127	1.8	1.5	1.4	1.5	6.6	9.3
15	33	5.9	6.6	2.1	6.9	28	1.8	1.6	1.5	1.6	2.5	7.8
16	2590	5.8	5.5	2.1	2.5	9.0	1.8	1.6	1.5	1.4	34	544
17	450	5.8	3.7	2.1	2.0	4.6	1.8	1.8	1.5	1.4	34	65
18	75	5.8	68	2.1	2.0	2.8	1.8	2.6	1.5	1.4	12	27
19	35	5.9	83	2.1	2.0	2.2	1.7	1.7	1.5	1.4	5.6	14
20	43	5.6	19	2.1	2.2	2.8	1.7	1.7	1.5	1.4	3.2	8.5
21	33	5.4	7.7	2.0	2.1	2.1	1.7	1.5	1.5	1.4	2.4	5.1
22	37	5.4	6.4	2.0	2.1	2.0	1.7	1.5	1.5	1.5	2.2	4.7
23	19	5.4	6.4	2.0	2.0	2.0	1.6	1.5	1.5	1.5	2.0	4.0
24	51	5.4	53	2.0	2.3	2.0	1.6	1.5	1.5	25	2.0	5.7
25	20	5.6	17	2.0	2.0	1.9	1.6	1.5	1.5	5.8	1.9	4.3
26	13	5.6	32	2.1	2.0	1.8	1.7	1.5	1.5	2.0	1.8	3.6
27	13	5.6	12	2.0	2.1	1.8	1.6	1.5	1.5	1.4	1.8	2.1
28	11	5.6	6.3	2.0	2.1	1.8	1.6	1.5	1.6	241	1.8	1.8
29	7.9	7.6	4.5	2.0	2.1	1.8	1.6	1.5	1.4	27	1.8	1.6
30	6.7	144	3.4	2.0	---	3.1	1.6	1.5	1.4	6.6	1.7	1.6
31	6.3	---	2.8	2.1	---	2.2	---	1.5	---	19	1.7	---
TOTAL	3548.7	315.5	499.3	77.9	147.9	297.6	52.4	50.2	45.3	405.3	666.0	3121.0
MEAN	114	10.5	16.1	2.51	5.10	9.60	1.75	1.62	1.51	13.1	21.5	104
MAX	2590	144	83	7.9	83	127	2.0	2.6	1.8	241	426	1970
MIN	2.1	5.4	2.8	2.0	2.0	1.8	1.6	1.5	1.4	1.4	1.5	1.6
AC-FT	7040	626	990	155	293	590	104	100	90	804	1320	6190

16216000 WAIAWA STREAM NEAR PEARL CITY--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1952 - 1992, BY WATER YEAR (WY)

MEAN	31.3	52.4	46.1	45.7	39.7	53.3	43.5	26.1	14.3	26.3	21.8	12.3
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	2.51	1.75	1.62	1.43	1.40	1.28	1.28
(WY)	1985	1990	1984	1986	1986	1984	1992	1992	1984	1984	1984	1984

SUMMARY STATISTICS FOR 1991 CALENDAR YEAR			FOR 1992 WATER YEAR			WATER YEARS 1952 - 1992		
ANNUAL TOTAL	17205.6		9227.1			34.5		
ANNUAL MEAN	47.1		25.2			80.8		
HIGHEST ANNUAL MEAN						1982		
LOWEST ANNUAL MEAN						7.56		
HIGHEST DAILY MEAN	4430	Mar 21	2590	Oct 16	4870	Mar 19	1980	
LOWEST DAILY MEAN	1.8	May 15	1.4	Jun 13	1.2	Aug 2	1984	
ANNUAL SEVEN-DAY MINIMUM	1.9	May 15	1.4	Jun 29	1.2	Aug 27	1984	
ANNUAL RUNOFF (AC-FT)	34130		18300		24960			
10 PERCENT EXCEEDS	36		25		48			
50 PERCENT EXCEEDS	5.4		2.1		6.7			
90 PERCENT EXCEEDS	2.2		1.5		2.5			



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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 mi².

PERIOD OF RECORD.--April 1991 to September 1991.

GAGE.--Water-stage recorder. Datum of gage is 646.52 ft above mean sea level.

REMARKS.--Records fair.

EXTREMES FOR CURRENT YEAR.--Maximum discharge during the period Apr. to Sep. 1991, 309 ft³/s, Sep. 21, gage height, 5.49 ft; minimum discharge, 0.08 ft³/s, Aug. 22.

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	---	---	---	---	---	---	---	1.3	.16	12	1.8	1.9
2	---	---	---	---	---	---	---	.83	.19	2.7	1.0	1.7
3	---	---	---	---	---	---	---	.68	8.3	1.3	.95	1.0
4	---	---	---	---	---	---	---	.68	1.9	.77	4.4	4.1
5	---	---	---	---	---	---	1.6	.51	2.1	.42	2.0	.85
6	---	---	---	---	---	---	1.5	.45	3.9	.34	1.2	.54
7	---	---	---	---	---	---	1.2	.40	8.4	1.3	.75	.42
8	---	---	---	---	---	---	7.0	.46	4.5	.46	31	.45
9	---	---	---	---	---	---	18	2.3	1.9	.26	16	.34
10	---	---	---	---	---	---	4.4	1.1	1.0	14	2.8	.42
11	---	---	---	---	---	---	9.3	.68	1.5	3.3	1.9	.77
12	---	---	---	---	---	---	3.2	.44	.62	2.9	1.5	.72
13	---	---	---	---	---	---	2.0	.37	.54	1.3	3.1	.85
14	---	---	---	---	---	---	1.6	.33	.28	1.1	.89	.55
15	---	---	---	---	---	---	1.9	.31	.22	.78	.54	.38
16	---	---	---	---	---	---	1.9	.28	.19	1.0	.26	.29
17	---	---	---	---	---	---	1.5	.27	.20	1.8	.16	.24
18	---	---	---	---	---	---	1.2	.25	.17	.86	.12	.21
19	---	---	---	---	---	---	1.1	.23	.18	1.2	1.4	2.8
20	---	---	---	---	---	---	.91	.26	.29	4.9	1.2	1.6
21	---	---	---	---	---	---	.99	.26	.31	1.1	.25	17
22	---	---	---	---	---	---	.84	.91	.23	.45	.10	5.4
23	---	---	---	---	---	---	.76	.68	.23	.27	1.3	1.2
24	---	---	---	---	---	---	.67	.28	.70	.26	.63	.56
25	---	---	---	---	---	---	1.1	.23	.99	2.2	1.0	.53
26	---	---	---	---	---	---	8.4	.19	1.3	.64	.92	.30
27	---	---	---	---	---	---	1.6	.17	2.7	.28	5.8	.24
28	---	---	---	---	---	---	1.3	.17	4.9	.18	2.5	.21
29	---	---	---	---	---	---	.98	.17	1.5	4.1	68	.19
30	---	---	---	---	---	---	1.2	.34	2.2	18	28	.20
31	---	---	---	---	---	---	---	.20	---	3.1	3.6	---
TOTAL	---	---	---	---	---	---	---	15.73	51.60	83.27	185.07	45.96
MEAN	---	---	---	---	---	---	---	.51	1.72	2.69	5.97	1.53
MAX	---	---	---	---	---	---	---	2.3	8.4	18	68	17
MIN	---	---	---	---	---	---	---	.17	.16	.18	.10	.19
AC-FT	---	---	---	---	---	---	---	31	102	165	367	91

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

MEAN	---	---	---	---	---	---	---	.51	1.72	2.69	5.97	1.53
MAX	---	---	---	---	---	---	---	.51	1.72	2.69	5.97	1.53
(WY)	---	---	---	---	---	---	---	1991	1991	1991	1991	1991
MIN	---	---	---	---	---	---	---	.51	1.72	2.69	5.97	1.53
(WY)	---	---	---	---	---	---	---	1991	1991	1991	1991	1991

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 mi².

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

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

REMARKS.--Records good except for the period July 13 to Sep. 30 during the construction operation which are poor. Suspended sediment data are collected at this site.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 468 ft³/s, Oct. 16, 1991, gage height, 6.92 ft; no flow at times each year.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 468 ft³/s, Oct. 16, gage height, 6.92 ft; no flow for many days.

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	.16	.25	13	.28	.00	.00	.00	.00	.00	.03	1.5	2.0
2	.15	.24	9.7	1.5	.00	.00	.00	.00	.00	.03	.56	23
3	.13	.21	1.6	.39	.00	.00	.00	.00	.02	.01	.28	124
4	.12	.20	.66	.24	.00	.00	.00	.01	.02	.00	.15	31
5	.12	.17	.38	.17	.00	.00	.00	.63	.01	.00	.20	8.2
6	.11	.18	3.6	.14	.00	.00	.00	.04	.02	.00	.17	4.0
7	.12	.22	1.1	.12	.00	.00	.00	.00	.01	.02	3.2	3.7
8	.13	.16	.34	5.5	.00	.00	.00	.00	.02	2.7	8.6	1.1
9	1.5	.15	.30	2.7	.00	.00	.00	.00	.00	18	.68	1.0
10	.38	.15	.20	.33	.00	.00	.00	.00	.02	2.2	.30	.85
11	.15	.13	.14	.16	.00	.00	.00	.00	.01	.68	.21	21
12	.11	.14	.15	.12	.00	4.3	.00	.00	.00	.34	7.9	18
13	.09	.12	3.1	.09	.00	14	.00	.00	.00	.10	1.1	2.8
14	.10	.10	6.2	10	14	18	.00	.00	.00	.04	.37	2.6
15	8.7	.08	1.3	2.0	.57	2.8	.00	.00	.00	.00	.24	1.9
16	82	.07	.51	.53	.11	.75	.00	.00	.00	.00	4.0	81
17	17	.10	2.0	.22	.04	.20	.00	.01	.00	.01	.59	5.2
18	4.4	.10	8.1	.17	.00	.09	.00	.01	.00	.03	.27	2.2
19	1.9	.26	3.6	.12	.00	.06	.01	.03	.71	.05	.20	1.4
20	2.9	2.9	1.1	.09	.00	.09	.01	.01	.40	.05	.18	.99
21	4.1	.32	.55	.07	.00	.04	.00	.00	.95	.06	.28	.74
22	5.8	.15	.79	.05	.00	.00	.00	.00	.11	.02	.26	3.5
23	1.8	.09	.33	.01	.00	.00	.00	.00	.06	11	.17	11
24	3.0	.12	20	.00	.00	.03	.00	.00	.04	8.0	.15	14
25	1.1	.07	5.9	.00	.00	.04	.00	.00	.01	1.0	.12	1.5
26	.82	.05	2.6	.00	.00	.06	.00	.00	.00	.42	.11	.55
27	.74	.03	1.1	.00	.00	.03	.00	.00	.03	1.1	.13	.52
28	.45	.00	.61	.00	.00	.00	.21	.01	.64	27	.11	.30
29	.34	.02	.36	.00	.00	.00	.31	.26	.07	3.2	2.7	.28
30	.29	10	.27	.00	---	.00	.00	.01	.01	3.3	.21	.22
31	.27	---	.26	.00	---	.00	---	.00	---	4.4	.17	---
TOTAL	138.98	16.78	89.85	25.00	14.72	40.49	0.54	1.02	3.16	83.79	35.11	368.55
MEAN	4.48	.56	2.90	.81	.51	1.31	.018	.033	.11	2.70	1.13	12.3
MAX	82	10	20	10	14	18	.31	.63	.95	27	8.6	124
MIN	.09	.00	.14	.00	.00	.00	.00	.00	.00	.00	.11	.22
AC-FT	276	33	178	50	29	80	1.1	2.0	6.3	166	70	731

16225800 NORTH HALAWA STREAM NEAR KANEOHE--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1991 - 1992, BY WATER YEAR (WY)

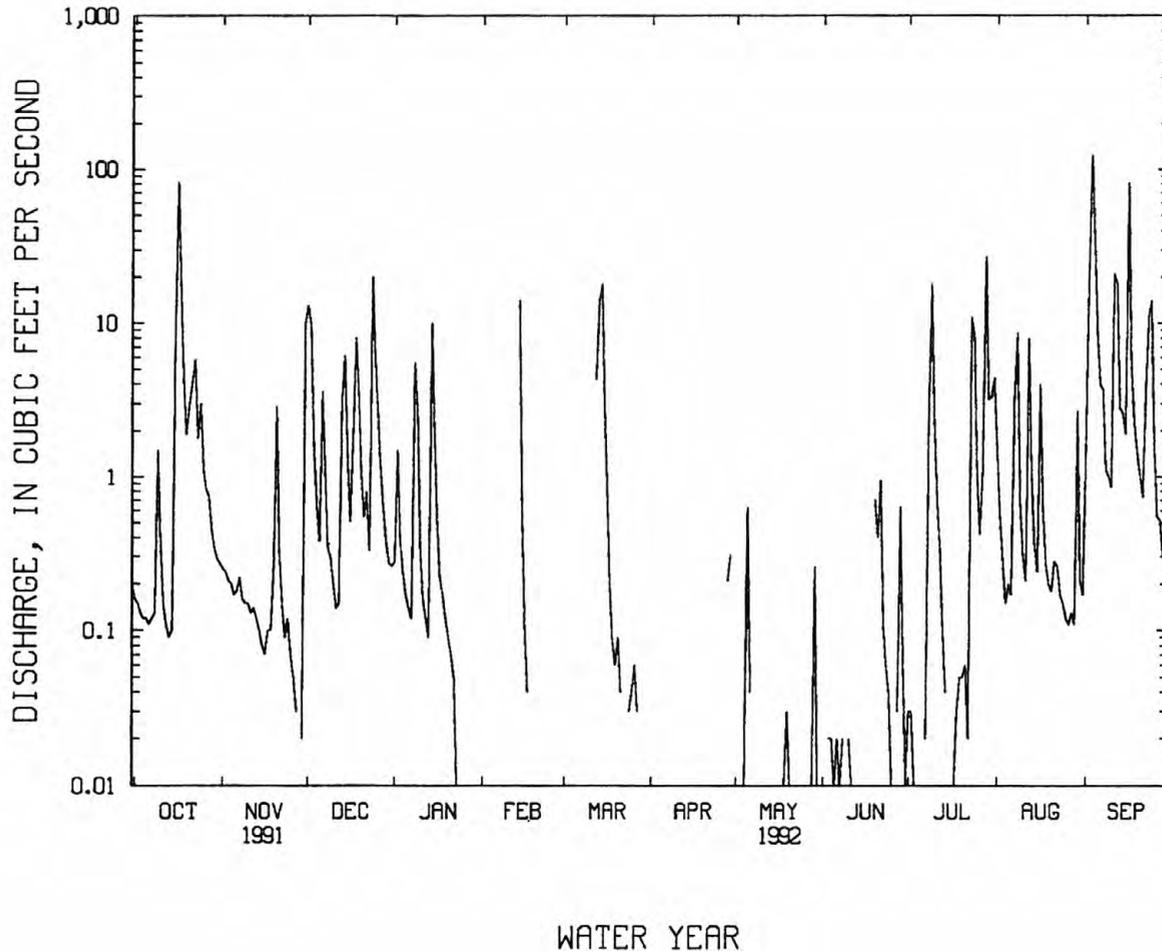
MEAN	4.48	.56	2.90	.81	.51	1.31	.018	.27	.91	2.69	3.55	6.91
MAX	4.48	.56	2.90	.81	.51	1.31	.018	.51	1.72	2.70	5.97	12.3
(WY)	1992	1992	1992	1992	1992	1992	1992	1991	1991	1992	1991	1992
MIN	4.48	.56	2.90	.81	.51	1.31	.018	.033	.11	2.69	1.13	1.53
(WY)	1992	1992	1992	1992	1992	1992	1992	1992	1992	1991	1992	1991

SUMMARY STATISTICS

FOR 1992 WATER YEAR

WATER YEARS 1991 - 1992

ANNUAL TOTAL	817.99	
ANNUAL MEAN	2.23	2.23
HIGHEST ANNUAL MEAN		2.23 1992
LOWEST ANNUAL MEAN		2.23 1992
HIGHEST DAILY MEAN	124 Sep 3	124 Sep 3 1992
LOWEST DAILY MEAN	.00 Nov 28	.00 Nov 28 1991
ANNUAL SEVEN-DAY MINIMUM	.00 Jan 24	.00 Jan 24 1992
ANNUAL RUNOFF (AC-FT)	1620	1620
10 PERCENT EXCEEDS	4.0	4.4
50 PERCENT EXCEEDS	.12	.27
90 PERCENT EXCEEDS	.00	.00



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

EXTREMES FOR PERIOD OF DAILY RECORD.--

SEDIMENT CONCENTRATIONS: Maximum daily mean, 5,620 mg/L (estimated), Sep. 3, 1992; no flow on many days in 1992.

SEDIMENT DISCHARGE: Maximum daily, 979 tons (estimated), Sep. 3, 1992; no flow on many days in 1992.

EXTREMES FOR CURRENT YEAR.--

Water year 1991:

SEDIMENT CONCENTRATIONS: Maximum daily mean, 1,200 mg/L (estimated), Aug. 29; minimum daily mean, 1 mg/L on many days.

SEDIMENT DISCHARGE: Maximum daily, 408 tons (estimated), Aug. 29; minimum daily, less than 0.01 tons on many days.

Water year 1992:

SEDIMENT CONCENTRATIONS: Maximum daily mean, 5,620 mg/L (estimated), Sep. 3; no flow on many days.

SEDIMENT DISCHARGE: Maximum daily, 979 tons (estimated), Sep. 3; no flow on many days.

WATER QUALITY DATA, WATER YEAR OCTOBER 1991 TO SEPTEMBER 1992

DATE	TIME	GAGE HEIGHT (FEET)	DIS- CHARGE, INST. CUBIC FEET PER SECOND	TEMPER- ATURE WATER (DEG C)	SEDI- MENT, SUS- PENDE (MG/L)	SEDI- MENT, DIS- CHARGE, SUS- PENDE (T/DAY)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM
DEC							
02...	0955	3.35	21	22.0	136	7.8	99
18...	1335	3.31	21	20.5	157	8.7	100
MAR							
13...	0920	3.20	14	19.0	135	5.1	99
JUL							
23...	0940	4.78	13	22.5	1930	69	98

16225800 NORTH HALAWA STREAM NR KANEOHE--Continued

SEDIMENT DISCHARGE, SUSPENDED (TONS/DAY), WATER YEAR OCTOBER 1991 TO SEPTEMBER 1992

DAY	MEAN DISCHARGE (CFS)	MEAN CONCEN- TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	OCTOBER			NOVEMBER			DECEMBER		
				MEAN DISCHARGE (CFS)	MEAN CONCEN- TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN- TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN- TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)
1	.16	e7	<.01	.25	e64	.04	13	95	13			
2	.15	e5	<.01	.24	e85	.05	9.7	95	9.4			
3	.13	e4	<.01	.21	e114	.07	1.6	7	.04			
4	.12	e3	<.01	.20	131	.07	.66	6	.01			
5	.12	e2	<.01	.17	e65	.03	.38	6	.01			
6	.11	e2	<.01	.18	e27	.01	3.6	e44	1.5			
7	.12	e1	<.01	.22	e12	.01	1.1	14	.05			
8	.13	3	<.01	.16	3	<.01	.34	6	.01			
9	1.5	e24	.22	.15	e1	<.01	.30	7	.01			
10	.38	8	.01	.15	e1	<.01	.20	7	<.01			
11	.15	e6	<.01	.13	e1	<.01	.14	5	<.01			
12	.11	e6	<.01	.14	e1	<.01	.15	7	<.01			
13	.09	e5	<.01	.12	e1	<.01	3.1	e49	2.4			
14	.10	e5	<.01	.10	1	<.01	6.2	e80	4.1			
15	8.7	259	61	.08	e1	<.01	1.3	10	.04			
16	82	796	316	.07	e2	<.01	.51	6	.01			
17	17	25	1.4	.10	e2	<.01	2.0	43	2.6			
18	4.4	6	.08	.10	5	<.01	8.1	135	4.2			
19	1.9	e10	.05	.26	e67	.09	3.6	85	.90			
20	2.9	e24	.30	2.9	109	1.0	1.1	11	.04			
21	4.1	21	.64	.32	37	.04	.55	7	.01			
22	5.8	e44	.95	.15	9	<.01	.79	14	.03			
23	1.8	e14	.07	.09	e7	<.01	.33	7	.01			
24	3.0	e35	.36	.12	e5	<.01	20	375	51			
25	1.1	12	.04	.07	e4	<.01	5.9	e39	.81			
26	.82	e13	.03	.05	e3	<.01	2.6	9	.07			
27	.74	e17	.03	.03	e2	<.01	1.1	5	.02			
28	.45	e21	.02	.00	0	.00	.61	5	.01			
29	.34	27	.02	.02	e1	<.01	.36	3	<.01			
30	.29	e35	.03	10	205	25	.27	3	<.01			
31	.27	e47	.03	---	---	---	.26	6	<.01			
TOTAL	138.98	---	381.40	16.78	---	26.59	89.85	---	90.34			
		JANUARY			FEBRUARY			MARCH				
1	.28	3	<.01	.00	0	.00	.00	0	.00			
2	1.5	7	.03	.00	0	.00	.00	0	.00			
3	.39	5	<.01	.00	0	.00	.00	0	.00			
4	.24	1	<.01	.00	0	.00	.00	0	.00			
5	.17	1	<.01	.00	0	.00	.00	0	.00			
6	.14	1	<.01	.00	0	.00	.00	0	.00			
7	.12	1	<.01	.00	0	.00	.00	0	.00			
8	5.5	e70	6.5	.00	0	.00	.00	0	.00			
9	2.7	19	.34	.00	0	.00	.00	0	.00			
10	.33	2	<.01	.00	0	.00	.00	0	.00			
11	.16	1	<.01	.00	0	.00	.00	0	.00			
12	.12	1	<.01	.00	e1	.00	4.3	e56	2.9			
13	.09	1	<.01	.00	e1	.00	14	194	11			
14	10	277	56	14	e209	65	18	e190	20			
15	2.0	49	.35	.57	9	.02	2.8	10	.09			
16	.53	5	.01	.11	5	<.01	.75	10	.02			
17	.22	3	<.01	.04	e5	<.01	.20	e18	.01			
18	.17	5	<.01	.00	0	.00	.09	e19	<.01			
19	.12	2	<.01	.00	0	.00	.06	e20	<.01			
20	.09	2	<.01	.00	0	.00	.09	e21	<.01			
21	.07	4	<.01	.00	0	.00	.04	e23	<.01			
22	.05	4	<.01	.00	0	.00	.00	e24	<.01			
23	.01	4	<.01	.00	0	.00	.00	0	<.01			
24	.00	0	.00	.00	4	.00	.03	e27	<.01			
25	.00	0	.00	.00	4	.00	.04	e29	<.01			
26	.00	0	.00	.00	0	.00	.06	e31	<.01			
27	.00	0	.00	.00	0	.00	.03	e33	<.01			
28	.00	0	.00	.00	0	.00	.00	0	.00			
29	.00	0	.00	.00	0	.00	.00	0	.00			
30	.00	0	.00	---	---	---	.00	0	.00			
31	.00	0	.00	---	---	---	.00	0	.00			
TOTAL	25.00	---	63.40	14.72	---	65.04	40.49	---	34.12			

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

16225800 NORTH HALAWA STREAM NR KANEHOE--Continued

SEDIMENT DISCHARGE, SUSPENDED (TONS/DAY), WATER YEAR OCTOBER 1991 TO SEPTEMBER 1992

DAY	MEAN DISCHARGE (CFS)	MEAN CONCEN- TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN- TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN- TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)
1	.00	0	.00	.00	0	.00	.00	0	.00
2	.00	0	.00	.00	0	.00	.00	0	.00
3	.00	0	.00	.00	0	.00	.02	e642	.03
4	.00	0	.00	.01	e396	.01	.02	e726	.04
5	.00	0	.00	.63	425	.73	.01	e822	.02
6	.00	0	.00	.04	e371	.04	.02	e930	.05
7	.00	0	.00	.00	0	.00	.01	e1050	.04
8	.00	0	.00	.00	0	.00	.02	e1190	.05
9	.00	0	.00	.00	0	.00	.00	e1350	.02
10	.00	0	.00	.00	0	.00	.02	e1520	.07
11	.00	0	.00	.00	0	.00	.01	e1720	.03
12	.00	0	.00	.00	0	.00	.00	0	.00
13	.00	0	.00	.00	0	.00	.00	0	.00
14	.00	0	.00	.00	0	.00	.00	0	.00
15	.00	0	.00	.00	0	.00	.00	0	.00
16	.00	0	.00	.00	0	.00	.00	0	.00
17	.00	0	.00	.01	58	<.01	.00	0	.00
18	.00	e132	.00	.01	87	<.01	.00	0	.00
19	.01	e141	<.10	.03	e101	.01	.71	2030	3.9
20	.01	e150	.01	.01	e114	<.01	.40	e950	.87
21	.00	0	.00	.00	0	.00	.95	371	.99
22	.00	0	.00	.00	0	.00	.11	e258	.08
23	.00	0	.00	.00	0	.00	.06	e225	.04
24	.00	0	.00	.00	0	.00	.04	e197	.02
25	.00	0	.00	.00	0	.00	.01	e172	.01
26	.00	0	.00	.00	e239	<.01	.00	0	.00
27	.00	0	.00	.00	0	.00	.03	e132	.01
28	.21	e248	.15	.01	e306	.01	.64	114	.20
29	.31	265	.21	.26	e346	.23	.07	e76	.02
30	.00	0	.00	.01	e392	.01	.01	e46	<.01
31	---	---	---	.00	0	.00	---	---	---
TOTAL	0.54	---	0.47	1.02	---	1.08	3.16	---	6.50
		JULY		AUGUST		SEPTEMBER			
1	.03	e28	<.01	1.5	69	.31	2.0	e933	34
2	.03	e17	<.01	.56	28	.04	23	e4360	250
3	.01	e10	<.01	.28	37	.03	124	e5620	979
4	.00	e6	.00	.15	107	.04	31	e1740	252
5	.00	0	.00	.20	2690	1.5	8.2	e1290	30
6	.00	0	.00	.17	1240	.60	4.0	e935	10
7	.02	e1	<.01	3.2	968	9.8	3.7	e1100	11
8	2.7	e699	12	8.6	e2400	67	1.1	e468	1.4
9	18	e1070	97	.68	831	1.7	1.0	e463	1.2
10	2.2	74	.48	.30	124	.11	.85	e423	.97
11	.68	80	.15	.21	57	.03	21	e1470	112
12	.34	79	.07	7.9	e1030	45	18	e832	30
13	.10	133	.04	1.1	e488	1.4	2.8	e721	5.5
14	.04	135	.01	.37	e230	.24	2.6	e709	5.0
15	.00	e146	<.01	.24	e185	.12	1.9	e600	3.1
16	.00	0	.00	4.0	e1090	20	81	e2160	655
17	.01	e231	.01	.59	e314	.50	5.2	e1080	15
18	.03	e290	.02	.27	e192	.14	2.2	e626	3.7
19	.05	e364	.05	.20	e167	.09	1.4	e526	2.0
20	.05	404	.05	.18	e165	.08	.99	e404	1.1
21	.06	63	.01	.28	e251	.19	.74	e340	.68
22	.02	66	.01	.26	e199	.14	3.5	e1100	11
23	11	1150	42	.17	e153	.07	11	e269	8.0
24	8.0	e1510	47	.15	e123	.05	14	e493	9.0
25	1.0	e761	2.2	.12	e123	.04	1.5	e551	2.2
26	.42	e445	.47	.11	e101	.03	.55	e296	.44
27	1.1	267	.86	.13	e142	.05	.52	e285	.40
28	27	1540	157	.11	e101	.03	.30	e210	.17
29	3.2	702	5.6	2.7	e1160	8.5	.28	e198	.15
30	3.3	1190	11	.21	e194	.11	.22	e202	.12
31	4.4	591	7.9	.17	e174	.08	---	---	---
TOTAL	83.79	---	383.98	35.11	---	158.02	368.55	---	2434.13
YEAR	817.99	---	3645.07	---	---	---	---	---	---

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

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 mi².

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.--42 years (water years 1930-32, 1954-92), 5.55 ft³/s (4,020 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 6,650 ft³/s, Feb. 28, 1932, gage height, 13.36 ft, from rating curve extended above 420 ft³/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 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Oct. 16	0130	*614	*8.98	No other peak greater than base discharge.			

Minimum discharge, no flow on many days.

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	.03	e.08	e14	.32	.01	.01	.01	.00	.00	.02	3.0	.02
2	.02	e.05	e12	1.9	.01	.01	.02	.00	.00	.04	1.3	26
3	.02	e.04	e2.4	.99	.01	.01	.02	.00	.00	.04	.67	105
4	.02	e.03	.94	.45	.00	.01	.02	.00	.00	.02	.31	29
5	.02	e.05	.52	.27	.00	.00	.02	.00	.00	.02	.15	12
6	.02	e.08	4.1	.19	.00	.00	.02	.00	.00	.02	.16	6.2
7	.01	e.06	2.2	.12	.00	.00	.02	.00	.00	.02	6.7	4.1
8	.01	e.05	.74	2.6	.00	.00	.02	.00	.01	1.5	19	1.9
9	.01	e.04	.43	4.7	.00	.00	.01	.00	.01	36	3.3	1.3
10	.01	e.04	.24	.35	.00	.00	.01	.00	.00	6.0	1.3	1.3
11	.01	e.03	.14	.15	.00	.00	.01	.00	.00	1.8	.61	7.7
12	.01	e.03	.11	.11	.00	2.3	.00	.00	.01	1.0	9.8	17
13	.01	e.02	1.4	.06	.00	21	.00	.00	.01	.50	5.2	3.7
14	.01	e.02	7.2	9.2	13	29	.00	.00	.01	.14	1.2	2.3
15	5.7	e.02	1.0	2.5	.56	7.3	.00	.00	.01	.08	.50	1.4
16	134	e.01	.44	.62	.07	2.0	.00	.00	.01	.06	14	75
17	e40	e.01	.21	.15	.04	.64	.00	.01	.01	.05	6.3	15
18	e10	e.01	16	.09	.02	.22	.00	.03	.01	.04	2.1	5.5
19	e3.6	e.10	9.4	.06	.02	.12	.00	.03	.01	.05	.93	3.0
20	e3.0	e.50	3.1	.04	.02	.15	.01	.02	.01	.06	.55	1.7
21	e3.8	e.20	1.2	.03	.02	.07	.00	.01	.01	.04	.34	1.1
22	e5.7	e.08	1.0	.02	.02	.04	.00	.01	.00	.06	1.2	2.7
23	e1.7	e.05	.52	.02	.01	.02	.00	.00	.00	16	.33	8.2
24	e2.9	e.06	27	.02	.01	.02	.00	.00	.00	10	.10	7.2
25	e1.1	e.05	15	.02	.02	.02	.00	.00	.01	1.9	.06	2.9
26	e.68	e.04	15	.01	.02	.02	.00	.00	.02	.72	.04	1.1
27	e.54	e.03	4.4	.01	.01	.02	.00	.00	.02	1.6	.03	.82
28	e.36	e.02	2.0	.01	.01	.02	.00	.00	.04	25	.02	.50
29	e.25	e.01	1.1	.01	.01	.02	.00	.00	.03	7.7	4.4	.42
30	e.15	e11	.55	.01	---	.02	.00	.00	.02	7.3	.45	.19
31	e.12	---	.35	.01	---	.01	---	.00	---	8.2	.05	---
TOTAL	213.81	12.81	144.69	25.04	13.89	63.05	0.19	0.11	0.26	125.98	84.10	344.25
MEAN	6.90	.43	4.67	.81	.48	2.03	.006	.004	.009	4.06	2.71	11.5
MAX	134	11	27	9.2	13	29	.02	.03	.04	36	19	105
MIN	.01	.01	.11	.01	.00	.00	.00	.00	.00	.02	.02	.02
AC-FT	424	25	287	50	28	125	.4	.2	.5	250	167	683

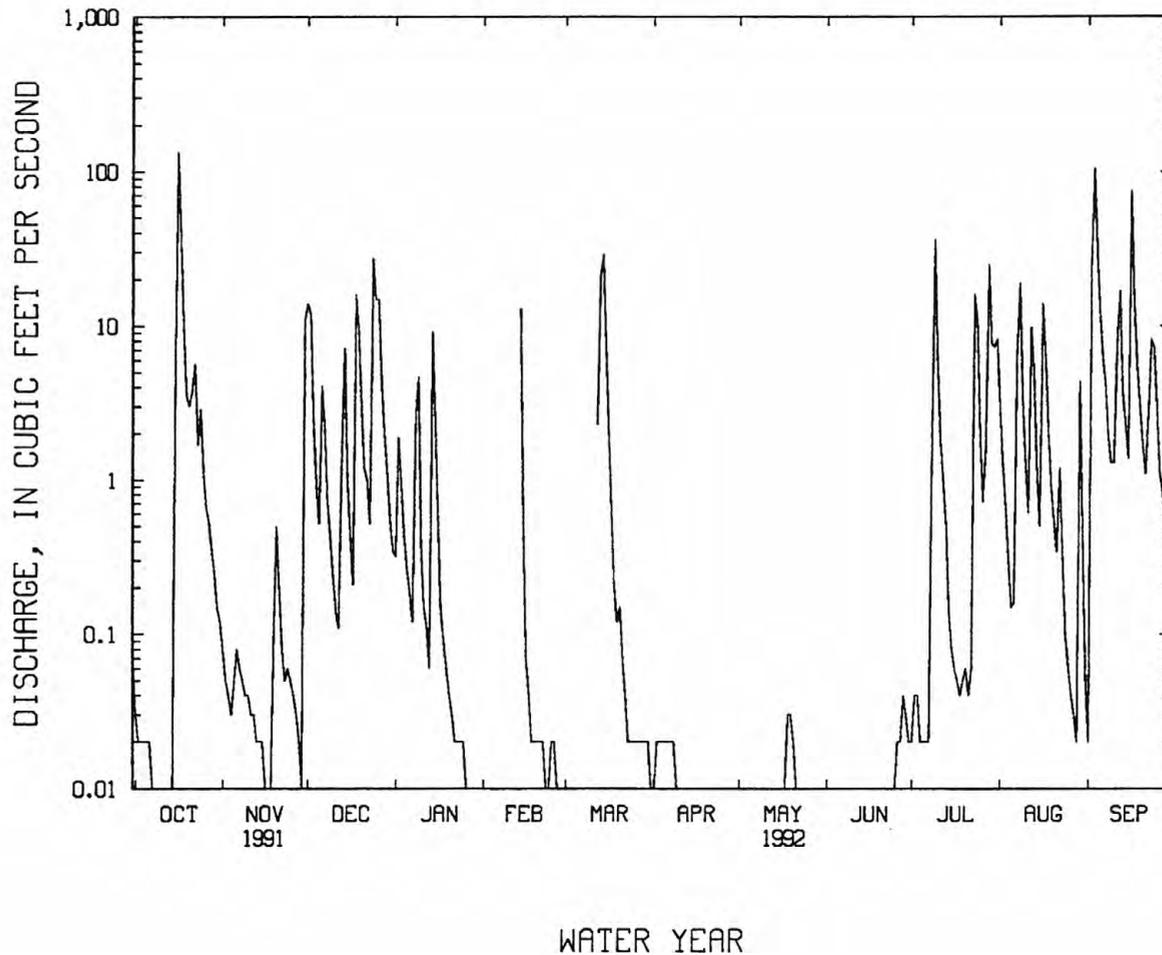
e Estimated

16226000 NORTH HALAWA STREAM NEAR AIEA--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1929 - 1992, BY WATER YEAR (WY)

MEAN	3.56	8.05	8.09	6.71	8.48	8.46	7.37	5.16	1.78	3.63	3.83	2.12
MAX	16.3	50.6	35.0	26.0	76.3	37.8	33.2	30.1	7.86	23.0	21.6	17.1
(WY)	1959	1966	1930	1988	1932	1968	1932	1965	1932	1954	1982	1931
MIN	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
(WY)	1933	1954	1990	1977	1931	1931	1931	1931	1931	1953	1962	1953

SUMMARY STATISTICS FOR 1991 CALENDAR YEAR	FOR 1992 WATER YEAR	WATER YEARS 1929 - 1992
ANNUAL TOTAL	1760.68	1028.18
ANNUAL MEAN	4.82	2.81
HIGHEST ANNUAL MEAN		5.55
LOWEST ANNUAL MEAN		15.7
HIGHEST DAILY MEAN	178 Mar 19	134 Oct 16
LOWEST DAILY MEAN	.01 Oct 7	.00 Feb 4
ANNUAL SEVEN-DAY MINIMUM	.01 Oct 7	.00 Feb 4
ANNUAL RUNOFF (AC-FT)	3490	2040
10 PERCENT EXCEEDS	11	7.2
50 PERCENT EXCEEDS	.64	.04
90 PERCENT EXCEEDS	.03	.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 mi².

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.--9 Years, 5.59 ft³/s (4,050 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,780 ft³/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 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Oct. 16	0145	*860	*10.60	No other peak greater than base discharge.			

Minimum discharge, no flow for many days.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1991 TO SEPTEMBER 1992
DAILY MEAN VALUES

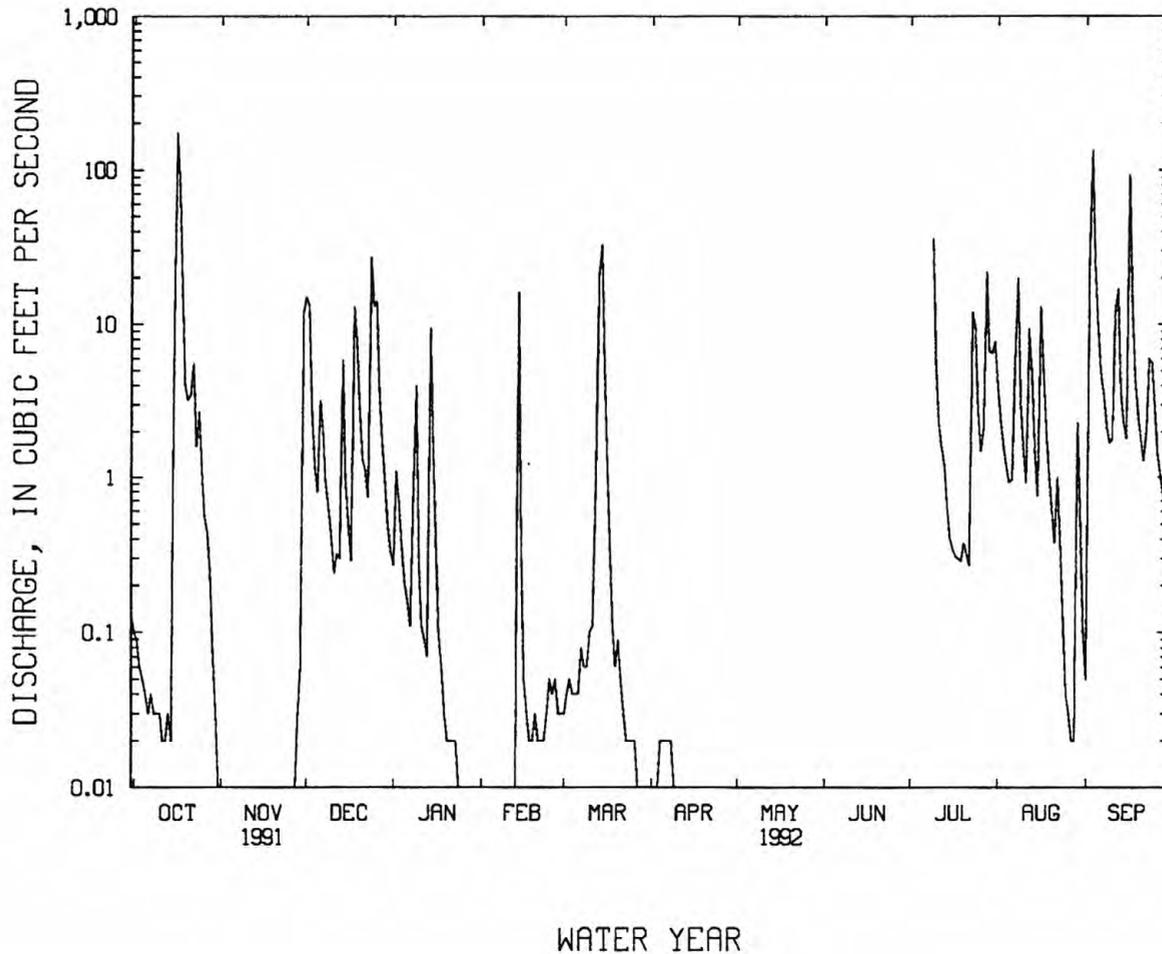
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.10	.01	15	.27	.01	.03	.01	.00	.00	.00	4.0	.05
2	.09	.01	13	1.1	.01	.04	.01	.00	.00	.00	2.4	25
3	.06	.01	2.6	.68	.01	.05	.01	.00	.00	.00	1.6	133
4	.05	.00	1.2	.36	.01	.04	.02	.00	.00	.00	1.2	24
5	.04	.00	.80	.21	.01	.04	.02	.00	.00	.00	.93	9.8
6	.03	.00	3.2	.16	.01	.04	.02	.00	.00	.00	.96	4.9
7	.04	.00	2.0	.11	.01	.08	.02	.00	.00	.00	6.2	3.5
8	.03	.00	.91	.81	.01	.06	.02	.00	.00	.00	20	2.2
9	.03	.01	.63	4.0	.01	.06	.01	.00	.00	36	3.0	1.7
10	.03	.01	.41	.29	.01	.10	.01	.00	.00	5.5	1.5	1.8
11	.02	.01	.24	.11	.01	.11	.01	.00	.00	2.3	.92	12
12	.02	.01	.32	.09	.01	.86	.01	.00	.00	1.6	9.4	17
13	.03	.01	.30	.07	.01	21	.01	.00	.00	1.2	4.8	3.5
14	.02	.01	5.9	9.5	16	33	.01	.00	.00	.65	1.5	2.3
15	8.4	.01	.94	1.6	.37	5.1	.01	.00	.00	.41	.75	1.8
16	174	.01	.51	.40	.05	1.3	.01	.00	.00	.35	13	93
17	78	.01	.29	.10	.03	.40	.00	.00	.00	.31	4.9	13
18	17	.01	13	.06	.02	.12	.00	.00	.00	.30	2.1	4.4
19	4.0	.01	7.4	.03	.02	.06	.00	.00	.00	.29	1.1	2.6
20	3.2	.01	2.7	.02	.03	.09	.00	.00	.00	.38	.64	1.8
21	3.5	.01	1.3	.02	.02	.05	.00	.00	.00	.32	.38	1.3
22	5.6	.01	1.1	.02	.02	.03	.00	.00	.00	.27	1.0	2.0
23	1.6	.01	.74	.02	.02	.02	.00	.00	.00	12	.38	6.0
24	2.7	.01	27	.01	.03	.02	.00	.00	.00	9.5	.12	5.6
25	1.1	.01	13	.01	.05	.02	.00	.00	.00	2.8	.04	2.8
26	.56	.01	14	.01	.04	.02	.00	.00	.00	1.5	.03	1.4
27	.44	.01	3.5	.01	.05	.01	.00	.00	.00	2.1	.02	.99
28	.23	.03	1.7	.01	.03	.01	.00	.00	.00	22	.02	.75
29	.07	.06	.92	.01	.03	.01	.00	.00	.00	6.7	2.3	.63
30	.03	12	.48	.01	---	.01	.00	.00	.00	6.5	.58	.47
31	.01	---	.33	.01	---	.01	---	.00	---	7.8	.10	---
TOTAL	301.03	12.31	135.42	20.11	16.94	62.79	0.21	0.00	0.00	120.78	85.87	379.29
MEAN	9.71	.41	4.37	.65	.58	2.03	.007	.000	.000	3.90	2.77	12.6
MAX	174	12	27	9.5	16	33	.02	.00	.00	36	20	133
MIN	.01	.00	.24	.01	.01	.01	.00	.00	.00	.00	.02	.05
AC-FT	597	24	269	40	34	125	.4	.00	.00	240	170	752

16226200 NORTH HALAWA STREAM NEAR HONOLULU--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1983 - 1992, BY WATER YEAR (WY)

MEAN	4.06	7.19	10.1	7.20	4.67	8.72	6.70	3.47	1.60	4.10	2.88	3.07
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 1991 CALENDAR YEAR	FOR 1992 WATER YEAR	WATER YEARS 1983 - 1992
ANNUAL TOTAL	2271.79	1134.75
ANNUAL MEAN	6.22	3.10
HIGHEST ANNUAL MEAN		5.59
LOWEST ANNUAL MEAN		10.1
HIGHEST DAILY MEAN	279 Mar 19	174 Oct 16
LOWEST DAILY MEAN	.00 Nov 4	.00 Nov 4
ANNUAL SEVEN-DAY MINIMUM	.00 Nov 2	.00 Apr 17
ANNUAL RUNOFF (AC-FT)	4510	2250
10 PERCENT EXCEEDS	13	5.9
50 PERCENT EXCEEDS	.53	.03
90 PERCENT EXCEEDS	.02	.00
		399 Dec 31 1987
		.00 Feb 1 1983
		.00 Feb 1 1983
		4050
		11
		.52
		.00



WATER-QUALITY RECORDS

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

PERIOD OF DAILY RECORD.--

SUSPENDED SEDIMENT DISCHARGE: February 1983 to current year.

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

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

EXTREMES FOR PERIOD OF DAILY RECORD.--

SEDIMENT CONCENTRATIONS: Maximum daily mean, 4,230 mg/L (estimated), Apr. 8, 1989; no flow on many days in 1983-1988, 1990, 1992.

SEDIMENT DISCHARGE: Maximum daily, 4,730 tons (estimated), Apr. 8, 1989; no flow on many days in 1983-1988, 1990, 1992.

EXTREMES FOR CURRENT YEAR.--

SEDIMENT CONCENTRATIONS: Maximum daily mean, 1,750 mg/L, Sep. 3; no flow on many days.

SEDIMENT DISCHARGE: Maximum daily, 1,110 tons, Sep. 3; no flow on many days.

WATER QUALITY DATA, WATER YEAR OCTOBER 1991 TO SEPTEMBER 1992

DATE	TIME	DIS- CHARGE, INST. CUBIC FEET PER SECOND	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH WATER FIELD (STAND- ARD UNITS)	TEMPER- ATURE WATER (DEG C)	TUR- BID- ITY (NTU)	BARO- METRIC PRES- SURE (MM OF HG)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)	COLI- FORM, FECAL, UM-MF (COLS./ 100 ML)	
OCT 1991										
16...	1000	101	66	7.7	22.5	520	757	8.5	99	1700
NOV										
27...	1340	0.02	660	7.2	22.5	0.90	755	5.6	65	--
DEC										
17...	1225	0.26	202	7.5	21.5	1.1	759	8.1	92	340
JAN 1992										
28...	1230	0.02	243	7.9	20.0	0.70	758	8.0	89	--
FEB										
27...	1255	0.00	258	7.7	19.5	1.1	762	9.9	108	48
APR										
03...	1310	E0.01	268	7.3	22.0	0.80	759	6.6	76	--
JUL										
10...	1330	4.8	184	7.8	24.5	11	758	8.2	99	710
28...	1040	43	140	6.7	22.5	320	759	8.4	97	--
AUG										
25...	1250	0.04	225	7.4	25.0	1.0	757	7.0	85	--
SEP										
21...	1345	1.2	218	8.2	25.0	1.0	757	8.1	99	190

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- LILITY 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)
FEB 1992												
27...	1255	80	14	11	19	34	0.9	0.90	83	5.5	28	0.10
SEP												
21...	1345	65	13	8.0	17	36	0.9	1.2	63	7.8	30	<0.10

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

E Estimated.

16226200 NORTH HALAWA STREAM NR HONOLULU--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1991 TO SEPTEMBER 1992

DATE	TIME	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- PENDE (MG/L)	NITRO- GEN, NO2+NO3 TOTAL (MG/L AS N)	NITRO- GEN, AMMONIA TOTAL (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)	PHOS- PHATE, TOTAL (MG/L AS PO4)
OCT 1991												
16...	1000	--	--	--	--	78	0.100	0.010	0.20	0.30	0.280	0.06
DEC												
17...	1225	--	--	--	--	1	<0.050	<0.010	<0.20	--	0.020	--
FEB 1992												
27...	1255	25	145	154	0.20	5	<0.050	<0.010	<0.20	--	0.010	--
JUL												
10...	1330	--	--	--	--	15	1.00	0.020	<0.20	--	<0.010	0.03
SEP												
21...	1345	21	123	136	0.17	<1	0.069	<0.010	<0.20	--	<0.010	--

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											
27...	1255	50	<10	--	<100	<2	<10	<1	<1	2	<3
SEP											
21...	1345	80	20	<1	<100	<2	<10	<1	<1	<1	<3

DATE	TIME	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												
27...	4	160	74	1	<10	<4	100	95	<0.10	<1	<10	
SEP												
21...	<1	160	24	<1	<10	<4	40	12	<0.10	<1	<10	

DATE	TIME	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												
27...	<1	<1	<1	<1	<1	<1	<1.0	87	<6	<10	1.0	<1
SEP												
21...	<1	<1	<1	<1	<1	<1	<1.0	68	<6	<10	1.2	<1

DATE	TIME	ALDRIN, TOTAL (UG/L)	CHLOR- DANE, TOTAL (UG/L)	CHLOR- DYRIFOS 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												
27...	<0.010	<0.1	<0.01	<0.010	<0.010	<0.010	<0.010	<0.01	<0.01	<0.010	<0.01	<0.01
SEP												
21...	<0.010	<0.1	<0.01	<0.010	<0.010	<0.010	<0.010	<0.01	<0.01	<0.010	<0.01	<0.01

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

HAWAII, ISLAND OF OAHU

16226200 NORTH HALAWA STREAM NR HONOLULU--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1991 TO SEPTEMBER 1992

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 27...	<0.01	<0.010	<0.010	<0.01	<0.01	<0.010	<0.010	<0.010	<0.01	<0.01	<0.01
SEP 21...	<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 27...	<0.01	<0.10	<0.01	<0.1	<0.1	<0.01	<0.01	<1	<0.01	<0.01
SEP 21...	<0.01	<0.10	<0.01	<0.1	<0.1	<0.01	<0.01	<1	<0.01	<0.01

PARTICLE-SIZE DISTRIBUTION OF SUSPENDED SEDIMENT, WATER YEAR OCTOBER 1991 TO SEPTEMBER 1992

DATE	TIME	SEDI- MENT, SUS- PENDE (MG/L)	SEDI- MENT, DIS- CHARGE, SUS- PENDE (T/DAY)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM	DATE	TIME	SEDI- MENT, SUS- PENDE (MG/L)	SEDI- MENT, DIS- CHARGE, SUS- PENDE (T/DAY)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM
FEB 14...	1146	343	13	99	AUG 07...	1400	1550	50	100

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

16226200 NORTH HALAWA STREAM NR HONOLULU--Continued

SEDIMENT DISCHARGE, SUSPENDED (TONS/DAY), WATER YEAR OCTOBER 1991 TO SEPTEMBER 1992

DAY	MEAN DISCHARGE (CFS)	MEAN CONCEN- TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN- TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN- TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)
1	.01	e6	<.01	.00	0	.00	.00	0	.00
2	.01	e6	<.01	.00	0	.00	.00	0	.00
3	.01	6	<.01	.00	0	.00	.00	0	.00
4	.02	e6	<.01	.00	0	.00	.00	0	.00
5	.02	e6	<.01	.00	0	.00	.00	0	.00
6	.02	e6	<.01	.00	0	.00	.00	0	.00
7	.02	e7	<.01	.00	0	.00	.00	0	.00
8	.02	e7	<.01	.00	0	.00	.00	0	.00
9	.01	e7	<.01	.00	0	.00	.00	0	.00
10	.01	e7	<.01	.00	0	.00	.00	0	.00
11	.01	e7	<.01	.00	0	.00	.00	0	.00
12	.01	e7	<.01	.00	0	.00	.00	0	.00
13	.01	e8	<.01	.00	0	.00	.00	0	.00
14	.01	e8	<.01	.00	0	.00	.00	0	.00
15	.01	e8	<.01	.00	0	.00	.00	0	.00
16	.01	e5	<.01	.00	0	.00	.00	0	.00
17	.00	0	.00	.00	0	.00	.00	0	.00
18	.00	0	.00	.00	0	.00	.00	0	.00
19	.00	0	.00	.00	0	.00	.00	0	.00
20	.00	0	.00	.00	0	.00	.00	0	.00
21	.00	0	.00	.00	0	.00	.00	0	.00
22	.00	0	.00	.00	0	.00	.00	0	.00
23	.00	0	.00	.00	0	.00	.00	0	.00
24	.00	0	.00	.00	0	.00	.00	0	.00
25	.00	0	.00	.00	0	.00	.00	0	.00
26	.00	0	.00	.00	0	.00	.00	0	.00
27	.00	0	.00	.00	0	.00	.00	0	.00
28	.00	0	.00	.00	0	.00	.00	0	.00
29	.00	0	.00	.00	0	.00	.00	0	.00
30	.00	0	.00	.00	0	.00	.00	0	.00
31	---	---	---	.00	0	.00	---	---	---
TOTAL	0.21	---	0.16	0.00	---	0.00	0.00	---	0.00
		JULY			AUGUST			SEPTEMBER	
1	.00	0	.00	4.0	43	.47	.05	9	<.01
2	.00	0	.00	2.4	e32	.21	25	1350	224
3	.00	0	.00	1.6	e25	.11	133	1750	1110
4	.00	0	.00	1.2	e19	.06	24	144	9.8
5	.00	0	.00	.93	e15	.04	9.8	50	1.4
6	.00	0	.00	.96	e11	.03	4.9	20	.27
7	.00	0	.00	6.2	497	17	3.5	e43	.46
8	.00	0	.00	20	683	83	2.2	e49	.29
9	36	e856	157	3.0	20	.17	1.7	e38	.18
10	5.5	50	.91	1.5	e16	.06	1.8	e30	.14
11	2.3	e21	.13	.92	e13	.03	12	444	87
12	1.6	e20	.09	9.4	257	38	17	248	19
13	1.2	e18	.06	4.8	e96	2.3	3.5	64	.60
14	.65	e17	.03	1.5	e15	.06	2.3	32	.20
15	.41	e15	.02	.75	e9	.02	1.8	16	.08
16	.35	e14	.01	13	238	24	93	1210	693
17	.31	e13	.01	4.9	24	.36	13	35	1.4
18	.30	e12	.01	2.1	e12	.07	4.4	11	.13
19	.29	e11	.01	1.1	e10	.03	2.6	8	.06
20	.38	e10	.01	.64	e9	.02	1.8	e7	.03
21	.32	e9	.01	.38	e9	.01	1.3	5	.02
22	.27	e9	.01	1.0	e15	.05	2.0	e43	.38
23	12	521	33	.38	e9	.01	6.0	187	4.1
24	9.5	e206	9.5	.12	e9	<.01	5.6	e145	4.8
25	2.8	45	.34	.04	e9	<.01	2.8	e55	.54
26	1.5	e33	.13	.03	e8	<.01	1.4	e11	.04
27	2.1	e40	.24	.02	e8	<.01	.99	e9	.02
28	22	694	67	.02	e8	<.01	.75	e9	.02
29	6.7	120	2.2	2.3	e49	.79	.63	e8	.01
30	6.5	162	3.1	.58	e16	.02	.47	e8	.01
31	7.8	110	2.5	.10	e12	<.01	---	---	---
TOTAL	120.78	---	276.32	85.87	---	166.98	379.29	---	2157.99
YEAR	1134.75		4289.73						

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

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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 Kanaiki Stream and 4.1 mi north of Honolulu Post Office.

DRAINAGE AREA.--2.61 mi².

WATER-DISCHARGE RECORDS

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

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

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

REMARKS.--Records good. No diversion upstream.

AVERAGE DISCHARGE.--78 years (water years 1915-92), 6.59 ft³/s (4,770 acre-ft/yr).

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

EXTREMES FOR CURRENT YEAR.--Peak discharge greater than base discharge of 700 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Sep. 11	2330	*926	*7.89	No other peak greater than base discharge.			

Minimum discharge, 0.52 ft³/s, on several days

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1991 TO SEPTEMBER 1992
DAILY MEAN VALUES

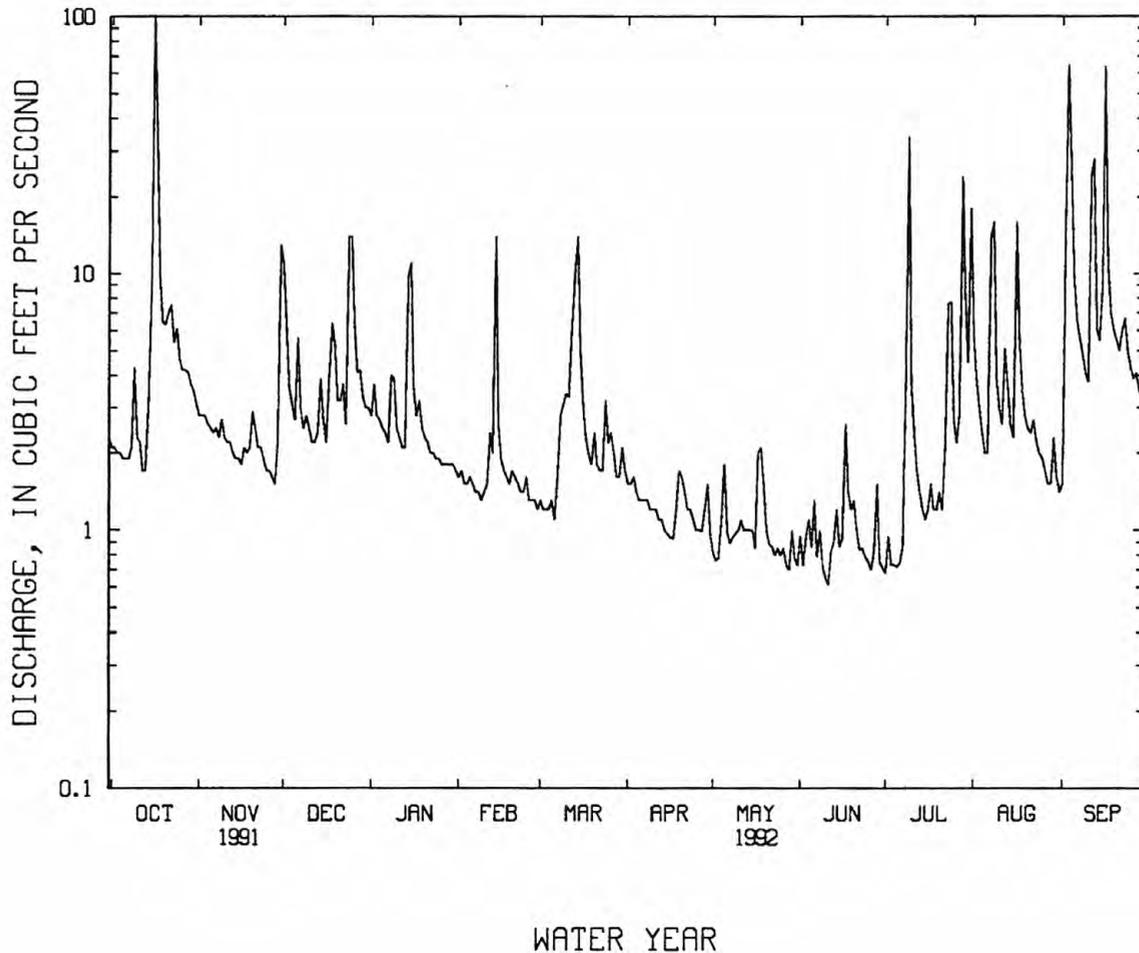
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.1	2.8	11	2.8	1.6	1.3	1.5	.82	.95	.68	5.8	1.5
2	2.1	2.8	6.3	3.7	1.7	1.2	1.5	.76	.73	.95	3.9	17
3	2.0	2.8	3.6	2.8	1.5	1.2	1.6	.78	.95	.73	3.0	65
4	2.0	2.6	3.1	2.7	1.5	1.2	1.4	1.1	1.1	.73	2.4	25
5	1.9	2.5	2.7	2.5	1.6	1.3	1.3	1.8	.86	.72	2.0	9.5
6	1.9	2.4	5.6	2.4	1.5	1.1	1.3	.99	1.3	.74	2.0	6.6
7	1.9	2.5	3.0	2.2	1.4	1.6	1.3	.89	.79	.86	14	5.6
8	2.1	2.3	2.5	4.0	1.4	2.8	1.3	.94	1.0	3.9	16	4.9
9	4.3	2.7	2.8	3.9	1.3	3.1	1.2	.97	.72	34	3.9	4.1
10	2.3	2.3	2.5	2.5	1.4	3.4	1.2	1.0	.65	3.7	3.0	3.8
11	2.2	2.2	2.2	2.3	1.5	3.3	1.2	1.1	.61	2.4	2.6	24
12	1.7	2.2	2.2	2.1	2.4	6.1	1.1	1.0	.82	1.7	5.1	28
13	1.7	2.0	2.4	2.1	2.0	10	1.1	1.0	.91	1.4	3.7	6.1
14	3.2	1.9	3.9	9.8	14	14	1.0	1.0	1.2	1.2	2.6	5.5
15	8.6	1.9	2.7	11	2.6	5.0	.97	1.0	.86	1.1	2.3	8.6
16	101	1.8	2.2	3.6	1.9	3.1	.94	.85	.93	1.2	16	64
17	37	2.1	4.0	2.8	1.7	2.3	.93	2.0	2.6	1.5	5.5	11
18	10	2.0	6.4	3.2	1.6	2.0	1.2	2.1	1.4	1.2	3.5	7.0
19	6.5	2.1	5.3	2.5	1.5	1.8	1.7	1.5	1.2	1.2	2.8	6.0
20	6.3	2.9	3.2	2.3	1.7	2.4	1.6	1.0	1.3	1.4	2.5	5.5
21	7.0	2.5	3.2	2.2	1.6	1.8	1.4	.88	1.0	1.2	2.4	5.0
22	7.5	2.1	3.7	2.0	1.5	1.7	1.2	.86	.84	2.1	2.7	6.0
23	5.4	2.1	2.6	2.0	1.4	1.7	1.2	.80	.85	7.6	2.2	6.7
24	6.1	1.9	14	1.9	1.4	3.2	1.1	.85	.79	7.7	2.0	5.0
25	4.6	1.7	14	1.9	1.6	2.2	1.0	.80	.75	2.7	1.9	4.3
26	4.2	1.7	6.3	1.8	1.3	2.4	1.0	.85	.70	2.2	1.7	3.9
27	4.2	1.6	4.1	1.8	1.3	2.0	.99	.73	.83	2.8	1.5	4.1
28	4.1	1.5	4.2	1.8	1.3	1.6	1.2	.70	1.5	24	1.5	3.5
29	3.7	2.2	3.3	1.8	1.2	1.6	1.5	1.0	.75	7.9	2.3	3.2
30	3.5	13	3.0	1.8	---	2.1	.96	.78	.71	4.5	1.6	3.0
31	3.1	---	3.0	1.7	---	1.7	---	.73	---	18	1.4	---
TOTAL	254.2	77.1	139.0	91.9	58.4	90.2	36.89	31.58	29.60	142.01	123.8	353.4
MEAN	8.20	2.57	4.48	2.96	2.01	2.91	1.23	1.02	.99	4.58	3.99	11.8
MAX	101	13	14	11	14	14	1.7	2.1	2.6	34	16	65
MIN	1.7	1.5	2.2	1.7	1.2	1.1	.93	.70	.61	.68	1.4	1.5
AC-FT	504	153	276	182	116	179	73	63	59	282	246	701

16229000 KALIHI STREAM NEAR HONOLULU--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1914 - 1992, BY WATER YEAR (WY)

MEAN	4.68	7.36	8.65	9.27	7.37	8.68	8.56	6.69	3.74	4.53	5.20	4.60
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 1991 CALENDAR YEAR			FOR 1992 WATER YEAR			WATER YEARS 1914 - 1992		
ANNUAL TOTAL	2299.8		1428.08			6.59		
ANNUAL MEAN	6.30		3.90			13.5		
HIGHEST ANNUAL MEAN						2.04		
LOWEST ANNUAL MEAN						951		
HIGHEST DAILY MEAN	212	Mar 19	101	Oct 16	Jan 19 1923			
LOWEST DAILY MEAN	1.5	Nov 28	.61	Jun 11	Jul 29 1966			
ANNUAL SEVEN-DAY MINIMUM	1.8	Nov 22	.75	Jun 30	.15 May 15 1926			
ANNUAL RUNOFF (AC-FT)	4560		2830			4770		
10 PERCENT EXCEEDS	10		6.5			12		
50 PERCENT EXCEEDS	3.1		2.0			2.9		
90 PERCENT EXCEEDS	2.0		.89			.96		



16229000 KALIHI STREAM NEAR HONOLULU--Continued

WATER-QUALITY RECORDS

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

REMARKS.--Miscellaneous chemical analyses published for this station for 1969, 1973 water years. Quality of water samples obtained at the gage.

WATER QUALITY DATA, WATER YEAR OCTOBER 1991 TO SEPTEMBER 1992

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	SPECIFIC CONDUCTANCE (US/CM)	PH WATER WHOLE FIELD (STANDARD UNITS)	TEMPERATURE WATER (DEG C)	HARDNESS TOTAL (MG/L AS CaCO3)	CALCIUM DIS-SOLVED (MG/L AS Ca)	MAGNESIUM, DIS-SOLVED (MG/L AS Mg)	SODIUM, DIS-SOLVED (MG/L AS Na)	SODIUM PERCENT
DEC 1991 31...	0920	3.0	156	7.9	18.5	36	6.2	5.0	14	45
MAR 1992 31...	0930	1.6	168	7.4	19.0	41	7.0	5.6	14	42
JUN 30...	1040	0.69	202	7.5	22.0	54	9.2	7.5	18	41
SEP 25...	1020	4.3	144	7.0	22.5	34	6.1	4.6	13	45

DATE	SODIUM ADSORPTION RATIO	POTASSIUM, DIS-SOLVED (MG/L AS K)	SULFATE DIS-SOLVED (MG/L AS SO4)	CHLORIDE, DIS-SOLVED (MG/L AS CL)	FLUORIDE, DIS-SOLVED (MG/L AS F)	SILICA, DIS-SOLVED (MG/L AS SiO2)	SOLIDS, SUM OF CONSTITUENTS, DIS-SOLVED (MG/L)	SOLIDS, DIS-SOLVED (TONS PER DAY)	IRON, DIS-SOLVED (UG/L AS FE)	MANGANESE, DIS-SOLVED (UG/L AS MN)
DEC 1991 31...	1	0.70	4.9	23	0.10	13	86	0.70	190	23
MAR 1992 31...	1	0.80	5.8	27	0.10	14	96	0.41	280	22
JUN 30...	1	1.1	5.9	32	<0.10	18	119	0.22	410	47
SEP 25...	1	0.70	4.8	24	<0.10	12	85	0.98	150	21

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

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

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

DRAINAGE AREA.--5.18 mi².

WATER-DISCHARGE RECORDS

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

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

REMARKS.--Records good.

AVERAGE DISCHARGE.--30 years, 10.6 ft³/s (7,660 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 7,110 ft³/s, Apr. 19, 1974, gage height, 9.98 ft from rating curve extended above 180 ft³/s on basis of slope-area measurement at gage height 9.98 ft; minimum, 0.16 ft³/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 ft³/s, from slope-area measurement of peak flow.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 980 ft³/s (revised) and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Oct. 16	0100	1,080	4.16	Sep. 16	1030	*1,290	*4.52
Sep. 11	2400	1,150	4.28				

Minimum discharge, 0.84 ft³/s, June 2, 3.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1991 TO SEPTEMBER 1992
DAILY MEAN VALUES

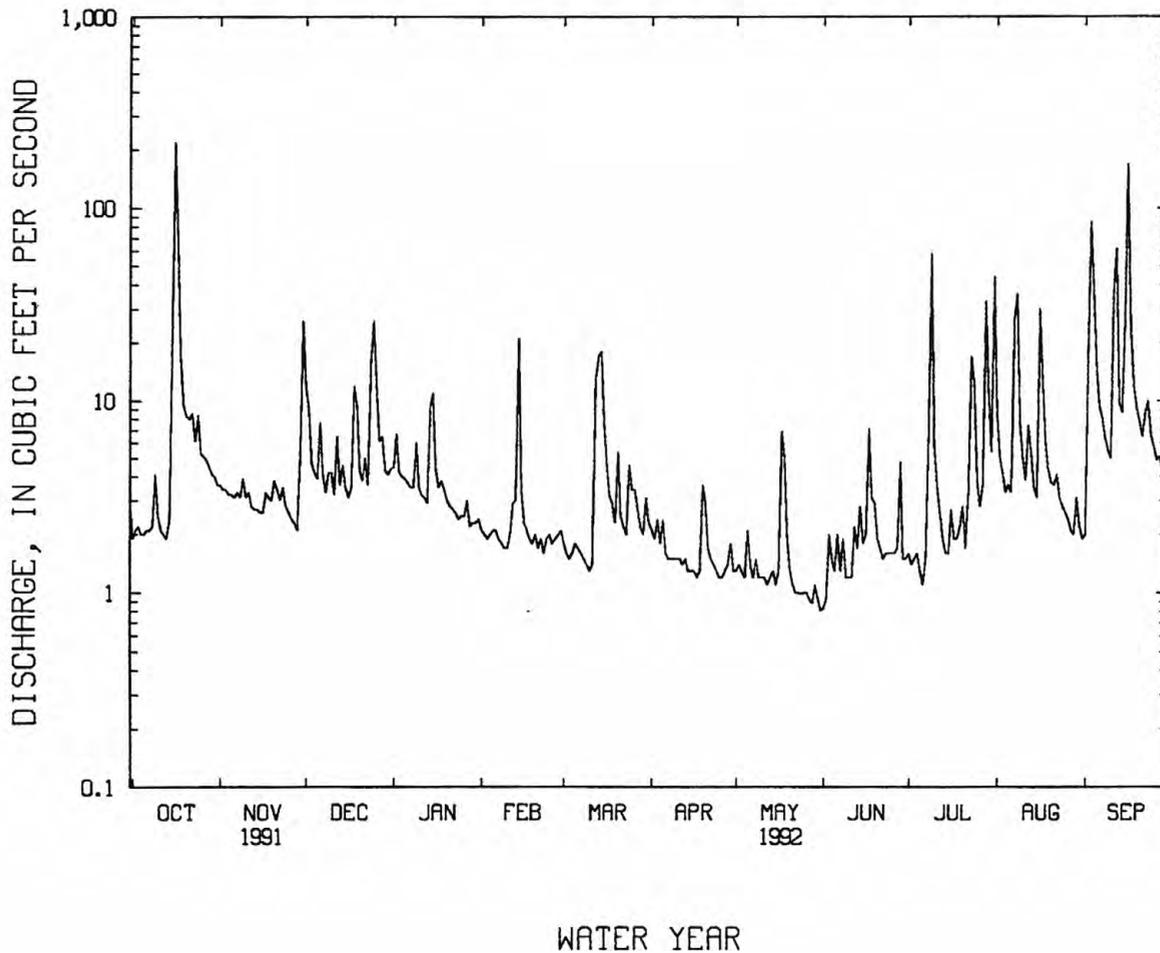
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.9	3.6	12	4.5	2.1	1.8	2.1	1.3	.83	1.6	8.4	2.0
2	2.1	3.4	8.9	6.7	2.0	1.6	1.9	1.4	.93	1.4	5.0	18
3	2.2	3.4	4.7	4.2	1.9	1.5	2.4	1.3	2.0	1.5	4.1	85
4	2.0	3.2	4.2	4.0	2.0	1.6	1.8	1.2	1.5	1.6	3.3	36
5	2.0	3.2	3.9	3.9	2.1	1.8	2.4	2.1	1.3	1.3	3.6	15
6	2.1	3.1	7.7	3.7	2.1	1.7	1.6	1.4	2.0	1.1	3.3	9.3
7	2.1	3.3	4.1	3.5	1.9	1.6	1.5	1.2	1.3	1.5	27	8.1
8	2.2	3.1	3.3	3.5	1.8	1.5	1.5	1.5	1.9	6.7	36	6.4
9	4.1	3.9	4.2	6.0	1.7	1.4	1.5	1.2	1.2	58	7.6	5.5
10	2.5	3.1	4.2	3.5	1.7	1.3	1.5	1.2	1.2	5.7	4.9	5.0
11	2.1	3.3	3.2	3.2	2.0	1.4	1.5	1.2	1.2	3.6	3.8	36
12	2.0	2.8	6.5	3.1	2.9	13	1.4	1.1	2.2	2.6	7.4	62
13	1.9	2.7	3.6	2.9	3.0	17	1.5	1.2	1.7	1.9	5.4	9.7
14	2.4	2.7	4.6	9.4	21	18	1.3	1.3	2.8	1.6	3.5	8.7
15	25	2.6	3.5	11	3.4	7.6	1.3	1.1	1.8	1.6	3.1	26
16	219	2.6	3.1	4.4	2.3	4.6	1.3	1.3	2.0	2.7	30	168
17	72	3.3	3.5	3.5	2.1	3.2	1.2	6.9	7.1	1.9	13	24
18	17	3.1	12	3.8	1.9	2.9	1.3	4.9	3.1	1.9	6.1	12
19	9.5	3.0	9.5	3.4	1.8	2.3	3.6	1.9	2.9	2.2	4.4	9.1
20	8.3	3.8	4.3	3.0	2.0	5.4	2.9	1.3	1.9	2.8	3.7	7.8
21	8.0	3.4	3.8	2.8	1.7	2.5	1.7	1.1	1.7	1.7	3.6	6.5
22	8.6	3.0	5.0	2.7	1.9	2.2	1.5	1.0	1.5	3.3	4.1	8.7
23	6.1	3.5	3.6	2.6	1.6	2.0	1.4	1.0	1.6	17	3.1	10
24	8.4	2.8	16	2.4	1.9	4.6	1.3	.99	1.6	12	2.8	6.6
25	5.3	2.6	26	2.5	2.0	3.4	1.2	1.0	1.6	3.9	2.6	5.7
26	5.1	2.4	12	2.5	1.8	3.4	1.2	1.0	1.6	2.8	2.4	4.9
27	4.9	2.3	6.1	3.0	1.9	2.7	1.3	.92	1.7	3.6	2.1	5.1
28	4.5	2.1	6.5	2.2	2.0	2.2	1.4	.88	4.8	33	2.0	4.2
29	4.1	5.0	4.3	2.3	2.1	2.0	1.8	1.1	1.5	11	3.1	3.9
30	4.0	26	4.1	2.3	---	3.1	1.3	.94	1.5	5.4	2.2	3.6
31	3.6	---	4.4	2.4	---	2.3	---	.81	---	44	1.9	---
TOTAL	445.0	116.3	202.8	118.9	78.6	121.6	49.6	46.74	59.96	240.9	213.5	612.8
MEAN	14.4	3.88	6.54	3.84	2.71	3.92	1.65	1.51	2.00	7.77	6.89	20.4
MAX	219	26	26	11	21	18	3.6	6.9	7.1	58	36	168
MIN	1.9	2.1	3.1	2.2	1.6	1.3	1.2	.81	.83	1.1	1.9	2.0
AC-FT	883	231	402	236	156	241	98	93	119	478	423	1220

16229300 KALIHI STREAM AT KALIHI--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1962 - 1992, BY WATER YEAR (WY)

MEAN	7.02	14.2	15.6	14.1	11.4	16.3	14.3	10.4	5.30	7.95	6.16	4.54
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 1991 CALENDAR YEAR	FOR 1992 WATER YEAR		WATER YEARS 1962 - 1992	
ANNUAL TOTAL	3703.38	2306.70		
ANNUAL MEAN	10.1	6.30	10.6	
HIGHEST ANNUAL MEAN			21.3	1982
LOWEST ANNUAL MEAN			3.13	1984
HIGHEST DAILY MEAN	340	219	781	Feb 1 1969
LOWEST DAILY MEAN	.49	.81	.23	Jun 28 1966
ANNUAL SEVEN-DAY MINIMUM	1.5	.92	.36	Oct 14 1984
ANNUAL RUNOFF (AC-FT)	7350	4580	7660	
10 PERCENT EXCEEDS	16	9.8	19	
50 PERCENT EXCEEDS	4.2	2.8	3.8	
90 PERCENT EXCEEDS	2.6	1.3	1.2	



16229300 KALIHI STREAM AT KALIHI--Continued

WATER-QUALITY RECORDS

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

WATER QUALITY DATA, WATER YEAR OCTOBER 1991 TO SEPTEMBER 1992

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 WATER (DEG C)	TUR-BID-ITY (NTU)	BARO-METRIC PRES-SURE (MM OF HG)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, (PER-CENT SATUR-ATION)	COLI-FORM, FECAL, UM-MF (COLS./ 100 ML)	STREP-TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML)
OCT 1991 30...	1045	3.6	222	7.5	21.5	2.1	762	8.5	96	5200	2000
JAN 1992 23...	1345	2.5	268	7.3	21.5	1.4	763	9.2	104	1400	1400
APR 23...	1030	1.4	285	7.6	22.5	1.4	760	7.5	87	3100	1800
JUL 14...	1155	1.9	292	7.8	24.5	1.1	761	7.9	95	2300	950

DATE	HARD-NESS TOTAL (MG/L AS CAC03)	HARD-NESS NONCARB DISSOLV FLD. AS CAC03 (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)
OCT 1991 30...	58	6	12	6.9	20	42	1	1.0	64	0	53
JAN 1992 23...	61	7	12	7.6	27	48	2	1.2	66	0	54
APR 23...	73	6	14	9.3	26	43	1	1.3	82	0	68
JUL 14...	79	6	16	9.4	25	40	1	1.5	89	0	73

DATE	SULFATE DIS-SOLVED (MG/L AS SO4)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)	FLUO-RIDE, DIS-SOLVED (MG/L AS F)	SILICA, DIS-SOLVED (MG/L AS SIO2)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L)	SOLIDS, DIS-SOLVED (TONS PER DAY)	NITRO-GEN, NITRITE TOTAL (MG/L AS N)	NITRO-GEN, NITRITE DIS-SOLVED (MG/L AS N)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N)
OCT 1991 30...	6.3	25	<0.10	15	127	119	1.23	0.010	<0.010	0.150
JAN 1992 23...	11	42	0.10	16	161	150	1.10	<0.010	<0.010	0.190
APR 23...	8.6	41	<0.10	17	150	159	0.57	0.010	<0.010	0.130
JUL 14...	9.4	37	<0.10	19	156	163	0.80	<0.010	<0.010	0.220

DATE	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N)	NITRO-GEN, AMMONIA (MG/L AS N)	NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS NH4)	NITRO-GEN, AM-MONIA + ORGANIC (MG/L AS N)	PHOS-PHORUS TOTAL (MG/L AS P)	PHOS-PHORUS DIS-SOLVED (MG/L AS P)	PHOS-PHORUS ORTHO TOTAL (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)
OCT 1991 30...	0.140	0.030	--	<0.20	0.050	0.040	0.020	0.030	<10	4
JAN 1992 23...	0.160	0.020	0.01	<0.20	0.030	0.040	0.030	0.030	<10	5
APR 23...	0.160	0.020	0.04	0.20	0.060	0.050	0.040	0.040	<10	6
JUL 14...	0.240	0.040	0.05	<0.20	0.060	0.030	0.050	0.040	20	7

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

16229300 KALIHI STREAM AT KALIHI--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1991 TO SEPTEMBER 1992

DATE	COBALT, DIS- SOLVED (UG/L AS CO)	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 1991 30...	<3	130	<4	7	<10	<1	<1	<1.0	92	<6
JAN 1992 23...	<3	210	<4	13	<10	<1	<1	<1.0	97	<6
APR 23...	<3	230	<4	14	<10	<1	<1	<1.0	130	<6
JUL 14...	<3	190	<4	21	<10	1	<1	<1.0	140	<6

CROSS SECTION ANALYSES, WATER YEAR OCTOBER 1991 TO SEPTEMBER 1992

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 HG)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)
OCT 1991 30...	1050	8.0	222	7.4	21.5	762	96
30...	1055	15.0	222	7.5	21.5	762	96
30...	1100	22.0	223	7.6	21.5	762	96
30...	1105	30.0	221	7.6	22.0	762	96

PARTICLE-SIZE DISTRIBUTION OF SUSPENDED SEDIMENT, WATER YEAR OCTOBER 1991 TO SEPTEMBER 1992

DATE	TIME	SEDI- MENT, DIS- SOLVED (MG/L)	SED- MENT, SUSP. CHARGE, SUS- PENDED (T/DAY)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM	DATE	TIME	SEDI- MENT, DIS- SOLVED (MG/L)	SED- MENT, SUSP. CHARGE, SUS- PENDED (T/DAY)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM
OCT 1991 30...	1045	1	0.01	100	APR 1992 23...	1030	8	0.03	98
JAN 1992 23...	1345	23	0.16	96	JUL 14...	1155	4	0.02	100

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

16232000 NUUANU STREAM BELOW RESERVOIR 2 WASTEWAY, NEAR HONOLULU

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

DRAINAGE AREA.--3.35 mi².

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.--76 years (water years 1915-16, 1918-20, 1922-92), 7.00 ft³/s (5,070 acre-ft/yr).

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

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 240 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Sept. 16	1000	*376	*5.18	No other peak greater than base discharge.			

Minimum discharge, 0.55 ft³/s, June 5, July 5-7.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1991 TO SEPTEMBER 1992
DAILY MEAN VALUES

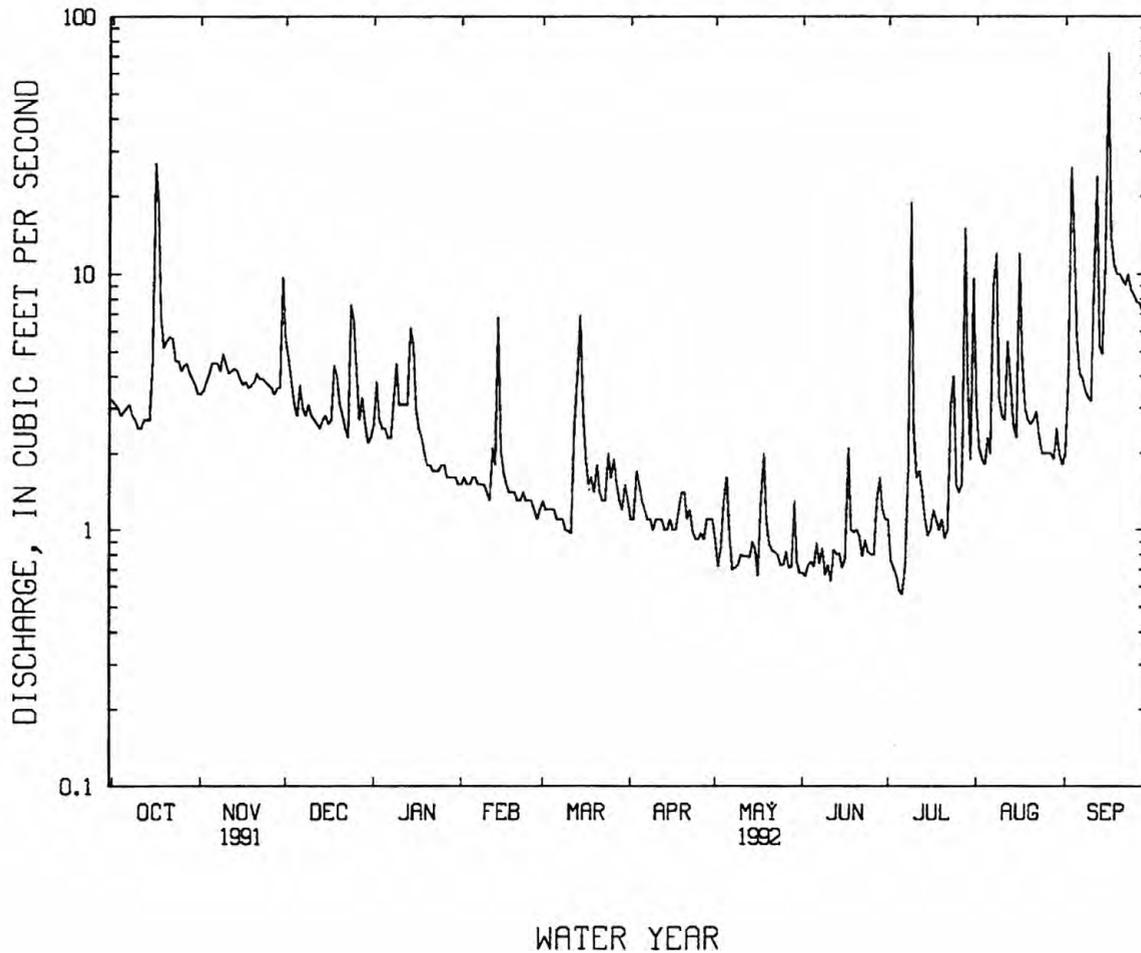
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3.2	3.4	5.6	2.6	1.5	1.3	1.1	.91	.68	1.1	3.1	2.0
2	3.1	3.5	4.7	3.8	1.6	1.2	1.1	.72	.66	.76	2.1	4.0
3	3.0	3.8	3.8	2.7	1.5	1.2	1.7	.85	.73	.71	1.9	26
4	2.8	4.1	3.1	2.5	1.5	1.2	1.5	1.3	.75	.66	1.8	13
5	2.9	4.5	2.8	2.5	1.6	1.2	1.3	1.6	.72	.58	2.3	5.7
6	3.0	4.5	3.7	2.3	1.6	1.1	1.2	.94	.89	.56	2.0	4.1
7	3.1	4.5	3.0	2.3	1.5	1.1	1.1	.70	.74	.71	9.1	3.9
8	2.8	4.2	2.8	3.2	1.5	1.1	1.1	.71	.85	1.7	12	3.5
9	2.7	4.9	3.1	4.5	1.5	1.0	1.0	.73	.67	19	3.3	3.3
10	2.5	4.5	2.8	3.1	1.4	.99	1.1	.80	.73	2.4	2.8	3.2
11	2.5	4.1	2.7	3.1	1.3	.97	1.1	.79	.63	1.6	2.7	9.4
12	2.7	4.2	2.6	3.1	2.1	2.6	1.1	.79	.84	1.7	5.5	24
13	2.7	4.3	2.5	3.1	1.8	4.0	1.0	.78	.80	1.4	3.9	5.3
14	2.7	4.2	2.7	6.2	6.8	6.9	1.0	.90	.81	1.1	2.6	4.9
15	4.6	3.9	2.8	5.4	2.1	2.9	1.1	.84	.71	.95	2.3	11
16	27	3.7	2.6	3.0	1.7	1.9	1.0	.66	.77	1.0	12	72
17	19	3.8	2.7	2.5	1.5	1.5	1.0	1.3	2.1	1.2	4.6	14
18	6.8	3.6	4.4	2.3	1.4	1.6	1.2	2.0	1.0	1.1	3.0	11
19	5.2	3.7	4.0	2.0	1.4	1.4	1.4	1.1	.98	1.0	2.7	10
20	5.5	3.8	3.1	1.8	1.4	1.8	1.4	.88	1.0	1.1	2.6	10
21	5.7	4.1	2.8	1.8	1.3	1.4	1.1	.83	.94	.93	2.7	9.5
22	5.6	3.9	2.5	1.7	1.3	1.3	1.2	.82	.79	1.0	2.9	9.1
23	4.6	3.9	2.3	1.7	1.4	1.3	.99	.80	.91	3.1	2.3	10
24	4.6	3.8	7.6	1.7	1.3	2.0	.92	.73	.82	4.0	2.0	8.7
25	4.2	3.7	6.6	1.8	1.3	1.6	.92	.73	.80	1.5	2.0	8.3
26	4.4	3.6	4.1	1.8	1.3	1.9	.97	.82	.80	1.4	2.0	7.8
27	4.5	3.4	2.7	1.6	1.2	1.5	.92	.71	1.3	1.5	2.0	7.7
28	4.1	3.6	3.3	1.6	1.1	1.3	1.1	.72	1.6	15	1.9	7.2
29	3.9	3.6	2.6	1.6	1.2	1.2	1.1	1.3	1.2	3.7	2.5	7.1
30	3.7	9.7	2.2	1.6	---	1.5	1.1	.75	1.1	1.9	2.0	6.8
31	3.4	---	2.3	1.5	---	1.3	---	.68	---	9.6	1.8	---
TOTAL	156.5	124.5	104.5	80.4	48.1	53.26	33.82	28.19	27.32	83.96	106.4	322.5
MEAN	5.05	4.15	3.37	2.59	1.66	1.72	1.13	.91	.91	2.71	3.43	10.7
MAX	27	9.7	7.6	6.2	6.8	6.9	1.7	2.0	2.1	19	12	72
MIN	2.5	3.4	2.2	1.5	1.1	.97	.92	.66	.63	.56	1.8	2.0
AC-FT	310	247	207	159	95	106	67	56	54	167	211	640

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

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1914 - 1992, BY WATER YEAR (WY)

MEAN	4.26	6.83	8.82	9.57	9.13	9.60	9.45	8.12	5.03	4.29	5.05	4.46
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 1991 CALENDAR YEAR	FOR 1992 WATER YEAR		WATER YEARS 1914 - 1992	
ANNUAL TOTAL	2574.3	1169.45		
ANNUAL MEAN	7.05	3.20	7.00	
HIGHEST ANNUAL MEAN			20.0	1932
LOWEST ANNUAL MEAN			.88	1920
HIGHEST DAILY MEAN	137	72	514	May 16 1927
LOWEST DAILY MEAN	2.2	.56	.14	Jul 7 1922
ANNUAL SEVEN-DAY MINIMUM	2.7	.71	.14	Jul 18 1922
ANNUAL RUNOFF (AC-FT)	5110	2320	5070	
10 PERCENT EXCEEDS	11	5.7	14	
50 PERCENT EXCEEDS	4.8	2.0	3.6	
90 PERCENT EXCEEDS	3.2	.80	.93	



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 mi².

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.--74 years (water years 1914-20, 1926-92), 4.93 ft³/s (3,570 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 3,090 ft³/s, Jan. 16, 1921, gage height, 10.4 ft, from floodmarks, site and datum then in use, from rating curve extended above 58 ft³/s. Current peak discharges are derived from rating curve extended above 1,760 ft³/s on the basis of slope-area measurement at gage height 5.28 ft; minimum, 0.6 ft³/s, June 7, 8, 1926.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 310 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Sept. 16	0330	*388	*3.48	No other peaks greater than base discharge.			

Minimum discharge, 1.3 ft³/s, June 11, 12.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1991 TO SEPTEMBER 1992
DAILY MEAN VALUES

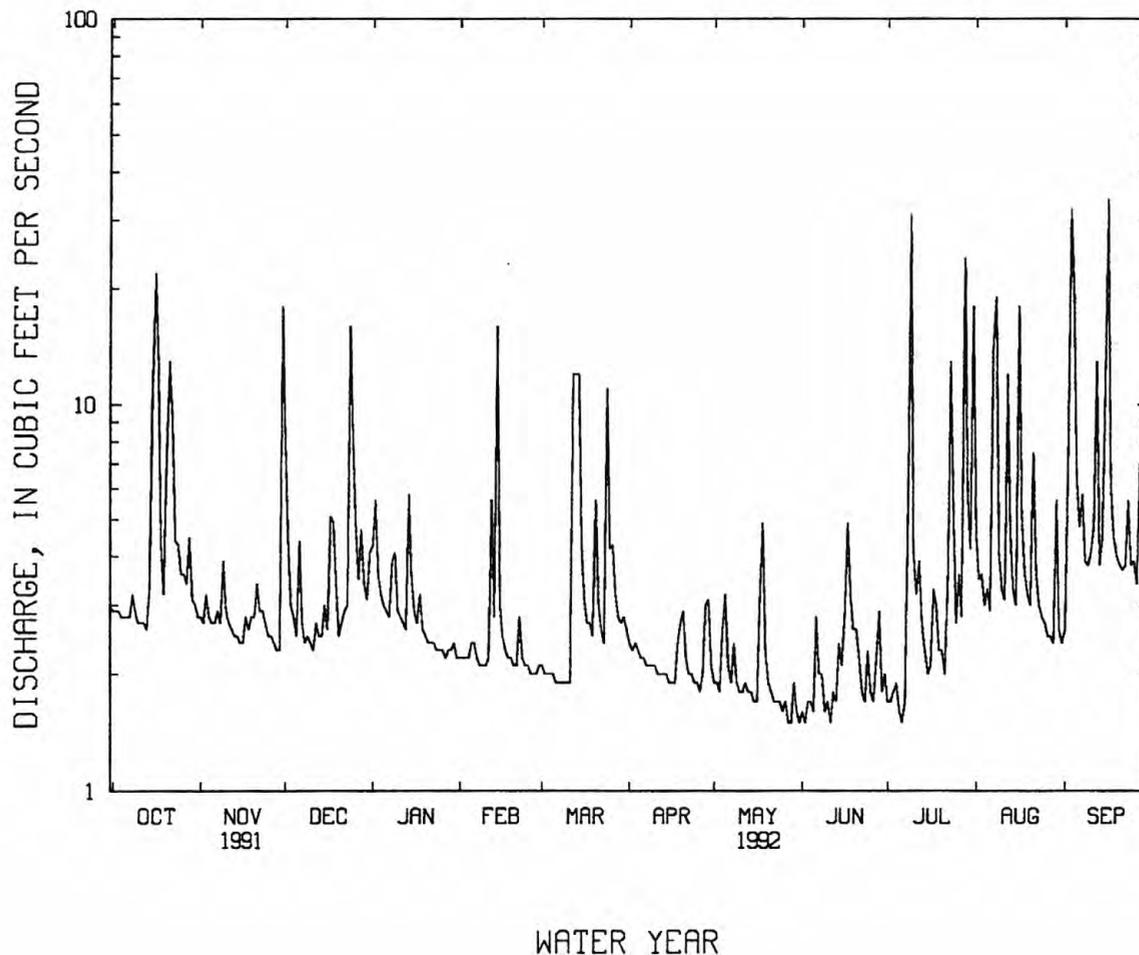
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.9	2.8	8.3	4.3	2.2	2.1	2.4	1.9	1.6	1.7	4.6	2.6
2	2.9	2.7	4.5	5.6	2.2	2.0	2.3	1.9	1.5	1.7	3.5	7.3
3	2.9	3.2	3.0	3.6	2.2	2.0	2.4	1.8	1.7	1.8	3.6	32
4	2.8	2.8	2.8	3.2	2.2	2.0	2.3	2.6	1.7	1.9	3.0	20
5	2.8	2.7	2.5	3.0	2.4	2.0	2.2	3.2	1.6	1.6	3.3	6.4
6	2.8	2.7	4.4	2.9	2.4	1.9	2.2	2.1	2.8	1.5	2.9	4.8
7	2.8	2.9	2.7	2.8	2.2	1.9	2.1	1.9	2.0	1.7	14	5.8
8	3.2	2.7	2.4	3.9	2.1	1.9	2.1	2.4	2.0	5.3	19	3.9
9	2.9	3.9	2.5	4.1	2.1	1.9	2.1	1.9	1.6	31	4.1	3.8
10	2.7	2.9	2.4	2.9	2.1	1.9	2.1	1.8	1.7	4.1	3.3	4.1
11	2.7	2.7	2.3	2.8	2.2	1.9	2.0	1.8	1.5	3.2	3.1	4.8
12	2.7	2.6	2.7	2.7	5.6	12	2.0	1.9	1.8	3.9	12	13
13	2.6	2.5	2.5	2.6	2.8	12	2.0	1.8	1.7	2.7	4.6	3.8
14	3.3	2.5	2.5	5.8	16	12	2.0	1.8	2.4	2.3	3.3	4.4
15	11	2.4	3.0	3.5	3.0	4.3	1.9	1.7	2.1	2.0	3.0	11
16	22	2.4	2.6	2.9	2.5	3.1	1.9	1.7	2.8	2.1	18	34
17	13	2.8	5.1	2.7	2.3	2.7	1.9	3.2	4.9	3.3	5.0	6.1
18	4.3	2.6	4.9	3.2	2.2	2.7	2.4	4.9	3.2	3.0	3.6	4.5
19	3.2	2.8	3.4	2.6	2.2	2.5	2.7	2.3	2.6	2.3	3.2	4.0
20	7.3	2.8	2.5	2.5	2.1	5.6	2.9	1.9	2.6	2.3	3.0	3.8
21	13	3.4	2.7	2.4	2.1	3.0	2.2	1.8	2.2	2.0	7.5	3.7
22	9.3	2.9	2.9	2.4	2.8	2.6	2.0	1.7	1.8	3.6	3.6	3.8
23	4.4	2.9	3.0	2.4	2.2	2.4	2.0	1.7	1.7	13	3.0	5.6
24	4.3	2.7	16	2.3	2.1	11	1.9	1.7	2.3	5.4	2.8	3.8
25	3.6	2.5	8.3	2.3	2.1	4.2	1.9	1.6	1.8	2.7	2.7	3.9
26	3.6	2.5	4.9	2.3	2.0	4.3	1.8	1.7	1.7	3.6	2.5	3.4
27	3.4	2.4	3.5	2.2	2.0	3.2	2.0	1.5	2.2	2.8	2.5	7.0
28	4.5	2.3	4.7	2.3	2.0	2.8	3.0	1.5	2.9	24	2.4	3.5
29	3.1	2.3	3.4	2.3	2.1	2.7	3.1	1.9	1.8	5.9	5.6	3.4
30	3.0	18	3.1	2.4	---	2.8	2.1	1.6	2.0	4.2	2.6	3.2
31	2.8	---	4.1	2.2	---	2.6	---	1.5	---	18	2.4	---
TOTAL	155.8	97.3	123.6	93.1	82.4	120.0	65.9	62.7	64.2	164.6	157.7	221.4
MEAN	5.03	3.24	3.99	3.00	2.84	3.87	2.20	2.02	2.14	5.31	5.09	7.38
MAX	22	18	16	5.8	16	12	3.1	4.9	4.9	31	19	34
MIN	2.6	2.3	2.3	2.2	2.0	1.9	1.8	1.5	1.5	1.5	2.4	2.6
AC-FT	309	193	245	185	163	238	131	124	127	326	313	439

16240500 WAIAKEAKUA STREAM AT HONOLULU--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1913 - 1992, BY WATER YEAR (WY)

MEAN	4.20	5.26	5.38	4.92	4.54	5.47	5.72	5.28	4.19	4.92	4.89	4.19
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 1991 CALENDAR YEAR	FOR 1992 WATER YEAR		WATER YEARS 1913 - 1992	
ANNUAL TOTAL	1914.0	1408.7		
ANNUAL MEAN	5.24	3.85	4.93	
HIGHEST ANNUAL MEAN			8.23	1988
LOWEST ANNUAL MEAN			1.94	1920
HIGHEST DAILY MEAN	84	34	164	Dec 31 1987
LOWEST DAILY MEAN	2.3	1.5	.62	Feb 26 1920
ANNUAL SEVEN-DAY MINIMUM	2.5	1.6	.75	May 23 1926
ANNUAL RUNOFF (AC-FT)	3800	2790	3570	
10 PERCENT EXCEEDS	8.5	5.7	8.1	
50 PERCENT EXCEEDS	3.7	2.7	3.6	
90 PERCENT EXCEEDS	2.8	1.8	1.7	



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16249500 MAUNAWILI DITCH AT AINONI SPRING

LOCATION.--Lat 12°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 to September 1991.

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

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

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge during the period of June to Sep. 1991, 2.3 ft³/s, Sept. 25; minimum daily, 0.84 ft³/s, Sept. 2.

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	---	---	---	---	---	---	---	---	---	1.9	1.4	1.5
2	---	---	---	---	---	---	---	---	---	2.2	1.8	.84
3	---	---	---	---	---	---	---	---	---	2.2	2.0	1.7
4	---	---	---	---	---	---	---	---	---	2.0	2.0	1.6
5	---	---	---	---	---	---	---	---	---	2.0	2.1	1.7
6	---	---	---	---	---	---	---	---	---	2.0	2.0	2.1
7	---	---	---	---	---	---	---	---	---	1.7	1.9	2.0
8	---	---	---	---	---	---	---	---	---	1.9	1.4	1.6
9	---	---	---	---	---	---	---	---	---	2.0	1.5	1.8
10	---	---	---	---	---	---	---	---	---	1.4	1.4	1.6
11	---	---	---	---	---	---	---	---	---	1.1	1.6	1.7
12	---	---	---	---	---	---	---	---	---	1.6	1.8	1.8
13	---	---	---	---	---	---	---	---	---	1.6	1.2	1.8
14	---	---	---	---	---	---	---	---	---	1.7	1.6	2.1
15	---	---	---	---	---	---	---	---	---	1.9	1.4	1.9
16	---	---	---	---	---	---	---	---	---	1.9	1.6	1.9
17	---	---	---	---	---	---	---	---	---	1.9	1.6	2.0
18	---	---	---	---	---	---	---	---	---	2.0	1.7	2.0
19	---	---	---	---	---	---	---	---	---	1.9	2.1	2.0
20	---	---	---	---	---	---	---	---	---	2.0	2.0	1.9
21	---	---	---	---	---	---	---	---	---	1.2	2.0	2.3
22	---	---	---	---	---	---	---	---	---	1.3	2.1	2.1
23	---	---	---	---	---	---	---	---	---	1.6	2.0	1.9
24	---	---	---	---	---	---	---	---	---	1.8	2.0	2.1
25	---	---	---	---	---	---	---	---	---	1.6	1.8	2.0
26	---	---	---	---	---	---	---	---	1.9	1.7	2.0	1.7
27	---	---	---	---	---	---	---	---	1.7	1.4	1.6	1.8
28	---	---	---	---	---	---	---	---	1.3	1.6	1.7	2.0
29	---	---	---	---	---	---	---	---	1.3	2.0	1.5	1.6
30	---	---	---	---	---	---	---	---	1.4	1.8	1.9	1.8
31	---	---	---	---	---	---	---	---	---	1.6	2.0	---
TOTAL	---	---	---	---	---	---	---	---	---	54.5	54.7	54.84
MEAN	---	---	---	---	---	---	---	---	---	1.76	1.76	1.83
MAX	---	---	---	---	---	---	---	---	---	2.2	2.1	2.3
MIN	---	---	---	---	---	---	---	---	---	1.1	1.2	.84
AC-FT	---	---	---	---	---	---	---	---	---	108	108	109

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

MEAN	---	---	---	---	---	---	---	---	---	1.76	1.76	1.83
MAX	---	---	---	---	---	---	---	---	---	1.76	1.76	1.83
(WY)	---	---	---	---	---	---	---	---	---	1991	1991	1991
MIN	---	---	---	---	---	---	---	---	---	1.76	1.76	1.83
(WY)	---	---	---	---	---	---	---	---	---	1991	1991	1991

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.

DRAINAGE AREA.--

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, 2.7 ft³/s, Oct. 29, 1991; minimum daily, 0.72 ft³/s Apr. 28, 1992.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 2.7 ft³/s, Oct. 29; minimum daily, 0.72 ft³/s, Apr. 28.

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	1.9	1.7	1.6	1.8	2.3	1.4	1.9	1.8	1.6	1.7	1.9	2.0
2	1.8	1.3	1.6	1.6	2.2	1.8	1.5	1.7	1.9	1.8	1.3	1.8
3	1.9	1.3	1.3	2.3	2.3	1.9	1.7	1.6	1.8	1.8	1.5	1.8
4	1.9	2.0	1.7	2.4	1.9	1.8	2.0	1.8	1.4	1.4	1.9	1.8
5	1.9	2.3	1.9	2.0	1.5	1.9	1.9	1.5	1.6	1.2	1.9	1.7
6	1.7	1.8	1.7	2.2	1.3	1.8	1.8	1.6	1.4	1.5	1.9	1.7
7	1.7	1.5	1.4	2.2	2.2	1.6	1.8	1.6	1.2	1.7	1.5	1.7
8	1.9	1.9	1.3	2.5	2.5	1.3	1.8	1.8	1.5	1.8	1.4	1.9
9	1.7	2.3	1.9	2.4	2.1	1.6	1.7	1.9	1.4	1.9	.92	2.1
10	1.8	1.8	2.0	2.1	2.0	1.8	1.9	1.8	1.5	1.8	1.6	2.1
11	1.8	1.6	1.8	1.9	1.7	1.7	1.7	1.5	1.6	1.8	1.7	1.6
12	1.8	2.1	2.2	1.9	1.6	1.4	1.7	1.7	1.7	1.4	1.8	1.3
13	1.6	2.4	2.1	2.0	1.3	1.5	1.8	1.8	1.6	1.6	2.0	.91
14	1.7	2.4	1.8	2.1	1.3	1.7	1.5	1.7	.98	1.8	2.1	1.7
15	2.1	2.3	1.6	1.7	.87	1.5	1.9	1.8	1.4	1.7	2.0	2.1
16	1.6	2.0	2.2	1.5	.96	1.8	1.8	1.7	1.6	1.7	1.6	1.8
17	2.1	1.5	2.5	1.4	1.1	1.8	1.8	1.0	1.7	1.7	1.9	2.0
18	2.3	1.7	2.5	1.3	1.0	1.9	1.7	1.4	1.4	1.8	2.1	2.3
19	1.7	1.8	2.0	1.3	1.2	1.9	1.1	1.6	1.6	1.8	2.2	1.9
20	1.3	1.6	2.1	1.2	1.3	2.0	1.5	1.3	1.8	1.8	1.9	1.8
21	2.1	1.5	1.8	1.7	1.4	2.0	1.8	.95	1.7	1.8	1.6	2.1
22	2.1	1.7	1.5	2.0	1.0	1.8	1.8	1.5	1.8	1.9	1.5	2.0
23	2.6	1.9	2.3	1.6	.86	1.8	1.8	1.4	1.6	2.1	1.6	1.6
24	2.2	1.6	2.1	1.4	1.2	2.0	1.8	1.2	1.8	2.0	1.6	1.9
25	2.6	1.9	1.7	1.5	.88	2.0	1.4	.98	1.5	1.6	1.9	2.5
26	2.6	2.0	1.4	1.5	1.5	1.9	.99	2.1	1.5	1.1	1.9	2.4
27	1.9	1.8	1.8	2.1	1.6	1.9	.85	2.1	1.6	1.5	1.9	1.9
28	2.6	1.6	1.9	2.3	1.8	2.0	.72	2.1	1.3	2.1	1.9	2.1
29	2.7	1.9	1.6	2.3	1.6	1.6	1.4	1.5	1.6	1.9	1.6	2.2
30	2.5	2.0	2.3	2.1	---	1.6	1.9	1.1	1.6	2.0	1.1	2.3
31	2.3	---	2.1	2.3	---	1.8	---	1.0	---	2.3	1.5	---
TOTAL	62.4	55.2	57.7	58.6	44.47	54.5	48.96	48.53	46.68	54.0	53.22	57.01
MEAN	2.01	1.84	1.86	1.89	1.53	1.76	1.63	1.57	1.56	1.74	1.72	1.90
MAX	2.7	2.4	2.5	2.5	2.5	2.0	2.0	2.1	1.9	2.3	2.2	2.5
MIN	1.3	1.3	1.3	1.2	.86	1.3	.72	.95	.98	1.1	.92	.91
AC-FT	124	109	114	116	88	108	97	96	93	107	106	113

16249500 MAUNAWILI DITCH AT AINONI SPRING--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1991 - 1992, BY WATER YEAR (WY)

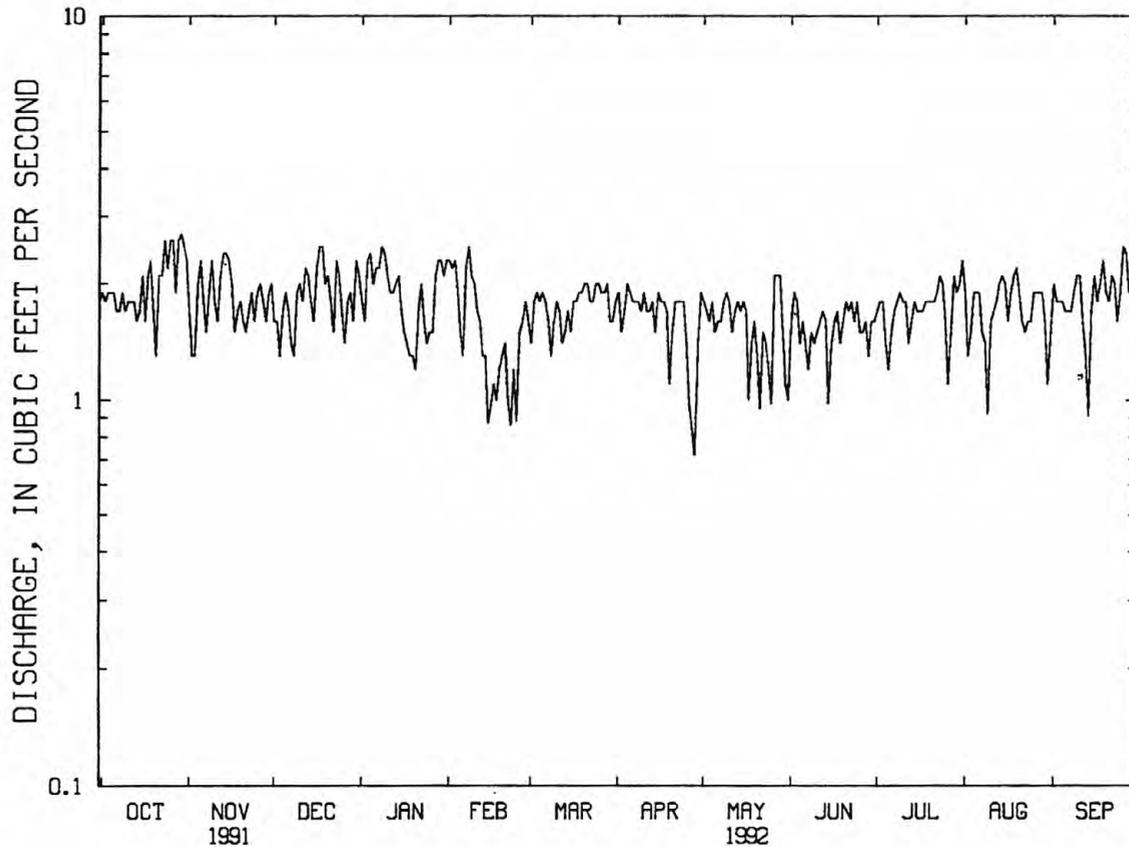
MEAN	2.01	1.84	1.86	1.89	1.53	1.76	1.63	1.57	1.56	1.75	1.74	1.86
MAX	2.01	1.84	1.86	1.89	1.53	1.76	1.63	1.57	1.56	1.76	1.76	1.90
(WY)	1992	1992	1992	1992	1992	1992	1992	1992	1992	1991	1991	1992
MIN	2.01	1.84	1.86	1.89	1.53	1.76	1.63	1.57	1.56	1.74	1.72	1.83
(WY)	1992	1992	1992	1992	1992	1992	1992	1992	1992	1992	1992	1991

SUMMARY STATISTICS

FOR 1992 WATER YEAR

WATER YEARS 1991 - 1992

ANNUAL TOTAL	641.27		
ANNUAL MEAN	1.75		
HIGHEST ANNUAL MEAN		1.75	1992
LOWEST ANNUAL MEAN		1.75	1992
HIGHEST DAILY MEAN	2.7	Oct 29	
LOWEST DAILY MEAN	.72	Apr 28	
ANNUAL SEVEN-DAY MINIMUM	1.1	Feb 13	
ANNUAL RUNOFF (AC-FT)	1270		
10 PERCENT EXCEEDS	2.2		
50 PERCENT EXCEEDS	1.8		
90 PERCENT EXCEEDS	1.3		



WATER YEAR

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16249900 MAUNAWILI DITCH ABOVE AINANINUI 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 with concrete on upstream end. Elevation of gage is 400 ft from topographic map.

REMARKS.--Records good.

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 4.6 ft³/s, Nov. 26, 1991; no flow on Mar. 22, 24, 1991.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 4.6 ft³/s, Nov. 26; minimum daily, 0.86 ft³/s, Apr. 28.

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	2.7	e2.6	e2.2	2.1	2.3	2.0	2.0	1.9	e2.0	e2.5	3.4	3.3
2	2.8	e2.1	e2.0	1.9	1.9	2.5	1.4	2.4	e2.8	e3.1	2.4	3.2
3	2.8	e2.1	e1.8	2.8	2.3	2.7	1.9	2.5	e2.4	e2.8	2.1	3.3
4	2.8	e2.7	e2.1	2.9	1.9	2.1	2.6	2.7	e1.8	e2.1	2.4	3.0
5	2.6	e2.9	2.5	2.2	1.6	2.6	2.4	2.3	e2.2	e1.5	2.9	2.7
6	2.4	e2.7	2.4	2.5	1.5	2.6	2.2	e1.9	e1.7	2.1	e2.0	2.8
7	2.8	2.4	2.1	2.6	2.2	2.5	2.5	e1.7	e1.5	2.9	e1.8	3.1
8	e2.7	2.9	2.0	3.1	2.1	1.6	2.5	e1.9	e2.0	2.7	e1.7	3.4
9	e2.4	2.8	2.6	3.1	1.7	2.1	2.5	e1.9	e1.7	2.9	e1.6	3.9
10	e2.5	2.3	2.6	2.7	2.4	2.5	2.1	e2.0	e1.8	3.2	e2.0	3.7
11	e2.8	2.2	2.3	2.1	2.4	2.4	2.6	e1.8	e1.9	2.9	1.9	2.7
12	e2.8	2.9	3.1	1.9	2.4	2.1	2.1	e1.9	e2.2	2.1	3.2	2.7
13	e2.3	3.3	3.0	2.4	2.0	1.8	2.7	e2.0	e1.9	2.4	3.6	2.6
14	e2.2	3.1	2.4	2.9	2.0	2.0	2.3	e1.9	e1.4	2.9	3.7	3.2
15	e2.6	3.1	2.1	2.3	e1.7	1.9	2.5	e2.3	e1.8	2.8	3.5	3.2
16	e2.2	2.8	2.9	e1.8	e1.8	2.6	2.3	e2.1	e1.9	3.0	3.1	3.3
17	e2.4	2.2	3.5	e1.7	e2.2	2.2	2.3	e1.8	e1.9	2.8	3.4	3.7
18	e2.9	2.4	3.9	e1.6	e1.8	e2.3	1.9	e1.9	e1.7	2.9	3.7	4.0
19	e2.6	2.7	3.1	e1.6	e2.4	e2.4	1.4	e1.8	e1.9	2.4	3.8	3.3
20	e2.3	2.6	2.9	e1.5	e2.6	2.0	2.0	e2.1	e2.1	2.5	3.3	3.0
21	e2.6	2.5	2.4	e1.6	e2.7	1.9	2.7	e1.5	e2.0	2.7	2.8	3.3
22	e2.6	3.4	1.8	e2.3	1.8	1.6	2.3	e2.1	e2.2	3.0	2.6	3.1
23	e3.1	4.2	2.9	e2.1	1.4	2.0	2.4	e1.9	e2.1	3.7	2.4	2.7
24	e2.6	3.9	3.3	e1.8	1.7	2.3	2.5	e2.0	e2.4	3.6	2.7	3.4
25	e3.0	4.4	2.8	e1.7	1.6	2.3	2.0	e2.2	e1.9	2.8	3.2	4.1
26	e3.1	4.6	2.2	e1.7	2.2	2.6	.93	3.3	e2.0	2.0	3.0	3.4
27	e2.6	4.3	2.5	e2.0	2.3	2.6	.95	3.3	e2.2	2.5	3.0	2.6
28	e3.1	4.1	2.6	2.7	2.5	2.9	.86	2.9	e1.8	3.5	3.0	3.2
29	e3.2	3.2	2.1	2.6	2.3	2.4	1.8	e2.0	e2.2	3.3	2.7	3.3
30	e3.0	2.4	2.9	2.3	---	1.7	1.4	e1.7	e2.3	3.3	2.1	3.3
31	e2.9	---	2.6	2.3	---	1.8	---	e1.8	---	4.0	2.4	---
TOTAL	83.4	89.8	79.6	68.8	59.7	69.0	62.04	65.5	59.7	86.9	85.4	96.5
MEAN	2.69	2.99	2.57	2.22	2.06	2.23	2.07	2.11	1.99	2.80	2.75	3.22
MAX	3.2	4.6	3.9	3.1	2.7	2.9	2.7	3.3	2.8	4.0	3.8	4.1
MIN	2.2	2.1	1.8	1.5	1.4	1.6	.86	1.5	1.4	1.5	1.6	2.6
AC-FT	165	178	158	136	118	137	123	130	118	172	169	191

e Estimated

16249900 MAUNAWILI DITCH ABOVE AINANINUI TUNNEL NR KAILUA--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1991 - 1992, BY WATER YEAR (WY)

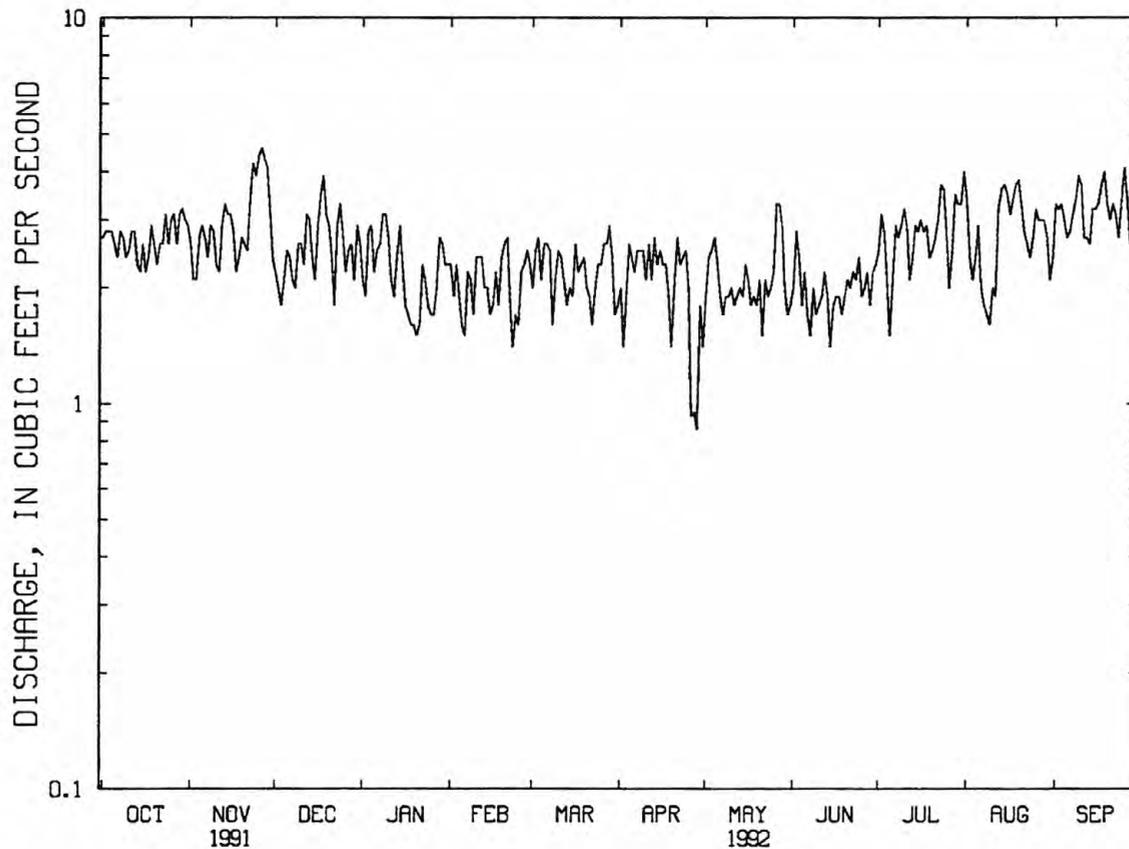
MEAN	2.69	2.99	2.57	2.22	2.26	1.96	2.16	2.20	2.19	2.60	2.56	2.92
MAX	2.69	2.99	2.57	2.22	2.46	2.23	2.26	2.29	2.39	2.80	2.75	3.22
(WY)	1992	1992	1992	1992	1991	1992	1991	1991	1991	1992	1992	1992
MIN	2.69	2.99	2.57	2.22	2.06	1.69	2.07	2.11	1.99	2.40	2.37	2.63
(WY)	1992	1992	1992	1992	1992	1991	1992	1992	1992	1991	1991	1991

SUMMARY STATISTICS

FOR 1992 WATER YEAR

WATER YEARS 1991 - 1992

ANNUAL TOTAL	906.34		
ANNUAL MEAN	2.48		
HIGHEST ANNUAL MEAN			2.48 1992
LOWEST ANNUAL MEAN			2.48 1992
HIGHEST DAILY MEAN	4.6	Nov 26	
LOWEST DAILY MEAN	.86	Apr 28	
ANNUAL SEVEN-DAY MINIMUM	1.4	Apr 25	
ANNUAL RUNOFF (AC-FT)	1800		1790
10 PERCENT EXCEEDS	3.3		3.1
50 PERCENT EXCEEDS	2.4		2.4
90 PERCENT EXCEEDS	1.8		1.7



WATER YEAR

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 mi².

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.--36 years (water years 1914-15, 1959-92), 5.15 ft³/s (3,730 acre-ft/yr).

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

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 390 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Nov. 30	0530	*460	*5.20	Feb. 14	0630	420	5.04

Minimum discharge, 0.71 ft³/s, July 7-9.

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	1.6	3.3	7.2	3.5	2.7	2.7	2.3	2.5	3.0	1.8	2.1	1.9
2	1.6	3.2	11	3.7	3.2	2.5	2.4	2.0	2.6	1.6	2.0	3.0
3	1.6	3.2	5.7	3.0	3.1	2.1	2.3	2.1	4.7	1.8	2.2	9.5
4	1.7	3.1	4.6	3.0	3.1	2.1	2.0	3.2	3.4	2.2	2.0	5.6
5	1.5	3.2	3.7	3.5	3.5	2.0	2.0	3.4	3.0	2.2	2.1	3.2
6	1.7	3.7	3.9	3.5	3.3	2.1	2.2	2.5	3.6	2.0	2.8	2.7
7	1.8	3.8	3.5	3.1	2.8	1.9	1.9	2.2	3.3	1.4	3.5	2.8
8	1.8	3.2	3.7	4.6	3.0	2.0	1.8	2.4	3.0	2.0	8.4	2.4
9	1.7	3.5	3.8	3.7	3.4	2.0	2.1	2.0	3.0	12	4.0	6.0
10	1.5	3.9	3.3	3.3	3.0	2.0	2.4	2.0	2.8	2.7	3.1	4.6
11	1.5	3.8	3.5	3.1	2.7	2.0	1.8	2.1	2.8	2.3	2.4	5.7
12	1.5	3.2	5.8	3.0	4.2	3.0	1.9	1.9	2.8	2.5	2.8	11
13	1.5	2.8	4.3	3.0	3.3	4.0	2.0	1.9	2.7	2.2	2.3	4.4
14	2.3	3.0	3.8	6.9	21	3.9	2.1	2.0	3.3	1.9	2.1	3.7
15	40	2.9	3.7	4.3	3.8	3.0	1.7	1.8	2.7	1.9	2.0	4.1
16	40	2.9	3.3	3.6	3.2	2.7	1.6	1.8	2.7	1.8	6.2	10
17	25	3.2	3.6	3.5	3.1	2.7	1.6	4.1	2.8	1.8	2.7	3.4
18	10	2.8	4.3	3.7	3.0	3.2	2.1	25	2.5	1.8	2.4	3.4
19	7.2	2.4	4.5	3.8	3.1	3.3	2.8	4.0	2.5	2.0	2.1	3.5
20	7.8	2.5	3.7	3.6	3.0	3.1	2.5	3.0	2.1	2.2	2.1	3.5
21	9.7	2.6	4.2	3.2	2.4	2.7	1.7	2.9	2.2	1.6	2.0	2.9
22	13	2.7	4.3	2.9	2.9	2.7	1.9	2.6	2.2	1.9	2.0	2.7
23	7.4	2.8	4.1	3.0	2.3	2.4	1.8	2.9	2.0	3.2	2.4	3.1
24	6.9	2.9	6.0	2.9	2.6	3.1	1.8	3.2	2.3	2.5	2.1	3.6
25	5.6	2.7	4.0	3.2	3.0	2.7	2.0	2.9	2.3	2.1	1.9	3.0
26	5.5	2.5	3.4	3.7	2.6	2.3	2.7	19	2.4	2.7	1.8	3.0
27	5.3	2.8	3.3	3.2	2.6	2.4	3.2	3.2	2.1	2.3	1.8	3.9
28	6.1	2.8	3.9	2.8	2.4	2.1	5.4	2.8	2.2	3.6	1.9	3.4
29	4.2	2.5	4.2	2.8	2.2	2.4	3.4	3.6	2.0	2.2	2.3	2.8
30	4.0	34	3.5	3.2	---	3.0	2.6	3.1	1.8	2.0	2.3	2.6
31	3.3	---	3.5	3.0	---	2.7	---	3.4	---	2.8	2.1	---
TOTAL	224.3	121.9	135.3	107.3	104.5	80.8	68.0	121.5	80.8	77.0	81.9	125.4
MEAN	7.24	4.06	4.36	3.46	3.60	2.61	2.27	3.92	2.69	2.48	2.64	4.18
MAX	40	34	11	6.9	21	4.0	5.4	25	4.7	12	8.4	11
MIN	1.5	2.4	3.3	2.8	2.2	1.9	1.6	1.8	1.8	1.4	1.8	1.9
AC-FT	445	242	268	213	207	160	135	241	160	153	162	249

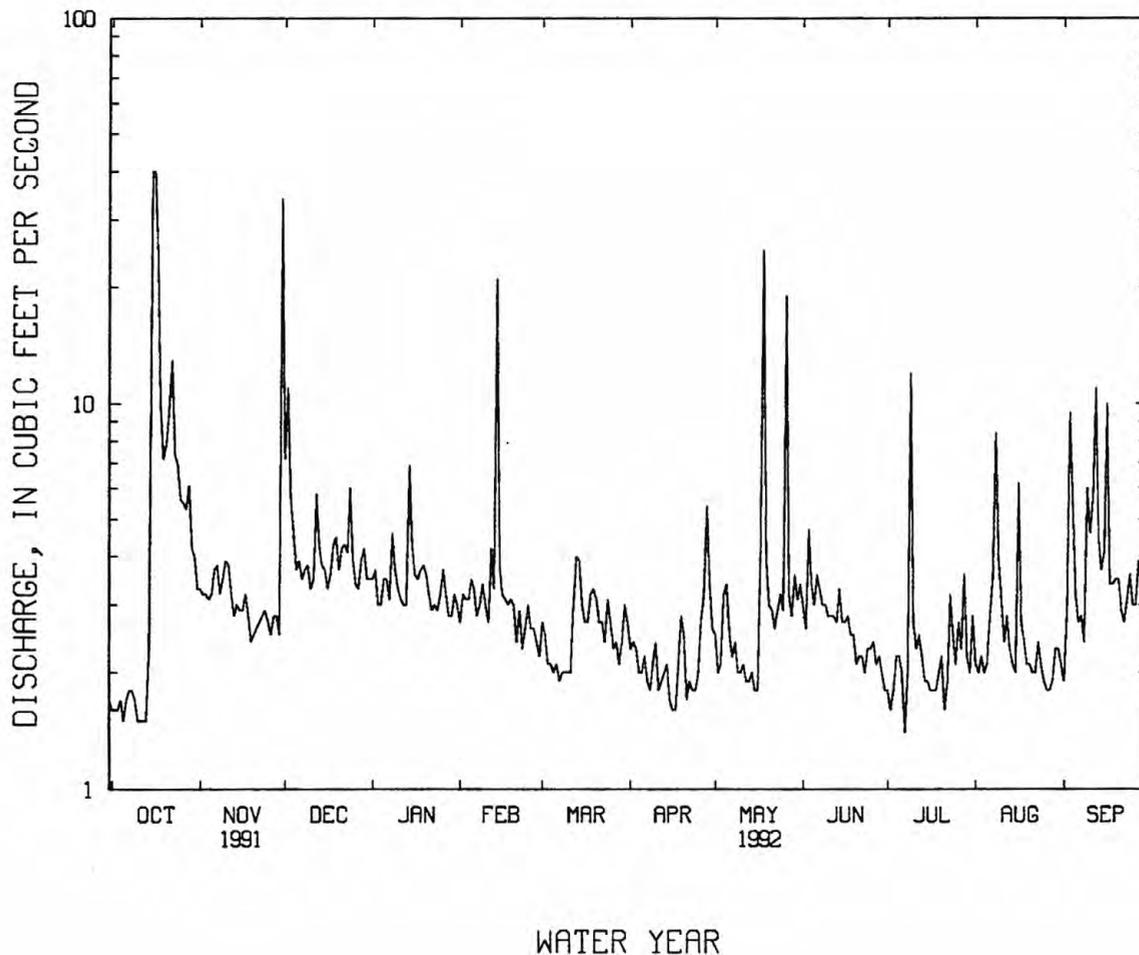
16254000 MAKAWAO STREAM NEAR KAILUA--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1913 - 1992, BY WATER YEAR (WY)

MEAN	2.92	5.39	7.18	8.57	7.18	7.85	6.86	5.53	3.38	2.67	2.57	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 1991 CALENDAR YEAR FOR 1992 WATER YEAR WATER YEARS 1913 - 1992

ANNUAL TOTAL	1979.8		1328.7		5.15	
ANNUAL MEAN	5.42		3.63		11.1	
HIGHEST ANNUAL MEAN					1982	
LOWEST ANNUAL MEAN					1973	
HIGHEST DAILY MEAN	233	Mar 19	40	Oct 15	518	Dec 31 1987
LOWEST DAILY MEAN	1.4	Aug 19	1.4	Jul 7	.50	Sep 8 1964
ANNUAL SEVEN-DAY MINIMUM	1.6	Oct 7	1.6	Oct 7	.67	Sep 8 1964
ANNUAL RUNOFF (AC-FT)	3930		2640		3730	
10 PERCENT EXCEEDS	6.8		4.6		9.0	
50 PERCENT EXCEEDS	3.6		2.8		2.8	
90 PERCENT EXCEEDS	1.8		1.9		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 mi².

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 to September 1991.

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 fair. 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.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 9,690 ft³/s, Feb. 4, 1965, gage height, 15.62 ft (site and datum then in use), from rating curve extended above 700 ft³/s on basis of contracted-opening measurement of peak flow; minimum, 2.3 ft³/s, Sep. 30, 1970.

EXTREMES FOR CURRENT YEAR.--Maximum discharge during period of Apr. to Sep. 1991, 70 ft³/s, Aug. 29, gage height, 2.81 ft; minimum, 3.1 ft³/s, Aug. 21, 22, 24-26, Sept. 14, 16-19.

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	---	---	---	---	---	---	---	9.8	8.6	11	5.2	6.4
2	---	---	---	---	---	---	---	9.3	8.7	7.7	4.7	6.8
3	---	---	---	---	---	---	---	9.7	8.1	6.9	3.6	5.4
4	---	---	---	---	---	---	---	11	5.9	5.4	4.4	5.1
5	---	---	---	---	---	---	---	9.6	7.0	6.7	5.1	5.2
6	---	---	---	---	---	---	---	8.8	7.5	5.7	2.6	4.3
7	---	---	---	---	---	---	---	9.0	7.9	6.9	3.5	4.1
8	---	---	---	---	---	---	---	9.2	6.6	6.6	14	4.6
9	---	---	---	---	---	---	---	9.3	6.6	5.6	7.6	4.3
10	---	---	---	---	---	---	---	8.8	6.2	11	5.8	3.8
11	---	---	---	---	---	---	---	8.6	5.6	6.6	5.4	4.6
12	---	---	---	---	---	---	---	9.0	6.5	7.4	5.4	5.3
13	---	---	---	---	---	---	---	8.7	5.8	e4.8	5.1	4.7
14	---	---	---	---	---	---	---	8.0	5.9	e5.2	5.0	3.6
15	---	---	---	---	---	---	---	8.5	5.4	e4.7	4.4	3.9
16	---	---	---	---	---	---	---	8.7	5.4	e4.7	4.5	4.0
17	---	---	---	---	---	---	---	8.7	5.7	e4.7	3.8	3.3
18	---	---	---	---	---	---	---	8.2	5.6	e4.2	4.3	3.4
19	---	---	---	---	---	---	---	9.1	6.5	e4.4	3.6	4.8
20	---	---	---	---	---	---	---	9.4	7.0	e4.4	3.8	4.6
21	---	---	---	---	---	---	---	8.6	7.2	e4.8	4.0	8.6
22	---	---	---	---	---	---	---	9.4	4.7	e4.6	3.7	12
23	---	---	---	---	---	---	11	8.9	5.9	e5.4	4.4	5.5
24	---	---	---	---	---	---	11	8.6	8.1	4.5	3.2	4.6
25	---	---	---	---	---	---	11	8.3	6.1	5.9	3.6	4.5
26	---	---	---	---	---	---	13	8.7	5.8	5.3	3.3	4.4
27	---	---	---	---	---	---	11	8.8	6.1	4.2	4.6	4.3
28	---	---	---	---	---	---	11	8.5	7.4	4.9	4.0	3.6
29	---	---	---	---	---	---	10	8.0	6.3	5.7	14	3.8
30	---	---	---	---	---	---	11	8.4	6.9	8.9	15	3.8
31	---	---	---	---	---	---	---	8.6	---	5.5	7.1	---
TOTAL	---	---	---	---	---	---	---	276.2	197.0	184.3	168.7	147.3
MEAN	---	---	---	---	---	---	---	8.91	6.57	5.95	5.44	4.91
MAX	---	---	---	---	---	---	---	11	8.7	11	15	12
MIN	---	---	---	---	---	---	---	8.0	4.7	4.2	2.6	3.3
AC-FT	---	---	---	---	---	---	---	548	391	366	335	292

e Estimated

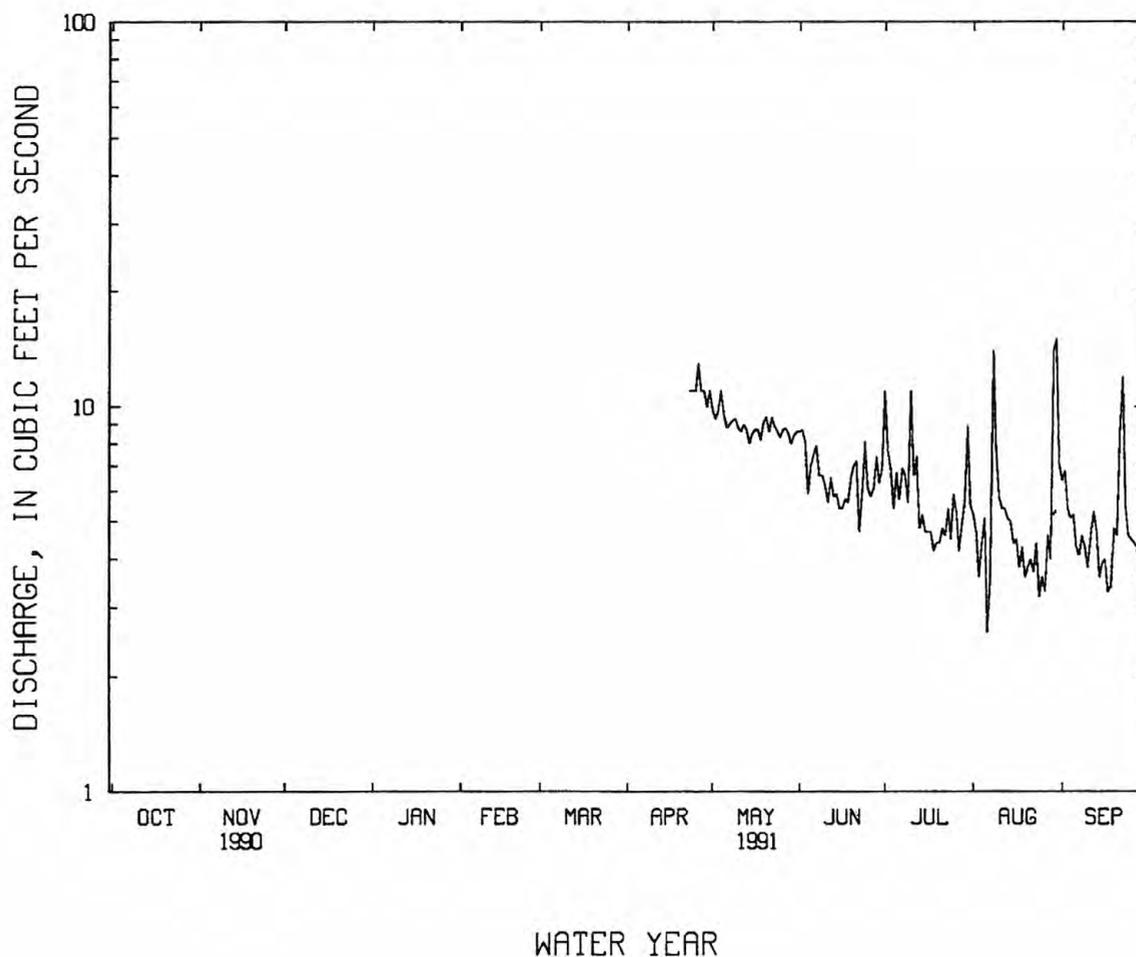
16260500 MAUNAWILI STREAM AT HIGHWAY 61, NEAR KAILUA--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1967 - 1991, BY WATER YEAR (WY)

MEAN	8.17	19.7	37.4	30.4	25.9	32.4	21.4	10.9	8.75	7.01	7.91	7.35
MAX	13.8	47.6	78.2	41.1	60.6	72.9	40.3	15.1	12.5	9.90	21.0	16.9
(WY)	1968	1971	1968	1969	1969	1968	1968	1968	1971	1967	1967	1967
MIN	5.91	7.14	10.1	12.0	11.5	6.94	7.36	5.98	4.51	5.55	4.75	4.73
(WY)	1971	1970	1970	1967	1970	1970	1970	1970	1970	1970	1971	1970

SUMMARY STATISTICS WATER YEARS 1967 - 1991

ANNUAL MEAN	18.4	
HIGHEST ANNUAL MEAN	26.0	1968
LOWEST ANNUAL MEAN	8.62	1970
HIGHEST DAILY MEAN	875	Dec 18 1967
LOWEST DAILY MEAN	2.6	Aug 6 1991
ANNUAL SEVEN-DAY MINIMUM	3.4	Oct 22 1970
ANNUAL RUNOFF (AC-FT)	13300	
10 PERCENT EXCEEDS	32	
50 PERCENT EXCEEDS	9.2	
90 PERCENT EXCEEDS	4.4	



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 mi².

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 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 fair. 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.--5 years (1967-1992), 16.6 ft³/s (12,000 acre-ft/yr)

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 9,690 ft³/s, Feb. 4, 1965, gage height, 15.62 ft (site and datum then in use), from rating curve extended above 700 ft³/s on basis of contracted-opening measurement of peak flow; minimum, 2.1 ft³/s, Oct. 12, 13, 1991.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 700 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Nov. 30	0700	668	6.76				

Minimum discharge, 2.10 ft³/s, Oct. 12, 13.

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	3.2	10	19	9.0	6.7	9.2	e5.0	e4.5	6.5	3.9	6.5	5.5
2	3.3	10	26	9.3	7.8	9.2	e5.0	e4.0	5.5	3.4	6.9	11
3	3.1	9.8	14	8.6	7.7	8.1	e4.9	e3.8	10	3.6	6.8	38
4	3.2	9.1	12	7.9	7.6	8.6	e4.5	e5.4	7.5	4.3	5.8	21
5	3.2	8.3	10	8.0	8.3	8.1	e4.3	e5.6	6.4	4.3	6.7	14
6	3.0	8.4	11	8.0	8.5	8.5	e4.6	3.5	7.7	4.0	6.7	12
7	3.4	8.7	9.9	7.4	7.7	8.1	e4.2	2.7	6.6	3.3	9.2	11
8	3.6	8.4	9.1	9.0	6.9	8.7	e4.0	3.4	6.2	5.3	23	9.5
9	3.2	7.9	8.9	8.1	7.6	8.6	e4.3	2.6	5.5	32	9.5	22
10	2.8	8.7	8.4	7.2	7.7	7.7	e4.7	2.8	5.6	7.9	8.1	18
11	2.6	8.3	8.4	7.7	7.0	8.4	e4.3	3.7	5.0	5.6	7.0	16
12	2.6	8.1	10	7.7	10	11	e3.9	3.2	5.6	6.2	9.1	48
13	2.5	7.4	10	7.5	8.4	13	e4.0	2.7	5.6	5.8	7.8	18
14	4.4	7.4	8.4	14	51	14	e4.3	3.1	6.4	4.6	6.4	16
15	64	7.4	8.2	10	12	10	e4.0	2.7	5.7	4.5	6.0	19
16	121	7.3	8.0	8.7	10	7.0	e3.8	2.7	5.2	4.5	18	54
17	83	7.5	7.9	8.2	9.6	5.1	e3.6	9.8	6.3	5.0	8.7	16
18	34	7.8	11	8.5	10	7.5	e4.0	36	5.2	4.5	7.0	13
19	23	7.6	10	8.1	9.9	8.1	e5.4	7.6	5.6	4.5	6.1	12
20	23	8.2	8.8	8.1	9.1	7.3	e5.0	5.4	4.9	4.9	6.1	12
21	26	8.6	8.5	7.7	8.2	5.2	e4.5	5.1	4.9	3.8	7.1	12
22	30	8.4	9.1	7.0	10	5.9	e3.7	4.6	4.5	4.5	7.3	11
23	19	7.5	8.3	7.1	10	6.0	e3.9	4.9	4.4	7.9	6.3	12
24	17	7.5	21	7.2	9.2	8.3	e3.6	6.3	4.6	7.6	6.6	11
25	14	7.3	13	7.1	11	7.5	e3.6	5.4	4.3	4.8	5.4	8.7
26	13	6.7	11	7.0	9.8	4.8	e4.5	27	4.7	5.4	5.6	8.0
27	13	6.9	10	6.7	9.1	4.9	e7.0	6.5	4.4	5.3	5.2	10
28	14	7.0	11	5.9	9.1	4.8	e11	5.5	4.5	11	5.4	8.2
29	11	7.1	9.8	6.1	8.7	4.9	e6.0	12	4.2	7.7	6.5	7.8
30	10	77	9.0	6.3	---	8.8	e5.0	7.7	3.7	6.1	5.9	7.3
31	9.9	---	8.6	6.1	---	6.2	---	7.0	---	8.4	6.2	---
TOTAL	569.0	310.3	338.3	245.2	298.6	243.5	140.6	207.2	167.2	194.6	238.9	482.0
MEAN	18.4	10.3	10.9	7.91	10.3	7.85	4.69	6.68	5.57	6.28	7.71	16.1
MAX	121	77	26	14	51	14	11	36	10	32	23	54
MIN	2.5	6.7	7.9	5.9	6.7	4.8	3.6	2.6	3.7	3.3	5.2	5.5
AC-FT	1130	615	671	486	592	483	279	411	332	386	474	956

e Estimated

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

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1967 - 1992, BY WATER YEAR (WY)

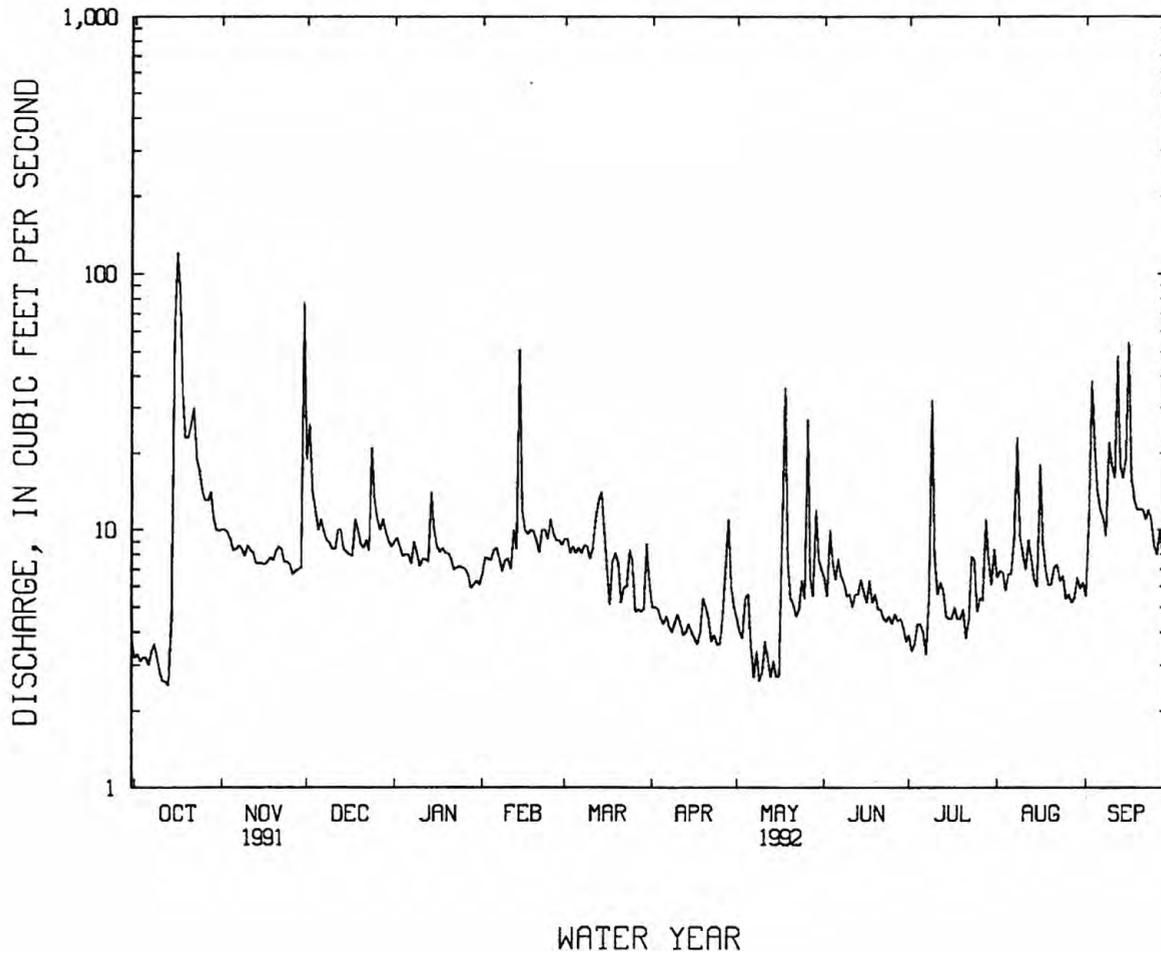
MEAN	10.2	17.8	32.1	26.7	23.3	28.3	18.6	10.3	8.29	6.91	7.88	8.60
MAX	18.4	47.6	78.2	41.1	60.6	72.9	40.3	15.1	12.5	9.90	21.0	16.9
(WY)	1992	1971	1968	1969	1969	1968	1968	1968	1971	1967	1967	1967
MIN	5.91	7.14	10.1	7.91	10.3	6.94	4.69	5.98	4.51	5.55	4.75	4.73
(WY)	1971	1970	1970	1992	1992	1970	1992	1970	1970	1970	1971	1970

SUMMARY STATISTICS

FOR 1992 WATER YEAR

WATER YEARS 1967 - 1992

ANNUAL TOTAL	3435.4			
ANNUAL MEAN	9.39		16.6	
HIGHEST ANNUAL MEAN			26.0	
LOWEST ANNUAL MEAN			8.62	
HIGHEST DAILY MEAN	121	Oct 16	875	Dec 18 1967
LOWEST DAILY MEAN	2.5	Oct 13	2.5	Oct 13 1991
ANNUAL SEVEN-DAY MINIMUM	3.0	Oct 7	3.0	Oct 7 1991
ANNUAL RUNOFF (AC-FT)	6810		12000	
10 PERCENT EXCEEDS	14		30	
50 PERCENT EXCEEDS	7.5		8.7	
90 PERCENT EXCEEDS	3.9		4.3	



16265600 RIGHT BRANCH KAMOOALII STREAM NEAR KANEOHE

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

DRAINAGE AREA.--1.11 mi².

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

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

REMARKS.--Records fair.

AVERAGE DISCHARGE.--9 years (water years 1984-92) 1.54 ft³/s (1,110 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,160 ft³/s, Nov. 10, 1986, gage height, 11.65 ft from rating curve extended above 100 ft³/s on basis of slope-conveyance computation; minimum, 0.03 ft³/s for several days in November, December 1984 and January 1985.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 600 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Sept. 11	2330	*443	*7.08				

Minimum discharge, 0.14 ft³/s, Aug. 27.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1991 TO SEPTEMBER 1992
DAILY MEAN VALUES

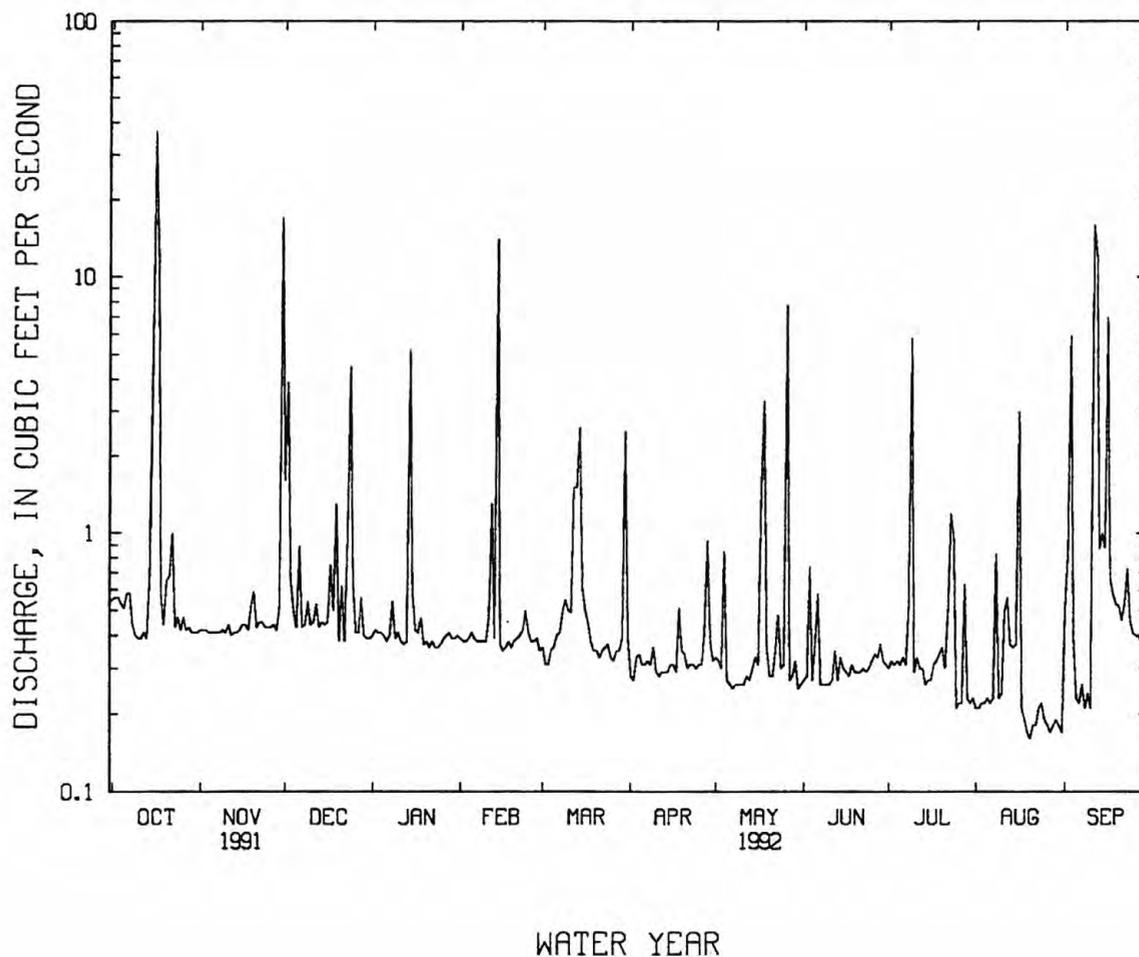
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.55	.42	1.6	.40	.39	.36	.28	.33	.27	.30	.21	.50
2	.56	.42	3.9	.42	.38	.31	.27	.32	.28	.32	.21	.87
3	.56	.42	.66	.41	.38	.31	.33	.30	.74	.31	.22	5.9
4	.53	.41	.50	.41	.39	.35	.34	.85	.27	.32	.22	.39
5	.51	.41	.43	.40	.41	.36	.31	.27	.37	.31	.23	.23
6	.58	.41	.89	.38	.39	.40	.31	.26	.58	.33	.22	.22
7	.58	.41	.43	.40	.38	.41	.32	.25	.26	.31	.23	.26
8	.44	.41	.44	.54	.38	.50	.31	.26	.26	.52	.83	.21
9	.40	.42	.54	.39	.38	.55	.36	.26	.26	5.8	.23	.24
10	.39	.41	.44	.41	.38	.50	.29	.26	.26	.29	.24	.21
11	.39	.44	.45	.38	.48	.49	.28	.26	.27	.33	.50	16
12	.41	.40	.53	.37	1.3	1.5	.29	.28	.35	.30	.56	12
13	.39	.41	.43	.38	.39	1.5	.29	.27	.27	.30	.37	.87
14	.68	.41	.45	5.2	14	2.6	.29	.30	.33	.26	.36	1.0
15	5.1	.42	.44	.59	.37	.61	.31	.33	.30	.27	.37	.88
16	37	.44	.45	.42	.35	.50	.31	.31	.29	.27	3.0	7.0
17	12	.44	.75	.41	.36	.45	.29	1.4	.28	.31	.21	.67
18	.57	.42	.50	.47	.38	.38	.51	3.3	.31	.32	.19	.58
19	.44	.52	1.3	.37	.36	.35	.35	.36	.29	.34	.17	.53
20	.65	.59	.38	.38	.38	.35	.34	.28	.29	.36	.16	.52
21	.68	.43	.62	.36	.39	.33	.30	.28	.29	.30	.18	.46
22	1.0	.45	.38	.38	.40	.35	.31	.35	.30	.51	.18	.53
23	.43	.45	1.0	.36	.42	.36	.31	.48	.29	1.2	.21	.73
24	.47	.43	4.5	.36	.50	.37	.30	.30	.30	.96	.22	.46
25	.42	.43	.65	.37	.41	.33	.31	.31	.32	.21	.19	.41
26	.47	.43	.41	.39	.38	.32	.31	7.8	.34	.22	.18	.40
27	.42	.44	.41	.40	.38	.35	.42	.27	.33	.22	.17	.40
28	.43	.42	.56	.41	.39	.35	.94	.28	.37	.63	.18	.37
29	.41	.52	.40	.39	.35	.39	.38	.32	.32	.23	.19	.37
30	.41	17	.39	.39	---	2.5	.32	.25	.31	.22	.18	.38
31	.41	---	.39	.40	---	.40	---	.26	---	.23	.17	---
TOTAL	68.28	29.63	25.22	17.34	25.85	18.83	10.28	21.35	9.70	16.80	10.78	53.59
MEAN	2.20	.99	.81	.56	.89	.61	.34	.69	.32	.54	.35	1.79
MAX	37	17	4.5	5.2	14	2.6	.94	7.8	.74	5.8	3.0	16
MIN	.39	.40	.38	.36	.35	.31	.27	.25	.26	.21	.16	.21
AC-FT	135	59	50	34	51	37	20	42	19	33	21	106

16265600 RIGHT BRANCH KAMOOALII STREAM NEAR KANEOHE--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1983 - 1992, BY WATER YEAR (WY)

MEAN	1.06	2.33	2.72	1.34	2.19	2.22	2.02	1.00	.88	.78	.60	1.15
MAX	2.21	9.43	15.0	4.05	5.46	8.83	11.9	1.95	2.17	1.92	1.10	4.36
(WY)	1990	1987	1988	1988	1985	1991	1989	1988	1989	1989	1989	1986
MIN	.34	.12	.35	.18	.44	.37	.34	.33	.28	.18	.14	.11
(WY)	1985	1985	1985	1985	1984	1984	1992	1984	1984	1984	1984	1984

SUMMARY STATISTICS FOR 1991 CALENDAR YEAR	FOR 1992 WATER YEAR		WATER YEARS 1983 - 1992	
ANNUAL TOTAL	637.98	307.65		
ANNUAL MEAN	1.75	.84	1.54	
HIGHEST ANNUAL MEAN			2.84	1989
LOWEST ANNUAL MEAN			.33	1984
HIGHEST DAILY MEAN	153	37	177	Dec 31 1987
LOWEST DAILY MEAN	.38	.16	.03	Nov 16 1984
ANNUAL SEVEN-DAY MINIMUM	.41	.18	.04	Nov 15 1984
ANNUAL RUNOFF (AC-FT)	1270	610	1110	
10 PERCENT EXCEEDS	1.4	.77	1.7	
50 PERCENT EXCEEDS	.74	.38	.59	
90 PERCENT EXCEEDS	.43	.25	.29	



16265600 RIGHT BRANCH OF KAMOOALII STREAM NEAR KANEOHE--Continued

WATER-QUALITY RECORDS

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

PERIOD OF DAILY RECORD.--

SUSPENDED SEDIMENT DISCHARGE: February 1983 to current year.

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

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

EXTREMES FOR PERIOD OF RECORD.--

SEDIMENT CONCENTRATIONS: Maximum daily mean, 1,230 mg/L, Apr. 19, 1984; minimum daily mean, less than 1 mg/L, Jan. 24, 1992.

SEDIMENT DISCHARGE: Maximum daily mean, 966 tons, Dec. 31, 1987; minimum daily, less than 0.01 ton on many days.

EXTREMES FOR CURRENT YEAR.--

SEDIMENT CONCENTRATIONS: Maximum daily mean, 73 mg/L (estimated), Oct. 16; minimum daily mean, less than 1 mg/L, Jan. 24.

SEDIMENT DISCHARGE: Maximum daily mean, 16 tons, Oct. 16; minimum daily, less than 0.01 ton on many days.

WATER QUALITY DATA, WATER YEAR OCTOBER 1991 TO SEPTEMBER 1992

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 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)
OCT 1991										
17...	1030	1.2	240	6.8	24.0	6.0	757	5.5	66	K1700
NOV										
26...	1450	0.45	225	6.8	23.5	0.90	755	5.3	63	--
DEC										
18...	1430	0.84	175	6.4	24.0	14	755	5.7	68	3000
JAN 1992										
29...	1330	0.41	220	7.0	23.0	1.0	756	5.4	64	--
FEB										
26...	1320	0.37	230	6.6	22.5	1.1	759	5.4	63	--
APR										
07...	1420	0.32	225	6.5	23.0	1.3	756	4.5	53	--
MAY										
05...	1040	0.41	235	6.6	22.0	1.1	760	5.1	59	1400
JUN										
19...	1030	0.31	215	6.4	23.5	1.4	759	5.0	59	--
JUL										
27...	1110	0.22	230	6.6	23.5	1.2	761	4.5	53	--
AUG										
27...	1300	0.15	220	6.4	24.0	0.90	760	4.0	48	--
SEP										
22...	0915	0.43	220	6.4	23.5	2.1	758	4.3	51	1000

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)	FLUO-RIDE, DIS-SOLVED (MG/L AS F)
FEB												
26...	1320	66	14	7.6	18	37	1	0.90	59	16	24	0.10
SEP												
22...	0915	74	16	8.3	16	31	0.8	1.6	68	16	20	<0.10

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

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

16265600 RIGHT BRANCH OF KAMOOALII STREAM NEAR KANEOHE--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1991 TO SEPTEMBER 1992

DATE	TIME	SILICA, DIS- SOLVED (MG/L AS SI02)	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, AMMONIA TOTAL (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)	PHOS- PHATE, TOTAL (MG/L AS PO4)
OCT 1991												
17...	1030	--	--	--	--	<1	0.300	0.040	<0.20	--	0.050	0.03
DEC												
18...	1430	--	--	--	--	3	0.270	0.040	0.30	0.57	0.070	0.06
FEB												
26...	1320	21	129	137	0.18	1	0.500	0.050	<0.20	--	0.020	--
MAY												
05...	1040	--	--	--	--	<1	0.430	0.030	<0.20	--	<0.010	0.03
SEP												
22...	0915	17	132	136	0.18	4	0.360	0.030	<0.20	--	0.020	0.06

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)	CADIUM 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											
26...	1320	40	<10	--	<100	10	<10	<1	1	2	<3
SEP											
22...	0915	80	<10	<1	<100	10	<10	<1	<1	<1	<3

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											
26...	4	270	120	1	<10	<4	130	120	<0.10	<1	<10
SEP											
22...	2	640	89	<1	<10	<4	120	70	<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											
26...	3	1	<1	<1	<1	<1.0	84	<6	<10	0.8	<1
SEP											
22...	1	<1	<1	<1	<1	<1.0	100	<6	<10	2.5	<1

DATE	ALDRIN, TOTAL (UG/L)	CHLOR- DANE, TOTAL (UG/L)	CHLOR- DYRIFOS 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											
26...	<0.010	<0.1	<0.01	<0.010	<0.010	<0.010	<0.01	<0.01	<0.010	<0.01	<0.01
SEP											
22...	<0.010	<0.1	<0.01	<0.010	<0.010	<0.010	<0.01	<0.01	<0.010	<0.01	<0.01

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

16265600 RIGHT BRANCH OF KAMOOCALII STREAM NEAR KANEOHE--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1991 TO SEPTEMBER 1992

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 26...	<0.01	<0.010	<0.010	<0.01	<0.01	<0.010	<0.010	<0.010	<0.01	<0.01	<0.01
SEP 22...	<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 26...	<0.01	<0.10	<0.01	<0.1	<0.1	<0.01	<0.01	<1	<0.01	<0.01
SEP 22...	<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.

16265600 RIGHT BRANCH OF KAMOQALII STREAM NR KANEOHE--Continued

SEDIMENT DISCHARGE, SUSPENDED (TONS/DAY), WATER YEAR OCTOBER 1991 TO SEPTEMBER 1992

DAY	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)
	OCTOBER			NOVEMBER			DECEMBER		
1	.55	2	<.01	.42	3	<.01	1.6	e3	.03
2	.56	3	<.01	.42	3	<.01	3.9	10	.36
3	.56	2	<.01	.42	2	<.01	.66	3	<.01
4	.53	4	<.01	.41	3	<.01	.50	2	<.01
5	.51	3	<.01	.41	3	<.01	.43	2	<.01
6	.58	4	.01	.41	2	<.01	.89	e3	.02
7	.58	4	.01	.41	3	<.01	.43	1	<.01
8	.44	7	.01	.41	2	<.01	.44	1	<.01
9	.40	3	<.01	.42	3	<.01	.54	e4	.01
10	.39	3	<.01	.41	2	<.01	.44	2	<.01
11	.39	3	<.01	.44	2	<.01	.45	2	<.01
12	.41	3	<.01	.40	3	<.01	.53	e2	<.01
13	.39	3	<.01	.41	2	<.01	.43	3	<.01
14	.68	e3	.01	.41	2	<.01	.45	5	.01
15	5.1	e20	1.1	.42	1	<.01	.44	1	<.01
16	37	e73	16	.44	1	<.01	.45	2	<.01
17	12	e20	1.6	.44	1	<.01	.75	e3	.01
18	.57	4	.01	.42	1	<.01	.50	3	<.01
19	.44	3	<.01	.52	e1	<.01	1.3	10	.10
20	.65	e4	.01	.59	1	<.01	.38	2	<.01
21	.68	e4	.01	.43	1	<.01	.62	e3	.01
22	1.0	6	.02	.45	1	<.01	.38	2	<.01
23	.43	2	<.01	.45	2	<.01	1.0	e3	.06
24	.47	3	<.01	.43	2	<.01	4.5	33	.79
25	.42	2	<.01	.43	1	<.01	.65	e4	.01
26	.47	3	<.01	.43	1	<.01	.41	2	<.01
27	.42	2	<.01	.44	2	<.01	.41	2	<.01
28	.43	3	<.01	.42	2	<.01	.56	e2	<.01
29	.41	3	<.01	.52	e2	<.01	.40	2	<.01
30	.41	4	<.01	17	e35	9.2	.39	1	<.01
31	.41	2	<.01	---	---	---	.39	1	<.01
TOTAL	68.28	---	18.99	29.63	---	9.49	25.22	---	1.61
		JANUARY		FEBRUARY		MARCH			
1	.40	2	<.01	.39	3	<.01	.36	5	<.01
2	.42	2	<.01	.38	4	<.01	.31	4	<.01
3	.41	2	<.01	.38	3	<.01	.31	3	<.01
4	.41	1	<.01	.39	3	<.01	.35	2	<.01
5	.40	1	<.01	.41	4	<.01	.36	2	<.01
6	.38	1	<.01	.39	3	<.01	.40	2	<.01
7	.40	2	<.01	.38	3	<.01	.41	3	<.01
8	.54	e2	<.01	.38	4	<.01	.50	2	<.01
9	.39	2	<.01	.38	3	<.01	.55	2	<.01
10	.41	2	<.01	.38	3	<.01	.50	2	<.01
11	.38	1	<.01	.48	e3	<.01	.49	2	<.01
12	.37	2	<.01	1.3	e6	.03	1.5	e7	.06
13	.38	1	<.01	.39	3	<.01	1.5	e6	.04
14	5.2	e12	1.1	14	e48	10	2.6	10	.17
15	.59	e2	.01	.37	3	<.01	.61	5	.01
16	.42	1	<.01	.35	3	<.01	.50	6	.01
17	.41	1	<.01	.36	7	.01	.45	3	<.01
18	.47	e2	<.01	.38	3	<.01	.38	3	<.01
19	.37	1	<.01	.36	2	<.01	.35	4	<.01
20	.38	1	<.01	.38	3	<.01	.35	7	.01
21	.36	1	<.01	.39	5	<.01	.33	3	<.01
22	.38	2	<.01	.40	3	<.01	.35	2	<.01
23	.36	1	<.01	.42	3	<.01	.36	2	<.01
24	.36	<1	<.01	.50	e4	.01	.37	4	<.01
25	.37	1	<.01	.41	4	<.01	.33	3	<.01
26	.39	1	<.01	.38	4	<.01	.32	3	<.01
27	.40	1	<.01	.38	3	<.01	.35	4	<.01
28	.41	2	<.01	.39	2	<.01	.35	3	<.01
29	.39	2	<.01	.35	6	.01	.39	4	<.01
30	.39	1	<.01	---	---	---	2.5	e10	.23
31	.40	3	<.01	---	---	---	.40	4	<.01
TOTAL	17.34	---	1.40	25.85	---	10.30	18.83	---	0.77

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

16265600 RIGHT BRANCH OF KAMOOLII STREAM NR KANEOHE--Continued

SEDIMENT DISCHARGE, SUSPENDED (TONS/DAY), WATER YEAR OCTOBER 1991 TO SEPTEMBER 1992

DAY	MEAN DISCHARGE (CFS)	MEAN CONCEN- TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN- TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN- TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)
1	.28	1	<.01	.33	3	<.01	.27	2	<.01
2	.27	2	<.01	.32	3	<.01	.28	2	<.01
3	.33	2	<.01	.30	2	<.01	.74	e3	.01
4	.34	3	<.01	.85	e8	.04	.27	2	<.01
5	.31	3	<.01	.27	4	<.01	.37	2	<.01
6	.31	3	<.01	.26	3	<.01	.58	4	.01
7	.32	2	<.01	.25	3	<.01	.26	2	<.01
8	.31	2	<.01	.26	2	<.01	.26	3	<.01
9	.36	4	<.01	.26	4	<.01	.26	2	<.01
10	.29	3	<.01	.26	3	<.01	.26	1	<.01
11	.28	2	<.01	.26	2	<.01	.27	3	<.01
12	.29	3	<.01	.28	3	<.01	.35	4	<.01
13	.29	5	<.01	.27	2	<.01	.27	4	<.01
14	.29	2	<.01	.30	2	<.01	.33	4	<.01
15	.31	1	<.01	.33	3	<.01	.30	4	<.01
16	.31	11	.01	.31	4	<.01	.29	2	<.01
17	.29	2	<.01	1.4	e18	.13	.28	3	<.01
18	.51	e5	.02	3.3	12	.35	.31	4	<.01
19	.35	3	<.01	.36	e4	<.01	.29	7	.01
20	.34	e2	<.01	.28	4	<.01	.29	3	<.01
21	.30	1	<.01	.28	1	<.01	.29	2	<.01
22	.31	2	<.01	.35	2	<.01	.30	2	<.01
23	.31	1	<.01	.48	e4	.01	.29	3	<.01
24	.30	2	<.01	.30	4	<.01	.30	1	<.01
25	.31	2	<.01	.31	3	<.01	.32	2	<.01
26	.31	1	<.01	7.8	e49	4.4	.34	3	<.01
27	.42	e4	.01	.27	3	<.01	.33	2	<.01
28	.94	e10	.08	.28	2	<.01	.37	3	<.01
29	.38	e4	<.01	.32	e4	<.01	.32	2	<.01
30	.32	3	<.01	.25	7	<.01	.31	6	<.01
31	---	---	---	.26	6	<.01	---	---	---
TOTAL	10.28	---	0.38	21.35	---	5.19	9.70	---	0.30
		JULY			AUGUST			SEPTEMBER	
1	.30	2	<.01	.21	3	<.01	.50	e4	<.01
2	.32	3	<.01	.21	3	<.01	.87	e5	.05
3	.31	2	<.01	.22	3	<.01	5.9	e18	.73
4	.32	2	<.01	.22	2	<.01	.39	5	.01
5	.31	3	<.01	.23	3	<.01	.23	2	<.01
6	.33	2	<.01	.22	3	<.01	.22	4	<.01
7	.31	2	<.01	.23	4	<.01	.26	2	<.01
8	.52	5	.01	.83	e6	.05	.21	2	<.01
9	5.8	e16	1.3	.23	6	<.01	.24	1	<.01
10	.29	2	<.01	.24	4	<.01	.21	2	<.01
11	.33	e2	<.01	.50	e5	.01	16	e8	8.7
12	.30	3	<.01	.56	e5	.01	12	14	4.0
13	.30	2	<.01	.37	3	<.01	.87	3	.01
14	.26	2	<.01	.36	4	<.01	1.0	e6	.03
15	.27	2	<.01	.37	14	.01	.88	2	<.01
16	.27	3	<.01	3.0	19	.34	7.0	e10	.29
17	.31	3	<.01	.21	4	<.01	.67	2	<.01
18	.32	4	<.01	.19	2	<.01	.58	1	<.01
19	.34	3	<.01	.17	2	<.01	.53	1	<.01
20	.36	3	<.01	.16	2	<.01	.52	3	<.01
21	.30	4	<.01	.18	3	<.01	.46	e3	<.01
22	.51	e6	.01	.18	2	<.01	.53	e2	<.01
23	1.2	e5	.03	.21	2	<.01	.73	5	.01
24	.96	7	.03	.22	3	<.01	.46	e4	<.01
25	.21	3	<.01	.19	3	<.01	.41	1	<.01
26	.22	3	<.01	.18	2	<.01	.40	1	<.01
27	.22	2	<.01	.17	1	<.01	.40	1	<.01
28	.63	e3	.01	.18	2	<.01	.37	1	<.01
29	.23	2	<.01	.19	2	<.01	.37	3	<.01
30	.22	3	<.01	.18	3	<.01	.38	3	<.01
31	.23	3	<.01	.17	53	.02	---	---	---
TOTAL	16.80	---	1.64	10.78	---	0.69	53.59	---	14.04
YEAR	307.65		64.80						

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

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16270900 LULUKU STREAM AT ALTITUDE 220 FT, NEAR KANEHOHE

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 mi².

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.--12 years (water years 1968-71, 1985-92), 1.40 ft³/s (1,010 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 651 ft³/s, Nov. 26, 1970 (gage height, 6.18 ft for datum and site then in use), from rating curve extended above 10 ft³/s on basis of slope-area measurement at gage height 6.09 ft; minimum, 0.03 ft³/s on many days 1984-85.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 180 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Sept. 11	2300	*231	*2.06	No other peaks greater than base discharge.			

Minimum discharge, 0.38 ft³/s, July 18, Aug. 8, 23, 24, Sept. 11.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1991 TO SEPTEMBER 1992
DAILY MEAN VALUES

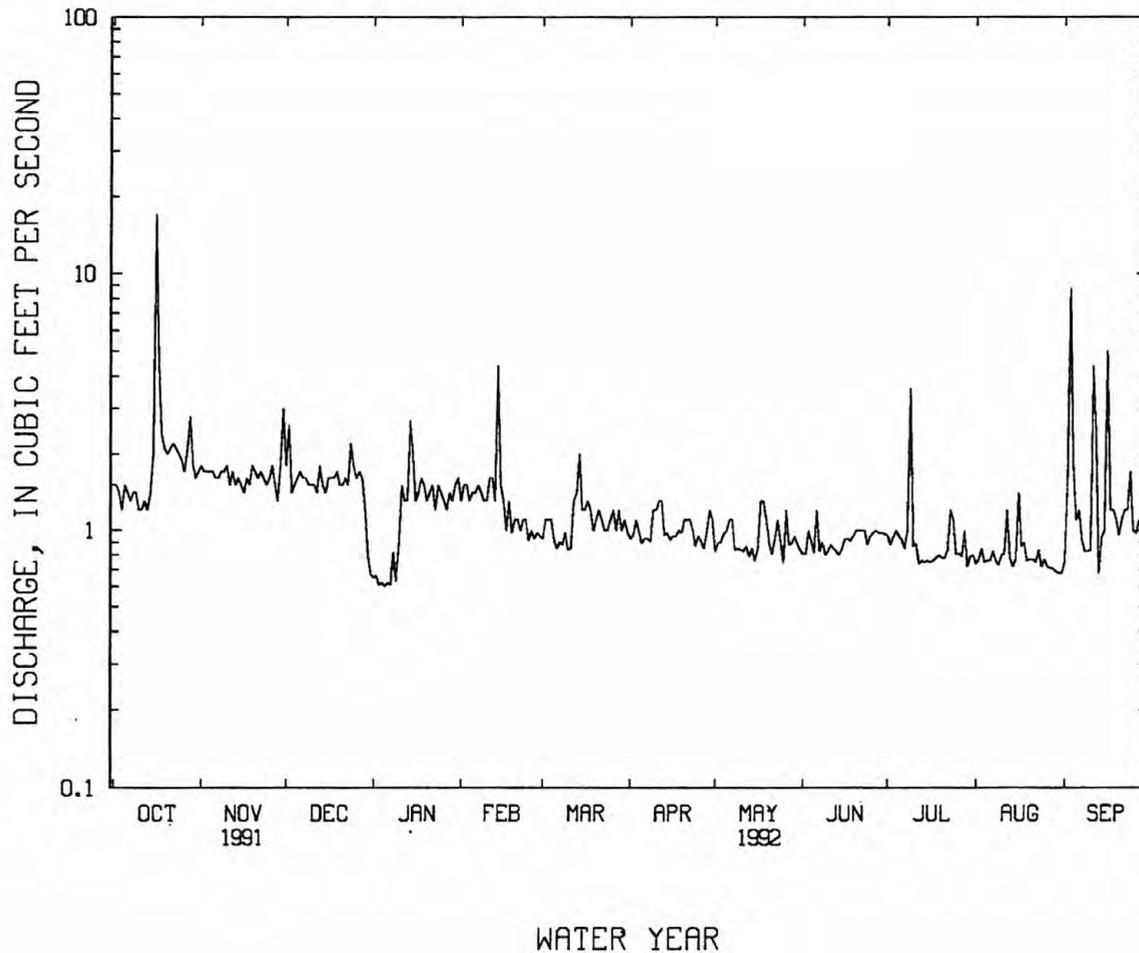
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.5	1.8	1.8	.65	1.3	.93	.93	.83	.81	.96	.74	.75
2	1.5	1.7	2.6	.66	1.5	1.1	.96	.89	.81	.88	.77	1.6
3	1.4	1.7	1.4	.61	1.5	1.1	1.1	.90	1.0	.94	.85	8.7
4	1.2	1.7	1.5	.62	1.3	1.1	1.0	.97	.91	1.0	.75	1.8
5	1.5	1.7	1.6	.60	1.4	.92	.89	1.0	.82	.95	.76	1.1
6	1.4	1.6	1.7	.62	1.4	.85	.93	1.1	1.2	.92	.76	1.2
7	1.3	1.6	1.6	.61	1.5	.90	.93	1.1	.83	.85	.83	.92
8	1.4	1.7	1.6	.82	1.4	.88	.91	.84	.90	1.0	.76	.83
9	1.4	1.7	1.5	.63	1.3	.98	1.2	.85	.80	3.6	.73	.83
10	1.2	1.8	1.5	.89	1.3	.84	1.2	.84	.83	.87	.80	.84
11	1.2	1.5	1.5	1.5	1.6	.85	1.3	.83	.88	.89	.81	4.4
12	1.3	1.7	1.4	1.3	1.6	1.3	1.3	.87	.85	.74	1.2	2.5
13	1.2	1.5	1.8	1.3	1.3	1.4	.96	.79	.83	.76	.78	.68
14	1.4	1.6	1.5	2.7	4.4	2.0	.98	.85	.80	.75	.72	.94
15	2.0	1.5	1.4	2.0	1.5	1.2	.92	.76	.85	.76	.77	1.0
16	17	1.4	1.6	1.3	1.3	1.2	.95	.85	.92	.75	1.4	5.0
17	4.8	1.6	1.6	1.4	1.0	1.3	.95	1.3	.93	.76	.87	1.2
18	2.4	1.5	1.6	1.6	1.3	1.2	1.0	1.3	.91	.78	.90	1.2
19	2.1	1.8	1.7	1.5	.98	1.0	.98	1.1	.95	.80	.76	1.1
20	2.0	1.7	1.5	1.3	1.1	1.1	1.1	.89	1.0	.78	.77	.96
21	2.1	1.6	1.5	1.4	1.1	1.2	1.1	.81	1.0	.78	.77	1.1
22	2.2	1.7	1.6	1.5	1.0	1.1	1.1	.93	1.0	.84	.75	1.2
23	2.1	1.6	1.5	1.2	1.1	1.0	1.0	1.1	1.0	1.2	.84	1.2
24	2.0	1.5	2.2	1.5	1.1	1.0	.87	.91	.88	1.1	.72	1.7
25	1.9	1.6	1.8	1.4	.91	1.1	.95	.75	.95	.81	.77	1.0
26	1.7	1.8	1.6	1.3	1.0	1.2	.91	1.2	.98	.81	.72	.98
27	2.1	1.5	1.7	1.2	.93	1.0	.85	.88	1.0	.79	.71	1.1
28	2.8	1.3	1.6	1.4	.98	1.2	.99	.89	.98	1.0	.71	1.0
29	1.8	1.8	1.2	1.3	.95	1.0	1.2	.95	.98	.72	.69	1.0
30	1.6	3.0	.79	1.5	---	1.1	1.1	.89	.97	.79	.68	.99
31	1.7	---	.67	1.6	---	.99	---	.84	---	.80	.68	---
TOTAL	71.2	50.2	48.56	37.91	39.05	34.04	30.56	29.01	27.57	29.38	24.77	48.82
MEAN	2.30	1.67	1.57	1.22	1.35	1.10	1.02	.94	.92	.95	.80	1.63
MAX	17	3.0	2.6	2.7	4.4	2.0	1.3	1.3	1.2	3.6	1.4	8.7
MIN	1.2	1.3	.67	.60	.91	.84	.85	.75	.80	.72	.68	.68
AC-FT	141	100	96	75	77	68	61	58	55	58	49	97

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

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1967 - 1992, BY WATER YEAR (WY)

MEAN	1.01	1.58	1.86	1.60	1.60	1.76	1.63	1.21	1.01	1.08	1.01	1.02
MAX	2.30	3.57	4.10	3.02	4.92	3.78	3.67	2.07	1.89	1.91	2.39	1.65
(WY)	1992	1971	1988	1969	1969	1968	1989	1969	1971	1971	1991	1971
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 1991 CALENDAR YEAR	FOR 1992 WATER YEAR	WATER YEARS 1967 - 1992
ANNUAL TOTAL	707.76	471.07
ANNUAL MEAN	1.94	1.29
HIGHEST ANNUAL MEAN		1.40
LOWEST ANNUAL MEAN		2.13
HIGHEST DAILY MEAN	27 Mar 19	17 Oct 16
LOWEST DAILY MEAN	.61 Feb 10	.60 Jan 5
ANNUAL SEVEN-DAY MINIMUM	.90 Feb 5	.62 Jan 1
ANNUAL RUNOFF (AC-FT)	1400	934
10 PERCENT EXCEEDS	2.4	1.7
50 PERCENT EXCEEDS	1.6	1.1
90 PERCENT EXCEEDS	1.3	.77



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

WATER-QUALITY RECORDS

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

PERIOD OF DAILY RECORD.--

SUSPENDED SEDIMENT DISCHARGE: April 1984 to current year.

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

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

EXTREMES FOR PERIOD OF RECORD.--

SEDIMENT CONCENTRATIONS: Maximum daily mean, 660 mg/L, July 22, 1987; minimum daily mean, 1 mg/L, Apr. 2, 4, 5, 1991.

SEDIMENT DISCHARGE: Maximum daily, 342 tons, Dec. 31, 1987; minimum daily, less than 0.01 ton on many days each year.

EXTREMES FOR CURRENT YEAR.--

SEDIMENT CONCENTRATIONS: Maximum daily mean, 162 mg/L, Oct. 16; minimum daily mean, 3 mg/L, Feb. 23, Apr. 5, 6.

SEDIMENT DISCHARGE: Maximum daily, 9.8 tons, Oct. 16; minimum daily, 0.01 ton on several days.

WATER QUALITY DATA, WATER YEAR OCTOBER 1991 TO SEPTEMBER 1992

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 WATER (DEG C)	TUR- BID- ITY (NTU)	BARO- METRIC PRES- SURE (MM OF HG)	OXYGEN, DIS- SOLVED (MG/L)	OXYGEN, DIS- SOLVED SATUR- ATION	COLI- FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)
OCT 1991										
17...	1330	20	175	7.4	22.0	6.8	755	7.5	87	9000
NOV										
26...	1015	1.7	140	7.5	20.5	0.80	757	8.2	92	--
DEC										
17...	1415	1.7	160	7.4	21.0	1.0	756	8.6	97	E200
JAN 1992										
28...	1105	1.3	180	7.5	20.0	0.90	758	8.6	95	--
FEB										
24...	1100	1.0	155	7.3	20.0	0.90	756	7.8	87	9800
APR										
06...	1000	1.1	165	7.9	26.0	0.40	758	8.4	104	--
MAY										
06...	1135	0.96	154	7.9	20.0	0.70	--	9.5	--	K4400
JUN										
19...	1400	0.95	151	7.6	22.5	0.60	757	7.9	92	--
JUL										
28...	0930	0.98	150	7.5	20.5	0.20	760	8.2	91	--
AUG										
25...	1420	0.74	150	7.0	21.5	3.5	758	8.3	95	--
SEP										
21...	1130	0.92	160	7.4	22.0	1.0	759	8.1	93	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)	FLUO- RIDE, DIS- SOLVED (MG/L AS F)
FEB												
24...	1100	45	9.3	5.3	13	38	0.8	0.90	49	5.0	19	<0.10
SEP												
21...	1130	46	9.3	5.5	13	37	0.8	1.3	50	3.6	18	<0.10

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

E Estimated.

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

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

WATER QUALITY DATA, WATER YEAR OCTOBER 1991 TO SEPTEMBER 1992

DATE	TIME	SILICA, DIS- SOLVED (MG/L AS SIO2)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L)	SOLIDS, SUM OF CONSTITUENTS, DIS- SOLVED (MG/L)	SOLIDS, DIS- SOLVED (TONS PER AC-FT)	RESIDUE TOTAL AT 105 DEG. C, SUS- PENDE (MG/L)	NITRO- GEN, NO2+NO3 TOTAL (MG/L AS N)	NITRO- GEN, AMMONIA TOTAL (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)	PHOS- PHATE, TOTAL (MG/L AS PO4)
OCT 1991												
17...	1330	--	--	--	--	<1	0.260	0.020	0.30	0.56	0.040	0.09
DEC												
17...	1415	--	--	--	--	1	0.150	<0.010	<0.20	--	0.030	0.06
FEB												
24...	1100	28	107	110	0.15	1	0.140	<0.010	<0.20	--	0.060	0.09
MAY												
06...	1135	--	--	--	--	<1	0.098	<0.010	<0.20	--	<0.010	0.09
SEP												
21...	1130	27	105	108	0.14	2	0.082	<0.010	<0.20	--	0.020	0.06

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											
24...	1100	80	40	--	<100	<2	<10	<1	2	2	<3
SEP											
21...	1130	70	20	<1	<100	<2	<10	<1	<1	<1	<3

DATE	TIME	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...		3	110	60	<1	<10	<4	10	9	<0.10	<1	<10
SEP												
21...		<1	190	31	<1	<10	<4	20	6	<0.10	<1	<10

DATE	TIME	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	52	8	<10	1.3	<1
SEP												
21...		<1	<1	<1	<1	<1	<1.0	54	<6	10	0.9	<1

DATE	TIME	ALDRIN, TOTAL (UG/L)	CHLOR- DANE, TOTAL (UG/L)	CHLOR- DYRIFOS 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
SEP												
21...		<0.010	<0.1	<0.01	<0.010	<0.010	<0.010	<0.01	<0.01	<0.010	<0.01	<0.01

< 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 1991 TO SEPTEMBER 1992

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	<0.010	<0.01	<0.01	<0.01
SEP 21...	<0.01	<0.010	<0.010	<0.01	<0.01	<0.010	<0.010	<0.010	<0.010	<0.01	<0.01	<0.01

DATE	METH- OXY- CHLOR, TOTAL (UG/L)	METHYL PARA- THION, TOTAL (UG/L)	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	<0.01	<0.01	<0.10	<0.01	<0.1	<0.1	<0.01	<0.01	<1	<0.01	<0.01
SEP 21...	<0.01	<0.01	<0.01	<0.10	<0.01	<0.1	<0.1	<0.01	<0.01	<1	<0.01	<0.01

PARTICLE-SIZE DISTRIBUTION OF SUSPENDED SEDIMENT, WATER YEAR OCTOBER 1991 TO SEPTEMBER 1992

DATE	TIME	SEDI- MENT, SUS- PENDE (MG/L)	SEDI- MENT, DIS- CHARGE, SUS- PENDE (T/DAY)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM	DATE	TIME	SEDI- MENT, SUS- PENDE (MG/L)	SEDI- MENT, DIS- CHARGE, SUS- PENDE (T/DAY)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM
OCT 16-16	1430	197	25	76	DEC 02-02	0845	215	3.7	98

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

16270900 LULUKU STREAM AT ALTITUDE 220 FT NR KANEOHE--Continued

SEDIMENT DISCHARGE, SUSPENDED (TONS/DAY), WATER YEAR OCTOBER 1991 TO SEPTEMBER 1992

DAY	MEAN DISCHARGE (CFS)	MEAN CONCEN- TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN- TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN- TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)
1	1.5	e13	.05	1.8	e39	.19	1.8	e48	.26
2	1.5	e14	.05	1.7	e37	.17	2.6	e107	1.3
3	1.4	e15	.06	1.7	e36	.16	1.4	e26	.10
4	1.2	e17	.05	1.7	e35	.16	1.5	e25	.10
5	1.5	e18	.07	1.7	e33	.16	1.6	e25	.11
6	1.4	e20	.08	1.6	e32	.14	1.7	e43	.22
7	1.3	e22	.08	1.6	e31	.13	1.6	e20	.09
8	1.4	e24	.09	1.7	e30	.14	1.6	e17	.08
9	1.4	e26	.10	1.7	e30	.13	1.5	e15	.06
10	1.2	e25	.09	1.8	e29	.14	1.5	e16	.06
11	1.2	e23	.08	1.5	e29	.12	1.5	e17	.07
12	1.3	e22	.08	1.7	e28	.13	1.4	e18	.07
13	1.2	e21	.07	1.5	e28	.11	1.8	e31	.17
14	1.4	e35	.14	1.6	e28	.12	1.5	e21	.08
15	2.0	130	.91	1.5	e27	.11	1.4	e15	.06
16	17	162	9.8	1.4	e27	.10	1.6	e9	.04
17	4.8	45	.77	1.6	e31	.13	1.6	e17	.09
18	2.4	7	.04	1.5	e35	.14	1.6	e24	.10
19	2.1	e12	.06	1.8	e46	.23	1.7	e33	.19
20	2.0	e14	.08	1.7	e27	.13	1.5	e18	.07
21	2.1	e24	.14	1.6	e32	.13	1.5	e24	.10
22	2.2	e29	.17	1.7	e36	.16	1.6	e24	.11
23	2.1	e29	.16	1.6	e38	.17	1.5	e27	.13
24	2.0	e31	.17	1.5	e35	.14	2.2	e46	.41
25	1.9	e26	.13	1.6	e24	.11	1.8	e45	.23
26	1.7	e41	.21	1.8	17	.08	1.6	e21	.10
27	2.1	e58	.34	1.5	e19	.08	1.7	e18	.08
28	2.8	80	1.4	1.3	e23	.08	1.6	e17	.07
29	1.8	e32	.16	1.8	e64	2.0	1.2	e16	.05
30	1.6	e36	.16	3.0	267	3.7	.79	e15	.03
31	1.7	e39	.18	---	---	---	.67	e14	.03
TOTAL	71.2	---	15.97	50.2	---	9.49	48.56	---	4.66
		JANUARY		FEBRUARY		MARCH			
1	.65	e13	.02	1.3	e10	.03	.93	e14	.04
2	.66	e13	.02	1.5	e9	.04	1.1	e12	.04
3	.61	e12	.02	1.5	e8	.04	1.1	e10	.03
4	.62	e11	.02	1.3	e8	.03	1.1	e8	.03
5	.60	e10	.02	1.4	e7	.03	.92	e7	.02
6	.62	e10	.02	1.4	8	.03	.85	e6	.02
7	.61	e10	.02	1.5	e8	.03	.90	e7	.02
8	.82	e16	.04	1.4	e8	.03	.88	e7	.02
9	.63	e15	.02	1.3	e9	.03	.98	e8	.02
10	.89	e12	.03	1.3	e10	.04	.84	e8	.02
11	1.5	e28	.11	1.6	e15	.06	.85	e9	.02
12	1.3	e29	.10	1.6	e21	.09	1.3	e38	.15
13	1.3	e29	.10	1.3	e16	.05	1.4	e11	.03
14	2.7	109	2.6	4.4	141	5.4	2.0	e56	.34
15	2.0	e50	.36	1.5	e25	.11	1.2	e19	.06
16	1.3	e19	.06	1.3	e21	.08	1.2	e13	.05
17	1.4	e19	.07	1.0	e17	.05	1.3	e13	.05
18	1.6	e23	.10	1.3	e14	.05	1.2	e12	.04
19	1.5	e24	.10	.98	e12	.03	1.0	e12	.03
20	1.3	e21	.07	1.1	e19	.06	1.1	e12	.04
21	1.4	e18	.06	1.1	e9	.03	1.2	e11	.04
22	1.5	e15	.06	1.0	e5	.02	1.1	e10	.03
23	1.2	e13	.04	1.1	e3	.01	1.0	e10	.03
24	1.5	e11	.04	1.1	e11	.03	1.0	e9	.03
25	1.4	e9	.03	.91	e16	.04	1.1	e8	.03
26	1.3	e8	.03	1.0	e11	.03	1.2	e8	.02
27	1.2	e7	.02	.93	e9	.02	1.0	e7	.02
28	1.4	8	.03	.98	e7	.02	1.2	e7	.02
29	1.3	e9	.03	.95	e9	.02	1.0	e6	.02
30	1.5	e22	.10	---	---	---	1.1	e6	.02
31	1.6	e10	.05	---	---	---	.99	e5	.02
TOTAL	37.91	---	4.39	39.05	---	6.53	34.04	---	1.35

e Estimated

16270900 LULUKU STREAM AT ALTITUDE 220 FT NR KANEOHE--Continued

SEDIMENT DISCHARGE, SUSPENDED (TONS/DAY), WATER YEAR OCTOBER 1991 TO SEPTEMBER 1992

DAY	MEAN DISCHARGE (CFS)	MEAN CONCEN- TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN- TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN- TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)
1	.93	e5	.01	.83	e16	.04	.81	e12	.03
2	.96	e4	.01	.89	e17	.05	.81	e13	.03
3	1.1	e4	.01	.90	e19	.05	1.0	e44	.15
4	1.0	e4	.01	.97	e21	.06	.91	36	.10
5	.89	e3	.01	1.0	e23	.07	.82	e24	.06
6	.93	3	.01	1.1	e22	.07	1.2	e62	.26
7	.93	e4	.01	1.1	e19	.06	.83	e28	.07
8	.91	e5	.01	.84	e16	.04	.90	e27	.07
9	1.2	e11	.04	.85	e13	.03	.80	e26	.06
10	1.2	e18	.07	.84	e11	.03	.83	e26	.06
11	1.3	e12	.04	.83	e10	.02	.88	e25	.06
12	1.3	e13	.05	.87	e20	.05	.85	e25	.06
13	.96	e14	.04	.79	e11	.03	.83	e25	.06
14	.98	e15	.04	.85	e9	.02	.80	e28	.07
15	.92	e16	.04	.76	e11	.02	.85	e33	.08
16	.95	e17	.05	.85	e13	.03	.92	e39	.11
17	.95	e18	.05	1.3	e47	.25	.93	e46	.12
18	1.0	e19	.06	1.3	e30	.12	.91	e54	.14
19	.98	e19	.05	1.1	e31	.10	.95	61	.16
20	1.1	e17	.05	.89	e14	.04	1.0	e57	.15
21	1.1	e15	.05	.81	e10	.02	1.0	e49	.13
22	1.1	e14	.04	.93	e11	.03	1.0	e43	.11
23	1.0	e13	.04	1.1	e18	.06	1.0	e37	.10
24	.87	e12	.03	.91	e12	.03	.88	e32	.08
25	.95	e11	.03	.75	e11	.02	.95	e29	.07
26	.91	e10	.03	1.2	e39	.16	.98	e29	.08
27	.85	e15	.04	.88	e18	.05	1.0	e29	.08
28	.99	e32	.09	.89	e17	.04	.98	e30	.08
29	1.2	e28	.10	.95	e27	.07	.98	e30	.08
30	1.1	e18	.06	.89	e19	.05	.97	e30	.08
31	---	---	---	.84	e13	.03	---	---	---
TOTAL	30.56	---	1.17	29.01	---	1.74	27.57	---	2.79
		JULY			AUGUST			SEPTEMBER	
1	.96	e27	.07	.74	e21	.04	.75	e13	.03
2	.88	e24	.06	.77	e24	.05	1.6	e40	.30
3	.94	e21	.05	.85	e26	.06	8.7	117	7.1
4	1.0	e18	.05	.75	e25	.05	1.8	22	.11
5	.95	e16	.04	.76	e24	.05	1.1	e18	.05
6	.92	e14	.03	.76	e23	.05	1.2	e16	.05
7	.85	e20	.05	.83	e23	.05	.92	e16	.04
8	1.0	e32	.10	.76	e27	.08	.83	e16	.04
9	3.6	87	2.9	.73	e13	.02	.83	e16	.04
10	.87	e33	.09	.80	e12	.03	.84	e16	.04
11	.89	e31	.09	.81	e12	.03	4.4	e40	2.5
12	.74	e28	.06	1.2	e44	.20	2.5	55	1.0
13	.76	e26	.05	.78	e15	.03	.68	e15	.03
14	.75	e24	.05	.72	e15	.03	.94	e8	.02
15	.76	e22	.05	.77	e14	.03	1.0	e11	.03
16	.75	e21	.04	1.4	e37	.22	5.0	e66	2.4
17	.76	e19	.04	.87	e11	.02	1.2	e16	.05
18	.78	e21	.04	.90	e11	.03	1.2	e12	.04
19	.80	e22	.05	.76	e12	.02	1.1	e11	.03
20	.78	e24	.05	.77	e13	.03	.96	e12	.03
21	.78	e26	.05	.77	e15	.03	1.1	e14	.04
22	.84	e28	.06	.75	e16	.03	1.2	e28	.10
23	1.2	e48	.44	.84	e17	.04	1.2	146	.46
24	1.1	e63	.30	.72	e19	.04	1.7	e66	.65
25	.81	e20	.05	.77	16	.03	1.0	e26	.07
26	.81	e21	.05	.72	e9	.02	.98	e24	.06
27	.79	e21	.05	.71	7	.01	1.1	e23	.07
28	1.0	91	.27	.71	e8	.02	1.0	e21	.06
29	.72	e15	.03	.69	e8	.02	1.0	e20	.05
30	.79	e17	.03	.68	e9	.02	.99	e19	.05
31	.80	e19	.04	.68	e10	.02	---	---	---
TOTAL	29.38	---	5.33	24.77	---	1.40	48.82	---	15.54
YEAR	471.07		70.36						

e Estimated

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16272200 KAMOOLII 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 mi².

WATER-DISCHARGE RECORDS

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

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

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

AVERAGE DISCHARGE.--15 years, 11.4 ft³/s (8,260 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,650 ft³/s, Dec. 31, 1987, gage height, 5.72 ft, from rating curve extended above 200 ft³/s; minimum, 0.25 ft³/s, on several days in October 1984.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 700 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Sep. 12	0030	*284	*3.17				

Minimum discharge, 1.7 ft³/s, Oct. 3, 4.

REVISIONS.--The maximum discharge for water year 1991 has been revised to 970 ft³/s, Mar. 19, 1991, gage height, 4.70 ft.

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	6.9	9.4	16	7.5	6.8	6.0	5.8	5.1	5.2	4.4	5.0	4.6
2	7.6	9.2	23	7.9	6.7	6.4	5.8	5.2	5.1	4.5	4.8	9.5
3	8.3	9.1	11	7.3	6.7	6.3	5.8	5.3	7.1	4.5	5.1	44
4	4.2	9.0	9.6	7.1	6.7	6.1	5.7	7.2	7.0	4.5	4.6	13
5	6.3	8.9	8.9	7.2	6.7	5.9	5.6	6.4	5.2	4.2	4.7	8.2
6	6.2	e8.7	11	7.0	7.0	5.8	5.6	5.4	7.9	4.2	4.6	7.2
7	6.2	e8.3	9.1	6.7	6.7	5.8	5.6	5.3	5.5	4.2	5.0	7.2
8	6.8	e11	8.6	7.6	6.4	5.6	5.4	5.2	5.5	6.3	7.1	6.3
9	6.5	e10	9.2	7.9	6.4	5.8	6.2	5.2	5.1	25	4.7	6.6
10	6.3	e12	8.9	7.3	6.4	5.5	7.0	5.2	4.9	6.1	4.5	6.3
11	6.1	e9.4	8.6	7.8	7.0	5.5	5.9	5.1	4.8	5.8	4.8	18
12	6.2	e9.8	8.3	7.5	12	9.4	5.7	5.6	5.4	5.3	7.0	54
13	5.8	e9.0	9.0	7.3	9.4	11	5.3	5.1	5.1	5.1	5.5	8.4
14	6.7	e9.6	8.4	18	33	15	5.3	5.0	5.4	4.9	4.7	7.9
15	20	e8.8	8.1	15	10	8.2	5.2	4.8	4.9	4.5	4.6	7.3
16	120	e8.7	8.1	8.7	7.7	6.9	5.2	4.8	5.1	4.6	11	29
17	68	e9.0	9.2	8.0	7.1	6.7	5.1	11	5.5	4.8	6.6	9.6
18	20	e10	12	8.8	7.1	6.3	5.7	16	5.3	5.0	5.3	8.1
19	14	e11	13	8.1	6.8	5.9	6.9	9.7	5.1	4.7	4.7	7.6
20	13	e10	8.6	7.4	7.2	6.5	6.3	6.0	5.2	5.0	4.5	7.2
21	14	e9.2	9.0	7.8	6.6	6.1	5.7	5.3	4.8	4.7	4.7	7.4
22	16	e9.5	9.9	7.8	6.6	5.9	5.6	5.3	4.6	5.4	4.8	8.0
23	12	e10	9.3	7.2	6.5	5.7	5.4	5.7	4.6	8.3	4.8	9.1
24	12	e10	23	7.2	6.4	6.1	5.0	5.8	4.4	11	4.4	8.7
25	11	e10	14	7.2	6.5	6.0	5.1	5.4	4.5	5.3	4.5	7.8
26	11	e9.9	10	7.2	6.1	6.0	5.1	19	4.5	5.0	4.4	7.3
27	10	7.8	9.2	7.0	6.0	5.6	5.4	6.5	4.6	4.9	4.2	7.6
28	13	7.7	10	7.0	6.0	5.7	7.6	6.0	4.9	8.5	4.2	6.9
29	9.9	8.3	8.6	7.0	5.9	5.8	6.7	7.6	4.3	5.7	4.5	6.8
30	9.4	40	7.6	7.8	---	12	5.7	6.1	4.3	5.3	4.4	6.5
31	9.4	---	7.5	7.2	---	6.5	---	5.4	---	5.7	4.2	---
TOTAL	472.8	313.3	326.7	250.5	230.4	212.0	172.4	206.7	155.8	187.4	157.9	346.1
MEAN	15.3	10.4	10.5	8.08	7.94	6.84	5.75	6.67	5.19	6.05	5.09	11.5
MAX	120	40	23	18	33	15	7.6	19	7.9	25	11	54
MIN	4.2	7.7	7.5	6.7	5.9	5.5	5.0	4.8	4.3	4.2	4.2	4.6
AC-FT	938	621	648	497	457	421	342	410	309	372	313	686

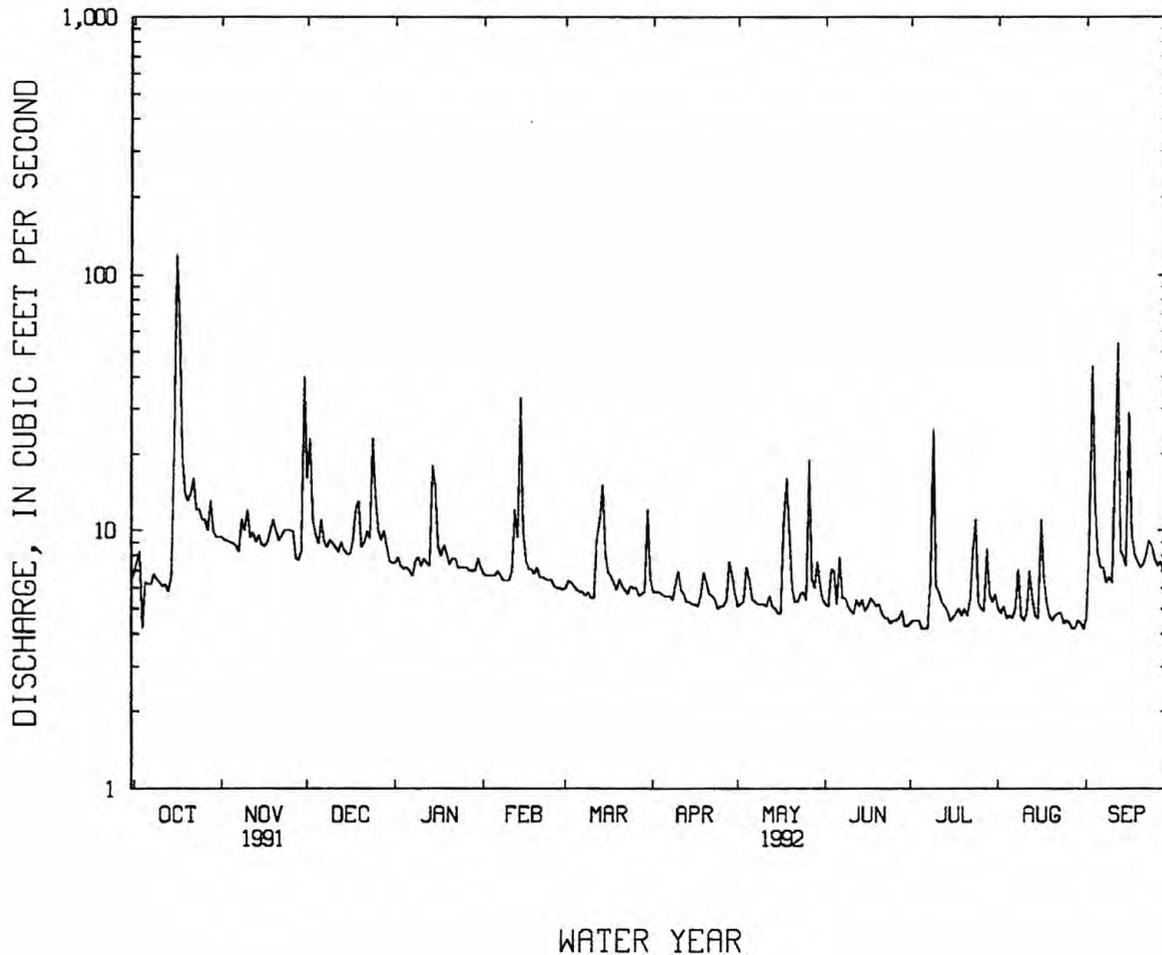
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16272200 KAMOOALII STREAM BELOW LULUKU STREAM NEAR KANEOHE--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1977 - 1992, BY WATER YEAR (WY)

MEAN	8.30	11.0	13.1	15.9	12.8	14.0	13.4	11.4	9.56	8.38	7.99	7.75
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 1991 CALENDAR YEAR	FOR 1992 WATER YEAR	WATER YEARS 1977 - 1992
ANNUAL TOTAL	4503.5	3032.0
ANNUAL MEAN	12.3	8.28
HIGHEST ANNUAL MEAN		11.4
LOWEST ANNUAL MEAN		22.0
HIGHEST DAILY MEAN	329 Mar 19	120 Oct 16
LOWEST DAILY MEAN	4.2 Oct 4	4.2 Oct 4
ANNUAL SEVEN-DAY MINIMUM	6.1 Oct 4	4.3 Aug 25
ANNUAL RUNOFF (AC-FT)	8930	6010
10 PERCENT EXCEEDS	15	11
50 PERCENT EXCEEDS	9.1	6.6
90 PERCENT EXCEEDS	6.8	4.7
		723 Jan 1 1988
		.29 Oct 10 1984
		.30 Oct 10 1984
		8260
		17
		7.6
		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. Construction of houses (Brookview Subdivision) is also going on this year at this site, on right bank.

EXTREMES FOR PERIOD OF RECORD.--

SEDIMENT CONCENTRATIONS: Maximum daily mean, 879 mg/L, Mar. 18, 1980; minimum daily mean, 1 mg/L on several days in 1988, 1990, 1991.

SEDIMENT DISCHARGE: Maximum daily, 1,380 tons, Mar. 18, 1980; minimum daily, 0.01 ton, Oct. 9-11, 1981.

EXTREMES FOR CURRENT YEAR.--

SEDIMENT CONCENTRATIONS: Maximum daily mean, 65 mg/L, Oct. 16; minimum daily mean, 3 mg/L, Dec. 15, 16, Mar. 20.

SEDIMENT DISCHARGE: Maximum daily, 24 tons, Oct. 16; minimum daily, 0.06 ton, Mar. 19, 20.

WATER QUALITY DATA, WATER YEAR OCTOBER 1991 TO SEPTEMBER 1992

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 WATER (DEG C)	TUR-BID-ITY (NTU)	BARO-METRIC PRES-SURE (MM OF HG)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, DIS-SOLVED SATUR-ATION (%)	COLI-FORM, FECAL, 0.7 UM-MF (COLS./100 ML)
OCT 1991										
18...	1110	17	159	7.6	24.0	24	757	8.1	97	K67
NOV 26...	1530	8.0	190	8.1	24.0	1.5	758	8.7	104	--
DEC 18...	1145	10	180	7.8	23.0	2.0	758	8.6	101	K320
JAN 1992										
29...	1110	6.7	210	8.2	21.5	1.7	759	10.0	114	--
FEB 26...	0905	5.7	182	7.6	22.0	1.7	761	8.1	93	--
APR 07...	1030	5.7	180	8.0	24.0	1.1	760	7.4	88	--
MAY 05...	1430	5.7	190	7.9	23.5	1.0	761	9.2	109	330
JUN 19...	1340	4.8	170	8.0	28.0	2.1	761	9.0	115	--
JUL 27...	1325	4.5	180	7.3	25.0	1.7	762	8.4	102	--
AUG 25...	1115	4.9	170	7.7	27.0	1.4	762	7.6	96	--
SEP 21...	1350	6.9	160	7.6	27.0	5.0	759	8.0	101	K100

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)	FLUO-RIDE, DIS-SOLVED (MG/L AS F)
FEB 26...	0905	53	9.6	7.1	14	36	0.8	1.0	54	9.5	22	<0.10
SEP 21...	1350	47	7.8	6.7	13	36	0.8	1.8	46	8.2	18	<0.10

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

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

16272200 KAMOOALII STREAM BELOW LULUKU STREAM NEAR KANEOHE--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1991 TO SEPTEMBER 1992

DATE	TIME	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, AMMONIA TOTAL (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)	PHOS- PHATE, TOTAL (MG/L AS PO4)
OCT 1991 18...	1110	--	--	--	--	10	0.300	0.040	<0.20	--	0.050	0.06
DEC 18...	1145	--	--	--	--	1	0.270	0.030	<0.20	--	0.030	0.03
FEB 26...	0905	20	109	116	0.15	1	0.300	0.040	<0.20	--	0.030	--
MAY 05...	1430	--	--	--	--	<1	0.220	0.040	<0.20	--	<0.010	--
SEP 21...	1350	18	96	102	0.13	6	0.180	0.040	0.20	0.38	0.020	0.03

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 26...	0905	90	20	--	<100	3	<10	<1	1	<1	<3
SEP 21...	1350	240	130	<1	<100	4	<10	<1	<1	<1	<3

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 26...	<1	130	42	<1	<10	<4	20	3	<0.10	<1	<10
SEP 21...	1	440	230	<1	<10	<4	30	18	<0.10	<1	<10

DATE	NICKEL, TOTAL RECOV- ERABLE (UG/L AS NI)	NICKEL, DIS- SOLVED (UG/L AS NI)	SELE- NIUM, TOTAL RECOV- ERABLE (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 26...	<1	<1	<1	<1	<1	<1.0	71	<6	<10	1.7	<1
SEP 21...	2	<1	<1	<1	<1	<1.0	66	<6	<10	2.6	<1

< 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 1991 TO SEPTEMBER 1992

DATE	ALDRIN, TOTAL (UG/L)	CHLOR- DANE, TOTAL (UG/L)	CHLOR- DYRIFOS 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 26...	<0.010	<0.1	<0.01	<0.010	<0.010	<0.010	<0.01	<0.01	<0.010	<0.01	<0.01
SEP 21...	<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 26...	<0.01	<0.010	<0.010	<0.01	<0.01	<0.010	<0.010	<0.010	<0.01	<0.01	<0.01
SEP 21...	<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 26...	<0.01	<0.10	<0.01	<0.1	<0.1	<0.01	<0.01	<1	<0.01	<0.01
SEP 21...	<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--Continued

SEDIMENT DISCHARGE, SUSPENDED (TONS/DAY), WATER YEAR OCTOBER 1991 TO SEPTEMBER 1992

DAY	MEAN DISCHARGE (CFS)	MEAN CONCEN- TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN- TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN- TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	
		APRIL			MAY			JUNE		
1	5.8	6	.09	5.1	e7	.10	5.2	e10	.15	
2	5.8	6	.10	5.2	e7	.10	5.1	e10	.13	
3	5.8	9	.15	5.3	e6	.09	7.1	e11	.23	
4	5.7	12	.19	7.2	10	.21	7.0	11	.21	
5	5.6	7	.10	6.4	8	.14	5.2	e9	.13	
6	5.6	7	.10	5.4	e6	.09	7.9	17	.36	
7	5.6	9	.13	5.3	e6	.08	5.5	17	.25	
8	5.4	e8	.11	5.2	e6	.08	5.5	e16	.24	
9	6.2	8	.14	5.2	e6	.08	5.1	e16	.22	
10	7.0	6	.11	5.2	e6	.08	4.9	e16	.21	
11	5.9	8	.13	5.1	e6	.08	4.8	e16	.21	
12	5.7	8	.12	5.6	6	.09	5.4	16	.23	
13	5.3	e8	.11	5.1	e6	.08	5.1	e16	.22	
14	5.3	e8	.11	5.0	e6	.08	5.4	e16	.24	
15	5.2	e7	.11	4.8	e5	.07	4.9	e16	.22	
16	5.2	e7	.10	4.8	e5	.07	5.1	e17	.23	
17	5.1	e7	.10	11	18	.62	5.5	e17	.25	
18	5.7	e7	.12	16	13	.59	5.3	17	.24	
19	6.9	8	.16	9.7	13	.38	5.1	e17	.23	
20	6.3	7	.11	6.0	9	.15	5.2	e16	.23	
21	5.7	5	.08	5.3	e10	.14	4.8	e16	.21	
22	5.6	e5	.08	5.3	e11	.16	4.6	e15	.19	
23	5.4	e5	.07	5.7	12	.18	4.6	15	.19	
24	5.0	e5	.07	5.8	12	.19	4.4	e15	.18	
25	5.1	e5	.07	5.4	e10	.15	4.5	e14	.17	
26	5.1	e5	.07	19	19	1.2	4.5	e14	.17	
27	5.4	e6	.09	6.5	9	.16	4.6	e13	.16	
28	7.6	10	.21	6.0	11	.18	4.9	e13	.17	
29	6.7	11	.21	7.6	11	.23	4.3	e13	.15	
30	5.7	8	.13	6.1	12	.19	4.3	e12	.14	
31	---	---	---	5.4	11	.16	---	---	---	
TOTAL	172.4	---	3.47	206.7	---	6.20	155.8	---	6.16	
		JULY			AUGUST			SEPTEMBER		
1	4.4	e12	.14	5.0	e10	.13	4.6	e8	.11	
2	4.5	e12	.14	4.8	e9	.12	9.5	16	.44	
3	4.5	e11	.14	5.1	e9	.12	44	29	4.1	
4	4.5	e11	.13	4.6	e8	.10	13	11	.40	
5	4.2	e11	.12	4.7	e8	.10	8.2	20	.44	
6	4.2	e10	.12	4.6	e8	.09	7.2	56	1.1	
7	4.2	e10	.11	5.0	e7	.10	7.2	63	1.2	
8	6.3	e10	.18	7.1	10	.21	6.3	11	.19	
9	25	17	1.8	4.7	e8	.11	6.6	7	.12	
10	6.1	9	.16	4.5	e8	.10	6.3	8	.13	
11	5.8	9	.14	4.8	e7	.10	18	10	2.2	
12	5.3	e9	.13	7.0	10	.22	54	46	12	
13	5.1	e9	.12	5.5	e8	.13	8.4	42	.93	
14	4.9	e9	.11	4.7	e8	.10	7.9	17	.35	
15	4.5	e9	.11	4.6	e8	.10	7.3	16	.32	
16	4.6	e9	.11	11	12	.38	29	24	2.5	
17	4.8	e8	.11	6.6	13	.23	9.6	16	.42	
18	5.0	e8	.11	5.3	e12	.18	8.1	11	.24	
19	4.7	e8	.10	4.7	e12	.15	7.6	9	.19	
20	5.0	e8	.11	4.5	e11	.13	7.2	12	.23	
21	4.7	e8	.10	4.7	e10	.13	7.4	10	.20	
22	5.4	8	.12	4.8	e10	.12	8.0	14	.30	
23	8.3	8	.21	4.8	e9	.12	9.1	10	.24	
24	11	12	.44	4.4	e8	.10	8.7	15	.38	
25	5.3	e7	.10	4.5	8	.10	7.8	10	.21	
26	5.0	e7	.09	4.4	e8	.09	7.3	14	.27	
27	4.9	e7	.09	4.2	e8	.09	7.6	11	.23	
28	8.5	9	.20	4.2	e8	.09	6.9	7	.13	
29	5.7	7	.10	4.5	e8	.10	6.8	9	.16	
30	5.3	e8	.12	4.4	e8	.10	6.5	9	.15	
31	5.7	10	.15	4.2	e8	.09	---	---	---	
TOTAL	187.4	---	5.91	157.9	---	4.03	346.1	---	29.88	
YEAR	3032.0		148.31							

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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 Course.

DRAINAGE AREA.--0.40 mi².

PERIOD OF RECORD.--October 1987 to current year.

GAGE.--Water-stage recorder.

REMARKS.--Records good except those above 10 cfs which are fair.

AVERAGE DISCHARGE.--5 years, 2.56 ft³/s (1,850 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 207 ft³/s, Dec. 31, 1987, gage height, 5.18 ft, from rating curve extended above 8.7 ft³/s; minimum, 1.5 ft³/s, July 18, 19, 1989.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 100 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Sept. 11	2315	*90	*3.64				

Minimum discharge, 1.7 ft³/s, Apr. 25-27, May 11, June 29, 30, July 1.

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	2.0	2.5	2.6	2.1	1.9	2.3	2.2	1.8	2.0	1.8	1.9	2.0
2	2.0	2.5	3.9	2.2	1.9	2.3	2.1	1.9	2.0	1.9	1.8	3.0
3	2.0	2.6	2.4	2.1	1.9	2.3	2.1	1.9	2.6	1.9	1.8	6.9
4	2.0	2.4	2.5	2.1	2.0	2.3	2.2	2.1	2.2	1.9	1.9	2.8
5	2.0	2.4	2.3	2.0	2.0	2.3	2.2	1.9	2.1	1.9	1.9	2.3
6	2.0	2.4	2.5	2.0	2.0	2.3	2.0	1.8	2.5	1.9	1.9	2.2
7	2.0	2.4	2.3	2.0	2.0	2.3	1.8	1.8	2.1	1.9	1.9	2.2
8	2.1	2.4	2.3	2.1	2.0	2.3	1.8	1.9	2.1	2.2	2.1	2.1
9	2.1	2.4	2.3	2.1	2.0	2.3	2.2	1.8	1.9	4.0	1.9	2.1
10	2.1	2.3	2.2	2.1	2.0	2.3	1.9	1.8	2.0	2.0	1.9	2.1
11	2.1	2.3	2.1	2.1	2.1	2.3	1.8	1.8	2.0	2.0	1.9	5.4
12	2.1	2.3	2.2	2.1	3.0	2.8	1.8	1.9	2.1	2.0	2.2	3.7
13	2.1	2.3	2.2	2.0	2.3	2.7	1.8	1.9	1.9	2.0	2.0	1.8
14	2.2	2.3	2.3	2.9	6.5	3.7	1.8	1.9	2.0	1.9	1.9	1.9
15	3.7	2.3	2.2	2.8	2.7	2.4	1.8	1.9	2.0	1.9	1.9	1.9
16	17	2.3	2.2	2.1	2.5	2.3	1.8	1.9	2.0	1.9	2.7	3.7
17	e5.7	2.3	2.6	2.1	2.4	2.3	1.9	2.8	2.0	1.9	2.1	1.9
18	e3.3	2.3	2.2	2.1	2.3	2.3	2.0	3.0	2.0	1.9	2.0	1.8
19	2.8	2.4	2.5	2.0	2.4	2.2	2.0	2.9	2.0	1.9	2.0	1.8
20	3.0	2.5	2.1	2.0	2.5	2.3	2.0	2.2	2.0	1.9	1.9	1.8
21	2.9	2.5	2.1	2.0	2.3	2.3	1.9	2.0	2.0	1.9	2.1	1.8
22	3.6	2.3	2.1	1.9	2.5	2.2	1.8	1.9	1.9	2.0	2.0	1.9
23	2.8	2.3	2.3	1.9	2.4	2.2	1.8	2.0	1.9	2.3	1.9	2.2
24	2.8	2.2	3.3	1.9	2.4	2.2	1.8	2.0	1.9	2.3	1.9	2.0
25	2.7	2.2	2.6	1.9	2.5	2.2	1.8	2.0	1.9	1.9	1.8	2.0
26	2.8	2.1	2.2	1.9	2.3	2.2	1.8	4.8	1.9	2.0	1.8	2.0
27	2.7	2.0	2.1	2.0	2.2	2.2	1.8	2.1	1.9	2.0	1.8	2.0
28	3.0	2.1	2.2	2.0	2.2	2.1	2.1	2.1	1.9	2.6	1.8	2.0
29	2.6	2.4	2.1	1.9	2.2	2.1	1.9	2.2	1.8	2.0	1.9	2.0
30	2.5	4.5	2.1	1.9	---	2.3	1.8	2.0	1.8	2.0	1.9	2.0
31	2.5	---	2.1	1.9	---	2.2	---	2.0	---	2.0	1.9	---
TOTAL	95.2	72.2	73.1	64.2	69.4	72.5	57.7	66.0	60.4	63.7	60.4	73.3
MEAN	3.07	2.41	2.36	2.07	2.39	2.34	1.92	2.13	2.01	2.05	1.95	2.44
MAX	17	4.5	3.9	2.9	6.5	3.7	2.2	4.8	2.6	4.0	2.7	6.9
MIN	2.0	2.0	2.1	1.9	1.9	2.1	1.8	1.8	1.8	1.8	1.8	1.8
AC-FT	189	143	145	127	138	144	114	131	120	126	120	145

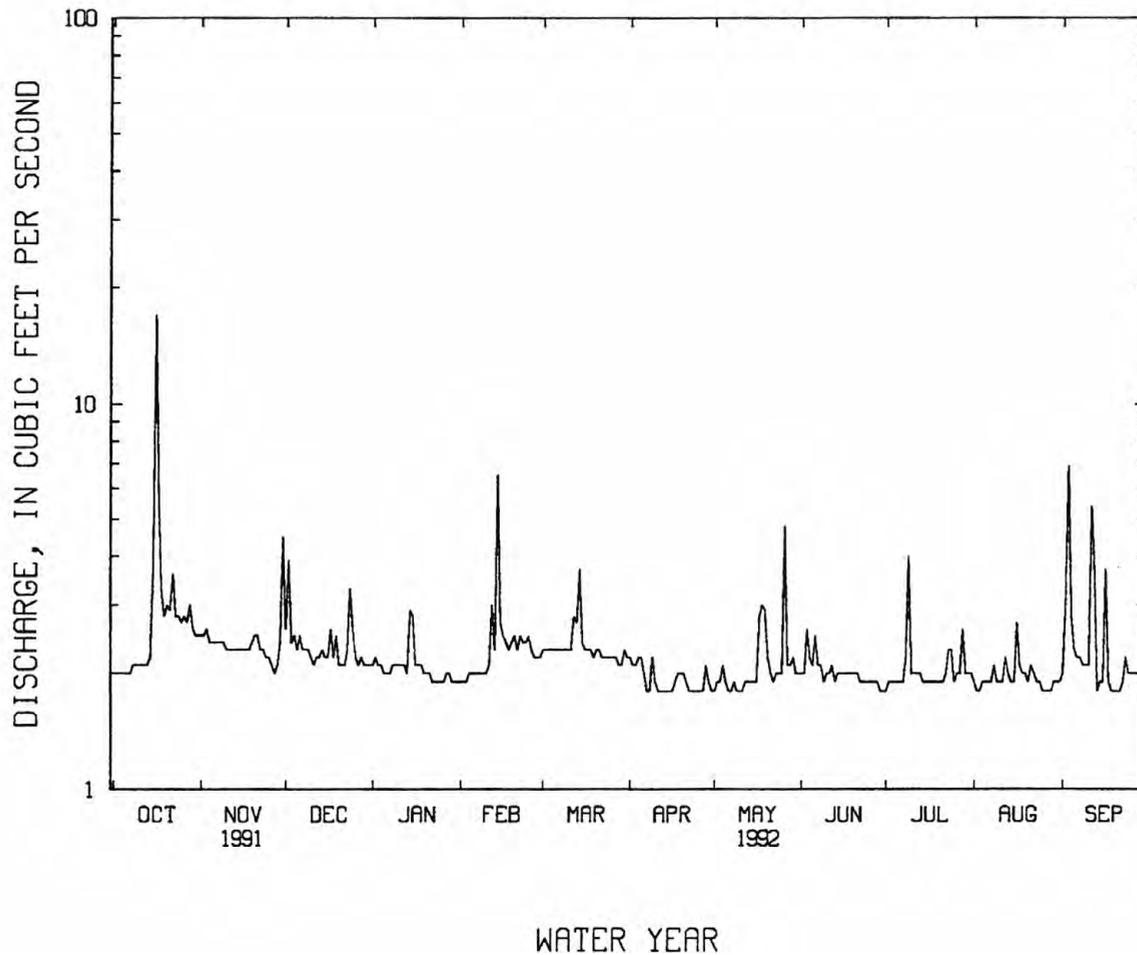
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16273950 SOUTH FORK KAPUNAHALA STREAM AT KANEOHE--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1988 - 1992, BY WATER YEAR (WY)

MEAN	2.45	2.63	3.09	2.85	2.79	2.88	2.93	2.21	2.15	2.25	2.27	2.30
MAX	3.07	3.45	4.99	4.31	3.41	3.78	5.44	2.46	2.31	2.64	2.50	2.85
(WY)	1992	1991	1988	1988	1989	1991	1989	1988	1988	1990	1989	1988
MIN	1.90	1.93	2.16	2.07	2.39	2.34	1.92	1.92	1.92	2.05	1.95	1.91
(WY)	1988	1990	1990	1992	1992	1992	1992	1990	1990	1992	1992	1990

SUMMARY STATISTICS FOR 1991 CALENDAR YEAR	FOR 1992 WATER YEAR		WATER YEARS 1988 - 1992	
ANNUAL TOTAL	926.7	828.1		
ANNUAL MEAN	2.54	2.26	2.57	
HIGHEST ANNUAL MEAN			2.87	1989
LOWEST ANNUAL MEAN			2.26	1992
HIGHEST DAILY MEAN	26	17	30	Apr 8 1989
LOWEST DAILY MEAN	2.0	1.8	1.5	Jul 18 1989
ANNUAL SEVEN-DAY MINIMUM	2.0	1.8	1.6	May 24 1990
ANNUAL RUNOFF (AC-FT)	1840	1640	1860	
10 PERCENT EXCEEDS	2.8	2.7	3.1	
50 PERCENT EXCEEDS	2.3	2.1	2.2	
90 PERCENT EXCEEDS	2.1	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 September 1992.

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

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

EXTREMES FOR PERIOD OF RECORD.--

SEDIMENT CONCENTRATIONS: Maximum daily mean, 1,010 mg/L, Mar. 19, 1991; minimum daily mean, 19 mg/L, Dec. 13, 1990, Nov. 26, 1991.

SEDIMENT DISCHARGE: Maximum daily, 117 tons, Mar. 19, 1991; minimum daily, 0.10 tons on several days.

EXTREMES FOR CURRENT YEAR.--

SEDIMENT CONCENTRATIONS: Maximum daily mean, 98 mg/L, Oct. 16; minimum daily mean, 19 mg/L, Nov. 26.

SEDIMENT DISCHARGE: Maximum daily, 6.9 tons, Feb. 14; minimum daily, 0.11 tons, Nov. 26, 27, June 30.

WATER QUALITY DATA, WATER YEAR OCTOBER 1991 TO SEPTEMBER 1992

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 WATER (DEG C)	TUR- BID- ITY (NTU)	BARO- METRIC PRES- SURE (MM OF HG)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)	OXYGEN, DIS- SOLVED (MG/L)	COLI- FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)
OCT 1991										
17...	1325	4.8	267	7.6	23.5	6.2	756	8.0	95	1100
NOV										
26...	1300	2.2	215	7.9	22.5	1.6	757	8.5	99	--
DEC										
17...	1320	2.3	178	7.9	21.5	4.9	758	8.4	96	2300
JAN 1992										
29...	1010	2.0	200	7.8	21.0	3.2	759	8.6	97	--
FEB										
26...	0910	2.2	205	7.8	20.0	2.7	761	8.1	89	600
APR										
06...	1345	1.9	188	7.8	23.0	5.7	759	8.2	96	--
MAY										
05...	1320	2.0	190	7.8	22.5	2.2	761	8.3	96	1800
JUN										
08...	1350	1.8	192	7.8	24.0	1.8	762	8.2	98	--
JUL										
27...	1100	2.0	193	7.8	22.0	1.5	762	8.2	94	--
AUG										
25...	1330	1.9	192	7.4	23.0	3.0	760	8.1	95	--
SEP										
22...	1330	2.6	203	7.9	22.5	4.5	759	8.0	93	5300

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)	FLUO- RIDE, DIS- SOLVED (MG/L AS F)
FEB												
26...	0910	57	12	6.5	17	39	1	1.2	63	3.9	19	<0.10
SEP												
22...	1330	59	12	7.1	17	38	1	1.5	63	5.5	26	<0.10

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

16273950 SOUTH FORK KAPUNAHALA STREAM AT KANEOHE--Continued
 WATER QUALITY DATA, WATER YEAR OCTOBER 1991 TO SEPTEMBER 1992

DATE	TIME	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, AMMONIA TOTAL (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)	PHOS- PHATE, TOTAL (MG/L AS PO4)
OCT 1991 17...	1325	--	--	--	--	<1	4.30	0.040	0.30	4.6	<0.010	0.06
DEC 17...	1320	--	--	--	--	2	0.240	0.010	<0.20	--	0.040	0.06
FEB 26...	0910	30	108	128	0.15	1	0.160	0.020	<0.20	--	0.050	0.06
MAY 05...	1320	--	--	--	--	<1	0.085	<0.010	<0.20	--	<0.010	0.06
SEP 22...	1330	28	130	135	0.18	14	0.550	0.020	<0.20	--	0.030	0.06

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 26...	0910	60	<10	--	<100	<2	<10	<1	2	<1	<3
SEP 22...	1330	260	10	<1	<100	3	<10	<1	2	<1	<3

DATE	TIME	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 26...		<1	370	99	<1	<10	<4	50	44	<0.10	<1	<10
SEP 22...		<1	820	120	<1	<10	<4	80	40	<0.10	<1	<10

DATE	TIME	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- ERABLE (MG/L)
FEB 26...		<1	<1	<1	<1	<1	<1.0	66	7	<10	1.1	<1
SEP 22...		2	<1	<1	<1	<1	<1.0	71	<6	30	2.5	<1

DATE	TIME	ALDRIN, TOTAL (UG/L)	CHLOR- DANE, TOTAL (UG/L)	CHLOR- DYRIFOS 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 26...		<0.010	<0.1	<0.01	<0.010	<0.010	<0.010	<0.01	<0.01	<0.010	<0.01	<0.01
SEP 22...		<0.010	<0.1	<0.01	<0.010	<0.010	<0.010	<0.01	0.01	0.020	<0.01	<0.01

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

HAWAII, ISLAND OF OAHU

16273950 SOUTH FORK KAPUNAHALA STREAM AT KANEOHE--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1991 TO SEPTEMBER 1992

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 26...	<0.01	<0.010	<0.010	<0.01	<0.01	<0.010	<0.010	<0.010	<0.01	<0.01	<0.01
SEP 22...	0.19	<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 26...	<0.01	<0.10	<0.01	<0.1	<0.1	<0.01	<0.01	<1	<0.01	<0.01
SEP 22...	<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--Continued

SEDIMENT DISCHARGE, SUSPENDED (TONS/DAY), WATER YEAR OCTOBER 1991 TO SEPTEMBER 1992

DAY	MEAN DISCHARGE (CFS)	MEAN CONCEN- TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN- TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN- TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	
										APRIL
1	2.2	e26	.15	1.8	e24	.12	2.0	e25	.13	
2	2.1	e26	.15	1.9	e24	.12	2.0	e25	.13	
3	2.1	e26	.15	1.9	e24	.12	2.6	e30	.23	
4	2.2	e26	.15	2.1	e26	.15	2.2	e27	.16	
5	2.2	e34	.20	1.9	e24	.12	2.1	e25	.14	
6	2.0	e36	.19	1.8	e24	.12	2.5	e29	.20	
7	1.8	e32	.16	1.8	e24	.12	2.1	e24	.14	
8	1.8	e28	.14	1.9	e24	.12	2.1	e27	.15	
9	2.2	e27	.18	1.8	e24	.12	1.9	e25	.13	
10	1.9	e24	.13	1.8	e24	.12	2.0	e24	.13	
11	1.8	e24	.12	1.8	e24	.12	2.0	e24	.13	
12	1.8	e24	.12	1.9	e25	.13	2.1	e26	.15	
13	1.8	e24	.12	1.9	e24	.12	1.9	e25	.13	
14	1.8	e24	.12	1.9	e24	.12	2.0	e25	.14	
15	1.8	e24	.12	1.9	e24	.12	2.0	e25	.13	
16	1.8	e24	.12	1.9	e24	.12	2.0	e25	.14	
17	1.9	e24	.12	2.8	e31	.28	2.0	e25	.13	
18	2.0	e25	.13	3.0	e29	.29	2.0	e25	.13	
19	2.0	e25	.13	2.9	e29	.27	2.0	e24	.13	
20	2.0	e24	.13	2.2	e25	.15	2.0	e24	.13	
21	1.9	e24	.12	2.0	e24	.13	2.0	e24	.13	
22	1.8	e24	.12	1.9	e25	.13	1.9	e24	.12	
23	1.8	e24	.12	2.0	e25	.14	1.9	e24	.12	
24	1.8	e24	.12	2.0	e25	.13	1.9	e24	.13	
25	1.8	e24	.12	2.0	e24	.13	1.9	e24	.13	
26	1.8	e24	.12	4.8	e47	1.3	1.9	e24	.13	
27	1.8	e24	.12	2.1	e25	.14	1.9	e24	.12	
28	2.1	e26	.15	2.1	e26	.15	1.9	e24	.12	
29	1.9	e24	.12	2.2	e27	.16	1.8	e24	.12	
30	1.8	e24	.12	2.0	e25	.14	1.8	e24	.11	
31	---	---	---	2.0	e25	.13	---	---	---	
TOTAL	57.7	---	4.06	66.0	---	5.63	60.4	---	4.11	
		JULY			AUGUST			SEPTEMBER		
1	1.8	e24	.12	1.9	e25	.13	2.0	e26	.16	
2	1.9	e24	.12	1.8	e25	.12	3.0	e34	.28	
3	1.9	e24	.12	1.8	e24	.12	6.9	e59	1.8	
4	1.9	e24	.12	1.9	e24	.12	2.8	e32	.25	
5	1.9	e24	.12	1.9	e24	.12	2.3	e29	.18	
6	1.9	e24	.12	1.9	e24	.12	2.2	e28	.17	
7	1.9	e24	.13	1.9	e34	.17	2.2	e28	.17	
8	2.2	e27	.16	2.1	e26	.15	2.1	e26	.15	
9	4.0	e54	1.4	1.9	e24	.13	2.1	e26	.15	
10	2.0	e25	.13	1.9	e24	.13	2.1	e26	.15	
11	2.0	e25	.14	1.9	e24	.13	5.4	e52	3.6	
12	2.0	e24	.13	2.2	e27	.17	3.7	e35	.75	
13	2.0	e24	.13	2.0	e26	.14	1.8	e24	.12	
14	1.9	e24	.13	1.9	e25	.13	1.9	e24	.12	
15	1.9	e24	.12	1.9	e24	.13	1.9	e24	.12	
16	1.9	e24	.12	2.7	e30	.24	3.7	e36	.70	
17	1.9	e24	.12	2.1	e25	.14	1.9	e24	.12	
18	1.9	e25	.13	2.0	e25	.14	1.8	e24	.12	
19	1.9	e24	.12	2.0	e24	.13	1.8	e24	.12	
20	1.9	e24	.12	1.9	e24	.13	1.8	e24	.12	
21	1.9	e24	.12	2.1	e25	.15	1.8	e24	.12	
22	2.0	e25	.14	2.0	e24	.13	1.9	e24	.13	
23	2.3	e27	.19	1.9	e24	.12	2.2	e27	.16	
24	2.3	e27	.18	1.9	e24	.12	2.0	e25	.13	
25	1.9	e24	.13	1.8	e24	.12	2.0	e24	.13	
26	2.0	e24	.13	1.8	e24	.12	2.0	e25	.13	
27	2.0	e24	.13	1.8	e24	.12	2.0	e25	.14	
28	2.6	e30	.23	1.8	e24	.12	2.0	e25	.13	
29	2.0	e25	.14	1.9	e24	.12	2.0	e25	.13	
30	2.0	e25	.13	1.9	e24	.12	2.0	e25	.14	
31	2.0	e25	.14	1.9	e24	.12	---	---	---	
TOTAL	63.7	---	5.46	60.4	---	4.15	73.3	---	10.69	
YEAR	828.1		81.56							

e Estimated

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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 mi².

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).--44 years (water years 1944-77, 1983-92), 2.24 ft³/s, (1,620 acre-ft/yr). The water year figure in the 1984-91 reports were in error; water year 1983 was inadvertently left out.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 5,740 ft³/s, May 2, 1965, gage height, 7.94 ft, from rating curve extended above 57 ft³/s on basis of slope-area measurements at gage heights 3.87 ft, 3.88 ft, and 7.94 ft; minimum, 0.20 ft³/s, July 20, 1957, Sept. 17, 1961.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 340 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Oct. 16	0100	*732	*3.52	No other peaks greater than base discharge.			
Minimum discharge, 1.2 ft ³ /s, Aug. 27 to Sept. 1.							

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1991 TO SEPTEMBER 1992
DAILY MEAN VALUES

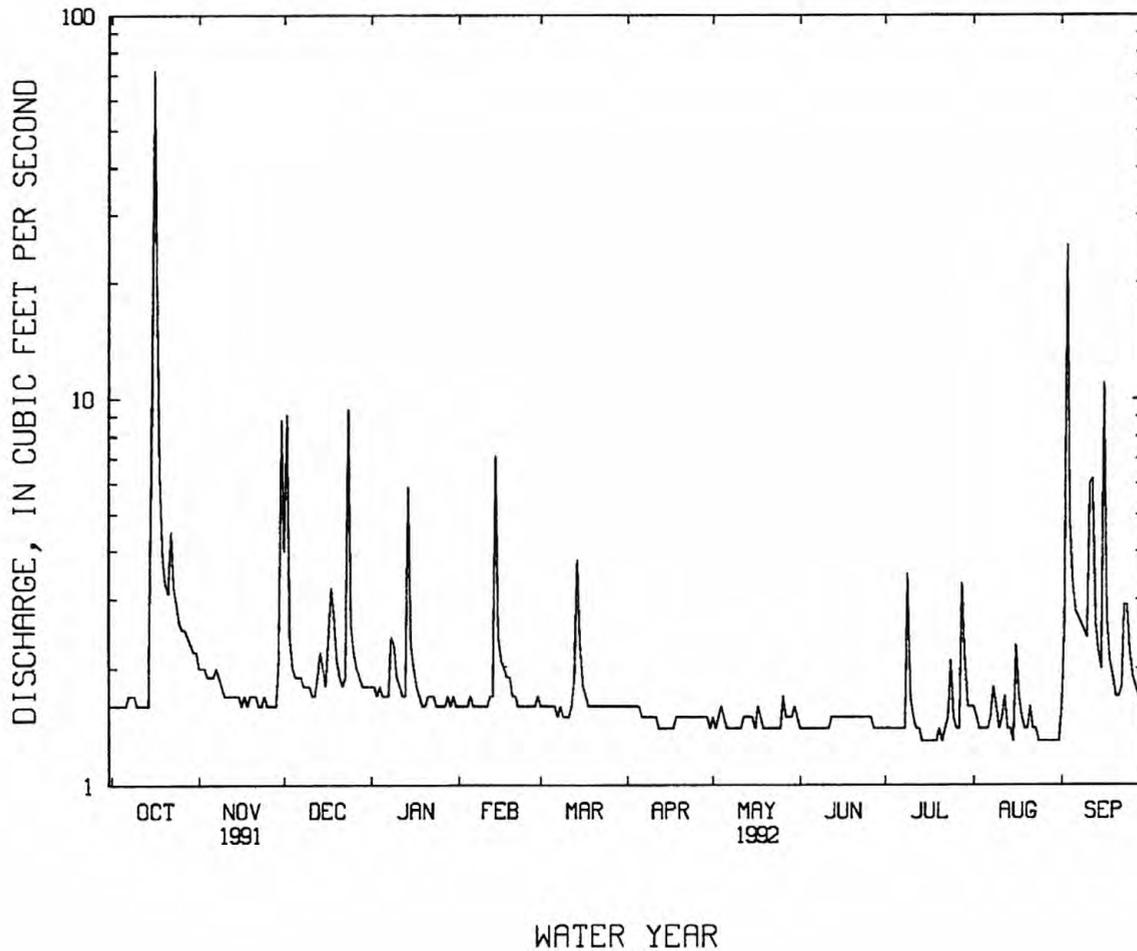
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.6	2.0	4.0	1.8	1.6	1.6	1.6	1.5	1.4	1.4	1.6	1.6
2	1.6	2.0	9.1	1.8	1.6	1.6	1.6	1.4	1.4	1.4	1.5	2.6
3	1.6	2.0	2.4	1.7	1.6	1.6	1.6	1.5	1.4	1.4	1.4	25
4	1.6	1.9	2.0	1.8	1.6	1.6	1.6	1.6	1.4	1.4	1.4	4.7
5	1.6	1.9	1.9	1.7	1.7	1.6	1.6	1.5	1.4	1.4	1.4	3.3
6	1.6	1.9	1.9	1.7	1.6	1.6	1.5	1.4	1.4	1.4	1.4	2.8
7	1.7	2.0	1.9	1.7	1.6	1.5	1.5	1.4	1.4	1.4	1.5	2.7
8	1.7	1.9	1.8	2.4	1.6	1.6	1.5	1.4	1.4	1.4	1.8	2.6
9	1.7	1.8	1.8	2.3	1.6	1.5	1.5	1.4	1.4	3.5	1.6	2.5
10	1.6	1.7	1.8	1.9	1.6	1.5	1.5	1.4	1.4	1.7	1.4	2.4
11	1.6	1.7	1.7	1.8	1.6	1.5	1.5	1.4	1.4	1.5	1.5	6.0
12	1.6	1.7	1.7	1.7	1.7	1.6	1.4	1.5	1.5	1.4	1.7	6.2
13	1.6	1.7	1.9	1.7	1.7	1.9	1.4	1.5	1.5	1.4	1.4	2.6
14	1.6	1.7	2.2	5.9	7.1	3.8	1.4	1.5	1.5	1.3	1.4	2.2
15	6.3	1.7	2.0	2.3	2.4	2.3	1.4	1.5	1.5	1.3	1.3	2.0
16	72	1.6	1.8	2.0	2.1	1.8	1.4	1.4	1.5	1.3	2.3	11
17	18	1.7	2.4	1.8	2.0	1.7	1.4	1.6	1.5	1.3	1.7	2.7
18	6.3	1.6	3.2	1.7	1.9	1.6	1.5	1.5	1.5	1.3	1.5	2.1
19	3.9	1.7	2.7	1.6	1.9	1.6	1.5	1.4	1.5	1.3	1.4	1.9
20	3.3	1.7	2.1	1.6	1.7	1.6	1.5	1.4	1.5	1.4	1.4	1.7
21	3.1	1.7	1.9	1.7	1.7	1.6	1.5	1.4	1.5	1.3	1.6	1.7
22	4.5	1.6	1.8	1.7	1.6	1.6	1.5	1.4	1.5	1.4	1.4	1.8
23	3.2	1.6	1.9	1.7	1.6	1.6	1.5	1.4	1.5	1.5	1.4	2.9
24	2.9	1.7	9.4	1.6	1.6	1.6	1.5	1.4	1.5	2.1	1.3	2.9
25	2.6	1.6	2.6	1.6	1.6	1.6	1.5	1.4	1.5	1.5	1.3	2.2
26	2.5	1.6	2.2	1.6	1.6	1.6	1.5	1.7	1.5	1.4	1.3	1.9
27	2.5	1.6	2.0	1.6	1.6	1.6	1.5	1.5	1.4	1.4	1.3	1.8
28	2.4	1.6	1.9	1.7	1.6	1.6	1.5	1.5	1.4	3.3	1.3	1.7
29	2.3	2.1	1.8	1.6	1.7	1.6	1.5	1.5	1.4	2.1	1.3	1.6
30	2.2	8.8	1.8	1.7	---	1.6	1.4	1.6	1.4	1.6	1.3	1.6
31	2.2	---	1.8	1.6	---	1.6	---	1.5	---	1.6	1.3	---
TOTAL	162.9	59.8	79.4	59.0	54.8	52.7	44.8	45.5	43.5	49.1	45.4	108.7
MEAN	5.25	1.99	2.56	1.90	1.89	1.70	1.49	1.47	1.45	1.58	1.46	3.62
MAX	72	8.8	9.4	5.9	7.1	3.8	1.6	1.7	1.5	3.5	2.3	25
MIN	1.6	1.6	1.7	1.6	1.6	1.5	1.4	1.4	1.4	1.3	1.3	1.6
AC-FT	323	119	157	117	109	105	89	90	86	97	90	216

16275000 HAIKU STREAM NEAR HEEIA--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1944 - 1992, BY WATER YEAR (WY)

MEAN	1.93	2.79	2.74	2.63	2.50	3.33	2.60	2.41	1.36	1.54	1.60	1.42
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 1991 CALENDAR YEAR	FOR 1992 WATER YEAR		WATER YEARS 1944 - 1992	
ANNUAL TOTAL	1134.1		805.6	
ANNUAL MEAN	3.11		2.20	
HIGHEST ANNUAL MEAN			2.24	
LOWEST ANNUAL MEAN			4.82	
HIGHEST DAILY MEAN	113	Mar 19	72	Oct 16
LOWEST DAILY MEAN	1.6	Feb 7	1.3	Jul 14
ANNUAL SEVEN-DAY MINIMUM	1.6	Sep 28	1.3	Aug 24
ANNUAL RUNOFF (AC-FT)	2250		1600	
10 PERCENT EXCEEDS	3.2		2.6	
50 PERCENT EXCEEDS	1.8		1.6	
90 PERCENT EXCEEDS	1.7		1.4	
			620	May 2 1965
			.67	1946
			.29	Jul 13 1945
			.29	Oct 19 1945
			1620	
			2.7	
			1.5	
			.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.

EXTREMES FOR PERIOD OF RECORD.--

SEDIMENT CONCENTRATIONS: Maximum daily mean, 2,130 mg/L (estimated), Apr. 8, 1989; minimum daily mean, 1 mg/L, on many days in 1984, 1988-92.

SEDIMENT DISCHARGE: Maximum daily, 1,800 tons (estimated), Apr. 8, 1989; minimum daily, less than 0.01 ton on many days in 1984, 1988-92.

EXTREMES FOR CURRENT YEAR.--

SEDIMENT CONCENTRATIONS: Maximum daily mean, 1,890 mg/L, Oct. 16; minimum daily mean, 1 mg/L on many days.

SEDIMENT DISCHARGE: Maximum daily, 1,120 tons, Oct. 16; minimum daily, less than 0.01 tons on many days.

WATER QUALITY DATA, WATER YEAR OCTOBER 1991 TO SEPTEMBER 1992

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 WATER (DEG C)	TUR- BID- ITY (NTU)	BARO- METRIC PRES- SURE (MM OF HG)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)	OXYGEN, DIS- SOLVED (MG/L)	COLI- FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)
NOV										
26...	1015	1.6	150	7.9	21.0	0.40	753	8.6	98	--
30...	0720	--	--	--	22.5	--	--	--	--	--
30...	0800	--	--	--	22.5	--	--	--	--	--
DEC										
17...	0940	1.7	144	7.9	20.0	0.50	754	8.4	93	40
JAN 1992										
28...	0945	1.6	150	7.4	19.0	0.50	755	9.0	98	--
FEB										
24...	1130	1.6	160	7.5	19.5	0.70	753	8.5	94	200
APR										
06...	1015	1.4	145	7.7	20.0	0.30	756	8.9	99	--
MAY										
05...	1115	1.4	146	7.8	19.5	0.30	757	9.0	99	130
JUN										
08...	1035	1.5	145	7.6	20.5	0.50	758	8.7	97	--
JUL										
27...	0920	1.4	150	7.8	20.5	0.30	758	8.6	96	--
AUG										
25...	1015	1.3	150	6.5	21.0	1.8	756	8.7	98	--
SEP										
22...	1000	1.9	153	8.2	21.0	1.5	756	8.6	97	400

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- LILITY 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)
FEB												
24...	1130	44	8.6	5.5	13	39	0.9	0.80	46	4.5	19	<0.10
SEP												
22...	1000	49	10	5.8	12	34	0.7	1.0	49	4.5	19	<0.10

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

16275000 HAIKU STREAM NEAR HEEIA--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1991 TO SEPTEMBER 1992

DATE	TIME	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- PENDE (MG/L)	NITRO- GEN, NO2+NO3 TOTAL (MG/L AS N)	NITRO- GEN, AMMONIA TOTAL (MG/L AS N)	NITRO- GEN,AM- MONIA + ORGANIC TOTAL (MG/L AS N)	PHOS- PHORUS TOTAL (MG/L AS P)	PHOS- PHATE, TOTAL (MG/L AS PO4)
DEC 17...	0940	--	--	--	--	1	0.130	<0.010	<0.20	0.020	0.03
FEB 24...	1130	27	104	106	0.14	1	0.130	0.010	<0.20	0.030	0.06
MAY 05...	1115	--	--	--	--	<1	0.120	<0.010	<0.20	<0.010	0.06
SEP 22...	1000	26	98	108	0.13	6	0.086	<0.010	<0.20	0.030	0.06

DATE	TIME	ALUM- INIUM, TOTAL RECOV- ERABLE (UG/L AS AL)	ALUM- INIUM, 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 24...	1130	40	<10	--	<100	<2	<10	<1	<1	<1	<3
SEP 22...	1000	80	10	<1	<100	2	<10	<1	<1	<1	<3

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...	<1	80	44	<1	<10	<4	20	6	<0.10	<1	<10
SEP 22...	<1	260	63	<1	<10	<4	30	5	<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	54	<6	<10	0.7	<1
SEP 22...	1	<1	<1	<1	<1	<1.0	58	<6	<10	1.7	4

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

16275000 HAIKU STREAM NEAR HEEIA--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1991 TO SEPTEMBER 1992

DATE	TIME	ALDRIN, TOTAL (UG/L)	ALDRIN, TOTAL IN BOT- TOM MA- TERIAL (UG/KG)	CHLOR- DANE, TOTAL (UG/L)	CHLOR- DANE, TOTAL IN BOT- TOM MA- TERIAL (UG/KG)	CHLOR- DYRIFOS TOTAL RECOVER (UG/L)	DDD, TOTAL (UG/L)	DDD, TOTAL IN BOT- TOM MA- TERIAL (UG/KG)	DDE, TOTAL (UG/L)	DDE, TOTAL IN BOT- TOM MA- TERIAL (UG/KG)
OCT 1991 c16-16	0005	--	<0.1	--	12	--	--	3.0	--	<1.0
NOV 30...	0720	<0.010	--	<0.1	--	--	<0.010	--	<0.010	--
NOV 30...	0800	<0.010	--	<0.1	--	--	<0.010	--	<0.010	--
DEC 18...	0940	<0.010	--	<0.1	--	--	<0.010	--	<0.010	--
DEC 18...	1015	<0.010	--	<0.1	--	--	<0.010	--	<0.010	--
DEC 18...	1055	<0.010	--	<0.1	--	--	<0.010	--	<0.010	--
DEC 18...	1147	<0.010	--	<0.1	--	--	<0.010	--	<0.010	--
FEB 14...	0730	<0.010	--	<0.1	--	--	<0.010	--	<0.010	--
FEB 24...	1130	<0.010	--	<0.1	--	<0.01	<0.010	--	<0.010	--
SEP 22...	1000	<0.010	--	<0.1	--	<0.01	<0.010	--	<0.010	--

DATE	DDT, TOTAL (UG/L)	DDT, TOTAL IN BOT- TOM MA- TERIAL (UG/KG)	DEF TOTAL (UG/L)	DI- AZINON, TOTAL (UG/L)	DI- ELDRIN TOTAL (UG/L)	DI- ELDRIN, TOTAL IN BOT- TOM MA- TERIAL (UG/KG)	DI- SYSTON TOTAL (UG/L)	2, 4-DP TOTAL (UG/L)	2,4-D, TOTAL (UG/L)	ENDO- SULFAN, TOTAL (UG/L)
OCT 1991 c16-16	--	0.8	--	--	--	0.6	--	--	--	--
NOV 30...	<0.010	--	--	--	<0.010	--	--	--	--	<0.010
NOV 30...	<0.010	--	--	--	<0.010	--	--	--	--	<0.010
DEC 18...	<0.010	--	--	--	<0.010	--	--	--	--	<0.010
DEC 18...	<0.010	--	--	--	<0.010	--	--	--	--	<0.010
DEC 18...	<0.010	--	--	--	<0.010	--	--	--	--	<0.010
DEC 18...	<0.010	--	--	--	<0.010	--	--	--	--	<0.010
FEB 14...	<0.010	--	--	--	<0.010	--	--	--	--	<0.010
FEB 24...	<0.010	--	<0.01	<0.01	<0.010	--	<0.01	<0.01	<0.01	<0.010
SEP 22...	<0.010	--	<0.01	<0.01	<0.010	--	<0.01	<0.01	<0.01	<0.010

DATE	ENDO- SULFAN, TOTAL IN BOT- TOM MA- TERIAL (UG/KG)	ENDRIN WATER UNFLTRD REC (UG/L)	ENDRIN, TOTAL IN BOT- TOM MA- TERIAL (UG/KG)	ETHION, TOTAL (UG/L)	FONOFOS (DY- FONATE) WATER WHOLE TOT.REC (UG/L)	HEPTA- CHLOR, TOTAL HEPTA- CHLOR, TOTAL (UG/L)	HEPTA- CHLOR, TOTAL IN BOT- TOM MA- TERIAL (UG/KG)	HEPTA- CHLOR EPOXIDE TOTAL (UG/L)	HEPTA- CHLOR EPOXIDE TOT. IN BOTTOM MATL. (UG/KG)	LINDANE TOTAL (UG/L)
OCT 1991 c16-16	<0.1	--	<0.1	--	--	--	<0.1	--	<0.1	--
NOV 30...	--	<0.010	--	--	--	<0.010	--	<0.010	--	<0.010
NOV 30...	--	<0.010	--	--	--	<0.010	--	<0.010	--	<0.010
DEC 18...	--	<0.010	--	--	--	<0.010	--	<0.010	--	<0.010
DEC 18...	--	<0.010	--	--	--	<0.010	--	<0.010	--	<0.010
DEC 18...	--	<0.010	--	--	--	<0.010	--	<0.010	--	<0.010
DEC 18...	--	<0.010	--	--	--	<0.010	--	<0.010	--	<0.010
FEB 14...	--	<0.010	--	--	--	<0.010	--	<0.010	--	<0.010
FEB 24...	--	<0.010	--	<0.01	<0.01	<0.010	--	<0.010	--	<0.010
SEP 22...	--	<0.010	--	<0.01	<0.01	<0.010	--	<0.010	--	<0.010

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

16275000 HAIKU STREAM NEAR HEEIA--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1991 TO SEPTEMBER 1992

DATE	LINDANE TOTAL IN BOT- TOM MA- TERIAL (UG/KG)	MALA- THON, TOTAL (UG/L)	METH- OXY- CHLOR, TOTAL (UG/L)	METH- OXY- CHLOR, TOT. IN BOTTOM MATL. (UG/KG)	METHYL PARA- THON, TOTAL (UG/L)	MIREX, TOTAL (UG/L)	MIREX, TOTAL IN BOT- TOM MA- TERIAL (UG/KG)	NAPH- THA- LENES, POLY- CHLOR. TOTAL (UG/L)	PCN, TOTAL IN BOT- TOM MA- TERIAL (UG/KG)	PARA- THON, TOTAL (UG/L)
OCT 1991 c16-16	<0.1	--	--	<0.1	--	--	<0.1	--	<1.0	--
NOV 30...	--	--	<0.01	--	--	<0.01	--	<0.10	--	--
30...	--	--	<0.01	--	--	<0.01	--	<0.10	--	--
DEC 18...	--	--	<0.01	--	--	<0.01	--	<0.10	--	--
18...	--	--	<0.01	--	--	<0.01	--	<0.10	--	--
18...	--	--	<0.01	--	--	<0.01	--	<0.10	--	--
18...	--	--	<0.01	--	--	<0.01	--	<0.10	--	--
FEB 14...	--	--	<0.01	--	--	<0.01	--	<0.10	--	--
24...	--	<0.01	<0.01	--	<0.01	<0.01	--	<0.10	--	<0.01
SEP 22...	--	<0.01	<0.01	--	<0.01	<0.01	--	<0.10	--	<0.01

DATE	PCB, TOTAL (UG/L)	PCB, TOTAL IN BOT- TOM MA- TERIAL (UG/KG)	PER- THANE TOTAL (UG/L)	PER- THANE IN BOT- TOM MA- TERIAL (UG/KG)	PHORATE TOTAL (UG/L)	SILVEX, TOTAL (UG/L)	TOX- APHENE, TOTAL (UG/L)	TOXA- PHENE, TOTAL IN BOT- TOM MA- TERIAL (UG/KG)	TOTAL TRI- THON (UG/L)	2,4,5-T TOTAL (UG/L)
OCT 1991 c16-16	--	67	--	<1.00	--	--	--	<10	--	--
NOV 30...	<0.1	--	<0.1	--	--	--	<1	--	--	--
30...	<0.1	--	<0.1	--	--	--	<1	--	--	--
DEC 18...	<0.1	--	<0.1	--	--	--	<1	--	--	--
18...	<0.1	--	<0.1	--	--	--	<1	--	--	--
18...	<0.1	--	<0.1	--	--	--	<1	--	--	--
18...	<0.1	--	<0.1	--	--	--	<1	--	--	--
FEB 14...	<0.1	--	<0.1	--	--	--	<1	--	--	--
24...	<0.1	--	<0.1	--	<0.01	<0.01	<1	--	<0.01	<0.01
SEP 22...	<0.1	--	<0.1	--	<0.01	<0.01	<1	--	<0.01	<0.01

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

c Composite sample.

16275000 HAIKU STREAM NEAR HEEIA--Continued

SEDIMENT DISCHARGE, SUSPENDED (TONS/DAY), WATER YEAR OCTOBER 1991 TO SEPTEMBER 1992

DAY	MEAN DISCHARGE (CFS)	MEAN CONCEN- TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN- TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN- TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)
1	1.6	1	.01	2.0	6	.03	4.0	e22	.50
2	1.6	2	.01	2.0	9	.05	9.1	e218	46
3	1.6	2	.01	2.0	e10	.05	2.4	13	.08
4	1.6	2	.01	1.9	10	.05	2.0	1	.01
5	1.6	1	<.01	1.9	9	.05	1.9	1	.01
6	1.6	1	<.01	1.9	7	.04	1.9	3	.02
7	1.7	1	<.01	2.0	7	.04	1.9	1	.01
8	1.7	3	.01	1.9	7	.04	1.8	1	<.01
9	1.7	2	.01	1.8	9	.04	1.8	e2	.01
10	1.6	1	<.01	1.7	6	.03	1.8	3	.01
11	1.6	2	.01	1.7	10	.05	1.7	5	.02
12	1.6	2	.01	1.7	6	.03	1.7	5	.02
13	1.6	1	.01	1.7	6	.03	1.9	5	.03
14	1.6	8	.04	1.7	4	.02	2.2	5	.03
15	6.3	215	24	1.7	5	.02	2.0	3	.02
16	72	1890	1120	1.6	4	.02	1.8	2	.01
17	18	115	8.4	1.7	3	.02	2.4	e12	.29
18	6.3	19	.34	1.6	5	.02	3.2	90	1.3
19	3.9	11	.12	1.7	e5	.02	2.7	21	.16
20	3.3	12	.10	1.7	4	.02	2.1	6	.04
21	3.1	12	.10	1.7	2	.01	1.9	6	.03
22	4.5	e20	.34	1.6	2	.01	1.8	5	.02
23	3.2	5	.05	1.6	4	.02	1.9	4	.02
24	2.9	7	.05	1.7	4	.02	9.4	e173	17
25	2.6	6	.04	1.6	4	.02	2.6	17	.12
26	2.5	6	.04	1.6	1	.01	2.2	10	.06
27	2.5	7	.04	1.6	2	.01	2.0	6	.03
28	2.4	8	.05	1.6	2	.01	1.9	4	.02
29	2.3	12	.07	2.1	83	8.0	1.8	2	.01
30	2.2	9	.06	8.8	130	15	1.8	3	.02
31	2.2	9	.05	---	---	---	1.8	4	.02
TOTAL	162.9	---	1154.02	59.8	---	23.78	79.4	---	65.93
		JANUARY		FEBRUARY			MARCH		
1	1.8	5	.02	1.6	7	.03	1.6	3	.01
2	1.8	3	.02	1.6	5	.02	1.6	3	.01
3	1.7	3	.01	1.6	14	.06	1.6	2	.01
4	1.8	3	.02	1.6	28	.12	1.6	3	.01
5	1.7	4	.02	1.7	2	.01	1.6	3	.01
6	1.7	3	.01	1.6	e1	.01	1.6	6	.03
7	1.7	3	.01	1.6	e2	.01	1.5	4	.02
8	2.4	e11	.15	1.6	e2	.01	1.6	4	.02
9	2.3	4	.02	1.6	e3	.01	1.5	7	.03
10	1.9	e2	.01	1.6	e4	.02	1.5	4	.02
11	1.8	2	.01	1.6	e6	.02	1.5	4	.02
12	1.7	4	.02	1.7	e8	.04	1.6	3	.01
13	1.7	10	.05	1.7	6	.03	1.9	4	.02
14	5.9	322	43	7.1	63	7.0	3.8	e26	.44
15	2.3	121	.75	2.4	5	.03	2.3	4	.02
16	2.0	28	.15	2.1	5	.03	1.8	3	.02
17	1.8	5	.02	2.0	6	.03	1.7	3	.01
18	1.7	6	.03	1.9	5	.02	1.6	4	.02
19	1.6	4	.02	1.9	3	.02	1.6	3	.01
20	1.6	4	.02	1.7	3	.02	1.6	3	.01
21	1.7	3	.01	1.7	5	.02	1.6	6	.02
22	1.7	5	.02	1.6	7	.03	1.6	e8	.03
23	1.7	4	.02	1.6	4	.02	1.6	5	.02
24	1.6	4	.02	1.6	4	.02	1.6	3	.01
25	1.6	8	.03	1.6	4	.02	1.6	3	.01
26	1.6	11	.05	1.6	4	.02	1.6	4	.02
27	1.6	8	.03	1.6	6	.02	1.6	4	.02
28	1.7	4	.02	1.6	3	.01	1.6	4	.02
29	1.6	1	.01	1.7	3	.02	1.6	4	.02
30	1.7	3	.01	---	---	---	1.6	7	.03
31	1.6	3	.01	---	---	---	1.6	e4	.02
TOTAL	59.0	---	44.59	54.8	---	7.72	52.7	---	0.97

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

16275000 HAIKU STREAM NEAR HEEIA--Continued

SEDIMENT DISCHARGE, SUSPENDED (TONS/DAY), WATER YEAR OCTOBER 1991 TO SEPTEMBER 1992

DAY	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)
1	1.6	9	.04	1.5	2	.01	1.4	10	.04
2	1.6	21	.09	1.4	3	.01	1.4	4	.02
3	1.6	3	.01	1.5	4	.02	1.4	3	.01
4	1.6	3	.01	1.6	5	.02	1.4	1	<.01
5	1.6	2	.01	1.5	17	.07	1.4	3	.01
6	1.5	2	.01	1.4	4	.02	1.4	5	.02
7	1.5	3	.01	1.4	2	.01	1.4	3	.01
8	1.5	e2	.01	1.4	1	<.01	1.4	2	.01
9	1.5	2	.01	1.4	2	.01	1.4	2	.01
10	1.5	3	.01	1.4	3	.01	1.4	1	<.01
11	1.5	3	.01	1.4	7	.03	1.4	2	.01
12	1.4	4	.02	1.5	2	.01	1.5	3	.01
13	1.4	3	.01	1.5	2	.01	1.5	1	.01
14	1.4	4	.02	1.5	4	.01	1.5	1	<.01
15	1.4	3	.01	1.5	e4	.01	1.5	1	<.01
16	1.4	2	.01	1.4	3	.01	1.5	1	<.01
17	1.4	2	.01	1.6	4	.02	1.5	2	.01
18	1.5	2	.01	1.5	3	.01	1.5	3	.01
19	1.5	2	.01	1.4	2	.01	1.5	2	.01
20	1.5	2	.01	1.4	2	.01	1.5	1	.01
21	1.5	2	.01	1.4	2	.01	1.5	2	.01
22	1.5	2	.01	1.4	3	.01	1.5	3	.01
23	1.5	2	.01	1.4	1	<.01	1.5	1	.01
24	1.5	1	<.01	1.4	2	.01	1.5	1	<.01
25	1.5	1	<.01	1.4	e2	.01	1.5	e1	.01
26	1.5	2	.01	1.7	4	.02	1.5	1	.01
27	1.5	3	.01	1.5	3	.01	1.4	2	.01
28	1.5	7	.03	1.5	2	.01	1.4	2	.01
29	1.5	3	.01	1.5	5	.02	1.4	1	<.01
30	1.4	2	.01	1.6	2	.01	1.4	1	<.01
31	---	---	---	1.5	3	.01	---	---	---
TOTAL	44.8	---	0.45	45.5	---	0.45	43.5	---	0.35
		JULY			AUGUST			SEPTEMBER	
1	1.4	e2	.01	1.6	2	.01	1.6	6	.11
2	1.4	2	.01	1.5	e2	.01	2.6	e22	.33
3	1.4	e3	.01	1.4	e2	.01	25	680	128
4	1.4	4	.01	1.4	e2	.01	4.7	17	.23
5	1.4	5	.02	1.4	e2	.01	3.3	5	.05
6	1.4	4	.02	1.4	e2	.01	2.8	6	.05
7	1.4	4	.02	1.5	4	.02	2.7	5	.04
8	1.4	3	.01	1.8	6	.03	2.6	3	.02
9	3.5	43	1.8	1.6	2	.01	2.5	3	.02
10	1.7	4	.02	1.4	3	.01	2.4	3	.02
11	1.5	3	.01	1.5	5	.02	6.0	434	101
12	1.4	3	.01	1.7	7	.04	6.2	613	25
13	1.4	e3	.01	1.4	4	.02	2.6	22	.16
14	1.3	3	.01	1.4	4	.01	2.2	40	.24
15	1.3	3	.01	1.3	3	.01	2.0	30	.16
16	1.3	3	.01	2.3	e13	.17	11	344	46
17	1.3	3	.01	1.7	5	.02	2.7	16	.12
18	1.3	2	.01	1.5	4	.02	2.1	14	.08
19	1.3	1	<.01	1.4	4	.02	1.9	11	.05
20	1.4	1	<.01	1.4	3	.01	1.7	12	.06
21	1.3	1	<.01	1.6	7	.04	1.7	17	.07
22	1.4	2	.01	1.4	6	.02	1.8	7	.03
23	1.5	5	.04	1.4	3	.01	2.9	e23	.19
24	2.1	8	.06	1.3	3	.01	2.9	e16	.34
25	1.5	2	.01	1.3	4	.01	2.2	6	.03
26	1.4	e2	.01	1.3	7	.02	1.9	5	.03
27	1.4	e2	.01	1.3	e5	.02	1.8	4	.02
28	3.3	30	.78	1.3	5	.02	1.7	5	.02
29	2.1	24	.13	1.3	6	.02	1.6	4	.02
30	1.6	20	.09	1.3	8	.03	1.6	5	.02
31	1.6	3	.01	1.3	8	.03	---	---	---
TOTAL	49.1	---	3.19	45.4	---	0.70	108.7	---	302.51
YEAR	805.6	---	1604.66	---	---	---	---	---	---

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

16283200 KAHALUU STREAM NEAR AHUIMANU

LOCATION.--Lat 21°26'32", long 157°50'47", Hydrologic Unit 20060000, on left bank, 1.1 mi west of Valley of the Temples Memorial Park, 1.3 mi south of Kahaluu School, and 2.7 mi northwest of Heeia Elementary School, and 2.7 mi northwest of Heeia Elementary School.

DRAINAGE AREA.--0.99 mi².

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 fair. Honolulu Board of Water Supply has diverted ground water from tunnel in drainage area since 1947. At times, farmers upstream of gage pumps and/or diverts small amount of water from the stream.

AVERAGE DISCHARGE.--9 years, 3.53 ft³/s (2,560 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 608 ft³/s, Mar. 19, 1991, gage height, 5.76 ft; minimum, 0.58 ft³/s on several days in September, October, November 1984.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 180 ft³/s and maximum(*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Oct. 16	1400	220	3.90	Sept. 3	0930	*466	*5.18

Minimum discharge, 1.6 ft³/s, Aug. 25.

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	3.6	4.0	8.8	4.1	3.6	3.4	e3.0	2.8	2.7	3.9	2.5	2.8
2	3.6	4.0	10	4.1	3.6	3.3	e3.0	2.8	2.6	2.8	2.4	8.0
3	3.6	3.9	5.0	4.1	3.6	3.3	3.0	2.8	2.7	2.6	2.4	52
4	3.6	3.9	4.4	4.2	3.6	3.3	3.0	2.8	2.6	2.5	2.3	7.3
5	3.5	3.9	4.1	4.1	3.6	3.3	3.0	2.7	2.6	2.5	2.4	4.5
6	3.5	3.9	4.1	4.1	3.6	3.3	2.9	2.7	3.0	2.5	2.3	3.6
7	3.6	4.0	3.9	4.1	3.6	3.2	3.0	2.7	2.6	2.5	2.4	3.4
8	4.0	3.9	3.9	4.3	3.6	3.2	2.9	2.7	2.6	2.9	5.2	3.1
9	7.7	3.9	4.1	4.2	3.5	3.2	2.9	2.7	2.6	2.9	2.6	3.8
10	3.8	3.9	4.0	4.1	3.5	3.2	2.9	2.7	2.5	2.6	2.5	3.6
11	3.6	4.0	3.9	4.0	3.6	3.2	2.9	2.7	2.5	2.6	2.4	11
12	3.6	3.9	4.0	4.0	3.7	3.6	2.9	2.8	2.6	2.5	2.4	6.7
13	3.6	3.9	5.8	4.0	3.6	4.9	2.9	2.7	2.5	2.4	2.4	4.1
14	3.7	3.9	4.6	5.0	10	5.4	2.9	2.7	2.5	2.4	2.3	3.6
15	7.2	3.8	4.0	4.0	4.2	e3.3	2.9	2.6	2.5	2.4	2.3	3.8
16	59	3.8	3.9	3.9	3.8	e3.2	2.9	2.6	2.5	2.4	4.3	7.1
17	16	3.8	4.6	3.8	3.7	e3.2	2.9	2.8	2.5	2.4	2.8	3.8
18	7.2	3.8	6.7	3.7	3.6	e3.2	3.0	3.3	2.5	2.4	2.4	3.4
19	5.4	3.9	5.4	3.7	3.6	e3.2	3.0	2.8	2.6	2.4	2.3	3.2
20	6.3	4.1	4.5	3.7	3.6	e3.1	2.9	2.7	2.5	2.4	2.3	3.1
21	6.5	3.9	4.5	3.8	3.5	e3.1	2.9	2.7	2.5	2.3	2.6	2.9
22	5.6	3.9	4.2	3.7	3.5	e3.1	2.8	2.6	2.5	2.4	2.5	3.0
23	4.9	3.8	4.3	3.7	3.4	e3.0	2.8	2.6	2.5	3.3	2.3	3.6
24	4.8	3.8	9.5	3.7	3.4	e3.0	2.8	2.6	2.5	4.0	2.2	4.6
25	4.4	3.7	5.3	3.7	3.4	e2.9	2.8	2.6	2.4	2.6	2.2	3.5
26	4.3	3.8	4.7	3.7	3.4	e3.0	2.8	3.0	2.4	2.5	2.2	3.2
27	4.3	3.7	4.4	3.7	3.4	e3.1	2.9	2.7	2.4	2.5	2.2	3.1
28	4.2	3.7	4.3	3.7	3.4	e3.1	3.2	3.8	2.4	3.7	2.2	2.9
29	4.1	4.0	4.2	3.7	3.4	e3.1	2.9	3.4	2.4	2.7	2.9	2.9
30	4.1	11	4.1	3.7	---	e3.1	2.8	2.8	2.5	2.6	2.1	2.8
31	4.1	---	4.1	3.6	---	e3.0	---	2.7	---	2.6	2.2	---
TOTAL	207.4	123.5	153.3	121.9	110.0	102.5	87.5	86.6	76.2	83.2	78.5	174.4
MEAN	6.69	4.12	4.95	3.93	3.79	3.31	2.92	2.79	2.54	2.68	2.53	5.81
MAX	59	11	10	5.0	10	5.4	3.2	3.8	3.0	4.0	5.2	52
MIN	3.5	3.7	3.9	3.6	3.4	2.9	2.8	2.6	2.4	2.3	2.1	2.8
AC-FT	411	245	304	242	218	203	174	172	151	165	156	346

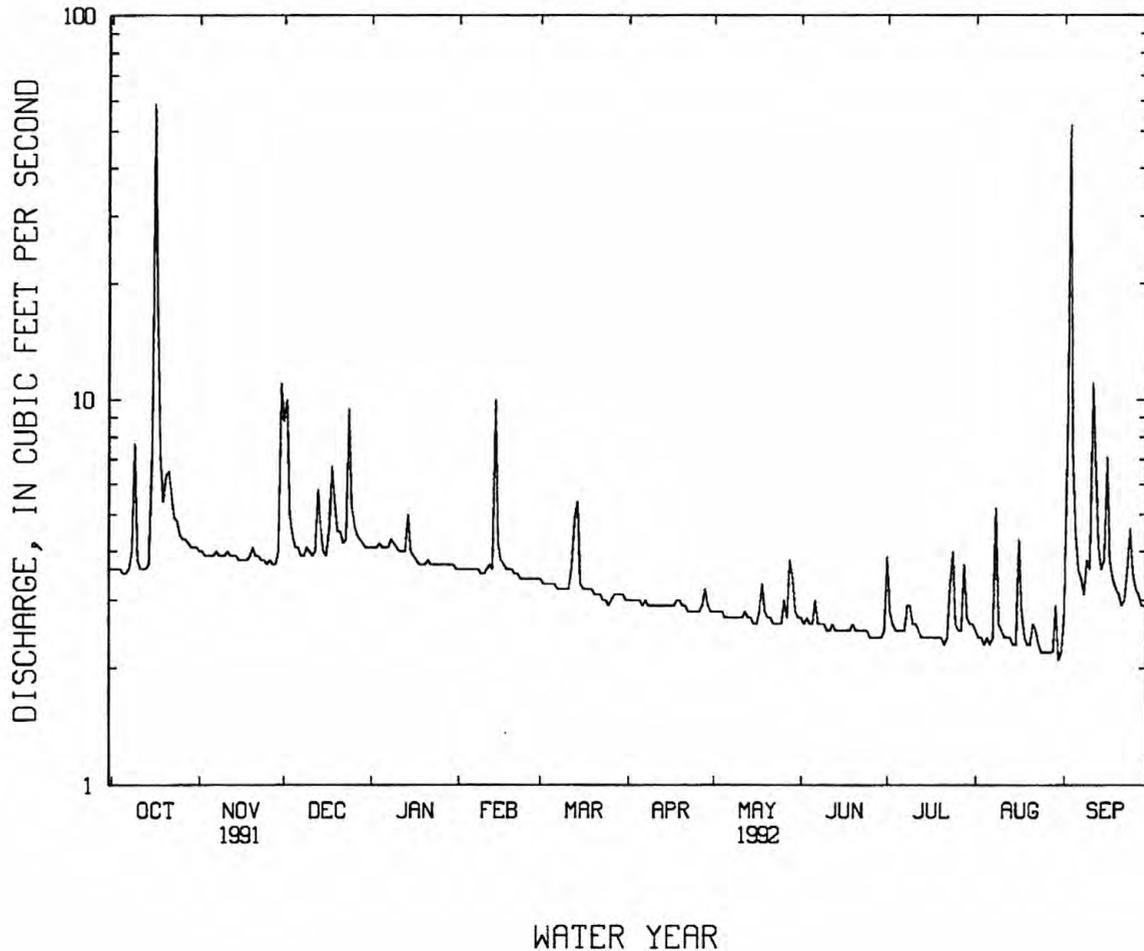
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16283200 KAHALUU STREAM NEAR AHUIMANU--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1984 - 1992, BY WATER YEAR (WY)

MEAN	3.33	3.90	4.10	3.71	3.75	4.63	3.72	3.31	2.77	3.06	2.81	3.24
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 1991 CALENDAR YEAR	FOR 1992 WATER YEAR		WATER YEARS 1984 - 1992	
ANNUAL TOTAL	2003.5		1405.0	
ANNUAL MEAN	5.49		3.84	
HIGHEST ANNUAL MEAN			3.53	
LOWEST ANNUAL MEAN			5.97	
HIGHEST DAILY MEAN	97	Mar 19	97	Mar 19 1991
LOWEST DAILY MEAN	3.5	Oct 5	.58	Sep 22 1984
ANNUAL SEVEN-DAY MINIMUM	3.6	Sep 30	.59	Nov 5 1984
ANNUAL RUNOFF (AC-FT)	3970		2560	
10 PERCENT EXCEEDS	5.9		5.2	
50 PERCENT EXCEEDS	4.3		3.0	
90 PERCENT EXCEEDS	3.8		.85	



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 mi².

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

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

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

AVERAGE DISCHARGE.--30 years, 1.34 ft³/s (968 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 430 ft³/s, Oct. 28, 1981, gage height, 4.68 ft, from rating curve extended above 4.8 ft³/s; no flow, July 7, 1977.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 47 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Sep. 3	0630	*112	*2.90	No other peak greater than base discharge.			

Minimum discharge, 0.47 ft³/s on several days in Sep.

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	.70	.75	1.4	.70	e.72	e.72	e.68	e.62	.65	.58	.57	.85
2	.70	.75	1.2	.70	e.72	e.72	e.68	e.62	.65	.60	.56	1.3
3	.70	.75	.75	.70	e.72	e.72	e.67	e.62	.65	.60	.56	5.3
4	.70	.75	.75	.70	e.72	e.70	e.67	e.61	.65	.58	.56	.62
5	.71	.75	.75	.70	e.72	e.70	e.67	e.61	.63	.56	.56	e.60
6	.70	.75	.75	.70	e.72	e.70	e.66	e.60	.64	.56	.56	e.56
7	.70	.75	.75	.70	e.72	e.70	e.66	e.60	.60	.56	.58	e.54
8	.73	.75	.75	.70	e.72	e.70	e.66	e.60	.60	.60	1.1	e.52
9	1.0	.75	.75	.75	e.72	e.70	e.66	.60	.60	.63	.56	e.50
10	.73	.75	.75	.75	e.72	e.70	e.65	.60	.60	.60	.56	e.47
11	.70	.75	.75	.75	e.72	e.70	e.65	.60	.60	.58	.56	e1.0
12	.70	.75	.75	.75	e.72	e.70	e.65	.60	.61	.56	.58	e.65
13	.70	.75	1.1	.75	e.72	e.85	e.65	.60	.61	.56	.56	e.47
14	.71	.75	.80	e.76	e1.4	e1.0	e.65	.60	.61	.56	.56	e.47
15	1.1	.75	.75	e.76	e.80	e.70	e.64	.60	.60	.56	.56	e.47
16	4.8	.75	.75	e.75	e.72	e.70	e.64	.60	.60	.56	.83	e1.1
17	1.2	.75	.77	e.75	e.72	e.70	e.64	.61	.61	.56	.58	e.65
18	.79	.75	1.2	e.72	e.72	e.70	e.64	.74	.60	.56	.56	e.47
19	.75	.75	.83	e.72	e.72	e.72	e.64	.66	.60	.56	.56	e.47
20	.80	.75	.75	e.72	e.72	e.72	e.64	.65	.60	.56	.56	e.47
21	.85	.75	.75	e.72	e.72	e.70	e.63	.65	.58	.56	.56	e.50
22	.79	.75	.75	e.72	e.72	e.70	e.63	.65	.56	.56	.56	e.47
23	.75	.75	.75	e.72	e.72	e.70	e.63	.65	.56	.75	.56	e.47
24	.78	.75	1.1	e.72	e.72	e.70	e.63	.65	.56	.76	.56	e.50
25	.75	.75	.70	e.72	e.72	e.70	e.63	.65	.56	.59	.56	e.47
26	.75	.75	.70	e.72	e.72	e.71	e.63	.65	.56	.56	.56	e.47
27	.75	.75	.70	e.72	e.72	e.70	e.62	.65	.59	.56	.58	e.47
28	.75	.75	.70	e.72	e.72	e.70	e.62	.65	.60	.62	.60	e.47
29	.75	.78	.70	e.72	e.72	e.68	e.62	.65	.60	.58	.65	e.47
30	.75	1.3	.70	e.72	---	e.68	e.62	.65	.56	.58	.61	e.47
31	.75	---	.70	e.72	---	e.68	---	.65	---	.62	.62	---
TOTAL	28.04	23.08	25.30	22.45	21.64	22.20	19.36	19.49	18.04	18.23	18.50	22.24
MEAN	.90	.77	.82	.72	.75	.72	.65	.63	.60	.59	.60	.74
MAX	4.8	1.3	1.4	.76	1.4	1.0	.68	.74	.65	.76	1.1	5.3
MIN	.70	.75	.70	.70	.72	.68	.62	.60	.56	.56	.56	.47
AC-FT	56	46	50	45	43	44	38	39	36	36	37	44

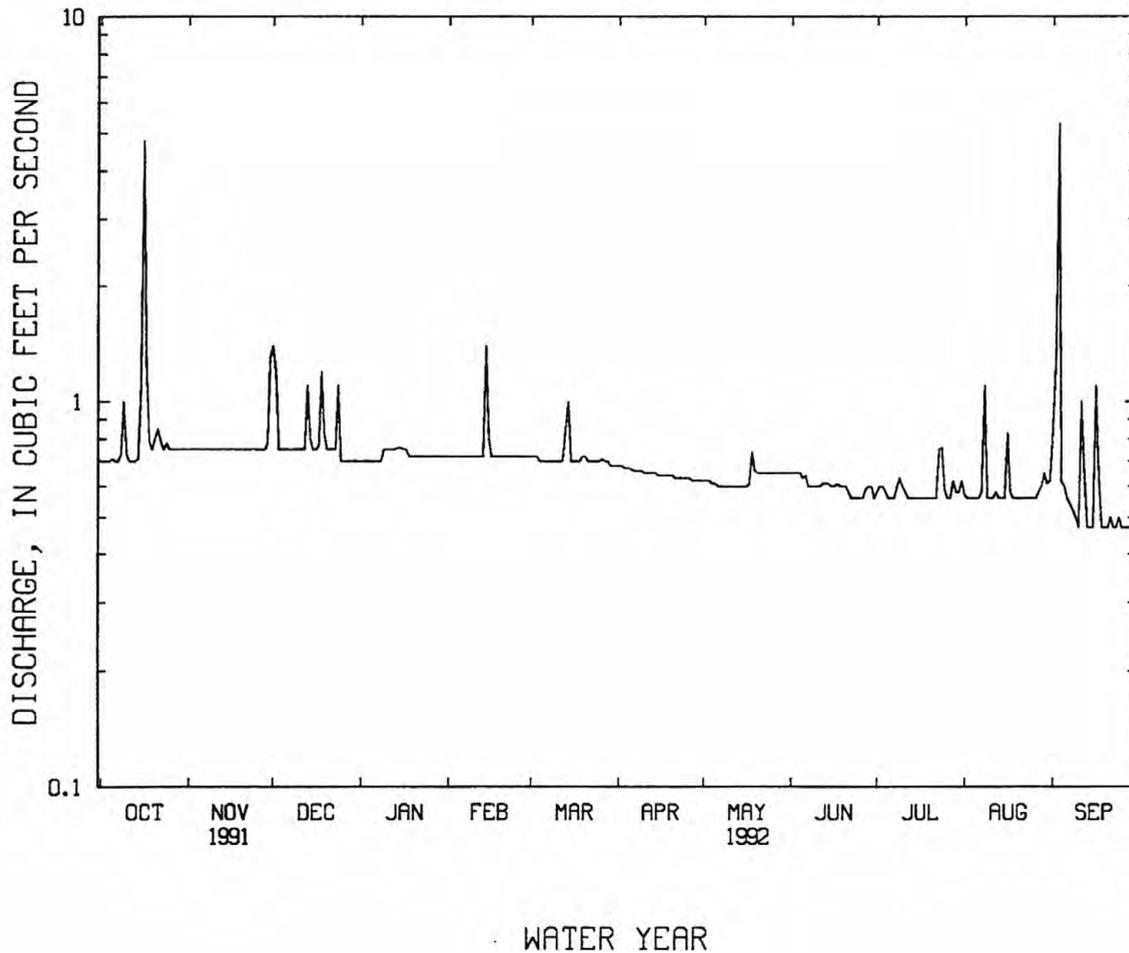
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16283600 SOUTH FORK WAIHEE STREAM NEAR HEEIA--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1962 - 1992, BY WATER YEAR (WY)

MEAN	1.35	1.39	1.34	1.33	1.32	1.38	1.33	1.34	1.25	1.32	1.35	1.33
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 1991 CALENDAR YEAR	FOR 1992 WATER YEAR	WATER YEARS 1962 - 1992
ANNUAL TOTAL	345.50	258.57
ANNUAL MEAN	.95	.71
HIGHEST ANNUAL MEAN		
LOWEST ANNUAL MEAN		
HIGHEST DAILY MEAN	13 Mar 19	5.3 Sep 3
LOWEST DAILY MEAN	.70 Jan 1	.47 Sep 10
ANNUAL SEVEN-DAY MINIMUM	.70 Dec 25	.47 Sep 22
ANNUAL RUNOFF (AC-FT)	685	513
10 PERCENT EXCEEDS	.98	.75
50 PERCENT EXCEEDS	.85	.70
90 PERCENT EXCEEDS	.71	.56
		1.34
		2.52
		.37
		33
		.00
		.21
		968
		2.2
		1.2
		.44



16283700 NORTH FORK WAIHEE STREAM NEAR HEEIA

LOCATION.--Lat 21°26'48", long 157°52'18", Hydrologic Unit 20060000, on left bank 0.3 mi upstream from confluence with South Fork, 2.8 mi southwest of Waiahole School, and 4.3 mi northwest of Heeia.

DRAINAGE AREA.--0.03 mi².

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 diverts water from wells in South Fork Waihee which affects the low flow at this station.

AVERAGE DISCHARGE.--30 years, 1.53 ft³/s (1,110 acre-ft/yr).

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

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 45 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Sept. 3	0930	*83	*2.11	No other peak greater than base discharge.			
Minimum discharge, 0.78 ft ³ /s, Aug. 28-31.							

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	e1.3	e1.2	1.7	1.2	1.2	1.3	1.1	1.1	.98	.92	.87	.95
2	e1.3	e1.2	1.6	1.2	1.2	1.3	1.1	1.1	.98	.92	.87	1.5
3	e1.3	e1.2	1.3	1.2	1.2	1.3	1.1	1.1	.98	.92	.87	5.0
4	e1.3	e1.2	1.3	1.2	1.2	1.2	1.1	1.1	e.98	.92	.87	.91
5	e1.3	1.3	1.3	1.2	1.2	1.2	1.1	1.1	e.98	.92	.87	.83
6	e1.3	1.3	1.3	1.2	1.2	1.2	1.1	1.0	e.96	.92	.87	.82
7	e1.3	1.3	1.3	1.2	1.2	1.2	1.1	1.0	e.96	.92	.90	.82
8	e1.3	1.3	1.3	1.2	1.2	1.2	1.1	1.0	e.96	.92	1.3	.82
9	e1.4	1.2	1.3	1.2	1.2	1.2	1.1	1.0	e.96	.95	.87	.82
10	e1.3	1.2	1.3	1.2	1.2	1.2	1.1	1.0	e.96	.91	.84	.82
11	e1.3	1.2	1.3	1.2	1.2	1.2	1.1	1.0	e.96	.92	.82	1.2
12	e1.3	1.2	1.3	1.2	1.2	1.2	1.1	1.0	e.95	.91	.86	1.0
13	e1.3	1.2	1.5	1.2	1.2	1.6	1.1	.98	e.95	.87	.84	.82
14	e1.3	1.2	1.3	1.3	2.0	1.6	1.1	.99	e.94	.88	.82	.82
15	e1.7	1.2	1.3	1.2	1.3	1.2	1.1	.98	e.94	.87	.82	.82
16	e6.0	1.2	1.3	1.2	1.3	1.1	1.1	.98	e.94	.88	1.0	1.3
17	e1.9	1.2	1.3	1.2	1.3	1.1	1.1	1.0	e.94	.87	.86	.83
18	e1.5	1.2	1.5	1.2	1.3	1.1	1.1	1.1	e.94	.88	.82	.82
19	e1.3	1.2	1.3	1.2	1.3	1.1	1.1	.98	e.94	.87	.82	.82
20	e1.4	1.3	1.3	1.2	1.3	1.1	1.1	.98	e.94	.87	.82	.82
21	e1.5	1.2	1.3	1.2	1.3	1.1	1.1	.98	e.94	.87	.82	.85
22	e1.4	1.2	1.3	1.2	1.3	1.1	1.1	.98	e.94	.87	.82	.82
23	e1.3	1.2	1.3	1.2	1.3	1.1	1.1	.98	e.93	1.0	.82	.82
24	e1.4	1.2	1.5	1.2	1.3	1.1	1.1	.98	e.93	1.0	.82	.84
25	e1.3	1.3	1.3	1.2	1.3	1.1	1.1	.98	e.93	.87	.82	.82
26	e1.3	1.2	1.2	1.2	1.3	1.1	1.1	.99	.92	.87	.82	.82
27	e1.3	1.2	1.2	1.2	1.3	1.1	1.1	.98	.92	.87	.82	.82
28	e1.3	1.2	1.2	1.2	1.3	1.1	1.1	.98	.92	.94	.80	.82
29	e1.3	1.2	1.2	1.2	1.3	1.1	1.1	.98	.92	.87	.81	.82
30	e1.3	1.9	1.2	1.2	---	1.1	1.1	.98	.92	.89	.82	.82
31	e1.2	---	1.2	1.2	---	1.1	---	.98	---	.90	.79	---
TOTAL	46.7	37.3	41.0	37.3	37.1	36.7	33.0	31.28	28.41	27.99	26.57	30.79
MEAN	1.51	1.24	1.32	1.20	1.28	1.18	1.10	1.01	.95	.90	.86	1.03
MAX	6.0	1.9	1.7	1.3	2.0	1.6	1.1	1.1	.98	1.0	1.3	5.0
MIN	1.2	1.2	1.2	1.2	1.2	1.1	1.1	.98	.92	.87	.79	.82
AC-FT	93	74	81	74	74	73	65	62	56	56	53	61

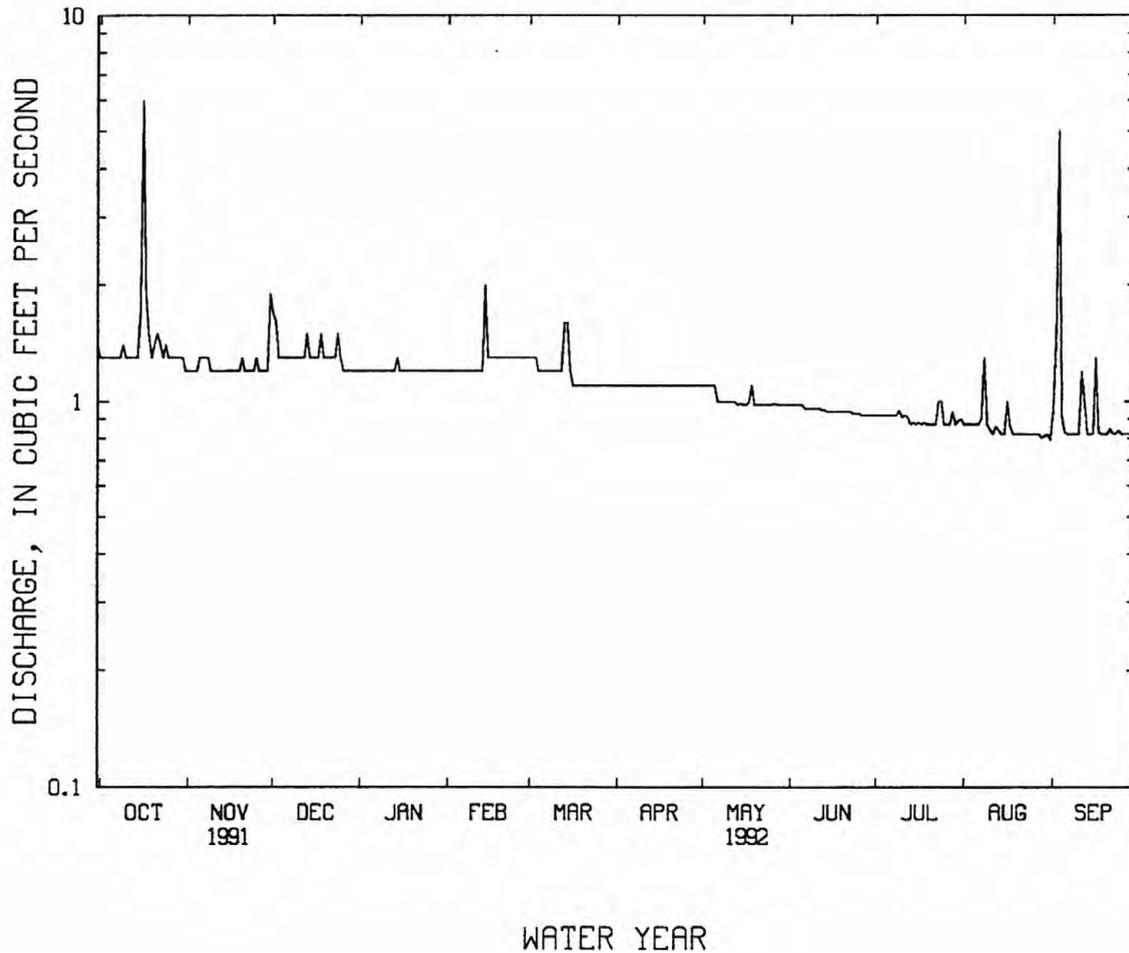
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16283700 NORTH FORK WAIHEE STREAM NEAR HEEIA--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1962 - 1992, BY WATER YEAR (WY)

MEAN	1.55	1.56	1.52	1.51	1.53	1.52	1.51	1.54	1.48	1.52	1.54	1.54
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 1991 CALENDAR YEAR	FOR 1992 WATER YEAR	WATER YEARS 1962 - 1992
ANNUAL TOTAL	516.3	414.14
ANNUAL MEAN	1.41	1.13
HIGHEST ANNUAL MEAN		1.53
LOWEST ANNUAL MEAN		2.42
HIGHEST DAILY MEAN	8.0 Mar 19	6.0 Oct 16
LOWEST DAILY MEAN	1.1 Jan 1	.79 Aug 31
ANNUAL SEVEN-DAY MINIMUM	1.1 Jan 1	.81 Aug 25
ANNUAL RUNOFF (AC-FT)	1020	821
10 PERCENT EXCEEDS	1.5	1.3
50 PERCENT EXCEEDS	1.3	1.1
90 PERCENT EXCEEDS	1.2	.83
		1110
		2.2
		1.5
		.86
		.76
		32
		May 2 1965
		Jul 7 1977
		Apr 25 1983
		1965
		1990



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 mi².

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

GAGE.--Water-stage recorder and concrete control. Elevation of gage is 170 ft, from topographic map.

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

AVERAGE DISCHARGE.--18 years, 6.32 ft³/s (4,580 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,530 ft³/s, Mar. 21, 1991, gage height, 7.93 ft, from rating curve extended above 100 ft³/s on basis of slope area measurement at gage height 7.93 ft; minimum, 1.1 ft³/s, Apr. 7, 1977.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 280 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Oct. 16	0130	308	5.09	Sep. 3	0930	*780	*6.50

Minimum discharge, 3.8 ft³/s, Aug. 20.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1991 TO SEPTEMBER 1992
DAILY MEAN VALUES

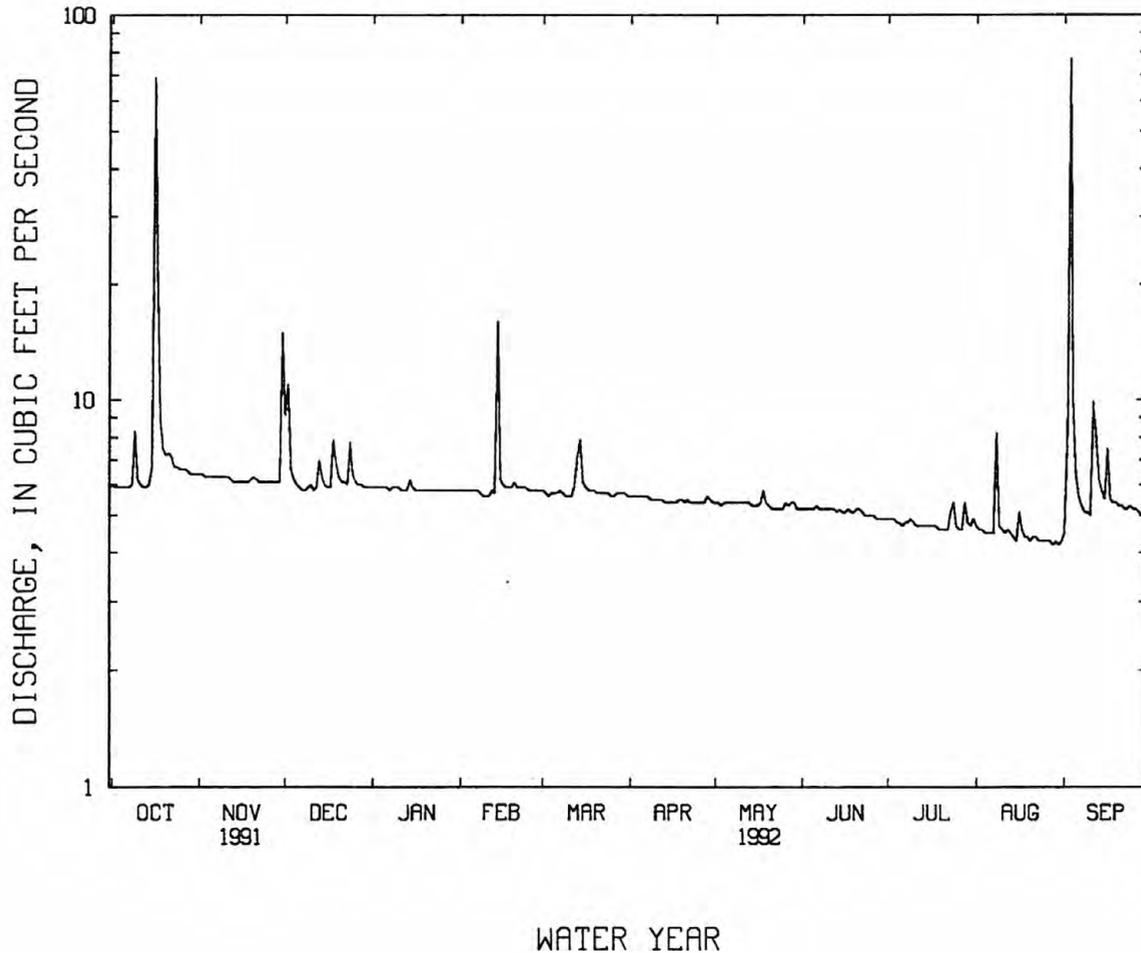
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	6.0	6.4	9.1	5.9	5.8	5.8	5.6	5.4	5.2	4.9	4.7	4.5
2	5.9	6.4	11	5.9	5.8	5.7	5.6	5.4	5.2	4.9	4.6	8.1
3	5.9	6.3	6.6	5.9	5.8	5.6	5.6	5.3	5.2	4.9	4.6	77
4	5.9	6.3	6.2	5.9	5.8	5.7	5.6	5.4	5.2	4.8	4.5	9.9
5	5.9	6.3	6.0	5.9	5.8	5.7	5.6	5.4	5.2	4.8	4.5	6.4
6	5.9	6.3	5.9	5.9	5.8	5.7	5.6	5.4	5.3	4.7	4.5	5.6
7	5.9	6.3	5.8	5.8	5.8	5.8	5.6	5.4	5.2	4.8	4.5	5.3
8	6.0	6.3	5.8	5.9	5.7	5.7	5.5	5.4	5.2	4.8	8.2	5.1
9	8.3	6.3	5.9	5.9	5.6	5.6	5.5	5.4	5.2	4.9	4.7	5.1
10	6.2	6.3	6.0	5.9	5.6	5.6	5.5	5.4	5.2	4.8	4.6	5.0
11	6.0	6.3	5.8	5.8	5.6	5.6	5.5	5.4	5.2	4.7	4.5	9.9
12	5.9	6.2	5.9	5.8	5.8	5.9	5.5	5.4	5.2	4.7	4.6	8.0
13	5.9	6.1	7.0	5.8	5.7	7.1	5.4	5.4	5.1	4.7	4.5	6.2
14	6.0	6.1	6.3	6.2	16	7.9	5.4	5.3	5.2	4.7	4.4	5.8
15	6.7	6.1	6.0	5.9	6.2	6.1	5.4	5.3	5.1	4.7	4.3	5.5
16	69	6.1	5.9	5.8	6.0	5.9	5.4	5.3	5.1	4.7	5.1	7.5
17	20	6.1	5.9	5.8	5.9	5.8	5.4	5.4	5.2	4.7	4.6	5.5
18	8.9	6.1	7.9	5.8	5.9	5.8	5.5	5.8	5.1	4.7	4.4	5.4
19	7.5	6.2	6.9	5.8	5.9	5.8	5.5	5.4	5.1	4.6	4.4	5.4
20	7.2	6.3	6.3	5.8	6.1	5.7	5.4	5.3	5.2	4.6	4.3	5.3
21	7.3	6.2	6.1	5.8	5.9	5.7	5.5	5.2	5.2	4.6	4.4	5.3
22	7.1	6.1	6.1	5.8	5.9	5.7	5.4	5.2	5.1	4.6	4.4	5.2
23	6.7	6.1	6.0	5.8	5.9	5.7	5.4	5.2	5.0	5.1	4.3	5.2
24	6.7	6.1	7.8	5.8	5.9	5.7	5.4	5.2	5.0	5.4	4.3	5.3
25	6.6	6.1	6.4	5.8	5.8	5.6	5.4	5.2	5.0	4.7	4.3	5.2
26	6.6	6.1	6.1	5.8	5.8	5.6	5.4	5.4	5.0	4.6	4.3	5.2
27	6.6	6.1	6.0	5.8	5.8	5.7	5.4	5.3	4.9	4.6	4.3	5.1
28	6.5	6.1	6.0	5.8	5.8	5.7	5.6	5.4	4.9	5.4	4.2	5.0
29	6.4	6.1	5.9	5.8	5.8	5.7	5.5	5.4	4.9	4.8	4.3	5.0
30	6.4	15	5.9	5.8	---	5.7	5.4	5.2	4.9	4.7	4.2	4.9
31	6.4	---	5.9	5.8	---	5.6	---	5.2	---	4.9	4.3	---
TOTAL	278.3	194.8	200.4	181.2	179.2	180.9	164.5	165.8	153.5	148.5	141.8	247.9
MEAN	8.98	6.49	6.46	5.85	6.18	5.84	5.48	5.35	5.12	4.79	4.57	8.26
MAX	69	15	11	6.2	16	7.9	5.6	5.8	5.3	5.4	8.2	77
MIN	5.9	6.1	5.8	5.8	5.6	5.6	5.4	5.2	4.9	4.6	4.2	4.5
AC-FT	552	386	397	359	355	359	326	329	304	295	281	492

16284200 WAIHEE STREAM NEAR KAHALUU--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1975 - 1992, BY WATER YEAR (WY)

MEAN	6.02	6.67	6.69	6.84	6.49	7.63	6.41	6.04	5.75	5.80	5.76	5.69
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 1991 CALENDAR YEAR	FOR 1992 WATER YEAR		WATER YEARS 1975 - 1992	
ANNUAL TOTAL	2920.2	2236.8		
ANNUAL MEAN	8.00	6.11	6.32	
HIGHEST ANNUAL MEAN			9.36	1982
LOWEST ANNUAL MEAN			3.32	1977
HIGHEST DAILY MEAN	149	77	149	Mar 19 1991
LOWEST DAILY MEAN	5.8	4.2	1.3	Apr 15 1977
ANNUAL SEVEN-DAY MINIMUM	5.9	4.3	1.4	Apr 12 1977
ANNUAL RUNOFF (AC-FT)	5790	4440	4580	
10 PERCENT EXCEEDS	7.7	6.4	7.6	
50 PERCENT EXCEEDS	6.4	5.7	5.6	
90 PERCENT EXCEEDS	5.9	4.7	3.7	



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 Waikēke Stream, 0.7 mi west of Waikane, and 1.2 mi northwest of Waiahole School.

DRAINAGE AREA.--2.22 mi².

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

REVISED RECORDS.--WSP 1937: Drainage area.

GAGE.--Water-stage recorder and concrete control. Elevation of gage is 75 ft, from topographic map.

REMARKS.--Records fair.

AVERAGE DISCHARGE.--32 years (water years 1961-92), 8.88 ft³/s (6,430 acre-ft/yr).

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

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 700 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Oct. 16	1200	2,430	7.50	Sept. 3	1000	*2,700	*7.79

Minimum discharge, 1.9 ft³/s, Aug. 11.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1991 TO SEPTEMBER 1992
DAILY MEAN VALUES

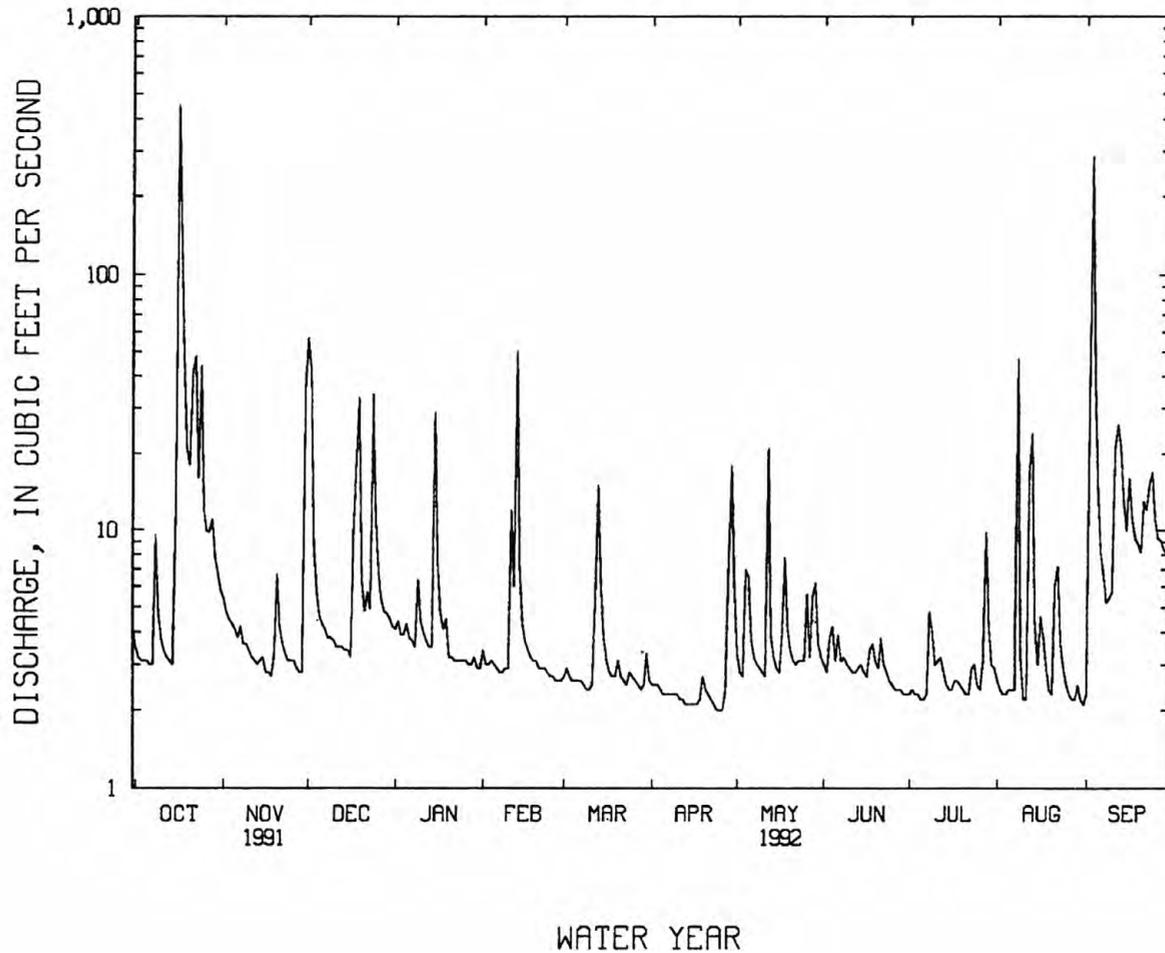
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3.5	5.4	57	4.1	3.4	2.7	2.5	3.3	3.0	2.3	2.6	2.3
2	3.2	4.8	42	4.4	3.0	2.9	2.5	2.8	2.8	2.4	2.4	37
3	3.1	4.5	8.7	3.9	3.0	2.7	2.5	2.7	3.8	2.3	2.3	287
4	3.1	4.3	5.7	3.9	3.1	2.6	2.4	7.0	4.2	2.3	2.3	36
5	3.1	4.1	4.6	4.3	3.0	2.6	2.3	6.5	3.1	2.2	2.4	14
6	3.0	3.8	4.3	3.8	2.9	2.6	2.3	3.7	3.9	2.2	2.4	8.2
7	3.0	4.2	4.1	3.7	2.8	2.6	2.3	3.2	3.1	2.3	2.4	6.7
8	9.6	3.6	3.8	3.5	2.8	2.5	2.3	3.0	3.2	4.8	47	5.2
9	4.9	3.6	3.8	6.4	2.9	2.4	2.3	2.9	3.0	4.1	3.2	5.4
10	3.8	3.4	3.7	4.4	2.9	2.4	2.3	2.8	2.9	3.0	2.2	5.7
11	3.4	3.2	3.5	4.0	12	2.5	2.2	2.7	2.8	3.1	2.2	21
12	3.2	3.1	3.5	3.7	6.0	5.1	2.2	21	2.8	3.2	17	26
13	3.1	3.0	3.5	3.5	50	15	2.1	3.9	2.9	2.8	24	21
14	3.0	3.1	3.4	3.5	7.1	6.0	2.1	3.2	3.0	2.5	4.4	13
15	12	3.2	3.4	29	4.3	3.8	2.1	2.9	2.8	2.4	3.0	10
16	453	2.8	3.2	7.5	3.7	3.1	2.1	2.8	2.7	2.4	4.6	16
17	144	2.8	9.9	4.8	3.4	2.8	2.1	3.9	3.4	2.6	3.8	11
18	47	2.7	19	4.1	3.2	2.7	2.2	7.8	3.6	2.6	2.9	9.3
19	21	3.3	33	4.5	3.1	2.7	2.7	4.2	3.1	2.5	2.4	8.8
20	18	6.7	6.4	3.2	3.1	3.1	2.4	3.4	2.9	2.4	2.3	8.2
21	41	4.2	4.8	3.2	2.9	2.7	2.3	3.1	3.8	2.3	6.1	13
22	48	3.6	5.7	3.1	2.9	2.6	2.2	3.0	3.0	2.3	7.2	12
23	16	3.3	4.9	3.1	2.9	2.5	2.1	3.1	2.8	2.9	3.6	15
24	44	3.1	34	3.1	2.8	2.8	2.0	3.1	2.6	3.0	2.9	17
25	12	3.1	11	3.1	2.7	2.7	2.0	3.1	2.5	2.5	2.5	11
26	9.9	3.1	6.7	3.1	2.7	2.6	2.0	5.6	2.4	2.4	2.3	9.3
27	9.8	2.9	5.3	3.0	2.6	2.5	2.4	3.2	2.4	3.1	2.2	9.1
28	11	2.8	4.8	3.0	2.6	2.4	7.2	5.5	2.4	9.8	2.2	8.4
29	7.8	2.8	4.7	3.2	2.6	2.5	18	6.2	2.3	4.3	2.5	8.1
30	6.7	36	4.5	2.9	---	3.3	6.0	3.6	2.3	3.0	2.2	7.5
31	5.8	---	4.2	2.9	---	2.6	---	3.2	---	2.9	2.1	---
TOTAL	960.0	140.5	317.1	143.9	150.4	102.0	92.1	136.4	89.5	92.9	171.6	662.2
MEAN	31.0	4.68	10.2	4.64	5.19	3.29	3.07	4.40	2.98	3.00	5.54	22.1
MAX	453	36	57	29	50	15	18	21	4.2	9.8	47	287
MIN	3.0	2.7	3.2	2.9	2.6	2.4	2.0	2.7	2.3	2.2	2.1	2.3
AC-FT	1900	279	629	285	298	202	183	271	178	184	340	1310

16294900 WAIKANE STREAM AT ALTITUDE 75 FT, AT WAIKANE--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1960 - 1992, BY WATER YEAR (WY)

MEAN	6.91	11.8	10.0	11.3	11.5	13.1	10.7	9.04	5.55	6.41	5.45	4.99
MAX	31.0	55.7	44.1	45.6	60.3	53.1	49.3	29.3	16.2	30.2	25.0	22.1
(WY)	1992	1966	1988	1988	1969	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 1991 CALENDAR YEAR	FOR 1992 WATER YEAR		WATER YEARS 1960 - 1992	
ANNUAL TOTAL	4608.2		3058.6	
ANNUAL MEAN	12.6		8.36	
HIGHEST ANNUAL MEAN			8.88	
LOWEST ANNUAL MEAN			16.7	
HIGHEST DAILY MEAN	580	Mar 19	868	Feb 4 1965
LOWEST DAILY MEAN	1.9	May 22	1.1	Oct 17 1975
ANNUAL SEVEN-DAY MINIMUM	1.9	May 22	1.3	Sep 19 1984
ANNUAL RUNOFF (AC-FT)	9140		6430	
10 PERCENT EXCEEDS	16		14	
50 PERCENT EXCEEDS	4.3		4.2	
90 PERCENT EXCEEDS	2.4		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 mi².

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

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

GAGE.--Water-stage recorder and concrete-masonry control. Elevation of gage is 30 ft, from topographic map.

REMARKS.--Records fair. Waiahole tunnel diverts water from tributaries and tunnels at 800-ft elevation upstream. Recording rain gage located at station.

AVERAGE DISCHARGE.--33 years (water years 1960-92), 37.4 ft³/s (27,070 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 6,250 ft³/s, Mar. 20, 1991, gage height, 8.60 ft, from rating curve extended above 530 ft³/s on basis of computation of peak flow over submerged weir; minimum, 10 ft³/s, Sept. 17, 18, 20, 1961.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 1,600 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Oct. 16	0930	*2,590	*5.85	Sept. 3	1100	2,150	5.40

Minimum discharge, 14 ft³/s, Jun 29-30.

CORRECTIONS.--The maximum discharge for water year 1991 is 6,250 ft³/s, Mar. 20, 1991, gage height, 8.60 ft; the previously published figure was not the maximum.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1991 TO SEPTEMBER 1992
DAILY MEAN VALUES

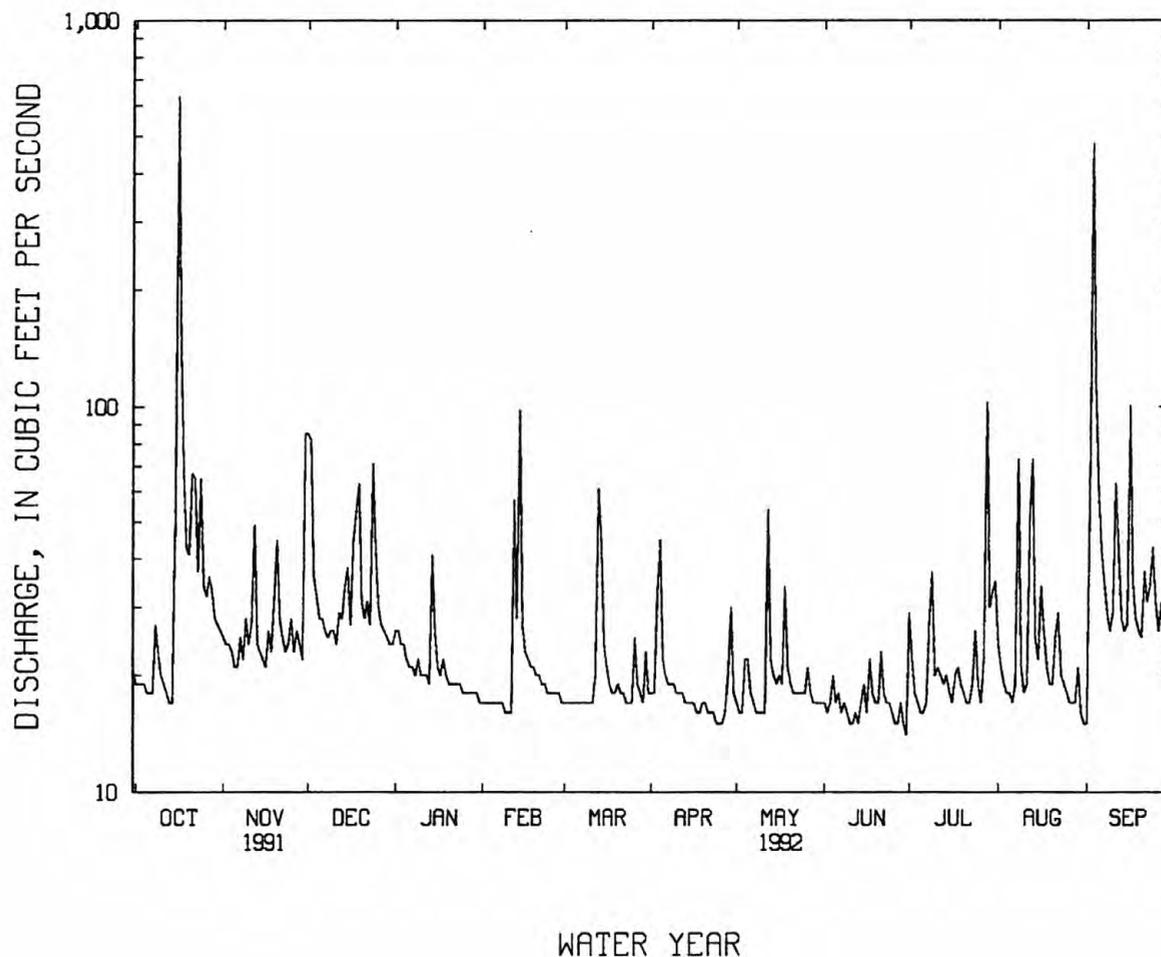
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	19	25	85	26	17	17	18	17	17	29	24	15
2	19	24	82	26	17	17	18	16	16	22	21	66
3	19	24	36	24	17	17	33	16	17	18	19	478
4	19	23	32	24	17	17	45	22	20	17	18	113
5	18	21	28	22	17	17	22	22	17	16	18	60
6	18	21	28	21	17	17	20	18	18	16	17	42
7	18	25	26	21	17	17	19	17	16	17	19	35
8	27	22	25	20	17	17	19	16	17	28	73	29
9	23	28	26	22	16	17	19	16	16	37	21	26
10	20	24	26	20	16	17	18	16	15	20	18	29
11	19	27	24	20	16	17	18	16	15	21	19	63
12	18	49	29	20	57	20	18	54	16	20	52	43
13	17	24	28	19	28	61	17	22	15	19	73	28
14	17	23	34	41	98	44	17	20	17	20	25	26
15	51	22	38	26	27	24	17	19	19	18	22	27
16	635	21	27	21	23	21	17	20	16	17	34	101
17	149	26	45	20	22	19	16	19	22	20	26	35
18	68	23	54	22	21	18	16	34	18	21	21	28
19	43	32	63	20	21	18	17	21	17	19	19	26
20	41	45	31	19	20	19	17	19	17	18	19	25
21	67	28	28	19	20	18	16	18	23	17	25	37
22	65	25	31	19	19	18	16	18	18	17	29	31
23	37	23	27	19	19	17	16	18	17	19	20	34
24	65	24	71	19	18	17	15	18	17	26	19	43
25	34	28	43	18	18	17	15	18	16	19	18	31
26	32	23	30	18	18	25	15	21	15	17	17	26
27	36	26	27	18	18	19	16	18	15	22	17	31
28	33	24	26	18	18	18	20	17	17	103	17	23
29	28	22	25	18	17	17	30	17	15	30	21	22
30	27	85	24	18	---	23	18	17	14	33	16	21
31	26	---	24	17	---	18	---	17	---	35	15	---
TOTAL	1708	837	1123	655	666	638	578	617	508	751	772	1594
MEAN	55.1	27.9	36.2	21.1	23.0	20.6	19.3	19.9	16.9	24.2	24.9	53.1
MAX	635	85	85	41	98	61	45	54	23	103	73	478
MIN	17	21	24	17	16	17	15	16	14	16	15	15
AC-FT	3390	1660	2230	1300	1320	1270	1150	1220	1010	1490	1530	3160

16296500 KAHANA STREAM AT ALTITUDE 30 FT, NEAR KAHANA--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1959 - 1992, BY WATER YEAR (WY)

MEAN	32.8	45.9	38.2	37.3	36.3	46.9	47.8	41.4	27.6	32.5	30.7	27.8
MAX	55.1	170	101	94.9	141	176	137	102	56.5	90.5	73.7	56.4
(WY)	1992	1991	1988	1988	1969	1982	1963	1965	1978	1987	1978	1986
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 1991 CALENDAR YEAR			FOR 1992 WATER YEAR			WATER YEARS 1959 - 1992		
ANNUAL TOTAL	16044		10447			37.4		
ANNUAL MEAN	44.0		28.5			67.2		
HIGHEST ANNUAL MEAN						20.1		
LOWEST ANNUAL MEAN						1982		
HIGHEST DAILY MEAN	1330	Mar 19	635	Oct 16	1750	Apr 15	1963	
LOWEST DAILY MEAN	17	Oct 13	14	Jun 30	11	Sep 16	1961	
ANNUAL SEVEN-DAY MINIMUM	19	Oct 1	16	Apr 21	11	Oct 16	1984	
ANNUAL RUNOFF (AC-FT)	31820		20720			27070		
10 PERCENT EXCEEDS	58		42			59		
50 PERCENT EXCEEDS	26		20			23		
90 PERCENT EXCEEDS	20		17			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.--39 years, 7.59 ft³/s (5,500 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 54 ft³/s, Oct. 31, 1964; no flow at times.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 19 ft³/s, Sep. 5; minimum daily, 4.0 ft³/s, Oct. 16.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1991 TO SEPTEMBER 1992
DAILY MEAN VALUES

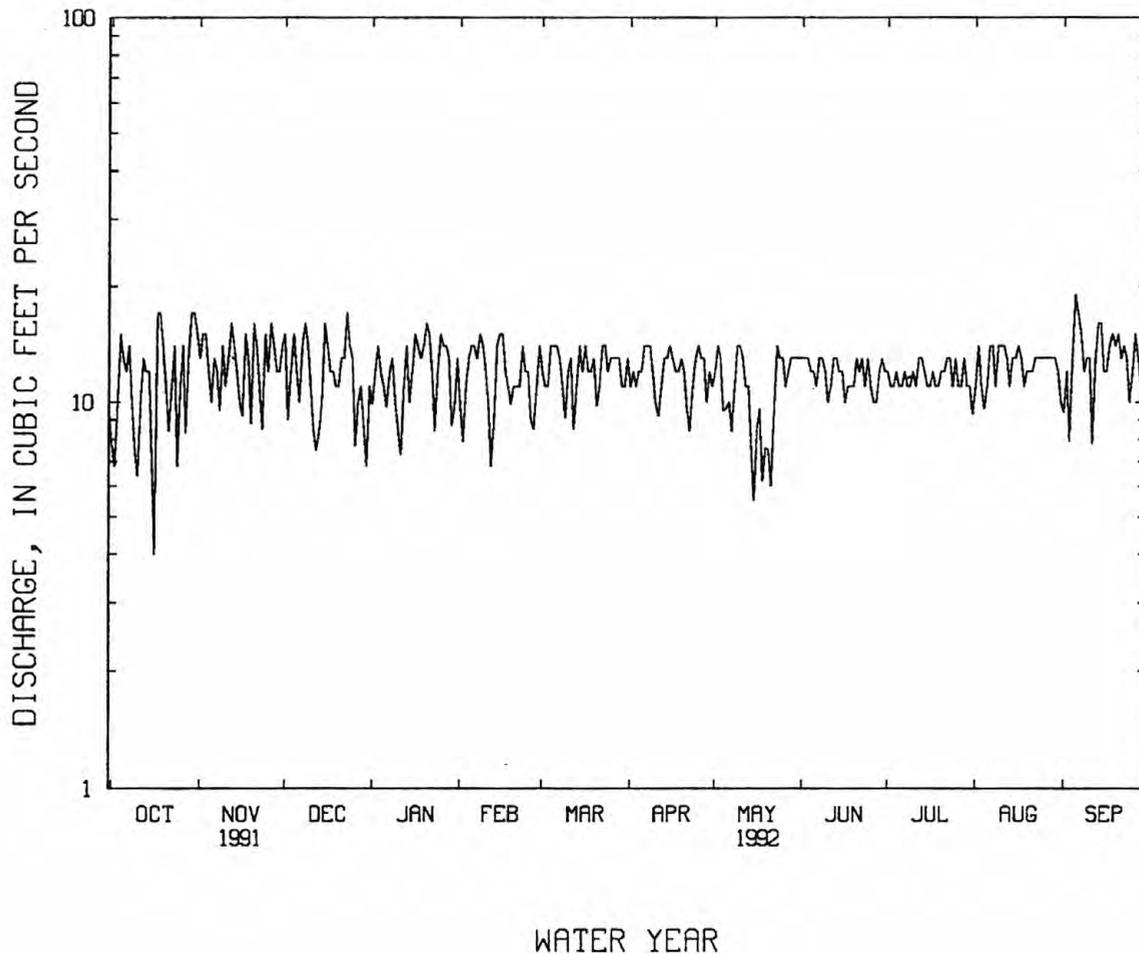
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	7.8	13	15	9.9	9.8	12	11	12	13	12	11	9.4
2	6.8	15	9.0	12	7.9	11	12	14	13	11	14	12
3	10	15	12	14	11	11	11	13	13	11	11	7.9
4	15	12	15	12	13	14	12	9.5	12	12	9.6	13
5	13	10	12	11	14	14	12	9.6	12	11	11	19
6	12	13	10	9.7	14	14	14	10	11	11	14	17
7	14	12	14	12	13	13	14	8.4	13	12	14	15
8	10	9.5	16	13	15	11	14	11	13	11	11	12
9	7.6	14	14	10	14	9.1	12	14	12	11	14	13
10	6.4	11	11	8.5	12	12	10	14	10	12	14	13
11	9.8	13	8.5	7.3	9.8	13	9.2	13	11	11	14	7.8
12	13	16	7.5	11	6.8	8.5	11	11	13	13	13	13
13	12	14	8.3	14	8.8	11	13	11	13	13	11	16
14	12	12	10	10	14	14	13	7.6	12	12	13	16
15	7.2	10	16	12	15	12	14	5.5	12	11	13	12
16	4.0	9.2	14	15	15	14	13	8.6	10	11	14	12
17	17	15	12	14	12	12	12	9.6	11	12	13	14
18	17	13	12	13	11	12	12	6.2	11	11	11	15
19	14	8.8	11	14	9.9	13	13	7.6	11	11	12	14
20	11	16	11	16	11	9.8	12	7.5	13	12	12	15
21	8.4	14	13	15	11	11	9.6	6.0	12	12	12	13
22	11	11	13	12	11	14	8.4	9.7	13	13	13	14
23	14	8.5	17	8.4	14	14	11	14	11	13	13	13
24	6.8	15	14	12	12	12	13	13	13	11	13	10
25	11	12	13	15	12	13	14	13	11	13	13	12
26	14	16	7.7	14	9.1	13	13	11	10	11	13	15
27	8.3	14	10	14	8.5	13	13	12	10	11	13	13
28	13	12	11	13	11	13	10	13	12	13	13	11
29	17	12	8.6	8.7	14	11	12	13	13	11	13	10
30	17	14	6.8	9.7	---	11	11	13	12	11	12	12
31	15	---	11	13	---	13	---	13	---	9.3	10	---
TOTAL	355.1	380.0	363.4	373.2	339.6	378.4	359.2	333.8	356	359.3	387.6	389.1
MEAN	11.5	12.7	11.7	12.0	11.7	12.2	12.0	10.8	11.9	11.6	12.5	13.0
MAX	17	16	17	16	15	14	14	14	13	13	14	19
MIN	4.0	8.5	6.8	7.3	6.8	8.5	8.4	5.5	10	9.3	9.6	7.8
AC-FT	704	754	721	740	674	751	712	662	706	713	769	772

16302000 PUNALUU DITCH NEAR PUNALUU--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1953 - 1992, BY WATER YEAR (WY)

MEAN	8.62	6.82	5.16	4.92	4.93	6.01	7.75	8.26	9.37	9.80	10.0	9.72
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 1991 CALENDAR YEAR	FOR 1992 WATER YEAR		WATER YEARS 1953 - 1992	
ANNUAL TOTAL	4100.6	4374.7		
ANNUAL MEAN	11.2	12.0	7.59	
HIGHEST ANNUAL MEAN			15.2	1964
LOWEST ANNUAL MEAN			.23	1981
HIGHEST DAILY MEAN	29	19	54	Oct 31 1964
LOWEST DAILY MEAN	2.2	4.0	.00	Dec 7 1963
ANNUAL SEVEN-DAY MINIMUM	6.1	7.3	.00	Jan 5 1969
ANNUAL RUNOFF (AC-FT)	8130	8680	5500	
10 PERCENT EXCEEDS	15	14	17	
50 PERCENT EXCEEDS	11	12	5.4	
90 PERCENT EXCEEDS	7.0	8.8	.15	



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 mi².

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

REMARKS.--Records poor. Records do not include flow of Punaluu ditch (see station 16302000).

AVERAGE DISCHARGE.--39 years, 17.6 ft³/s (12,780 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 6,900 ft³/s, Mar. 20, 1991, gage height, 8.02 ft, from rating curve extended above 170 ft³/s on basis of slope-area measurements at gage heights 5.77 ft and 7.60 ft; no flow at times.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 930 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Sometime during Oct. 16	--	1,500	unknown	No other peak greater than base discharge.			

Minimum discharge, not determined.

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	e10	e8.0	e29	e12	e7.2	e5.0	e6.0	e5.0	e2.5	e7.0	e7.0	e2.6
2	e11	e6.0	e34	e10	e9.1	e6.0	e5.0	e2.0	e2.0	e5.0	e3.0	e23
3	e8.0	e6.0	e14	e7.0	e6.0	e6.0	e14	e3.0	e2.5	e3.0	e4.0	e215
4	e3.0	e8.0	e10	e9.0	e4.0	e3.0	e18	e10	e4.5	e2.0	e4.2	e41
5	e4.0	e9.0	e11	e9.0	e3.0	e3.0	e8.0	e10	e3.5	e2.0	e3.0	e14
6	e5.0	e6.0	e13	e9.3	e3.0	e3.0	e5.0	e7.0	e4.0	e2.0	e2.0	e9.0
7	e3.0	e9.0	e8.0	e7.0	e4.0	e4.0	e4.0	e8.6	e2.0	e2.0	e3.0	e8.0
8	e12	e10	e5.0	e6.0	e2.0	e6.0	e4.0	e5.0	e2.5	e8.0	e26	e8.0
9	e12	e9.0	e8.0	e10	e2.0	e7.9	e6.0	e2.0	e2.5	e12	e3.0	e6.0
10	e13	e10	e11	e10	e4.0	e5.0	e7.0	e2.0	e4.0	e1.8	e2.0	e7.0
11	e8.2	e9.0	e12	e12	e6.2	e4.0	e7.8	e3.0	e3.5	e2.1	e3.0	e26
12	e4.0	e16	e15	e8.0	e27	e10	e6.0	e22	e1.8	e1.8	e17	e13
13	e5.0	e7.0	e15	e4.0	e14	e25	e4.0	e9.0	e1.8	e1.6	e26	e4.0
14	e5.0	e8.0	e15	e18	e35	e16	e4.0	e11	e3.0	e2.5	e4.5	e3.0
15	e25	e10	e11	e10	e7.0	e9.0	e3.0	e12	e3.5	e2.0	e2.8	e7.0
16	e315	e9.8	e8.0	e4.0	e5.0	e5.0	e4.0	e10	e3.5	e2.0	e5.0	e36
17	e49	e7.0	e18	e5.0	e8.0	e6.0	e4.0	e8.4	e6.0	e2.5	e3.0	e9.0
18	e21	e7.0	e21	e7.0	e8.0	e5.0	e4.0	e19	e3.5	e3.0	e2.5	e5.0
19	e15	e16	e26	e5.0	e9.1	e4.0	e4.0	e11	e3.5	e2.8	e2.0	e5.0
20	e17	e14	e13	e2.0	e8.0	e8.2	e5.0	e10	e2.3	e1.7	e2.0	e3.0
21	e30	e9.0	e10	e3.0	e8.0	e6.0	e6.4	e11	e4.5	e1.7	e3.0	e11
22	e26	e10	e11	e6.0	e7.0	e3.0	e7.6	e5.0	e2.2	e1.5	e4.5	e7.0
23	e13	e11	e5.0	e9.6	e4.0	e3.0	e5.0	e2.0	e3.0	e1.7	e2.5	e9.0
24	e30	e6.0	e25	e6.0	e5.0	e5.0	e3.0	e2.5	e1.9	e7.0	e1.5	e16
25	e14	e11	e16	e2.0	e5.0	e4.0	e2.0	e2.5	e2.5	e2.5	e1.4	e9.0
26	e11	e4.0	e16	e3.0	e7.9	e8.0	e3.0	e6.0	e3.0	e3.0	e1.4	e4.0
27	e18	e8.0	e12	e3.0	e8.5	e5.0	e3.0	e3.0	e3.0	e6.0	e1.4	e7.0
28	e12	e9.0	e11	e4.0	e6.0	e4.0	e9.0	e2.5	e2.5	e35	e1.4	e6.0
29	e6.0	e8.0	e12	e8.3	e3.0	e6.0	e12	e2.5	e1.7	e10	e2.0	e7.0
30	e5.0	e30	e14	e7.3	---	e9.0	e6.0	e2.5	e1.7	e11	e1.4	e4.0
31	e7.0	---	e10	e4.0	---	e4.0	---	e2.5	---	e14	e2.0	---
TOTAL	717.2	290.8	439.0	220.5	226.0	198.1	179.8	212.0	88.4	160.2	147.5	524.6
MEAN	23.1	9.69	14.2	7.11	7.79	6.39	5.99	6.84	2.95	5.17	4.76	17.5
MAX	315	30	34	18	35	25	18	22	6.0	35	26	215
MIN	3.0	4.0	5.0	2.0	2.0	3.0	2.0	2.0	1.7	1.5	1.4	2.6
AC-FT	1420	577	871	437	448	393	357	421	175	318	293	1040

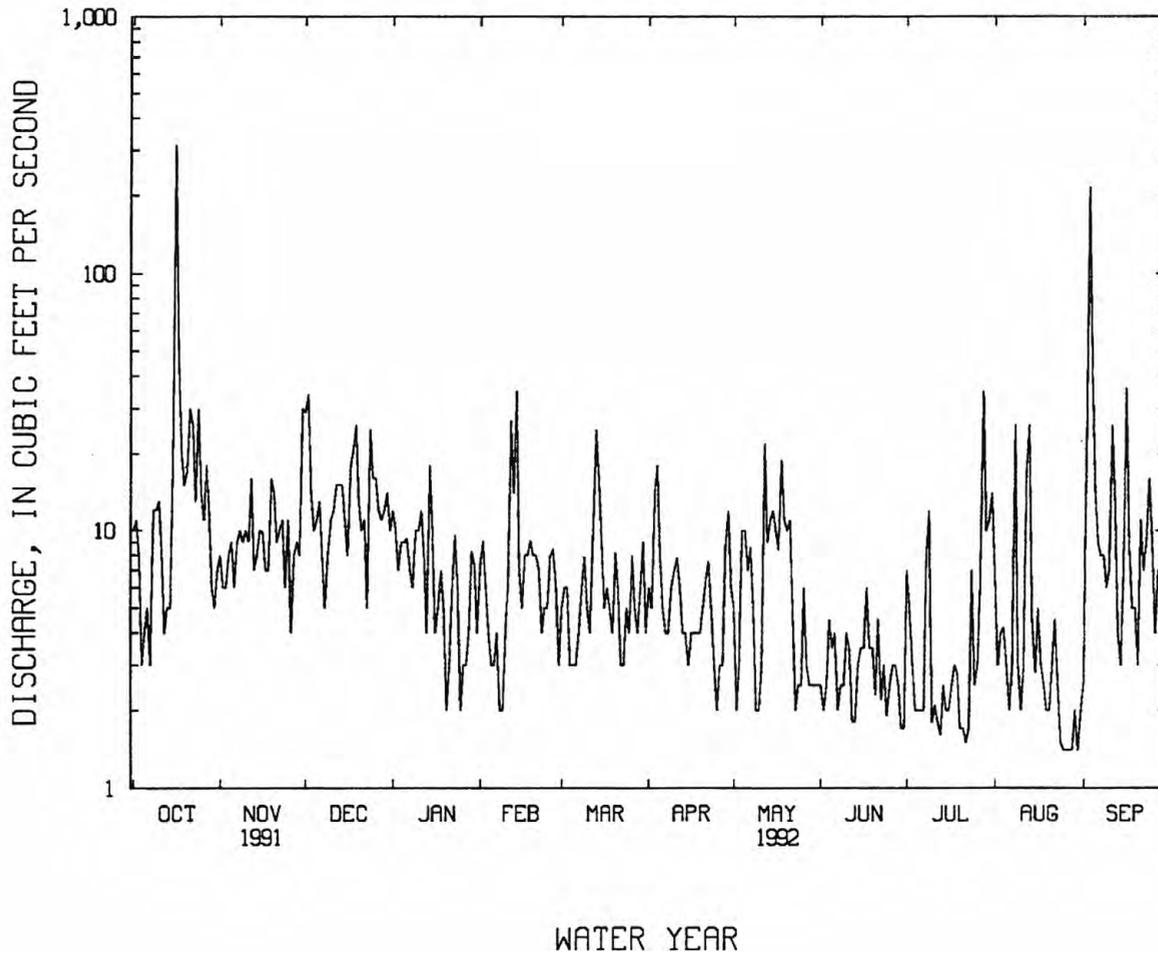
e Estimated

16303000 PUNALUU STREAM NEAR PUNALUU--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1953 - 1992, BY WATER YEAR (WY)

MEAN	14.4	21.1	21.8	22.0	21.9	23.4	23.2	18.4	11.8	12.5	11.8	10.0
MAX	38.7	74.7	64.5	40.9	76.3	73.1	84.6	64.9	35.4	39.0	36.9	29.6
(WY)	1959	1991	1965	1988	1969	1982	1963	1965	1982	1974	1982	1982
MIN	.28	4.58	.23	3.32	.58	5.70	2.37	1.00	.000	.000	.31	.49
(WY)	1958	1960	1960	1960	1964	1959	1954	1961	1953	1953	1961	1961

SUMMARY STATISTICS FOR 1991 CALENDAR YEAR	FOR 1992 WATER YEAR		WATER YEARS 1953 - 1992	
ANNUAL TOTAL	6874.5	3404.1		
ANNUAL MEAN	18.8	9.30	17.6	
HIGHEST ANNUAL MEAN			35.4	1982
LOWEST ANNUAL MEAN			.29	1953
HIGHEST DAILY MEAN	688	315	1010	Apr 15 1963
LOWEST DAILY MEAN	3.0	1.4	.00	Jun 1 1953
ANNUAL SEVEN-DAY MINIMUM	6.3	1.5	.00	Jun 1 1953
ANNUAL RUNOFF (AC-FT)	13640	6750	12780	
10 PERCENT EXCEEDS	25	16	31	
50 PERCENT EXCEEDS	12	6.0	13	
90 PERCENT EXCEEDS	7.0	2.0	2.2	



16304200 KALUANUI STREAM NEAR PUNALUU

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

DRAINAGE AREA.--1.11 mi².

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.--25 years, 4.42 ft³/s (3,210 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 2,390 ft³/s, Jan. 6, 1982, gage height, 11.90 ft, from rating curve extended above 14 ft³/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 ft³/s and maximum(*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Oct. 16	0845	*1,200	*10.06	No other peaks greater than base discharge.			

Minimum discharge, No flow, Mar. 9-11 and Apr. 14-19, 26.

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	.51	.51	19	2.5	.08	.02	.19	.58	.08	1.9	1.7	.47
2	.35	.43	13	4.4	.06	.12	.15	.38	.06	2.1	1.3	32
3	.30	.40	2.5	1.4	.86	.13	.81	.23	.79	1.1	1.9	59
4	.26	.53	2.3	6.7	.17	.08	.33	15	3.6	.83	1.3	9.6
5	.26	.95	1.7	1.3	1.8	1.1	.15	4.9	.45	.52	3.0	6.8
6	.24	.37	1.8	.77	1.2	.26	.10	.82	1.1	.44	1.3	4.1
7	.49	3.4	1.9	.60	.50	.08	.07	.48	.33	.36	11	4.4
8	12	1.1	.81	4.8	.16	.04	.06	.40	2.0	7.8	11	2.2
9	1.0	1.1	.73	3.6	.08	.01	.05	.45	.49	7.4	1.6	3.0
10	.44	.98	1.3	.86	.05	.00	.09	.43	.28	1.2	1.3	1.8
11	.27	3.5	1.8	.79	.04	.00	.11	.33	.23	1.1	1.5	26
12	.20	5.7	.64	.53	13	10	.06	1.9	3.2	2.0	7.8	6.5
13	.17	.56	27	.38	5.6	23	.02	.57	1.3	1.1	4.7	1.8
14	.15	.43	18	27	33	10	.00	.30	4.4	.72	1.5	4.6
15	9.0	.30	4.0	4.0	1.7	1.5	.00	.22	2.1	.47	1.2	2.1
16	142	.20	1.5	1.1	.85	.85	.00	.17	.65	.42	8.0	11
17	13	1.5	12	.69	.50	.52	.00	3.1	3.5	2.2	4.5	2.7
18	3.7	1.6	12	4.5	.33	.31	.00	11	2.4	4.4	1.5	1.6
19	1.5	6.2	11	1.1	.25	.23	2.4	1.0	1.4	.97	1.1	1.3
20	1.2	7.1	1.7	.47	.27	4.5	1.3	.43	1.2	.89	.92	1.0
21	14	4.4	4.3	.37	.18	.94	.71	.28	2.2	3.7	.90	1.1
22	10	1.9	8.4	.30	.13	.32	.19	.20	.90	3.5	6.5	9.4
23	1.7	.98	4.1	.30	.10	.19	.08	.19	1.3	15	1.3	7.6
24	11	2.1	24	.22	.07	2.9	.03	.29	1.4	5.4	1.0	4.3
25	1.4	2.8	14	.18	.11	.99	.01	.45	1.5	1.3	.74	2.0
26	1.6	.99	2.9	.16	.08	2.7	.00	2.5	.80	1.0	.60	1.2
27	5.5	.75	1.6	.14	.05	.68	2.0	.37	.73	2.5	.51	3.5
28	3.0	.93	1.4	.12	.03	.25	12	.22	1.1	14	.49	1.1
29	1.3	.45	1.4	.11	.02	.23	9.6	.18	.56	2.1	1.2	.84
30	.80	19	.94	.11	---	1.3	1.7	.25	.37	3.8	.68	.69
31	.63	---	.97	.16	---	.45	---	.12	---	6.3	.39	---
TOTAL	237.97	71.16	198.69	69.66	61.27	63.70	32.21	47.74	40.42	96.52	82.43	213.70
MEAN	7.68	2.37	6.41	2.25	2.11	2.05	1.07	1.54	1.35	3.11	2.66	7.12
MAX	142	19	27	27	33	23	12	15	4.4	15	11	59
MIN	.15	.20	.64	.11	.02	.00	.00	.12	.06	.36	.39	.47
AC-FT	472	141	394	138	122	126	64	95	80	191	163	424

16304200 KALUANUI STREAM NEAR PUNALUU--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1967 - 1992, BY WATER YEAR (WY)

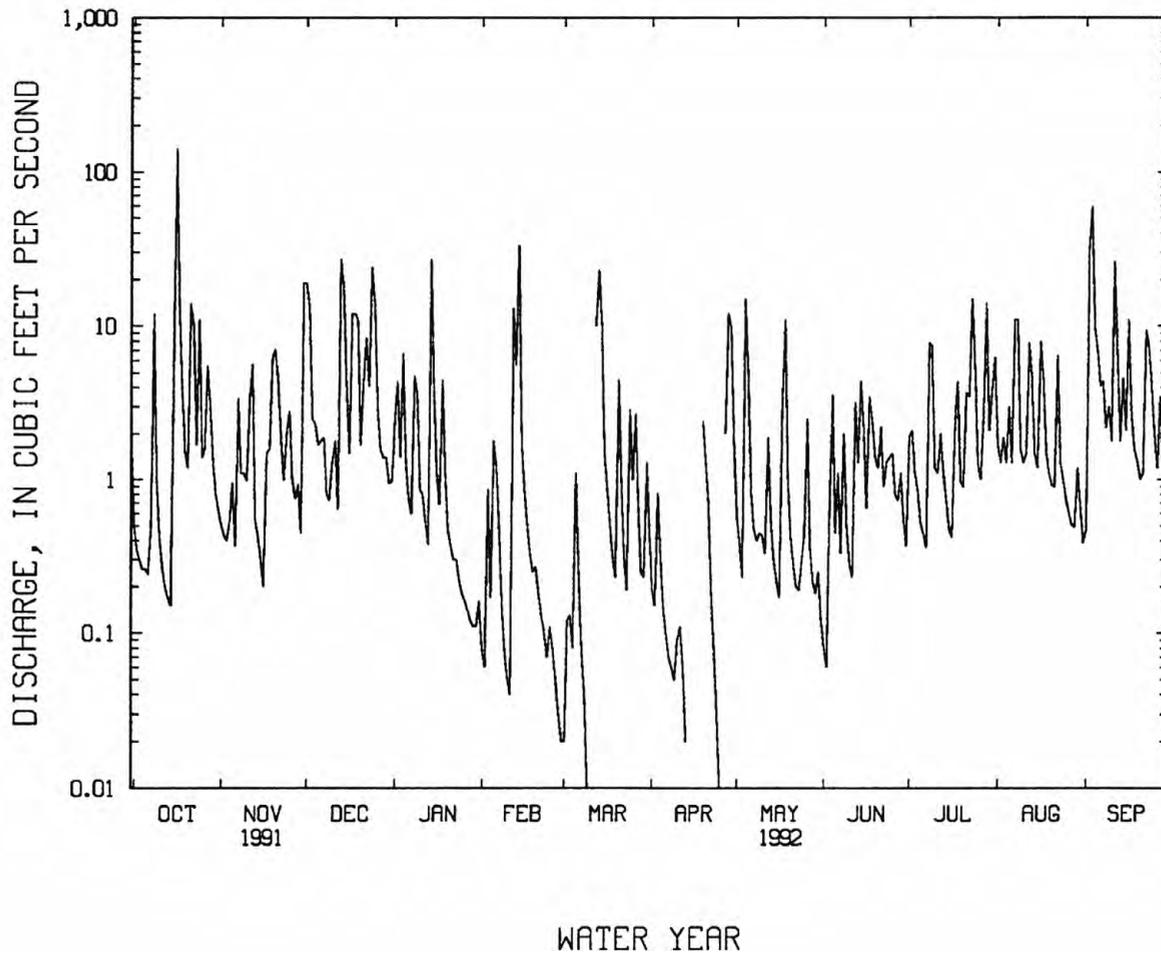
MEAN	3.44	5.91	5.14	5.31	4.61	6.16	5.97	3.93	2.77	3.99	3.29	2.84
MAX	7.68	19.0	17.7	17.9	19.7	32.2	19.3	7.93	7.72	11.7	8.37	8.04
(WY)	1992	1991	1988	1988	1979	1982	1989	1988	1987	1982	1991	1986
MIN	.27	1.66	.48	.26	.41	.14	.87	.85	.61	.21	.53	.22
(WY)	1985	1981	1977	1986	1983	1983	1979	1991	1981	1971	1984	1975

SUMMARY STATISTICS FOR 1991 CALENDAR YEAR

FOR 1992 WATER YEAR

WATER YEARS 1967 - 1992

ANNUAL TOTAL	1836.59			1215.47								
ANNUAL MEAN	5.03			3.32					4.42			
HIGHEST ANNUAL MEAN									9.94			1982
LOWEST ANNUAL MEAN									2.04			1984
HIGHEST DAILY MEAN	174	Mar 19		142	Oct 16				230			Feb 1 1969
LOWEST DAILY MEAN	.10	Feb 11		.00	Mar 10				.00			Jul 24 1971
ANNUAL SEVEN-DAY MINIMUM	.21	Feb 5		.01	Apr 12				.00			Sep 14 1975
ANNUAL RUNOFF (AC-FT)	3640			2410					3210			
10 PERCENT EXCEEDS	12			9.1					9.5			
50 PERCENT EXCEEDS	1.5			1.0					1.4			
90 PERCENT EXCEEDS	.35			.11					.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 mi².

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.--29 years, 10.5 ft³/s (7,620 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 16,800 ft³/s, Nov. 20, 1990, gage height, 15.84 ft, from rating curve extended above 150 ft³/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 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Oct. 16	1500	*1,460	*8.15	No other peak greater than base discharge.			

Minimum discharge, 0.02 ft³/s, June 6 and 7.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1991 TO SEPTEMBER 1992
DAILY MEAN VALUES

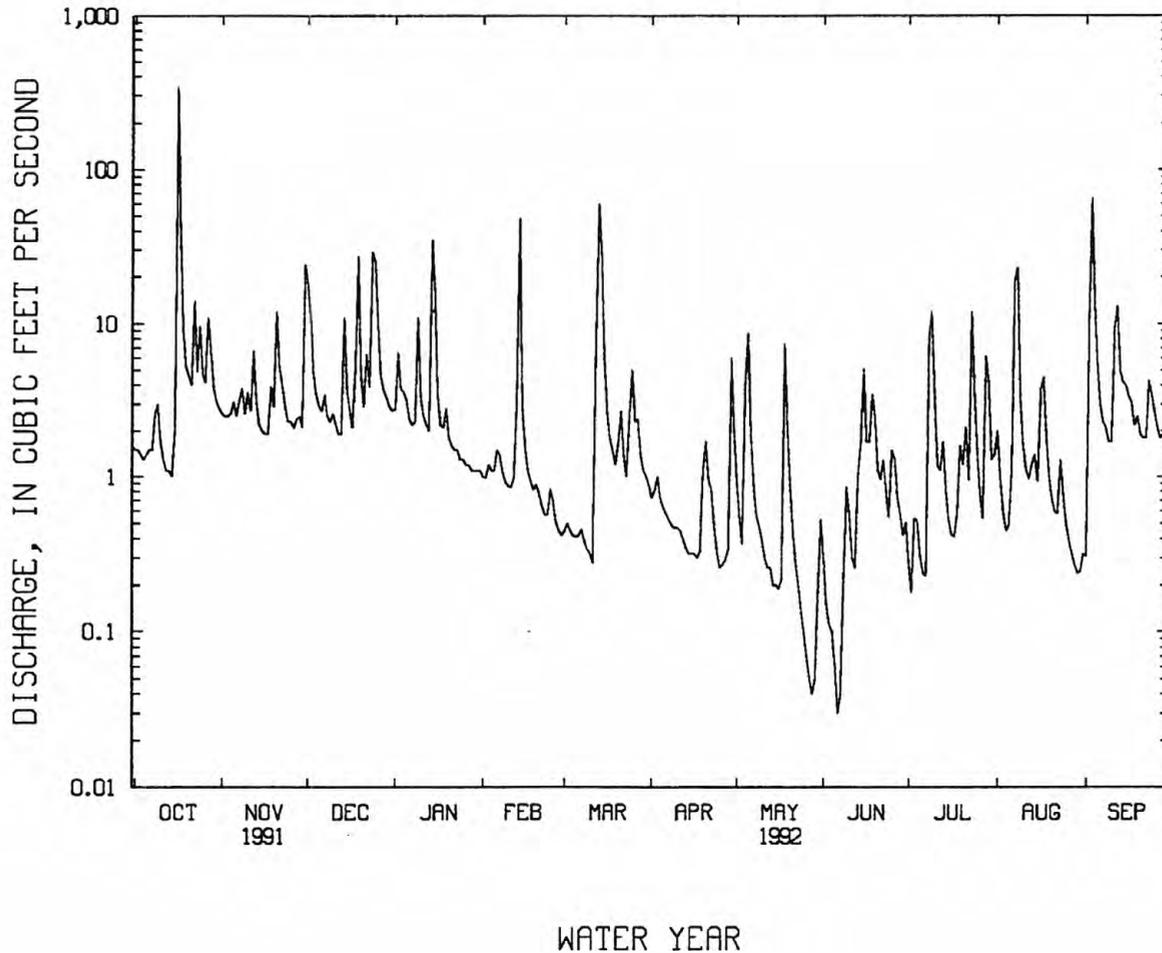
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.5	2.6	18	2.8	1.0	.45	.73	.93	.30	.28	2.0	.31
2	1.5	2.5	11	6.5	.98	.50	.81	.55	.15	.18	.98	11
3	1.4	2.5	4.8	3.8	1.2	.45	1.0	.37	.11	.54	.60	65
4	1.3	2.6	3.4	3.6	1.1	.42	.73	4.0	.10	.52	.45	13
5	1.4	3.1	2.9	3.2	1.1	.41	.64	8.7	.06	.31	.49	5.3
6	1.5	2.5	2.7	2.4	1.5	.42	.58	1.8	.03	.24	1.1	3.0
7	1.5	3.2	3.5	2.2	1.4	.46	.53	.88	.04	.23	19	2.3
8	2.6	3.8	2.5	2.3	1.1	.38	.49	.56	.20	8.1	23	2.1
9	3.0	2.6	2.3	11	.93	.34	.47	.48	.85	12	3.2	1.7
10	1.7	3.6	2.6	3.3	.87	.32	.47	.39	.58	3.6	1.6	1.7
11	1.3	2.7	2.2	2.5	.85	.28	.45	.30	.30	1.2	1.1	9.4
12	1.1	6.7	1.9	2.2	.98	7.1	.40	.26	.26	1.1	.97	13
13	1.1	3.1	1.9	2.0	3.0	60	.35	.26	1.0	1.7	1.2	4.9
14	1.0	2.2	11	35	48	27	.32	.20	1.7	.80	1.4	4.2
15	2.0	2.0	3.7	16	3.0	5.8	.32	.20	5.1	.53	.93	4.0
16	338	1.9	2.8	3.4	1.6	2.6	.32	.19	1.7	.43	3.8	3.4
17	41	1.9	2.1	2.2	1.1	1.8	.30	.22	1.7	.41	4.5	3.1
18	9.4	3.9	5.2	2.1	.94	1.5	.33	7.4	3.5	.56	1.8	2.2
19	5.3	2.9	27	2.8	.82	1.2	1.1	2.2	2.5	1.6	1.0	2.5
20	4.6	12	4.7	1.8	.89	1.7	1.7	.87	1.1	1.2	.73	1.9
21	4.0	5.2	2.9	1.6	.78	2.7	.95	.45	.96	2.1	.60	1.8
22	14	4.0	6.3	1.5	.65	1.4	.83	.28	1.3	.95	.58	1.8
23	4.9	2.9	3.9	1.5	.57	1.0	.50	.20	.81	12	1.3	4.3
24	9.7	2.3	29	1.3	.57	2.5	.33	.14	.55	3.4	.76	3.5
25	4.7	2.3	25	1.3	.83	5.0	.26	.10	1.5	1.4	.49	2.7
26	4.2	2.1	9.6	1.2	.70	2.3	.27	.07	1.3	.75	.38	2.1
27	11	2.4	4.6	1.2	.51	2.4	.29	.05	.73	.54	.32	1.8
28	6.5	2.5	3.7	1.1	.45	1.4	.34	.04	.57	6.2	.27	1.9
29	3.8	2.1	3.3	1.1	.42	1.1	6.0	.05	.42	4.2	.24	1.7
30	3.1	24	2.9	1.1	---	1.0	2.0	.17	.51	1.3	.25	1.5
31	2.8	---	2.7	1.1	---	.88	---	.53	---	1.4	.32	---
TOTAL	490.9	118.1	210.1	125.1	77.84	134.81	23.81	32.84	29.93	69.77	75.36	177.11
MEAN	15.8	3.94	6.78	4.04	2.68	4.35	.79	1.06	1.00	2.25	2.43	5.90
MAX	338	24	29	35	48	60	6.0	8.7	5.1	12	23	65
MIN	1.0	1.9	1.9	1.1	.42	.28	.26	.04	.03	.18	.24	.31
AC-FT	974	234	417	248	154	267	47	65	59	138	149	351

16325000 KAMANANUI STREAM AT PUPUKEA MILITARY ROAD, NEAR MAUNAWAI--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1963 - 1992, BY WATER YEAR (WY)

MEAN	7.06	16.4	13.5	15.2	12.4	16.7	14.6	8.55	4.81	7.88	5.34	3.81
MAX	16.3	68.6	44.8	75.8	64.2	77.3	53.6	30.5	20.1	20.2	19.7	8.87
(WY)	1966	1966	1965	1988	1969	1968	1989	1965	1978	1982	1982	1988
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 1991 CALENDAR YEAR	FOR 1992 WATER YEAR	WATER YEARS 1963 - 1992
ANNUAL TOTAL	3369.8	1565.67
ANNUAL MEAN	9.23	4.28
HIGHEST ANNUAL MEAN		10.5
LOWEST ANNUAL MEAN		22.1
HIGHEST DAILY MEAN	565 Mar 19	338 Oct 16
LOWEST DAILY MEAN	1.0 Oct 14	.03 Jun 6
ANNUAL SEVEN-DAY MINIMUM	1.4 Oct 1	.09 May 24
ANNUAL RUNOFF (AC-FT)	6680	3110
10 PERCENT EXCEEDS	13	6.5
50 PERCENT EXCEEDS	3.3	1.5
90 PERCENT EXCEEDS	1.9	.30
		7620
		20
		3.3
		.60
		4.09
		1982
		1984
		Nov 20 1990
		Aug 27 1971
		Oct 15 1971



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 Waiialua School, and 7.3 mi southwest of Kahuku School.

DRAINAGE AREA.--12.36 mi², 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.--Station destroyed by flood of Nov. 20, 1990

REMARKS.--Records poor. Small diversion upstream.

AVERAGE DISCHARGE.--34 years, 18.7 ft³/s (13,560 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 16,800 ft³/s, Nov. 20, 1990, gage height, 15.84 ft, from rating curve extended above 150 ft³/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 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Oct. 16	--	unknown	unknown				

Minimum discharge, observed no flow, June 2 and also may have been on May 25-29, and June 3-7.

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	e1.3	e2.6	e32	e2.9	e.77	e.27	e.51	e.70	e.05	e.15	e1.9	e.17
2	e1.3	e2.5	e17	e8.7	e.75	e.31	e.59	e.35	e.00	e.08	e.75	e17
3	e1.2	e2.5	e7.0	e4.3	e1.0	e.27	e.77	e.21	e.00	e.35	e.60	e170
4	e1.1	e2.6	e5.0	e4.0	e.96	e.25	e.51	e4.6	e.00	e.33	e.50	e26
5	e1.2	e3.3	e4.2	e3.5	e.96	e.24	e.43	e13	e.00	e.17	e.31	e9.0
6	e1.3	e2.5	e3.5	e2.4	e1.3	e.25	e.30	e1.6	e.00	e.12	e.87	e4.8
7	e1.3	e3.5	e3.9	e2.1	e1.2	e.28	e.20	e.65	e.00	e.11	e35	e3.3
8	e2.6	e4.3	e2.5	e2.3	e.87	e.22	e.16	e.36	e.10	e12	e44	e2.9
9	e3.2	e2.6	e2.3	e17	e.70	e.19	e.15	e.30	e.62	e19	e3.5	e1.9
10	e1.5	e4.0	e2.6	e3.6	e.64	e.18	e.15	e.23	e.38	e4.0	e1.4	e2.3
11	e1.1	e2.8	e2.1	e2.5	e.62	e.15	e.15	e.16	e.16	e.97	e.87	e15
12	e.87	e9.0	e1.8	e2.1	e.75	e9.7	e.12	e.13	e.13	e.87	e.74	e26
13	e.87	e3.3	e1.8	e1.9	e3.2	e154	e.12	e.12	e.77	e1.5	e.97	e7.0
14	e.77	e2.1	e17	e77	e115	e55	e.10	e.06	e1.5	e.58	e1.2	e4.9
15	e1.9	e1.9	e4.2	e28	e3.2	e7.5	e.10	e.06	e6.3	e.34	e.70	e4.6
16	e1440	e1.8	e2.9	e3.7	e1.4	e2.6	e.10	e.05	e1.5	e.26	e4.3	e3.7
17	e94	e1.8	e2.0	e2.1	e.87	e1.6	e.10	e.08	e1.5	e.24	e5.4	e3.3
18	e14	e4.5	e6.5	e2.0	e.71	e1.3	e.10	e10	e3.9	e.36	e1.6	e2.1
19	e6.7	e3.0	e55	e2.9	e.59	e.97	e.87	e2.1	e2.5	e1.4	e.77	e2.5
20	e5.5	e19	e5.7	e1.6	e.66	e1.5	e1.5	e.64	e.87	e.97	e.51	e1.8
21	e4.6	e6.5	e3.0	e1.4	e.56	e2.8	e.72	e.27	e.73	e2.0	e.40	e1.6
22	e23	e4.6	e8.3	e1.3	e.44	e1.2	e.60	e.15	e1.1	e.72	e.38	e1.6
23	e6.0	e3.0	e4.5	e1.3	e.37	e.77	e.31	e.06	e.59	e19	e1.1	e5.1
24	e15	e2.3	e60	e1.1	e.37	e2.5	e.18	e.03	e.35	e3.7	e.54	e3.9
25	e5.7	e2.3	e50	e1.1	e.60	e6.2	e.13	e.00	e1.3	e1.2	e.31	e2.8
26	e4.9	e2.0	e14	e.97	e.48	e2.3	e.14	e.00	e1.1	e.53	e.22	e2.0
27	e17	e2.4	e5.5	e.97	e.32	e2.4	e.15	e.00	e.51	e.35	e.18	e1.6
28	e8.7	e2.5	e4.2	e.87	e.27	e1.2	e.19	e.00	e.37	e8.1	e.14	e1.8
29	e4.3	e2.0	e3.6	e.87	e.25	e.87	e7.8	e.00	e.25	e4.9	e.12	e1.5
30	e3.3	e47	e3.0	e.87	---	e.77	e1.9	e.08	e.32	e1.1	e.13	e1.3
31	e2.9	---	e2.8	e.87	---	e.65	---	e.20	---	e1.2	e.18	---
TOTAL	1677.11	154.2	337.9	186.22	139.81	258.44	19.15	36.19	26.90	86.60	109.59	331.47
MEAN	54.1	5.14	10.9	6.01	4.82	8.34	.64	1.17	.90	2.79	3.54	11.0
MAX	1440	47	60	77	115	154	7.8	13	6.3	19	44	170
MIN	.77	1.8	1.8	.87	.25	.15	.10	.00	.00	.08	.12	.17
AC-FT	3330	306	670	369	277	513	38	72	53	172	217	657

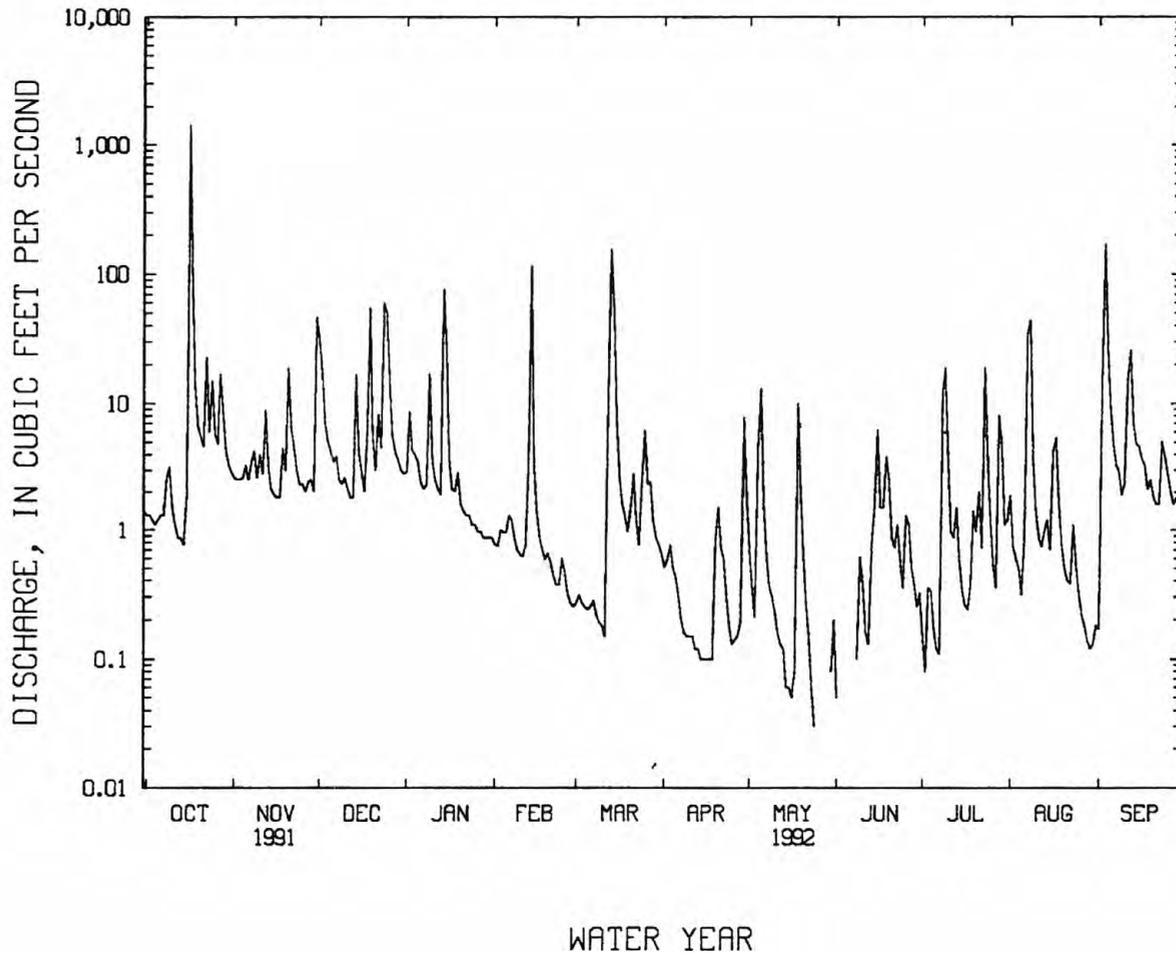
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16330000 KAMANANUI STREAM AT MAUNAWAI--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1958 - 1992, BY WATER YEAR (WY)

MEAN	12.8	28.6	22.5	27.1	22.5	33.4	29.6	15.9	7.03	12.4	9.29	5.41
MAX	56.7	168	107	143	106	155	168	62.8	52.9	52.7	68.0	18.4
(WY)	1959	1991	1988	1988	1969	1982	1989	1965	1978	1989	1958	1988
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 1991 CALENDAR YEAR	FOR 1992 WATER YEAR		WATER YEARS 1958 - 1992	
ANNUAL TOTAL	7581.01	3363.58		
ANNUAL MEAN	20.8	9.19	18.7	
HIGHEST ANNUAL MEAN			50.3	1982
LOWEST ANNUAL MEAN			4.81	1984
HIGHEST DAILY MEAN	1700	Mar 19	1440	Oct 16
LOWEST DAILY MEAN	.77	Oct 14	.00	May 25
ANNUAL SEVEN-DAY MINIMUM	1.2	Oct 1	.01	Jun 1
ANNUAL RUNOFF (AC-FT)	15040	6670	13560	
10 PERCENT EXCEEDS	21	8.8	31	
50 PERCENT EXCEEDS	3.6	1.3	3.9	
90 PERCENT EXCEEDS	1.8	.14	.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 Waiialua School.

DRAINAGE AREA.--2.98 mi².

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.--33 years, 14.0 ft³/s (10,170 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 5,540 ft³/s, July 17, 1974, gage height, 11.94 ft from rating curve extended above 110 ft³/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 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Oct. 16	1130	*1,860	*8.31	Feb. 14	0530	1,300	7.20

Minimum discharge, 0.02 ft³/s, June 2, 3.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1991 TO SEPTEMBER 1992
DAILY MEAN VALUES

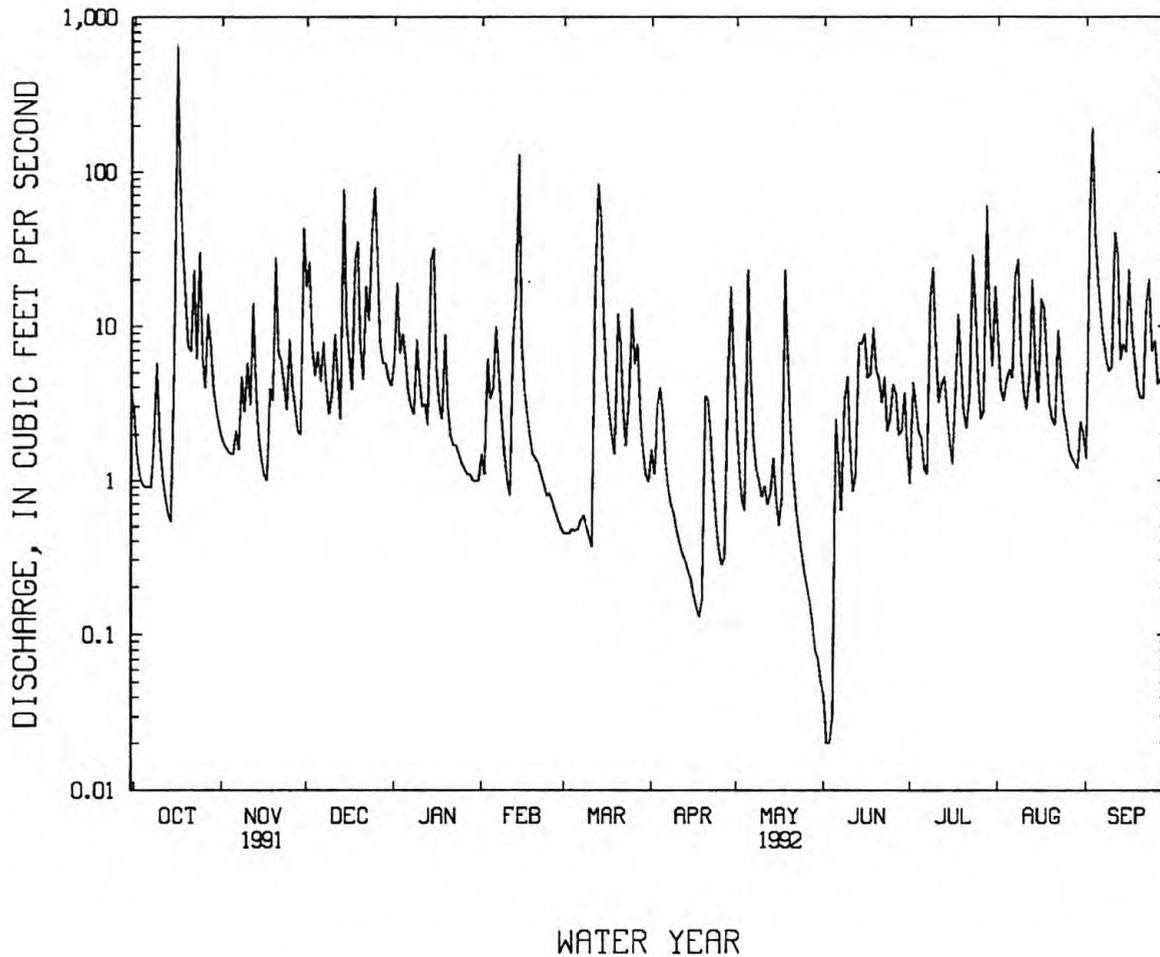
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.8	1.9	18	6.1	1.5	.45	1.6	2.6	.04	.96	8.5	1.4
2	1.5	1.7	26	19	1.1	.45	1.1	1.3	.02	4.3	3.9	45
3	1.1	1.6	7.6	6.7	6.1	.45	3.1	.76	.02	3.0	3.3	193
4	.95	1.5	4.8	9.0	3.4	.48	4.0	.64	.03	2.1	4.4	40
5	.90	1.5	6.8	6.2	3.9	.47	2.7	23	2.5	1.9	5.2	20
6	.91	2.1	4.4	3.7	10	.48	1.3	4.7	1.4	1.2	4.6	12
7	.90	1.6	7.9	3.0	5.1	.55	.89	1.9	.64	1.1	21	8.1
8	1.8	4.7	4.1	2.7	2.6	.59	.70	1.2	3.3	15	27	6.1
9	5.8	2.8	2.7	8.2	1.5	.50	.61	1.0	4.7	24	6.6	5.1
10	2.0	5.8	3.7	4.4	1.0	.43	.48	.78	1.7	7.5	3.7	5.4
11	1.1	3.1	8.9	3.0	.80	.37	.39	.92	.85	3.2	2.9	40
12	.79	14	4.5	3.1	8.5	19	.33	.70	1.1	4.1	4.7	30
13	.62	4.0	2.5	2.3	16	83	.30	.82	7.8	4.7	20	6.1
14	.54	2.0	77	27	130	50	.26	1.4	7.7	2.7	5.9	7.6
15	5.4	1.4	11	32	8.1	11	.23	.76	9.0	1.8	3.2	6.8
16	655	1.1	6.4	5.3	3.9	4.5	.18	.51	4.6	1.3	15	23
17	91	1.0	3.9	3.2	2.7	2.8	.15	.77	4.9	3.9	13	10
18	34	3.9	27	2.5	2.0	2.0	.13	23	9.8	12	5.9	6.1
19	16	3.3	35	8.8	1.5	1.5	.17	6.1	5.2	5.7	3.1	4.0
20	7.4	28	7.3	3.1	1.4	12	3.5	2.2	4.5	2.8	2.5	3.4
21	6.9	6.8	4.5	2.0	1.3	7.8	3.3	1.1	3.2	2.2	2.3	3.4
22	23	6.0	18	1.7	1.1	2.9	2.0	.67	4.7	3.6	9.4	14
23	6.2	4.3	11	1.7	.93	1.7	.96	.47	2.1	29	4.9	20
24	30	2.9	41	1.5	.79	3.4	.53	.34	2.5	13	2.8	6.9
25	6.3	8.2	79	1.3	.82	13	.35	.25	4.2	4.6	2.2	8.1
26	4.0	4.0	26	1.2	.73	5.7	.28	.20	3.6	2.5	1.6	4.2
27	12	2.9	7.6	1.1	.63	7.7	.31	.16	2.0	2.8	1.4	4.5
28	7.7	2.1	5.8	1.1	.55	2.7	4.9	.12	2.1	60	1.3	5.0
29	3.9	2.0	5.7	1.0	.49	1.6	18	.08	3.7	12	1.2	2.8
30	2.9	43	4.5	.99	---	1.1	5.6	.07	1.6	5.5	2.4	2.3
31	2.3	---	4.1	1.0	---	.98	---	.05	---	18	2.0	---
TOTAL	935.71	169.2	476.7	173.89	218.44	239.60	58.35	78.57	99.50	256.46	195.9	544.3
MEAN	30.2	5.64	15.4	5.61	7.53	7.73	1.94	2.53	3.32	8.27	6.32	18.1
MAX	655	43	79	32	130	83	18	23	9.8	60	27	193
MIN	.54	1.0	2.5	.99	.49	.37	.13	.05	.02	.96	1.2	1.4
AC-FT	1860	336	946	345	433	475	116	156	197	509	389	1080

16345000 OPAEULA STREAM NEAR WAHIAWA--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1959 - 1992, BY WATER YEAR (WY)

MEAN	11.3	19.0	16.2	16.0	14.1	22.1	21.9	13.1	7.35	11.8	8.46	7.21
MAX	30.7	71.9	52.6	54.1	66.9	90.0	75.7	43.7	24.9	29.3	31.0	22.8
(WY)	1982	1991	1988	1988	1969	1982	1989	1965	1978	1989	1982	1986
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 1991 CALENDAR YEAR	FOR 1992 WATER YEAR	WATER YEARS 1959 - 1992
ANNUAL TOTAL	5477.97	3446.62
ANNUAL MEAN	15.0	9.42
HIGHEST ANNUAL MEAN		14.0
LOWEST ANNUAL MEAN		29.7
HIGHEST DAILY MEAN	655 Oct 16	655 Oct 16
LOWEST DAILY MEAN	.54 Oct 14	.02 Jun 2
ANNUAL SEVEN-DAY MINIMUM	1.1 Feb 6	.04 May 29
ANNUAL RUNOFF (AC-FT)	10870	6840
10 PERCENT EXCEEDS	27	19
50 PERCENT EXCEEDS	4.5	3.1
90 PERCENT EXCEEDS	1.6	.51
		10170
		29
		4.5
		.88
		7.24
		Feb 1 1969
		Jan 24 1977
		Oct 24 1984
		1982
		1984



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 mi².

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.--68 years (water years 1918-31, 1939-92), 29.9 ft³/s (21,660 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 26,900 ft³/s, Feb. 4, 1965, gage height, 19.91 ft, from floodmarks, from rating curve extended above 163 ft³/s on basis of slope-area measurement of peak flow; minimum, 0.76 ft³/s, about Nov. 23, 1962.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 1,900 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Sept. 3	0700	*2,200	*8.71	No other peak greater than base discharge			
Minimum discharge, 2.4 ft ³ /s, Mar. 9-11.							

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1991 TO SEPTEMBER 1992
DAILY MEAN VALUES

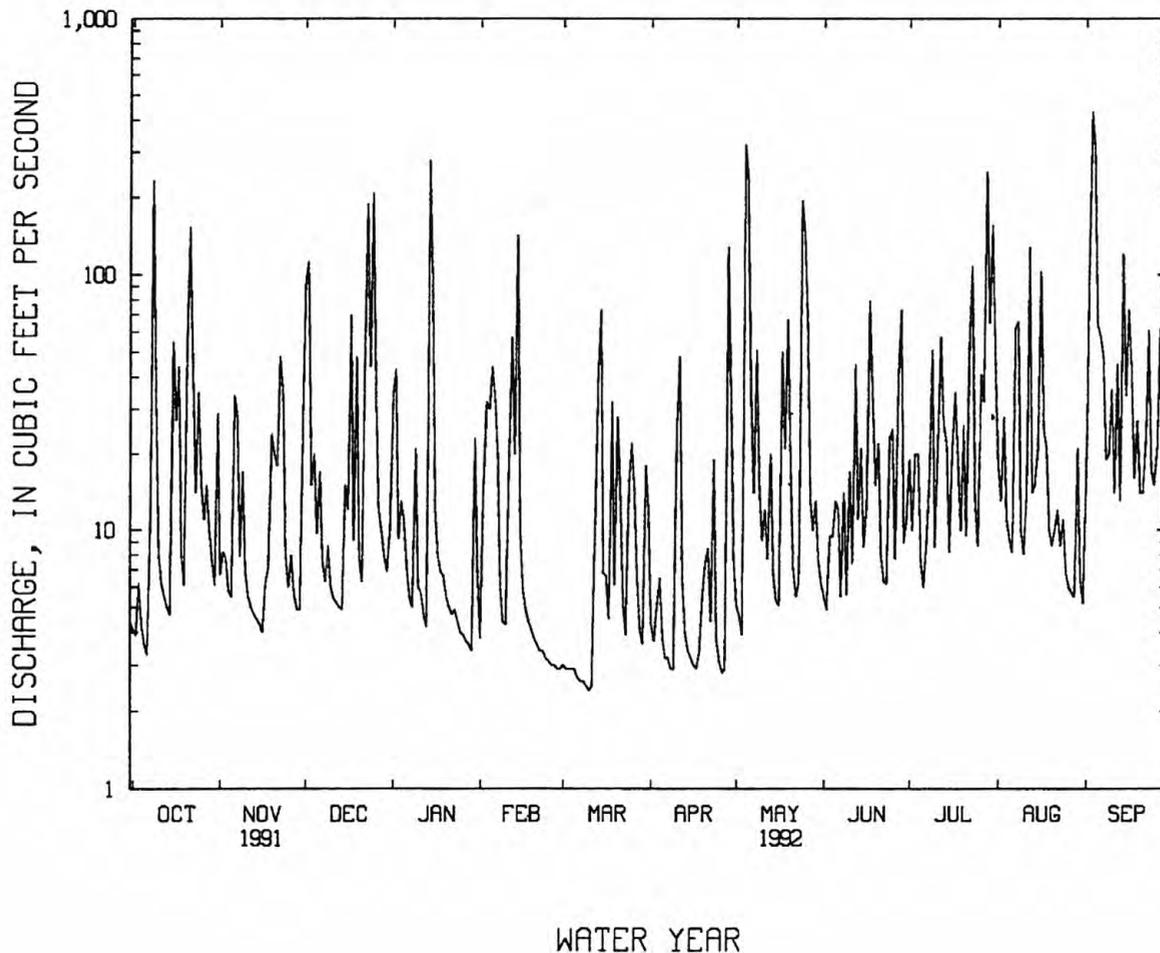
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4.1	6.7	95	34	3.8	3.0	4.3	5.1	5.5	19	18	16
2	3.9	8.2	112	43	15	2.9	3.7	4.6	4.9	10	13	102
3	6.2	7.8	15	9.2	32	2.9	5.1	3.9	9.5	20	28	432
4	4.3	5.8	20	13	30	2.9	6.5	321	9.4	20	11	307
5	3.6	5.5	9.7	11	44	2.9	3.8	236	13	7.6	9.2	64
6	3.3	34	17	7.3	34	2.7	3.2	34	12	6.0	8.2	58
7	9.8	28	7.5	5.5	20	2.6	3.2	14	5.5	8.8	62	48
8	233	7.9	6.3	5.0	6.1	2.6	2.9	51	14	16	66	19
9	31	17	8.7	21	4.4	2.5	2.9	15	5.6	51	10	20
10	8.2	6.9	6.0	6.0	4.3	2.4	26	9.1	17	8.6	8.1	36
11	6.2	5.5	5.4	5.7	21	2.5	48	12	7.4	21	14	14
12	5.5	5.0	5.2	4.7	57	8.6	6.5	7.7	45	57	128	45
13	5.0	4.7	5.0	4.2	20	38	4.0	20	11	26	14	13
14	4.7	4.5	4.9	278	143	73	3.4	6.7	21	22	15	120
15	55	4.3	15	98	10	6.8	3.2	5.3	8.6	8.2	21	34
16	27	4.0	12	12	6.0	6.6	3.0	5.1	12	21	103	73
17	44	6.2	70	8.1	4.9	4.5	2.9	50	79	35	25	44
18	8.1	7.2	9.1	6.9	4.4	32	3.4	21	34	19	21	16
19	6.1	24	48	6.6	4.1	6.1	5.6	67	15	10	10	27
20	52	20	7.9	5.5	3.8	28	7.5	18	22	26	8.7	14
21	154	18	6.3	5.0	3.6	13	8.5	7.0	8.0	9.5	10	14
22	44	48	46	4.7	3.4	5.1	4.4	5.5	6.3	57	12	23
23	14	35	189	4.9	3.4	3.9	19	6.3	6.2	108	8.7	61
24	35	8.1	44	4.4	3.2	15	3.8	194	23	13	11	17
25	15	6.0	208	4.0	3.1	22	3.1	142	25	8.7	6.8	15
26	11	8.0	31	3.9	3.0	14	2.8	63	7.7	41	6.0	21
27	15	5.6	12	3.7	3.0	6.4	2.9	13	40	32	5.7	62
28	9.9	4.9	10	3.6	2.9	4.1	128	10	73	252	5.5	11
29	7.5	4.9	7.9	3.4	2.9	3.6	31	13	8.9	65	21	9.3
30	6.1	29	6.9	23	---	18	7.7	7.7	11	156	6.4	11
31	29	---	10	6.9	---	12	---	6.2	---	46	5.2	---
TOTAL	861.5	380.7	1050.8	652.2	496.3	350.6	360.3	1374.2	560.5	1200.4	691.5	1746.3
MEAN	27.8	12.7	33.9	21.0	17.1	11.3	12.0	44.3	18.7	38.7	22.3	58.2
MAX	233	48	208	278	143	73	128	321	79	252	128	432
MIN	3.3	4.0	4.9	3.4	2.9	2.4	2.8	3.9	4.9	6.0	5.2	9.3
AC-FT	1710	755	2080	1290	984	695	715	2730	1110	2380	1370	3460

16400000 HALAWA STREAM NEAR HALAWA--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1917 - 1992, BY WATER YEAR (WY)

MEAN	27.0	35.7	36.8	34.1	29.9	37.7	41.0	27.4	18.6	25.3	25.1	20.4
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 1991 CALENDAR YEAR		FOR 1992 WATER YEAR		WATER YEARS 1917 - 1992	
ANNUAL TOTAL	10024.4	9725.3		29.9	
ANNUAL MEAN	27.5	26.6		47.4	1965
HIGHEST ANNUAL MEAN				17.4	1975
LOWEST ANNUAL MEAN				1240	Feb 4 1965
HIGHEST DAILY MEAN	428	Mar 19	432	Sep 3	Sep 1 1971
LOWEST DAILY MEAN	2.7	Jun 22	2.4	Mar 10	Aug 26 1971
ANNUAL SEVEN-DAY MINIMUM	3.5	Jun 16	2.6	Mar 5	
ANNUAL RUNOFF (AC-FT)	19880		19290		21650
10 PERCENT EXCEEDS	60		59		65
50 PERCENT EXCEEDS	10		9.9		14
90 PERCENT EXCEEDS	4.4		3.6		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 1991 TO SEPTEMBER 1992

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 WATER (DEG C)	TUR-BID-ITY (NTU)	BARO-METRIC PRES-SURE (MM OF HG)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, (PER-CENT SATUR-ATION)	COLI-FORM, FECAL, 0.7 UM-MF (COLS./100 ML)	STREP-TOCOCCI, FECAL, KF AGAR (COLS. PER 100 ML)
OCT 1991											
22...	1230	35	34	6.6	21.0	10	760	8.4	95	470	1400
DEC											
10...	1130	6.1	52	7.2	20.5	1.5	756	8.0	90	45	1200
FEB 1992											
04...	1200	60	62	6.8	16.0	2.5	761	9.8	99	2400	740
MAY											
05...	1200	86	43	6.5	17.5	4.0	758	9.2	97	1300	1400
JUN											
09...	1140	5.8	53	7.0	23.5	3.2	759	8.4	99	93	980
JUL											
28...	0915	916	29	6.3	21.5	51	758	8.8	100	12000	1700

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)
OCT 1991											
22...	4	1	0.70	0.62	4.1	65	0.9	0.40	4	0	4
DEC											
10...	8	2	1.2	1.2	6.8	63	1	0.60	7	0	6
FEB 1992											
04...	10	7	1.4	1.5	7.8	62	1	0.60	3	0	2
MAY											
05...	6	4	0.67	0.93	5.7	67	1	0.50	2	0	2
JUN											
09...	7	1	1.1	1.1	6.7	65	1	0.50	8	0	6
JUL											
28...	3	2	0.48	0.54	3.9	68	0.9	0.50	2	0	2

DATE	SULFATE DIS-SOLVED (MG/L AS SO4)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)	FLUO-RIDE, DIS-SOLVED (MG/L AS F)	SILICA, DIS-SOLVED (MG/L AS SiO2)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L)	SOLIDS, DIS-SOLVED (TONS PER DAY)	NITRO-GEN, NITRITE TOTAL (MG/L AS N)	NITRO-GEN, NITRITE DIS-SOLVED (MG/L AS N)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N)
OCT 1991										
22...	1.2	4.9	<0.10	3.2	34	18	3.21	0.020	<0.010	<0.050
DEC										
10...	1.8	11	0.20	7.3	21	34	0.35	<0.010	<0.010	<0.050
FEB 1992										
04...	2.1	16	<0.10	4.1	32	35	5.18	<0.010	<0.010	<0.050
MAY										
05...	2.0	11	<0.10	2.5	31	25	7.20	0.010	<0.010	<0.050
JUN										
09...	1.8	11	<0.10	6.5	39	33	0.61	<0.010	0.010	<0.050
JUL										
28...	1.3	5.6	<0.10	1.5	23	16	56.9	0.010	<0.010	<0.050

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

16400000 HALAWA STREAM NEAR HALAWA--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1991 TO SEPTEMBER 1992

DATE	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA TOTAL (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS NH4)	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 TOTAL (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)
OCT 1991 22...	<0.050	0.040	0.04	0.40	0.040	0.010	0.020	<0.010	290	12
DEC 10...	<0.050	<0.010	0.03	<0.20	<0.010	<0.010	0.010	<0.010	--	--
FEB 1992 04...	<0.050	0.020	0.04	<0.20	0.020	<0.010	<0.010	<0.010	170	12
MAY 05...	<0.050	0.020	0.03	<0.20	<0.010	0.010	0.010	<0.010	120	10
JUN 09...	<0.050	0.010	0.03	<0.20	0.040	0.030	<0.010	<0.010	--	--
JUL 28...	<0.050	0.040	0.05	0.40	0.070	0.010	<0.010	<0.010	380	12

DATE	TIME	COBALT, DIS- SOLVED (UG/L AS CO)	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 1991 22...	1230	<3	440	<4	3	<10	<1	<1	<1.0	10	<6
FEB 1992 04...	1200	<3	80	4	3	<10	<1	<1	<1.0	23	<6
MAY 05...	1200	<3	110	<4	4	<10	<1	<1	<1.0	12	<6
JUL 28...	0915	<3	380	<4	7	<10	<1	<1	<1.0	8	<6

CROSS SECTION ANALYSES, WATER YEAR OCTOBER 1991 TO SEPTEMBER 1992

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 (MG/L)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)
JUN 1992 09...	1035		11.0	53	7.0	23.5	759	8.4	99
09...	1040		9.0	53	7.0	23.5	759	8.4	99
09...	1045		7.0	53	7.0	23.5	759	8.4	99
09...	1050		5.0	53	7.0	23.5	759	8.4	99
09...	1055		3.0	53	7.0	23.5	759	8.4	99
09...	1100		1.0	53	7.0	23.5	759	8.4	99

PARTICLE-SIZE DISTRIBUTION OF SUSPENDED SEDIMENT, WATER YEAR OCTOBER 1991 TO SEPTEMBER 1992

DATE	TIME	SEDI- MENT, DIS- SOLVED (MG/L)	SEDI- MENT, DIS- SOLVED (T/DAY)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM	DATE	TIME	SEDI- MENT, DIS- SOLVED (MG/L)	SEDI- MENT, DIS- SOLVED (T/DAY)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM
OCT 1991 22...	1230	3	0.28	100	MAY 1992 05...	1200	6	1.4	100
DEC 10...	1130	2	0.03	100	JUN 09...	1140	2	0.03	100
FEB 1992 04...	1200	20	3.2	100	JUL 28...	0915	2	4.9	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 mi².

PERIOD OF RECORD.--August 1968 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 1,000 ft, from topographic map.

REMARKS.--Records fair. No diversion upstream.

AVERAGE DISCHARGE.--24 years, 1.62 ft³/s (1,180 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 835 ft³/s, Jan. 25, 1982, gage height, 4.25 ft, from rating curve extended above 6.2 ft³/s on basis of slope-area measurement at gage height, 4.25 ft; minimum, 0.50 ft³/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 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Jan. 14	2200	*159	*3.18	Feb. 14	0930	113	3.00

Minimum discharge, 0.58 ft³/s, Nov. 25-30.

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	.72	.72	.89	1.2	.84	1.2	1.3	1.1	e1.4	.94	.99	.84
2	.76	.72	2.2	1.5	1.4	1.2	1.3	1.0	e1.2	.94	.99	1.1
3	.72	.72	.76	.94	2.0	1.2	1.3	1.0	e1.2	.94	1.0	1.6
4	.76	.72	.72	.89	1.9	1.2	1.3	3.1	e1.2	.94	.99	2.9
5	.76	.72	.68	.84	3.1	1.2	1.2	5.8	1.3	.94	.99	1.6
6	.76	.72	.76	.80	3.8	1.2	1.2	2.7	1.2	.94	.94	1.3
7	.76	.68	.68	.80	1.9	1.2	1.2	1.6	1.2	.99	1.1	1.1
8	.88	.64	.64	1.3	1.4	1.2	1.2	2.3	1.2	.99	.99	1.0
9	.76	.72	.64	1.8	1.2	1.2	1.3	1.9	1.1	1.2	.94	.99
10	.72	.64	.68	.99	1.2	1.2	2.0	1.6	1.2	.94	.89	1.0
11	.72	.64	.64	.89	1.2	1.2	1.3	1.4	1.1	.99	.89	1.2
12	.72	.64	.64	.84	1.1	3.4	1.2	1.3	1.2	.99	.94	1.5
13	.72	.64	.61	.80	1.0	1.6	1.2	1.3	1.1	.94	.89	1.2
14	.75	.61	.64	19	8.9	1.9	1.2	1.2	1.0	.94	.89	4.4
15	1.0	.61	.64	5.9	2.3	1.5	1.2	1.2	1.1	.94	.89	1.7
16	2.1	.61	.64	2.2	1.9	1.5	1.2	1.2	1.2	.94	1.7	1.8
17	.94	.68	.68	1.7	1.7	1.6	1.2	2.0	1.5	.94	1.3	1.5
18	.84	.61	.64	1.5	1.6	2.8	1.2	3.5	1.3	.94	.94	1.2
19	.80	.64	1.4	1.3	1.6	1.6	1.2	4.5	1.2	.89	.89	1.2
20	.80	.61	.72	1.2	1.5	1.8	1.2	3.4	1.2	1.1	.89	1.1
21	.94	.61	.68	1.2	1.4	1.6	1.2	2.2	1.1	.94	.94	1.0
22	.84	.71	.77	1.1	1.3	1.6	1.2	2.0	1.0	1.0	.94	1.1
23	.80	.68	1.6	1.1	1.5	1.5	1.2	1.8	1.0	1.7	.94	1.3
24	.85	.61	1.2	.94	1.3	1.6	1.2	2.4	1.2	.94	.94	1.0
25	.76	.58	10	.94	1.5	1.6	1.2	2.4	1.1	.89	.89	1.1
26	.76	.58	4.5	.94	1.3	1.5	1.2	1.6	.99	1.4	.89	1.1
27	.72	.58	1.5	.94	1.3	1.4	1.2	1.6	1.2	1.2	.84	1.2
28	.76	.58	1.2	.94	1.3	1.3	1.2	e1.5	1.5	1.8	.84	1.0
29	.76	.58	.99	.89	1.3	1.3	1.1	e1.5	1.0	1.5	.84	1.2
30	.72	1.6	.99	1.2	---	1.4	1.1	e1.4	.99	1.2	.80	1.1
31	.72	---	.99	.89	---	1.3	---	e1.4	---	1.0	.80	---
TOTAL	25.62	20.40	40.32	57.47	53.74	47.0	37.2	62.9	35.18	32.94	29.70	41.33
MEAN	.83	.68	1.30	1.85	1.85	1.52	1.24	2.03	1.17	1.06	.96	1.38
MAX	2.1	1.6	10	19	8.9	3.4	2.0	5.8	1.5	1.8	1.7	4.4
MIN	.72	.58	.61	.80	.84	1.2	1.1	1.0	.99	.89	.80	.84
AC-FT	51	40	80	114	107	93	74	125	70	65	59	82

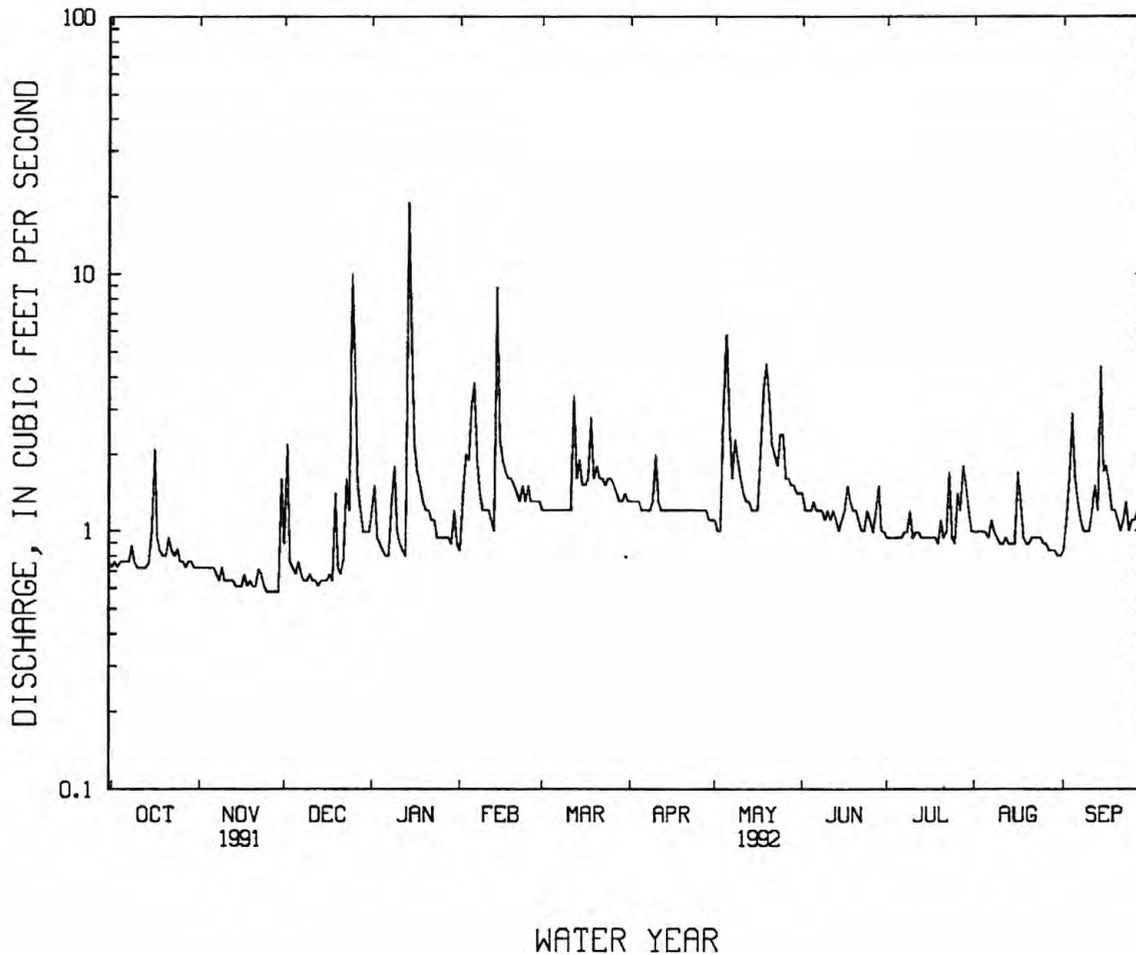
e Estimated

16404200 PILIPILILAU STREAM NEAR PELEKUNU--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1968 - 1992, BY WATER YEAR (WY)

MEAN	.88	1.53	1.83	2.70	2.14	2.29	2.46	1.75	1.16	1.04	.91	.82
MAX	1.32	4.85	3.92	6.55	5.56	4.41	12.1	5.92	2.22	1.90	1.56	1.38
(WY)	1984	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 1991 CALENDAR YEAR	FOR 1992 WATER YEAR	WATER YEARS 1968 - 1992
ANNUAL TOTAL	525.85	483.80
ANNUAL MEAN	1.44	1.32
HIGHEST ANNUAL MEAN		
LOWEST ANNUAL MEAN		
HIGHEST DAILY MEAN	14 Jan 27	19 Jan 14
LOWEST DAILY MEAN	.58 Nov 25	.58 Nov 25
ANNUAL SEVEN-DAY MINIMUM	.60 Nov 23	.60 Nov 23
ANNUAL RUNOFF (AC-FT)	1040	960
10 PERCENT EXCEEDS	2.2	1.8
50 PERCENT EXCEEDS	1.0	1.1
90 PERCENT EXCEEDS	.72	.72



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 excellent. Tunnel diverts from Waikolu Stream and two tributaries; diversion is augmented by water pumped from two wells and from the stream at elevation 728 ft in Waikolu Valley near the east portal. Water is used for irrigation in west-central Molokai.

AVERAGE DISCHARGE.--26 years, 4.33 ft³/s (3,140 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 41 ft³/s, Mar. 19, 1986; no flow at times.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 24 ft³/s, Dec. 25; minimum daily, 1.0 ft³/s, Aug. 29 to Sept. 1.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1991 TO SEPTEMBER 1992
DAILY MEAN VALUES

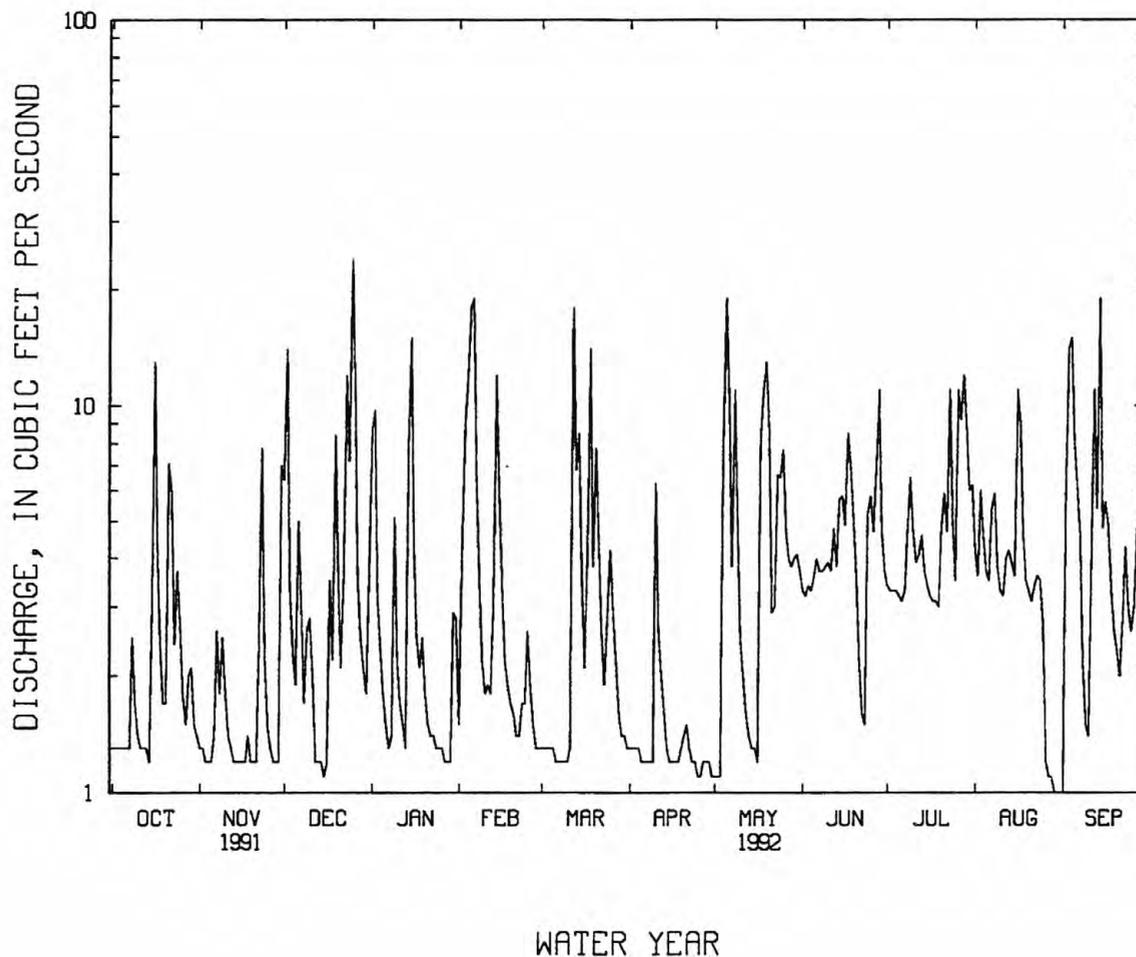
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.3	1.3	6.4	8.7	1.5	1.3	1.3	1.1	3.3	3.4	4.2	1.0
2	1.3	1.3	14	9.7	4.2	1.3	1.3	1.1	3.2	3.3	3.6	5.7
3	1.3	1.2	3.3	3.2	8.9	1.3	1.3	1.1	3.4	3.3	6.0	14
4	1.3	1.2	2.3	2.4	12	1.3	1.3	8.2	3.3	3.3	4.6	15
5	1.3	1.2	1.9	1.8	18	1.3	1.2	19	3.6	3.2	3.7	8.2
6	1.3	1.4	5.0	1.5	19	1.2	1.2	10	4.0	3.1	3.5	6.2
7	1.3	2.6	3.0	1.3	6.5	1.2	1.2	3.8	3.7	3.3	5.4	4.7
8	2.5	1.8	1.7	1.4	3.6	1.2	1.2	11	3.7	4.8	5.9	2.2
9	1.7	2.5	2.6	5.1	2.2	1.2	1.2	5.1	3.8	6.5	3.8	1.5
10	1.4	1.8	2.8	2.2	1.8	1.2	6.3	2.5	3.9	4.7	3.3	1.4
11	1.3	1.4	2.0	1.7	1.9	1.3	2.6	2.0	3.7	3.9	3.2	3.6
12	1.3	1.3	1.2	1.5	1.8	18	2.0	1.6	4.8	4.1	4.0	11
13	1.3	1.2	1.2	1.3	3.0	6.8	1.6	1.4	3.8	4.6	4.2	5.4
14	1.2	1.2	1.2	8.1	12	8.5	1.3	1.3	5.7	3.7	3.9	19
15	3.0	1.2	1.1	15	6.1	3.6	1.2	1.3	5.8	3.4	3.6	4.8
16	13	1.2	1.2	4.2	3.4	2.1	1.2	1.2	4.9	3.2	11	5.6
17	4.1	1.2	3.5	2.5	2.2	4.1	1.2	8.3	8.5	3.1	9.1	4.9
18	2.4	1.4	2.2	2.1	1.9	14	1.2	11	7.0	3.1	4.6	3.3
19	1.7	1.2	8.4	2.5	1.7	3.8	1.3	13	5.1	3.0	3.5	2.6
20	1.7	1.2	3.6	1.8	1.6	7.8	1.4	8.5	3.5	4.8	3.3	2.3
21	7.1	1.2	2.1	1.5	1.4	4.5	1.5	2.9	2.2	5.9	3.1	2.0
22	5.9	2.4	3.5	1.4	1.4	2.6	1.3	3.0	1.6	4.7	3.4	2.8
23	2.4	7.8	12	1.4	1.7	1.9	1.2	6.6	1.5	11	3.6	4.3
24	3.7	2.3	7.2	1.3	1.7	2.8	1.2	6.5	5.2	4.9	3.5	3.0
25	2.7	1.5	24	1.3	2.6	4.2	1.1	7.7	5.8	3.5	2.7	2.6
26	1.8	1.3	11	1.3	1.9	2.9	1.1	4.7	4.7	11	1.2	3.0
27	1.5	1.2	3.5	1.2	1.5	2.2	1.2	4.0	7.0	9.2	1.1	4.8
28	2.0	1.2	2.5	1.2	1.3	1.6	1.2	3.8	11	12	1.1	2.8
29	2.1	1.2	2.1	1.2	1.3	1.4	1.2	4.0	4.7	8.7	1.0	2.5
30	1.5	7.0	1.8	2.9	---	1.4	1.1	4.1	3.7	6.0	1.0	2.9
31	1.4	---	3.9	2.8	---	1.3	---	3.7	---	6.2	1.0	---
TOTAL	77.8	55.9	142.2	95.5	128.1	109.3	44.6	163.5	136.1	158.9	117.1	153.1
MEAN	2.51	1.86	4.59	3.08	4.42	3.53	1.49	5.27	4.54	5.13	3.78	5.10
MAX	13	7.8	24	15	19	18	6.3	19	11	12	11	19
MIN	1.2	1.2	1.1	1.2	1.3	1.2	1.1	1.1	1.5	3.0	1.0	1.0
AC-FT	154	111	282	189	254	217	88	324	270	315	232	304

16405100 MOLOKAI TUNNEL AT EAST PORTAL--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1966 - 1992, BY WATER YEAR (WY)

MEAN	3.71	5.02	4.94	4.77	4.62	5.17	5.13	4.21	3.64	4.01	3.55	3.05
MAX	7.34	10.2	10.6	12.5	12.5	13.8	12.8	12.3	8.37	9.89	7.22	5.63
(WY)	1986	1988	1991	1987	1990	1986	1986	1987	1986	1986	1985	1984
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 1991 CALENDAR YEAR	FOR 1992 WATER YEAR		WATER YEARS 1966 - 1992	
ANNUAL TOTAL	1762.3		1382.1	
ANNUAL MEAN	4.83		3.78	
HIGHEST ANNUAL MEAN			4.33	
LOWEST ANNUAL MEAN			8.19	
HIGHEST DAILY MEAN	28	Mar 9	41	Mar 19 1986
LOWEST DAILY MEAN	1.1	Dec 15	.00	Mar 30 1967
ANNUAL SEVEN-DAY MINIMUM	1.2	Nov 13	.00	Mar 30 1967
ANNUAL RUNOFF (AC-FT)	3500		2740	
10 PERCENT EXCEEDS	9.9		8.3	
50 PERCENT EXCEEDS	3.7		2.6	
90 PERCENT EXCEEDS	1.4		1.2	



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. 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.--27 years, 6.87 ft³/s (4,970 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 39 ft³/s, Apr. 8, 9, 1986, Jan. 2, 26, 1988, and Mar. 3, 1989; minimum daily, 1.8 ft³/s, Oct. 15, 1967, Aug. 27, 1992.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 27 ft³/s, Dec. 25; minimum daily, 1.8 ft³/s, Aug. 27.

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	4.0	4.0	9.6	10	3.8	4.0	3.8	2.1	6.7	7.2	7.6	2.2
2	4.0	3.8	16	14	4.9	4.0	3.8	2.1	6.7	7.2	6.8	5.3
3	4.0	3.8	6.1	5.4	13	4.0	4.7	2.2	6.7	6.8	8.6	16
4	3.8	3.8	4.9	4.5	13	4.0	5.6	7.8	6.8	6.8	8.1	17
5	3.8	3.8	4.5	4.0	20	4.0	5.4	21	6.8	6.8	6.8	10
6	3.8	4.0	7.0	3.8	24	3.8	5.2	13	7.3	6.5	6.5	8.0
7	3.8	4.9	5.8	3.6	10	3.6	5.2	5.5	6.8	6.5	8.1	6.4
8	4.9	4.5	4.5	3.6	6.4	3.6	4.9	13	6.9	8.2	9.5	4.3
9	4.3	4.9	4.9	6.7	4.9	3.6	4.7	7.2	6.8	9.7	7.0	3.4
10	3.8	4.7	5.2	4.5	4.5	3.6	9.7	4.5	e6.8	8.4	6.4	3.2
11	3.8	4.3	4.9	4.0	4.5	3.6	6.1	4.0	6.7	7.3	6.2	4.7
12	3.8	4.0	3.8	3.8	4.2	21	5.4	3.8	7.5	7.6	6.8	13
13	3.8	3.8	3.6	3.6	5.6	10	4.9	3.6	6.4	8.0	7.1	7.9
14	3.8	3.8	3.6	8.9	15	11	4.7	3.6	6.4	7.2	6.9	22
15	5.4	3.8	3.6	19	8.9	6.4	4.7	3.4	6.7	6.9	6.4	6.9
16	17	3.8	3.6	6.6	5.8	4.9	4.7	3.4	5.3	6.7	13	7.7
17	7.2	3.8	5.6	4.7	4.7	6.2	4.7	10	9.8	6.7	12	7.2
18	5.4	4.0	4.7	4.5	4.3	19	4.5	13	7.8	6.7	5.4	5.5
19	4.7	3.8	10	4.7	4.0	6.4	4.7	16	6.4	6.5	4.3	4.7
20	4.5	3.8	6.1	4.0	3.8	9.6	4.7	12	5.2	7.2	4.0	4.4
21	9.4	3.8	4.5	3.8	3.8	7.4	4.7	6.9	3.8	9.4	3.9	4.2
22	9.4	4.0	4.7	3.6	3.8	5.2	4.7	6.4	3.4	7.7	4.1	4.4
23	5.2	12	14	3.6	4.0	4.5	4.7	10	3.2	14	4.1	7.7
24	6.3	4.9	8.8	3.6	4.3	4.7	4.5	9.6	6.6	8.4	4.1	6.7
25	5.6	4.5	27	3.6	4.9	6.9	4.7	11	8.6	6.7	3.9	6.3
26	4.7	4.3	16	3.6	4.7	5.3	4.5	8.4	8.1	13	2.1	6.6
27	4.3	4.3	5.8	3.6	4.3	4.7	4.7	7.4	8.2	13	1.8	8.3
28	4.4	4.0	4.7	3.6	4.3	4.3	4.0	7.0	14	15	2.2	6.6
29	4.9	4.0	4.3	3.6	4.0	4.0	2.0	7.1	7.7	13	2.0	6.0
30	4.3	9.4	4.0	4.6	---	3.8	2.0	7.5	7.4	8.9	2.0	6.1
31	4.0	---	5.1	5.2	---	3.8	---	6.9	---	9.6	2.1	---
TOTAL	162.1	136.3	216.9	166.3	203.4	190.9	142.6	239.4	207.5	263.6	179.8	222.7
MEAN	5.23	4.54	7.00	5.36	7.01	6.16	4.75	7.72	6.92	8.50	5.80	7.42
MAX	17	12	27	19	24	21	9.7	21	14	15	13	22
MIN	3.8	3.8	3.6	3.6	3.8	3.6	2.0	2.1	3.2	6.5	1.8	2.2
AC-FT	322	270	430	330	403	379	283	475	412	523	357	442

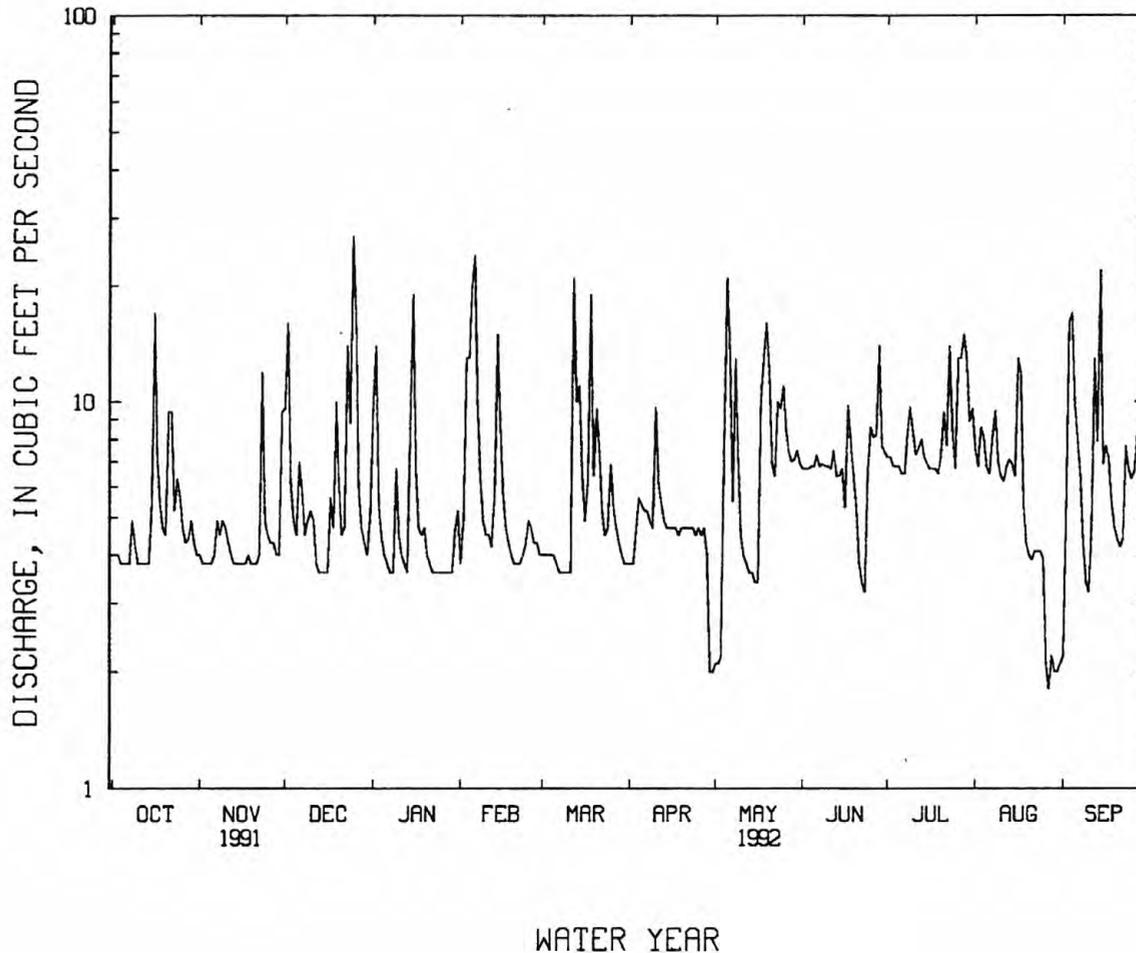
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16405300 MOLOKAI TUNNEL AT WEST PORTAL--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1965 - 1992, BY WATER YEAR (WY)

MEAN	6.09	7.29	7.21	7.01	7.09	7.75	7.77	6.94	6.34	6.71	6.21	5.59
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 1991 CALENDAR YEAR	FOR 1992 WATER YEAR		WATER YEARS 1965 - 1992	
ANNUAL TOTAL	2766.6	2331.5		
ANNUAL MEAN	7.58	6.37	6.87	
HIGHEST ANNUAL MEAN			11.4	1987
LOWEST ANNUAL MEAN			3.46	1974
HIGHEST DAILY MEAN	33	27	39	Apr 8 1986
LOWEST DAILY MEAN	3.6	1.8	1.8	Oct 15 1967
ANNUAL SEVEN-DAY MINIMUM	3.8	2.1	1.9	May 3 1976
ANNUAL RUNOFF (AC-FT)	5490	4620	4970	
10 PERCENT EXCEEDS	13	10	12	
50 PERCENT EXCEEDS	6.4	4.9	5.5	
90 PERCENT EXCEEDS	4.0	3.6	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 mi².

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 except those for estimated days which are fair. Since Nov. 16, 1960, water diverted upstream at times, either into or from Molokai tunnel.

AVERAGE DISCHARGE (since Molokai tunnel diversion began).--31 years (water years 1961, 1963-92), 6.66 ft³/s (4,820 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 3,570 ft³/s, Jan. 25, 1982, gage height, 6.64 ft, from rating curve extended above 43 ft³/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 ft³/s, by slope-area measurement.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 590 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Jan. 14	2130	*1,120	*4.55	Feb. 14	1000	1,050	4.46

Minimum discharge, 0.65 ft³/s, many days.

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	.90	.90	1.3	7.5	.90	.90	.90	.75	.90	.65	.75	.65
2	.90	.90	15	9.3	6.2	.85	.90	.75	.90	.65	.75	3.4
3	.90	.90	.90	1.2	13	.81	.86	.75	.92	.65	1.1	12
4	.90	.90	.90	.90	14	.75	.75	28	.90	.65	.77	25
5	.90	.93	.75	.90	22	.87	.75	63	.92	.65	.75	5.6
6	.90	1.1	1.4	.90	23	.81	.75	11	.94	.65	.75	2.9
7	.90	1.2	.90	.83	4.1	.75	.75	2.1	.90	.65	.85	1.4
8	.92	1.2	.75	.80	1.0	.75	.78	13	.92	.75	.76	.75
9	.90	1.2	.75	3.8	.90	.83	.90	5.3	.90	2.2	.75	.77
10	.90	1.2	.75	.90	.90	.80	6.0	1.2	.90	e.90	.75	.78
11	.90	1.2	.75	.90	.90	.86	1.2	.94	.90	e.90	.75	.86
12	.90	1.2	.75	.90	.91	52	.95	.91	.90	e.90	.75	8.6
13	.90	1.2	.75	.90	.91	3.8	.90	.90	.90	e.75	.75	3.2
14	.90	1.2	.75	174	70	5.5	.83	.90	.90	e.75	.75	40
15	.96	1.1	.75	20	2.6	1.0	.75	.81	1.0	e.75	.75	2.2
16	10	1.0	.75	1.2	1.3	.90	.75	.76	.90	e.75	9.8	2.6
17	.94	1.1	.86	.90	1.6	1.5	.77	7.8	6.9	e.75	3.0	1.8
18	.90	1.2	.90	.90	1.8	25	.76	29	5.3	e.75	.75	.82
19	.90	1.2	8.5	.90	1.7	1.5	.83	20	2.8	e.65	.75	.75
20	.90	1.2	.86	.90	1.4	7.2	.83	7.4	1.2	e.75	.75	.75
21	2.9	1.1	.75	.90	1.0	2.9	.83	1.2	.75	e.75	.75	.92
22	1.3	1.1	3.7	.90	.90	.96	.75	.99	.75	e.75	.75	3.3
23	.90	2.1	17	.88	.95	.91	.76	1.4	.65	e6.0	.75	4.9
24	.95	.90	7.8	.92	1.1	1.6	.75	7.7	2.0	e.90	.70	1.0
25	.88	.88	136	.75	1.2	3.6	.75	8.3	1.6	e.75	.65	.98
26	.90	.90	27	.75	1.1	1.1	.76	1.6	.75	e6.0	.65	.85
27	.90	.90	1.2	.75	.91	.92	.75	1.0	3.5	e10	.75	1.9
28	.92	.88	1.0	.83	.90	.90	.75	.94	8.4	e6.0	.65	.86
29	.90	.81	.90	.90	.90	.90	.75	.96	.75	e3.0	.65	.77
30	.89	3.3	.91	1.1	---	.90	.75	1.1	.75	1.3	.65	.80
31	.88	---	2.4	.93	---	.90	---	.93	---	.94	.65	---
TOTAL	39.54	34.90	237.68	238.14	178.08	122.97	29.51	221.39	50.70	52.49	34.38	131.11
MEAN	1.28	1.16	7.67	7.68	6.14	3.97	.98	7.14	1.69	1.69	1.11	4.37
MAX	10	3.3	136	174	70	52	6.0	63	8.4	10	9.8	40
MIN	.88	.81	.75	.75	.90	.75	.75	.75	.65	.65	.65	.65
AC-FT	78	69	471	472	353	244	59	439	101	104	68	260

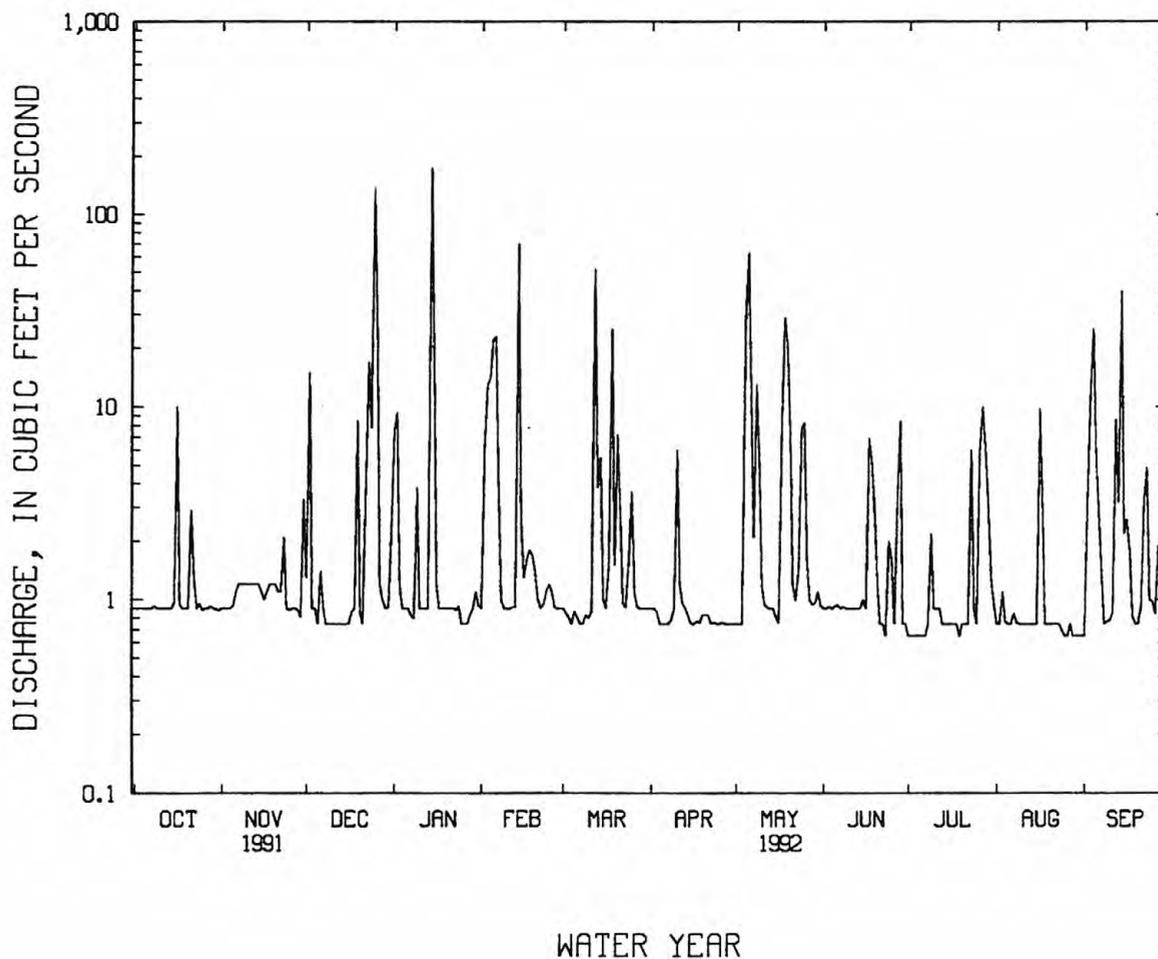
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16405500 WAIKOLU STREAM AT ALTITUDE 900 FT, NEAR KALAUPAPA--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1961 - 1992, BY WATER YEAR (WY)

MEAN	3.50	8.97	10.2	12.6	9.97	9.38	10.5	5.39	2.67	3.13	2.28	1.62
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 1991 CALENDAR YEAR	FOR 1992 WATER YEAR		WATER YEARS 1961 - 1992	
ANNUAL TOTAL	1404.91		1370.89	
ANNUAL MEAN	3.85		3.75	
HIGHEST ANNUAL MEAN			6.66	
LOWEST ANNUAL MEAN			11.8	
HIGHEST DAILY MEAN	136	Dec 25	174	Jan 14
LOWEST DAILY MEAN	.15	Mar 3	.65	Jun 23
ANNUAL SEVEN-DAY MINIMUM	.32	Feb 26	.65	Jul 1
ANNUAL RUNOFF (AC-FT)	2790		2720	
10 PERCENT EXCEEDS	5.4		7.0	
50 PERCENT EXCEEDS	1.1		.90	
90 PERCENT EXCEEDS	.88		.75	
			847	Apr 8 1989
			.00	Sep 12 1984
			.00	Sep 12 1984
			4820	
			12	
			1.5	
			.48	



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 mi².

PERIOD OF RECORD.--July 1919 to November 1930, August 1931 to July 1932, September 1937 to January 1948, July 1948 to current year. Prior to August 1931, published as "at pipeline crossing, near Kalaupapa."

REVISED RECORDS.--WSP 1155: 1932(M), 1938-44(M), 1946-48(M). WSP 1319: 1923(M), 1930(M), 1932, 1938-40, 1945(M), 1974-81(M), drainage area.

GAGE.--Water-stage recorder. Datum of gage is 252 ft above mean sea level (hand levels by Bureau of Reclamation). Prior to Nov. 19, 1930, at site 500 ft upstream at different datums. Aug. 14, 1931, to July 20, 1932, and Sept. 20, 1937, to Jan. 26, 1948, at present site at datum 1.49 ft higher, and July 30, 1948, to June 30, 1962, at present site at datum 1.00 ft higher.

REMARKS.--Records fair. Diversion upstream for domestic use in Kalaupapa, and since Nov. 16, 1960, water has been diverted upstream both to and from Molokai tunnel.

AVERAGE DISCHARGE (since Molokai tunnel diversion began).--32 years (water years 1961-92), 16.8 ft³/s (12,170. acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 13,210 ft³/s, Apr. 8, 1989, gage height, 8.50 ft, from rating curve extended above 26 ft³/s on basis of slope-area measurement at gage height 6.68 ft; minimum, 2.0 ft³/s, Nov. 1, 2, 1926, June 5, 1926.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 1,200 ft³/s (revised) and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Jan. 14	2130	*1,920	*5.16	Feb. 14	1000	1,650	4.96

Minimum discharge, 5.3 ft³/s, Aug. 15, 16, 25-31.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1991 TO SEPTEMBER 1992
DAILY MEAN VALUES

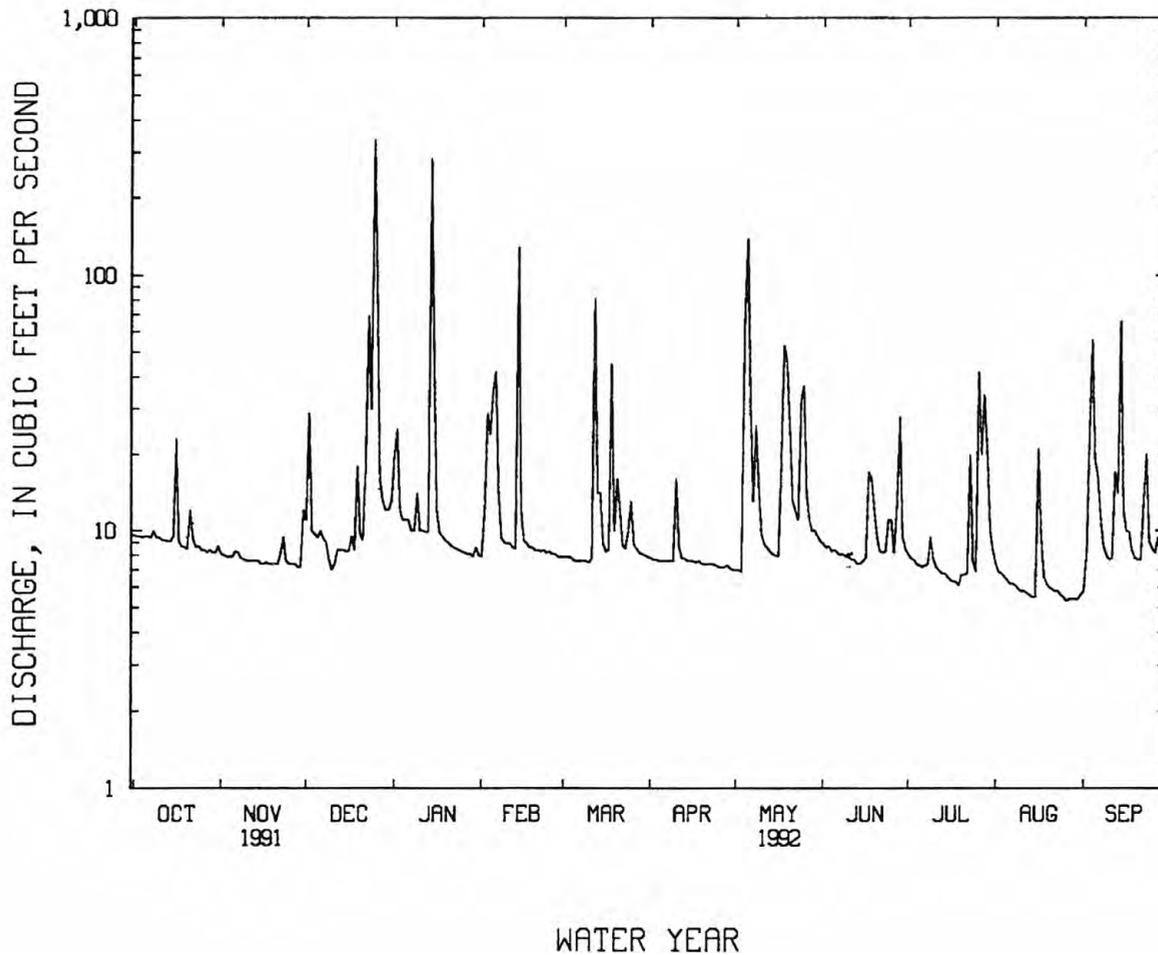
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	9.6	8.1	11	20	7.9	7.9	7.8	7.0	8.9	8.1	7.4	5.8
2	9.5	8.0	29	25	12	7.9	7.7	7.0	8.6	7.8	6.9	8.2
3	9.5	7.9	10	12	29	7.9	7.7	6.9	8.7	7.7	6.8	23
4	9.4	7.9	9.7	11	24	7.8	7.6	6.4	8.3	7.4	6.6	56
5	9.5	7.9	9.4	11	35	7.6	7.6	139	8.4	7.3	6.4	19
6	9.5	8.3	10	11	42	7.6	7.6	31	8.2	7.2	6.2	16
7	9.4	8.2	9.3	10	14	7.6	7.6	13	8.0	7.3	6.2	11
8	10	7.8	9.0	10	9.4	7.6	7.6	26	8.1	7.4	6.1	8.7
9	9.4	7.7	7.7	14	9.0	7.6	7.6	15	7.9	9.4	5.9	8.0
10	9.4	7.6	7.0	10	8.9	7.5	16	9.7	7.9	7.8	5.8	7.7
11	9.2	7.6	7.4	10	8.9	7.8	8.7	8.9	7.7	7.2	5.8	7.8
12	9.2	7.6	8.4	9.9	8.6	8.1	7.8	8.6	7.7	7.0	5.7	17
13	9.1	7.6	8.4	9.9	8.5	14	7.8	8.3	7.4	6.8	5.6	14
14	9.1	7.6	8.4	283	129	14	7.6	8.1	7.4	6.8	5.5	66
15	9.5	7.4	8.3	48	12	8.9	7.6	8.0	7.6	6.6	5.5	12
16	23	7.4	8.3	12	9.2	8.3	7.6	7.9	7.8	6.4	21	10
17	9.1	7.5	9.5	9.9	8.9	8.4	7.5	18	17	6.3	9.7	9.9
18	8.7	7.4	8.4	9.5	8.6	45	7.6	53	16	6.3	6.6	8.4
19	8.6	7.4	18	9.2	8.6	10	7.4	46	12	6.1	6.2	7.8
20	8.5	7.4	9.6	9.0	8.4	16	7.4	26	9.4	6.7	6.0	7.7
21	12	7.4	9.2	8.8	8.4	12	7.4	13	8.3	6.7	5.9	7.7
22	9.3	8.1	17	8.6	8.3	8.8	7.4	12	8.2	6.8	5.8	13
23	8.6	9.4	69	8.5	8.4	8.5	7.4	11	8.3	20	5.8	20
24	8.7	7.6	30	8.4	8.2	10	7.3	32	11	7.6	5.6	9.1
25	8.4	7.4	337	8.3	8.3	13	7.2	37	11	6.9	5.5	8.5
26	8.4	7.4	86	8.2	8.1	8.9	7.2	14	8.2	42	5.3	8.2
27	8.2	7.4	16	8.1	8.1	8.5	7.2	11	13	20	5.4	9.4
28	8.4	7.2	13	8.1	7.9	8.2	7.3	10	28	34	5.4	8.0
29	8.2	7.2	12	7.9	7.9	8.1	7.1	10	9.5	20	5.4	8.4
30	8.2	12	12	8.6	---	8.0	7.0	9.5	8.5	10	5.4	8.3
31	8.7	---	13	8.0	---	7.9	---	9.1	---	8.4	5.6	---
TOTAL	296.3	235.4	821.0	635.9	475.5	392.3	234.3	680.0	297.0	326.0	203.0	424.6
MEAN	9.56	7.85	26.5	20.5	16.4	12.7	7.81	21.9	9.90	10.5	6.55	14.2
MAX	23	12	337	283	129	81	16	139	28	42	21	66
MIN	8.2	7.2	7.0	7.9	7.9	7.5	7.0	6.9	7.4	6.1	5.3	5.8
AC-FT	588	467	1630	1260	943	778	465	1350	589	647	403	842

16408000 WAIKOLU STREAM BELOW PIPELINE CROSSING, NEAR KALAUPAPA--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1919 - 1992, BY WATER YEAR (WY)

MEAN	12.7	19.8	23.9	24.0	21.6	24.7	26.4	17.9	12.5	12.4	12.2	9.83
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 1991 CALENDAR YEAR	FOR 1992 WATER YEAR		WATER YEARS 1919 - 1992	
ANNUAL TOTAL	5924.3		5021.3	
ANNUAL MEAN	16.2		13.7	
HIGHEST ANNUAL MEAN				18.1
LOWEST ANNUAL MEAN				37.9
HIGHEST DAILY MEAN	337	Dec 25	337	Dec 25
LOWEST DAILY MEAN	7.0	Dec 10	5.3	Aug 26
ANNUAL SEVEN-DAY MINIMUM	7.4	Nov 15	5.4	Aug 24
ANNUAL RUNOFF (AC-FT)	11750		9960	
10 PERCENT EXCEEDS	20		20	
50 PERCENT EXCEEDS	11		8.4	
90 PERCENT EXCEEDS	8.0		6.8	
				6.12
				3810
				2.0
				2.2
				13090
				29
				11
				6.0
				1989
				1985
				Apr 8 1989
				Oct 6 1985
				Dec 27 1984



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 mi².

PERIOD OF RECORD.--December 1949 to current year. Prior to July 1958, published as Kaunakakai Stream at Kaunakakai.

REVISED RECORDS.--WSP 1289: 1950-51. WSP 1569: Drainage area.

GAGE.--Water-stage recorder. Elevation of gage is 240 ft, from topographic map.

REMARKS.--Records fair. Flow has been augmented by occasional spillage from Molokai tunnel since May 1965.

AVERAGE DISCHARGE.--42 years (water years 1951-92), 1.89 ft³/s (1,370 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 3,060 ft³/s, Oct. 31, 1961, gage height, 9.30 ft, from rating curve extended above 620 ft³/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 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Jan. 14	2230	*800	*5.94	No other peak greater than base discharge.			

Minimum discharge, no flow for many days.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1991 TO SEPTEMBER 1992
DAILY MEAN VALUES

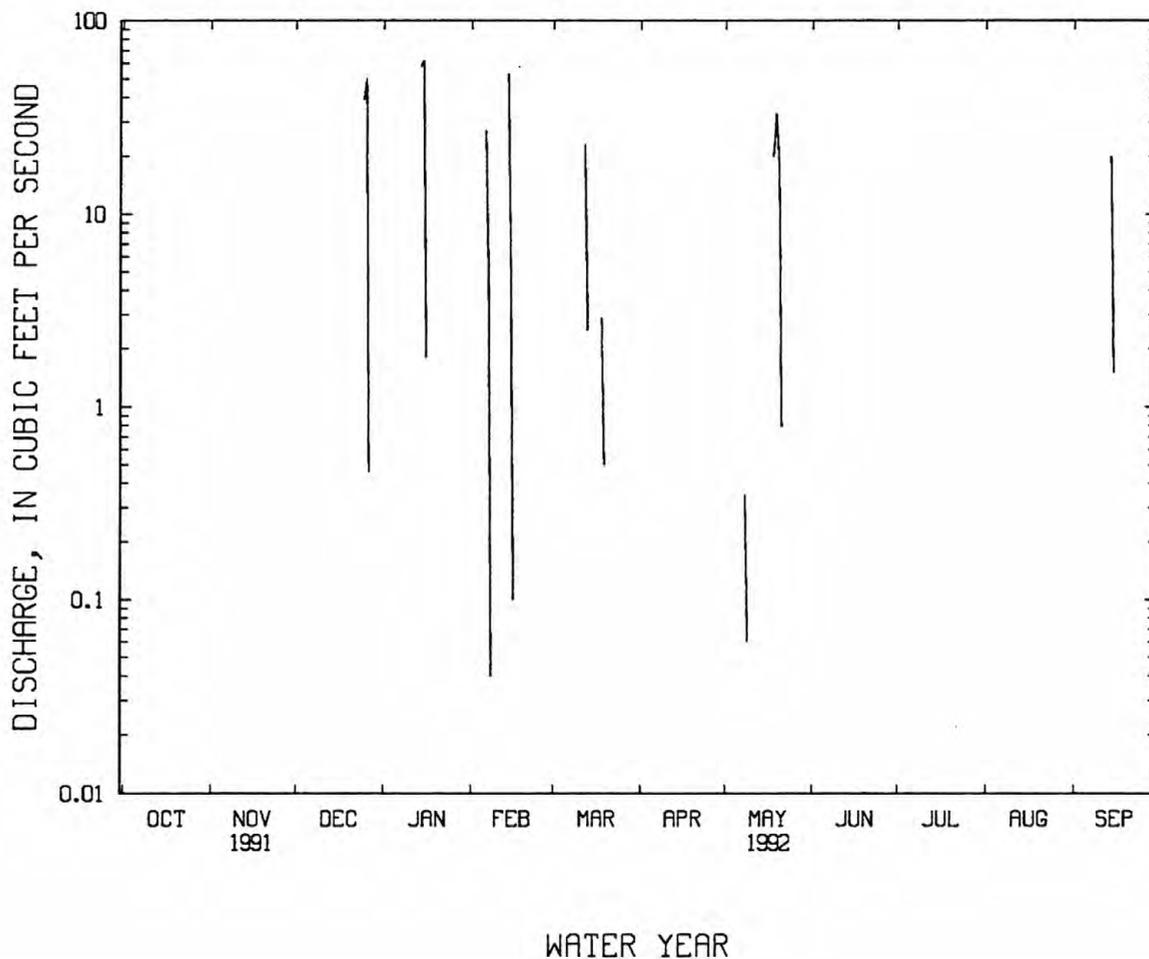
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
2	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
3	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
4	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
5	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
6	.00	.00	.00	.00	27	.00	.00	.00	.00	.00	.00	.00
7	.00	.00	.00	.00	4.2	.00	.00	.00	.00	.00	.00	.00
8	.00	.00	.00	.00	.04	.00	.00	.35	.00	.00	.00	.00
9	.00	.00	.00	.00	.00	.00	.00	.06	.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	23	.00	.00	.00	.00	.00	.00
13	.00	.00	.00	.00	.00	2.5	.00	.00	.00	.00	.00	.00
14	.00	.00	.00	58	53	.00	.00	.00	.00	.00	.00	20
15	.00	.00	.00	62	4.5	.00	.00	.00	.00	.00	.00	1.5
16	.00	.00	.00	1.8	.10	.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	2.9	.00	20	.00	.00	.00	.00
19	.00	.00	.00	.00	.00	.50	.00	33	.00	.00	.00	.00
20	.00	.00	.00	.00	.00	.00	.00	18	.00	.00	.00	.00
21	.00	.00	.00	.00	.00	.00	.00	.79	.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	39	.00	.00	.00	.00	.00	.00	.00	.00	.00
26	.00	.00	50	.00	.00	.00	.00	.00	.00	.00	.00	.00
27	.00	.00	.46	.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	.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	89.46	121.80	88.84	28.90	0.00	72.20	0.00	0.00	0.00	21.50
MEAN	.000	.000	2.89	3.93	3.06	.93	.000	2.33	.000	.000	.000	.72
MAX	.00	.00	50	62	53	23	.00	33	.00	.00	.00	20
MIN	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
AC-FT	.00	.00	177	242	176	57	.00	143	.00	.00	.00	43

1641400 KAUNAKAKAI GULCH AT KAUNAKAKAI--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1950 - 1992, BY WATER YEAR (WY)

MEAN	.53	3.16	4.09	5.50	2.69	2.99	2.57	.72	.033	.059	.31	.062
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 1991 CALENDAR YEAR	FOR 1992 WATER YEAR		WATER YEARS 1950 - 1992	
ANNUAL TOTAL	427.01		422.70	
ANNUAL MEAN	1.17		1.15	
HIGHEST ANNUAL MEAN			1.89	
LOWEST ANNUAL MEAN			6.01	
HIGHEST DAILY MEAN	88	Mar 9	62	Jan 15
LOWEST DAILY MEAN	.00	Jan 1	.00	Oct 1
ANNUAL SEVEN-DAY MINIMUM	.00	Jan 1	.00	Oct 1
ANNUAL RUNOFF (AC-FT)	847		838	
10 PERCENT EXCEEDS	.00		.40	
50 PERCENT EXCEEDS	.00		.00	
90 PERCENT EXCEEDS	.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 mi².

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 days which are poor. Diversion upstream for domestic use at Puu O Hoku Ranch.

AVERAGE DISCHARGE.--29 years, 0.90 ft³/s (652 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 2,720 ft³/s, Apr. 13, 1965, gage height, 11.25 ft, from rating curve extended above 37 ft³/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 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Sept. 1	0700	*348	*4.79	No other peak greater than base discharge.			

Minimum discharge, No flow, Apr. 26, 27.

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	.29	.38	1.0	.18	.16	.10	e.08	e.12	.23	.10	.32	.01
2	.26	.32	1.2	.26	.16	.10	e.08	e.10	.18	.12	.20	.29
3	.20	.32	.42	.23	.38	.08	e.10	e.08	.20	.14	.18	31
4	.26	.29	.29	.18	.23	.06	e.10	8.3	.16	.14	.16	19
5	.23	.23	.26	.16	.26	.06	e.08	9.4	.16	.14	.12	1.9
6	.20	.59	.23	.16	.31	.08	e.08	.61	.18	.14	.10	1.5
7	.29	.38	.23	.18	.23	.08	e.08	.23	.16	.16	.18	1.3
8	15	.32	.20	.18	.16	.06	e.05	.46	.16	.20	.77	e.32
9	1.2	.26	.20	.18	.12	.12	e.05	.26	.16	.36	.16	e.34
10	.42	.26	.20	.18	.12	.10	e.15	.16	.16	.20	.08	e.40
11	.35	.23	.18	.18	.14	.08	e.30	.14	.16	.08	.06	e.30
12	.29	.23	.18	.18	.18	.10	e.20	.12	.28	.20	1.3	e.45
13	.23	.23	.18	.18	.16	.46	e.10	.12	.23	.26	.30	e.30
14	.20	.23	.16	7.1	5.0	.87	e.08	.12	.16	.18	.18	2.5
15	1.1	.20	.16	6.1	.50	.30	e.07	.15	.14	.12	.12	1.3
16	4.2	.18	.16	.68	.26	.14	e.06	.12	.16	.18	1.8	1.4
17	.70	.18	.68	.35	.18	e.10	e.05	4.4	.23	.40	.35	1.3
18	.35	.20	.32	.29	.16	e.20	e.08	1.8	.35	.23	.18	e.30
19	.29	.20	.52	.26	.18	e.15	e.10	1.5	.20	.12	.12	e.34
20	.85	.26	.32	.23	.20	e.30	e.12	.95	.18	.14	.08	e.25
21	2.7	.23	.20	.20	.18	e.20	e.15	.50	.16	.18	.08	e.25
22	1.6	.23	.18	.18	.16	e.10	e.10	.20	.14	.12	.10	e.32
23	.65	.98	3.1	.18	.18	e.08	e.20	.16	.12	2.6	.10	e.40
24	.84	.29	1.3	.18	.18	e.10	e.12	3.3	.16	.32	.10	e.30
25	.46	.20	5.1	.16	.18	e.15	e.07	12	.20	.12	.12	e.23
26	.38	.23	.95	.16	.18	e.10	e.00	1.0	.23	.10	.16	e.30
27	.77	.20	.35	.18	.16	e.08	e.00	.50	.23	.10	.20	e.40
28	.46	.18	.29	.18	.12	e.06	e.50	.35	.98	5.7	.18	e.22
29	.35	.18	.23	.18	.12	e.06	e.29	.32	.20	.72	.16	e.18
30	.32	.47	.23	.19	---	e.12	e.16	.29	.12	2.2	.05	e.22
31	.69	---	.18	.31	---	e.10	---	.26	---	.70	.02	---
TOTAL	36.13	8.68	19.20	19.54	10.55	4.69	3.60	48.02	6.38	16.47	8.03	67.32
MEAN	1.17	.29	.62	.63	.36	.15	.12	1.55	.21	.53	.26	2.24
MAX	15	.98	5.1	7.1	5.0	.87	.50	12	.98	5.7	1.8	31
MIN	.20	.18	.16	.16	.12	.06	.00	.08	.12	.08	.02	.01
AC-FT	72	17	38	39	21	9.3	7.1	95	13	33	16	134

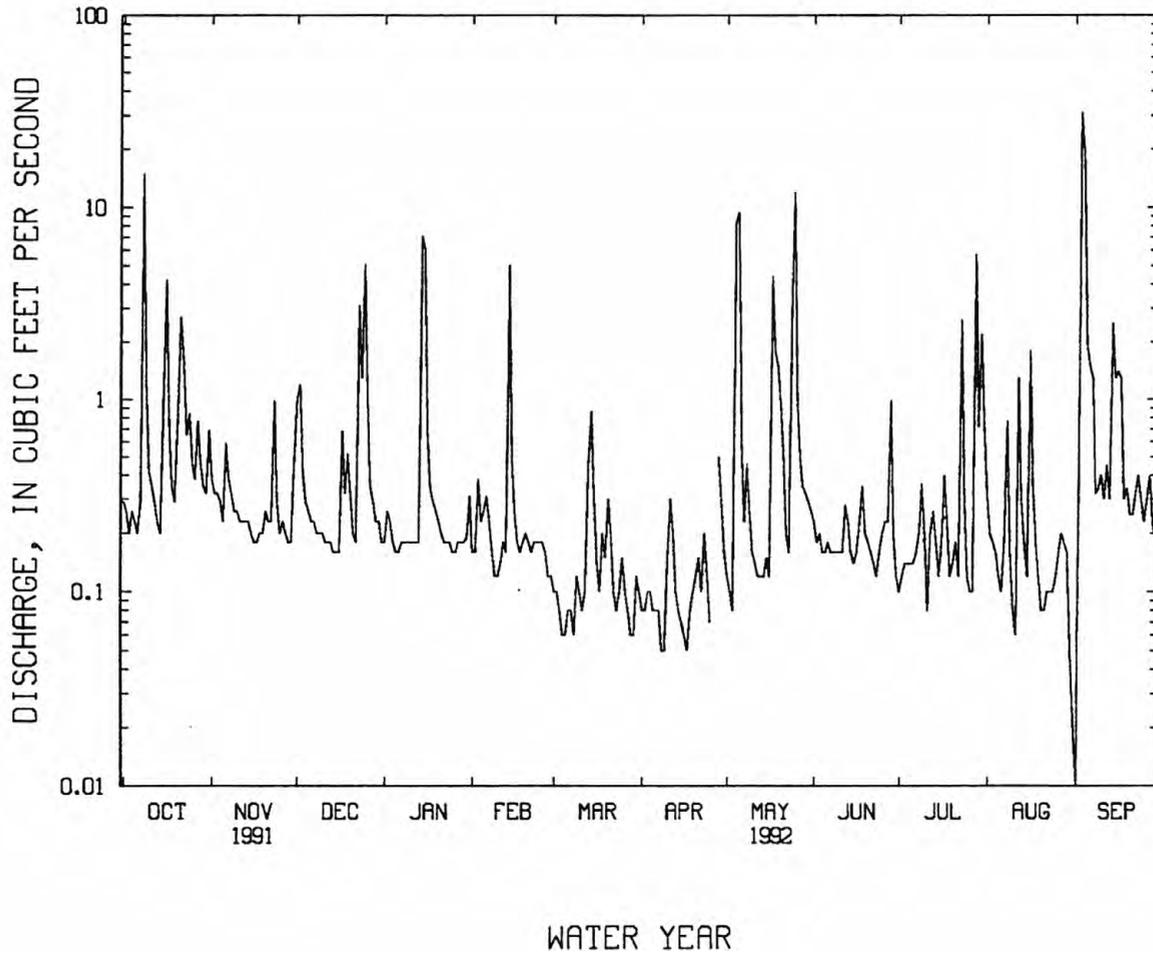
e Estimated

16419500 PAPIO GULCH AT HALAWA--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1963 - 1992, BY WATER YEAR (WY)

MEAN	.55	1.19	1.20	1.37	1.32	1.49	1.60	.74	.32	.43	.30	.30
MAX	2.63	7.56	6.12	4.84	5.88	6.42	10.3	3.99	1.43	1.31	1.21	2.24
(WY)	1986	1971	1965	1988	1965	1968	1989	1987	1982	1980	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 1991 CALENDAR YEAR	FOR 1992 WATER YEAR	WATER YEARS 1963 - 1992		
ANNUAL TOTAL	436.68	248.61		
ANNUAL MEAN	1.20	.68		
HIGHEST ANNUAL MEAN			.90	
LOWEST ANNUAL MEAN			2.32	1989
HIGHEST DAILY MEAN	29 Mar 23	31 Sep 3	.063	1973
LOWEST DAILY MEAN	.16 Dec 14	.00 Apr 26	164	Apr 13 1965
ANNUAL SEVEN-DAY MINIMUM	.17 Dec 10	.07 Mar 2	.00	Jul 5 1963
ANNUAL RUNOFF (AC-FT)	866	493	.00	Aug 3 1963
10 PERCENT EXCEEDS	2.1	.99	650	
50 PERCENT EXCEEDS	.70	.20	1.6	
90 PERCENT EXCEEDS	.23	.10	.22	
			.00	



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 mi².

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 Sept. 30, 1983.

GAGE.--Water-stage recorder. Datum of gage is 420 ft above mean sea level (from topographic map).

REMARKS.--Records good. No diversion upstream.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 8,770 ft³/s, revised, Dec. 6, 1988, from rating curve extended above 6,020 ft³/s, on basis of slope-area measurement at gage height 7.35 ft; 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 3,770 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Dec. 2	0500	*6,290	*7.44	No other peak greater than base discharge.			

Minimum discharge, No flow, many days.

CORRECTIONS.--The maximum discharge for water year 1991 is 8,770 ft³/s, Dec. 6, 1988, gage height, 8.20 ft; the previously published figure was not the maximum.

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	.61	1.3	32	36	.32	.00	5.0	.92	.39	14	10	4.5
2	.63	1.5	988	100	.28	.00	6.7	2.7	.32	3.9	7.3	46
3	.66	1.1	46	8.8	.22	.00	42	.44	.34	3.3	17	507
4	.61	.68	22	4.9	.33	.00	106	.29	.71	5.0	7.6	380
5	.51	.58	11	3.0	.47	.00	5.5	.20	.44	2.4	4.3	126
6	.51	1.3	82	2.1	9.0	.00	2.2	6.1	5.8	5.5	31	64
7	4.6	1.5	11	1.8	1.6	.00	1.2	.89	.76	9.1	23	26
8	11	.66	5.1	1.4	.45	.00	.82	.36	4.7	4.2	28	7.9
9	6.1	9.0	6.6	3.9	.35	.00	1.5	.23	6.6	155	6.0	141
10	2.1	10	3.3	2.7	.30	.00	1.6	.09	4.8	12	3.7	133
11	1.4	3.4	14	1.5	1.8	.00	1.3	.00	.97	38	63	9.3
12	1.2	1.4	71	1.5	9.9	.41	.63	.00	35	30	264	62
13	1.0	1.5	136	1.5	7.4	2.8	.27	1.3	7.8	10	17	13
14	1.2	14	36	36	40	105	.01	2.3	11	13	7.5	246
15	1.2	3.1	84	121	6.3	7.5	.00	45	49	4.6	6.2	91
16	1.2	1.7	8.2	5.1	2.0	37	.00	1.9	13	3.4	81	162
17	7.0	4.9	43	2.5	.92	6.3	.08	3.1	95	7.1	97	171
18	.61	2.9	8.0	1.8	.71	1.9	1.7	1.9	47	17	8.8	19
19	.46	58	4.1	1.2	.57	.72	3.3	5.0	58	66	5.1	19
20	.58	38	2.5	.97	.47	5.7	1.5	4.7	77	93	3.5	15
21	1.6	7.4	2.2	.83	.38	3.5	2.4	1.3	7.6	32	30	7.7
22	4.7	12	11	.72	.27	.60	1.0	.87	5.7	6.0	25	5.2
23	.54	28	19	.63	.16	.40	2.1	.63	3.4	5.3	45	6.1
24	37	37	10	.53	.02	.32	.69	.67	5.7	3.0	7.3	24
25	126	15	75	.46	.00	.60	.26	4.0	6.6	2.3	6.0	8.7
26	11	5.2	126	.44	.00	1.1	.10	1.2	2.9	56	20	6.8
27	12	2.7	8.1	.44	.00	.40	.00	.55	15	32	7.3	11
28	5.3	3.2	14	.46	.00	.13	.00	.44	14	90	8.5	3.4
29	2.7	1.7	27	.39	.00	.00	4.5	5.1	5.1	17	32	2.9
30	1.8	68	5.9	.39	---	5.8	4.5	1.1	8.2	64	20	2.6
31	1.6	---	5.1	.39	---	136	---	.76	---	118	6.3	---
TOTAL	247.42	336.72	1917.1	343.35	84.22	316.18	196.86	94.04	492.83	922.1	898.4	2321.1
MEAN	7.98	11.2	61.8	11.1	2.90	10.2	6.56	3.03	16.4	29.7	29.0	77.4
MAX	126	68	988	121	40	136	106	45	95	155	264	507
MIN	.46	.58	2.2	.39	.00	.00	.00	.00	.32	2.3	3.5	2.6
AC-FT	491	668	3800	681	167	627	390	187	978	1830	1780	4600

16501200 OHEO GULCH AT DAM NEAR KIPAHULU--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1988 - 1992, BY WATER YEAR (WY)

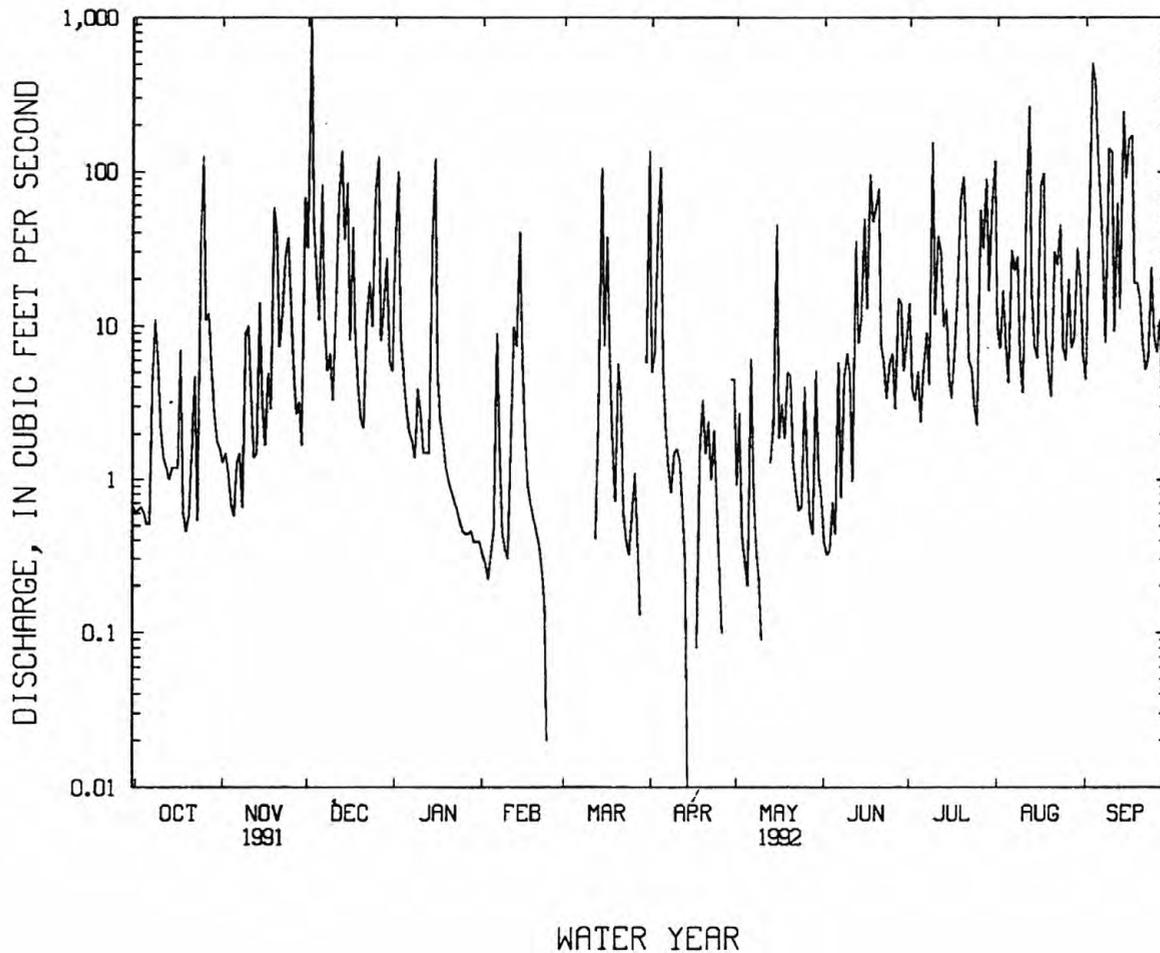
MEAN	66.5	104	91.6	97.1	51.3	119	54.3	38.6	34.0	40.9	36.3	40.3
MAX	145	334	153	218	133	320	116	99.1	66.5	111	82.4	77.4
(WY)	1990	1991	1991	1989	1990	1991	1989	1989	1990	1989	1991	1992
MIN	7.98	11.2	5.28	11.1	2.90	10.2	6.56	3.03	16.4	15.2	10.4	12.5
(WY)	1992	1992	1990	1992	1992	1992	1992	1992	1992	1988	1988	1988

SUMMARY STATISTICS FOR 1991 CALENDAR YEAR

FOR 1992 WATER YEAR

WATER YEARS 1988 - 1992

ANNUAL TOTAL	21817.01			8170.32					66.4			
ANNUAL MEAN	59.8			22.3					102		1991	
HIGHEST ANNUAL MEAN									22.3		1992	
LOWEST ANNUAL MEAN									2220		Nov 19 1990	
HIGHEST DAILY MEAN	2090	Mar 19		988	Dec 2				.00		Feb 25 1992	
LOWEST DAILY MEAN	.46	Oct 19		.00	Feb 25				.00		Feb 25 1992	
ANNUAL SEVEN-DAY MINIMUM	.60	Sep 30		.00	Feb 25				.00		Feb 25 1992	
ANNUAL RUNOFF (AC-FT)	43270			16210					48070			
10 PERCENT EXCEEDS	147			62					177			
50 PERCENT EXCEEDS	5.8			4.1					6.9			
90 PERCENT EXCEEDS	1.3			.28					1.1			



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 mi².

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.--70 years (water years 1923-92), 24.0 ft³/s (17,390 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, about 5,570 ft³/s, Jan. 18, 1916, gage height, 11.6 ft, present site and datum, from rating curve extended above 814 ft³/s by physical model of station site; minimum, 0.90 ft³/s, Oct. 28 to Nov. 1, 1984.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 1,700 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Dec. 2	0500	*2,060	*7.12	Jan. 14	2230	1,940	6.87

Minimum discharge, 1.7 ft³/s, June 4.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1991 TO SEPTEMBER 1992
DAILY MEAN VALUES

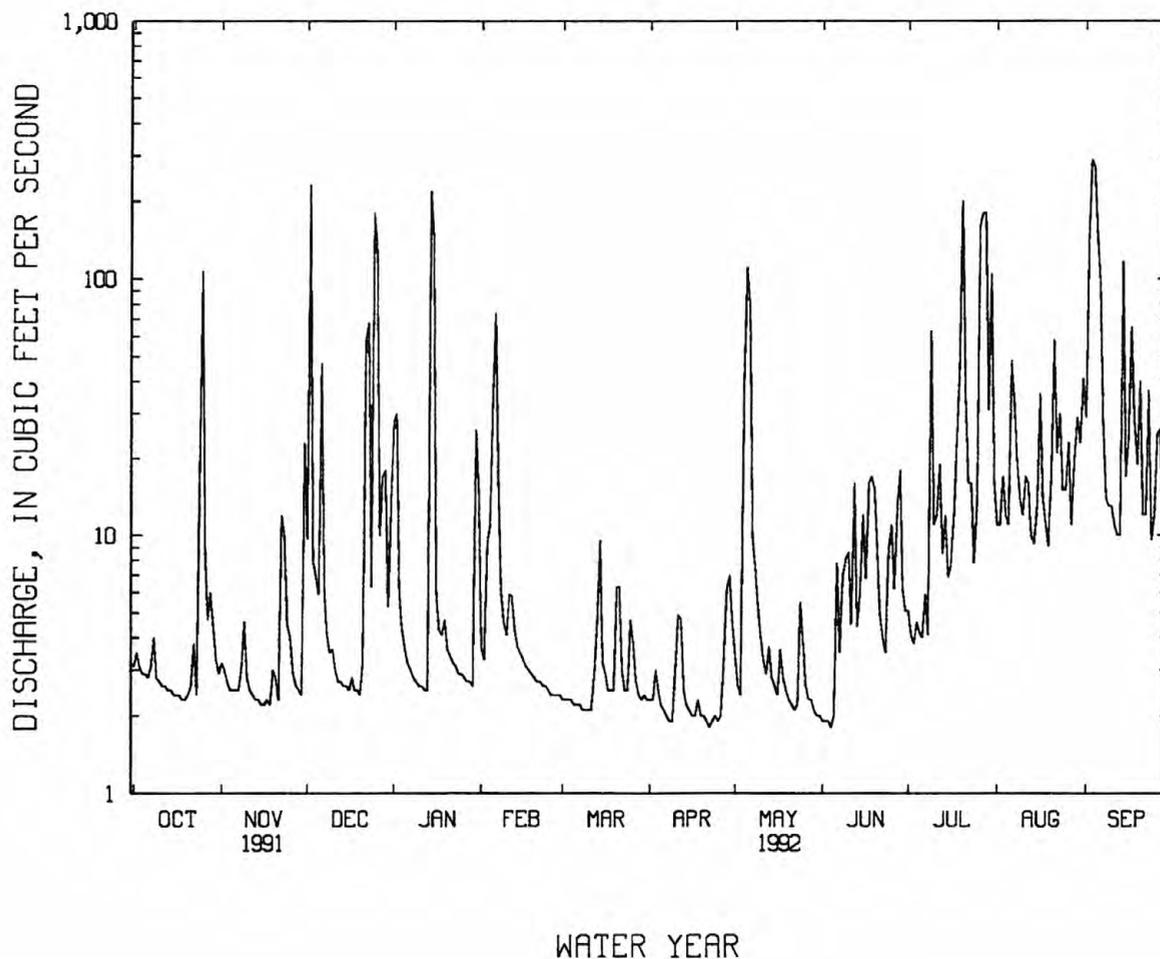
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3.1	3.2	9.7	28	3.7	2.3	2.3	3.4	1.9	5.1	11	29
2	3.5	3.0	232	30	3.3	2.3	2.3	2.6	1.9	4.1	11	145
3	3.1	2.7	8.0	6.0	9.2	2.3	3.0	2.4	1.9	3.8	17	290
4	2.9	2.5	6.9	4.3	11	2.3	2.5	40	1.8	4.6	12	274
5	2.9	2.5	5.9	3.6	33	2.2	2.2	111	2.0	4.2	11	150
6	2.8	2.5	47	3.2	74	2.2	2.1	79	7.8	4.0	48	96
7	3.1	2.5	6.3	3.0	16	2.2	2.0	9.8	3.5	5.9	33	27
8	4.0	3.0	4.1	2.8	6.1	2.1	1.9	7.6	7.0	4.1	19	14
9	2.8	4.6	3.5	2.7	4.6	2.1	1.9	5.5	8.1	63	14	13
10	2.7	2.8	3.6	2.6	4.1	2.1	3.0	4.1	8.6	11	12	13
11	2.6	2.5	3.0	2.6	5.9	2.1	4.9	3.3	4.5	12	17	11
12	2.6	2.4	2.7	2.5	5.8	2.8	4.7	2.9	16	19	16	10
13	2.5	2.3	2.7	2.5	4.3	4.4	2.5	3.7	4.4	8.5	10	10
14	2.5	2.3	2.6	219	3.7	9.6	2.2	2.8	5.8	12	9.3	117
15	2.4	2.2	2.6	147	3.5	3.2	2.1	2.6	12	6.9	13	17
16	2.4	2.2	2.5	6.1	3.3	2.9	2.0	2.4	6.8	7.6	36	23
17	2.4	2.3	2.8	4.3	3.1	2.5	2.0	3.6	16	12	14	65
18	2.3	2.2	2.5	4.1	3.0	2.5	2.3	2.8	17	24	11	28
19	2.3	3.0	2.5	4.7	2.9	2.5	2.0	2.5	15	44	9.1	19
20	2.4	2.8	2.4	3.6	2.8	6.3	2.0	2.3	8.5	200	17	40
21	2.6	2.3	3.2	3.4	2.7	6.3	1.9	2.2	4.9	35	58	12
22	3.8	12	58	3.2	2.7	3.0	1.8	2.1	4.0	16	21	12
23	2.4	10	68	3.1	2.6	2.5	1.9	2.2	3.5	16	30	37
24	20	4.5	6.3	2.9	2.6	2.5	2.0	5.5	8.9	7.8	15	9.6
25	107	4.0	180	2.9	2.5	4.7	1.9	3.9	11	13	15	12
26	8.5	2.9	135	2.8	2.4	3.8	2.0	2.6	6.2	161	23	25
27	4.7	2.6	10	2.7	2.4	2.7	3.2	2.3	13	179	11	26
28	6.0	2.5	17	2.7	2.4	2.4	6.2	2.3	18	181	20	10
29	4.4	2.4	18	2.6	2.4	2.3	7.0	2.1	6.2	31	29	9.0
30	3.3	23	5.3	26	---	2.4	4.6	2.0	5.1	104	23	12
31	2.9	---	14	15	---	2.3	---	2.0	---	16	41	---
TOTAL	220.9	119.7	868.1	549.9	226.0	95.8	82.4	323.5	231.3	1215.6	626.4	1555.6
MEAN	7.13	3.99	28.0	17.7	7.79	3.09	2.75	10.4	7.71	39.2	20.2	51.9
MAX	107	23	232	219	74	9.6	7.0	111	18	200	58	290
MIN	2.3	2.2	2.4	2.5	2.4	2.1	1.8	2.0	1.8	3.8	9.1	9.0
AC-FT	438	237	1720	1090	448	190	163	642	459	2410	1240	3090

16508000 HANAWI STREAM NEAR NAHIKU--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1914 - 1992, BY WATER YEAR (WY)

MEAN	14.6	29.3	32.3	31.4	31.4	41.0	37.1	20.7	10.7	15.4	17.2	11.7
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 1991 CALENDAR YEAR			FOR 1992 WATER YEAR			WATER YEARS 1914 - 1992		
ANNUAL TOTAL	10605.0		6115.2			24.0		
ANNUAL MEAN	29.1		16.7			52.6		
HIGHEST ANNUAL MEAN						7.59		
LOWEST ANNUAL MEAN						1969		
HIGHEST DAILY MEAN	808	Mar 9	290	Sep 3	1610	1926		
LOWEST DAILY MEAN	2.2	Nov 15	1.8	Apr 22	.90	Jan 25 1948		
ANNUAL SEVEN-DAY MINIMUM	2.3	Nov 12	1.9	Apr 19	.96	Oct 31 1984		
ANNUAL RUNOFF (AC-FT)	21040		12130		17380	Oct 25 1984		
10 PERCENT EXCEEDS	49		32		51			
50 PERCENT EXCEEDS	6.2		4.0		7.3			
90 PERCENT EXCEEDS	2.7		2.2		2.8			



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 mi².

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 fair. No diversion upstream. Water is diverted by Koolau ditch, 500 ft downstream, for domestic supply and irrigation of sugarcane in central Maui.

AVERAGE DISCHARGE.--72 years (water years 1915, 1917, 1923-92), 35.5 ft³/s (25,720 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 9,900 ft³/s, Jan. 14, 1923, gage height, 13.5 ft, from floodmarks, from rating curve extended above 660 ft³/s by logarithmic plotting; minimum, 0.5 ft³/s, July 26, 1922.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 1,900 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Dec. 2	0700	2,380	8.33	July 30	1300	2,000	7.83
Jan. 14	2230	*2,970	*9.01	Sept. 4	0830	2,180	8.07

Minimum discharge, 1.9 ft³/s, Apr. 9, 23.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1991 TO SEPTEMBER 1992
DAILY MEAN VALUES

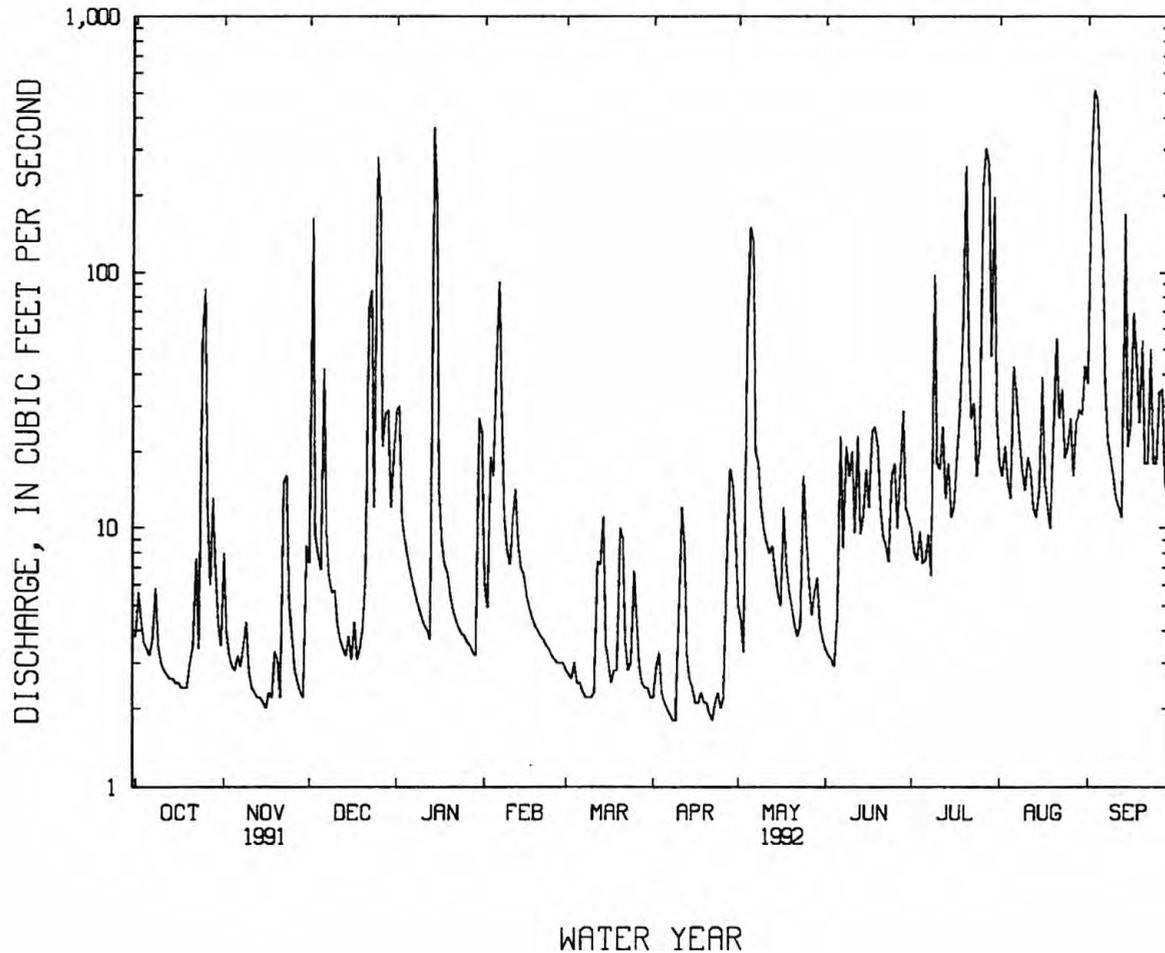
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3.8	8.0	7.3	29	6.2	2.8	2.2	5.0	3.4	10	18	37
2	5.6	3.9	162	30	4.9	2.7	2.9	4.4	3.2	8.1	16	270
3	4.4	3.2	9.4	11	19	2.6	3.3	3.3	3.1	7.5	21	513
4	3.6	2.9	7.9	9.1	16	3.0	2.3	60	2.9	9.7	15	470
5	3.4	2.8	6.9	7.8	44	2.5	2.1	150	4.5	7.3	13	203
6	3.2	3.2	42	6.8	92	2.5	2.0	131	23	7.5	43	135
7	3.7	2.9	9.6	6.0	28	2.3	1.9	20	8.4	9.4	33	37
8	5.8	3.5	6.4	5.4	11	2.2	1.8	18	21	6.5	23	22
9	3.5	4.3	5.6	4.9	8.2	2.2	1.8	12	16	98	17	19
10	3.0	2.8	5.7	4.5	7.2	2.2	4.6	9.9	20	18	14	16
11	2.8	2.4	4.2	4.2	11	2.3	12	8.8	9.6	17	19	13
12	2.7	2.3	3.7	4.0	14	7.4	8.5	8.0	23	25	17	12
13	2.6	2.2	3.4	3.7	8.7	7.2	3.2	8.5	9.5	13	12	11
14	2.6	2.2	3.2	367	7.0	11	2.6	6.8	11	18	11	168
15	2.5	2.1	3.8	192	6.6	3.5	2.4	5.6	17	11	14	21
16	2.5	2.0	3.1	14	5.5	3.0	2.1	5.0	12	12	39	25
17	2.4	2.3	4.3	8.9	4.9	2.5	2.1	12	24	19	15	69
18	2.4	2.2	3.1	7.2	4.5	2.8	2.3	7.3	25	29	12	45
19	2.4	3.3	3.4	6.7	4.2	2.8	2.1	5.7	21	59	10	26
20	3.0	3.1	4.1	5.5	4.0	10	2.1	4.9	12	259	23	54
21	3.5	2.2	6.3	4.8	3.8	9.1	1.9	4.2	9.3	52	55	18
22	7.6	15	73	4.4	3.7	3.6	1.8	3.8	8.5	27	27	18
23	3.4	16	85	4.1	3.5	2.8	2.1	4.2	7.4	31	35	50
24	57	5.0	12	3.9	3.4	3.0	2.3	16	16	16	19	18
25	86	3.8	281	3.8	3.2	6.8	2.0	9.5	18	21	21	18
26	12	2.8	182	3.6	3.1	4.4	2.2	6.3	10	219	27	34
27	6.0	2.5	21	3.5	3.0	2.9	7.2	4.6	17	304	16	35
28	13	2.3	28	3.3	3.0	2.5	17	5.6	29	263	26	15
29	6.8	2.2	29	3.2	3.0	2.4	15	6.4	12	47	29	13
30	4.2	8.5	12	27	---	2.4	9.4	4.2	11	196	28	15
31	3.5	---	20	24	---	2.2	---	3.7	---	28	43	---
TOTAL	268.9	121.9	1048.4	813.3	336.6	119.6	125.2	554.7	407.8	1848.0	711	2400
MEAN	8.67	4.06	33.8	26.2	11.6	3.86	4.17	17.9	13.6	59.6	22.9	80.0
MAX	86	16	281	367	92	11	17	150	29	304	55	513
MIN	2.4	2.0	3.1	3.2	3.0	2.2	1.8	3.3	2.9	6.5	10	11
AC-FT	533	242	2080	1610	668	237	248	1100	809	3670	1410	4760

16518000 WEST WAILUAIKI STREAM NEAR KEANAE--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1914 - 1992, BY WATER YEAR (WY)

MEAN	23.6	46.4	49.9	43.3	47.7	56.2	56.2	30.4	16.5	24.8	26.5	18.5
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 1991 CALENDAR YEAR			FOR 1992 WATER YEAR			WATER YEARS 1914 - 1992		
ANNUAL TOTAL	12498.8		8755.4			35.5		
ANNUAL MEAN	34.2		23.9			67.3		
HIGHEST ANNUAL MEAN						14.5		
LOWEST ANNUAL MEAN						1980		
HIGHEST DAILY MEAN	1210	Aug 7	513	Sep 3	2260	Jan 26	1948	
LOWEST DAILY MEAN	2.0	Nov 16	1.8	Apr 8	.62	Jul 23	1922	
ANNUAL SEVEN-DAY MINIMUM	2.2	Nov 12	2.0	Apr 19	.71	Oct 25	1984	
ANNUAL RUNOFF (AC-FT)	24790		17370			25720		
10 PERCENT EXCEEDS	52		42			79		
50 PERCENT EXCEEDS	8.5		7.3			10		
90 PERCENT EXCEEDS	3.3		2.4			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 mi².

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.--81 years (water years 1912-92), 4.80 ft³/s (3,480 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 5,710 ft³/s, Nov. 18, 1930, gage height, 7.28 ft from rating curve extended above 110 ft³/s by test of model of station site; minimum, 0.02 ft³/s, several days in 1933, 1934.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 270 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Dec. 25	2130	541	3.49	Sept. 3	1030	694	3.67
Jan. 14	2400	*823	*3.82				

Minimum discharge, 0.26 ft³/s, May 3, 4.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1991 TO SEPTEMBER 1992
DAILY MEAN VALUES

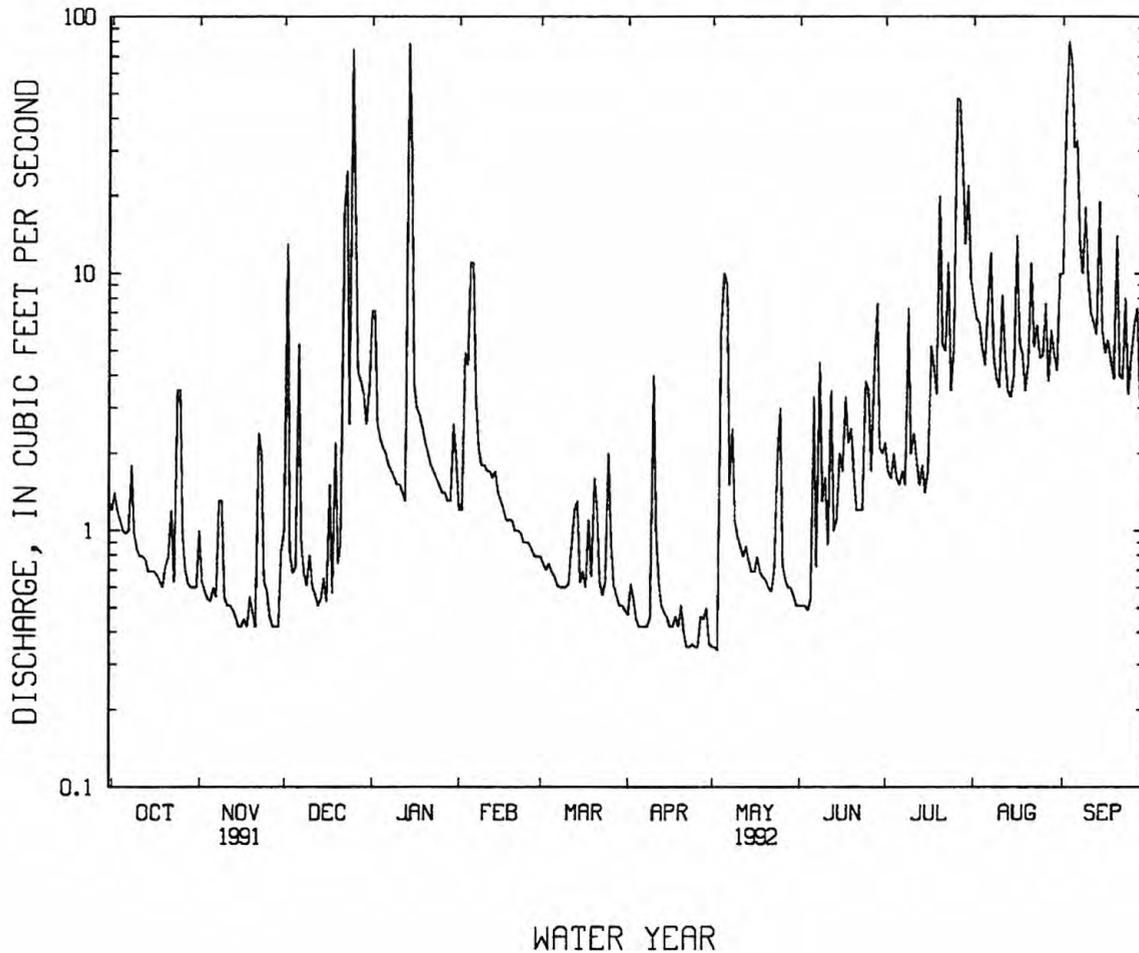
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.2	1.0	1.0	7.1	1.2	.79	.47	.35	.51	2.2	7.8	10
2	1.4	.63	13	7.1	1.2	.74	.62	.35	.51	1.7	6.7	42
3	1.2	.58	.82	2.6	4.9	.70	.54	.34	.51	1.6	6.4	80
4	1.1	.54	.68	2.3	4.4	.74	.45	6.0	.49	2.0	5.1	67
5	1.0	.53	.72	2.1	11	.69	.42	10	.54	1.6	4.4	31
6	.97	.60	5.3	2.0	11	.66	.42	9.0	3.3	1.5	7.5	33
7	1.0	.55	.92	1.8	3.3	.61	.42	1.5	.72	1.7	12	13
8	1.8	1.3	.68	1.7	2.1	.60	.42	2.5	4.5	1.5	4.8	10
9	.98	1.3	.61	1.6	1.8	.60	.46	1.1	1.3	7.3	3.9	18
10	.85	.55	.80	1.5	1.8	.60	4.0	.95	1.6	2.0	3.6	9.7
11	.79	.51	.60	1.5	1.7	.62	1.0	.87	.88	2.4	8.2	7.0
12	.79	.51	.56	1.4	1.7	.87	.63	.79	3.5	1.9	4.9	6.4
13	.77	.49	.51	1.3	1.6	1.2	.51	.87	1.0	1.5	3.5	5.8
14	.69	.46	.54	79	1.7	1.3	.48	.76	1.1	1.8	3.3	19
15	.69	.42	.65	30	1.4	.63	.46	.69	2.0	1.4	4.0	6.0
16	.69	.42	.53	3.7	1.3	.69	.42	.69	1.7	1.7	14	4.9
17	.67	.45	1.5	3.0	1.2	.60	.42	.79	3.3	5.2	5.4	5.5
18	.64	.42	.57	2.8	1.1	1.1	.46	.69	2.2	4.3	4.8	4.6
19	.60	.55	2.2	2.5	1.1	.66	.42	.66	2.5	3.4	3.5	3.9
20	.72	.48	.74	2.2	1.1	1.6	.51	.64	1.6	20	4.4	14
21	.79	.42	.88	2.0	1.0	1.2	.40	.60	1.2	5.3	11	4.0
22	1.2	2.4	17	1.8	1.0	.63	.35	.58	1.2	5.0	5.2	3.9
23	.63	2.0	25	1.7	.98	.56	.35	.70	1.2	11	6.3	8.0
24	3.5	.63	2.6	1.6	.90	.63	.36	1.9	3.8	3.5	4.7	3.4
25	3.5	.58	75	1.5	.90	2.0	.35	3.0	3.5	5.1	4.8	4.8
26	.98	.46	17	1.4	.89	.92	.35	.74	1.7	48	7.6	6.3
27	.70	.42	4.1	1.4	.84	.61	.46	.64	4.4	47	3.8	7.3
28	.62	.42	3.8	1.3	.79	.56	.45	.60	7.6	28	6.0	3.3
29	.60	.42	3.4	1.3	.79	.51	.50	.60	2.1	13	4.8	3.1
30	.60	.83	2.6	2.6	---	.51	.36	.56	2.0	22	4.2	4.1
31	.60	---	3.6	1.9	---	.49	---	.51	---	9.5	10	---
TOTAL	32.27	20.87	187.91	175.7	64.69	24.62	17.46	49.97	62.46	264.1	186.6	439.0
MEAN	1.04	.70	6.06	5.67	2.23	.79	.58	1.61	2.08	8.52	6.02	14.6
MAX	3.5	2.4	75	79	11	2.0	4.0	10	7.6	48	14	80
MIN	.60	.42	.51	1.3	.79	.49	.35	.34	.49	1.4	3.3	3.1
AC-FT	64	41	373	349	128	49	35	99	124	524	370	871

16587000 HONOPOU STREAM NEAR HUELO--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1911 - 1992, BY WATER YEAR (WY)

MEAN	2.72	5.43	6.09	5.56	5.43	6.97	7.70	5.21	2.79	3.43	4.01	2.69
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 1991 CALENDAR YEAR	FOR 1992 WATER YEAR	WATER YEARS 1911 - 1992
ANNUAL TOTAL	1957.61	1525.65
ANNUAL MEAN	5.36	4.17
HIGHEST ANNUAL MEAN		4.80
LOWEST ANNUAL MEAN		9.88
HIGHEST DAILY MEAN	158 Mar 20	80 Sep 3
LOWEST DAILY MEAN	.42 Nov 15	.34 May 3
ANNUAL SEVEN-DAY MINIMUM	.45 Nov 15	.37 Apr 21
ANNUAL RUNOFF (AC-FT)	3880	3030
10 PERCENT EXCEEDS	9.5	8.1
50 PERCENT EXCEEDS	1.7	1.3
90 PERCENT EXCEEDS	.63	.49



16599500 OPANA TUNNEL AT KAILIILI

LOCATION.--Lat 20°51'04", long 156°16'17", Hydrologic Unit 20020000, on left bank at tunnel outlet, 0.3 mi north of Kailiili, and 2.7 mi east of Makawao.

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

GAGE.--Water-stage recorder and concrete control. Elevation of gage is 2,340 ft, from topographic map.

REMARKS.--Records good. Tunnel diverts from Opana Gulch for agricultural and domestic use in the Kokomo, Makawao, and Pukalani areas.

AVERAGE DISCHARGE.--27 years, 3.19 ft³/s (2,310 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 18 ft³/s, Mar. 31, 1982, Apr. 12, 1986; minimum daily, 0.11 ft³/s, Nov. 5-10, 1973, Oct. 5, 6, 25, 26, 1974.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 10 ft³/s on Dec. 26, Jan. 15, Feb. 6, July 28, Sept. 4, 5; minimum daily, 0.14 ft³/s on Nov. 29.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1991 TO SEPTEMBER 1992
DAILY MEAN VALUES

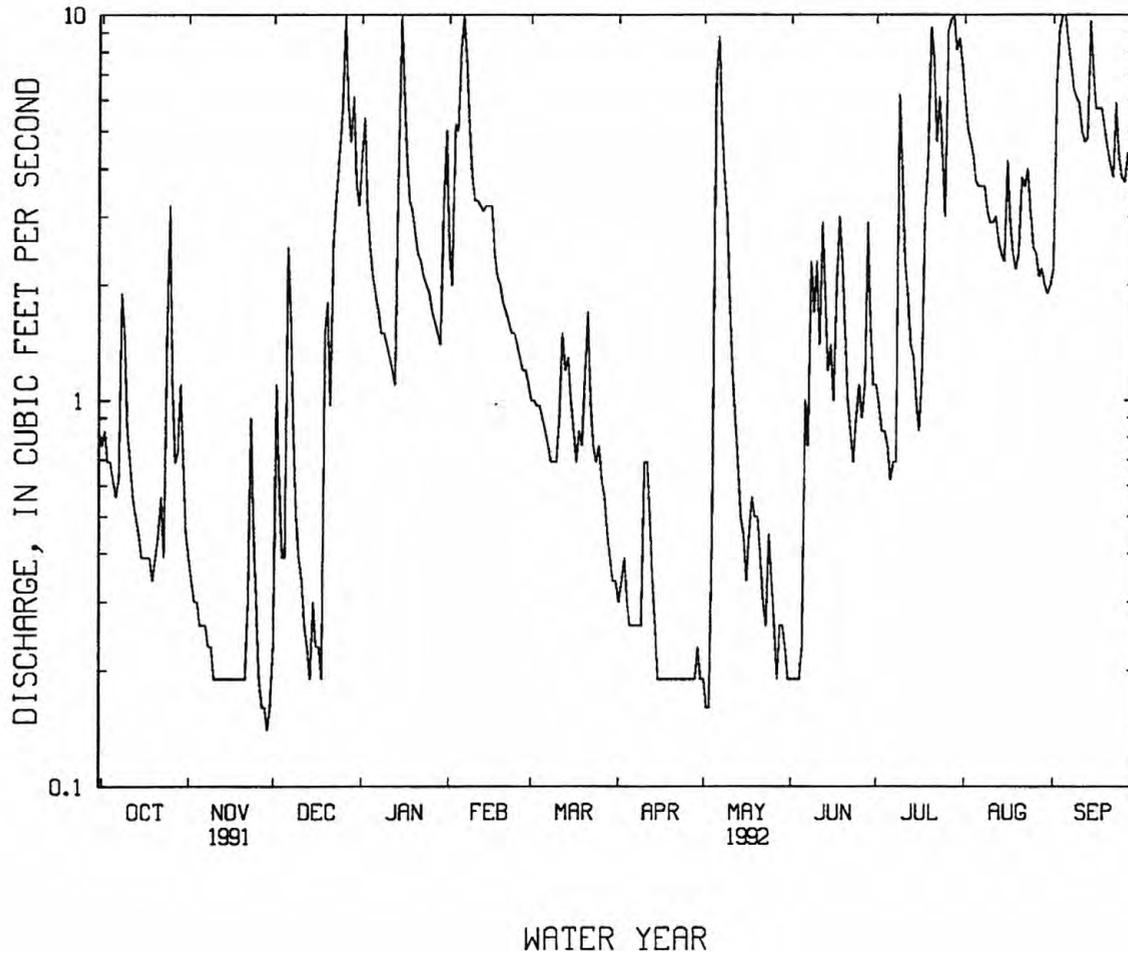
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.76	.39	.23	4.3	2.5	1.0	.30	.19	.19	1.1	6.1	2.2
2	.83	.34	1.1	5.4	2.0	1.0	.34	.16	.19	.97	5.1	6.7
3	.69	.30	.62	3.2	5.2	.97	.39	.16	.19	.83	4.7	9.2
4	.69	.30	.39	2.5	5.0	.97	.30	.48	.19	.83	4.3	10
5	.62	.26	.39	2.1	8.0	.90	.26	6.9	.23	.76	3.7	10
6	.56	.26	2.5	1.9	10	.83	.26	8.8	1.0	.62	3.6	8.5
7	.62	.26	1.7	1.7	7.6	.76	.26	5.2	.76	.69	3.6	7.4
8	1.9	.23	.83	1.5	5.1	.69	.26	3.8	2.3	.69	3.6	6.4
9	1.5	.23	.50	1.5	3.8	.69	.26	3.1	1.7	6.2	3.1	6.1
10	.83	.19	.39	1.4	3.3	.69	.69	1.8	2.3	4.0	2.9	5.9
11	.69	.19	.34	1.3	3.3	.90	.69	1.2	1.4	2.3	2.9	5.0
12	.56	.19	.26	1.2	3.2	1.5	.50	.90	2.9	1.9	3.0	4.7
13	.50	.19	.23	1.1	3.1	1.2	.34	.69	1.9	1.4	2.6	4.8
14	.45	.19	.19	3.8	3.2	1.3	.26	.50	1.2	1.3	2.4	9.6
15	.39	.19	.30	10	3.2	1.0	.19	.45	1.4	1.0	2.3	7.1
16	.39	.19	.23	6.4	3.2	.83	.19	.34	1.0	.83	4.2	5.7
17	.39	.19	.23	4.3	2.4	.69	.19	.45	2.0	1.2	2.9	5.7
18	.39	.19	.19	3.3	2.1	.83	.19	.56	3.0	3.1	2.4	5.7
19	.34	.19	1.5	3.1	2.0	.76	.19	.50	2.3	4.2	2.2	5.0
20	.39	.19	1.8	2.7	1.8	1.2	.19	.50	1.5	9.3	2.4	4.5
21	.45	.19	.97	2.4	1.7	1.7	.19	.39	1.0	7.6	3.8	4.1
22	.56	.30	2.6	2.3	1.6	1.0	.19	.30	.83	4.7	3.6	3.8
23	.39	.90	3.4	2.1	1.5	.76	.19	.26	.69	6.1	4.0	5.9
24	1.5	.45	4.4	2.0	1.5	.69	.19	.45	.90	4.3	3.1	4.3
25	3.2	.30	5.7	1.9	1.4	.76	.19	.34	1.1	3.0	2.5	3.8
26	1.1	.19	10	1.7	1.3	.62	.19	.26	.90	9.1	2.4	3.7
27	.69	.16	5.9	1.6	1.2	.56	.19	.19	1.1	9.7	2.1	4.4
28	.73	.16	4.7	1.5	1.2	.45	.19	.26	2.9	10	2.2	3.6
29	1.1	.14	6.1	1.4	1.1	.39	.23	.26	1.6	8.1	2.0	3.2
30	.69	.16	3.7	3.2	---	.34	.19	.23	1.1	8.7	1.9	3.6
31	.45	---	3.2	5.0	---	.34	---	.19	---	7.4	2.0	---
TOTAL	24.35	7.61	64.59	87.8	92.5	26.32	8.19	39.81	39.77	121.92	97.6	170.6
MEAN	.79	.25	2.08	2.83	3.19	.85	.27	1.28	1.33	3.93	3.15	5.69
MAX	3.2	.90	10	10	10	1.7	.69	8.8	3.0	10	6.1	10
MIN	.34	.14	.19	1.1	1.1	.34	.19	.16	.19	.62	1.9	2.2
AC-FT	48	15	128	174	183	52	16	79	79	242	194	338

16599500 OPANA TUNNEL AT KAILIILI--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1965 - 1992, BY WATER YEAR (WY)

MEAN	1.84	3.21	3.77	3.81	3.81	4.86	5.32	3.57	2.08	2.50	2.08	1.53
MAX	5.40	7.97	9.19	7.55	9.04	11.1	9.35	7.42	5.99	6.40	4.98	5.69
(WY)	1984	1968	1971	1989	1969	1982	1968	1987	1986	1982	1969	1992
MIN	.14	.25	.65	.22	.36	.51	.27	1.28	.54	.40	.19	.15
(WY)	1985	1992	1977	1977	1978	1983	1992	1992	1981	1981	1974	1984

SUMMARY STATISTICS FOR 1991 CALENDAR YEAR	FOR 1992 WATER YEAR	WATER YEARS 1965 - 1992
ANNUAL TOTAL	981.92	781.06
ANNUAL MEAN	2.69	2.13
HIGHEST ANNUAL MEAN		
LOWEST ANNUAL MEAN		
HIGHEST DAILY MEAN	15 Mar 9	10 Dec 26
LOWEST DAILY MEAN	.14 Nov 29	.14 Nov 29
ANNUAL SEVEN-DAY MINIMUM	.19 Nov 10	.19 Apr 27
ANNUAL RUNOFF (AC-FT)	1950	1550
10 PERCENT EXCEEDS	6.4	5.7
50 PERCENT EXCEEDS	1.9	1.2
90 PERCENT EXCEEDS	.30	.19
		3.19
		5.34
		1.45
		18
		.11
		.11
		2310
		7.9
		2.2
		.37



16604500 IAO STREAM AT KEPANIWAI PARK, NEAR WAILUKU

LOCATION.--Lat 20°53'08", long 156°32'32", Hydrologic Unit 20020000, on left bank of Maniania and Waikapu ditch intake, 0.3 mi upstream from Kepaniwai Park, 0.5 mi downstream from Iao Valley State Park, and 2.3 mi west of Wailuku Post Office.

DRAINAGE AREA.--5.98 mi².

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

GAGE.--Water-stage recorder. Elevation of gage is 780 ft, from topographic map.

REMARKS.--Records fair. No appreciable diversion upstream.

AVERAGE DISCHARGE.--9 years (1984-92), 66.4 ft³/s (48,130 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge 6,260 ft³/s, Jan. 28, 1988, gage height, 9.0 ft, from rating curve extended above 181 ft³/s on basis of slope-area measurements at gage heights 6.48 ft and 9.0 ft; minimum, 11 ft³/s for several days in October and November 1984.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum discharge known, 7,540 ft³/s, Dec. 3, 1950, from rating curve based on model study of site 2.3 mi downstream.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 1,000 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Sept. 15	1400	*2,100	*5.34	No other peak greater than base discharge			

Minimum discharge, 12 ft³/s, several days.

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	26	30	65	80	19	26	21	15	15	e40	e78	66
2	26	29	48	72	23	21	19	13	14	e24	e67	244
3	26	28	37	37	84	22	19	12	14	e28	e109	318
4	26	26	34	31	116	26	26	39	14	e27	e145	485
5	25	29	34	27	250	21	26	160	17	e25	e44	337
6	25	65	69	26	230	21	25	96	56	e24	e82	306
7	26	38	32	24	88	20	24	31	19	e25	e61	164
8	26	36	28	22	50	20	24	61	21	e42	e62	95
9	23	30	26	24	38	19	23	26	43	e86	e51	64
10	21	26	25	21	33	19	24	21	30	e32	e41	55
11	21	26	25	22	32	19	25	19	19	e37	e190	51
12	21	25	24	25	42	45	23	18	26	e47	e152	39
13	21	24	24	19	33	45	22	19	18	e31	e73	72
14	21	23	23	55	133	35	22	16	20	e31	e73	217
15	153	22	29	121	70	23	22	16	30	e24	e76	290
16	88	22	42	50	46	22	22	16	31	e24	e251	158
17	46	20	69	37	40	41	22	42	55	e42	e129	162
18	39	20	29	35	73	85	22	28	e24	e34	e68	89
19	36	25	29	29	46	26	23	53	e26	e27	e51	60
20	48	22	26	26	39	167	24	37	e22	e80	e54	60
21	59	19	40	24	34	62	16	23	e20	111	e111	42
22	60	99	132	23	31	33	12	21	e22	52	e79	36
23	39	67	251	22	30	26	12	19	e25	e102	e78	68
24	69	37	98	21	28	42	12	20	e26	e54	e54	33
25	136	27	340	20	34	46	12	24	e22	e62	e68	63
26	64	24	262	19	26	35	12	18	e20	e418	e111	85
27	45	20	93	19	25	26	12	16	e22	e312	e57	167
28	39	19	73	19	25	23	21	15	e37	e340	44	53
29	36	19	45	19	26	23	35	16	e24	e160	113	45
30	32	19	47	30	---	23	21	15	e54	e270	87	72
31	31	---	74	25	---	22	---	15	---	e120	66	---
TOTAL	1354	916	2173	1024	1744	1084	623	940	786	2731	2725	3996
MEAN	43.7	30.5	70.1	33.0	60.1	35.0	20.8	30.3	26.2	88.1	87.9	133
MAX	153	99	340	121	250	167	35	160	56	418	251	485
MIN	21	19	23	19	19	19	12	12	14	24	41	33
AC-FT	2690	1820	4310	2030	3460	2150	1240	1860	1560	5420	5410	7930

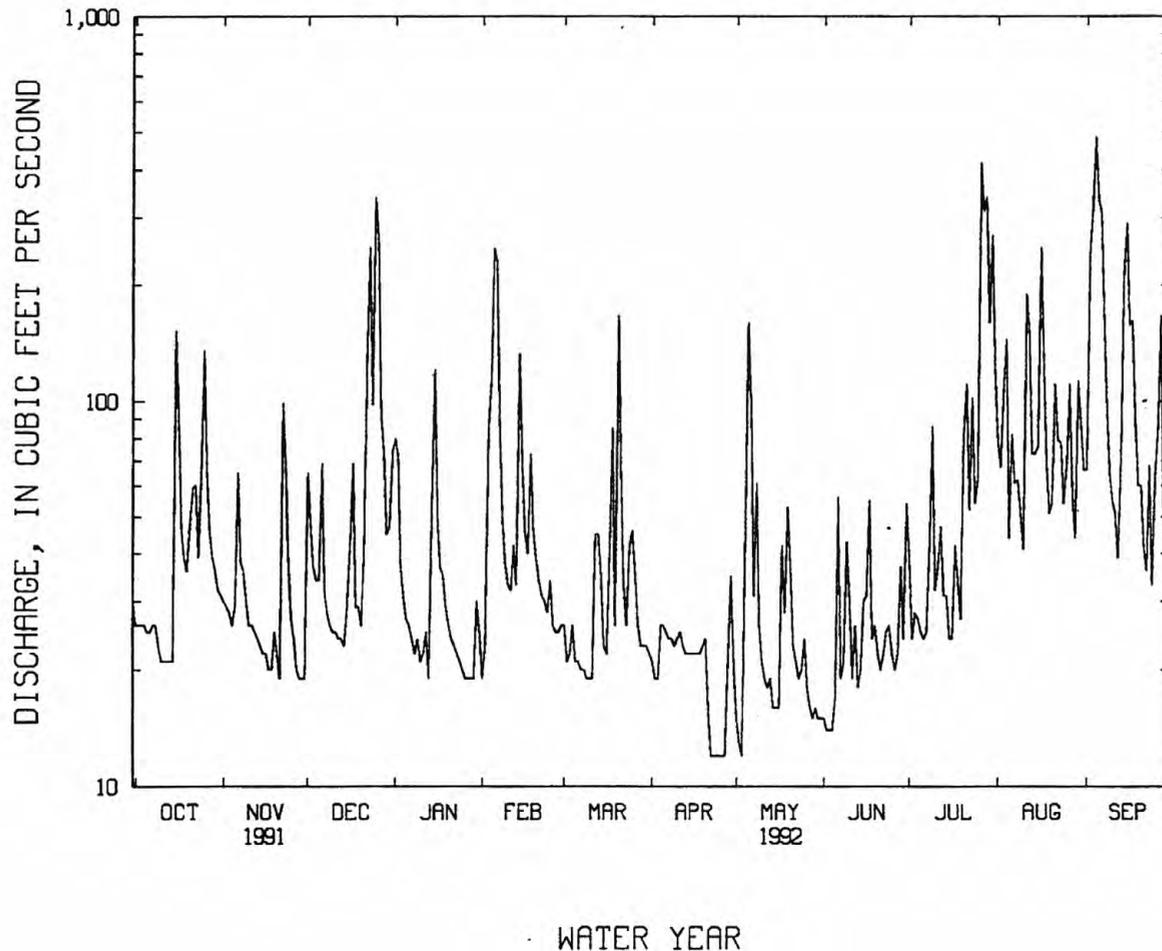
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16604500 IAO STREAM AT KEPANIWAI PARK, NEAR WAILUKU--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1983 - 1992, BY WATER YEAR (WY)

MEAN	58.5	65.2	63.8	66.4	60.0	84.2	91.0	74.3	55.9	63.1	57.2	49.6
MAX	103	132	97.5	149	82.2	169	230	136	99.7	105	92.3	133
(WY)	1984	1988	1988	1988	1987	1986	1989	1987	1987	1989	1991	1992
MIN	11.9	20.5	18.3	25.4	32.7	30.4	20.8	27.9	24.4	25.2	26.0	15.8
(WY)	1985	1985	1985	1985	1985	1987	1992	1984	1985	1984	1984	1984

SUMMARY STATISTICS FOR 1991 CALENDAR YEAR	FOR 1992 WATER YEAR		WATER YEARS 1983 - 1992	
ANNUAL TOTAL	23502	20096		
ANNUAL MEAN	64.4	54.9	66.4	
HIGHEST ANNUAL MEAN			85.2	1986
LOWEST ANNUAL MEAN			41.4	1985
HIGHEST DAILY MEAN	678	485	913	Apr 10 1986
LOWEST DAILY MEAN	19	12	11	Oct 7 1984
ANNUAL SEVEN-DAY MINIMUM	21	13	11	Oct 16 1984
ANNUAL RUNOFF (AC-FT)	46620	39860	48130	
10 PERCENT EXCEEDS	127	112	133	
50 PERCENT EXCEEDS	40	30	41	
90 PERCENT EXCEEDS	26	19	20	



16614000 WAIHEE RIVER AT DAM NEAR WAIHEE

LOCATION.--LAT 20°56'21", long 156°32'59", Hydrologic Unit 20020000, on right bank at dam 8 ft upstream from the abandoned Waihee canal intake, 2.6 mi southwest from Waihee Point, and 4.4 mi northwest from Wailuku Post Office.

DRAINAGE AREA.--4.20 mi².

PERIOD OF RECORD.--November 1910 to December 1913, November 1983 to current year. Low-flow records not equivalent prior to Dec. 31, 1913, due to Waihee canal diverted water upstream.

GAGE.--Water-stage recorder. Elevation of gage is 605 ft, from topographic map.

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

AVERAGE DISCHARGE.--8 years, 84.6 ft³/s (61,370 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 9,660 ft³/s, Jan. 28, 1988, gage height, 8.95 ft, from rating curve extended above 280 ft³/s on basis of slope-area measurements at gage heights 6.70 ft and 8.95 ft; minimum, 22 ft³/s, Jan. 18-22, 24, 25, 1985.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 2,000 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Feb. 14	1230	2,120	4.41	Sept. 3	--	e*6,000	--

Minimum discharge, 31 ft³/s, Apr. 23-27.

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	48	45	135	73	38	36	34	38	32	63	49	e80
2	49	44	61	68	41	36	36	34	32	39	46	e520
3	49	43	46	47	68	36	37	33	33	47	82	e650
4	48	43	47	44	83	39	35	75	33	44	47	e800
5	48	49	46	44	131	36	33	180	35	40	45	e250
6	49	84	65	43	87	35	33	70	97	39	54	e330
7	59	52	43	43	46	34	33	40	36	40	55	e150
8	62	49	41	41	41	34	33	56	37	39	55	e80
9	47	47	40	43	39	34	33	43	51	145	44	e70
10	46	43	40	40	39	34	47	38	42	52	45	e90
11	45	43	40	43	42	35	47	37	35	59	292	e60
12	45	42	39	41	48	45	36	37	46	77	82	e56
13	44	42	40	40	42	51	34	37	35	51	51	e56
14	44	42	40	212	118	45	33	34	35	51	48	e170
15	219	41	52	91	42	35	32	33	37	39	49	e70
16	54	40	48	43	39	35	32	33	42	39	273	e64
17	46	43	75	41	38	44	32	50	57	70	60	e130
18	45	41	43	42	39	84	34	38	39	56	49	e80
19	44	57	50	41	38	38	33	43	43	44	46	e64
20	69	43	41	40	37	150	37	37	36	134	e45	e120
21	83	41	54	39	37	44	32	34	33	66	e210	e64
22	75	171	179	39	37	37	32	33	36	45	e90	e54
23	50	63	272	39	37	35	32	33	40	70	e70	e90
24	81	52	57	39	36	49	31	50	111	41	e60	e76
25	99	43	451	39	37	53	31	50	62	69	e64	e110
26	54	41	127	38	36	44	31	37	41	515	e96	e130
27	49	40	52	38	36	38	36	36	100	244	e70	e200
28	47	40	56	38	36	35	66	35	92	340	e50	e60
29	46	39	47	38	39	35	61	35	38	84	e120	e52
30	45	39	50	45	---	35	41	33	89	217	e66	e66
31	44	---	69	40	---	34	---	32	---	56	e54	---
TOTAL	1833	1502	2446	1552	1427	1355	1097	1394	1475	2915	2467	4792
MEAN	59.1	50.1	78.9	50.1	49.2	43.7	36.6	45.0	49.2	94.0	79.6	160
MAX	219	171	451	212	131	150	66	180	111	515	292	800
MIN	44	39	39	38	36	34	31	32	32	39	44	52
AC-FT	3640	2980	4850	3080	2830	2690	2180	2760	2930	5780	4890	9500

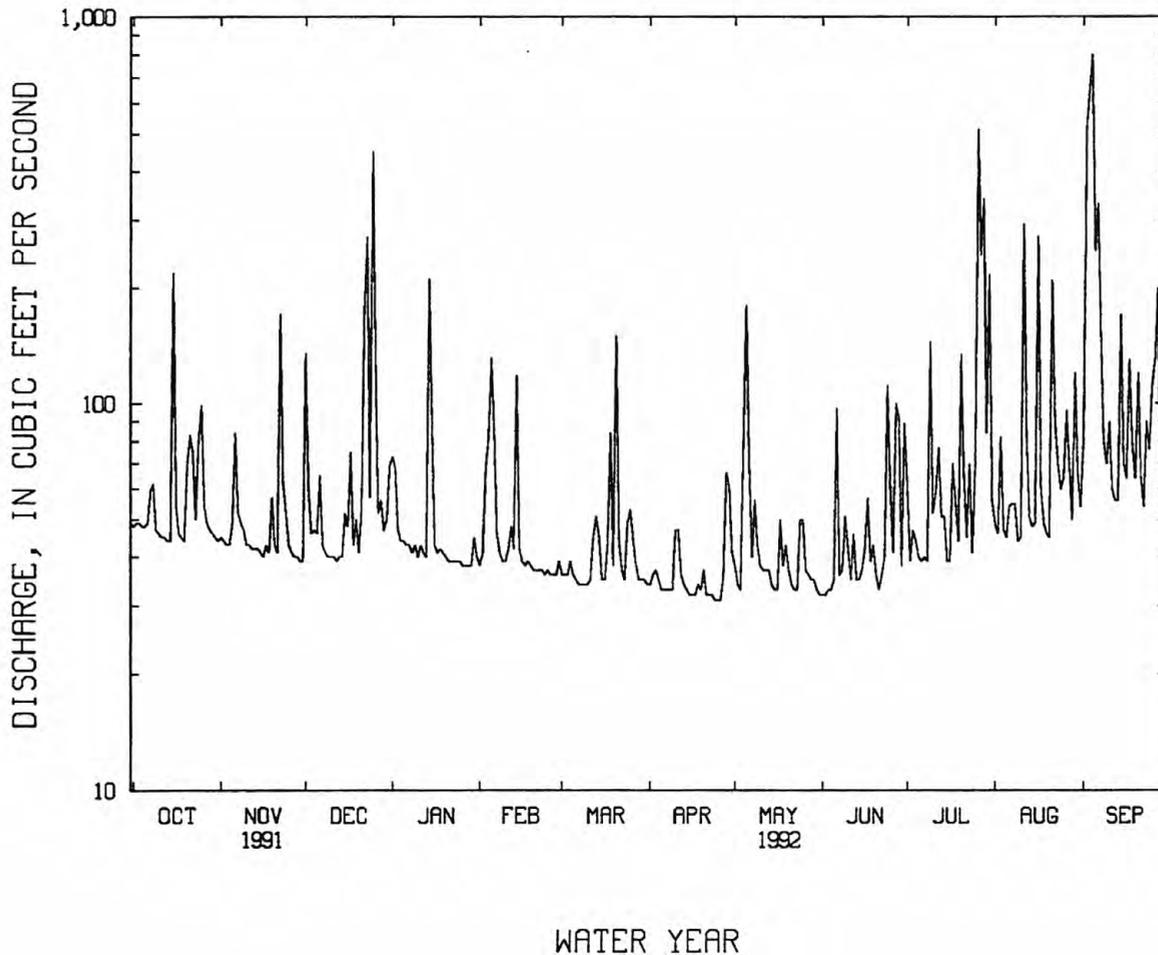
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16614000 WAIHEE RIVER AT DAM NEAR WAIHEE--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1984 - 1992, BY WATER YEAR (WY)

MEAN	71.9	84.3	74.3	79.0	69.8	93.0	102	91.8	74.6	87.8	78.5	74.6
MAX	91.7	150	109	186	106	158	276	143	118	129	99.6	160
(WY)	1986	1991	1988	1988	1988	1986	1989	1987	1987	1989	1991	1992
MIN	27.4	36.8	31.3	29.4	49.0	43.7	36.6	45.0	43.4	54.8	46.1	32.9
(WY)	1985	1985	1985	1985	1986	1992	1992	1992	1984	1984	1984	1984

SUMMARY STATISTICS FOR 1991 CALENDAR YEAR	FOR 1992 WATER YEAR		WATER YEARS 1984 - 1992	
ANNUAL TOTAL	27966	24255		
ANNUAL MEAN	76.6	66.3	84.6	
HIGHEST ANNUAL MEAN			103	1988
LOWEST ANNUAL MEAN			57.5	1985
HIGHEST DAILY MEAN	729	800	1160	Jan 28 1988
LOWEST DAILY MEAN	39	31	22	Jan 18 1985
ANNUAL SEVEN-DAY MINIMUM	40	32	23	Jan 18 1985
ANNUAL RUNOFF (AC-FT)	55470	48110	61310	
10 PERCENT EXCEEDS	119	99	143	
50 PERCENT EXCEEDS	52	44	56	
90 PERCENT EXCEEDS	43	34	38	



16618000 KAHAKULOA STREAM NEAR HONOKOHAU
(National stream-quality accounting network station)

LOCATION.--Lat 20°58'54", long 156°33'26", Hydrologic Unit 20020000, on right bank 0.5 mi downstream from Kapuna Stream, 1.3 mi south of Kahakuloa, 2.0 mi west of Puu Makawana, and 4.3 mi southeast of Honokohau.

DRAINAGE AREA.--3.47 mi².

PERIOD OF RECORD.--July 1939 to August 1943, September 1947 to November 1970, December 1974 to current year.
Records for January 1913 to December 1914 (fragmentary) at site 1.0 mi upstream not equivalent owing to difference in drainage areas.

REVISED RECORDS.--WSP 1319: 1948, 1949(M). WSP 1569: Drainage area.

GAGE.--Water-stage recorder and concrete control. Elevation of gage is 330 ft, from topographic map.

REMARKS.--Records fair. No diversion upstream.

AVERAGE DISCHARGE.--43 years (1940-42, 1948-70, 1976-92), 17.9 ft³/s (12,970 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 4,220 ft³/s, Jan. 28, 1988, gage height, 9.93 ft from floodmarks, from rating curve extended above 510 ft³/s, on basis of slope-area measurements at gage heights 6.70 ft, 8.48 ft, and 9.93 ft; minimum, 2.7 ft³/s, Jan. 22, 28, 29, Feb. 10, 12, 13, 1985.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 700 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Sept. 3	1400	*855	*5.97	No other peak greater than base discharge			

Minimum discharge, 3.9 ft³/s, Apr. 26-27.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1991 TO SEPTEMBER 1992
DAILY MEAN VALUES

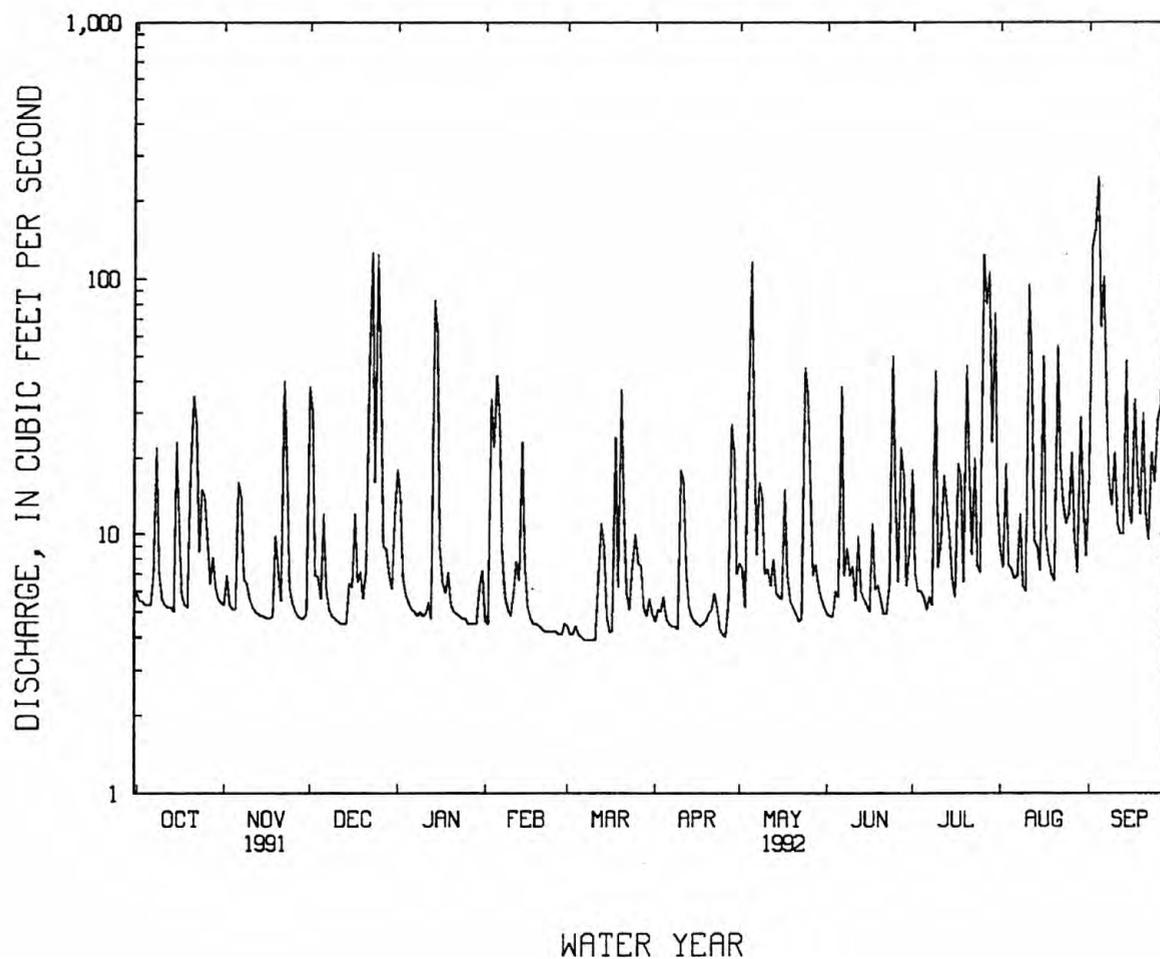
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	5.9	5.3	38	18	4.6	4.4	4.6	7.7	4.9	18	8.8	17
2	5.5	6.9	30	14	4.5	4.1	5.1	7.3	4.8	7.0	7.4	135
3	5.5	5.3	6.9	6.7	34	4.1	5.0	5.2	4.8	6.0	19	155
4	5.3	5.1	6.8	5.8	22	4.4	5.7	33	6.0	6.0	7.6	247
5	5.3	5.1	5.6	5.4	42	4.1	4.7	116	5.7	5.7	7.3	65
6	5.3	16	12	5.1	28	4.0	4.5	24	38	5.1	6.7	102
7	7.2	14	6.2	5.0	8.5	3.9	4.4	8.3	6.9	5.7	6.9	32
8	22	6.7	5.1	4.8	5.7	3.9	4.4	16	8.8	5.3	12	16
9	7.1	6.4	4.8	5.0	5.1	3.9	4.3	14	6.9	44	6.3	13
10	5.6	5.6	4.7	4.8	4.8	3.9	18	7.0	7.5	7.4	6.0	21
11	5.3	5.2	4.6	4.9	5.8	3.9	16	7.3	5.5	9.4	95	11
12	5.2	5.0	4.5	5.4	7.8	6.7	7.4	6.3	9.8	17	43	10
13	5.2	4.9	4.5	4.7	6.6	11	5.3	8.0	6.0	13	9.4	10
14	5.0	4.8	4.5	83	23	9.0	4.8	5.9	5.6	9.9	8.9	48
15	23	4.8	6.4	62	7.4	4.8	4.6	5.7	5.3	6.6	7.2	13
16	11	4.7	6.2	8.9	5.2	4.2	4.5	5.6	5.0	5.7	50	11
17	5.8	4.7	12	6.5	4.7	4.2	4.4	15	11	19	10	34
18	5.3	4.8	6.5	5.9	4.5	24	4.5	6.9	6.1	17	8.0	17
19	5.2	9.8	7.1	7.1	4.5	6.2	4.6	5.5	6.3	6.5	7.0	12
20	18	7.3	5.6	5.3	4.4	37	4.9	5.2	5.5	46	6.6	30
21	35	5.5	7.2	5.0	4.3	13	5.1	4.9	4.9	19	55	12
22	27	40	50	4.9	4.2	5.9	5.9	4.6	4.9	8.3	19	9.5
23	8.5	19	126	4.8	4.2	5.1	5.2	4.7	6.3	20	13	21
24	15	6.2	16	4.7	4.2	7.6	4.3	45	50	7.5	11	16
25	14	5.4	124	4.7	4.2	10	4.1	35	14	7.1	12	28
26	9.6	5.0	41	4.5	4.2	7.7	4.0	16	6.5	124	21	32
27	6.4	4.8	8.9	4.5	4.1	7.5	5.3	6.9	22	80	9.6	58
28	8.1	4.7	8.8	4.5	4.1	5.2	27	7.6	17	106	7.1	12
29	6.2	4.7	7.0	4.5	4.5	4.8	21	6.2	6.3	23	29	9.8
30	5.6	4.9	6.1	6.3	---	5.6	7.0	5.6	8.7	74	13	15
31	5.4	---	12	7.2	---	4.9	---	5.2	---	13	8.2	---
TOTAL	304.5	232.6	589.0	323.9	271.1	229.0	210.6	451.6	301.0	742.2	531.0	1212.3
MEAN	9.82	7.75	19.0	10.4	9.35	7.39	7.02	14.6	10.0	23.9	17.1	40.4
MAX	35	40	126	83	42	37	27	116	50	124	95	247
MIN	5.0	4.7	4.5	4.5	4.1	3.9	4.0	4.6	4.8	5.1	6.0	9.5
AC-FT	604	461	1170	642	538	454	418	896	597	1470	1050	2400

16618000 KAHAKULOA STREAM NEAR HONOKOHAU--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1939 - 1992, BY WATER YEAR (WY)

MEAN	15.3	20.3	19.0	17.7	17.8	25.0	24.5	17.8	12.0	15.9	16.7	11.6
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 1991 CALENDAR YEAR	FOR 1992 WATER YEAR		WATER YEARS 1939 - 1992	
ANNUAL TOTAL	6213.1	5398.8		
ANNUAL MEAN	17.0	14.8	17.9	
HIGHEST ANNUAL MEAN			30.8	1942
LOWEST ANNUAL MEAN			11.0	1981
HIGHEST DAILY MEAN	210	247	696	Mar 10 1942
LOWEST DAILY MEAN	4.5	3.9	2.7	Jan 28 1985
ANNUAL SEVEN-DAY MINIMUM	4.7	3.9	2.8	Feb 6 1985
ANNUAL RUNOFF (AC-FT)	12320	10710	12950	
10 PERCENT EXCEEDS	30	32	35	
50 PERCENT EXCEEDS	8.2	6.6	9.0	
90 PERCENT EXCEEDS	5.4	4.5	5.2	



16618000 KAHAKULOA STREAM NEAR HONOKOHAU--Continued

WATER-QUALITY RECORDS

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

WATER QUALITY DATA, WATER YEAR OCTOBER 1991 TO SEPTEMBER 1992

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 WATER (DEG C)	TUR-BID-ITY (NTU)	BARO-METRIC PRES-SURE (MM OF HG)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, (PER-CENT SATUR-ATION)	COLI-FORM, FECAL, UM-MF (COLS./ 100 ML)	STREP-TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML)
OCT 1991											
15...	1015	4.8	83	7.2	21.0	0.50	749	8.2	94	K11	480
DEC											
03...	1200	7.4	70	7.2	21.0	0.90	753	7.8	89	44	1300
FEB 1992											
11...	1115	6.1	77	7.8	18.5	0.50	752	9.3	101	K22	400
APR											
21...	1130	5.0	90	8.2	20.0	0.60	751	8.2	92	K8	1200
JUN											
01...	1130	5.2	90	8.1	22.0	0.40	754	8.4	97	K17	1200
AUG											
11...	1130	181	35	6.7	21.5	13	753	8.5	97	1700	10000

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)
OCT 1991											
15...	25	0	4.9	3.0	8.0	40	0.7	0.90	32	0	27
DEC											
03...	19	0	3.6	2.5	7.8	46	0.8	0.80	24	0	20
FEB 1992											
11...	21	1	4.1	2.6	7.5	43	0.7	0.80	25	0	21
APR											
21...	25	0	4.9	3.0	8.3	41	0.7	1.0	32	0	26
JUN											
01...	25	1	5.1	2.9	7.9	40	0.7	0.80	29	0	24
AUG											
11...	7	4	1.4	0.83	4.3	55	0.7	0.50	4	0	5

DATE	SULFATE DIS-SOLVED (MG/L AS SO4)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)	FLUO-RIDE, DIS-SOLVED (MG/L AS F)	SILICA, DIS-SOLVED (MG/L AS SiO2)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L)	SOLIDS, DIS-SOLVED (TONS PER DAY)	NITRO-GEN, NITRITE TOTAL (MG/L AS N)	NITRO-GEN, NITRITE DIS-SOLVED (MG/L AS N)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N)
OCT 1991										
15...	1.8	11	0.10	21	68	67	0.88	<0.010	<0.010	0.110
DEC										
03...	1.8	10	0.20	16	41	55	0.82	<0.010	<0.010	0.130
FEB 1992										
11...	1.6	10	0.10	18	56	57	0.92	0.010	<0.010	0.077
APR										
21...	1.9	10	0.10	20	63	65	0.85	<0.010	<0.010	0.076
JUN										
01...	1.7	11	<0.10	20	70	64	0.98	<0.010	<0.010	0.058
AUG										
11...	1.3	6.6	<0.10	4.1	37	22	18.1	<0.010	<0.010	<0.050

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

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

16618000 KAHAKULOA STREAM NEAR HONOKOHAU--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1991 TO SEPTEMBER 1992

DATE	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N)	NITRO-GEN, AMMONIA TOTAL (MG/L AS N)	NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS NH4)	NITRO-GEN, AMMONIA + 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)	PHOS-PHORUS ORTHO, DIS-SOLVED (MG/L AS P)	ALUM-INUM, DIS-SOLVED (UG/L AS AL)	BARIUM, DIS-SOLVED (UG/L AS BA)
OCT 1991 15...	0.110	0.020	--	<0.20	0.040	0.020	<0.010	0.020	50	11
DEC 03...	0.140	<0.010	0.01	<0.20	0.020	0.020	0.020	0.020	--	--
FEB 1992 11...	0.062	0.010	--	<0.20	<0.010	<0.010	<0.010	0.010	20	8
APR 21...	0.073	0.020	--	<0.20	0.040	0.020	0.020	0.020	90	9
JUN 01...	0.053	0.030	0.01	<0.20	0.030	0.020	0.020	0.010	--	--
AUG 11...	0.050	0.040	0.04	0.30	0.030	<0.010	0.020	0.010	230	10

DATE	TIME	COBALT, DIS-SOLVED (UG/L AS CO)	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 1991 15...	1015	<3	5	<4	<1	<10	<1	<1	<1.0	31	<6
FEB 1992 11...	1115	<3	<3	<4	<1	<10	<1	<1	<1.0	26	<6
APR 21...	1130	<3	9	<4	<1	<10	1	<1	<1.0	31	<6
AUG 11...	1130	<3	93	<4	2	<10	<1	<1	<1.0	14	<6

CROSS SECTION ANALYSES, WATER YEAR OCTOBER 1991 TO SEPTEMBER 1992

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 HG)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, (PER-CENT SATUR-ATION)	
FEB 1992 11...	1130		0.5	77	7.8	18.5	752	9.3	101
11...	1132		2.2	77	7.8	18.5	752	9.2	100
11...	1134		3.8	77	7.8	18.5	752	9.3	101
11...	1136		5.4	77	7.8	18.5	752	9.3	101
11...	1138		7.0	77	7.8	18.5	752	9.2	100
JUN 01...	1045		1.0	90	8.1	22.0	754	8.4	97
01...	1055		3.0	90	8.1	22.0	754	8.4	97
01...	1105		5.0	90	8.1	22.0	754	8.4	97
01...	1115		7.0	90	8.1	22.0	754	8.4	97

PARTICLE-SIZE DISTRIBUTION OF SUSPENDED SEDIMENT, WATER YEAR OCTOBER 1991 TO SEPTEMBER 1992

DATE	TIME	SEDI-MENT, SUS-PENDED (MG/L)	SEDI-MENT, DIS-CHARGE, SUS-PENDED (T/DAY)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM	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 1991 15...	1015	<1	--	100	APR 1992 21...	1130	1	0.01	100
DEC 03...	1200	<1	--	100	JUN 01...	1130	1	0.01	100
FEB 1992 11...	1115	1	0.02	100	AUG 11...	1130	2	0.98	10

< 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 mi².

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.--74 years (water years 1914-19, 1923-88, 1991-1992), 39.5 ft³/s (28,620 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Prior to Oct. 1990. Maximum discharge, 7,260 ft³/s revised, Jan. 28, 1988 (gage height, 8.38 ft for datum and site then in use, from rating curve extended above 3,200 ft³/s, on basis of slope-area measurement at gage height 8.38 ft; minimum, 8.4 ft³/s, May 1, 1945, Jan. 5, 1946.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 998 ft³/s, Sept. 3, gage height 4.18 ft, no peak greater than base discharge of 1,100 ft³/s; minimum, 9.7 ft³/s, June 2-5.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1991 TO SEPTEMBER 1992
DAILY MEAN VALUES

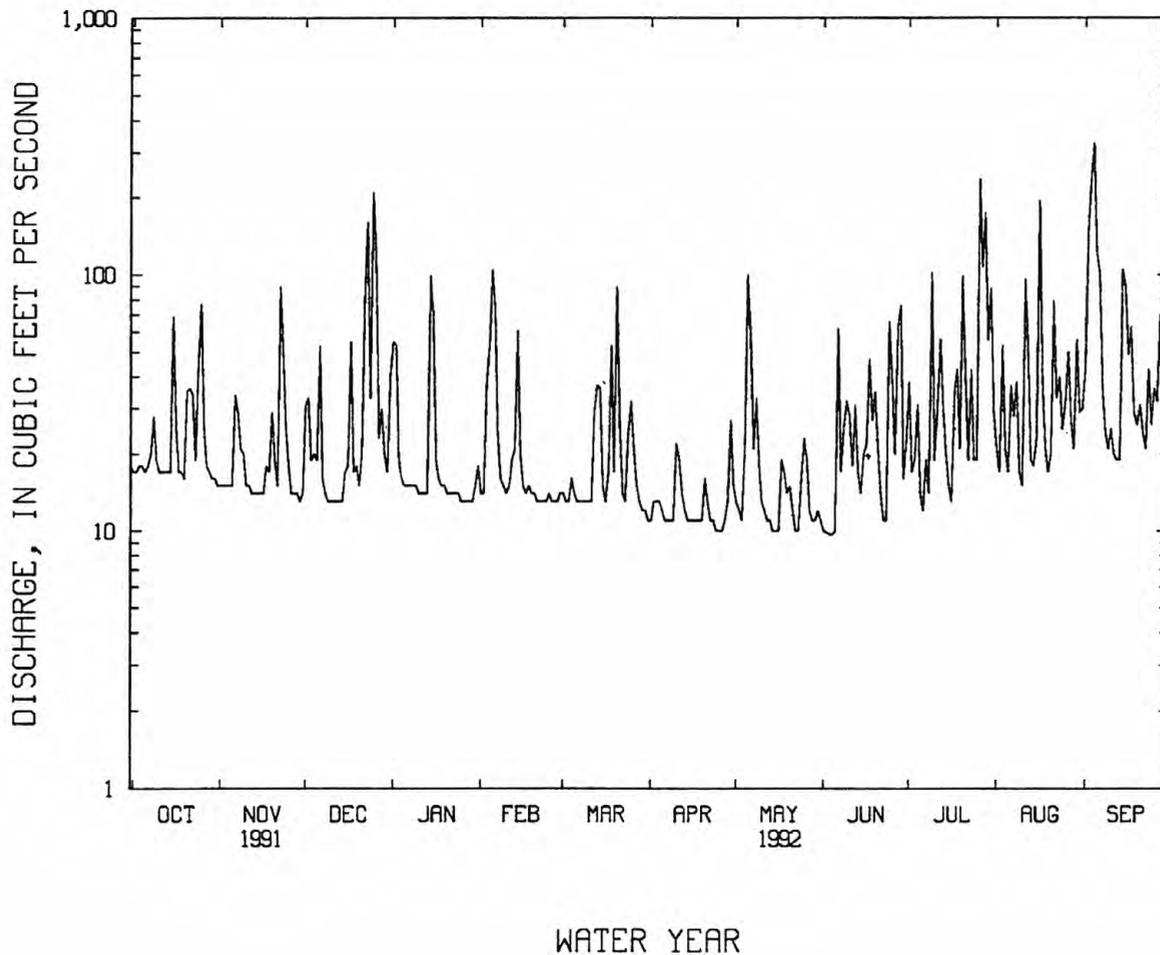
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	17	15	31	55	14	14	11	13	10	38	21	43
2	17	15	33	53	14	13	13	12	9.9	17	17	150
3	18	15	19	19	39	13	13	11	9.7	19	53	242
4	18	15	20	16	54	16	13	21	9.7	31	21	327
5	17	15	19	15	104	14	12	100	10	14	17	122
6	18	34	53	15	74	13	11	58	62	12	37	101
7	20	29	16	15	24	13	11	21	17	19	28	36
8	28	21	14	15	16	13	11	33	25	14	38	24
9	19	20	13	15	15	13	11	18	32	102	17	21
10	17	15	13	14	14	13	22	13	28	19	15	25
11	17	15	13	14	15	13	19	12	18	30	96	20
12	17	14	13	14	19	29	14	11	31	56	49	19
13	17	14	13	14	21	37	12	11	17	30	19	19
14	17	14	13	99	61	36	11	10	14	20	18	105
15	69	14	17	71	20	15	11	10	20	15	23	90
16	25	14	18	19	15	13	11	10	22	13	194	49
17	17	18	55	16	14	17	11	19	47	35	37	63
18	17	17	17	15	15	53	11	17	27	43	21	29
19	16	29	18	15	14	17	11	14	35	21	17	26
20	35	19	15	14	14	90	16	15	21	99	20	31
21	36	15	20	14	13	25	13	12	14	40	79	24
22	34	90	82	14	13	14	11	10	11	19	33	21
23	19	50	160	14	13	13	11	10	11	43	40	43
24	44	25	33	14	13	24	10	16	66	19	25	26
25	77	18	211	13	14	32	10	23	40	19	31	36
26	25	14	112	13	13	21	10	19	20	238	50	32
27	18	14	23	13	13	15	11	12	63	107	27	70
28	17	14	30	13	13	13	13	11	76	174	21	24
29	16	13	20	13	14	12	27	11	16	56	56	21
30	16	14	17	15	---	12	15	12	22	88	29	31
31	15	---	41	18	---	11	---	11	---	29	30	---
TOTAL	753	629	1172	677	695	647	386	576	804.3	1479	1179	1870
MEAN	24.3	21.0	37.8	21.8	24.0	20.9	12.9	18.6	26.8	47.7	38.0	62.3
MAX	77	90	211	99	104	90	27	100	76	238	194	327
MIN	15	13	13	13	13	11	10	10	9.7	12	15	19
AC-FT	1490	1250	2320	1340	1380	1280	766	1140	1600	2930	2340	3710

1662000 HONOKOHAU STREAM NEAR HONOKOHAU--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1913 - 1992, BY WATER YEAR (WY)

MEAN	31.6	41.2	41.5	35.9	37.5	44.1	49.5	42.3	34.5	39.8	41.5	30.6
MAX	94.8	110	97.5	98.6	132	144	120	130	81.1	116	103	122
(WY)	1915	1915	1955	1916	1932	1942	1980	1916	1916	1914	1914	1914
MIN	10.8	11.8	13.0	12.3	13.5	13.4	12.9	12.2	14.2	16.2	14.5	12.1
(WY)	1985	1963	1936	1944	1963	1926	1992	1945	1962	1926	1971	1984

SUMMARY STATISTICS FOR 1991 CALENDAR YEAR			FOR 1992 WATER YEAR			WATER YEARS 1913 - 1992		
ANNUAL TOTAL	13874		10867.3			39.5		
ANNUAL MEAN	38.0		29.7			68.3		
HIGHEST ANNUAL MEAN						1914		
LOWEST ANNUAL MEAN						24.1		
HIGHEST DAILY MEAN	392	Mar 9	327	Sep 4	781	Apr 7	1938	
LOWEST DAILY MEAN	13	Nov 29	9.7	Jun 3	8.0	Aug 10	1920	
ANNUAL SEVEN-DAY MINIMUM	13	Dec 8	10	May 30	8.5	Feb 6	1985	
ANNUAL RUNOFF (AC-FT)	27520		21560			28620		
10 PERCENT EXCEEDS	77		59			79		
50 PERCENT EXCEEDS	23		17			24		
90 PERCENT EXCEEDS	16		12			13		



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HAWAII, ISLAND OF HAWAII

16700000 WAIAKEA STREAM NEAR MOUNTAIN VIEW

RECORDS BEING REVIEWED

HAWAII, ISLAND OF HAWAII

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16700900 OLAA FLUME SPRING NEAR KAUMANA

RECORDS BEING REVIEWED

HAWAII, ISLAND OF HAWAII
16700950 LYMAN SPRINGS NO. 2 NEAR PIIHONUA

RECORDS BEING REVIEWED

HAWAII, ISLAND OF HAWAII
16704000 WAILUKU RIVER AT PIIHONUA

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RECORDS BEING REVIEWED

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HAWAII, ISLAND OF HAWAII
16713000 WAILUKU RIVER AT HILO
(National stream-quality accounting network station)

RECORDS BEING REVIEWED

HAWAII, ISLAND OF HAWAII

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16717000 HONOLII STREAM NEAR PAPAIKOU
(Hydrologic bench-mark station)

RECORDS BEING REVIEWED

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HAWAII, ISLAND OF HAWAII
16720000 KAWAINUI STREAM NEAR KAMUELA

RECORDS BEING REVIEWED

HAWAII, ISLAND OF HAWAII

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16720300 KAWAIKI STREAM NEAR KAMUELA

RECORDS BEING REVIEWED

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HAWAII, ISLAND OF HAWAII

16720500 UPPER HAMAKUA DITCH BELOW KAWAIKI STREAM, NEAR KAMUELA

RECORDS BEING REVIEWED

HAWAII, ISLAND OF HAWAII

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16724800 UPPER HAMAKUA DITCH ABOVE ALAKAHI STREAM, NEAR KAMUELA

RECORDS BEING REVIEWED

HAWAII, ISLAND OF HAWAII
16725000 ALAKAHI STREAM NEAR KAMUELA

RECORDS BEING REVIEWED

HAWAII, ISLAND OF HAWAII

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16726000 UPPER HAMAKUA DITCH ABOVE WAIMEA RESERVOIR DIVERSION, NEAR KAMUELA

RECORDS BEING REVIEWED

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HAWAII, ISLAND OF HAWAII

16727000 UPPER HAMAKUA DITCH ABOVE PUUKAPU RESERVOIR, NEAR KAMUELA

RECORDS BEING REVIEWED

HAWAII, ISLAND OF HAWAII
16756000 KOHAKOHAU STREAM NEAR KAMUELA

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RECORDS BEING REVIEWED

HAWAII, ISLAND OF HAWAII

16758000 WAIKOLOA STREAM AT MARINE DAM, NEAR KAMUELA

RECORDS BEING REVIEWED

HAWAII, ISLAND OF HAWAII

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16759000 HAUANI GULCH NEAR KAMUELA

RECORDS BEING REVIEWED

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HAWAII, ISLAND OF HAWAII
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.

Records collected at partial-record stations are presented in two tables. The first is a table of discharge measurements at low-flow partial-record stations, and the second is a table of annual maximum stage and discharge at crest-stage stations.

Low-flow partial-record stations

Measurements of streamflow in the area covered by this report made at low-flow partial-record stations are given in the following table. Most of these measurements were made during periods of base flow when streamflow is primarily from ground-water storage. These measurements, when correlated with the simultaneous discharge of a nearby stream where continuous records are available, will give a picture of the low-flow potentiality of the stream. The column headed "Period of record" shows the water years in which measurements were made at the same, or practically the same, site.

Discharge measurements made at low-flow partial-record stations during water year 1992						
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	1968-92	11-05-91 01-28-92 06-04-92	0.87 1.18 1.10
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	1968-92	11-05-91 01-28-92 06-04-92	1.42 1.85 1.59
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 [‡] , 1974-92	11-05-91 01-28-92 06-04-92	2.60 3.30 3.09
16403700	Kawainui Stream at altitude 1,000 ft, near Pelekunu	Lat 20°07'46", long 156°52'31", 400 ft upstream from Kawaiipoko Stream, 2.4 mi south of former village of Pelekunu, and 5.4 mi north of Kamalo.	0.79	1968-92	11-05-91 01-28-92 06-04-92	1.68 2.13 2.33
16403800	Kawaiipoko 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	1968-92	11-05-91 01-28-92 06-04-92	0.45 0.46 0.48
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 [‡] , 1980-92	11-05-91 01-28-92 06-04-92	2.19 2.63 2.84

[‡] 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 1992 maximum		Period of record maximum	
				Date	Gage height (ft)	Date	Gage height (ft)

Hawaii, Island of Oahu

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	1958-91	a03-19-91	6.23	e75	02-07-76	8.00	3,220
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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 maximum	
				Date	Gage height (ft)	Date	Gage height (ft)

Hawaii, Island of Kauai

16038000 Waimea Riv 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	1944-92b	09-11-92	9.34	-	02-07-49	11.40	
16052000 Hanapepe Riv 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	1950-92b	09-11-92	7.74	-	04-15-63	11.22	-
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 [†] 1973-92	12-14-91	6.46	2,430	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 [†] , 1971-92	12-14-91	15.32	9,480	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	1962-92b	12-14-91	6.50	-	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, 1970-92	12-14-91	16.92	2,530	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 [†] , 1986-92	12-14-91	5.66	9,660	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	1964-92	12-14-91	11.40	1,550	12-14-91	11.40	1,550

[†] Operated as a continuous-record gaging station.

a Revised.

b Gage height only.

Annual maximum discharge at crest-stage partial-record stations during water year 1992--Continued										
Station name and number	Location	Drainage area mi ²	Period of record	Water year 1992 maximum			Period of record max			
				Date	Gage height (ft)	Dis- charge (ft ³ /s)	Date	Gage height (ft)	Dis- charge (ft ³ /s)	
Hawaii, Island of Kauai--Continued										
16084500 Kapaa Str at old high- way 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 north- west of Kealia, and 2.1 mi upstream from mouth.	14.0	1962-92	12-14-91	23.11	30,330	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	1964-92	12-14-91	-	e3,800	12-14-91	-	e3,800	
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, 1971-92	12-14-91	13.66	1,100	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	1963-92b	12-14-91	13.37	-	12-14-91	13.37	-	
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 [‡] , 1972-92	12-14-91	5.84	624	04-15-72	7.15	2,120	
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 south- west of Weed Circle.	38.7	1963, 1968-91	10-16-91	20.51	2,710	04-15-63	26.4	15,600	
16211200 Poamoho Str at Waialua	Lat 21°34'00", long 158°06'40", at culvert crossing of Kaheaka Road, 0.2 mi upstream from Highway 83, and 1.1 mi east of Waialua High School.	12.7	1967-91	10-16-91	20.11	e2,000	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 [‡] 1966-91	10-16-91	5.07	e500	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	1974-91	10-16-91	13.30	e250	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 Far- rington Highway box culvert, 0.1 mi north of Makua cemetery, and 4.5 mi southeast of Kaena Point lighthouse.	4.24	1958-91	10-16-91	2.34	e500	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 Farring- ton Highway and 1.1 mi north of junction of Farrington High- way and Makaha Valley Road.	5.25	1966-91	10-16-91	11.53	1,200	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 [‡] , 1973-91	10-16-91	6.37	e400	01-06-82	7.82	3,640	

‡ 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 1992--Continued										
Station name and number	Location	Drainage area mi ²	Period of record	Water year 1992 maximum			Period of record max			
				Date	Gage height (ft)	Dis- charge (ft ³ /s)	Date	Gage height (ft)	Dis- charge (ft ³ /s)	
Hawaii, Island of Oahu--Continued										
16212200 Mailiilii Str nr Waianae	Lat 21°27'34", long 158°08'05", at bridge at Lualualei Naval Reservation and 3.4 mi east of cemetery nr Waianae.	1.51	1958-91	10-16-91	4.36	e350	01-06-82	7.20	2,460	
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	1968-91	10-16-91	24.36	e400	02-07-76	26.20	3,320	
16212450 Kaloī 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	1968-91	10-16-91	3.83	179	01-08-80	7.45	724	
16212500 Honouliuli Str nr Waipahu	Lat 21°22'40", long 158°02'10", at bridge on Farrington High- way and 1.8 mi west of Waipahu Post Office.	11.0	1956-91	10-16-91	4.23	1,030	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, 1960-91	10-16-91	7.79	483	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	1958-91	10-16-91	12.07	2,330	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	1974-91	10-16-91	13.49	e100	-	-	-	
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#, 1973-91	09-03-92	3.78	2,440	-	-	-	
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#, 1984-91	09-03-92	-	e1,500	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#, 1979-91	10-16-91	7.27	e800	-	-	-	
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	1969-91	10-16-91	4.39	843	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	1971-91	10-16-91	14.66	880	03-18-80	21.0	6,200	
16228900 Kalihi Str nr Kaneohe	Lat 21°22'35", long 157°49'32", on right bank 800 ft down- stream from Likelike Highway and 2.8 mi southwest of Castle High School in Kaneohe.	0.60	1967-71#, 1972-91	09-11-92	3.88	630	01-08-80	5.60	1,700	

Operated as a continuous-record gaging station.
e Estimated.

Annual maximum discharge at crest-stage partial-record stations during water year 1992--Continued										
Station name and number	Location	Drainage area mi ²	Period of record	Water year 1992 maximum			Period of record max			
				Date	Gage height (ft)	Dis- charge (ft ³ /s)	Date	Gage height (ft)	Dis- charge (ft ³ /s)	
Hawaii, Island of Oahu--Continued										
16235400 Waalani 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	1958-91	09-16-92	1.99	397	05-14-63	6.14	2,500	
16237500 Paoua 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	1958-91	09-16-92	0.33	170	05-14-63	4.65	2,200	
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 Strs, and 0.6 mi upstream from point of discharge into Ala Ala Wai Canal.	10.6	1968-91	09-16-92	87.75	3,350	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 Kalaniana'ole Highway in Aina Haina.	2.35	1958-91	09-16-92	4.44	1,760	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, 1970-91	09-16-92	29.60	1,250	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 north- west of Waimanalo Post Office.	1.21	1958-91	10-16-91	4.05	e208	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 north- east of Waimanalo Post Office.	2.16	1967-70 ^a , 1971-91	10-15-91	2.53	-	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 Kalaniana'ole Highway, 1.6 mi northwest of Waimanalo School, and 2.4 mi south of Kailua Post Office.	0.16	1963-91	10-15-91	-	e50	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, 1967-91 ^b	11-30-91	2.54	-	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, 1977-91	02-14-92	5.76	398	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	1959-91	09-03-92	2.08	e250	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, 1968-91	10-16-91	4.48	e1,500	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	1963-91	10-16-91	-	466	02-01-69	11.8	7,300	

^a 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 1992--Continued									
Station name and number	Location	Drainage area mi ²	Period of record	Water year 1992 maximum			Period of record max		
				Date	Gage height (ft)	Dis- charge (ft ³ /s)	Date	Gage height (ft)	Dis- charge (ft ³ /s)
Hawaii, Island of Oahu--Continued									
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	1958-91	10-16-91	5.88	e2,300	01-06-82	6.95	4,920
16310501 Malaekahana Str at altitude 30 ft, nr Kahuku	Lat 21°39'47", long 157°57'11", at abandoned plantation rail- road bridge, 1.1 mi southwest of junction of plantation road and Highway 83, and 1.2 mi south of Kahuku Hospital.	4.05	1958-91	10-16-91	6.57	446	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	1958-91	10-16-91	-	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	1973-91	07-09-92	4.19	e100	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	1968-91	02-14-92	4.35	e225	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	1968-91	10-16-91	3.27	145	03-18-80	11.2	2,030
16340000 Anahulu Riv 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	1958-91	10-16-91	8.18	3,340	04-19-74	15.8	15,900
16350000 Opaepala 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	1956-91	10-16-91	13.7	1,820	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	1964-92	01-14-92	-	e1.0	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 [‡] , 1973-92	02-14-92	-	e27	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	1964-92	05-17-92	1.06	13	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	1965-92	09-11-92	3.90	745	01-11-74	8.20	2,920
16411800 Kaluaapeelua# 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	1964-92	-	-	-	12-08-73	3.30	86

[‡] Operated as a continuous-record gaging station.
e Estimated.

Annual maximum discharge at crest-stage partial-record stations during water year 1992--Continued									
Station name and number	Location	Drainage area mi ²	Period of record	Water year 1992 maximum			Period of record max		
				Date	Gage height (ft)	Dis-charge (ft ³ /s)	Date	Gage height (ft)	Dis-charge (ft ³ /s)
Hawaii, Island of Molokai--Continued									
16413500 Manawainui Gulch nr Kualapuu	Lat 21°07'42", long 157°03'25", at bridge on Highway 46, 0.5 mi south of Holomua School, and 2.3 mi southwest of Kualapuu.	10.4	1965-92	01-14-92	-	e200	04-04-89	-	3,620
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	1964-92	02-14-92	1.44	489	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	1964-92	05-25-92	5.81	71	11-04-66	8.93	989
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 [‡] , 1973-92	12-02-91	5.02	268	11-04-88	8.96	1,180
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	1967-92	12-02-91	6.94	1,360	01-08-80	15.10	13,600
16500800 Kukuilua 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 [‡] , 1969-92	08-12-92	4.80	300	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	1963-92	12-02-91	-	e2.0	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	1963-92	12-02-91	7.70	339	02-04-65	14.46	2,070
16502900 Kawaiipapa 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	1965-92	12-02-91	7.47	4,430	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	1963-92	-	-	-	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	1967-92	01-14-92	2.16	31	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	1963-92	08-26-92	1.24	16	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	1967-92	01-14-92	-	e1.0	01-28-71	8.33	1,330

[‡] Operated as a continuous-record gaging station.
e Estimated.

Annual maximum discharge at crest-stage partial-record stations during water year 1992--Continued									
Station name and number	Location	Drainage area mi ²	Period of record	Water year 1992 maximum			Period of record max		
				Date	Gage height (ft)	Dis- charge (ft ³ /s)	Date	Gage height (ft)	Dis- charge (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 [≠] , 1952-92	09-15-92	4.70	2,840	12-03-50	6.21	7,540
16616500 Unnamed gulch at Maluhia Camp	Lat 20°57'26", long 156°31'41", at Kahekili Highway, 0.6 mi east of Maluhia Camp, and 1.8 mi northwest of Waihee.	0.12	1964-92	-	-	-	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	1965-92	09-03-92	8.93	319	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, 1965-92	09-19-92	3.81	332	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 [≠] 1990-92a	09-15-92	-	e200	07-11-65	11.03	2,490
16643300 Kauaula Str nr mouth, nr Lahaina	Lat 20°52'09", long 156°39'43", 0.7 mi upstream from Honoapiilani Highway (bypass) and 1.3 mi southeast of Lahaina Lighthouse.	4.12	1960, 1962, 1964-92	09-15-92	3.38	226	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 [≠] , 1973-92	09-15-92	4.03	524	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	1964-92	-	-	-	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	1963-92	02-14-92	-	e200	11-04-88	8.69	1,170
16658500 Waiakoa Gulch tri- butary 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	1964-92	-	-	-	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	1963-92	-	-	-	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 up- stream from mouth, and 1.3 mi southeast of Kihei.	14.4	1963-70 [≠] , 1971-92	-	-	-	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	1972-92	-	-	-	03-17-82	9.01	291

≠ Operated as a continuous-record gaging station.
a At a different datum.
e Estimated.

Annual maximum discharge at crest-stage partial-record stations during water year 1992--Continued									
Station name and number	Location	Drainage area mi ²	Period of record	Water year 1992 maximum			Period of record max		
				Date	Gage height (ft)	Dis- charge (ft ³ /s)	Date	Gage height (ft)	Dis- charge (ft ³ /s)
Hawaii, Island of Maui--Continued									
16664000 Lilioholo 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	1972-92	-	-	-	02-11-82	13.73	526
Hawaii, Island of Hawaii									
16701300 Waiakea Str at Hilo	Lat 19°42'38", long 155°05'02", 0.3 mi upstream from Kinooole Street bridge and 1.3 mi south- east of Hilo Post Office.	35.8	1968-92						Records being reviewed.
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	1965-92						Records being reviewed.
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	1963-91						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 [‡] , 1973-92						Records being reviewed.
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	1963-92						Records being reviewed.
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 southwest of Papaaloa.	2.76	1963-80 [‡] , 1983-92						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	1963-92						Records being reviewed.
16717920 Ahualoa Gulch at Honokaa	Lat 20°05'12", long 155°29'17", at Highway 24, 1.1 mi northwest of Honokaa Hospital, and 1.5 mi upstream from mouth.	2.27	1963-92						Records being reviewed.
16717950 Honokaia Gulch tri- butary 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	1963-92						Records being reviewed.
16752600 Hapahapai Gulch at Kapaaui	Lat 20°14'00", long 155°48'00", at Highway 27, 300 ft east of Kapaaui Post Office.	1.52	1963-92						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	1963-92						Records being reviewed.
16756500 Keanuio mano Str nr Kamuela	Lat 20°14'48", 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 [‡] , 1973-92						Records being reviewed.

[‡] Operated as a continuous-record gaging station.

DISCHARGE AT PARTIAL-RECORD STATIONS AND MISCELLANEOUS SITES

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	Dis- charge (ft ³ /s)
				Gage height (ft)	Dis- charge (ft ³ /s)	Date	Gage height (ft)		
Hawaii, Island of Hawaii--Continued									
16759040 Paiaakuli 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 northeast of Waimea.	0.27	1963-92						Records being reviewed.
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	1963-92						Records being reviewed.
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	1963-92						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, 1965-92						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 [‡] , 1972-92						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	1963-92						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 [‡] , 1983-92						Records being reviewed.
16770000 Hionamao 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	1963-92						Records being reviewed.
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 [‡] , 1980-92						Records being reviewed.

[‡] Operated as a continuous-record gaging station.

Discharge measurements made at miscellaneous sites during water year 1986

Station No.	Station name	Location	Measured previously (water years)	Measurements	
				Date	Discharge (ft ³ /s)
Hawaii, Island of Maui					
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#	10-02-85	42.1
				03-13-86	147
				03-13-86	146
				03-26-86	40.8
				04-16-86	43.0
06-25-86	154				
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#	10-08-85	18.9
				01-08-86	78.4
				03-25-86	67.6
				06-16-86	78.2
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#	10-08-85	.91
				01-08-86	36.9
				03-25-86	62.5
				06-16-86	85.1

Discharge measurements made at miscellaneous sites during water year 1987

Station No.	Station name	Location	Measured previously (water years)	Measurements	
				Date	Discharge (ft ³ /s)
Hawaii, Island of Maui					
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	10-20-86	158
				01-08-87	2.00
				04-03-87	158
				07-07-87	45.9
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	10-20-86	108
				02-09-87	11.2
				04-23-87	40.8
				07-16-87	27.9
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	10-20-86	102
				02-09-87	1.98
				04-22-87	71.3
				07-16-87	6.44

Discharge measurements made at miscellaneous sites during water year 1988

Station No.	Station name	Location	Measured previously (water years)	Measurements	
				Date	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#	10-01-87	172
				01-26-88	30.3
				08-02-88	92.7
				09-29-88	197
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#, 1986-87	10-01-87	102
				11-18-87	151
				01-26-88	134
				03-30-88	27.7
				03-30-88	122
				08-02-88	0.70
09-29-88	35.1				
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#, 1986-87	11-18-87	94.8
				01-27-88	10.2
				09-27-88	84.0
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#, 1986-87	11-18-87	98.4
				01-27-88	46.6
				09-27-88	95.1

Operated as a continuous-record gaging station.

DISCHARGE AT PARTIAL-RECORD STATIONS AND MISCELLANEOUS SITES

Discharge measurements made at miscellaneous sites during water year 1989

Station No.	Station name	Location	Measured previously (water years)	Measurements	
				Date	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	01-19-89	263
				05-04-89	183
				07-05-89	258
				09-19-89	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 [‡] , 1986-88	01-19-89	64.5
				05-03-89	11.9
				07-05-89	130
				07-05-89	130
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 [‡] , 1986-88	01-31-89	18.8
				02-03-89	87.2
				05-03-89	4.05
				07-06-89	85.0
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 [‡] , 1986-88	01-31-89	4.03
				02-03-89	76.1
				05-03-89	26.6
				07-06-89	73.4
				07-06-89	71.7

Discharge measurements made at miscellaneous sites during water year 1990

Station No.	Station name	Location	Measured previously (water years)	Measurements	
				Date	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 [‡] , 1988-89	01-02-90	202
				03-29-90	236
				06-28-90	231
				09-10-90	290
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 [‡] , 1986-89	01-02-90	138
				03-29-90	10.6
				05-30-90	10.1
				09-10-90	148
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 [‡] , 1986-89	12-13-89	118
				02-08-90	25.1
				05-21-90	79.2
				09-05-90	93.0
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 [‡] , 1986-89	12-13-89	112
				02-08-90	52.1
				05-21-90	66.6
				05-21-90	65.6
				09-05-90	64.6

[‡] Operated as a continuous-record gaging station.

DISCHARGE AT PARTIAL-RECORD STATIONS AND MISCELLANEOUS SITES

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Discharge measurements made at miscellaneous sites during water year 1991

Station No.	Station name	Location	Measured previously (water years)	Measurements	
				Date	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 [‡] , 1988-90	03-26-91	201
				05-01-91	295
				07-11-91	301
				09-12-91	176
16589000	New Hamakua ditch at Honopou, near Huelo	Lat 20°53'28", long 156°15'22", on right bank 15 ft upstream from tunnel portal, 600 ft downstream from Honopou Stream crossing and 2.1 mi southwest of Huelo.	1919-85 [‡] , 1986-90	10-30-90	150
				10-30-90	148
				03-26-91	1.60
				05-01-91	146
				05-01-91	137
				07-11-91	155
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 [‡] , 1986-90	02-13-91	34.4
				05-02-91	15.3
				07-10-91	43.3
				09-24-91	32.6
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 [‡] , 1986-90	02-13-91	73.8
				02-13-91	74.9
				05-01-91	6.98
				07-10-91	3.33
				09-24-91	3.82

Discharge measurements made at miscellaneous sites during water year 1992

Station No.	Station name	Location	Measured previously (water years)	Measurements	
				Date	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 [‡] , 1988-91	11-07-91	63.8
				03-25-92	201
				06-29-92	219
				09-02-92	296
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 [‡] , 1986-91	12-30-91	5.14
				03-25-92	14.0
				06-29-92	4.44
				08-24-92	93.7
				09-04-92	163
				09-04-92	161
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 [‡] , 1986-91	09-24-91	32.6
				02-10-92	25.3
				03-25-92	11.6
				07-10-92	28.0
				08-24-92	43.6
				09-24-92	10.8
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 [‡] , 1986-91	09-24-91	3.82
				02-10-92	1.47
				07-10-92	1.70
				08-24-92	3.83
				09-02-92	111
				09-02-92	110
				09-04-92	120
				09-04-92	117
				09-24-92	20.4
				09-24-92	20.5

[‡] Operated as a continuous-record gaging station.

ANALYSES OF SAMPLES COLLECTED AT WATER-QUALITY PARTIAL-RECORD STATIONS

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 figures 15 and the data are listed in downstream order.

WATER QUALITY DATA, WATER YEAR OCTOBER 1991 TO SEPTEMBER 1992

HAWAII, ISLAND OF OAHU

16225100 - NORTH HALAWA STREAM MISCELLANEOUS SITE NO. 1 (LAT 21°24'26" LONG 157°51'12")

DATE	TIME	GAGE HEIGHT (FEET)	DIS- CHARGE, INST. CUBIC FEET PER SECOND	TEMPER- ATURE WATER (DEG C)	SEDI- MENT, DIS- CHARGE, SUS- PENDED (MG/L)	SEDI- MENT, DIS- CHARGE, SUS- PENDED (T/DAY)
OCT 1991						
16...	1105	4.13	8.1	21.0	24	0.52
16...	1110	4.13	8.1	21.0	25	0.55
DEC						
18...	1425	3.67	--	--	3	--
MAR 1992						
13...	1155	3.74	--	18.5	2	--
MAY						
18...	0740	3.02	--	21.0	2	--
JUL						
23...	1405	3.44	--	--	2	--
28...	1215	3.69	--	21.5	7	--
28...	1225	3.69	--	21.5	5	--

WATER QUALITY DATA, WATER YEAR OCTOBER 1991 TO SEPTEMBER 1992

HAWAII, ISLAND OF OAHU--Continued

16227100 - HALAWA STREAM BELOW H1 (LAT 21°22'17" LONG 157°55'57")

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 WATER (DEG C)	TUR-BID-ITY (NTU)	BARO-METRIC PRES-SURE (MM OF HG)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, (PER-CENT SATUR-ATION)	COLI-FORM, FECAL, 0.7 UM-MF (COLS./100 ML)	
OCT 1991	16...	1115	E530	93	7.8	24.5	390	760	8.1	97	30000
NOV	27...	1055	0.13	800	8.4	24.0	4.2	760	7.4	88	--
DEC	17...	1025	0.43	900	9.1	24.5	0.60	764	11.1	133	2900
JAN 1992	28...	1015	0.18	1400	8.6	22.5	0.80	764	10.8	125	--
FEB	27...	1000	E0.04	970	9.2	27.5	4.2	766	12.6	159	300
APR	03...	1115	0.13	680	9.4	31.0	2.1	764	11.4	153	--
JUL	10...	1030	6.4	235	8.7	28.5	34	762	9.2	119	2500
	28...	0900	E21	205	7.6	25.0	35	764	8.1	98	--
AUG	25...	1100	0.06	715	9.6	32.5	2.3	761	11.9	165	--
SEP	21...	1115	1.8	345	9.8	31.0	3.0	763	11.0	148	K97

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)	FLUO-RIDE, DIS-SOLVED (MG/L AS F)	
FEB	27...	1000	270	50	36	76	37	2	3.8	71	51	230	0.10
SEP	21...	1115	89	19	10	33	44	2	1.8	67	18	53	<0.10

DATE	TIME	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, AMMONIA TOTAL (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)	PHOS-PHATE, TOTAL (MG/L AS PO4)	
OCT 1991	16...	1115	--	--	--	389	0.150	0.050	0.30	0.45	0.150	0.12	
DEC	17...	1025	--	--	--	1	<0.050	<0.010	<0.20	--	<0.010	--	
FEB	27...	1000	14	513	504	0.70	1	<0.050	0.010	0.40	--	0.050	--
JUL	10...	1030	--	--	--	26	0.540	0.050	0.20	0.74	0.060	0.15	
SEP	21...	1115	21	182	196	0.25	10	<0.050	<0.010	0.20	--	<0.010	--

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	27...	1000	440	<10	--	<100	14	<10	<1	2	3	<3
SEP	21...	1115	70	<10	<1	<100	3	<10	<1	<1	<1	<3

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

ANALYSES OF SAMPLES COLLECTED AT WATER-QUALITY PARTIAL-RECORD STATIONS

WATER QUALITY DATA, WATER YEAR OCTOBER 1991 TO SEPTEMBER 1992

HAWAII, ISLAND OF OAHU--Continued

16227100 - HALAWA STREAM BELOW H1--Continued

DATE	COPPER, TOTAL RECOVERABLE (UG/L AS CU)	IRON, TOTAL RECOVERABLE (UG/L AS FE)	IRON, DIS- SOLVED (UG/L AS FE)	LEAD, TOTAL RECOVERABLE (UG/L AS PB)	LITHIUM TOTAL RECOVERABLE (UG/L AS LI)	LITHIUM DIS- SOLVED (UG/L AS LI)	MANGA- NESE, TOTAL RECOVERABLE (UG/L AS MN)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	MERCURY TOTAL RECOVERABLE (UG/L AS HG)	MOLYB- DENUM, TOTAL RECOVERABLE (UG/L AS MO)	MOLYB- DENUM, DIS- SOLVED (UG/L AS MO)
FEB 27...	9	770	8	3	<10	<4	50	2	<0.10	<1	<10
SEP 21...	2	200	13	<1	<10	<4	30	3	<0.10	<1	<10

DATE	NICKEL, TOTAL RECOVERABLE (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 RECOVERABLE (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 RECOVERABLE (UG/L AS ZN)	CARBON, ORGANIC TOTAL (MG/L AS C)	OIL AND GREASE, TOTAL RECOVERABLE GRAVI- METRIC (MG/L)
FEB 27...	2	<1	<1	<1	<1	<1.0	460	<6	10	5.3	<1
SEP 21...	2	<1	<1	<1	<1	<1.0	130	<6	<10	3.2	<1

DATE	ALDRIN, TOTAL (UG/L)	CHLOR- DANE, TOTAL (UG/L)	CHLOR- DYRIFOS 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 27...	<0.010	<0.1	<0.01	<0.010	<0.010	<0.010	<0.01	0.04	<0.010	<0.01	0.03
SEP 21...	<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 27...	<0.01	<0.010	<0.010	<0.01	<0.01	<0.010	<0.010	<0.010	<0.01	<0.01	<0.01
SEP 21...	<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 27...	<0.01	<0.10	<0.01	<0.1	<0.1	<0.01	<0.01	<1	<0.01	<0.01
SEP 21...	<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.

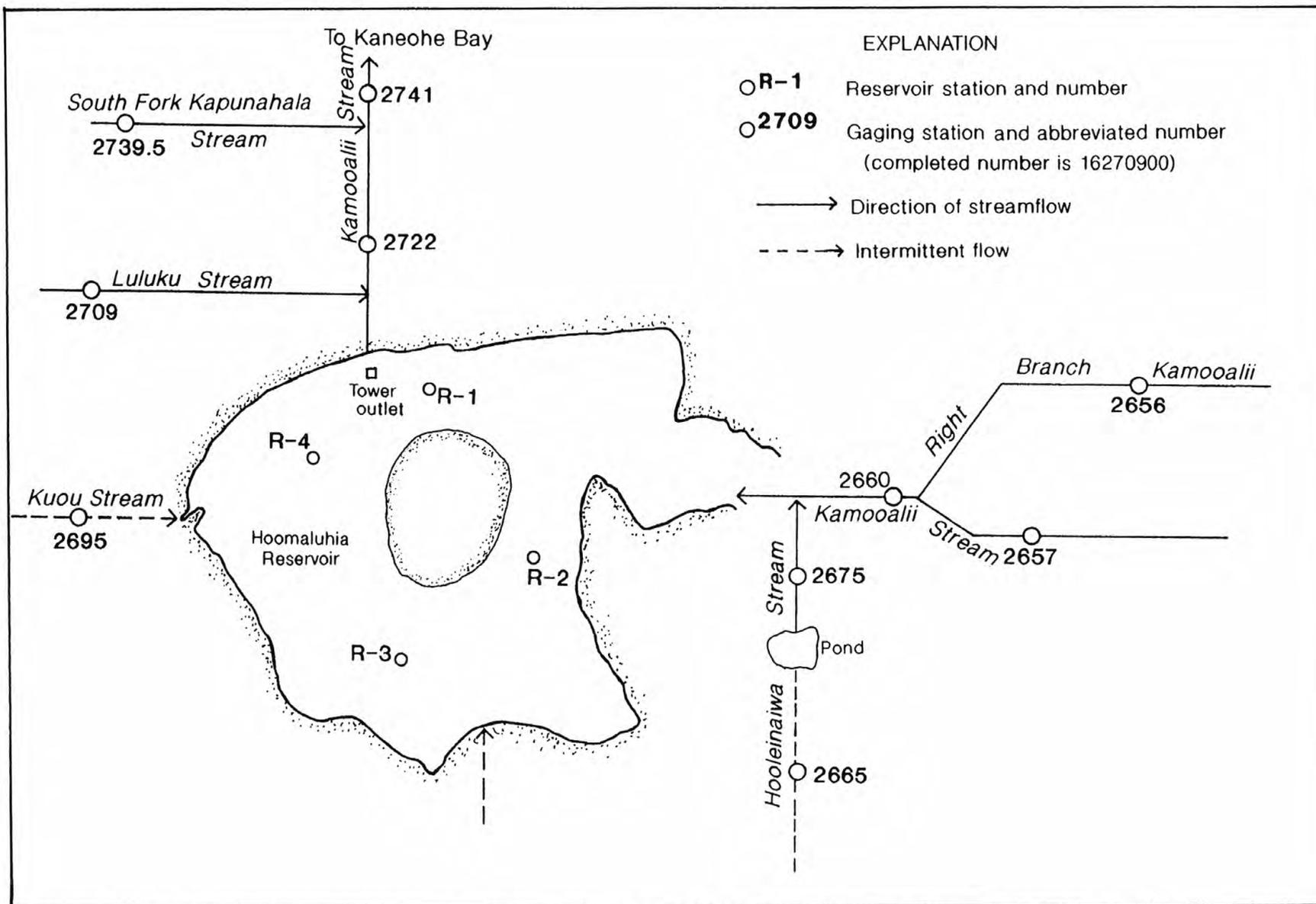


Figure 15.--Schematic diagram showing water-quality stations in Kamooalii Stream basin, Kaneohe, Oahu.

ANALYSES OF SAMPLES COLLECTED AT WATER-QUALITY PARTIAL-RECORD STATIONS

WATER QUALITY DATA, WATER YEAR OCTOBER 1991 TO SEPTEMBER 1992

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	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH WATER WHOLE FIELD (STAND-ARD UNITS)	TEMPER-ATURE WATER (DEG C)	TUR-BID-ITY (NTU)	BARO-METRIC PRES-SURE (MM OF HG)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, (PER-CENT SATUR-ATION)
OCT 1991 16...	1245	39	148	7.5	24.0	180	754	--	--
NOV 26...	1145	0.83	228	7.0	22.0	0.60	756	7.3	84
DEC 18...	1205	2.4	226	7.0	21.5	41	755	8.1	93
JAN 1992 29...	1345	0.70	235	7.5	21.5	1.0	755	8.3	95
FEB 26...	1045	0.48	245	7.3	20.0	1.5	759	8.4	93
APR 07...	1215	0.28	230	7.3	22.0	0.90	756	8.4	97
MAY 06...	1430	0.22	248	7.4	21.0	0.50	--	8.2	--
JUN 19...	1010	0.15	239	6.9	23.0	0.80	758	5.8	68
JUL 27...	1440	0.14	215	6.4	22.0	0.30	759	5.0	57
AUG 24...	1345	0.19	232	6.6	24.5	0.80	758	7.4	89
SEP 22...	1250	0.83	230	6.6	23.5	1.0	758	7.2	85

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, AMMONIA TOTAL (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)	PHOS-PHATE, TOTAL (MG/L AS PO4)
OCT 1991 16...	1245	3100	14	0.840	0.060	0.50	1.3	0.340	0.25
NOV 26...	1145	--	--	--	--	--	--	--	--
DEC 18...	1205	12000	48	0.270	0.060	0.50	0.77	0.260	0.28
JAN 1992 29...	1345	--	--	--	--	--	--	--	--
FEB 26...	1045	140	7	0.240	0.010	<0.20	--	0.030	0.06
APR 07...	1215	--	--	--	--	--	--	--	--
MAY 06...	1430	K750	<1	0.400	<0.010	<0.20	--	<0.010	0.06
JUN 19...	1010	--	--	--	--	--	--	--	--
JUL 27...	1440	--	--	--	--	--	--	--	--
AUG 24...	1345	--	--	--	--	--	--	--	--
SEP 22...	1250	500	4	0.150	<0.010	<0.20	--	0.020	0.06

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

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

ANALYSES OF SAMPLES COLLECTED AT WATER-QUALITY PARTIAL-RECORD STATIONS

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WATER QUALITY DATA, WATER YEAR OCTOBER 1991 TO SEPTEMBER 1992

HAWAII, ISLAND OF OAHU--Continued

16266500 - HOOLEINAIWA STREAM AT ALTITUDE 220 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 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 1991									
17...	1100	0.93	190	7.0	23.0	0.60	754	7.1	84
NOV									
26...	1040	0.20	160	7.0	22.0	0.20	756	7.1	82
DEC									
17...	1225	0.26	134	6.9	22.0	1.2	756	7.0	81
JAN 1992									
29...	1105	0.15	152	7.3	21.5	0.50	756	7.1	81
FEB									
26...	1230	0.12	160	6.8	21.5	0.70	757	7.0	80
APR									
07...	1130	0.10	150	6.5	22.0	0.50	756	6.9	80
MAY									
06...	1100	0.06	170	6.8	21.0	0.60	759	6.6	74
JUN									
19...	1230	0.06	152	6.8	23.0	1.1	757	5.4	63
JUL									
27...	1245	0.07	151	6.7	23.0	0.50	759	6.1	71
AUG									
24...	1130	0.06	152	6.0	23.5	0.70	757	5.5	65
SEP									
23...	1040	0.30	167	7.0	23.0	1.0	757	6.5	76

DATE	TIME	COLI- FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)	RESIDUE TOTAL AT 105 DEG. C, SUS- PENDE (MG/L)	NITRO- GEN, NO2+NO3 TOTAL (MG/L AS N)	NITRO- GEN, AMMONIA TOTAL (MG/L AS N)	NITRO- GEN,AM- MONIA + ORGANIC TOTAL (MG/L AS N)	PHOS- PHORUS TOTAL (MG/L AS P)
OCT 1991							
17...	1100	190	<1	0.200	0.010	<0.20	<0.010
DEC							
17...	1225	230	2	0.110	<0.010	<0.20	<0.010
FEB							
26...	1230	44	5	0.100	0.020	<0.20	<0.010
MAY							
06...	1100	82	<1	0.058	<0.010	<0.20	<0.010
SEP							
23...	1040	--	<1	0.120	0.010	<0.20	<0.010

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

ANALYSES OF SAMPLES COLLECTED AT WATER-QUALITY PARTIAL-RECORD STATIONS

WATER QUALITY DATA, WATER YEAR OCTOBER 1991 TO SEPTEMBER 1992

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 WATER (DEG C)	TUR-BID-ITY (NTU)	BARO-METRIC PRES-SURE (MM OF HG)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, (PER-CENT SATUR-ATION)
OCT 1991									
17...	0945	4.3	150	7.2	24.0	12	756	7.3	88
NOV									
26...	0900	0.64	199	7.2	22.5	2.5	757	7.8	91
DEC									
17...	1045	0.66	166	7.2	22.0	4.3	758	7.3	84
JAN 1992									
29...	1000	0.61	192	7.8	20.5	3.8	757	7.7	86
FEB									
26...	1015	0.43	204	7.1	21.5	4.5	761	7.4	84
APR									
07...	1030	0.42	192	7.2	22.0	4.3	757	7.8	90
MAY									
06...	1020	0.35	192	7.5	21.5	5.0	760	8.1	92
JUN									
19...	1120	0.38	201	7.3	26.0	3.2	758	6.9	86
JUL									
27...	1210	0.45	199	7.3	25.0	3.0	760	6.9	84
AUG									
24...	1030	0.46	200	6.8	25.5	31	759	7.0	86
SEP									
23...	1000	0.95	200	7.3	24.0	61	757	6.7	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, AMMONIA TOTAL (MG/L AS N)	NITRO-GEN, AM-MONIA + ORGANIC TOTAL (MG/L AS N)	PHOS-PHORUS TOTAL (MG/L AS P)	PHOS-PHATE, TOTAL (MG/L AS PO4)
OCT 1991								
17...	0945	490	5	0.190	0.030	<0.20	0.050	0.09
DEC								
17...	1045	36	1	<0.050	0.010	<0.20	<0.010	--
FEB								
26...	1015	--	2	<0.050	0.020	<0.20	<0.010	--
MAY								
06...	1020	78	<1	<0.050	0.020	<0.20	<0.010	0.03
SEP								
23...	1000	480	174	<0.050	0.060	0.30	0.090	0.03

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

WATER QUALITY DATA, WATER YEAR OCTOBER 1991 TO SEPTEMBER 1992

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 WATER (DEG C)	TUR-BID-ITY (NTU)	BARO-METRIC PRES-SURE (MM OF HG)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, (PER-CENT SATUR-ATION)
OCT 1991									
18...	1350	0.38	280	7.0	23.5	1.7	753	7.6	91
NOV									
27...	1000	E0.02	310	7.2	22.5	0.20	756	7.2	84
DEC									
17...	1035	E0.03	315	7.4	22.0	1.2	760	7.3	84
JAN 1992									
28...	1410	E0.03	320	7.1	21.5	1.0	756	6.6	75
FEB									
24...	1355	E0.03	315	7.2	21.5	1.5	755	7.9	90
APR									
06...	1330	E0.01	300	7.0	22.5	0.40	762	7.6	88
MAY									
06...	1400	<0.00	287	7.7	20.5	0.60	--	8.7	--
JUN									
19...	0930	0.01	280	6.8	23.5	1.0	759	7.1	84
JUL									
27...	1415	0.02	302	7.1	23.0	0.50	759	7.3	86
AUG									
27...	1100	E0.02	295	7.4	24.5	1.0	759	8.3	100
SEP									
23...	1320	E0.05	360	7.0	24.0	4.0	757	7.3	87

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, AMMONIA TOTAL (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)	PHOS-PHATE, TOTAL (MG/L AS PO4)
OCT 1991									
18...	1350	200	17	0.310	0.010	<0.20	--	<0.010	--
DEC									
17...	1035	130	3	0.260	<0.010	0.40	0.66	0.020	--
FEB									
24...	1355	28000	1	0.310	0.010	<0.20	--	0.020	--
MAY									
06...	1400	500	<1	0.260	<0.010	<0.20	--	<0.010	--
SEP									
23...	1320	--	<1	0.220	0.010	<0.20	--	<0.010	0.06

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

WATER QUALITY DATA, WATER YEAR OCTOBER 1991 TO SEPTEMBER 1992

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	SPECIFIC CONDUCTANCE (US/CM)	PH WATER WHOLE FIELD (STANDARD UNITS)	TEMPERATURE WATER (DEG C)	TURBIDITY (NTU)	BAROMETRIC PRESSURE (MM HG)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, (PER-CENT SATURATION)	COLIFORM, FECAL, 0.7 UM-MF (COLS./100 ML)
OCT 1991										
18...	0940	30	200	7.8	24.0	18	760	8.4	100	K1300
NOV										
26...	0900	13	205	8.3	23.5	1.5	761	9.5	112	--
DEC										
18...	1030	19	186	7.9	22.5	6.2	761	9.2	106	20000
JAN 1992										
28...	1440	11	195	9.2	24.0	3.7	760	9.6	114	--
FEB										
24...	0945	11	210	7.9	20.5	2.4	760	9.3	104	7900
APR										
07...	0925	8.9	198	8.4	23.0	1.6	762	10.0	117	--
MAY										
06...	0915	9.2	195	8.5	21.0	2.1	764	10.2	114	4800
JUN										
19...	1050	8.9	192	8.5	28.0	4.7	764	8.7	111	--
JUL										
28...	1330	12	190	9.2	27.5	4.7	764	9.6	121	--
AUG										
25...	1505	7.5	197	9.2	27.0	1.4	761	8.8	111	--
SEP										
23...	1030	14	200	8.8	26.0	6.0	763	9.4	116	--

DATE	TIME	HARDNESS TOTAL (MG/L AS CaCO3)	CALCIUM DIS-SOLVED (MG/L AS Ca)	MAGNESIUM, DIS-SOLVED (MG/L AS Mg)	SODIUM, DIS-SOLVED (MG/L AS Na)	SODIUM PERCENT	SODIUM ADSORPTION RATIO	POTASSIUM, DIS-SOLVED (MG/L AS K)	ALKALINITY LAB (MG/L AS CaCO3)	SULFATE DIS-SOLVED (MG/L AS SO4)	CHLORIDE, DIS-SOLVED (MG/L AS Cl)	FLUORIDE, DIS-SOLVED (MG/L AS F)
FEB												
24...	0945	61	12	7.6	16	36	0.9	1.1	63	10	27	<0.10
SEP												
23...	1030	56	11	6.8	14	35	0.8	1.7	54	9.0	22	<0.10

DATE	TIME	SILICA, DIS-SOLVED (MG/L AS SiO2)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L)	SOLIDS, SUM OF CONSTITUENTS, DIS-SOLVED (MG/L)	SOLIDS, DIS-SOLVED (TONS PER AC-FT)	RESIDUE TOTAL AT 105 DEG. C, SUSPENDED (MG/L)	NITROGEN, NO2+NO3 TOTAL (MG/L AS N)	NITROGEN, AMMONIA (MG/L AS N)	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)	NITROGEN, TOTAL (MG/L AS N)	PHOSPHORUS, TOTAL (MG/L AS P)	PHOSPHATE, TOTAL (MG/L AS PO4)
OCT 1991												
18...	0940	--	--	--	--	2	0.790	0.090	<0.20	--	0.080	0.12
DEC												
18...	1030	--	--	--	--	1	0.370	0.020	0.20	0.57	0.040	0.06
FEB												
24...	0945	21	121	133	0.16	1	0.280	0.010	<0.20	--	0.040	--
MAY												
06...	0915	--	--	--	--	<1	0.170	<0.010	<0.20	--	<0.010	--
SEP												
23...	1030	19	113	116	0.15	6	0.210	0.020	0.30	0.51	0.040	0.06

DATE	TIME	ALUMINUM, TOTAL RECOVERABLE (UG/L AS AL)	ALUMINUM, DIS-SOLVED (UG/L AS AL)	ARSENIC TOTAL (UG/L AS AS)	BARIUM, TOTAL RECOVERABLE (UG/L AS BA)	BARIUM, DIS-SOLVED (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, DIS-SOLVED (UG/L AS CO)
FEB											
24...	0945	90	20	--	<100	<2	<10	<1	<1	<1	<3
SEP											
23...	1030	360	50	<1	<100	3	<10	<1	1	<1	<3

< 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 1991 TO SEPTEMBER 1992

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 24...	3	350	97	<1	<10	<4	30	16	<0.10	<1	<10
SEP 23...	2	780	120	1	<10	<4	50	11	<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- METRIC (MG/L)
FEB 24...	<1	<1	<1	<1	<1	<1.0	82	<6	<10	1.7	<1
SEP 23...	2	<1	<1	<1	<1	<1.0	77	<6	<10	3.3	<1

DATE	ALDRIN, TOTAL (UG/L)	CHLOR- DANE, TOTAL (UG/L)	CHLOR- DYRIFOS 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
SEP 23...	<0.010	<0.1	0.01	<0.010	<0.010	<0.010	<0.01	0.01	0.020	<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
SEP 23...	<0.01	<0.010	<0.010	<0.01	<0.01	<0.010	<0.010	<0.010	0.04	<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
SEP 23...	<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.

ANALYSES OF SAMPLES COLLECTED AT WATER-QUALITY PARTIAL-RECORD STATIONS

WATER QUALITY DATA, WATER YEAR OCTOBER 1991 TO SEPTEMBER 1992

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	SAM- PLING DEPTH (FEET)	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)
JAN								
30...	1027	1.00	190	7.1	22.0	762	6.4	73
30...	1030	3.00	190	7.2	22.0	762	5.7	65
30...	1032	5.00	190	7.3	22.0	762	5.0	57
30...	1033	7.00	192	7.4	22.0	762	4.1	46
30...	1035	8.00	192	7.4	22.0	762	3.5	40
FEB								
25...	1055	1.00	182	7.8	23.5	757	7.4	88
25...	1056	3.00	182	7.8	23.0	757	7.2	85
25...	1057	5.00	182	7.8	23.0	757	7.2	85
25...	1058	7.00	182	7.8	23.0	757	7.2	85
25...	1059	8.00	182	7.8	23.0	757	7.0	82
JUN								
18...	1006	1.00	184	7.7	26.0	761	6.8	84
18...	1007	3.00	186	7.7	26.0	761	6.7	83
18...	1008	5.00	186	7.6	26.0	761	6.3	78
18...	1009	7.00	188	7.5	26.0	761	5.1	64
18...	1010	8.00	190	7.4	26.0	761	4.2	51
AUG								
26...	0942	1.00	182	7.5	26.5	760	6.7	84
26...	0943	3.00	182	7.6	26.5	760	6.6	82
26...	0944	5.00	186	7.6	26.0	760	5.8	72
26...	0945	7.00	186	7.5	26.0	760	5.7	71
26...	0946	8.00	186	7.5	26.0	760	4.1	51

WATER QUALITY DATA, WATER YEAR OCTOBER 1991 TO SEPTEMBER 1992

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	SAM- PLING DEPTH (FEET)	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)
JAN								
30...	1042	1.00	190	7.5	22.0	762	6.7	77
30...	1044	3.00	190	7.6	22.0	762	6.2	71
30...	1046	5.00	190	7.7	22.0	762	5.9	68
30...	1048	7.00	190	7.7	22.0	762	5.4	62
30...	1050	9.00	190	7.7	22.0	762	5.1	59
FEB								
25...	1102	1.00	182	7.8	23.5	757	7.4	88
25...	1103	3.00	182	7.8	23.0	757	7.1	84
25...	1105	5.00	182	7.8	23.0	757	7.2	85
25...	1107	7.00	182	7.8	23.0	757	7.1	83
25...	1112	9.00	184	7.8	23.0	757	6.7	79
JUN								
18...	1012	1.00	184	7.7	26.0	761	6.8	84
18...	1013	3.00	184	7.7	26.0	761	6.8	84
18...	1014	5.00	186	7.7	26.0	761	6.5	81
18...	1017	7.00	188	7.4	26.0	761	5.2	64
18...	1018	9.00	190	7.3	26.0	761	3.7	45
AUG								
26...	0935	1.00	182	7.6	26.5	760	7.0	87
26...	0936	3.00	182	7.6	26.5	760	7.0	87
26...	0937	5.00	182	7.6	26.0	760	6.9	85
26...	0938	7.00	188	7.6	26.0	760	4.5	56
26...	0939	9.00	190	7.4	26.0	760	2.4	30

ANALYSES OF SAMPLES COLLECTED AT WATER-QUALITY PARTIAL-RECORD STATIONS

WATER QUALITY DATA, WATER YEAR OCTOBER 1991 TO SEPTEMBER 1992

HAWAII, ISLAND OF DAHU--Continued

212335157482603 - HOOMALUHIA RES SEC 1-3 NR KANEOHE (LAT 21°23'35" LONG 157°48'26")

DATE	TIME	SAM-PLING DEPTH (FEET)	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH WATER WHOLE FIELD (STAND-ARD UNITS)	TEMPER-ATURE WATER (DEG C)	TUR-BID-ITY (NTU)	BARO-METRIC PRES-SURE (MM OF HG)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, (PER-CENT SATUR-ATION)	COLI-FORM, FECAL, UM-MF (COLS./100 ML)
JAN										
30...	1054	1.00	190	7.7	22.0	15	762	7.6	87	--
30...	1056	3.00	190	7.7	22.0	--	762	7.2	82	--
30...	1057	5.00	190	7.7	22.0	--	762	7.0	80	--
30...	1058	7.00	190	7.7	22.0	1.6	762	6.6	75	--
30...	1101	9.00	192	7.7	22.0	--	762	6.4	73	--
30...	1103	11.0	190	7.7	22.0	2.0	762	6.2	71	--
FEB										
25...	1114	1.00	182	7.8	23.5	3.8	757	7.4	88	K8
25...	1115	3.00	182	7.8	23.0	--	757	7.3	86	--
25...	1116	5.00	182	7.8	23.0	--	757	7.1	83	--
25...	1117	7.00	182	7.8	23.0	5.9	757	7.0	82	K15
25...	1118	9.00	184	7.8	23.0	--	757	6.7	79	--
25...	1119	11.0	186	7.7	23.0	5.5	757	6.6	77	K28
25...	1125	--	182	7.8	23.0	4.6	757	7.0	82	--
JUN										
18...	1024	1.00	184	7.7	26.5	1.0	761	6.8	84	--
18...	1025	3.00	184	7.7	26.5	--	761	6.8	84	--
18...	1026	5.00	186	7.7	26.0	--	761	6.3	77	--
18...	1027	7.00	188	7.5	26.0	1.2	761	5.0	62	--
18...	1028	9.00	190	7.3	26.0	--	761	4.0	49	--
18...	1029	11.0	194	7.3	25.0	3.5	761	4.7	57	--
AUG										
26...	0925	1.00	182	7.6	26.5	2.0	760	7.1	89	--
26...	0926	3.00	182	7.6	26.5	--	760	7.1	89	--
26...	0927	5.00	182	7.7	26.5	--	760	7.1	89	--
26...	0928	7.00	182	7.7	26.0	1.5	760	6.5	80	--
26...	0930	9.00	192	7.5	25.5	--	760	2.1	26	--
26...	0931	11.0	192	7.4	25.0	9.0	760	4.2	51	--

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)	FLUO-RIDE, DIS-SOLVED (MG/L AS F)
FEB	25...	57	9.9	7.7	14	34	0.8	1.3	53	10	22	<0.10

DATE	TIME	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, AMMONIA TOTAL (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)
FEB	25...	--	--	--	--	8	0.330	0.010	<0.20	--	0.020
25...	1117	--	--	--	--	16	0.340	0.020	0.30	0.64	0.040
25...	1119	--	--	--	--	13	0.370	0.020	0.20	0.57	0.040
25...	1125	18	107	115	0.15	--	--	--	--	--	--

< 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 1991 TO SEPTEMBER 1992

HAWAII, ISLAND OF OAHU--Continued

212335157482603 - HOOMALUHIA RES SEC 1-3 NR KANEEOHE--Continued

DATE	TIME	ALUM- INUM, TOTAL RECOV- ERABLE (UG/L AS AL)	ALUM- INUM, DIS- SOLVED (UG/L AS AL)	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)	COPPER, TOTAL RECOV- ERABLE (UG/L AS CU)	
FEB 25...	1125	370	20	<100	3	<10	<1	3	2	<3	6	
DATE	TIME	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...	580	23	3	<10	<4	60	<1	<0.10	<1	<10		
DATE	TIME	NICKEL, TOTAL RECOV- ERABLE (UG/L AS NI)	NICKEL, DIS- SOLVED (UG/L AS NI)	SELE- NIUM, TOTAL RECOV- ERABLE (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- ERABLE GRAVI- METRIC (MG/L)
FEB 25...	1	<1	<1	<1	<1	<1.0	78	<6	<10	2.3	<1	
DATE	TIME	ALDRIN, TOTAL (UG/L)	CHLOR- DANE, TOTAL (UG/L)	CHLOR- DYRIFOS 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	<0.010	<0.01	<0.01
DATE	TIME	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
DATE	TIME	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	

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

ANALYSES OF SAMPLES COLLECTED AT WATER-QUALITY PARTIAL-RECORD STATIONS

WATER QUALITY DATA, WATER YEAR OCTOBER 1991 TO SEPTEMBER 1992

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	SAM- PLING DEPTH (FEET)	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)
JAN								
30...	1143	1.00	192	7.8	22.0	762	8.2	94
30...	1145	3.00	190	7.8	22.0	762	8.1	93
30...	1146	5.00	190	7.8	22.0	762	8.1	92
30...	1147	7.00	190	7.8	22.0	762	8.0	92
30...	1149	8.00	190	7.8	22.0	762	7.9	90
FEB								
25...	1008	1.00	182	7.7	23.0	757	7.4	87
25...	1009	3.00	182	7.7	23.0	757	7.4	87
25...	1010	5.00	182	7.7	23.0	757	7.2	85
25...	1011	7.00	182	7.7	23.0	757	7.2	85
25...	1013	8.00	182	7.7	23.0	757	7.2	85
JUN								
18...	1150	1.00	184	7.8	26.5	761	6.8	85
18...	1151	3.00	186	7.8	26.5	761	6.8	85
18...	1152	5.00	186	7.8	26.5	761	6.8	85
18...	1153	7.00	184	7.8	26.5	761	6.6	82
18...	1154	8.00	186	7.8	26.0	761	6.4	79
AUG								
26...	1121	1.00	184	7.7	26.5	760	7.3	91
26...	1122	3.00	184	7.7	26.5	760	7.3	91
26...	1123	5.00	182	7.7	26.5	760	7.1	89
26...	1124	7.00	182	7.7	26.0	760	6.6	82
26...	1125	8.00	184	7.6	26.0	760	6.4	79

WATER QUALITY DATA, WATER YEAR OCTOBER 1991 TO SEPTEMBER 1992

HAWAII, ISLAND OF OAHU--Continued

212331157482502 - HOOMALUHIA RES SEC 2-2 NR KANEOHE (LAT 21°23'31" LONG 157°48'25")

DATE	TIME	SAM- PLING DEPTH (FEET)	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)
JAN								
30...	1126	3.00	190	7.8	22.0	762	8.1	92
30...	1130	5.00	190	7.8	22.0	762	8.0	91
30...	1131	7.00	190	7.8	22.0	762	7.8	89
30...	1132	9.00	190	7.8	22.0	762	7.6	87
30...	1136	11.0	190	7.7	22.0	762	7.4	84
30...	1224	1.00	190	7.7	22.0	762	8.2	94
FEB								
25...	1016	1.00	182	7.8	23.0	757	7.4	87
25...	1017	3.00	182	7.8	23.0	757	7.3	86
25...	1018	5.00	182	7.8	23.0	757	7.1	84
25...	1020	7.00	182	7.8	23.0	757	7.1	83
25...	1021	9.00	182	7.7	23.0	757	7.1	83
25...	1023	11.0	182	7.7	23.0	757	7.1	83
JUN								
18...	1142	1.00	186	7.8	26.5	761	6.9	87
18...	1143	3.00	186	7.8	26.5	761	6.9	87
18...	1144	5.00	186	7.8	26.5	761	6.9	86
18...	1145	7.00	186	7.8	26.5	761	6.9	86
18...	1146	9.00	184	7.8	26.0	761	6.8	84
18...	1147	11.0	196	7.3	25.0	761	3.3	40
AUG								
26...	1112	1.00	184	7.7	26.5	760	7.5	94
26...	1113	3.00	184	7.8	26.5	760	7.4	92
26...	1114	5.00	182	7.8	26.5	760	7.3	91
26...	1115	7.00	184	7.8	26.5	760	7.0	87
26...	1117	9.00	192	7.4	25.0	760	3.5	43
26...	1118	11.0	194	7.3	25.0	760	3.8	46

ANALYSES OF SAMPLES COLLECTED AT WATER-QUALITY PARTIAL-RECORD STATIONS

WATER QUALITY DATA, WATER YEAR OCTOBER 1991 TO SEPTEMBER 1992

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	SAM- PLING DEPTH (FEET)	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 OF (MG/L)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)
JAN								
30...	1112	1.00	190	7.8	22.0	762	7.7	88
30...	1113	3.00	190	7.8	22.0	762	7.5	85
30...	1116	5.00	190	7.8	22.0	762	7.4	84
30...	1119	7.00	190	7.7	22.0	762	7.1	81
30...	1121	9.00	190	7.7	22.0	762	6.7	76
FEB								
25...	1032	1.00	182	7.8	23.0	757	7.4	87
25...	1033	3.00	182	7.8	23.0	757	7.3	86
25...	1034	5.00	182	7.8	23.0	757	7.3	86
25...	1035	7.00	182	7.8	23.0	757	7.1	83
25...	1037	9.00	182	7.8	23.0	757	7.0	82
JUN								
18...	1136	1.00	184	7.8	26.5	761	6.9	87
18...	1137	3.00	186	7.8	26.5	761	7.0	87
18...	1138	5.00	186	7.8	26.5	761	6.9	86
18...	1139	7.00	186	7.8	26.5	761	7.0	87
18...	1140	9.00	188	7.5	26.0	761	5.5	67
AUG								
26...	1104	1.00	184	7.8	26.5	760	7.6	95
26...	1105	3.00	184	7.8	26.5	760	7.5	94
26...	1106	5.00	184	7.8	26.5	760	7.5	94
26...	1107	7.00	182	7.8	26.5	760	7.1	89
26...	1109	9.00	192	7.5	25.0	760	4.2	51

WATER QUALITY DATA, WATER YEAR OCTOBER 1991 TO SEPTEMBER 1992

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	SAM- PLING DEPTH (FEET)	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)
JAN								
30...	1324	1.00	192	7.9	22.0	762	7.7	88
30...	1325	3.00	192	7.9	22.0	762	7.5	86
30...	1326	5.00	192	7.9	22.0	762	7.5	85
30...	1327	7.00	192	7.9	22.0	762	7.4	85
30...	1328	8.00	192	7.9	22.0	762	7.3	84
FEB								
25...	1000	1.00	182	7.7	23.0	757	7.5	88
25...	1001	3.00	182	7.7	23.0	757	7.4	87
25...	1002	5.00	182	7.7	23.0	757	7.3	86
25...	1003	7.00	182	7.7	23.0	757	7.3	86
25...	1004	8.00	182	7.7	23.0	757	7.1	84
JUN								
18...	1118	1.00	182	7.8	27.0	761	7.0	88
18...	1119	3.00	184	7.9	26.5	761	7.0	88
18...	1120	5.00	186	7.9	26.5	761	7.0	87
18...	1121	7.00	186	7.8	26.5	761	7.0	87
18...	1122	8.00	186	7.8	26.5	761	7.0	87
AUG								
26...	1054	1.00	184	7.8	26.5	760	7.5	94
26...	1055	3.00	184	7.8	26.5	760	7.4	92
26...	1056	5.00	184	7.8	26.5	760	7.5	94
26...	1057	7.00	184	7.8	26.5	760	7.5	94
26...	1058	8.00	184	7.8	26.5	760	7.4	92

ANALYSES OF SAMPLES COLLECTED AT WATER-QUALITY PARTIAL-RECORD STATIONS

WATER QUALITY DATA, WATER YEAR OCTOBER 1991 TO SEPTEMBER 1992

HAWAII, ISLAND OF OAHU--Continued

212329157483102 - HOOMALUHIA RES SEC 3-2 NR KANEOHE (LAT 21°23'29" LONG 157°48'31")

DATE	TIME	SAM- PLING DEPTH (FEET)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH WATER WHOLE FIELD (STAND- ARD UNITS)	TEMPER- ATURE WATER (DEG C)	TUR- BID- ITY (NTU)	BARO- METRIC PRES- SURE (MM OF HG)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)
JAN									
30...	1316	1.00	192	7.8	22.0	1.6	762	8.1	93
30...	1318	3.00	190	7.9	22.0	--	762	8.1	92
30...	1320	5.00	192	7.9	22.0	2.2	762	8.0	91
30...	1321	7.00	192	7.9	22.0	--	762	7.8	90
30...	1322	9.00	192	7.8	22.0	--	762	7.8	89
30...	1323	10.0	190	7.9	22.0	2.3	762	7.7	88
FEB									
25...	0953	1.00	182	7.6	23.0	3.6	757	7.5	88
25...	0954	3.00	182	7.6	23.0	--	757	7.4	87
25...	0955	5.00	182	7.6	23.0	3.6	757	7.2	85
25...	0956	7.00	182	7.6	23.0	--	757	7.2	85
25...	0957	9.00	182	7.6	23.0	--	757	7.1	83
25...	0958	10.0	180	7.6	23.0	4.3	757	7.0	82
JUN									
18...	1108	1.00	184	7.8	26.5	0.90	761	7.0	87
18...	1109	3.00	186	7.9	26.5	--	761	7.0	88
18...	1111	5.00	186	7.9	26.5	1.8	761	7.1	89
18...	1112	7.00	184	7.9	26.5	--	761	7.0	87
18...	1114	9.00	184	7.8	26.5	--	761	7.0	86
18...	1115	10.0	186	7.7	26.0	1.6	761	6.3	78
AUG									
26...	1046	1.00	184	7.8	26.5	1.6	760	7.4	92
26...	1047	3.00	184	7.8	26.5	--	760	7.4	92
26...	1048	5.00	184	7.8	26.5	1.0	760	7.4	92
26...	1049	7.00	184	7.8	26.5	--	760	7.2	90
26...	1050	9.00	182	7.8	26.5	--	760	7.0	87
26...	1051	10.0	184	7.6	26.0	1.0	760	5.4	67

DATE	TIME	COLI- FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)	RESIDUE TOTAL AT 105 DEG. C, SUS- PENDE (MG/L)	NITRO- GEN, NO2+NO3 TOTAL (MG/L AS N)	NITRO- GEN, AMMONIA TOTAL (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)
FEB								
25...	0953	K9	12	0.340	0.010	0.20	0.54	0.030
25...	0955	K16	4	0.350	0.020	0.30	0.65	0.030
25...	0958	K15	10	0.340	0.020	0.20	0.54	0.030

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

WATER QUALITY DATA, WATER YEAR OCTOBER 1991 TO SEPTEMBER 1992

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	SAM- PLING DEPTH (FEET)	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)
JAN								
30...	1303	1.00	188	7.9	22.0	762	8.4	96
30...	1305	3.00	188	7.9	22.0	762	8.3	95
30...	1309	5.00	188	7.9	22.0	762	8.3	95
30...	1310	7.00	188	7.9	22.0	762	8.2	94
30...	1311	9.00	186	7.8	22.0	762	8.0	92
30...	1313	11.0	186	7.8	22.0	762	7.8	89
FEB								
25...	0940	1.00	182	7.3	23.0	757	7.5	88
25...	0942	3.00	182	7.3	23.0	757	7.4	87
25...	0944	5.00	182	7.3	23.0	757	7.3	86
25...	0946	7.00	182	7.4	23.0	757	7.2	85
25...	0947	9.00	182	7.4	23.0	757	7.1	83
25...	0948	11.0	182	7.4	23.0	757	6.9	81
JUN								
18...	1059	1.00	184	7.8	26.5	761	7.0	87
18...	1100	3.00	184	7.8	26.5	761	7.0	87
18...	1102	5.00	184	7.8	26.5	761	7.0	87
18...	1103	7.00	184	7.8	26.0	761	6.9	85
18...	1104	9.00	186	7.7	26.0	761	6.5	80
18...	1105	11.0	186	7.7	26.0	761	6.6	82
AUG								
26...	1037	1.00	184	7.8	26.5	760	7.4	92
26...	1038	3.00	184	7.8	26.5	760	7.3	91
26...	1039	5.00	184	7.8	26.5	760	7.1	89
26...	1040	7.00	184	7.8	26.5	760	7.1	89
26...	1041	9.00	184	7.7	26.5	760	7.0	87
26...	1043	11.0	186	7.6	26.0	760	6.1	75

ANALYSES OF SAMPLES COLLECTED AT WATER-QUALITY PARTIAL-RECORD STATIONS

WATER QUALITY DATA, WATER YEAR OCTOBER 1991 TO SEPTEMBER 1992

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	SAM- PLING DEPTH (FEET)	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)
JAN								
30...	1345	1.00	190	7.8	22.0	762	7.5	86
30...	1346	3.00	190	7.8	22.0	762	7.4	85
30...	1347	5.00	190	7.8	22.0	762	7.4	84
30...	1348	7.00	190	7.7	22.0	762	7.3	83
30...	1349	8.00	190	7.7	22.0	762	7.3	83
FEB								
25...	1138	1.00	182	7.9	23.5	757	7.6	90
25...	1139	3.00	184	7.9	23.0	757	7.3	86
25...	1140	5.00	182	7.8	23.0	757	7.0	82
25...	1141	7.00	182	7.8	23.0	757	6.9	81
25...	1143	8.00	182	7.8	23.0	757	6.8	80
JUN								
18...	1049	1.00	184	7.7	26.5	761	6.8	85
18...	1050	3.00	184	7.8	26.5	761	6.8	84
18...	1051	5.00	184	7.8	26.0	761	6.8	84
18...	1052	7.00	186	7.7	26.0	761	6.6	81
18...	1053	8.00	186	7.7	26.0	761	6.5	81
AUG								
26...	1011	1.00	182	7.6	26.5	760	7.2	90
26...	1012	3.00	184	7.7	26.5	760	7.2	90
26...	1013	5.00	184	7.7	26.5	760	7.0	87
26...	1015	7.00	184	7.7	26.5	760	7.1	89
26...	1016	8.00	182	7.7	26.5	760	7.0	87

WATER QUALITY DATA, WATER YEAR OCTOBER 1991 TO SEPTEMBER 1992

HAWAII, ISLAND OF OAHU--Continued

212335157483002 - HOOMALUHIA RES SEC 4-2 NR KANEHOE (LAT 21°23'35" LONG 157°48'30")

DATE	TIME	SAM- PLING DEPTH (FEET)	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 (PER- CENT SATUR- ATION)	OXYGEN, DIS- SOLVED (MG/L)
JAN								
30...	1339	1.00	190	7.8	22.0	762	7.8	89
30...	1340	3.00	190	7.8	22.0	762	7.8	89
30...	1341	5.00	190	7.8	22.0	762	7.7	88
30...	1342	7.00	190	7.8	22.0	762	7.6	87
30...	1343	9.00	192	7.8	21.5	762	7.6	86
FEB								
25...	1131	1.00	182	7.8	24.0	757	7.5	89
25...	1132	3.00	182	7.8	23.5	757	7.5	89
25...	1133	5.00	182	7.8	23.0	757	7.2	85
25...	1134	7.00	182	7.8	23.0	757	7.0	82
25...	1135	9.00	182	7.8	23.0	757	6.8	80
JUN								
18...	1043	1.00	184	7.7	26.5	761	6.8	84
18...	1044	3.00	184	7.7	26.5	761	6.8	84
18...	1045	5.00	184	7.7	26.0	761	6.6	82
18...	1046	7.00	186	7.7	26.0	761	6.6	82
18...	1047	9.00	188	7.4	26.0	761	4.6	56
AUG								
26...	1004	1.00	184	7.6	26.5	760	7.1	89
26...	1005	3.00	184	7.6	26.5	760	7.0	87
26...	1006	5.00	184	7.6	26.5	760	6.9	86
26...	1007	7.00	184	7.6	26.0	760	6.7	83
26...	1008	9.00	188	7.5	26.0	760	3.0	37

ANALYSES OF SAMPLES COLLECTED AT WATER-QUALITY PARTIAL-RECORD STATIONS

WATER QUALITY DATA, WATER YEAR OCTOBER 1991 TO SEPTEMBER 1992

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	SAM- PLING DEPTH (FEET)	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)
JAN								
30...	1333	1.00	192	7.9	22.0	762	8.2	94
30...	1334	3.00	192	7.9	22.0	762	8.2	93
30...	1335	5.00	190	7.8	22.0	762	8.1	92
30...	1336	7.00	190	7.8	22.0	762	8.0	91
30...	1337	9.00	190	7.8	22.0	762	8.0	91
30...	1338	11.0	192	7.8	21.5	762	7.9	90
FEB								
25...	1121	5.00	182	7.8	23.0	757	7.3	86
25...	1122	7.00	182	7.8	23.0	757	7.2	85
25...	1126	9.00	182	7.8	23.0	757	7.1	84
25...	1127	1.00	182	7.8	23.5	757	7.5	89
25...	1128	3.00	182	7.8	23.0	757	7.3	86
25...	1129	11.0	182	7.8	23.0	757	6.9	81
JUN								
18...	1035	1.00	184	7.7	26.5	761	6.8	85
18...	1036	3.00	184	7.7	26.5	761	6.7	84
18...	1037	5.00	184	7.7	26.0	761	6.8	84
18...	1038	7.00	186	7.7	26.0	761	6.8	84
18...	1039	9.00	190	7.4	26.0	761	4.1	50
18...	1040	11.0	194	7.2	25.5	761	2.2	27
AUG								
26...	0954	1.00	182	7.7	26.5	760	7.0	87
26...	0955	3.00	184	7.7	26.5	760	7.0	87
26...	0956	5.00	184	7.7	26.5	760	6.9	86
26...	0957	7.00	184	7.7	26.0	760	6.8	84
26...	0959	9.00	186	7.6	26.0	760	5.4	67
26...	1001	11.0	194	7.4	25.5	760	1.4	17

WATER QUALITY DATA, WATER YEAR OCTOBER 1991 TO SEPTEMBER 1992

HAWAII, ISLAND OF OAHU--Continued

212336157482601 - HOOMALUHIA RESERVOIR AT OUTLET, NEAR KANEOHE (LAT 21°23'36" LONG 157°48'26")

DATE	TIME	TEMPER- ATURE WATER (DEG C)	OXYGEN, DIS- SOLVED (MG/L)
JUN			
18...	1300	26.5	6.6
18...	1400	26.5	6.9
18...	1500	26.5	6.6
18...	1600	26.5	6.6
18...	1700	26.5	6.4
18...	1900	27.0	6.8
18...	2000	26.5	6.7
18...	2100	26.5	6.8
18...	2200	26.5	6.5
18...	2300	26.5	6.4
18...	2400	26.5	6.5
19...	0100	26.5	6.4
19...	0200	26.5	6.3
19...	0300	26.5	6.2
19...	0400	26.0	6.2
19...	0500	26.0	6.2
19...	0600	26.0	6.2
19...	0700	26.0	6.2
19...	0800	26.0	6.3
19...	0900	26.0	6.3
19...	1000	26.0	6.2
19...	1100	26.0	6.6
19...	1200	26.5	6.7
19...	1300	26.5	6.6
AUG			
26...	1400	26.5	7.2
26...	1500	27.0	7.2
26...	1600	27.0	7.2
26...	1700	27.0	7.0
26...	1800	27.0	7.3
26...	1900	27.0	7.2
26...	2000	27.0	7.1
26...	2100	27.0	7.0
26...	2200	26.5	6.9
26...	2300	26.5	6.8
26...	2400	26.5	6.7
27...	0100	26.5	6.5
27...	0200	26.5	6.5
27...	0300	26.5	6.3
27...	0400	26.5	6.1
27...	0500	26.0	5.8
27...	0600	26.0	6.0
27...	0700	26.0	5.9
27...	0800	26.0	6.0
27...	0900	26.0	6.2
27...	1000	26.0	6.3
27...	1100	26.5	6.5
27...	1200	26.5	6.6
27...	1300	27.0	6.6

ANALYSES OF SAMPLES COLLECTED AT WATER-QUALITY PARTIAL-RECORD STATIONS

WATER QUALITY DATA, WATER YEAR OCTOBER 1991 TO SEPTEMBER 1992

HAWAII, ISLAND OF HAWAII

16737500 - WAIMANU STREAM NEAR KAMUELA (LAT 20°08'16" LONG 155°38'33")

DATE	TIME	DIS-CHARGE, 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, DIS-SOLVED (MG/L)	OXYGEN, (PERCENT SATURATION)	COLIFORM, FECAL, 0.7 UM-MF (COLS./100 ML)	STREPTOCOCCI, FECAL, KF AGAR (COLS. PER 100 ML)	
JAN 1992	14...	1015	39	--	6.9	23.0	20.0	0.50	760	7.4	--	K37	200
MAY	22...	0940	32	217	6.9	24.0	20.0	0.70	760	8.2	91	--	--
JUL	30...	1145	76	118	7.4	24.0	21.0	1.4	764	8.4	94	80	500

DATE	HARDNESS TOTAL (MG/L AS CaCO3)	CALCIUM DIS-SOLVED (MG/L AS Ca)	MAGNESIUM, DIS-SOLVED (MG/L AS Mg)	SODIUM, DIS-SOLVED (MG/L AS Na)	SODIUM SODIUM PERCENT	SODIUM ADSORPTION RATIO	POTASSIUM, DIS-SOLVED (MG/L AS K)	ALKALINITY LAB (MG/L AS CaCO3)	SULFATE DIS-SOLVED (MG/L AS SO4)	CHLORIDE, DIS-SOLVED (MG/L AS Cl)	FLUORIDE, DIS-SOLVED (MG/L AS F)	SILICA, DIS-SOLVED (MG/L AS SiO2)	
JAN 1992	14...	99	25	8.9	89	64	4	6.3	51	21	170	0.10	35
MAY	22...	49	11	5.1	21	47	1	2.1	44	4.3	35	<0.10	33
JUL	30...	33	7.2	3.7	10	38	0.8	1.5	35	2.1	14	<0.10	27

DATE	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L)	SOLIDS, SUM OF CONSTITUENTS, DIS-SOLVED (MG/L)	SOLIDS, DIS-SOLVED (TONS PER AC-FT)	NITROGEN, NO2+NO3 (MG/L AS N)	NITROGEN, AMMONIA (MG/L AS N)	NITROGEN, AMMONIA + ORGANIC (MG/L AS N)	NITROGEN, TOTAL (MG/L AS N)	PHOSPHORUS (MG/L AS P)	PHOSPHATE, TOTAL (MG/L AS PO4)	ALUMINUM, TOTAL RECOVERABLE (UG/L AS AL)	ALUMINUM, DIS-SOLVED (UG/L AS AL)	ARSENIC TOTAL (UG/L AS AS)	
JAN 1992	14...	366	386	0.50	0.150	0.020	1.5	1.7	0.050	0.09	30	10	<1
MAY	22...	139	138	0.19	0.053	0.020	<0.20	--	0.050	--	10	<10	<1
JUL	30...	84	87	0.11	0.056	0.030	<0.20	--	0.020	0.06	230	30	<1

DATE	BARIUM, TOTAL RECOVERABLE (UG/L AS Ba)	BARIUM, DIS-SOLVED (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, DIS-SOLVED (UG/L AS Co)	COPPER, TOTAL RECOVERABLE (UG/L AS Cu)	IRON, TOTAL RECOVERABLE (UG/L AS Fe)	IRON, DIS-SOLVED (UG/L AS Fe)	LEAD, TOTAL RECOVERABLE (UG/L AS Pb)	LITHIUM, TOTAL RECOVERABLE (UG/L AS Li)	
JAN 1992	14...	<100	5	<10	<1	2	<1	<3	<1	170	100	<1	<10
MAY	22...	<100	<2	<10	<1	1	<1	<3	27	200	250	1	<10
JUL	30...	<100	<2	<10	<1	<1	<1	<3	2	410	220	<1	<10

< 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).

ANALYSES OF SAMPLES COLLECTED AT WATER-QUALITY PARTIAL-RECORD STATIONS

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WATER QUALITY DATA, WATER YEAR OCTOBER 1991 TO SEPTEMBER 1992

HAWAII, ISLAND OF HAWAII--Continued

16737500 - WAIMANU STREAM NEAR KAMUELA--Continued

DATE	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)	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)
JAN 1992 14...	<4	10	8	--	1	<10	1	<1	<1	<1	<1	<1.0
MAY 22...	<4	10	15	<0.10	<1	<10	1	<1	<1	<1	<1	<1.0
JUL 30...	<4	20	15	<0.10	<1	<10	<1	2	<1	<1	<1	<1.0

DATE	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)	ALDRIN, TOTAL (UG/L)	CHLOR- DANE, TOTAL (UG/L)	CHLOR- DYRIFOS 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)
JAN 1992 14...	120	9	<10	0.6	<0.010	<0.1	<0.02	<0.010	<0.010	<0.010	<0.02	<0.02
MAY 22...	47	7	20	0.5	<0.010	<0.1	<0.01	<0.010	<0.010	<0.010	<0.01	<0.01
JUL 30...	30	7	<10	1.4	<0.010	<0.1	<0.01	<0.010	<0.010	<0.010	<0.01	<0.01

DATE	DI- ELDRIN TOTAL (UG/L)	DI- SYSTON TOTAL (UG/L)	2, 4-DP TOTAL (UG/L)	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- THON, TOTAL (UG/L)
JAN 1992 14...	<0.010	<0.02	<0.01	<0.01	<0.010	<0.010	<0.02	<0.02	<0.010	<0.010	<0.010	<0.02
MAY 22...	<0.010	<0.01	<0.01	<0.01	<0.010	<0.010	<0.01	<0.01	<0.010	<0.010	<0.010	<0.01
JUL 30...	<0.010	<0.01	<0.01	<0.01	<0.010	<0.010	<0.01	<0.01	<0.010	<0.010	<0.010	<0.01

DATE	METH- OXY- CHLOR, TOTAL (UG/L)	METHYL PARA- THON, TOTAL (UG/L)	MIREX, TOTAL (UG/L)	NAPH- THA- LENES, POLY- CHLOR. TOTAL (UG/L)	PARA- THON, 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- THON (UG/L)	2,4,5-T TOTAL (UG/L)
JAN 1992 14...	<0.01	<0.02	<0.01	<0.10	<0.02	<0.1	<0.1	<0.02	<0.01	<1	<0.02	<0.01
MAY 22...	<0.01	<0.01	<0.01	<0.10	<0.01	<0.1	<0.1	<0.01	<0.01	<1	<0.01	<0.01
JUL 30...	<0.01	<0.01	<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.

GROUND WATER LEVELS

HAWAII, ISLAND OF KAUAI

220057159210301. Local number 2-0021-01.

LOCATION.--Lat 22°00'57", Long 159°21'04", Hydrologic Unit 20070000, 1.0 mi south southwest of Wailua County Golf Course, and 1.3 mi north of Hanamaulu Park. Owner: State of Hawaii, DOWALD.

AQUIFER.--Waimea Canyon Volcanic Series, Pliocene age.

WELL CHARACTERISTICS.--Drilled basal water table; depth 276 ft, casing diameter 8 in., cased to 196 ft.

DATUM.--Elevation of land surface datum is 166 ft. Measuring point: Top of 4-in. galvanized coupling, 166.70 ft. above mean sea level.

PERIOD OF RECORD.--Occasional measurements June 1980 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured 15.71 ft above mean sea level, Nov. 19, 1982. Lowest measured, 12.65 ft above mean sea level, Oct. 28, 1991.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1991 TO SEPTEMBER 1992

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 28	12.65	JAN 24	12.83	FEB 18	12.95	APR 7	13.10	JUN 16	12.84	AUG 18	13.22

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 10.19 ft above mean sea level, Nov. 9, 1983. Lowest measured 8.33 ft above mean sea level, Mar. 29, 1984.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1991 TO SEPTEMBER 1992

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 7	9.62	DEC 16	9.99	FEB 10	9.83	APR 13	9.78	JUN 8	9.75	AUG 10	9.64

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 Volcanic 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 1991 TO SEPTEMBER 1992
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	9.60	9.69	9.78	10.01	9.88	9.88	9.79	9.80	9.80	9.65	9.63	9.77
10	9.63	9.68	9.81	10.04	9.89	9.99	9.85	9.71	9.68	9.61	9.66	9.82
15	9.72	9.79	9.96	10.06	9.96	10.01	9.75	9.73	9.77	9.63	9.70	10.00
20	9.86	9.85	9.93	10.03	10.01	9.86	9.89	9.79	9.69	9.60	9.70	10.00
25	9.91	9.79	9.98	10.02	10.03	9.82	9.86	9.88	9.69	9.61	9.70	10.09
EOM	9.77	9.79	9.98	9.79	9.99	9.88	9.69	9.75	9.67	9.66	9.75	10.13
WTR YEAR	1992	MAX 10.30	JAN. 17	MIN 9.39	JUL. 28							

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.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured 11.73 ft above mean sea level, Jan. 24, 1978. Lowest water level measured 4.16 ft above mean sea level, May 10, 1977.

REMARKS.--Water used for irrigation of sugar cane.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1991 TO SEPTEMBER 1992

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 7	8.47	DEC 13	9.49	FEB 10	9.45	APR 13	9.45	JUN 8	8.47	AUG 10	8.69

HAWAII, ISLAND OF KAUAI--Continued

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 1991 TO SEPTEMBER 1992

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 28	9.49	JAN 24	9.82	FEB 18	10.09	APR 7	9.46	JUN 13	8.77	AUG 18	9.01

220148159453502. Local number, 2-0145-11.

LOCATION.--Lat 22°01'48", long 159°43'35", Hydrologic Unit 20070000, 1.0 mi Southeast from Mana Camp and 3.3 mi north of Kokole Point. Owner: Kekaha Sugar Co.

AQUIFER.--Waimea Canyon Volcanic Series, Pliocene age.

WELL CHARACTERISTICS.--Drilled artesian well; depth 31.5 ft, probably obstructed; casing diameter 12 in, cased depth unknown.

DATUM.--Elevation of land-surface datum is 29 ft. Measuring point 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 24.18 ft above mean sea level on Jan 31, 1974; Lowest water level measured 17.52 ft above mean sea level on Sept. 6, 1978.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1991 TO SEPTEMBER 1992

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 7	21.97	DEC 16	23.44	FEB 10	22.44	APR 13	22.44	JUN 8	22.58	AUG 10	22.61

HAWAII, ISLAND OF KAUAI--Continued

220354159205601. Local number, 2-0320-01

LOCATION.--Lat 22°03'54", long 159°20'56", Hydrologic unit 20070000, 0.6 mi east of Sleeping Giant Mountain, and 1.3 mi northwest of Wailua River bridge. Owner: Kauai County, Department of Water.

AQUIFER.--Koloa Volcanic Series, Pleistocene age.

WELL CHARACTERISTICS.--Drilled basal water-table well, depth 240 ft, casing diameter 8 in., cased to 193 ft.

DATUM.--Elevation of land-surface datum is 155 ft. Measuring point: Top edge of steel pump-base at breather hole, 155.98 ft above mean sea level.

PERIOD OF RECORD.--

WATER LEVEL: Occasional measurements, February 1960, June 1973 to current year.

WATER QUALITY: 1960, 1966, 1972-80, 1985-89, 1991.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 20.04 ft above mean sea level, Feb. 17, 1960. Lowest measured, 3.31 ft below mean sea level, May 27, 1977.

REMARKS.--Water used for public supply. Water level affected by pumping of nearby well.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1991 TO SEPTEMBER 1992

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 25	3.94	DEC 13	4.38	FEB 14	3.83	APR 3	3.25	JUN 5	2.29	AUG 14	.88

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.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 13.91 ft above mean sea level, Nov. 19, 1982. Lowest water level measured, 0.35 ft below mean sea level, Sept. 22, 1979.

REMARKS.--Water is used for public supply. Water level affected by pumping of nearby well.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1991 TO SEPTEMBER 1992

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 25	4.20	DEC 13	4.64	FEB 14	4.11	APR 3	3.51	JUN 5	2.57	AUG 14	1.36

GROUND WATER LEVELS

HAWAII, ISLAND OF KAUAI--Continued

220341159453901. Local number, 2-0345-04.

LOCATION.--Lat 22°03'41", long 159°43'39", Hydrologic Unit 20070000, 1.7 mi north northeast from Mana Camp and 1.7 mi east southeast from Nohili Point. Owner: Kekaha Sugar Co.

AQUIFER.--Waimea Canyon Volcanic Series, Pliocene age.

WELL CHARACTERISTICS.--Drilled 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.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 6.90 ft above mean sea level, Jan. 31, 1974.
Lowest water level measured, 1.42 ft below mean sea level, Jan. 22, 1985.

REMARKS.--Water is used for irrigation of sugar cane.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1991 TO SEPTEMBER 1992

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 7	2.96	DEC 10	4.65	FEB 10	4.32	APR 13	3.06	JUN 8	3.33	AUG 10	3.05

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 .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.

DATUM.--Elevation of land surface datum is 267 ft. Measuring point: Top of 4 1/2 in. galvanized coupling, after removing plug, elevation 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, 1.42 ft above mean sea level, Feb. 14, 1992.

REMARKS.--Water used for future public supply. Water level affected by nearby well.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1991 TO SEPTEMBER 1992

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 25	11.84	DEC 13	11.96	FEB 14	12.03	APR 3	11.52	JUN 5	11.62	AUG 14	11.42

GROUND WATER LEVELS

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HAWAII, ISLAND OF KAUAI--Continued

221038159203801. Local number, 2-1020-03.

LOCATION.--Lat 22°10'38", long 159°20'38", Hydrologic Unit, 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 airvent pipe after removing 2 in. elbow on the southwest side of base, elevation 359.04 ft above mean sea level.

PERIOD OF RECORD.--

Water level: Occasional measurements 1972 to current year.

Water quality: Occasional measurements 1972 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 144.56 ft above mean sea level, Mar. 30, 1990. Lowest water level measured, 42.69 ft above mean sea level, Oct. 4, 1973.

REMARKS.--Water is used for public supply and truck farming irrigation.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1991 TO SEPTEMBER 1992

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 25	130.72	FEB 18	128.84	APR 7	127.94	JUN 16	125.51	AUG 18	121.69

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 southside 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.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 43.36 ft above mean sea level, June 3, 1974. Lowest water level measured, 9.24 ft below mean sea level, Aug. 10, 1983.

REMARKS.--Water used for public supply and irrigation of golf course. Water level affected by nearby well.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1991 TO SEPTEMBER 1992

DATE	WATER LEVEL								
OCT 22	-3.33	DEC 11	-2.11	FEB 18	1.21	JUN 19	-3.68	AUG 18	-3.27

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.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 23.48 ft above mean sea level, June 3, 1974.
Lowest water level measured, 10.04 ft below mean sea level, June 9, 1975.

REMARKS.--Water used for public supply.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1991 TO SEPTEMBER 1992

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 25	7.76	DEC 13	8.38	FEB 14	8.31	APR 3	7.62	JUN 5	5.58	AUG 14	5.60

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, .22 ft above hole on pump base, 82.45 ft above mean sea level.

PERIOD OF RECORD.--

Water level: Occasional measurements 1972 to current year.

Water quality: Occasional measurements 1972 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 11.35 ft above mean sea level, Dec. 8, 1989.
Lowest water level measured 4.37 ft below mean sea level, Jan. 13, 1975.

REMARKS.--Water used for public supply.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1991 TO SEPTEMBER 1992

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 25	9.98	DEC 13	10.28	FEB 14	10.14	APR 3	9.72	JUN 5	9.23	AUG 14	8.60

GROUND WATER LEVELS

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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.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 34.83 ft above mean sea level, Jan. 10, 1974. Lowest water level measured, 5.05 ft above mean sea level, Mar.10, 1975.

REMARKS.--Water used for irrigation and washing of sugar cane at mill.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER OCTOBER 1991 TO SEPTEMBER 1992

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 28	25.98	MAR 3	25.02	APR 27	25.84	JUN 18	25.31	AUG 24	25.46

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.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 40.04 ft above mean sea level, July 15, 1974. Lowest water level measured, 22.07 ft above mean sea level, Mar. 3, 1983.

REMARKS.--Water used for public supply. Water level affected by nearby well.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1991 TO SEPTEMBER 1992

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL		
OCT 24	35.15	DEC 12	35.37	FEB 13	35.82	APR 2	35.13	JUN 4	35.17	AUG 13	34.63

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.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 108.83 ft above mean sea level, Jun. 4, 1992.
Lowest water level measured, 22.67 ft below mean sea level, July 27, 1978.

REMARKS.--Water used for sugar cane irrigation.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1991 TO SEPTEMBER 1992

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 24	102.57	DEC 12	105.39	FEB 13	106.38	APR 2	107.44	JUN 4	108.83

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 pump base east side, 78.97 ft above mean sea level. Measuring point is the top of 3/4" galvanized pipe on northwest side of pump base from June 4, 1992.

PERIOD OF RECORD.--

Water level: Occasional measurements 1972 to current year.

Water quality: Occasional measurements 1972 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 22.91 ft above mean sea level, Feb. 1, 1990.
Lowest water level measured, 9.19 ft above mean sea level, Oct. 13, 1978.

REMARKS.--Water used for public supply.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1991 TO SEPTEMBER 1992

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 24	17.38	DEC 12	18.19	FEB 13	18.06	APR 2	17.69	AUG 13	16.17

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.

REMARKS.--No record June 5-15, Sept. 15, recorder malfunction.

PERIOD OF RECORD.--Water level recorder, February 1986 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level, 17.83 ft above mean sea level, Jan. 15-16 1992, lowest 15.87 ft above mean sea level, Nov. 1, 1989

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1991 TO SEPTEMBER 1992
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	17.45	17.52	17.64	17.72	17.49	17.45	17.17	16.81		16.76	16.69	16.68
10	17.44	17.53	17.66	17.76	17.49	17.44	17.10	16.77		16.71	16.64	16.76
15	17.42	17.52	17.70	17.76	17.52	17.37	17.02	16.71		16.77	16.59	
20	17.46	17.56	17.69	17.72	17.47	17.35	17.01	16.79	16.79	16.78	16.60	16.80
25	17.48	17.61	17.73	17.64	17.49	17.31	16.97	16.84	16.77	16.75	16.65	16.79
EOM	17.50	17.63	17.72	17.54	17.46	17.19	16.86	16.86	16.77	16.76	16.59	16.80
WTR YEAR	1992	MAX	17.83	JAN. 15-16	MIN	16.55	AUG 29, 30					

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.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 13.10 ft above mean sea level on Jan. 26, 1989. Lowest water level measured, 5.26 ft above mean sea level on July 24, 1985.

REMARKS.--Water used for public supply.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1991 TO SEPTEMBER 1992

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
DEC 12	9.01	FEB 13	8.93	APR 2	8.82	AUG 13	8.41

HAWAII, ISLAND OF KAUAI--Continued

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. Obtained nearby elevation from Kekaha Sugar Co. Levels run to measuring point on June 15, 1972.

PERIOD OF RECORD.--

Water level: Recording station 1973-79. Occasional measurements 1979 to current year.

Water quality: Occasional measurements 1972 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 9.45 ft above mean sea level, Jan 16, 1974. Lowest water level measured, 2.58 ft below mean sea level, July 11, 1977.

REMARKS.--Water used for irrigation and for cleaning sugar cane at mill.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1991 TO SEPTEMBER 1992

DATE	WATER LEVEL
DEC 16	5.82

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.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 9.52 ft above mean sea level, Feb. 5, 1990. Lowest water level measured, 8.32 ft below mean sea level, Dec. 16, 1985 and June 19, 1986.

REMARKS.--Well used as a standby for public supply.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1991 TO SEPTEMBER 1992

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 7	8.67	DEC 12	9.09	FEB 13	9.03	APR 2	8.73	JUN 4	8.70	AUG 13	8.48

HAWAII, ISLAND OF KAUAI--Continued

215958159214301. Local number 2-5921-01.

LOCATION.--Lat 21°59'58", Long 159°21'43", Hydrologic Unit 20070000, 1.0 mi west of Hanamaulu Beach Park and 3.3 mi south southwest of Lydgate State Park. Owner: Kauai County, Department of Water.

AQUIFER.--Waimea Canyon Volcanic Series, Pliocene age.

WELL CHARACTERISTICS.--Drilled basal water-table well, depth 540 ft, casing diameter 14 in., cased to 315 ft.

DATUM.--Elevation of land-surface datum is 302 ft. Measuring point: Top of tee flange, elevation 303.77 ft, above mean sea level.

REMARKS.--Recorder malfunction Feb. 5-15. No record July 10 to Sept. 30, recorder removed for aquifer test.

PERIOD OF RECORD.--Occasional measurements, July 1980 to September 1985. Water-level recorder, October 1985 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level, 17.69 ft, Nov. 26, 1985. Lowest measured, 13.39 ft, Aug. 25, 1980.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1991 TO SEPTEMBER 1992
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	13.70	13.68	13.73	13.93		13.97	13.93	13.80	13.72	13.61		
10	13.66	13.70	13.73	14.01		13.92	13.89	13.79	13.72			
15	13.66	13.67	13.75	14.02		13.89	13.87	13.75	13.67			
20	13.66	13.73	13.69	14.02	13.98	13.91	13.91	13.76	13.69			
25	13.68	13.77	13.79	14.00	14.01	13.89	13.89	13.77	13.62			
EOM	13.67	13.70	13.85	13.90	13.98	13.88	13.83	13.72	13.62			
WTR YEAR 1992		MAX	14.14	FEB 23-24	MIN	13.56	JUN 26					

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. 08, 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 1991 TO SEPTEMBER 1992

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 25	215.40	DEC 13	217.43	FEB 14	218.40	APR 3	217.81	JUN 5	216.58	AUG 14	215.78

HAWAII, ISLAND OF KAUAI--Continued

215906159395601. Local number, 2-5939-01.

LOCATION.--Lat 21°59'06", Long 159°39'56", Hydrologic Unit 20070000, 2.3 mi north northeast of Waimea Recreational Pier State Park and 3.2 mi northeast from Oomano Point. Owner: Kauai County, Dept. of Water.

AQUIFER.--Waimea Canyon Volcanic Series, Pliocene age.

WELL CHARACTERISTICS.--Drilled basal water-table well; depth 40 ft, 6.5 ft diameter, uncased.

DATUM.--Elevation of land surface is 42 ft. Measuring point 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.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 10.43 ft above mean sea level, Jan. 14, 1988.

Lowest water level measured 6.05 ft below mean sea level, Sept. 8, 1980.

REMARKS.--Water is used for public supply.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1991 TO SEPTEMBER 1992

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 24	9.56	DEC 12	9.54	FEB 13	9.69	APR 2	9.14	JUN 4	9.37	AUG 13	8.93

215937159434201. Local number, 2-5943-01.

LOCATION.--Lat 21°59'37", Long 159°43'42", Hydrologic Unit 20070000, 2.2 mi northeast of Kokole Point and 2.4 mi northwest of Oomano Point. Owner: Kekaha Sugar Co.

AQUIFER.--Koloa Volcanic Series, Pliocene age.

WELL CHARACTERISTICS.--Drilled basal water-table well. Well is a 45 degree inclined Maui type shaft from 59 ft to 16 ft elevation and a vertical pump 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.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 10.62 ft above mean sea level, Oct. 16, 1989.

Lowest water level measured, 0.07 ft above mean sea level, Sept 17, 1979.

REMARKS.--Water used for irrigation of sugar cane.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1991 TO SEPTEMBER 1992

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 7	8.67	DEC 16	9.74	FEB 10	10.43	APR 13	8.97	JUN 8	8.71	AUG 10	8.60

HAWAII, ISLAND OF OAHU

211907157594701. Local number, 3-1959-05.

LOCATION.--Lat 21°19'06", long 157°59'46", Hydrologic Unit 20060000, 600 ft northwest of Ewa Beach Park, and 1.2 mi southeast of Campbell High School. Owner: Hawaii Institute of Geophysics.

AQUIFER.--Basalt of Koolau Volcanic Series, Tertiary age.

WELL CHARACTERISTICS.--Drilled basal water-table well, depth 1,110 ft, 5-in. PVC casing, bottom 12 ft perforated.

DATUM.--Elevation of land surface datum is 6 ft. Measuring point: Top of 5-in. PVC casing, 6.40 ft above mean sea level.

REMARKS.--Geophysical log and water-quality records are available in files of district office.

PERIOD OF RECORD.--Water-level recorder, December 1966 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level, 5.38 ft above mean sea level, Jan. 17, 1969; lowest, 2.81 ft below mean sea level, Aug. 25, 1977.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1991 TO SEPTEMBER 1992
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	1.98	2.33	2.57	2.90	2.64	2.57	2.24	1.45	1.24	.77	.72	.75
10	1.94	2.36	2.57	2.85	2.68	2.49	2.12	1.48	1.26	.88	.61	.69
15	2.04	2.34	2.63	2.89	2.85	2.51	1.90	1.36	1.08	.77	.67	.98
20	2.56	2.36	2.78	2.83	2.82	2.37	1.91	1.56	1.00	.72	.86	.89
25	2.41	2.29	2.92	2.76	2.79	2.40	1.75	1.43	.87	.64	.74	.74
EOM	2.35	2.34	2.87	2.63	2.62	2.41	1.56	1.35	.79	.59	.53	.62

WTR YEAR 1992 MAX 3.21 DEC 23 MIN 0.35 AUG 29

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 1991 TO SEPTEMBER 1992

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 28	17.84	FEB 18	19.29	APR 20	16.76	JUNE 10	14.57
DEC 10	18.29					AUG 18	15.82

HAWAII, ISLAND OF OAHU--Continued

212123157535501. Local number, 3-2153-05.

LOCATION.--Lat 21°21'23", Long 157°53'55", Hydrologic Unit 20060000, 0.4 mi northwest of Moanalua Elementary School, and 0.5 mi southwest of Tripler Hospital, in Moanalua. Owner: Honolulu Board of Water Supply.

AQUIFER.--Basalt of Koolau Volcanic Series, Tertiary age.

WELL CHARACTERISTICS.--Drilled basal water-table well, depth 1,246 ft, 6-in. PVC casing, cased to 24 ft, perforated from 24 to 1,246 ft. Well was modified and deepened August 1980.

DATUM.--Elevation of land-surface datum is 35 ft. Measuring point: Top of 6-in. PVC casing, 37.90 ft, revised, above mean sea level.

REMARKS.--Geophysical logs are available in files of district office.

PERIOD OF RECORD.--

WATER LEVEL: Water-level recorder, March 1981 to current year.

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 1991 TO SEPTEMBER 1992
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	19.50	19.84	19.93	20.43	20.13	20.13	19.92	19.19	18.88	18.41	18.10	18.02
10	19.46	19.95	20.07	20.37	20.11	20.08	19.73	19.16	18.80	18.36	18.11	18.00
15	19.51	19.87	20.17	20.45	20.28	20.16	19.63	19.03	18.68	18.30	17.98	18.14
20	19.83	19.89	20.13	20.32	20.25	20.00	19.59	19.16	18.65	18.26	18.18	18.18
25	19.84	19.89	20.30	20.28	20.31	19.95	19.53	19.04	18.53	18.21	18.08	18.06
EOM	19.83	19.86	20.34	20.15	20.24	19.88	19.29	18.93	18.43	18.14	17.96	18.02
WTR YEAR 1992		MAX 20.84	JAN 6	MIN 17.79	AUG 30							

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 1991 TO SEPTEMBER 1992
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	16.46	16.73	16.82	17.27	17.02	16.99	16.72	15.85	15.56	15.15	14.84	14.68
10	16.35	16.74	16.86	17.18	17.02	16.88	16.54	15.90	15.50	15.02	14.75	14.79
15	16.41	16.72	16.92	17.22	17.12	16.86	16.45	15.71	15.42	14.99	14.77	14.89
20	16.79	16.77	17.00	17.21	17.21	16.78	16.36	15.83	15.33	14.99	14.86	14.93
25	16.75	16.69	17.24	17.14	17.15	16.77	16.24	15.82	15.22	14.88	14.79	14.78
EOM	16.74	16.74	17.26	16.99	17.05	16.79	16.01	15.74	15.19	14.80	14.63	14.65
WTR YEAR 1992		MAX 17.36	JAN 2	MIN 14.54	SEP 1, 2.							

GROUND WATER LEVELS

HAWAII, ISLAND OF OAHU--Continued

214125158013401. Local number, 3-4101-03.

LOCATION.--Lat 21°41'25", long 158°01'34", Hydrologic Unit 20060000, 1,500 ft northeast of UH agriculture experiment Station in Waialea, 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 1991 TO SEPTEMBER 1992

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
JAN 8	14.74	MAR 30	14.31	JULY 13	13.81	SEP 25	14.12

GROUND WATER LEVELS

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HAWAII, ISLAND OF MOLOKAI--Continued

210711157000501. Local number, 4-0700-01.

LOCATION.--Lat 21°07'11", Long 157°00'05", Hydrologic Unit 20050000, 2.3 mi northeast of Kaunakakai, and 2.4 mi north of Kamiloloa. Owner: Kaluakoi Corporation.

AQUIFER.--East Molokai Volcanic Series.

WELL CHARACTERISTICS.--Drilled basal water-table well, depth 1,080 ft, casing diameter 20 in., cased to 956 ft, perforated from 956 to 1056 ft.

DATUM.--Measuring point: Top of casing, 979.00 ft, land-surface datum.

REMARKS.--Water-quality records for 1973-75 are available in files of district office.

PERIOD OF RECORD.--Occasional 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 1991 TO SEPTEMBER 1992

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 24	975.52	FEB 5	975.46	MAY 7	975.59	JUL 29	975.70

GROUND WATER LEVELS
HAWAII, ISLAND OF MAUI

203908156041201. Local number, 6-3904-01.

LOCATION.--Lat 20°39'08", long 156°04'12", Hydrologic Unit 20020000, 1,300 ft northwest of Kakanoni Point, and 0.7 mi west of Kipahulu School. Owner: Cordelia May.

AQUIFER.--Hana Volcanic Series, Pleistocene age.

WELL CHARACTERISTICS.--Drilled basal water-table well, depth 150 ft, casing diameter 4 in.

DATUM.--Elevation of land-surface datum is 133 ft. Measuring point: Top of 1-in. pipe nipple, 133.61 ft above mean sea level.

REMARKS.--Water-quality records for 1978 are available in files of district office.

PERIOD OF RECORD.--Occasional measurements, July 1978 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 2.97 ft above mean sea level, Jun. 29, 1988; lowest measured, 0.70 ft above mean sea level, July 2, 1986.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1991 TO SEPTEMBER 1992

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 02	2.22	JAN 8	1.68	APR 8	1.18	MAY 27	1.54	JUL 8	1.16	AUG 19	1.83
NOV 20	1.95	FEB 26	1.86								

203912156255901. Local number, 6-3925-01.

LOCATION.--Lat 20°39'12", long 156°25'59", Hydrologic Unit 20020000, 0.8 mi east of Keawalai Church, and 0.9 mi southeast of intersection of Kihei and Makena roads. Owner: State of Hawaii.

AQUIFER.--Hana Volcanic Series, Pleistocene age.

WELL CHARACTERISTICS.--Drilled basal water-table well, depth 382 ft, casing diameter 8 in., cased to 343 ft. perforated from 343 to 363 ft.

DATUM.--Elevation of land-surface datum is 352 ft. Measuring point: Top of 2-in. pipe attached to the casing cover, 352.29 ft above mean sea level.

REMARKS.--Water-quality records for 1964 are available in files of district office.

PERIOD OF RECORD.--Occasional measurements, August 1964, June 1972 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 0.47 ft above mean sea level, Aug. 24, 1964; lowest measured, 0.41 ft below mean sea level, May 4, 1977.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1991 TO SEPTEMBER 1992

DATE	WATER LEVEL						
OCT 11	0.06	JAN 24	0.06	APR 20	-0.11	JUL 14	-0.30

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 in., cased to 520 ft, perforated from 520 to 570 ft.

DATUM.--Elevation of land-surface datum is 518 ft. Measuring point: Top of casing, 519.33 ft above mean sea level.

REMARKS.--Water-quality records for 1974 are available in files of district office.

PERIOD OF RECORD.--Water-level recorder, August 1983 to September 1984. Occasional measurements, October 1984 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 15.03 ft above mean sea level, Jul. 15, 1987; lowest measured, 12.87 ft above mean sea level, Apr. 23, 1992.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1991 TO SEPTEMBER 1992

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL						
OCT 17	13.27	JAN 30	13.04	APR 23	12.87	JUN 24	12.96	AUG 5	12.98	SEP 15	13.03
DEC 5	13.27	FEB 28	13.10								

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 869 ft, casing diameter 4 in., cased to 829 ft, perforated from 829 to 859 ft.

DATUM.--Elevation of land-surface datum is 828 ft. Measuring point: Top of 6-in. pipe coupling, 828.44 ft above mean sea level.

REMARKS.--Water level readings are affected by oil floating on top of the water.

PERIOD OF RECORD.--Occasional measurements, October 1984 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 5.60 ft above mean sea level, May 2, 1989; lowest measured, 4.36 ft above mean sea level, July 9, 1985.

CORRECTIONS.--The well depth in water years 1988 to 1991 has been revised to 869 ft. The previously published well depth was erroneous.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1991 TO SEPTEMBER 1992

DATE	WATER LEVEL	DATE	WATER LEVEL
APR 23	4.77	AUG 5	Area fenced in. Construction for a new water tank.
JUN 24	4.63		

HAWAII, ISLAND OF MAUI--Continued

205419156304401. Local number, 6-5430-03.

LOCATION.--Lat 20°54'19", long 156°30'44", Hydrologic Unit 20020000, 2,000 ft north of Puuohala Village, and 0.5 mi northwest of Wailuku Sugar Mill reservoir. Owner: Wailuku Sugar Co.

AQUIFER.--Wailuku Volcanic Series, Pliocene age.

WELL CHARACTERISTICS.--Drilled basal water-table well, depth 580 ft, 1.5-in. PVC casing, cased to 400 ft, perforated from 400 to 580 ft.

DATUM.--Elevation of land-surface datum is 415 ft. Measuring point: Top of 1-in. galvanized pipe, 416.75 ft above mean sea level.

PERIOD OF RECORD.--Water-level recorder, August 1982 to February 1984. Occasional measurements, March 1984 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level, 22.09 ft above mean sea level, Dec. 31, 1982; lowest measured, 14.24 ft above mean sea level, Sep. 08, 1992.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1991 TO SEPTEMBER 1992

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 01	15.25	DEC 5	16.07	MAR 12	15.52	JUN 3	15.58	JUL 22	14.47	SEP 8	14.24
OCT 17	15.47	JAN 22	16.61	APR 24	15.72						

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 in., cased to 400 ft.

DATUM.--Elevation of land-surface datum is 380 ft. Measuring point: Top of 10-in. casing, 380.84 ft. revised, above mean sea level.

PERIOD OF RECORD.--

WATER LEVEL: Occasional measurements, August 1983 to MAY 1986. Water-level recorder, June 1986 to current year.

WATER QUALITY: 1982, 1985 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 18.20 ft above mean sea level, Dec. 14, 1989; lowest measured, 11.88 ft above mean sea level, Sept. 10-12, 1991.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1991 TO SEPTEMBER 1992
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	13.31	13.79	14.14	14.10	14.35	13.28	13.55	13.29	13.33	12.71	12.39	12.30
10	13.36	13.81	14.09	14.10	14.08	13.30	13.45	13.26	13.29	12.61	12.39	12.30
15	13.49	13.85	14.10	14.25	13.93	13.49	13.44	13.19	13.19	12.52	12.45	12.35
20	13.65	13.84	14.15	14.46	13.72	13.57	13.44	13.60	13.07	12.44	12.31	12.30
25	13.73	13.86	14.25	14.43	13.52	13.58	13.42	13.63	12.95	12.55	12.24	12.32
EOM	13.81	13.93	14.13	14.33	13.40	13.54	13.35	13.46	12.79	12.48	12.23	12.30

WTR YEAR 1992 MAX 14.55 Jan. 27 MIN 12.12 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-in. PVC casing, cased to 515 ft, perforated from 515 to 555 ft.

DATUM.--Elevation of land-surface datum is 493 ft. Measuring point: Top of 1.5-in. PVC casing, 492.51 ft above mean sea level.

PERIOD OF RECORD.--Water-level recorder, August 1982 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 19.52 ft above mean sea level, Jan. 2, 1983; lowest measured, 10.98 ft above mean sea level, Aug. 29, 1991.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1991 TO SEPTEMBER 1992
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	12.89	13.39	13.84	13.85	14.14	12.86	13.21	13.00	12.94	12.30	11.89	11.81
10	12.94	13.40	13.78	13.85	13.77	12.89	e13.09	13.01	12.89	12.19	11.89	11.81
15	13.09	13.40	13.80	14.10	13.60	13.19	e13.10	12.90	12.83	12.07	11.99	11.88
20	13.29	13.36	13.90	14.33	13.35	13.28	e13.11	13.45	12.67	11.99	11.83	11.84
25	13.36	13.45	e14.01	e14.19	13.11	13.28	13.15	13.45	12.56	12.07	11.74	11.88
EQM	13.42	13.56	13.84	14.10	12.96	13.21	13.05	13.23	12.35	12.03	11.70	11.84

WTR YEAR 1992 MAX 14.42 ft Jan. 19-20 MIN 11.55 ft Aug. 29.

e - Estimated G.H. based on Waiehu Monitor Well (06-5430-05).

205617156311101. Local number, 6-5631-01.

LOCATION.--Lat 20°56'17", long 156°31'11", Hydrologic Unit 20020000, 2,000 ft southwest of Waihee Farm, and 1.3 mi northwest of Waiehu Golf Course. Owner: Wailuku Sugar Co.

AQUIFER.--Wailuku Volcanic Series, Pliocene age.

WELL CHARACTERISTICS.--Drilled basal water-table well, depth 300 ft, 1.5-in. PVC casing, cased to 260 ft, perforated from 260 to 300 ft.

DATUM.--Elevation of land-surface datum is 248 ft. Measuring point: Top of 1.5-in. PVC pipe, 248.05 ft above mean sea level.

PERIOD OF RECORD.--Water-level recorder, August 1982 to September 1984. Occasional measurements, October 1984 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 18.83 ft above mean sea level, Dec. 6, 1982; lowest measured, 14.38 ft above mean sea level, Sep. 8, 1992.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1991 TO SEPTEMBER 1992

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 1	15.14	DEC 5	15.56	MAR 12	15.08	JUN 3	14.91	JUL 22	14.46	SEP 8	14.38
OCT 17	15.24	JAN 22	15.64	APR 24	15.03						

HAWAII, ISLAND OF MAUI--Continued

205651156313201. Local number, 6-5631-02.

LOCATION.--Lat 20°56'51", Long 156°31'32", Hydrologic Unit 20020000, 0.9 mi northwest of Waihee School, and 0.9 mi upstream from mouth of Waihee river. Owner: Hawaiian Investments.

AQUIFER.--Wailuku Volcanic Series, Pliocene age.

WELL CHARACTERISTICS.--Drilled basal water-table well, depth 387 ft, casing diameter 16 in., cased to 290 ft, perforated from 290 to 310 ft.

DATUM.--Elevation of land-surface datum is 281 ft. Measuring point: Top of 16-in. casing, 284.78 ft above mean sea level.

PERIOD OF RECORD.--Water-level recorder, 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, 8.80 ft Aug. 27, 1992.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1991 TO SEPTEMBER 1992
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	9.46	9.70	9.80	9.71	9.71	9.55	9.45	9.21	9.25	9.05	-	8.89
10	9.50	9.71	9.80	9.75	9.74	9.51	9.41	9.23	9.24	9.01	-	8.94
15	9.50	9.70	9.79	9.81	9.76	9.49	9.40	9.18	9.20	9.00	-	8.95
20	9.56	9.74	9.75	9.80	9.73	9.45	9.35	9.18	9.15	-	-	8.89
25	9.63	9.76	9.75	9.79	9.70	9.45	9.34	9.24	9.12	-	8.87	8.90
EOM	9.67	9.81	9.74	9.75	9.60	9.44	9.24	9.26	9.07	-	8.86	8.90

WTR YEAR 1992 MAX 9.87 ft Nov. 30, Jan. 17 MIN 8.80 ft Aug. 27
No G.H. record July 16 to Aug. 20 (clock stopped).

205856156400101. Local number, 6-5840-01.

LOCATION.--Lat 20°58'56", Long 156°40'01", Hydrologic Unit 20020000, on sugar plantation road 0.9 mi east of Kahana, and 1.5 mi southwest of Honokahua. Owner: State of Hawaii.

AQUIFER.--Honolua Volcanic Series, Pliocene age.

WELL CHARACTERISTICS.--Drilled basal water-table well, depth 274 ft, casing diameter 8 in., cased to 264 ft, perforated from 264 to 274 ft. Hole was drilled to depth of 284 ft but plugged back 10 ft with cement.

DATUM.--Elevation of land-surface datum is 257 ft. Measuring point: Top of 9-in. casing, 257.34 ft above mean sea level.

REMARKS.--Water-quality records for 1964, 1980 are available in files of district office.

PERIOD OF RECORD.--Occasional measurements, March 1972 to July 1975. Water-level recorder, August 1975 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level, 3.68 ft above mean sea level, Sept. 20, 1981; lowest, 2.40 ft above mean sea level May 4, 5, 1985.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1991 TO SEPTEMBER 1992
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	3.15	3.24	3.35	3.16	3.05	3.25	3.24	2.90	2.99	2.98	2.95	3.19
10	3.20	3.24	3.26	3.25	3.20	3.26	3.15	2.95	2.99	2.98	2.90	3.26
15	3.11	3.20	3.24	3.34	3.31	3.28	3.12	2.89	2.94	2.96	2.97	3.25
20	3.19	3.27	3.20	3.22	3.37	3.19	3.08	2.89	2.91	2.94	3.02	3.14
25	3.25	3.37	3.17	3.16	3.36	3.18	3.09	2.95	2.91	2.92	3.04	3.17
EOM	3.24	3.46	3.14	3.10	3.21	3.17	2.86	3.01	2.90	3.04	3.14	3.17

WTR YEAR 1992 MAX 3.56 ft Nov. 30 MIN 2.71 ft June 28-29.

HAWAII, ISLAND OF HAWAII

190602155325901. Local number, 8-0632-01.

LOCATION.--Lat 19°06'02", long 155°32'59", Hydrologic Unit 20010000, 0.9 mi north of Whittington Park, and 3.3 mi northeast of Naalehu. Owner: Kau Agribusiness (formerly Kau Sugar Company).

AQUIFER.--Ninole Volcanic Series, Pleistocene age.

WELL CHARACTERISTICS.--Drilled basal water-table, depth 140 ft, casing diameter 14 in., cased to 105 ft, perforated from 105 to 125 ft.

DATUM.--Elevation of land-surface datum is 102 ft. Measuring point: 1-in. hole in pump base, 103.26 ft above mean sea level.

REMARKS.--Water-quality records for 1972 and 1973 are available in files of district office.

PERIOD OF RECORD.--Occasional measurements, April 1972 to current year.

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 1991 TO SEPTEMBER 1992

DATE	WATER LEVEL						
NOV 20	1.48	JAN 21	1.13	JUN 15	0.94	SEP 15	1.10

192728154530101. Local number, 8-2783-01.

LOCATION.--Lat 19°27'28", long 154°53'01", Hydrologic Unit 20010000, 0.8 mi southeast of Pawai crater in Keahialaka, and 1.9 mi north of Opihikao road junction, south Pahoia. Owner: State of Hawaii.

AQUIFER.--Hilina Volcanic Series, Pleistocene age.

WELL CHARACTERISTICS.--Drilled basal water-table well, depth 319 ft, casing diameter 8 in., cased to 279 ft, perforated from 279 to 319 ft.

DATUM.--Elevation of land-surface datum is 273 ft. Measuring point: Top of casing, 273.00 ft above mean sea level.

PERIOD OF RECORD.--

WATER LEVEL: Occasional measurements, March 1972 to current year.

WATER QUALITY: 1962, 1972 to current year.

REVISED RECORDS.--WDR HI-91-1: 1984-90(The maximum water level for the period of record.)

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 3.55 ft above mean sea level, July 11, 1977; lowest measured, 0.97 ft above mean sea level, July 26, 1976.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1991 TO SEPTEMBER 1992

DATE	WATER LEVEL	DATE	WATER LEVEL
DEC 9	3.25	JAN 31	2.74

GROUND WATER LEVELS

HAWAII, ISLAND OF HAWAII--Continued

193017154502101. Local number, 8-3080-02.

LOCATION.--Lat 19°30'17", long 154°50'21", Hydrologic Unit 20010000, 0.5 mi south of intersection of Highway 132 and Highway 137 near Pahoia. Owner: County of Hawaii.

AQUIFER.--Puna Volcanic Series, Holocene age.

WELL CHARACTERISTICS.--Dug basal water-table well, depth 46 ft, casing diameter 66 in., with two horizontal infiltration tunnels 2 x 50 ft extending in opposite directions from 3 ft above bottom of well.

DATUM.--Elevation of land-surface datum is 39 ft. Measuring point: Top of steel manhole cover at 1-in. hole, 39.50 ft above mean sea level.

REMARKS.--Water from this well is used for public supply and at times, water level affected by pumping.

PERIOD OF RECORD.--

WATER LEVEL: Occasional measurements, March 1972 to current year.

WATER QUALITY: 1972-81, 1983 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 4.77 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 1991 TO SEPTEMBER 1992

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
JAN 31	4.54	JUN 8	4.39	AUG 13	4.10

193339154594801. Local number, 8-3389-01.

LOCATION.--Lat 19°33'39", long 154°59'48", Hydrologic Unit 20010000, 3.5 mi northwest of Pahoia airstrip, and 5.5 mi southeast of Keaau. Owner: County of Hawaii.

AQUIFER.--Puna Volcanic Series, Holocene age.

WELL CHARACTERISTICS.--Drilled basal water-table well, depth 475 ft, casing diameter 8 in., cased to 403 ft, perforated from 403 to 475 ft.

DATUM.--Elevation of land-surface datum is 427 ft. Measuring point: Top of casing, 428.14 ft above mean sea level.

REMARKS.--Water-quality records for 1961 are available in files of district office.

PERIOD OF RECORD.--Occasional measurements, September 1974 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 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 1991 TO SEPTEMBER 1992

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
DEC 9	19.29	FEB 3	18.65	APR 18	11.34	JUN 9	9.92	AUG 13	10.51

HAWAII, ISLAND OF HAWAII--Continued

194222155035101. Local number, 8-4203-04.

LOCATION.--Lat 19°42'22", long 155°03'51", Hydrologic Unit 20010000, 0.5 mi east of Hawaii Technical School, and 1.0 mi south of Hilo airport terminal. Owner: Hawaii Electric Light Company.

AQUIFER.--Kahuku Volcanic Series, Pleistocene age.

WELL CHARACTERISTICS.--Drilled basal water-table well, depth 201 ft, casing diameter 16 in., cased to 63 ft.

DATUM.--Elevation of land-surface datum is 47 ft. Measuring point: Top of 3-in. nipple above casing; 46.54 ft above mean sea level.

REMARKS.--Water-quality records for 1961 are available in files of district office. Water level affected by pumping of nearby industrial wells.

PERIOD OF RECORD.--Occasional measurements, July 1973 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 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 1991 TO SEPTEMBER 1992

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
DEC 6	7.31	FEB 3	6.83	JUN 9	6.20	SEP 22	7.25

GROUND WATER LEVELS

HAWAII, ISLAND OF HAWAII--Continued

195947155485801. Local number, 8-5948-01.

LOCATION.--Lat 19°59'47", Long 155°48'58", Hydrologic Unit 20010000, 0.7 mi east of Hapuna Beach Park, and 3.1 mi southeast of Kawaihae. Owner: State of Hawaii.

AQUIFER.--Hamakua Volcanic Series, Pleistocene age.

WELL CHARACTERISTICS.--Drilled basal water-table well, depth 268 ft, casing diameter 10 in., cased to 246 ft, screened from 246 to 266 ft.

DATUM.--Elevation of land-surface datum is 244 ft. Measuring point: Hole in pumpbase, 246.47 ft above mean sea level.

REMARKS.--Water from this well is used for irrigation.

PERIOD OF RECORD.--

WATER LEVEL: Occasional measurements, April 1970, March 1973 to current year.

WATER QUALITY: 1970, 1973 to current year.

REVISED RECORDS.--WDR HI-91-1: 1976-80(Water level data), 1976-90 (Maximum and minimum water levels for the period of record). WDR HI-92-1: 1976, 1979, 1980 (Water level data footnote).

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 4.58 ft above mean sea level, Oct. 23, 1978; lowest measured, 1.38 ft above mean sea level, Sep. 28, 1979.

REVISIONS.--The water level data footnote for the 1976, 1979, and 1980 water years have been revised, as shown in the tables below. They supersede figures published in the data report for 1991.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 9	3.59	FEB 3	3.17	MAY 27	3.21	AUG 2	3.46	SEP 20	3.67

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1978 TO SEPTEMBER 1979

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 23	4.58	JAN 15	4.14	APR 4	4.43	JUN 14	3.94	JUL 23	3.84	SEP 28	a1.38

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
DEC 11	4.02	JAN 6	4.25	FEB 27	4.07	APR 18	4.02	JUN 17	3.66	SEP 15	a1.85

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1991 TO SEPTEMBER 1992

DATE	WATER LEVEL	DATE	WATER LEVEL
JAN 17	4.44	JUN 11	4.20

a well being pumped

HAWAII, ISLAND OF HAWAII--Continued

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 in., cased to 997 ft, perforated from 997 to 1,008 ft. Hole was drilled to 1,040 ft but was finally plugged back to 1,008 ft.

DATUM.--Elevation of land-surface datum is 982 ft. Measuring point: Top of pipe coupling on casing cover 982.8 ft, revised, above mean sea level.

REMARKS.--Water-quality records for 1963-64 are available in files of district office.

PERIOD OF RECORD.--Occasional measurements, June to July 1963, June 1973 to current year.

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, 4.82 ft above mean sea level, Sept. 20, 1976.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1991 TO SEPTEMBER 1992

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 22	5.61	JAN 17	5.74	JUN 11	5.61	AUG 7	5.56

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 Hoesa Camp. Owner: Kohala Corporation.

AQUIFER.--Pololu Volcanic Series, Pleistocene age.

WELL CHARACTERISTICS.--Dug basal water-table well, with horizontal infiltration tunnels from pump sump.

DATUM.--Elevation of land-surface datum is 33 ft. Measuring point: Top of 4-in. steel I-beam placed across sump, 7.75 ft above mean sea level.

PERIOD OF RECORD.--

WATER LEVEL: Occasional measurements, March 1973 to current year.

WATER QUALITY: 1973 to current year.

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.

REVISIONS.--The maximum water level for the period of record reported for water years 1988 to 1990 have been revised to 3.09 ft above mean sea level, Aug. 22, 1974.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1991 TO SEPTEMBER 1992

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
DEC 4	2.60	JAN 24	2.87	JUN 17	2.12	SEP 22	3.07

QUALITY OF GROUND WATER

WATER QUALITY DATA, WATER YEAR OCTOBER 1991 TO SEPTEMBER 1992

STATION NUMBER	LOCAL IDENTIFIER	LATITUDE	LONGITUDE	DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	TEMPERATURE WATER (DEG C)	CHLORIDE, DIS-SOLVED (MG/L AS CL)
HAWAII, ISLAND OF KAUAI								
220018159444702	2-0044-13 W34 KEKAHA	22 00 18 N	159 44 47 W	10-08-91	1150	520	22.5	84
				12-23-91	1400	500	22.0	82
				02-12-92	1330	512	21.5	80
				04-14-92	1405	497	24.0	78
				08-11-92	1200	498	23.5	78
220016159442701	2-0044-15 S14 KEKAHA	22 00 16 N	159 44 27 W	10-07-91	0900	1650	23.0	200
				12-13-91	0850	810	22.5	160
				02-10-92	0910	830	21.5	160
				04-14-92	1450	820	22.0	160
				06-08-92	0840	850	22.5	170
				08-10-92	0850	890	23.0	170
220136159205501	2-0120-01 W7 WAILUA	22 01 36 N	159 20 55 W	10-28-91	0915	850	25.5	140
				01-24-92	0930	950	24.0	160
				02-18-92	1130	850	24.5	140
				04-07-92	1320	850	26.0	310
				06-13-92	1250	850	26.0	150
				08-18-92	1300	860	26.0	160
220148159453501	2-0145-10 W45F MANA	22 01 48 N	159 45 35 W	10-07-91	1050	520	23.5	77
				04-13-92	1050	590	21.0	90
				06-08-92	1030	720	21.5	130
220354159205601	2-0320-01 W9-1A WAIL	22 03 54 N	159 20 56 W	10-25-91	0900	400	23.5	41
				08-14-92	0850	402	25.5	42
220354159205602	2-0320-03 W9-1B WAIL	22 03 54 N	159 20 56 W	12-13-91	0905	395	23.0	44
				02-14-92	0850	385	22.0	42
				04-03-92	0855	405	25.0	46
				06-05-92	0915	430	25.0	48
220341159453901	2-0345-04 S16 SAKIMA	22 03 41 N	159 45 39 W	10-07-91	0925	1700	22.0	420
				02-10-92	0940	1260	21.5	150
				04-13-92	0930	1500	22.0	370
				06-08-92	0910	1400	22.0	330
				08-10-92	0940	1140	22.0	260
220530159450401	2-0545-01 W59 KAULAU	22 05 30 N	159 45 07 W	10-07-91	0955	800	24.0	150
				12-16-91	1015	790	22.5	140
				02-10-92	1025	800	22.0	150
				04-13-92	1000	780	23.0	140
				06-08-92	0945	775	24.5	140
				08-10-92	1015	770	22.5	150
220827159185401	2-0818-01 W90A ANAHO	22 08 27 N	159 18 54 W	02-14-92	1005	255	23.0	20
				06-05-92	1030	245	24.0	21
220826159185401	2-0818-02 W90B ANAHO	22 08 26 N	159 18 54 W	10-25-91	1300	267	24.5	21
				12-13-91	1020	272	23.5	22
				04-03-92	0945	250	23.5	20
				08-14-92	0945	260	24.0	20
221141159252501	2-1125-01 N1 KILAUEA	22 11 41 N	159 25 25 W	10-25-91	0950	172	23.5	16
				02-14-92	1050	158	23.0	14
				06-05-92	1110	155	24.0	14
221141159252502	2-1125-02 N2 KILAUEA			12-13-91	1110	152	23.0	14
				04-03-92	1030	160	24.5	14
				08-14-92	1030	153	25.0	14
221150159264501	2-1126-01 KALIHIWAI	22 11 50 N	159 26 45 W	12-11-91	0700	232	22.5	22
				02-18-92	0810	230	22.0	26
				06-16-92	0830	251	23.0	26
				08-18-92	0750	232	24.0	27
221151159265001	2-1126-02 KALIHIWAI	22 11 51 N	159 26 50 W	10-22-91	0850	220	22.0	26
				04-07-92	0840	230	22.0	27

QUALITY OF GROUND WATER

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WATER QUALITY DATA, WATER YEAR OCTOBER 1991 TO SEPTEMBER 1992

STATION NUMBER	LOCAL IDENTIFIER	LATITUDE	LONGITUDE	DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	TEMPERATURE WATER (DEG C)	CHLORIDE, DIS-SOLVED (MG/L AS CL)
HAWAII, ISLAND OF KAUAI--Continued								
221201159293401	2-1229-03 W73 HANALE	22 12 01 N	159 29 34 W	10-25-91	1030	240	23.0	28
				02-14-92	1300	240	23.0	28
				04-03-92	1250	240	23.0	29
				06-05-92	1300	243	23.0	30
221247159324801	2-1232-01 W67 WAINIH	22 12 47 N	159 32 48 W	10-25-91	1140	145	27.0	19
				12-13-91	1150	145	23.5	20
				02-14-92	1220	140	25.5	20
				04-03-92	1210	140	28.0	20
				06-05-92	1215	132	23.0	20
08-14-92	1205	143	28.0	20				
221318159335901	2-1333-01 W66 HAENA	22 13 18 N	159 33 59 W	10-25-91	1110	215	21.5	20
				12-13-91	1225	210	21.5	20
				02-14-92	1140	215	21.5	21
				04-03-92	1120	180	22.5	31
				06-05-92	1200	215	21.5	21
08-14-92	1125	157	22.0	20				
215454159274201	2-5427-01 W16A KOLOA	21 54 54 N	159 27 42 W	12-12-91	0830	235	22.5	--
				02-13-92	0830	228	22.5	--
				06-04-92	0845	237	22.5	26
215455159274201	2-5427-02 W16B KOLOA	21 54 55 N	159 27 42 W	10-24-91	0850	222	23.0	24
				04-02-92	0830	222	22.0	24
				08-13-92	0800	222	23.0	25
215536159263501	2-5526-01 KOLOA	21 55 36 N	159 26 35 W	08-13-92	0830	228	23.0	22
215528159303001	2-5530-02 W23 LAWAI	21 55 28 N	159 30 30 W	10-24-91	1430	--	23.0	28
				04-02-92	0930	250	22.0	29
				06-04-92	1405	258	23.0	28
				08-10-92	1420	323	23.0	26
215535159302601	2-5530-03 W22 LAWAI	21 55 35 N	159 30 26 W	12-16-91	1430	218	24.0	--
				02-24-92	0810	225	22.5	--
				04-02-92	0920	210	22.0	25
				06-04-92	1400	230	22.5	26
				08-10-92	1415	278	24.0	24
215522159342601	2-5534-03 W25-1 HANA	21 55 22 N	159 34 26 W	10-24-91	1020	375	27.0	44
				12-12-91	1040	365	25.0	--
				02-13-92	1020	330	22.5	--
				08-13-92	0925	350	27.0	34
215635159355001	2-5635-01 S7 HANAPEP	21 56 35 N	159 35 50 W	10-24-91	1300	670	23.0	120
				12-12-91	1315	670	23.0	--
				02-10-92	1335	660	23.0	--
				04-13-92	1345	650	23.0	120
				06-15-92	1000	660	23.0	110
				08-20-92	1030	670	23.5	120
215854159424601	2-5842-02 S11 KEKAHA	21 58 54 N	159 42 46 W	10-07-91	1145	670	25.0	110
				10-07-91	1150	680	25.5	100
				12-16-91	1245	620	24.0	100
				12-16-91	1250	620	24.5	100
				01-10-92	1210	690	24.0	100
				04-13-92	1145	690	25.0	100
				06-08-92	1230	675	25.5	110
				08-10-92	1230	690	25.0	100
215843159422901	2-5842-03 S10 KEKAHA	21 58 43 N	159 42 29 W	10-07-91	1200	950	24.0	200
				12-16-91	1320	725	24.0	--
				02-10-92	1230	740	23.5	--
				04-14-92	1430	690	24.0	100
				06-08-92	1130	930	24.0	190
				08-10-92	1210	1000	24.0	210

WATER QUALITY DATA, WATER YEAR OCTOBER 1991 TO SEPTEMBER 1992

STATION NUMBER	LOCAL IDENTIFIER	LATITUDE	LONGITUDE	DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	TEMPERATURE WATER (DEG C)	CHLORIDE, DIS-SOLVED (MG/L AS CL)
HAWAII, ISLAND OF KAUAI--Continued								
215958159214301	2-5921-01 W10 HANAMA	21 59 58 N	159 21 43 W	07-08-92	1052	525	25.5	66
				07-08-92	1150	519	26.0	62
				07-08-92	1350	490	26.0	53
				07-08-92	1500	470	26.0	51
				07-09-92	0715	490	26.0	56
				07-09-92	1500	510	26.0	62
				07-10-92	0700	520	26.0	64
				07-10-92	1530	525	26.0	66
				07-13-92	0715	545	25.5	70
				07-13-92	1515	535	26.0	70
				07-14-92	0715	540	25.5	70
				07-14-92	1515	550	26.0	72
				07-15-92	0700	540	26.0	72
				07-15-92	1515	565	26.0	74
				07-16-92	0700	540	25.5	72
				07-16-92	1515	450	26.0	76
				07-17-92	0700	540	26.0	70
				07-17-92	1515	540	26.0	70
				07-20-92	0700	550	26.0	74
				07-20-92	1515	550	26.0	74
				07-21-92	0700	550	25.5	74
				07-21-92	1545	550	26.0	72
				07-22-92	0730	545	26.0	72
				07-22-92	1530	548	26.0	72
				07-23-92	0730	540	26.0	72
				07-23-92	1530	540	26.0	68
				07-24-92	0700	540	26.0	72
				07-24-92	1530	542	26.0	70
				07-27-92	0730	542	26.0	70
				07-27-92	1530	548	26.0	72
				07-28-92	0700	540	26.0	70
				07-28-92	1530	540	26.0	70
				07-29-92	0700	540	26.0	70
07-29-92	1530	540	26.0	70				
07-30-92	0700	540	26.0	70				
07-30-92	1530	540	26.0	70				
07-31-92	0700	540	26.0	70				
07-31-92	1530	540	26.0	70				
08-03-92	0700	540	26.0	68				
08-03-92	1530	542	26.0	72				
08-04-92	0700	540	25.5	72				
08-04-92	1530	542	26.0	74				
08-05-92	0700	540	25.5	68				
08-05-92	1420	540	26.0	70				
08-10-92	0750	540	26.0	72				
215901159235301	2-5923-01 KILOHANA A	21 59 01 N	159 23 53 W	10-25-91	0800	245	24.5	16
				12-13-91	0815	195	20.5	18
				02-14-92	0820	255	24.5	19
				04-03-92	0755	250	24.5	17
				06-05-92	0830	245	25.0	19
				08-14-92	0755	280	25.0	17
215901159235201	2-5923-07 KILOHANA I	21 59 01 N	159 23 52 W	10-25-91	0740	195	23.0	20
				12-13-91	0800	182	21.0	20
				02-14-92	0740	195	21.5	20
				04-03-92	0730	190	23.0	21
				06-05-92	0730	195	24.0	20
				08-14-92	0740	190	23.5	20
215906159395601	2-5939-01 S9 WAIMEA	21 59 06 N	159 39 56 W	10-24-91	1100	310	23.0	24
				12-12-91	1230	328	23.0	27
				02-13-92	1315	290	22.0	23
				04-02-92	1015	240	22.0	22
				06-04-92	1035	298	23.0	22
				08-13-92	1040	400	23.5	62
215937159434201	2-5943-01 S13 KEKAHA	21 59 37 N	159 43 42 W	10-07-91	0830	850	24.5	170
				12-16-91	0830	800	24.0	140
				02-10-92	0840	805	23.0	140
				04-13-92	1130	900	23.5	160
				06-08-92	0815	800	23.5	140
				08-10-92	0830	990	24.5	210

WATER QUALITY DATA, WATER YEAR OCTOBER 1991 TO SEPTEMBER 1992

STATION NUMBER	LOCAL IDENTIFIER	LATITUDE	LONGITUDE	DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	TEMPERATURE WATER (DEG C)	CHLORIDE, DIS-SOLVED (MG/L AS CL)
HAWAII, ISLAND OF OAHU								
211646157465201	3-1646-01 W1-B WAIAL	21 16 46 N	157 46 52 W	10-28-91	0915	680	21.0	--
				12-12-91	0935	660	20.5	--
				02-20-92	0845	620	21.0	--
				04-17-92	1055	735	21.5	--
				06-12-92	1045	800	21.5	--
				08-14-92	1200	810	22.0	--
211832157515501	3-1851-19 W102 TUBEA	21 18 32 N	157 51 55 W	10-11-91	1345	36000	24.0	13000
				12-11-91	1525	35000	23.0	12000
				02-19-92	1535	35000	23.5	12000
				04-17-92	0930	31500	24.0	12000
				06-12-92	0845	30500	24.0	12000
				08-19-92	0840	29500	24.0	12000
211832157515502	3-1851-19 W102 TUBEB	21 18 32 N	157 51 55 W	10-11-91	1405	11500	24.0	--
				12-11-91	1535	11800	23.0	--
				02-19-92	1550	11900	23.5	--
				04-17-92	0940	11400	23.5	--
				06-12-92	0840	11600	24.0	--
				08-19-92	0900	12100	24.0	--
212133158035501	3-2103-03 S14 MAKAKI	21 21 33 N	158 03 55 W	10-11-91	0840	1220	23.0	--
				10-11-91	0855	1220	23.0	240
				12-11-91	0900	1160	22.5	230
				02-19-92	0930	1120	23.0	230
				04-21-92	1015	1130	23.5	230
				06-11-92	0945	1110	23.5	240
212106157533701	3-2153-02 W153 MOANA	21 21 06 N	157 53 37 W	10-11-91	1135	460	21.5	90
				12-11-91	1415	460	21.5	90
				02-18-92	1425	453	21.5	92
				04-17-92	1510	478	22.0	92
				06-11-92	1410	480	22.0	--
				06-11-92	1510	480	22.0	96
212259157554201	3-2255-35 W189-3A	21 22 59 N	157 55 42 W	04-30-92	0840	1140	21.5	--
				06-17-92	0805	1120	21.5	--
				08-20-92	0945	935	22.5	--
				10-10-91	1450	820	23.0	210
				12-11-91	1220	820	22.0	220
				02-19-92	1215	800	22.5	210
212238157561102	3-2256-12 W187-C	21 22 39 N	157 56 09 W	04-16-92	1345	840	23.5	220
				04-20-92	1420	830	23.5	220
				06-11-92	1440	840	23.5	220
				08-19-92	1110	840	24.0	220
				10-10-91	1450	820	23.0	210
				12-11-91	1220	820	22.0	220
212343158001001	3-2300-11 W238 WAIPH	21 23 43 N	158 00 10 W	10-28-91	1420	870	21.5	--
				12-11-91	1020	850	21.5	--
				02-18-92	1105	815	22.0	--
				04-20-92	1140	865	22.0	--
				06-11-92	1215	885	22.5	--
				08-18-92	1350	875	22.5	--
212358158010901	3-2301-09,10 W247-1J	21 23 58 N	158 01 09 W	10-28-91	1300	760	21.5	--
				12-10-91	1330	750	23.0	--
				02-18-92	1040	715	21.5	--
				04-20-92	1110	780	22.5	--
				06-11-92	1110	870	22.5	--
				08-18-92	1245	795	22.5	--
212332157582201	3-2358-02 W201	21 23 32 N	157 58 22 W	06-11-92	1410	1060	21.0	280
212336157591801	3-2359-05 W204-11	21 23 36 N	157 59 18 W	10-29-91	1200	2980	21.5	--
				12-11-91	1045	2930	22.0	--
				02-18-92	1125	3050	22.0	--
				04-20-92	1200	2800	22.5	--
				06-11-92	1230	2580	22.5	--
				08-18-92	1410	2440	22.5	--

WATER QUALITY DATA, WATER YEAR OCTOBER 1991 TO SEPTEMBER 1992

STATION NUMBER	LOCAL IDENTIFIER	LATITUDE	LONGITUDE	DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	TEMPERATURE WATER (DEG C)	CHLORIDE, DIS-SOLVED (MG/L AS CL)
HAWAII, ISLAND OF OAHU--Continued								
212422157485601	3-2448-01 W416	21 24 22 N	157 48 56 W	01-09-92	0930	195	20.5	18
				04-01-92	1420	190	21.0	18
				06-26-92	0950	185	20.5	19
				09-08-92	1440	195	20.5	19
212556157500301	3-2550-01 W407-16	21 25 56 N	157 50 03 W	01-02-92	1000	135	23.0	18
				03-13-92	1200	140	23.0	18
				06-26-92	1130	130	23.0	19
212506157582301	3-2558-10 S16	21 25 06 N	157 58 23 W	10-28-91	1440	282	20.5	--
				11-12-91	1105	277	21.0	--
				02-18-92	1200	270	21.0	--
				04-20-92	1230	280	21.5	--
				06-11-92	0915	270	21.5	--
				08-18-92	1440	263	21.5	--
212617158033801	3-2603-01 W330-8	21 26 17 N	158 03 38 W	10-10-91	1200	340	22.5	48
				02-19-92	1110	340	22.0	50
				04-21-92	0845	350	23.0	49
				06-17-92	0845	350	22.5	48
				08-19-92	1215	350	23.0	48
212803158000701	3-2800-01 W250-4A	21 28 03 N	158 00 06 W	10-11-91	1500	160	22.0	17
				12-06-91	0900	160	21.5	17
				02-04-92	1425	160	21.5	16
				04-17-92	0820	152	22.5	18
212828158092001	3-2809-06 TU WAIANAE	21 28 27 N	158 09 20 W	10-25-91	0915	380	22.5	--
				12-11-91	0915	380	22.5	--
				02-18-92	1045	380	22.5	--
				04-10-92	0905	360	22.5	--
				06-17-92	0920	360	23.0	--
212859158124301	3-2812-01 S1	21 28 59 N	158 12 43 W	10-15-91	1430	710	25.0	--
				12-11-91	1030	730	24.5	--
				02-11-92	1425	720	24.5	--
				04-10-92	1300	725	25.0	--
				08-05-92	1345	725	25.5	--
212927158014801	3-2901-07 S4	21 29 27 N	158 01 48 W	10-22-91	1020	175	21.5	17
				12-09-91	1025	175	21.5	18
				02-14-92	0800	180	21.0	17
				04-20-92	0900	170	21.0	19
				06-23-92	1145	170	21.0	18
				08-12-92	0920	172	21.0	19
212945158014301	3-2901-09 W330-6	21 29 45 N	158 01 43 W	12-06-91	1015	200	22.0	21
				02-04-92	1240	200	21.5	21
				04-17-92	0935	192	22.0	21
				06-16-92	1410	195	21.5	20
212939158112301	3-2911-02 TU MAKAHA	21 29 39 N	158 11 23 W	12-03-91	1000	265	21.0	25
				02-11-92	1030	270	21.0	24
				04-10-92	0940	255	21.0	25
				08-05-92	1300	255	21.5	26
213224158135901	3-3213-06 W277-101	21 32 24 N	158 13 59 W	10-25-91	1120	900	23.0	210
				12-11-91	1055	900	23.0	210
				02-18-92	1225	915	23.0	200
				04-10-92	1420	890	23.0	200
				06-23-92	0950	880	23.5	210
				08-05-92	1425	890	23.5	200
213243157510001	3-3251-01 W406	21 32 43 N	157 51 00 W	01-08-92	0850	860	22.0	200
				03-30-92	1510	880	22.0	200
				07-14-92	1225	900	23.0	220
				09-25-92	1425	900	23.0	220

QUALITY OF GROUND WATER

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WATER QUALITY DATA, WATER YEAR OCTOBER 1991 TO SEPTEMBER 1992

STATION NUMBER	LOCAL IDENTIFIER	LATITUDE	LONGITUDE	DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	TEMPERATURE WATER (DEG C)	CHLORIDE, DIS-SOLVED (MG/L AS CL)
213327157524401	3-3352-01 W405	21 33 27 N	157 52 43 W	01-08-92	1000	280	22.0	33
				03-30-92	1410	280	22.0	33
				07-14-92	1150	260	22.0	34
				09-25-92	1400	255	22.5	34
213429158055501	3-3405-01 W323-1	21 34 29 N	158 05 55 W	02-04-92	1300	400	22.0	--
				04-17-92	1110	400	22.0	--
				06-16-92	1345	400	22.0	--
213411158074501	3-3407-25 W320	21 34 11 N	158 07 45 W	02-13-92	1000	1400	23.0	--
				04-21-92	1000	1420	23.0	--
				06-16-92	0845	1400	23.0	--
213444158075501	3-3407-30 W318-2	21 34 44 N	158 07 55 W	12-11-91	1410	6450	25.0	1800
				02-18-92	1420	4000	24.5	1000
				04-14-92	1440	6200	24.5	1800
				06-02-92	1330	8800	24.5	2800
				08-13-92	1015	8000	25.0	2300
213512158061601	3-3506-03 TO 04 W329 A-B	21 35 12 N	158 06 16 W	02-19-92	0815	455	22.5	--
				04-21-92	0855	450	22.0	--
				06-16-92	0910	430	22.5	--
				08-13-92	0900	450	22.0	--
213636158053701	3-3605-03 W334-C	21 36 36 N	158 05 37 W	10-22-91	1130	1650	21.0	--
				12-12-91	0925	1650	21.0	--
				02-19-92	0940	1650	21.0	--
				04-21-92	0915	2100	21.0	--
				06-16-92	1025	1800	21.0	--
				08-13-92	0920	1850	21.0	--
213636158053702	3-3605-21 W334-U	21 36 35 N	158 05 40 W	10-22-91	1140	1400	21.5	--
				12-12-91	0935	1400	21.0	--
				02-19-92	0955	1400	21.0	--
				04-21-92	0925	1400	21.5	--
				06-16-92	1015	1350	21.0	--
				08-13-92	0930	1310	21.5	--
213656157550401	3-3655-01 W394	21 36 56 N	157 55 04 W	01-08-92	1030	270	21.0	35
				03-30-92	1345	250	21.0	37
				07-13-92	1500	240	21.0	34
				09-25-92	1345	245	21.0	34
213902157561601	3-3956-04 W366	21 39 02 N	157 56 16 W	01-08-92	1110	410	21.5	74
				03-30-92	1255	390	21.5	68
				07-13-92	1430	370	21.5	--
				09-25-92	1325	380	21.5	--
214157158000101	3-4100-01 W338	21 41 57 N	158 00 01 W	03-30-92	1020	335	21.0	52
214131158011601	3-4101-08 W337-6	21 41 31 N	158 01 16 W	01-08-92	1400	230	21.0	32
				03-30-92	1130	235	21.0	33
				07-13-92	1215	225	20.5	33
214233157583501	3-4258-04 W345	21 42 33 N	157 58 35 W	01-08-92	1215	1600	22.5	480
				07-13-92	1330	1700	26.5	480
				09-25-92	0920	1700	26.0	480

HAWAII, ISLAND OF OAHU--Continued

QUALITY OF GROUND WATER

WATER QUALITY DATA, WATER YEAR OCTOBER 1991 TO SEPTEMBER 1992

STATION NUMBER	LOCAL IDENTIFIER	LATITUDE	LONGITUDE	DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	TEMPERATURE WATER (DEG C)	CHLORIDE, DIS-SOLVED (MG/L AS CL)
HAWAII, ISLAND OF MOLOKAI								
210605157012001	4-0601-01 W11	21 06 06 N	157 01 11 W	10-24-91	j1355	340	24.0	22
				12-12-91	j1355	340	24.5	28
				02-05-92	j1445	320	24.5	23
				03-17-92	j1420	330	24.5	20
				05-07-92	j1120	320	24.0	22
				06-11-92	j1015	320	24.5	21
				07-31-92	j0840	325	24.5	24
				210856157011201	4-0801-01 W16	21 08 56 N	157 01 12 W	10-16-91
11-14-91	j1330	446	--					100
12-12-91	j1200	440	--					100
01-15-92	j0915	420	--					90
02-04-92	j0915	420	--					96
03-02-92	j0945	440	--					98
04-01-92	j1000	440	--					98
05-01-92	j0915	440	--					100
06-01-92	j1440	450	--					100
07-01-92	j1500	440	--					100
08-03-92	j1645	440	--					99
09-25-92	j0930	430	--					94
210857156010701	4-0801-02	21 08 57 N	157 01 07 W					10-16-91
				11-14-91	j0855	370	--	78
				12-12-91	j1230	370	--	77
				01-15-92	j0845	380	--	80
				02-04-92	j0840	380	--	78
				03-02-92	j0910	400	--	82
				04-01-92	j0915	390	--	78
				05-01-92	j0830	390	--	80
				06-01-92	j0840	380	--	82
				07-01-92	j0800	375	--	78
				08-03-92	j0910	370	--	78
				09-25-92	j0850	370	--	76
				210903157013001	4-0901-01 W17	21 09 03 N	157 01 30 W	10-25-91
11-01-91	j0900	a297	--					59
12-01-91	j0835	a238	--					42
01-01-92	j0815	a236	--					41
02-01-92	j0930	a236	--					41
03-02-92	j --	a236	--					42
04-01-92	j0845	a290	--					57
05-01-92	j0738	a292	--					57
06-09-92	j0830	a290	--					55
07-01-92	j0900	a290	--					54
08-01-92	j0830	a286	--					55
09-01-92	j0835	a286	--					54

a Laboratory conductance.
j Collected by non - USGS agency.

QUALITY OF GROUND WATER

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WATER QUALITY DATA, WATER YEAR OCTOBER 1991 TO SEPTEMBER 1992

STATION NUMBER	LOCAL IDENTIFIER	LATITUDE	LONGITUDE	DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	TEMPERATURE WATER (DEG C)	CHLORIDE, DISSOLVED (MG/L AS CL)
HAWAII, ISLAND OF MAUI								
203835156065001	6-3806-01 PUNAHOU SPRIN	20 38 35 N	156 06 50 W	01-08-92	1330	800	20.0	200
				02-26-92	1020	925	21.5	250
				04-08-92	1320	800	20.5	210
203947156261201	6-3926-03 WAILEA 8	20 39 47 N	156 26 13 W	04-20-92	1205	5500	18.0	1600
				07-14-92	1230	3000	18.5	850
204601156001501	6-4600-01 W55	20 46 01 N	156 00 15 W	10-02-91	0815	360	--	68
				11-20-91	0840	350	--	73
				01-07-92	1400	370	--	80
				02-26-92	0720	410	--	94
				04-08-92	0820	450	--	92
				05-26-92	1425	490	--	110
				07-07-92	1400	500	--	110
				08-18-92	1350	500	--	120
204633156003201	6-4600-03 WAKIU B	20 46 36 N	156 00 30 W	10-02-91	0800	190	19.0	32
				11-20-91	0820	330	19.5	78
				01-07-92	1440	440	20.0	110
				02-26-92	0705	480	20.0	120
				05-27-92	0705	775	20.0	190
				07-08-92	0750	875	21.0	220
204635156270101	6-4627-14 W226	20 46 35 N	156 27 01 W	10-11-91	1020	1700	23.5	320
				01-24-92	1015	1600	23.5	290
				04-20-92	0910	1700	23.0	320
				06-19-92	1000	1700	23.5	300
				07-14-92	1015	1700	23.0	280
204931156371201	6-4937-01 S10	20 49 31 N	156 37 12 W	12-04-91	1120	1090	24.0	240
				03-17-92	1015	1240	24.5	280
				04-10-92	1115	1300	24.5	290
				08-27-92	1405	1400	24.5	320
205014156212701	6-5021-01 PUKALANI	20 50 14 N	156 21 27 W	10-03-91	j1320	2200	21.5	600
				01-21-92	j1310	2200	22.0	620
				02-05-92	j0800	2200	--	630
				03-04-92	j1400	2200	--	630
				06-03-92	j1325	2200	21.5	620
205243156243201	6-5224-02 S22	20 52 43 N	156 24 32 W	11-15-91	1005	1300	23.0	270
				04-23-92	1410	1400	23.0	290
				06-24-92	1430	1400	23.0	290
205329156305502	6-5330-09 W15A	20 53 29 N	156 30 55 W	03-17-92	1310	650	22.0	140
				06-22-92	1310	640	21.5	130
205329156305501	6-5330-10 W15B	20 53 29 N	156 30 55 W	10-11-91	1240	580	22.5	120
				12-04-91	1305	625	22.5	120
				01-30-92	1345	570	22.0	120
205330156305401	6-5330-11 W15F	20 53 30 N	156 30 54 W	03-17-92	1315	500	22.5	90
				06-22-92	1315	500	22.0	88
				07-14-92	1230	490	22.5	88
205322156394501	6-5339-01 W291	20 53 22 N	156 39 45 W	09-03-92	0955	775	21.0	150
205320156394501	6-5339-02 W292	20 53 20 N	156 39 45 W	09-03-92	0940	850	21.0	170
205343156401101	6-5340-01 S5	20 53 43 N	156 40 11 W	04-09-92	1430	1000	21.5	230
				07-13-92	1040	1400	21.5	350

j Collected by non - USGS agency.

QUALITY OF GROUND WATER

WATER QUALITY DATA, WATER YEAR OCTOBER 1991 TO SEPTEMBER 1992

STATION	NUMBER	LOCAL IDENT- IFIER	LAT- ITUDE	LONG- ITUDE	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 MAUI--Continued									
205405156305401	6-5430-05	WAIIEHU MONITO	20 54 59 N	156 30 54 W	11-13-91	j0940	200	213	11
					11-13-91	j1000	400	490	110
					11-13-91	j1045	500	491	110
					11-13-91	j1200	600	623	150
					11-13-91	j1215	675	2070	560
					11-13-91	j1235	750	8640	2800
					11-13-91	j1305	800	43300	16000
					11-13-91	j1330	825	47300	18000
					11-13-91	j1400	850	48300	19000
					11-13-91	j1430	900	49600	19000
					11-13-91	j1500	1000	49900	20000
					01-22-92	j0935	200	215	11
					01-22-92	j1000	400	442	100
					01-22-92	j1030	600	506	120
					01-22-92	j1055	675	1970	540
					01-22-92	j1145	750	10000	3300
					01-22-92	j1210	800	43900	16000
					01-22-92	j1245	825	47500	18000
					01-22-92	j1315	850	48700	18000
					01-22-92	j1350	900	49400	19000
					01-22-92	j1415	1000	50600	19000
					03-12-92	j0930	200	212	11
					03-12-92	j0955	400	465	100
					03-12-92	j1015	500	437	100
					03-12-92	j1045	600	478	110
					03-12-92	j1110	675	1940	540
					03-12-92	j1140	750	11500	3900
					03-12-92	j1210	800	44000	17000
					03-12-92	j1245	825	47500	18000
					03-12-92	j1320	850	48300	19000
					03-12-92	j1355	900	49700	19000
					03-12-92	j1430	1000	50400	20000
					06-03-92	j0930	200	213	11
					06-03-92	j1000	400	235	19
					06-03-92	j1020	500	478	110
					06-03-92	j1050	600	589	140
					06-03-92	j1115	675	2120	600
					06-03-92	j1145	750	12900	4400
					06-03-92	j1215	800	43900	17000
					06-03-92	j1240	825	47400	18000
					06-03-92	j1310	850	48400	18000
					06-03-92	j1345	900	50200	20000
					06-03-92	j1420	1000	49600	19000
					07-22-92	j0945	200	213	10
					07-22-92	j1010	400	467	100
					07-22-92	j1040	500	478	110
					07-22-92	j1105	600	564	130
					07-22-92	j1130	675	2140	600
					07-22-92	j1205	750	13300	4500
					07-22-92	j1230	800	44100	17000
					07-22-92	j1310	825	47500	18000
					07-22-92	j1345	850	48300	18000
					07-22-92	j1420	900	49000	19000
					07-22-92	j1445	1000	50300	19000
					09-16-92	j0945	200	213	10
					09-16-92	j1005	400	275	35
					09-16-92	j1020	500	429	90
					09-16-92	j1045	600	539	110
					09-16-92	j1120	675	2090	600
					09-16-92	j1150	750	16300	5800
					09-16-92	j1220	800	44300	17000
					09-16-92	j1305	825	47600	18000
					09-16-92	j1345	850	48300	19000
					09-16-92	j1420	900	49500	19000
					09-16-92	j1450	1000	50300	20000

j Collected by non - USGS agency.

QUALITY OF GROUND WATER

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WATER QUALITY DATA, WATER YEAR OCTOBER 1991 TO SEPTEMBER 1992

STATION NUMBER	LOCAL IDENTIFIER	LATITUDE	LONGITUDE	DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	TEMPERATURE WATER (DEG C)	CHLORIDE, DISSOLVED (MG/L AS CL)
HAWAII, ISLAND OF MAUI--Continued								
205651156401001	6-5640-01 S36	20 56 51 N	156 40 10 W	10-10-91	1030	540	21.5	110
				04-09-92	1405	800	21.0	170
				07-13-92	1015	900	20.5	210
205837156384601	6-5838-01 NAPILI A	20 58 37 N	156 38 46 W	01-24-92	1335	675	21.5	160
				03-04-92	1215	670	20.5	160
				04-09-92	1130	675	21.5	160
				07-13-92	1320	700	21.0	160
205838156383101	6-5838-02 NAPILI B	20 58 38 N	156 38 31 W	10-10-91	1330	280	23.0	51
				01-24-92	1345	260	20.0	48
				04-09-92	1205	310	20.0	65
				06-15-92	1405	290	19.5	56
				07-13-92	1335	260	20.0	51
205848156383601	6-5838-04 NAPILI	20 58 48 N	156 38 36 W	10-10-91	1350	490	21.0	120
				01-24-92	1405	500	20.0	120
				04-09-92	1220	550	20.5	140
				06-15-92	1415	570	20.0	130

GROUND-WATER RECORDS

WATER QUALITY DATA, WATER YEAR OCTOBER 1991 TO SEPTEMBER 1992

STATION NUMBER	LOCAL IDENTIFIER	LATITUDE	LONGITUDE	DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	TEMPERATURE WATER (DEG C)	CHLORIDE, DIS-SOLVED (MG/L AS CL)
HAWAII, ISLAND OF HAWAII								
190347155354301	8-0335-01 NAALEHU W1	19 03 47 N	155 35 43 W	06-15-92	1310	139	19.0	9.0
190832155310901	8-0831-02 NINOLE A	19 08 32 N	155 31 09 W	01-21-92 06-15-92 09-15-92	1050 1130 1245	690 680 690	18.0 18.0 18.5	180 180 170
191108155281701	8-1128-02 PALIMA	19 11 08 N	155 28 17 W	06-15-92	1040	134	19.0	14
191114155294801	8-1129-01	19 11 14 N	155 29 48 W	06-15-92	1100	98	18.0	4.0
191219155291601	8-1229-01 PAHALA	19 12 25 N	155 29 22 W	06-15-92	1015	100	17.5	4.0
192646155532001	8-2653-01 KEEI C	19 26 46 N	155 53 20 W	10-08-91 10-08-91 01-23-92 06-15-92 09-17-92	1445 1450 0920 1530 1355	360 360 345 355 315	19.5 19.5 19.5 19.0 19.5	74 74 74 66 63
192738155534201	8-2753-01 W12-4	19 27 31 N	155 53 41 W	10-08-91 11-20-91 01-23-92 09-17-92	1430 1420 0845 1440	700 645 700 680	19.5 19.5 19.5 19.5	170 150 180 170
192731155534101	8-2753-02 W12-8	19 27 22 N	155 53 38 W	11-20-91 01-23-92 09-17-92	1435 0905 1430	1100 1180 1350	19.0 19.0 19.0	290 330 320
192728154530101	8-2783-01 W9-9	19 27 28 N	154 53 01 W	12-09-91 01-31-92	1030 1200	7300 15300	54.0 56.0	2200 5200
192923154564701	8-2986-02 W9-5A	19 29 23 N	154 56 47 W	12-09-91 01-31-92 06-09-92	1220 0930 1230	126 118 125	23.0 23.0 23.5	5.0 7.0 5.0
193017154502101	8-3080-02 S9	19 30 17 N	154 50 21 W	12-09-91	0945	900	25.0	120
193113154555801	8-3185-01 W9-11 HAWN SHORE	19 31 13 N	154 55 58 W	06-09-92 09-21-92	1140 1450	119 130	21.5 21.5	12 13
193105154580301	8-3188-01 KEONEPOKO	19 31 05 N	154 58 03 W	01-21-92	1345	105	20.0	5.0
193510155570801	8-3557-01 W12-5	19 35 10 N	155 57 08 W	10-09-91 01-23-92 06-16-92	0755 1040 1000	355 350 280	20.0 20.0 20.0	72 72 49
193505155570801	8-3557-02 W12-6	19 35 05 N	155 57 08 W	10-09-91 11-21-91 01-23-92 06-16-92 09-18-92	0810 1055 1010 1025 0845	820 820 820 800 755	20.5 20.0 20.0 20.0 20.5	210 210 220 200 200
193508155570701	8-3557-03 KAHALUU C	19 35 08 N	155 57 07 W	10-09-91 11-21-91 01-23-92 06-16-92	0745 1025 1025 1015	305 308 305 225	20.5 20.0 20.0 20.0	56 59 57 34
193505155570701	8-3557-04 KAHALUU D	19 35 05 N	155 57 07 W	10-09-91 11-21-91 01-23-92 06-16-92 09-18-92	0820 1105 1000 1035 0830	455 440 435 445 430	20.5 20.0 20.0 20.5 20.5	94 98 96 98 95
193502155572301	8-3557-05 KAH SHAFT	19 35 02 N	155 57 23 W	10-09-91 11-21-91 01-23-92 06-16-92 09-18-92	0840 1005 1140 0935 1025	940 870 1030 970 1050	20.0 20.0 20.0 20.0 20.0	240 220 280 250 280

WATER QUALITY DATA, WATER YEAR OCTOBER 1991 TO SEPTEMBER 1992

STATION NUMBER	LOCAL IDENTIFIER	LATITUDE	LONGITUDE	DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	TEMPERATURE WATER (DEG C)	CHLORIDE, DIS-SOLVED (MG/L AS CL)
HAWAII, ISLAND OF HAWAII--Continued								
193805155020201	8-3802-03 KEAAU 1	19 38 05 N	155 02 02 W	12-06-91	1015	79	19.0	4.0
				02-03-92	0945	77	19.0	4.0
				09-21-92	1525	77	19.0	5.0
194037155035301	8-4003-01 W8-3	19 40 37 N	155 03 53 W	12-06-91	0950	83	20.5	3.0
				02-03-92	1000	80	20.5	4.0
				06-09-92	1435	77	20.5	4.0
				09-21-92	1550	75	20.5	4.0
194222155034801	8-4203-06 W8-2B	19 42 22 N	155 03 48 W	12-06-91	1045	88	25.0	6.0
				02-03-92	1055	92	24.5	8.0
				06-09-92	1515	162	25.0	26
				09-22-92	0915	138	24.0	18
194337155041801	8-4304-01 WAIAKEA DUG WELL	19 43 37 N	155 04 18 W	12-06-91	1105	45000	22.0	15000
				02-03-92	1130	45000	20.0	16000
				06-10-92	1535	45000	21.0	16000
				09-22-92	0940	10800	22.5	4100
194818155582301	8-4858-02 KONA VILLAGE	19 48 18 N	155 58 23 W	10-08-91	1035	2200	21.0	500
				11-21-91	1430	2200	20.5	500
				01-22-92	1120	2150	20.5	500
				06-16-92	1210	2450	20.5	500
				09-18-92	1145	2400	20.5	500
195035155054501	8-5005-01 W7-1	19 50 35 N	155 05 45 W	12-06-91	1305	195	20.0	11
				02-03-92	1350	190	20.5	12
				06-10-92	1440	185	19.5	13
				09-22-92	1050	180	22.0	17
195043155053801	8-5005-02 MAKAI	19 50 43 N	155 05 38 W	12-06-91	1300	210	22.5	18
				02-03-92	1405	205	22.0	18
				06-10-92	1430	260	21.5	29
				09-22-92	1040	190	22.5	14
195049155051601	8-5005-04 SALT WTR 2	19 50 49 N	155 05 16 W	12-06-91	1320	21000	18.0	7000
				02-03-92	1415	21000	18.0	7000
				06-10-92	1455	21000	18.0	6800
				09-22-92	1020	21000	17.5	7000
195546155462001	8-5546-01 WAIKOLOA WATER W	19 55 46 N	155 46 20 W	02-04-92	1210	520	28.5	88
				06-10-92	1100	585	28.5	100
				08-11-92	1300	605	28.5	110
195546155480301	8-5548-01 PARKER 1	19 55 46 N	155 48 03 W	02-04-92	1035	2050	28.5	600
				06-10-92	1120	2400	28.5	620
				08-11-92	1335	2200	28.5	610
195724155455301	8-5745-01 PARKER 5	19 57 24 N	155 45 53 W	06-10-92	1040	290	26.5	28
195722155455201	8-5745-02 PARKER 4	19 57 22 N	155 45 52 W	12-03-91	1255	280	26.5	27
				06-10-92	1030	285	26.5	28
				08-11-92	1125	280	26.5	28
195728155455401	8-5745-03 WAIKOLOA WELL 1	19 57 28 N	155 45 54 W	12-03-91	1310	270	27.0	25
				02-04-92	1140	270	26.5	25
195929155462501	8-5946-01 LALAMILO A	19 59 30 N	155 46 30 W	11-22-91	0845	500	26.0	92
				01-17-92	1100	630	26.5	96
				06-11-92	1225	500	28.0	94
195912155464201	8-5946-02 LALAMILO B	19 59 14 N	155 46 39 W	11-22-91	0810	365	26.0	52
				06-11-92	1255	318	26.0	37
				08-07-92	1250	350	26.0	46
195953155464701	8-5946-04 LALAMILO D	19 59 53 N	155 46 47 W	01-17-92	1140	500	26.0	96
				08-07-92	1230	525	26.0	100

GROUND-WATER RECORDS

WATER QUALITY DATA, WATER YEAR OCTOBER 1991 TO SEPTEMBER 1992

STATION NUMBER	LOCAL IDENTIFIER	LATITUDE	LONGITUDE	DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	TEMPERATURE WATER (DEG C)	CHLORIDE, DISSOLVED (MG/L AS CL)
HAWAII, ISLAND OF HAWAII--Continued								
195947155485801	8-5948-01 HAPUNA PRK	19 59 47 N	155 48 58 W	11-22-91	0910	1720	26.0	480
				01-17-92	1225	1720	26.0	480
				06-11-92	1110	1850	26.0	460
				08-07-92	1340	1730	26.0	490
201428155494201	8-7449-02 HAWI	20 14 28 N	155 49 42 W	12-05-91	1130	190	22.0	22
				01-24-92	1150	190	22.0	23
201603155521801	8-7652-01 S1 WAIKANE	20 16 03 N	155 52 18 W	12-04-91	1000	2100	21.5	600
				01-24-92	0940	2000	21.0	580
				06-17-92	0915	2200	21.0	580
				09-22-92	1350	1950	21.5	580

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FACTORS FOR CONVERTING INCH-POUND UNITS TO INTERNATIONAL SYSTEM UNITS (SI)

The following factors may be used to convert the inch-pound units published herein to the International System of Units (SI).

Multiply inch-pound units	By	To obtain SI units
<i>Length</i>		
inches (in)	2.54×10^1 2.54×10^{-2}	millimeters (mm) meters (m)
feet (ft)	3.048×10^{-1}	meters (m)
miles (mi)	1.609×10^0	kilometers (km)
<i>Area</i>		
acres	4.047×10^3 4.047×10^{-1} 4.047×10^{-3}	square meters (m ²) square hectometers (hm ²) square kilometers (km ²)
square miles (mi ²)	2.590×10^0	square kilometers (km ²)
<i>Volume</i>		
gallons (gal)	3.785×10^0 3.785×10^0 3.785×10^{-3}	liters (L) cubic decimeters (dm ³) cubic meters (m ³)
million gallons	3.785×10^3 3.785×10^{-3}	cubic meters (m ³) cubic hectometers (hm ³)
cubic feet (ft ³)	2.832×10^1 2.832×10^{-2}	cubic decimeters (dm ³) cubic meters (m ³)
cfs-days	2.447×10^3 2.447×10^{-3}	cubic meters (m ³) cubic hectometers (hm ³)
acre-feet (acre-ft)	1.233×10^3 1.233×10^{-3} 1.233×10^{-6}	cubic meters (m ³) cubic hectometers (hm ³) cubic kilometers (km ³)
<i>Flow</i>		
cubic feet per second (ft ³ /s)	2.832×10^1 2.832×10^1 2.832×10^{-2}	liters per second (L/s) cubic decimeters per second (dm ³ /s) cubic meters per second (m ³ /s)
gallons per minute (gal/min)	6.309×10^{-2} 6.309×10^{-2} 6.309×10^{-5}	liters per second (L/s) cubic decimeters per second (dm ³ /s) cubic meters per second (m ³ /s)
million gallons per day	4.381×10^1 4.381×10^{-2}	cubic decimeters per second (dm ³ /s) cubic meters per second (m ³ /s)
<i>Mass</i>		
tons (short)	9.072×10^{-1}	megagrams (Mg) or metric tons

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