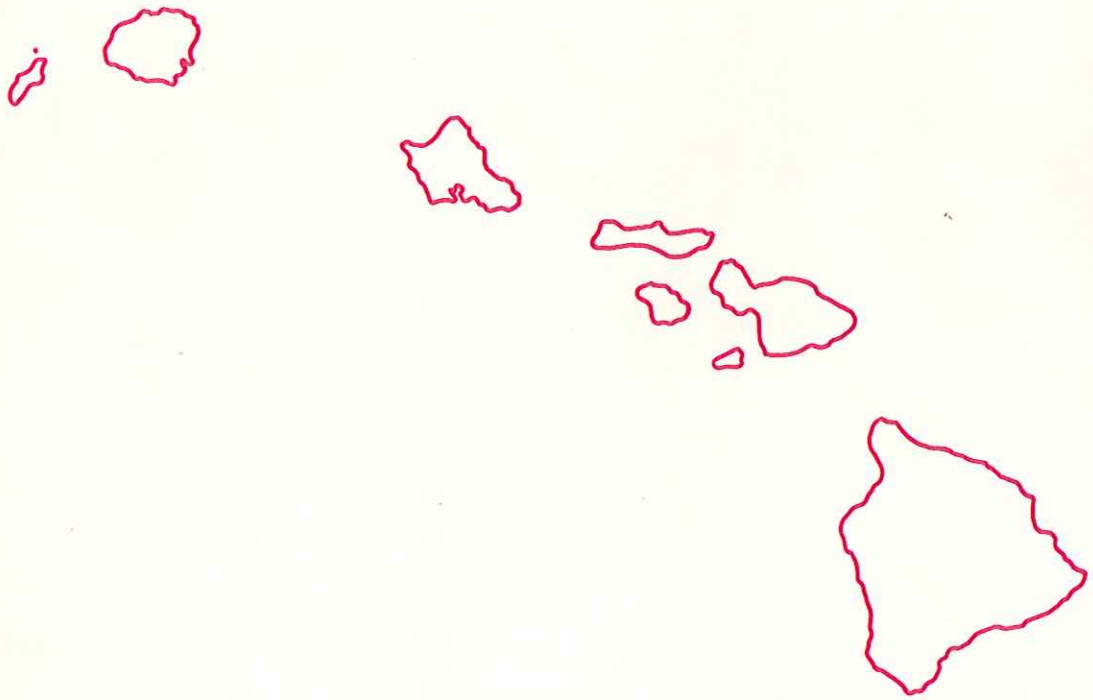
Water Resources Data
Hawaii and other Pacific Areas
Water Year 1987

Volume 1. Hawaii



U.S. GEOLOGICAL SURVEY WATER-DATA REPORT HI-87-1
Prepared in cooperation with the State of Hawaii Department of Land and Natural Resources, Division of Water and Land Development and with other agencies

CALENDAR FOR WATER YEAR 1987

1986

OCTOBER

S	M	T	W	T	F	S
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	

NOVEMBER

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

DECEMBER

S	M	T	W	T	F	S
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31			

1987

JANUARY

S	M	T	W	T	F	S
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31

FEBRUARY

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

MARCH

S	M	T	W	T	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				

APRIL

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

MAY

S	M	T	W	T	F	S
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
31						

JUNE

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

JULY

S	M	T	W	T	F	S
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	

AUGUST

S	M	T	W	T	F	S
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31					

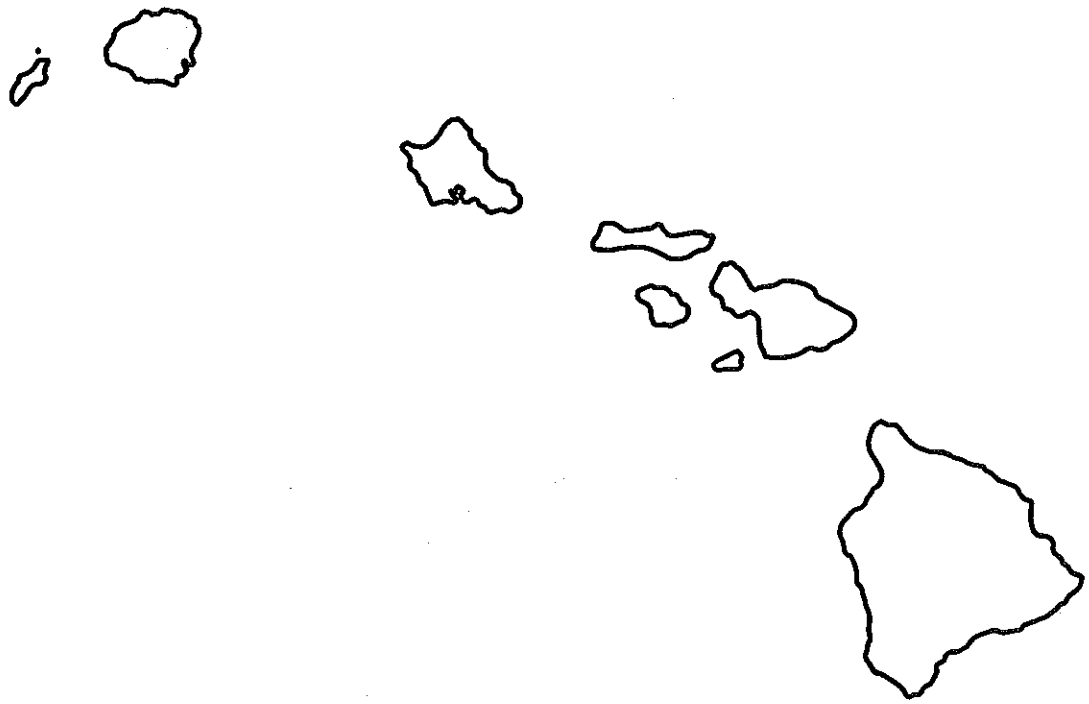
SEPTEMBER

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

Water Resources Data
Hawaii and other Pacific Areas
Water Year 1987

Volume 1. Hawaii

by Richard H. Nakahara, Johnson J.S. Yee, and Jerome A. Domingo



U.S. GEOLOGICAL SURVEY WATER-DATA REPORT HI-87-1
Prepared in cooperation with the State of Hawaii Department of Land and Natural Resources, Division of Water and Land Development and with other agencies

UNITED STATES DEPARTMENT OF THE INTERIOR

DONALD PAUL HODEL, Secretary

GEOLOGICAL SURVEY

Dallas L. Peck, Director

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

1988

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:

George Gohara
Eugene S. Capellas
Lodie P. Celebrado
Leonora L. Fukuda
Roy I. Taogoshi
Isao Yamashiro
Frank M. Romouldo

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

50272-101

REPORT DOCUMENTATION PAGE	1. REPORT NO. USGS/WRD/HD-89/204	2.	3. Recipient's Accession No.

4. Title and Subtitle

Water Resources Data for Hawaii and other Pacific Areas, Water Year 1987. Volume 1, Hawaii

5. Report Date

October 1988

6.

7. Author(s)

Richard H. Nakahara, Johnson J. S. Yee, and Jerome A. Domingo

8. Performing Organization Rept. No.

USGS-WDR-HI-87-1

9. Performing Organization Name and Address

U.S. Geological Survey, Water Resources Division
677 Ala Moana Blvd., Suite 415
Honolulu, Hawaii 96813

10. Project/Task/Work Unit No.

11. Contract(C) or Grant(G) No.

(C)

(G)

12. Sponsoring Organization Name and Address

U.S. Geological Survey, Water Resources Division
677 Ala Moana Blvd., Suite 415
Honolulu, Hawaii 96813

13. Type of Report & Period Covered

Annual - Oct. 1, 1986 to Sept. 30, 1987

14.

15. Supplementary Notes

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

16. Abstract (Limit: 200 words)

Water resources data for the 1987 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 84 gaging stations; water quality for 14 gaging stations, 53 partial-record flow stations, and 184 wells; and water levels for 41 observations wells. Also included are 107 crest-stage partial-record stations and 10 low-flow partial-record stations. These data represent that part of the National Water Data System operated by the U.S. Geological Survey and cooperating State, Federal, and other agencies in Hawaii.

17. Document Analysis a. Descriptors

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

b. Identifiers/Open-Ended Terms

c. COSATI Field/Group

18. Availability Statement	19. Security Class (This Report)	21. No. of Pages
No restriction on distribution This report may be purchased from: National Technical Information Service Springfield, VA 22161	UNCLASSIFIED	260
	20. Security Class (This Page) UNCLASSIFIED	22. Price

(See ANSI-Z39.18) See Instructions on Reverse

OPTIONAL FORM 272 (4-77)
(Formerly NTIS-35)
Department of Commerce

CONTENTS

	Page
Preface	III
List of surface-water and water-quality stations, in downstream order, for which records are published	VI
List of ground-water stations for which water-level and water-quality records are published	VIII
Introduction	1
Cooperation	1
Summary of hydrologic conditions	2
Definition of terms	4
Downstream order and station number	8
Numbering system for wells and miscellaneous sites	9
Special networks and programs	22
Explanation of stage and water-discharge records	22
Collection and computation of data	22
Accuracy of field data and computed results	24
Records of discharge collected by agencies other than the Geological Survey	24
Other data available	24
Publications	24
Explanation of water-quality records	25
Collection and examination of data	25
Water analysis	25
Water temperature	25
Sediment	25
Publications	26
Explanation of ground-water level records	26
Collection of the data	26
Publications	26
Access to WATSTORE data	27
Publications on techniques of water-resources investigations	28
Hydrologic-data station records	30
Discharge at partial-record stations and miscellaneous sites	164
Low-flow partial-record stations	164
Crest-stage partial-record stations	165
Analyses of samples collected at water-quality partial-record stations	173
Periodic determinations of water temperature at gaging stations	182
Ground-water records	191
Index	258

ILLUSTRATIONS

Figure 1.	Graphs showing discharge during 1985 water year compared with median discharge for period 1951-80 for four representative gaging stations	3
2.	Map of Kauai showing locations of gaging, water-quality, and partial-record stations	10
3.	Map of Kauai showing locations of observation wells and ground-water quality sampling sites	11
4.	Map of Oahu showing locations of gaging, water-quality, and partial-record stations	12
5.	Map of Oahu showing locations of observation wells and ground-water quality sampling sites	13
6.	Map of Molokai showing locations of gaging, water-quality, and partial-record stations	14
7.	Map of Molokai showing locations of observation wells and ground-water quality sampling sites	15
8.	Map of Maui showing locations of gaging, water-quality, and partial-record stations	16
9.	Map of Maui showing locations of observation wells and ground-water quality sampling sites	17
10.	Map of Hawaii showing locations of gaging, water-quality, and partial-record stations	18
11.	Map of Hawaii showing locations of observation wells and ground-water quality sampling sites	19
12.	Sketch showing system for numbering wells and miscellaneous sites	20
13.	Sketch showing local well numbering system	20
14.	Map of Hawaii showing system for numbering local well numbers	21
15.	Schematic diagram showing water-quality stations in Kamooalii Stream basin, Kaneohe, Oahu	174

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

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

Page

HAWAII
ISLAND OF KAUAI
Kawaikoi Stream (head of Waimea River) near Waimea (dt) 30
Waimea River:
Waialae Stream at altitude 3,820 ft, near Waimea (dct) 31
Waimea River near Waimea (dcmts) 33
Makaweli River near Waimea (dt) 36
Hanapepe River below Manuahi Stream, near Eleele (dt) 37
Wailua River:
South Fork Wailua River near Lihue (dt) 38
North Fork Wailua River:
North Wailua ditch below Waikoko Straam, near Lihue (dt) 39
Stable storm ditch near Lihue (dt) 40
East Branch of North Fork Wailua River near Lihue (dt) 41
Wailua ditch near Kapaa (dt) 42
North Fork Wailua River near Kapaa (dt) 43
Opaekaa Stream:
Left Branch Opaekaa Stream near Kapaa (dt) 44
Kapaa Stream:
Makaleha Stream:
Makaleha ditch near Kealia (dt) 45
Kapahi ditch near Kealia (dt) 46
Anahola Stream:
Anahola ditch above Kaneha Reservoir, near Kealia (dt) 47
Lower Anahola ditch near Kealia (dt) 48
Kilauea Stream:
Halaulani Stream at altitude 400 ft, near Kilauea (dt) 49
Hanalei River near Hanalei (dt) 50
Wainiha River near Hanalei (dt) 51
ISLAND OF OAHU
Kaukonahua Stream (head of Kiikii Stream):
North Fork Kaukonahua Stream above Right Branch, near Wahiawa (dt) 52
South Fork Kaukonahua Stream at East Pump Reservoir, near Wahiawa (dt) 53
Makaha Stream near Makaha (dt) 54
Waikele Stream:
Kipapa Stream near Wahiawa (dt) 55
Waikele Stream at Waipahu (dcmta) 56
Waiawa Stream near Pearl City (dt) 62
Halawa Stream:
North Halawa Stream near Aiea (dt) 63
North Halawa Stream near Honolulu (dt) 64
Kalihi Stream near Honolulu (dct) 78
Kalihi Stream at Kalihi (dcmts) 78
Nuuanu Stream below reservoir 2 wasteway, near Honolulu (dt) 81
Waiakeakua Stream (head of Manoa Stream) at Honolulu (dt) 82
Maunawili Stream:
Makawao Stream near Kailua (dt) 83
Kaneohe Stream:
Kamooalii Stream:
Right Branch Kamooalii Stream near Kaneohe (dcts) 84
Luluku Stream at altitude 220 ft, near Kaneohe (dcmts) 89
Kamooalii Stream below Luluku Stream, near Kaneohe (dcmts) 94
Haiku Stream near Heeia (dt) 101
Kahaluu Stream near Ahuimanu (dt) 104
Waihee Stream:
South Fork Waihee Stream near Heeia (dt) 105
North Fork Waihee Stream near Heeia (dt) 106
Waihee Stream near Kahaluu (dt) 107
Waikane Stream at altitude 75 ft, at Waikane (dt) 108
Kahana Stream at altitude 30 ft, near Kahana (dt) 109
Punaluu Stream:
Punaluu ditch near Punaluu (dt) 110
Punaluu Stream near Punaluu (dt) 111
Kaluanui Stream near Punaluu (dt) 112
Waimea River:
Kamananui Stream at Pupukea Military Road, near Maunawai (dt) 113
Kamananui Stream at Maunawai (dt) 114
Paukauila Stream:
Opaeula Stream near Wahiawa (dt) 115

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

Page

HAWAII--Continued
ISLAND OF MOLOKAI
Halawa Stream near Halawa (dcmts) 116
Pelekunu Stream:
Pilipililau Stream near Pelekunu (dt) 120
Waikolu Stream:
Molokai tunnel at east portal (dt) 121
Molokai tunnel at west portal (dt) 122
Waikolu Stream at altitude 900 ft, near Kalaupapa (dt) 123
Waikolu Stream below pipeline crossing, near Kalaupapa (dt) 124
Kaunakakai Gulch at Kaunakakai (d) 125
Papio Gulch at Halawa (dt) 126
ISLAND OF MAUI
Hanawi Stream near Nahiku (dt) 127
West Wailuaiki Stream near Keanae (dt) 128
Koolau ditch at Haipuaena, near Huelo (dt) 129
Honopou Stream near Huelo (dt) 130
Wailoa ditch at Honopou, near Huelo (dt) 131
Kakipi Gulch:
Opana Gulch:
Opana tunnel at Kailiili (dt) 132
Iao Stream at Kepaniwai Park, near Wailuku (dt) 133
Waihee River at dam, near Waihee (dt) 134
Kahakuloa Stream near Honokohau (dcmts) 135
Honokohau Stream near Honokohau (dt) 139
Kahoma Stream at Lahaina (dt) 140
ISLAND OF HAWAII
Waiakea Stream (head of Wailoa River) near Mountain View (dt) 141
Olaa flume Spring near Kaumana (dt) 142
Lyman Springs No. 2 near Piihonua (dt) 143
Wailuku River at Piihonua (dt) 144
Wailuku River at Hilo (dcmts) 145
Honolii Stream near Papaikou (dcmts) 149
Kawainui Stream (head of Wailoa Stream) near Kamuela (dt) 153
Kawaiki Stream near Kamuela (dt) 154
Upper Hamakua ditch below Kawaiki Stream, near Kamuela (dt) 155
Upper Hamakua ditch above Alakahi Stream, near Kamuela (dt) 156
Waipio Stream (continuation of Kawainui Stream):
Alakahi Stream near Kamuela (dt) 157
Upper Hamakua ditch above Waimea Reservoir diversion, near Kamuela (dt) 158
Upper Hamakua ditch above Puukapu Reservoir, near Kamuela (dt) 159
Kohakohau Stream near Kamuela (dt) 160
Waikoloa Stream at Marine Dam, near Kamuela (dt) 161
Hauani Gulch (head of Lanimaumau Stream) near Kamuela (dt) 162
Hilea Gulch tributary near Honuapo (dt) 163

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

			Page
HAWAII			
ISLAND OF KAUAI			
(2-0021-01)	220057159210301	(w)	191
(2-0044-13)	220018159444702	(ct)	225
(2-0044-14)	220019159444801	(w)	191
(2-0044-15)	220016159442701	(ct)	225
(2-0120-01)	220138159205501	(ct)	225
(2-0120-02)	220134159205401	(ct)	225
(2-0145-10)	220148159453501	(ct)	225
(2-0320-01)	220354159205801	(ctw)	192
(2-0345-04)	220341159453901	(ct)	225
(2-0545-01)	220530159450401	(ct)	225
(2-0818-01)	220827159185401	(ct)	225
(2-0818-02)	220826159185401	(ct)	225
(2-1020-03)	221030159202803	(ct)	226
(2-1125-01)	221141159252501	(ct)	226
(2-1125-02)	221141159252502	(ct)	226
(2-1126-01)	221150159264501	(ct)	226
(2-1126-02)	221151159285001	(ct)	226
(2-1229-03)	221201159293401	(ct)	226
(2-1232-01)	221247159324801	(ct)	226
(2-1333-01)	221318159335901	(ct)	228
(2-5427-01)	215454159274201	(ct)	228
(2-5526-01)	215536159263501	(ct)	227
(2-5530-02)	215528159303001	(ct)	227
(2-5530-03)	215525159302601	(ct)	227
(2-5534-03)	215522159342601	(ct)	227
(2-5834-01)	215608159344301	(w)	193
(2-5635-01)	215835159355001	(ct)	227
(2-5725-01)	215747159253401	(ct)	238
(2-5840-01)	215803159401201	(ct)	227
(2-5842-02)	215854159424601	(ct)	227
(2-5842-03)	215843159422901	(ct)	228
(2-5921-01)	215959159214301	(w)	193
(2-5923-01)	215901159235301	(ct)	228
(2-5923-07)	215901159235201	(ct)	228
(2-5939-01)	215908159395801	(ct)	228
(2-5943-01)	215937159434201	(ct)	226
ISLAND OF OAHU			
(3-1846-01)	211646157465201	(ct)	229
(3-1851-19A)	211832157515501	(ct)	229
(3-1851-19B)	211832157515502	(ct)	229
(3-1959-05)	211907157594701	(w)	194
(3-2042-13)	212038157422501	(ct)	229
(3-2101-03)	212154158015201	(w)	194
(3-2103-03)	212133158035501	(ct)	229
(3-2153-02)	212108157533701	(ct)	229
(3-2153-05)	212123157535501	(ctw)	195,196
(3-2255-35)	212259157554201	(ct)	229
(3-2256-10)	212238157561101	(w)	196
(3-2256-12)	212238157581102	(ct)	229
(3-2300-08)	212300156004801	(ct)	229
(3-2300-11)	212343158001001	(ct)	230
(3-2300-18)	212340158001901	(ctw)	197
(3-2301-09,10)	212358158010901	(ct)	239,240
(3-2303-02)	212328158031201	(ct)	241
(3-2358-02)	212332157582201	(ct)	230
(3-2358-22)	212342157584301	(ct)	230
(3-2358-29)	212343157584701	(ct)	230
(3-2359-05)	212336157591801	(ct)	230

Page

HAWAII--Continued
ISLAND OF OAHU--Continued
(3-2400-02) 212408158002601 (ct) 242
(3-2400-06) 212414158005302 (ct) 243
(3-2401-01) 212426158010801 (ct) 244
(3-2402-01) 212410158020201 (ct) 245
(3-2448-01) 212422157485601 (ct) 230
(3-2459-23) 212426157595201 (ct) 246
(3-2500-01) 212522158003001 (ct) 247,248
(3-2550-01) 212556157500301 (ct) 230
(3-2558-10) 212506157582301 (ct) 249,250
(3-2600-02) 212601158004101 (ct) 251
(3-2600-03) 212659158004101 (ct) 252
(3-2600-04) 212659158004102 (w) 198
(3-2603-01) 212617158033801 (ct) 230
(3-2607-01) 212656158071801 (ct) 230
(3-2800-01) 212803158000701 (ct) 230
(3-2808-01) 212813158080201 (ct) 231
(3-2809-06) 212828158092001 (ct) 231
(3-2812-01) 212859158124301 (ct) 231
(3-2901-07) 212927158014801 (ctw) 199
(3-2901-09) 212945158014301 (ct) 231
(3-2911-02) 212939158112301 (ct) 231
(3-3213-06) 213224158135901 (ct) 231
(3-3213-07) 213224158135601 (ct) 253
(3-3251-01) 213243157510001 (ct) 231
(3-3352-01) 213327157524401 (ctw) 200
(3-3405-01) 213429158055501 (ct) 231
(3-3405-02) 213427158055501 (ct) 231
(3-3407-25) 213411158074501 (ct) 231
(3-3407-30) 213444158075501 (ct) 231
(3-3410-08) 213446158104901 (w) 201
(3-3506-03,04) 213512158061601 (ct) 231
(3-3605-03) 213636158053701 (ct) 232
(3-3605-21) 213836158053702 (ct) 232
(3-3655-01) 213856157550401 (ct) 232
(3-3958-04) 213902157561601 (ct) 232
(3-4100-01) 214157158000101 (ct) 232
(3-4101-03) 214125158013401 (w) 201
(3-4101-08) 214131158011601 (ct) 232
(3-4258-04) 214233157583501 (ct) 232
ISLAND OF MOLOKAI
(4-0448-02) 210425156483001 (w) 202
(4-0449-01) 210402156495801 (ctw) 203,204
(4-0457-01) 210419156570501 (ctw) 205,206
(4-0601-01) 210605157012001 (ctw) 207
(4-0700-01) 210711157000501 (w) 208
(4-0801-01) 210856157011201 (c) 232
(4-0601-02) 210857156010701 (c) 232
(4-0801-03) 210857157011701 (ct) 254
(4-0901-01) 210903157013001 (c) 232
ISLAND OF MAUI
(6-3806-01) 203835156065001 (ct) 233
(6-3904-01) 203908156041201 (w) 209
(6-3925-01) 203912158255901 (w) 209
(6-3926-03) 203947156261201 (ct) 233
(6-4600-01) 204601156001501 (ct) 233
(6-4600-02) 204636156002601 (ct) 233
(6-4600-03) 204633156003201 (ct) 233
(8-4627-14) 204635156270101 (ct) 233
(6-4824-01) 204827156242201 (w) 210
(6-4825-01) 204845156255001 (ct) 233
(6-4831-01) 204818156310301 (w) 210
(8-4928-02) 204909156281401 (w) 211

Page

HAWAII--Continued
ISLAND OF MAUI--Continued
(6-4937-01) 204931156371201 (ct) 233
(6-5021-01) 205014156212701 (ct) 233
(6-5130-01) 205140156304501 (w) 211
(6-5130-02) 205154156303601 (w) 212
(6-5224-02) 205243156243201 (ct) 233
(6-5330-09) 205320156305502 (ct) 233
(6-5330-11) 205330156305401 (ct) 234
(6-5339-01) 205322156394501 (ct) 234
(6-5339-02) 205320156394501 (ct) 234
(6-5340-01) 205343156401101 (ct) 234
(6-5420-01) 205458156205401 (ct) 255
(6-5424-01) 205416156244301 (ct) 234
(6-5430-03) 205419156304401 (w) 212
(6-5430-05) 205405156305401 (w) 213,214
(6-5431-01) 205437156310501 (w) 215
(6-5522-01) 205511156222101 (ct) 234
(6-5631-01) 205617156311101 (w) 215
(6-5838-01) 205837156384801 (ct) 234
(6-5836-02) 205838156383101 (ct) 234
(6-5838-04) 205848156383601 (ct) 234
(8-5840-01) 205856158400101 (w) 216
ISLAND OF HAWAII
(8-0335-01) 190347155354301 (ct) 235
(8-0632-01) 190802155325901 (w) 216
(8-0831-02) 190832155310901 (ct) 235
(8-1128-02) 191108155281701 (ct) 235
(8-1129-01) 191114155294801 (ct) 235
(8-1229-01) 191219155291601 (ct) 235
(8-2102-01) 192108155021201 (ct) 235
(8-2653-01) 192646155532001 (ct) 235
(8-2753-01) 192738155534201 (ct) 235
(8-2753-02) 192731155534101 (ct) 235
(8-2783-01) 192728154530101 (ctw) 217
(8-2988-01) 192923154564701 (ct) 235
(8-2986-02) 192924154564701 (ct) 235
(8-3080-02) 193017154502101 (ctw) 218
(8-3165-01) 193113154555801 (ct) 236
(8-3389-01) 193339154594801 (w) 218
(8-3557-01) 193510155570801 (ct) 236
(8-3557-03) 193508155570701 (ct) 236
(8-3557-04) 193505155570701 (ct) 236
(8-3557-05) 193502155572301 (ct) 256
(8-3657-01) 193659155571701 (ct) 236
(8-3802-03) 193605155020201 (ct) 236
(8-3804-01) 193812155041701 (ct) 257
(8-4003-01) 194037155035301 (ct) 236
(8-4003-02) 194040155035201 (ct) 236
(8-4003-03) 194039155035601 (ct) 236
(8-4100-01) 194134155005601 (ctw) 220
(8-4203-04) 194222155035101 (w) 221
(8-4203-06) 194222155034801 (ct) 236
(8-4304-01) 194337155041801 (ct) 238
(8-4306-02) 194320155061701 (ct) 237
(8-4850-01) 194846155501801 (ct) 237
(8-4858-02) 194818155582301 (ct) 237
(8-5005-01) 195035155054501 (ct) 237
(8-5005-02) 195043155053801 (ct) 237
(8-5005-05) 195051155051501 (ct) 237
(8-5548-01) 195546155480301 (ct) 237
(8-5745-01) 195724155455301 (ct) 237
(8-5745-02) 195722155455201 (ct) 237
(8-5946-01) 195929155462501 (ct) 237
(8-5948-02) 195912155484201 (ct) 237
(8-5946-03) 195939155464201 (ct) 237
(8-5948-01) 195947155485801 (ctw) 222
(8-6147-01) 200132155471001 (w) 223
(8-7652-01) 201603155521801 (ctw) 224

WATER RESOURCES DATA FOR HAWAII AND OTHER PACIFIC AREAS, 1987

Volume 1

INTRODUCTION

Water resources data for the 1987 water year for Hawaii and other Pacific areas consist of records of stage, discharge, and water quality of streams, ditches, and springs; and water-levels and water quality of wells. This report, Volume 1, contains discharge records for 84 gaging stations; water quality for 14 gaging stations, 53 partial-record flow stations, and 184 wells; and water levels for 41 observation wells. Also included are 107 crest-stage partial-record stations and 10 low-flow partial-record stations. These data represent that part of the National Water Data System operated by the U.S. Geological Survey and cooperating State, Federal, and other agencies in Hawaii.

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

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

Beginning with the 1975 water year, water data for streamflow, water quality, and ground water are published as an official Survey report on a state-boundary basis. These official Survey reports carry an identification number consisting of the two-letter state abbreviation, the last two digits of the water year, and the volume number. For example, this report is identified as "U.S. Geological Survey Water-Data Report HI-87-1." For archiving and general distribution, the reports for water years 1971-74 are also indentified as water-data reports. These water-data reports are for sale, in paper copy or in microfiche by the National Technical Information Service, U.S. Department of Commerce, Springfield, VA 22161.

Additional information for ordering specific reports may be obtained from the district chief at the address given on the back of the title page or by telephone (808) 541-2820.

COOPERATION

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

Hawaii Department of Land and Natural Resources, Division of Water and Land Development, Manabu Tagomori, Manager-Chief Engineer.
Hawaii Department of Health, John C. Lewin, Director.
City and County of Honolulu, Board of Water Supply, Kazu Hayashida, Manager and Chief Engineer.
City and County of Honolulu, Department of Public Works, Alfred J. Thiede, Director and Chief Engineer.

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

The following organizations aided in collecting records:

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

SUMMARY OF HYDROLOGIC CONDITIONS

Runoff during the 1987 year was deficient (lower 25 percent of record) at the index station on the island of Maui, normal for the index stations on the islands of Kauai and Oahu, and excessive (upper 25 percent of record) at the station on the island of Hawaii.

At East Branch of North Fork Wailua River near Lihue, Kauai, streamflow was deficient for every month except December to March. Its annual mean discharge was 9 percent greater than the 1951-80 annual median. Streamflow at Kalihi Stream near Honolulu, Oahu was deficient for every month except January, March, April, August, and September. The yearly mean was 15 percent greater than the 1951-80 annual median. Monthly mean discharge at the index station, Honopou Stream near Huelo, Maui was deficient for every month except February, March, and August. Annual mean was 68 percent of the 1951-80 annual median. Monthly mean flow at Waiakea Stream near Mountain View, Hawaii was excessive for every month except November, January, June, and July. The annual mean was 26 percent greater than the 1951-80 annual median.

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

Dissolved-solids concentrations at the six NASQAN (National Stream Quality Accounting Network) stations showed little change during the 1987 year from the previous year. Samples collected every other month showed dissolved-solids concentrations ranged from 31 to 312 mg/L (milligrams per liter) during 1987. Waikele Stream at Waipahu, Oahu, had the highest concentration values.

Average dissolved-oxygen concentrations ranged from 84 to 102 percent saturation. Waikele and Kalihi streams were the lowest at 84 and 95 percent, respectively.

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

NASQAN Station	Fecal Coliform (colonies per 100 milliliters) 1986	1987
Waimea River at Waimea, Kauai	470	920
Waikele Stream at Waipahu, Oahu	14200	5200
Kalihi Stream at Kalihi, Oahu	8430	9700
Halawa Stream near Halawa, Molokai	58	15
Kahakuloa Stream at Kahakuloa, Maui	28	45
Wailuku River at Hilo, Hawaii	61	230
Benchmark Station		
Honolii Stream near Papaikou, Hawaii	27	82

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

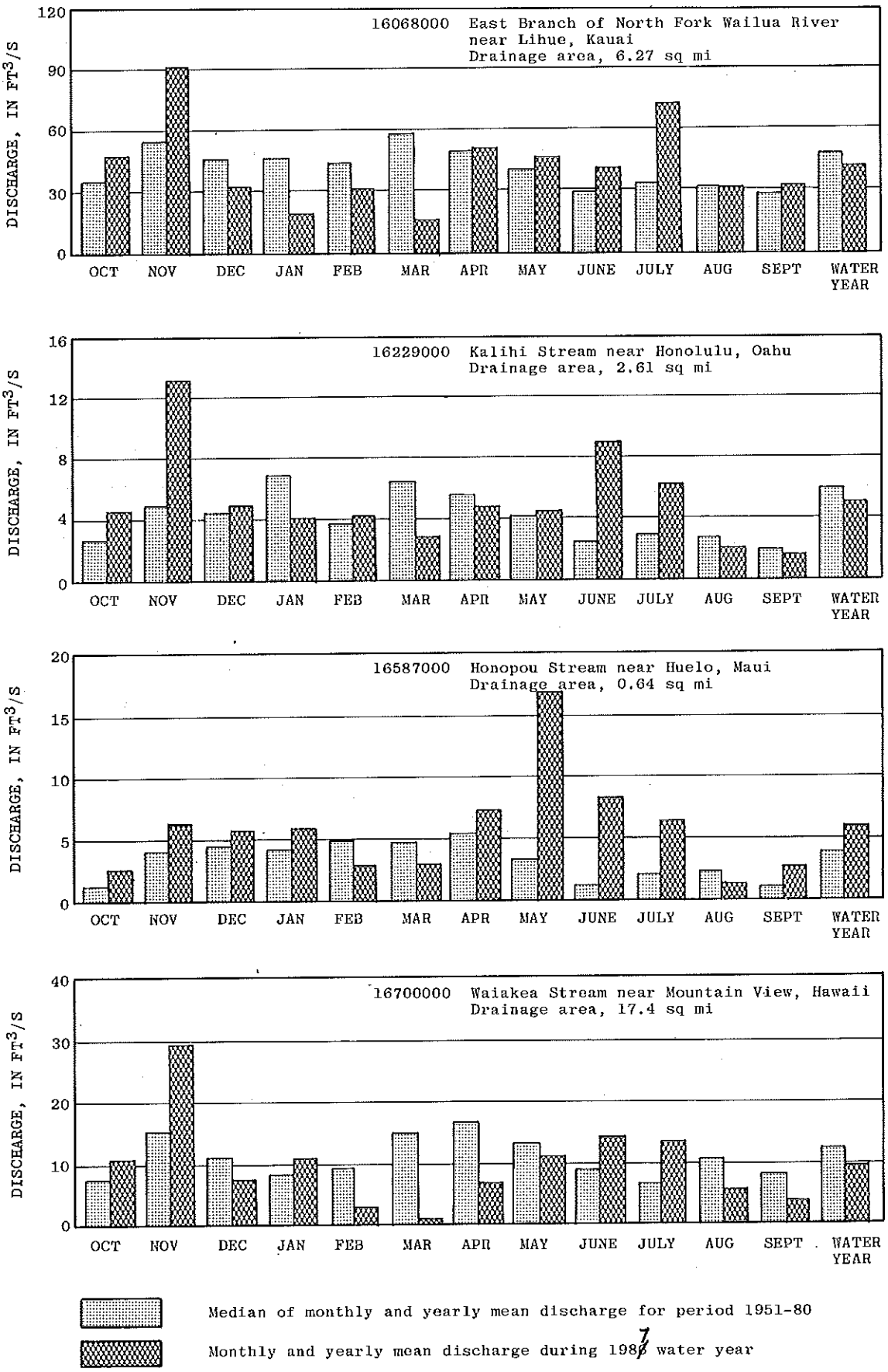


FIGURE 1. DISCHARGE DURING 1987 WATER YEAR COMPARED WITH MEDIAN DISCHARGE FOR PERIOD 1951-80 FOR FOUR REPRESENTATIVE GAGING STATIONS.

DEFINITION OF TERMS

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

DOWNSTREAM ORDER AND STATION NUMBER

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

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

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

NUMBERING SYSTEM FOR WELLS AND MISCELLANEOUS SITES

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

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

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

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

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

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

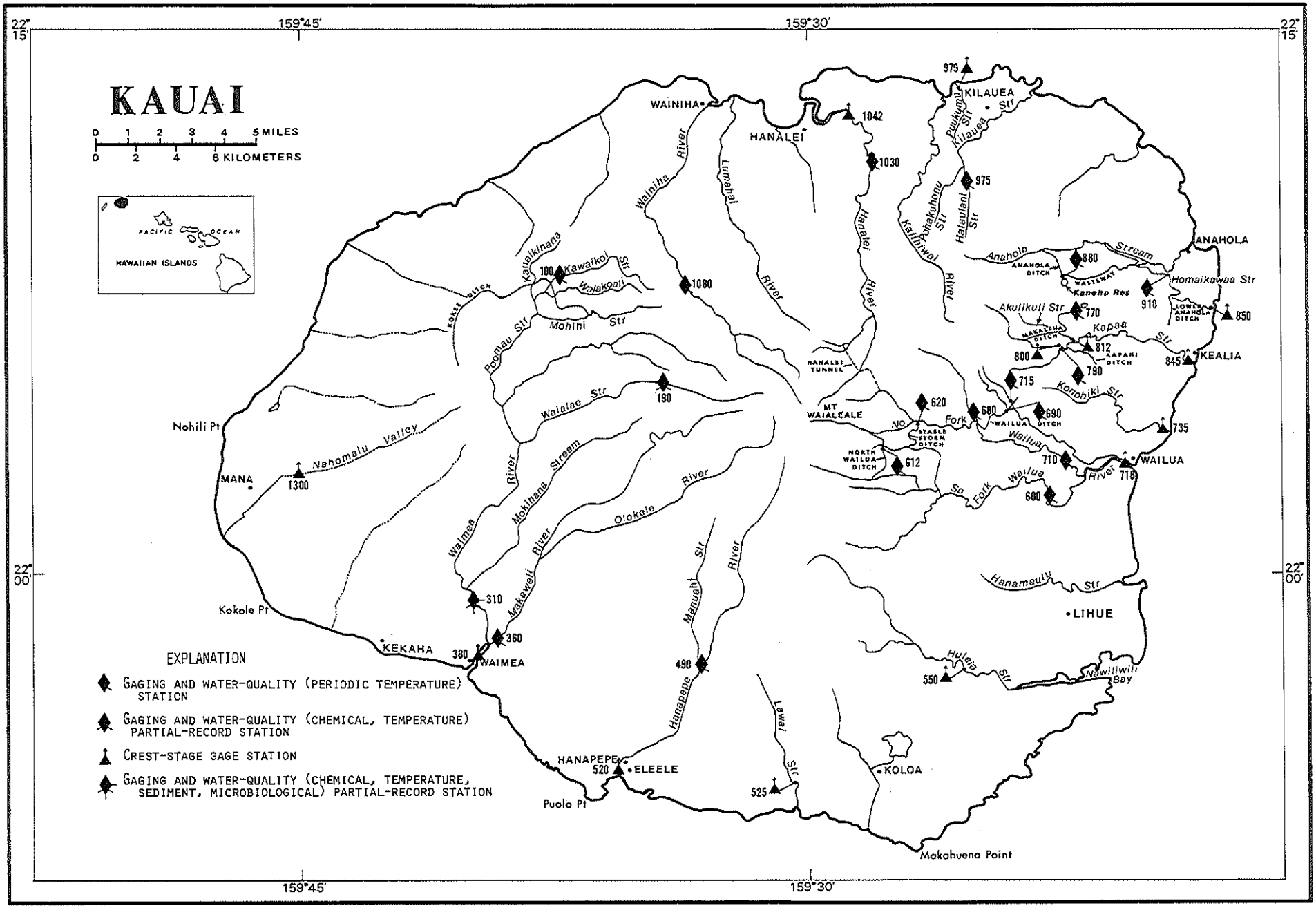


FIGURE 2.--LOCATIONS OF GAGING, WATER-QUALITY, AND PARTIAL-RECORD STATIONS ON KAUAI.

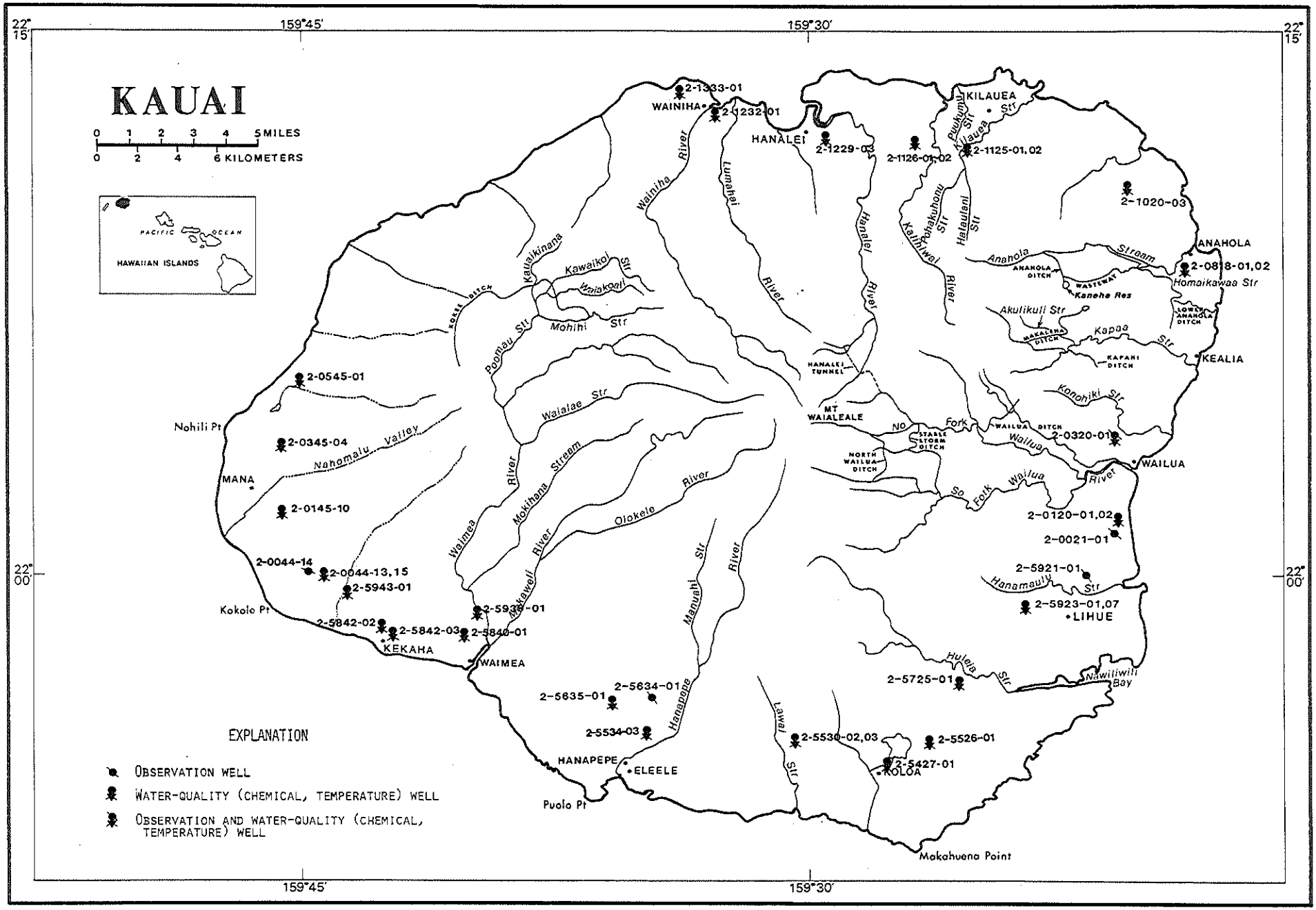


FIGURE 3.--LOCATIONS OF OBSERVATION WELLS AND GROUND-WATER QUALITY SAMPLING SITES ON KAUAI.

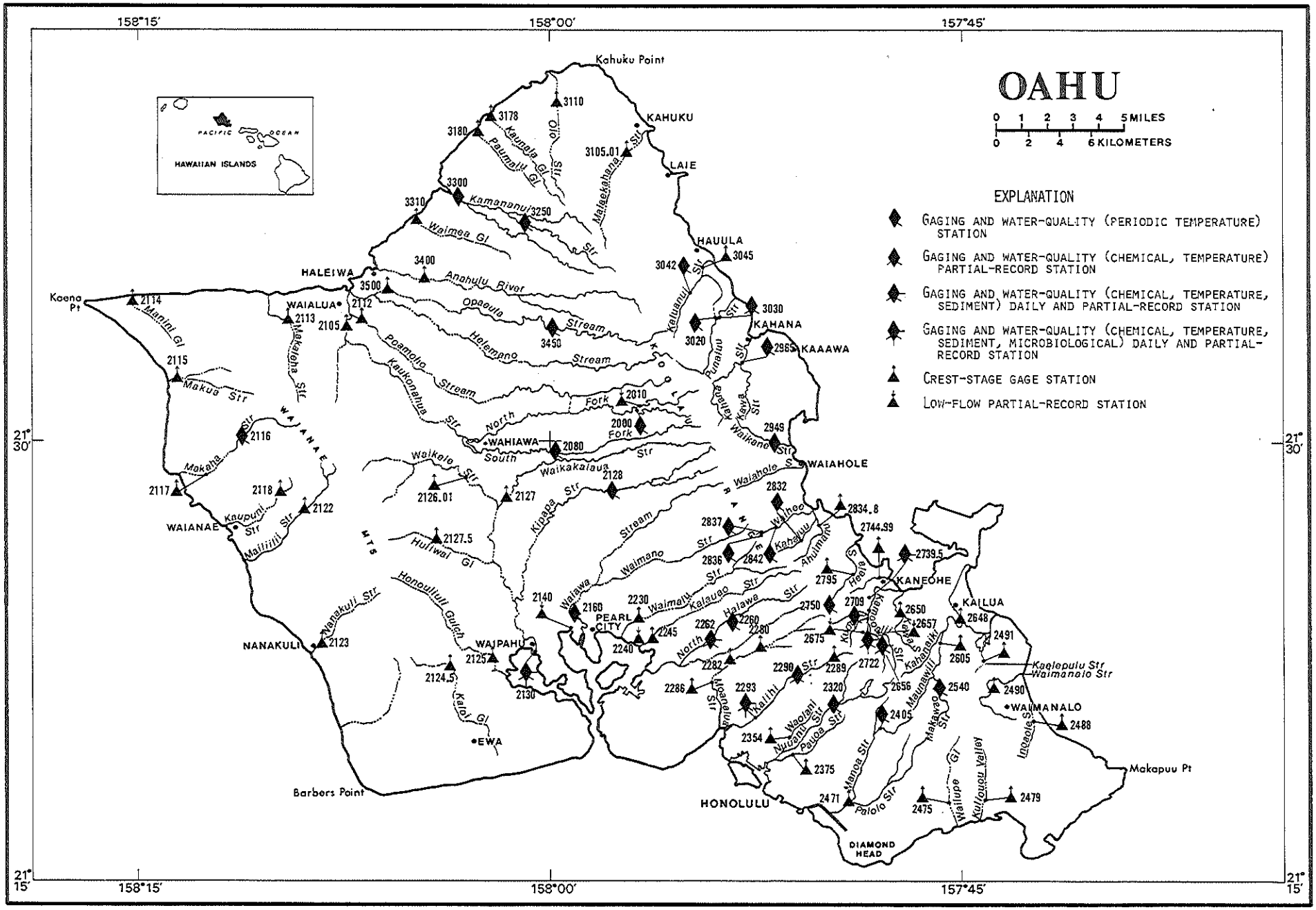


FIGURE 4.--LOCATIONS OF GAGING, WATER-QUALITY, AND PARTIAL-RECORD STATIONS ON OAHU.

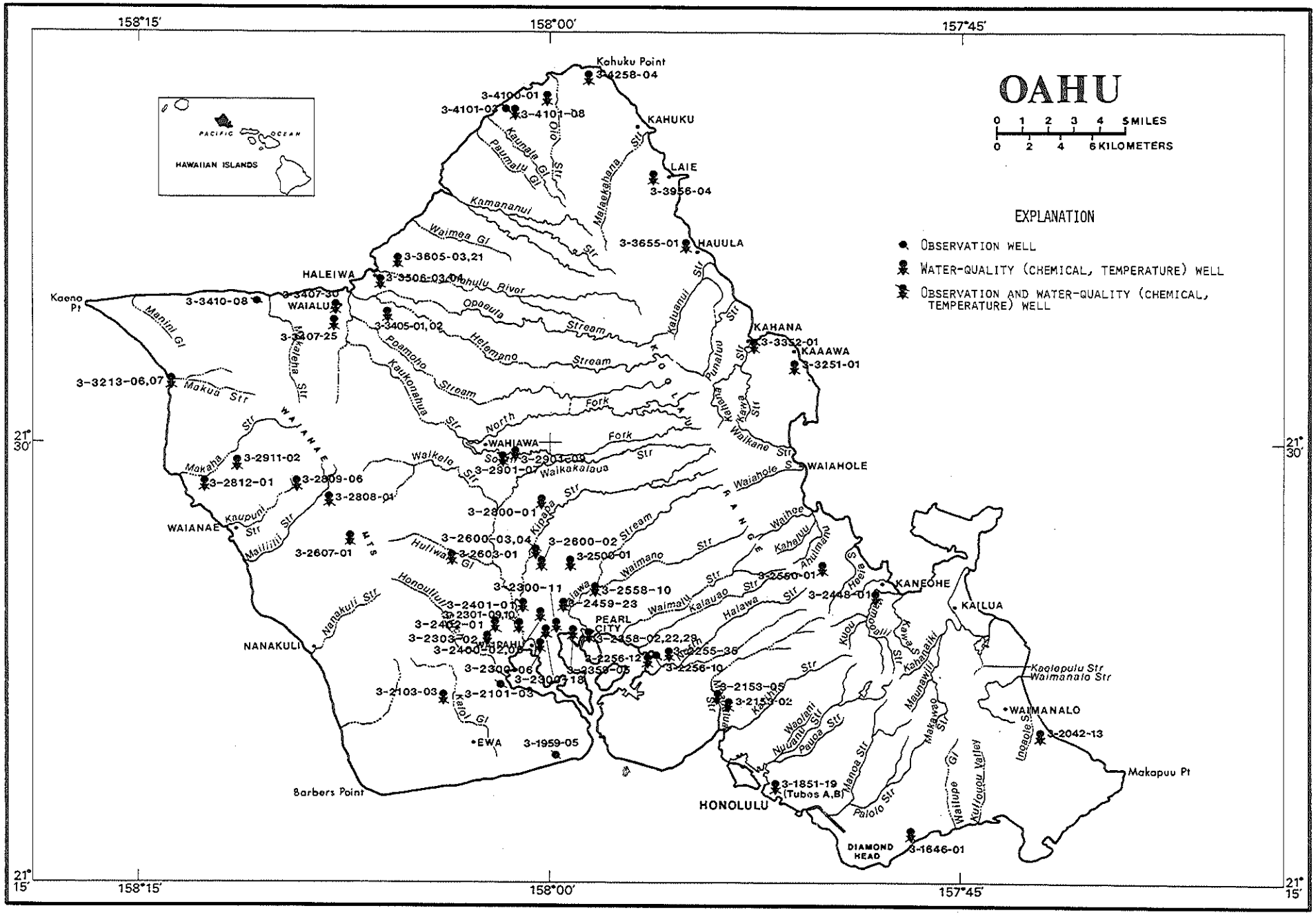


FIGURE 5.--LOCATIONS OF OBSERVATION WELLS AND GROUND-WATER QUALITY SAMPLING SITES ON OAHU.

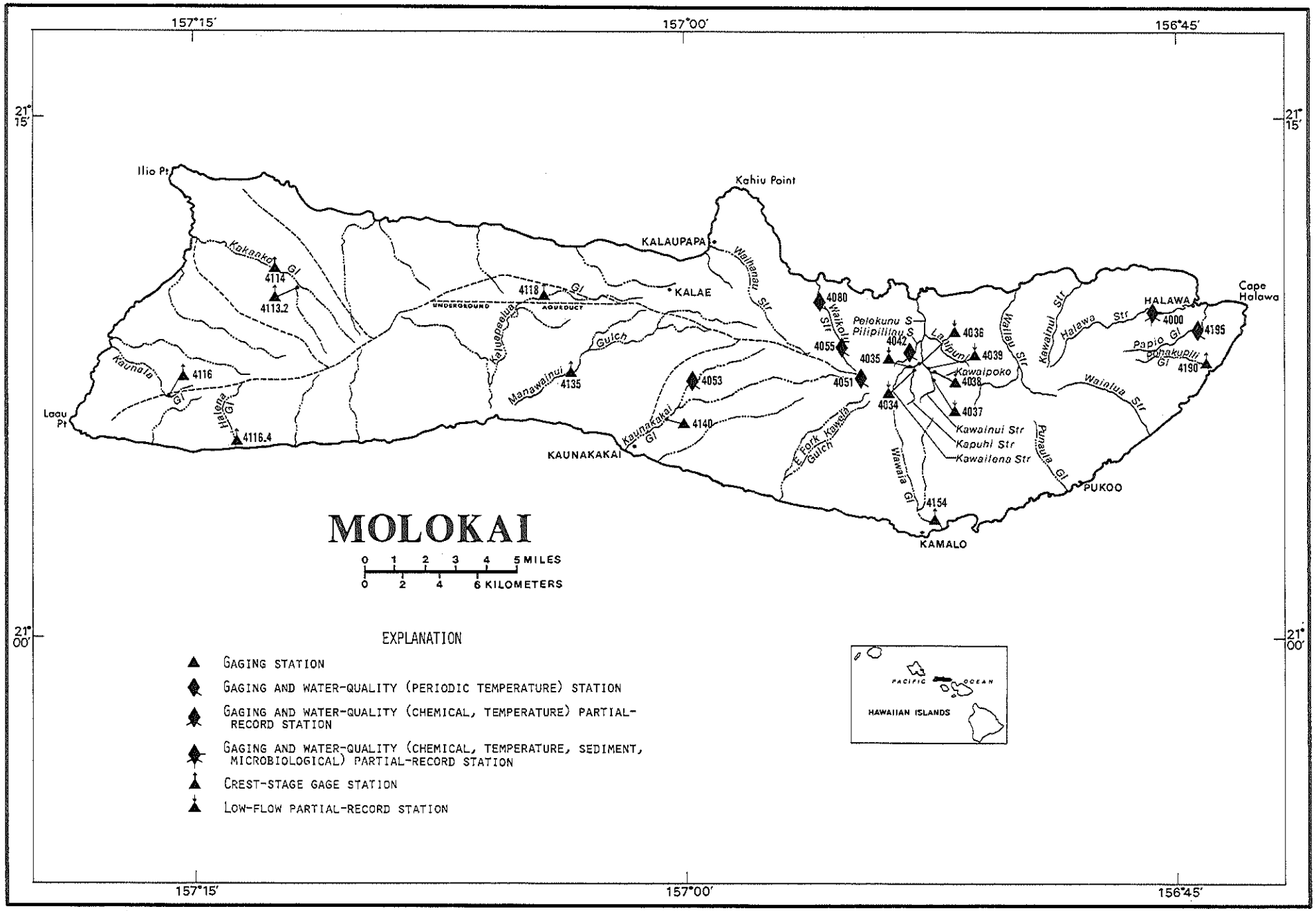


FIGURE 6.--LOCATIONS OF GAGING, WATER-QUALITY, AND PARTIAL-RECORD STATIONS ON MOLOKAI.

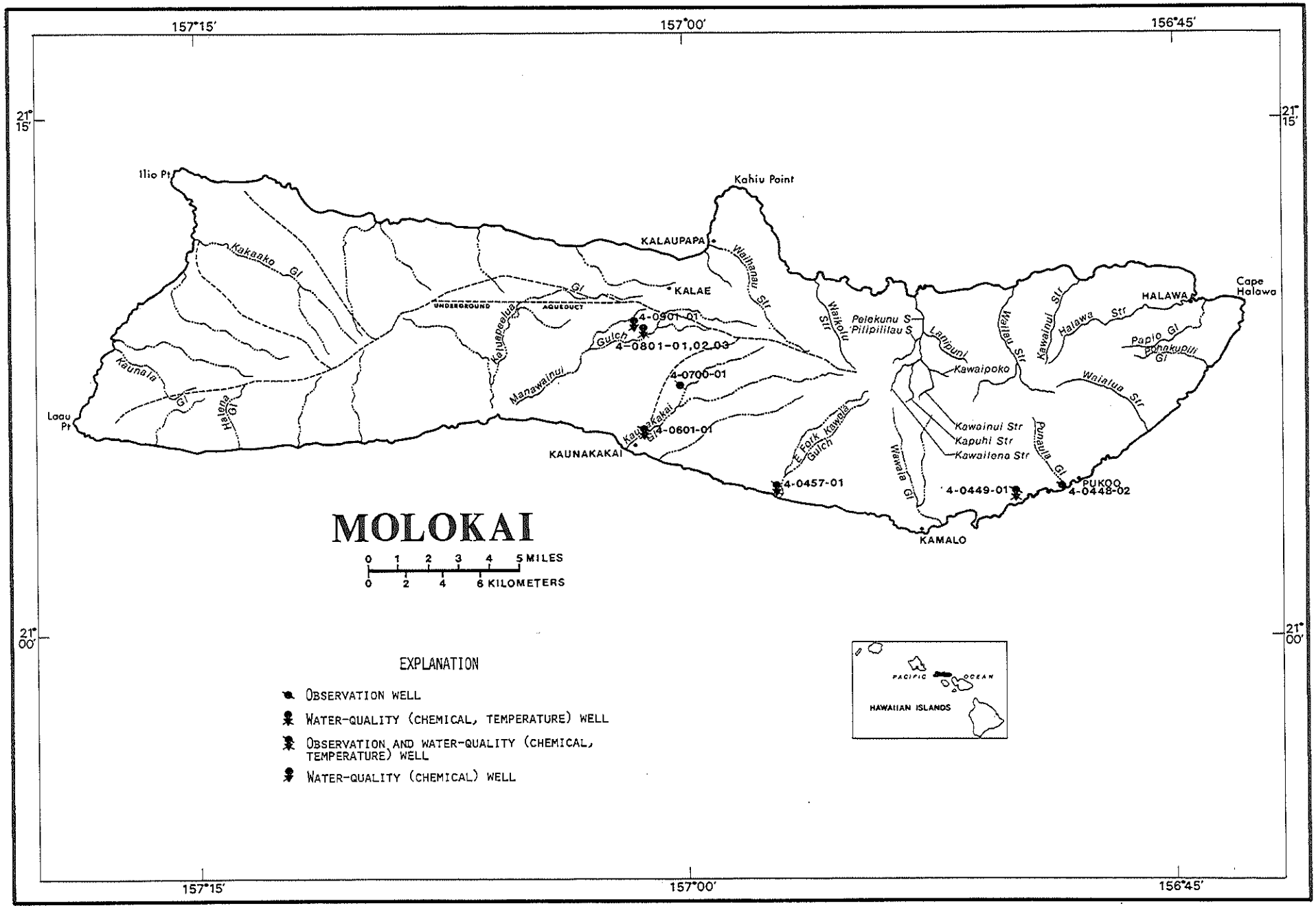


FIGURE 7.--LOCATIONS OF OBSERVATION WELLS AND GROUND-WATER QUALITY SAMPLING SITES ON MOLOKAI.

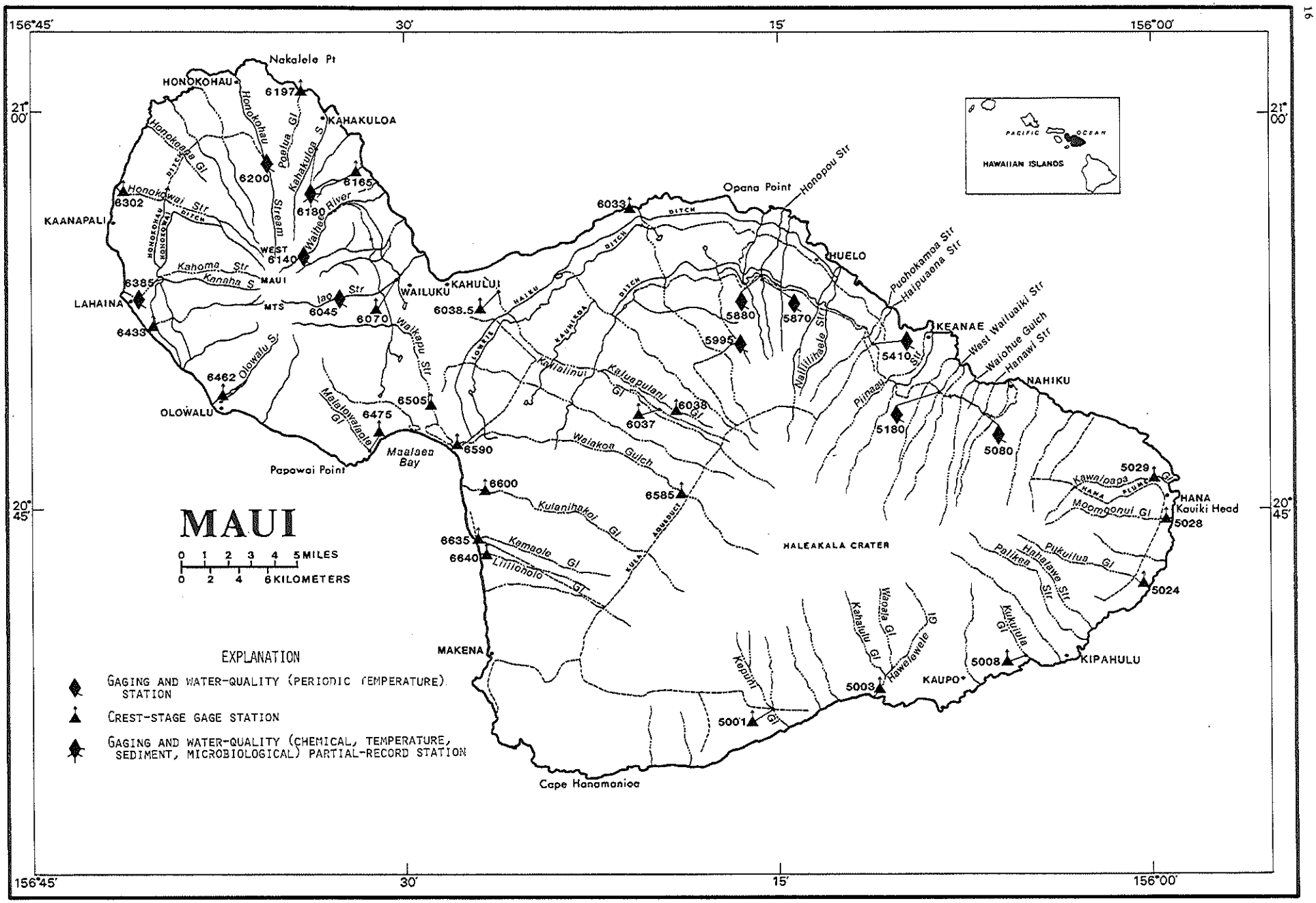


FIGURE 8.--LOCATIONS OF GAGING, WATER-QUALITY, AND PARTIAL-RECORD STATIONS ON MAUI.

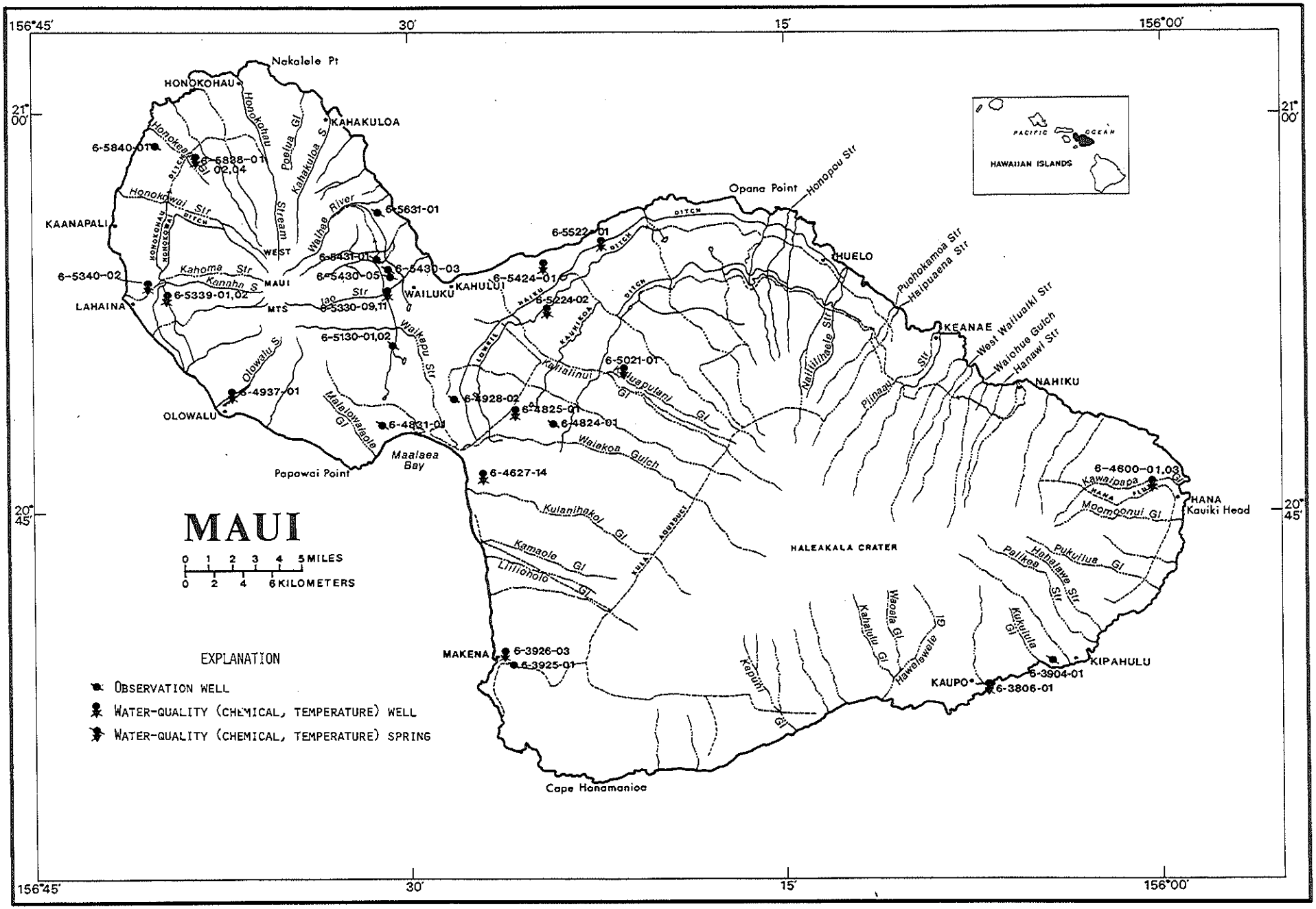


FIGURE 9.--LOCATIONS OF OBSERVATION WELLS AND GROUND-WATER QUALITY SAMPLING SITES ON MAUI.

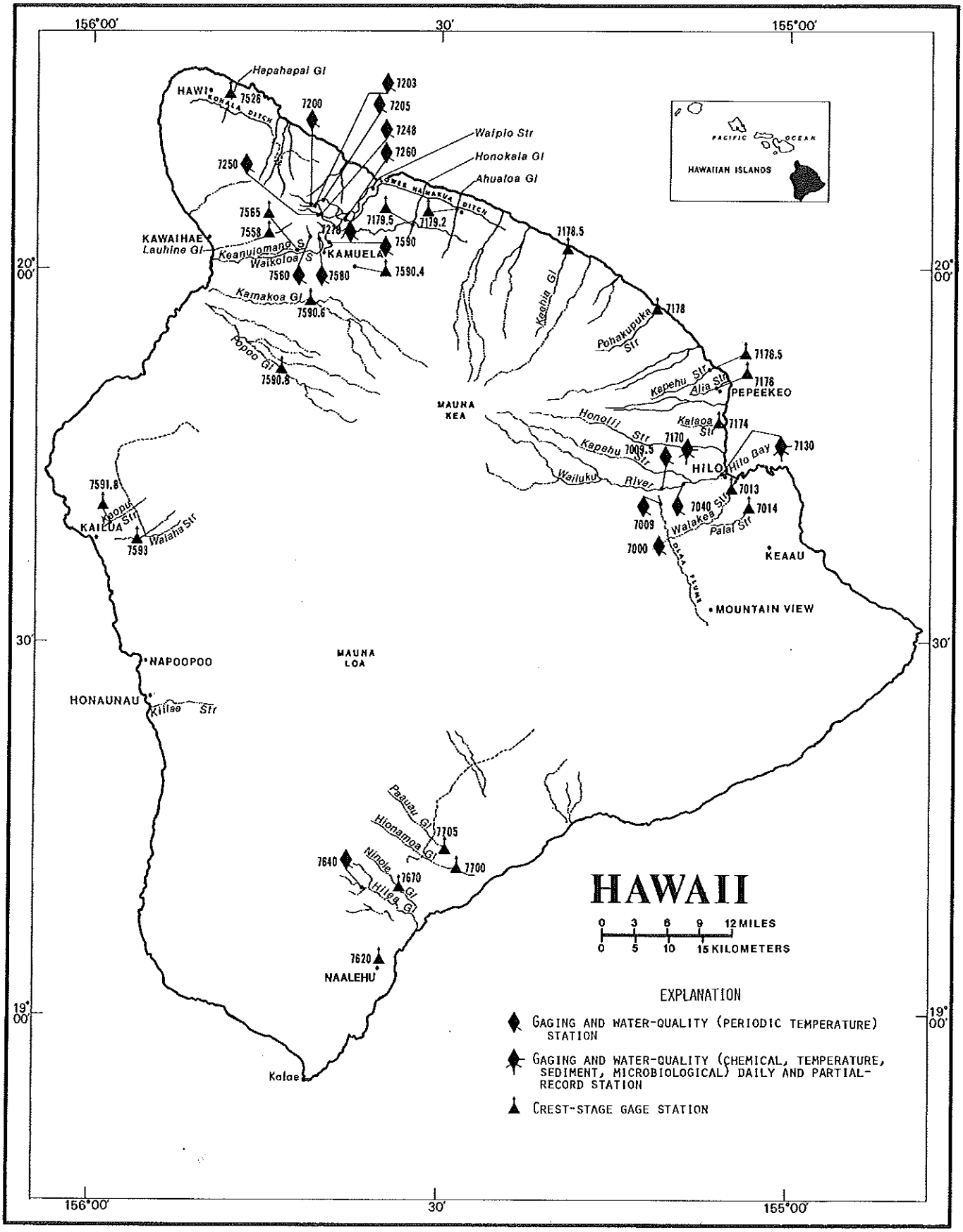


FIGURE 10.--LOCATIONS OF GAGING, WATER-QUALITY, AND PARTIAL-RECORD STATIONS ON HAWAII.

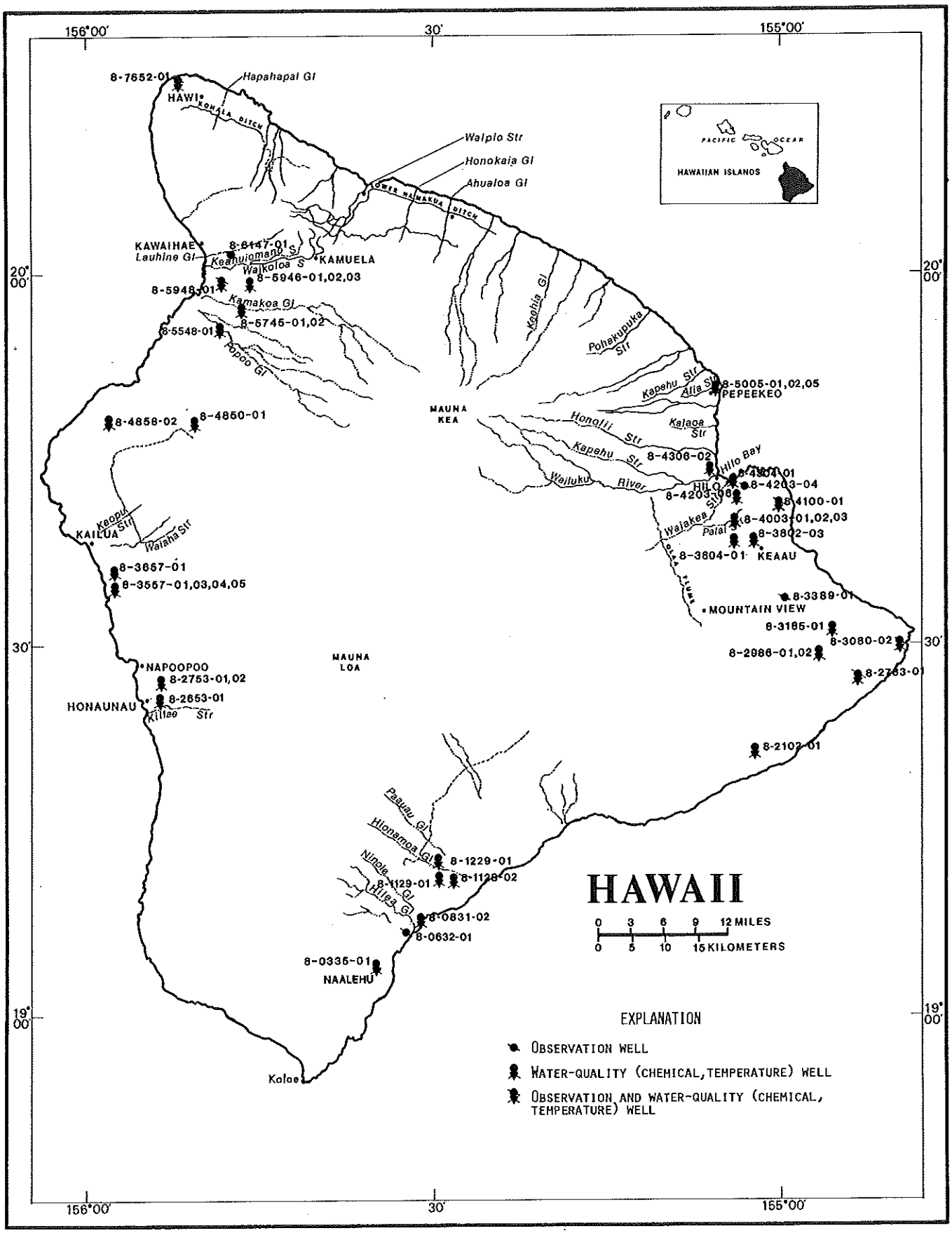


FIGURE 11.--LOCATIONS OF OBSERVATION WELLS AND GROUND-WATER QUALITY SAMPLING SITES ON HAWAII.

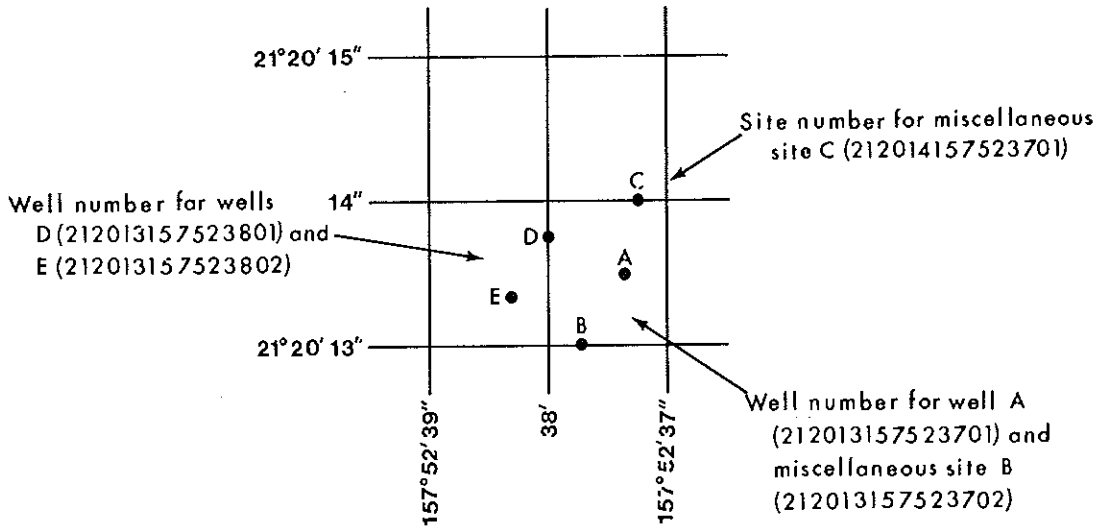


Figure 12. Sketch showing system for numbering wells and miscellaneous sites

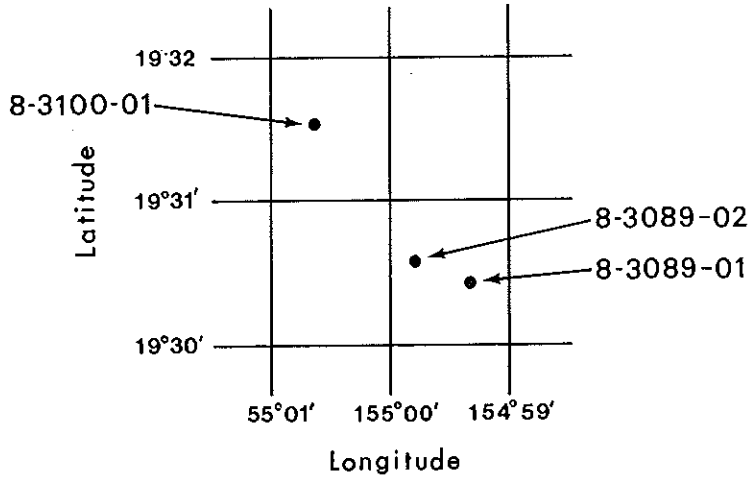


Figure 13. Sketch showing local well numbering system

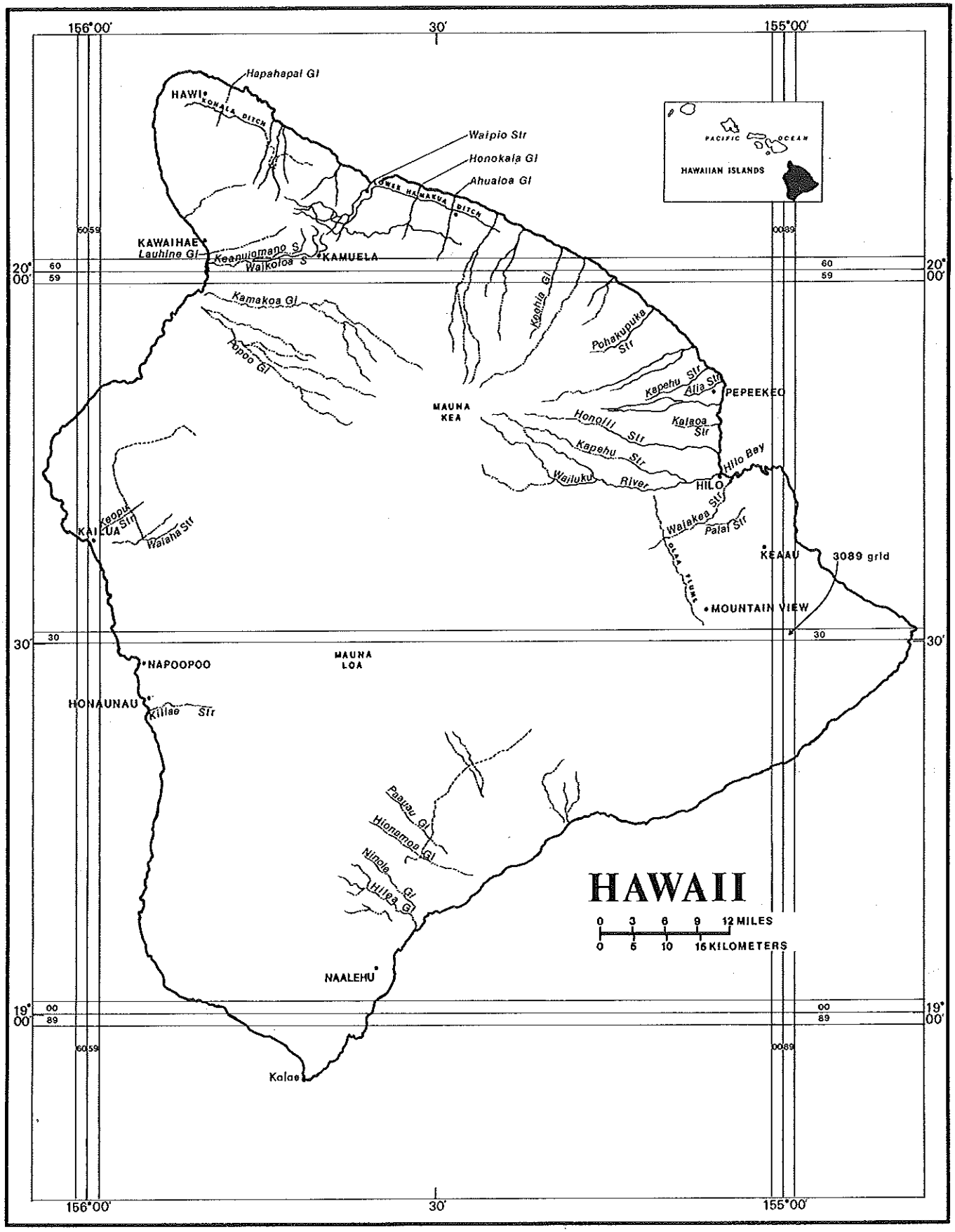


FIGURE 14.--MAP OF HAWAII SHOWING SYSTEM FOR NUMBERING LOCAL WELL NUMBERS.

SPECIAL NETWORKS AND PROGRAMS

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

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

EXPLANATION OF STAGE AND WATER-DISCHARGE RECORDS

Collection and computation of data

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

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

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

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

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

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

Previously published stresmflow records of some stations have been found to be in error on the basis of data or information later obtained. Revisions of such records are usually published along with the current records in one of the snnual or compilation reports. In order to make it easier to find such revised records, a paragraph headed "REVISED RECORDS" has been sdded to the description of all stations for which revised records have been published. Listed therein are all the reports in which revisions have been published, each followed by the water years for which figures are revised in that report. In listing the water years only one number is given; for instance, 1965 stands for the water year October 1, 1964, to September 30, 1965. If no daily, monthly, or annual figures of discharge are affected by the revision, the fact is brought out by notations after the year dates as follows: "(M)" means that only the instantaneous maximum discharge was revised; "(m)" that only the instsntsneous minimum was revised; and "(P)" that only peak discharge were revised. If the drainage area has been revised, the report in which the revised figures was first published is given.

The type of gage ourrently in use, the datum of the present gsge above mean sea level, and a condensed history of the types, locations, snd datums of previous gages used during the period of record are given under "GAGE." In references to datum of gage, the phrase "mean sea level" denotes "Sea Level Datum of 1929" as used by the Topographic Division of the Geological Survey unless otherwise qualified.

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

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

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

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

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

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

Accuracy of field data and computed results

The accuracy of streamflow data depends primarily on (1) the stability of the stage-discharge relation or, if the control is unstable, the frequency of discharge measurements and (2) the accuracy of observations of stage, measurements of discharge, and interpretations of records.

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

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

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

Records of discharge collected by agencies other than the Geological Survey

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

Other data available

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

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

Publications

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

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

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

EXPLANATION OF WATER-QUALITY RECORDS

Collection and examination of data

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

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

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

Water analysis

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

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

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

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

Water temperature

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

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

Sediment

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

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

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

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

Publications

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

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

EXPLANATION OF GROUND-WATER LEVEL RECORDS

Collection of the data

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

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

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

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

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

Publications

Publication of ground-water level data for the United States in Water-Supply Papers was begun by the Geological Survey in 1935. From 1935 through 1939, a single Water-Supply Paper for each year covering the entire nation was issued (Water-Supply Papers 777, 817, 840, 845, and 886). From 1940 through 1974, separate Water-Supply Papers were issued for 8 sections of the United States. Water-level data for Hawaii are in the Water-Supply Papers listed below each report containing one or more calendar years (January-December) of data. Data in this report are for the 12-month water year ending September 30.

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

ACCESS TO WATSTORE DATA

The National WATer Data STOrage and REtrieval System (WATSTORE) was established for handling water data collected through the activities of the U.S. Geological Survey and to provide for more effective and efficient means of releasing the data to the public. The system is operated and maintained on the central computer facilities of the Survey at its National Center in Reston, Virginia.

WATSTORE can provide a variety of useful products ranging from simple data tables to complex statistical analyses. A minimal fee, plus the actual computer cost incurred in producing a desired product, is charged to the requester. Information about the availability of specific types of data, the acquisition of data or products, and user charges can be obtained locally from each of the Water Resources Division's district offices (see address given on the back of the title page).

General inquiries about WATSTORE may be directed to:

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

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. Ficke, and G. F. Smoot: USGS--TWRI Book 1, Chapter D1. 1975. 65 pages.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

5-A6. *Quality assurance practices for the chemical and biological analyses of water and fluvial sedments,* 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.

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

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

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

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

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

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

HAWAII, ISLAND OF KAUAI

16010000 KAWAIKOI STREAM NEAR WAIMEA

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

DRAINAGE AREA.--3.95 mi^2.

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

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

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

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

AVERAGE DISCHARGE.--70 years (water years 1912, 1914, 1920-87), 34.4 ft^3/s (24,920 acre-ft/yr).

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

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 1,960 ft^3/s Nov. 10, gage height, 7.54 ft, no peak greater than base discharge of 2,100 ft^3/s; minimum, 4.0 ft^3/s Oct. 5.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	5.1	15	51	9.4	18	15	50	38	18	12	9.0	36
2	4.7	12	29	9.2	13	29	19	32	21	9.4	6.4	16
3	4.4	11	24	9.6	11	22	14	93	16	19	10	16
4	4.2	13	19	10	12	14	12	40	14	18	7.8	6.8
5	67	11	181	8.6	9.8	12	11	47	14	20	6.6	6.7
6	42	9.1	117	8.0	9.1	17	9.6	97	15	24	6.0	5.7
7	15	8.3	38	7.6	8.6	14	9.2	199	13	19	5.8	5.1
8	13	7.7	23	7.3	8.3	11	8.5	46	12	15	5.5	4.7
9	14	7.1	19	14	8.0	10	8.2	32	11	12	5.2	4.5
10	7.6	245	17	13	7.7	9.4	8.1	43	10	13	5.8	4.5
11	14	278	15	10	7.5	8.8	7.7	31	78	14	7.7	45
12	19	33	14	15	13	8.3	51	31	68	11	7.9	17
13	18	30	14	15	31	8.1	435	36	33	9.6	6.3	211
14	20	48	13	10	346	7.7	459	58	63	10	5.3	59
15	46	22	12	8.3	180	7.5	151	36	45	14	4.8	27
16	18	121	49	7.5	142	7.2	111	32	31	15	13	11
17	9.4	33	65	7.1	47	7.1	87	23	22	9.6	40	8.8
18	12	23	48	172	22	7.1	98	18	37	13	125	7.9
19	210	47	17	28	23	29	34	16	74	12	23	7.4
20	51	21	29	12	108	41	51	15	20	8.3	9.5	6.6
21	15	15	125	11	92	12	61	14	21	31	7.0	179
22	11	13	46	32	49	8.2	72	13	14	58	6.2	217
23	9.2	13	21	16	23	7.3	49	164	21	17	5.7	33
24	8.6	37	15	17	28	7.5	26	212	15	14	5.2	21
25	104	21	13	416	76	12	21	35	12	13	4.9	13
26	24	32	12	31	24	105	297	169	10	9.2	7.1	40
27	82	188	12	20	22	57	163	176	12	7.8	13	23
28	51	255	34	17	17	14	50	66	11	7.0	47	12
29	18	49	15	19	---	10	54	30	9.1	30	11	11
30	17	149	12	14	---	31	29	23	15	25	7.0	66
31	36	---	10	54	---	276	---	20	---	14	9.8	---
TOTAL	970.2	1767.2	1107	1026.6	1356.0	825.2	2456.5	1885	755.1	503.9	436.3	1125.7
MEAN	31.3	58.9	35.7	33.1	48.4	26.6	81.9	60.8	25.2	16.3	14.1	37.5
MAX	210	276	181	416	346	276	459	212	78	58	125	217
MIN	4.2	7.1	10	7.1	7.5	7.1	7.7	13	9.1	7.0	4.8	4.5
AC-FT	1920	3510	2200	2040	2690	1640	4870	3740	1500	999	865	2230

CAL YR 1986	TOTAL	11986.1	MEAN	32.8	MAX	637	MIN	4.0	AC-FT	23780
WTR YR 1987	TOTAL	14214.7	MEAN	38.9	MAX	459	MIN	4.2	AC-FT	28190

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

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

DRAINAGE AREA.--1.79 mi^2.

WATER-DISCHARGE RECORDS

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

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

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

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

AVERAGE DISCHARGE.--46 years (water years 1921-31, 1953-87), 21.8 ft^3/s (15,790 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 4,530 ft^3/s Jan. 16, 1921, gage height, 8.44 ft, from rating curve extended above 1,100 ft^3/s on basis of slope-area measurement at gage height 4.60 ft; minimum, 0.99 ft^3/s May 17, 18, May 30 to June 2, 1988.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 835 ft^3/s Sept. 18, gage height, 3.74 ft, no peak greater than base discharge of 1,300 ft^3/s; minimum, 2.3 ft^3/s for many days.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4.0	5.5	20	e3.9	8.0	3.5	16	22	8.4	3.2	4.8	11
2	3.4	4.5	16	e3.9	4.8	6.1	8.0	9.6	5.5	3.2	4.0	8.0
3	3.2	21	15	e4.1	3.5	6.0	4.0	12	4.2	2.9	3.8	8.4
4	3.4	19	9.2	e4.8	3.4	4.2	3.4	8.4	4.0	2.9	3.4	4.8
5	20	6.4	37	e3.9	3.0	3.4	3.0	6.4	5.1	3.2	3.0	3.5
6	20	4.8	36	e3.4	2.9	3.2	2.9	7.2	19	17	2.9	3.0
7	7.8	4.0	14	3.0	2.8	2.9	2.8	41	7.2	21	2.6	2.8
8	4.8	3.4	9.2	2.8	2.8	2.8	2.4	13	4.5	11	2.8	2.6
9	4.0	3.4	7.8	2.8	2.6	2.8	2.4	9.6	4.2	5.8	2.4	2.4
10	3.4	4.2	6.4	2.8	2.8	2.6	2.9	12	5.0	4.8	4.6	2.4
11	3.4	19	8.0	2.8	2.8	2.4	4.2	7.6	4.5	16	41	126
12	3.5	31	6.0	3.4	6.7	2.3	5.2	6.0	14	8.8	10	17
13	3.8	137	6.8	5.0	19	2.3	65	5.6	13	5.0	5.2	12
14	4.2	75	5.2	3.8	67	2.3	142	6.6	49	4.8	3.5	189
15	24	22	4.8	3.0	53	2.4	40	7.6	24	6.4	3.0	25
16	9.2	183	18	2.8	58	2.3	40	29	8.0	5.0	3.4	10
17	8.0	42	31	2.8	13	2.3	38	9.8	5.8	3.5	12	7.2
18	8.2	20	18	9.1	7.8	10	45	5.8	5.0	4.0	24	13
19	49	85	7.6	8.9	6.0	4.2	13	4.8	6.0	5.8	9.8	7.8
20	17	21	6.4	4.0	35	43	13	4.0	4.5	4.0	5.0	5.0
21	8.4	17	13	3.2	23	7.2	21	3.8	3.8	4.0	3.8	17
22	4.5	10	20	6.8	9.2	3.8	26	3.5	3.5	17	3.2	87
23	3.5	49	8.8	5.5	6.4	2.9	18	36	6.6	8.0	3.0	10
24	3.5	58	5.8	3.8	5.2	3.0	8.8	98	5.5	13	2.9	6.8
25	22	20	e5.1	86	9.2	4.0	6.4	11	4.0	13	2.6	19
26	8.0	16	e4.9	11	6.8	8.0	17	18	3.5	8.8	2.9	15
27	11	72	e8.0	5.5	5.5	5.5	52	53	7.3	4.5	8.8	8.8
28	11	102	e12	4.2	4.2	4.0	12	22	6.0	3.8	11	5.5
29	8.4	19	e6.0	3.5	---	3.0	9.2	10	4.0	5.4	5.5	4.8
30	44	58	e4.8	3.4	---	3.4	7.6	7.2	3.5	15	3.5	7.2
31	9.8	---	e4.1	39	---	61	---	13	---	8.0	4.5	---
TOTAL	332.0	1112.2	372.7	252.7	374.2	214.8	629.2	501.5	246.6	238.8	202.5	621.8
MEAN	10.7	37.1	12.0	8.15	13.4	6.93	21.0	16.2	8.22	7.64	6.53	20.7
MAX	49	163	37	86	87	61	142	98	49	21	41	189
MIN	3.2	3.4	4.1	2.6	2.6	2.3	2.4	3.5	3.5	2.9	2.4	2.4
AC-FT	659	2210	739	501	742	426	1250	995	489	470	402	1230

CAL YR 1986	TOTAL	6219.5	MEAN	17.0	MAX	401	MIN	2.3	AC-FT	12340
WTR YR 1987	TOTAL	5097.0	MEAN	14.0	MAX	189	MIN	2.3	AC-FT	10110

e Estimated

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

WATER QUALITY RECORDS

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

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH (STAND-ARD UNITS)	TEMPER-ATURE WATER (DEG C)	HARD-NESS TOTAL (MG/L AS CACO3)	HARD-NESS NONCARB-ONATE (MG/L AS CACO3)	CALCIUM DIS-SOLVED (MG/L AS CA)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG)	SODIUM, DIS-SOLVED (MG/L AS NA)	SODIUM PERCENT	SODIUM AD-SORP-TION RATIO
OCT												
06...	1030	15	--	5.80	17.0	0	12	1.6	1.9	4.9	56	0.6
JAN												
06...	1025	3.5	--	6.90	13.0	7	2	1.1	1.1	3.7	45	0.6
MAR												
05...	1025	3.6	34	6.60	11.0	6	3	1.3	1.2	4.0	51	0.6
MAY												
13...	1000	5.8	32	7.10	13.5	6	3	0.94	1.0	4.0	50	0.7
JUL												
14...	1000	5.1	33	6.80	18.5	11	7	2.3	1.2	4.3	45	0.6
SEP												
21...	1020	4.0	32	7.20	17.0	7	3	1.1	0.97	4.0	54	0.7

DATE	POTAS-SIUM, DIS-SOLVED (MG/L AS K)	ALKA-LINITY LAB (MG/L AS CACO3)	SULFATE DIS-SOLVED (MG/L AS SO4)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)	FLUO-RIDE, DIS-SOLVED (MG/L AS F)	SILICA, DIS-SOLVED (MG/L AS SIO2)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L)	SOLIDS, DIS-SOLVED (TONS PER AC-FT)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N)	IRON, DIS-SOLVED (UG/L AS FE)	MANGA-NESE, DIS-SOLVED (UG/L AS MN)
OCT											
06...	0.60	--	16	7.6	<0.10	3.1	38	0.05	0.280	660	6
JAN											
06...	0.40	5.0	9.2	7.0	<0.10	5.9	32	0.04	<0.100	390	3
MAR											
05...	0.40	5.0	5.4	7.9	<0.10	5.7	29	0.04	<0.100	180	<3
MAY											
13...	0.20	3.0	12	7.8	<0.10	4.3	32	0.04	<0.100	260	3
JUL											
14...	0.50	4.0	--	6.6	0.10	3.8	--	--	<0.100	460	3
SEP											
21...	0.50	4.0	11	8.0	0.10	4.7	31	0.04	<0.100	470	4

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

16031000 WAIMEA RIVER NEAR WAIMEA

(National stream-quality accounting network station)

LOCATION.--Lat 21°59'02", long 159°38'47", Hydrologic Unit 20070000, on right bank 1.3 mi upstream from Makaweli River and 1.9 mi north of Waimea Post Office.

DRAINAGE AREA.--57.8 mi^2.

WATER-DISCHARGE RECORDS

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

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

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

AVERAGE DISCHARGE.--46 years (water years 1911-17, 1945-68, 1970-72, 1976-87), 124 ft^3/s (91,290 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 37,100 ft^3/s Feb. 7, 1949, gage height, 19.3 ft, from rating curve extended above 5,200 ft^3/s on basis of slope-area measurements at gage heights 10.28 ft and 16.7 ft; practically no flow occasionally owing to upstream diversions.

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

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 3,080 ft^3/s Sept. 14, gage height, 8.05 ft, no peak greater than base discharge of 8,700 ft^3/s; minimum, 3.6 ft^3/s Jan. 21.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	9.1	14	150	8.0	38	8.4	135	58	15	11	15	54
2	8.4	9.2	49	10	9.0	8.7	19	44	11	11	12	54
3	8.1	9.0	38	8.8	6.6	17	8.6	57	9.6	11	11	20
4	8.3	52	20	14	6.0	10	5.8	37	9.2	11	11	15
5	9.3	19	106	11	6.0	7.5	5.8	19	10	12	11	13
6	98	12	541	6.4	5.7	7.3	5.5	15	17	13	13	11
7	21	9.2	129	5.7	8.0	7.0	5.8	340	26	43	11	11
8	10	8.7	41	6.2	6.2	7.0	5.8	83	11	34	10	9.9
9	9.1	8.4	19	6.2	6.8	6.8	6.2	32	9.6	16	11	10
10	8.6	37	11	6.2	8.0	6.8	6.4	29	9.6	12	11	10
11	8.2	505	9.0	6.4	8.2	6.8	7.3	24	13	12	37	177
12	8.8	75	8.2	6.8	8.7	6.8	8.4	12	40	27	50	114
13	9.2	243	8.7	8.0	34	6.4	817	11	112	14	16	210
14	9.8	311	9.0	8.7	407	6.4	1160	11	25	12	11	611
15	22	57	7.3	7.3	360	6.4	320	27	182	13	10	224
16	43	392	6.4	6.8	605	8.4	130	47	27	21	10	24
17	13	221	107	7.0	82	6.2	197	48	15	14	14	8.5
18	10	40	98	123	30	7.5	210	13	13	13	115	7.6
19	216	148	23	99	12	10	63	9.2	53	14	89	13
20	244	72	8.4	8.2	110	48	18	8.6	18	14	13	8.8
21	20	28	83	4.7	246	23	76	8.1	11	12	9.0	8.7
22	8.7	20	86	5.5	78	7.3	153	8.1	10	29	8.9	615
23	7.5	11	26	8.7	24	5.8	132	95	10	56	8.9	54
24	6.8	144	8.7	6.8	11	5.8	39	821	16	16	9.9	15
25	76	55	7.0	716	61	6.8	15	82	13	29	8.9	9.5
26	31	22	6.4	84	37	47	221	84	11	20	9.2	16
27	20	62	6.0	12	14	25	434	459	11	14	9.6	44
28	45	1000	6.2	5.7	9.8	11	87	195	14	11	23	13
29	20	115	7.3	6.0	---	6.2	40	56	13	11	24	9.0
30	26	317	6.4	6.2	---	5.3	26	20	10	37	12	27
31	51	---	5.5	86	---	386	---	16	---	33	18	---
TOTAL	1085.5	4016.5	1637.5	1303.3	2236.0	726.6	4155.6	2769.0	745.0	596	622.4	2417.0
MEAN	35.0	134	52.8	42.0	79.9	23.4	139	89.3	24.8	19.2	20.1	80.6
MAX	244	1000	541	718	605	386	1160	821	182	56	115	615
MIN	6.8	8.4	5.5	4.7	5.7	5.3	5.5	8.1	9.2	11	8.9	7.6
AC-FT	2150	7970	3250	2590	4440	1440	8240	5490	1480	1180	1230	4790

CAL YR 1986	TOTAL	24344.9	MEAN	66.7	MAX	1920	MIN	5.5	AC-FT	48290
WTR YR 1987	TOTAL	22310.4	MEAN	61.1	MAX	1160	MIN	4.7	AC-FT	44250

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 1986 TO SEPTEMBER 1987

DATE	TIME	BAROMETRIC PRESSURE (MM OF HG)	STREAMFLOW, INSTANTANEOUS (CFS)	SPECIFIC CONDUCTANCE (US/CM)	PH (STANDARD UNITS)	TEMPERATURE WATER (DEG C)	TURBIDITY (FTU)	OXYGEN, DISSOLVED (MG/L)	OXYGEN, DISSOLVED (PERCENT SATURATION)
OCT									
21...	1030	765	21	90	7.30	21.0	5.2	6.6	96
DEC									
15...	1030	740	7.5	135	7.80	21.0	4.5	--	92
FEB									
09...	1000	764	6.8	160	7.70	19.0	3.1	9.5	102
APR									
13...	1130	765	720	48	7.10	18.0	12	9.5	100
JUN									
16...	0945	--	13	--	--	22.0	--	--	--
AUG									
10...	1030	764	12	146	8.20	24.0	3.1	8.9	106

DATE	TIME	COLIFORM, FECAL, 0.7 UM-MF (COLS./100 ML)	STREPTOCOCCI FECAL, KF AGAR (COLS. PER 100 ML)	HARDNESS TOTAL (MG/L AS CACO3)	HARDNESS NONCARBONATE MG/L AS CACO3	CALCIUM DISSOLVED (MG/L AS CA)	MAGNESIUM, DISSOLVED (MG/L AS MG)	SODIUM, DISSOLVED (MG/L AS NA)	SODIUM PERCENT	SODIUM ADSORPTION RATIO
OCT										
21...	1030	590	2500	40	8	7.0	5.5	6.1	24	0.4
DEC										
15...	1030	590	750	54	2	6.7	9.1	8.2	24	0.5
FEB										
09...	1000	400	710	65	4	7.9	11	9.1	23	0.5
APR										
13...	1130	5100	5200	14	5	2.0	2.2	4.8	41	0.6
AUG										
10...	1030	--	--	58	0	7.3	9.6	8.6	24	0.5

DATE	POTASSIUM, DISSOLVED (MG/L AS K)	BICARBONATE WATER TOTAL FIELD (MG/L AS HCO3)	ALKALINITY LAB (MG/L AS CACO3)	ALKALINITY WH WAT TOT FLD (MG/L AS CACO3)	SULFATE DISSOLVED (MG/L AS SO4)	CHLORIDE, DISSOLVED (MG/L AS CL)	FLUORIDE, DISSOLVED (MG/L AS F)	SILICA, DISSOLVED (MG/L AS SIO2)	SOLIDS, RESIDUE AT 180 DEG. C DISSOLVED (MG/L)	SOLIDS, SUM OF CONSTITUENTS, DISSOLVED (MG/L)	SOLIDS, DISSOLVED (TONS PER AC-FT)
OCT											
21...	0.90	39	33	32	11	8.3	<0.10	17	80	76	0.11
DEC											
15...	0.80	64	52	52	5.2	11	<0.10	24	98	97	0.13
FEB											
09...	0.80	74	63	61	5.4	13	<0.10	26	102	110	0.14
APR											
13...	0.60	11	10	9	7.7	8.1	<0.10	7.3	36	36	0.05
AUG											
10...	0.70	--	59	--	3.3	10	0.10	24	93	99	0.13

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

16031000 WAIMEA RIVER NEAR WAIMEA--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	NITROGEN, NO2+NO3 DISSOLVED (MG/L AS N)	NITROGEN, NITRITE DISSOLVED (MG/L AS N)	NITROGEN, AMMONIA TOTAL (MG/L AS N)	NITROGEN, AMMONIA DISSOLVED (MG/L AS N)	NITROGEN,AMMONIA + ORGANIC TOTAL (MG/L AS N)	PHOSPHOROUS TOTAL (MG/L AS P)	PHOSPHOROUS DISSOLVED (MG/L AS P)	PHOSPHOROUS ORTHO, DISSOLVED (MG/L AS P)
DEC									
15...	1030	<0.100	<0.010	0.030	0.040	0.50	<0.010	<0.010	<0.010
FEB									
09...	1000	<0.100	<0.010	<0.010	<0.010	0.50	0.300	0.010	<0.010
APR									
13...	1130	<0.100	<0.010	0.020	0.010	0.80	0.050	0.010	<0.010
AUG									
10...	1030	<0.100	<0.010	0.040	0.040	0.50	0.070	0.010	<0.010

DATE	ALUMINUM, DISSOLVED (UG/L AS AL)	ARSENIC DISSOLVED (UG/L AS AS)	BARIUM, DISSOLVED (UG/L AS BA)	BERYLLIUM, DISSOLVED (UG/L AS BE)	CADMIUM DISSOLVED (UG/L AS CD)	CHROMIUM, DISSOLVED (UG/L AS CR)	COBALT, DISSOLVED (UG/L AS CO)	COPPER, DISSOLVED (UG/L AS CU)	IRON, DISSOLVED (UG/L AS FE)	LEAD, DISSOLVED (UG/L AS PB)
OCT										
21...	190	<1	11	<0.5	1	<1	<3	8	290	<5
FEB										
09...	100	<1	12	<0.5	<1	2	<3	4	340	<5
APR										
13...	80	<1	11	<0.5	<1	<1	<3	3	210	<5
AUG										
10...	30	<1	7	0.7	<1	<1	<3	1	140	<5

DATE	LITHIUM DISSOLVED (UG/L AS LI)	MANGANESE, DISSOLVED (UG/L AS MN)	MERCURY DISSOLVED (UG/L AS HG)	MOLYBDENUM, DISSOLVED (UG/L AS MO)	NICKEL, DISSOLVED (UG/L AS NI)	SELENIUM, DISSOLVED (UG/L AS SE)	SILVER, DISSOLVED (UG/L AS AG)	STRONTIUM, DISSOLVED (UG/L AS SR)	VANADIUM, DISSOLVED (UG/L AS V)	ZINC, DISSOLVED (UG/L AS ZN)
OCT										
21...	<4	16	0.4	<10	3	<1	<1.0	28	<6	36
FEB										
09...	<4	19	2.9	<10	<1	<1	<1.0	49	<6	8
APR										
13...	<4	14	0.7	<10	1	<1	<1.0	14	<6	12
AUG										
10...	5	21	0.2	<10	1	<1	<1.0	46	<6	<3

DATE	TIME	SEDIMENT, SUSPENDED (MG/L)	SEDIMENT, DISCHARGE, SUSPENDED (T/DAY)	SED. SUSP. SIEVE DIAM. % FINER THAN .062	DATE	TIME	SEDIMENT, SUSPENDED (MG/L)	SEDIMENT, DISCHARGE, SUSPENDED (T/DAY)	SED. SUSP. SIEVE DIAM. % FINER THAN .062
OCT					FEB				
21...	1030	8	0.45	100	09...	1000	4	0.07	100
DEC					APR				
15...	1030	5	0.10	100	13...	1130	62	121	100

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

16036000 MAKAWELI RIVER NEAR WAIMEA

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

DRAINAGE AREA.--26.0 mi^2.

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

REVISED RECORDS.--WSP 2137: Drainage area.

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

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

AVERAGE DISCHARGE.--44 years, 85.5 ft^3/s (61,940 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 28,000 ft^3/s Jan. 31, 1975, gage height, 15.51 ft, from rating curve extended above 3,200 ft^3/s on basis of slope-area measurement at gage height 10.65 ft; minimum, 3.15 ft^3/s July 19, 1951.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 1,620 ft^3/s Sept. 14, gage height, 4.86 ft, no peak greater than base discharge of 4,700 ft^3/s; minimum, 7.3 ft^3/s Aug. 9.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	22	19	74	13	19	11	20	65	13	11	11	19
2	20	18	50	13	13	12	13	19	13	9.5	9.7	14
3	65	68	30	28	12	15	12	18	8.8	8.6	9.8	13
4	22	60	23	19	12	12	11	16	8.8	8.9	8.8	11
5	87	24	48	14	11	11	9.5	14	100	9.8	8.0	9.9
6	75	22	63	13	11	11	9.5	13	91	83	8.1	11
7	26	19	32	12	11	11	9.8	18	18	57	8.2	9.8
8	18	18	27	12	11	11	9.7	17	13	20	7.8	9.0
9	19	17	23	11	11	11	9.6	14	34	16	7.7	8.9
10	16	17	21	11	12	11	9.9	14	14	11	15	9.1
11	16	36	20	11	12	11	24	14	12	22	103	277
12	17	69	43	13	13	10	12	13	48	14	43	57
13	16	533	26	13	26	10	39	13	29	11	11	34
14	16	510	19	12	122	10	212	12	98	14	8.9	380
15	52	121	18	11	125	11	64	13	58	10	8.1	141
16	26	507	51	11	145	10	38	98	17	11	8.1	e35
17	22	192	74	11	25	90	64	19	13	10	19	e19
18	29	118	51	11	18	53	97	13	12	20	29	e42
19	88	321	21	15	14	15	25	12	18	14	25	e17
20	44	117	17	14	19	98	18	11	12	10	12	e10
21	20	127	18	13	22	20	27	12	11	9.6	9.3	e70
22	17	72	52	16	16	13	70	14	11	40	9.0	e105
23	16	154	19	16	14	11	70	62	16	14	8.8	e25
24	15	215	16	15	12	21	23	205	13	229	9.4	e14
25	45	103	15	54	13	20	18	22	12	53	8.4	e11
26	21	72	15	22	13	12	17	15	11	15	9.1	e10
27	25	119	15	13	12	11	42	24	57	12	25	e10
28	20	279	14	12	12	10	21	22	14	11	11	10
29	18	84	15	12	---	9.9	16	16	12	14	10	e10
30	49	127	13	11	---	9.9	15	63	11	57	8.9	e9.6
31	30	---	13	39	---	50	---	40	---	16	11	---
TOTAL	972	4158	936	491	754	621.8	1026.0	921	798.6	841.4	480.9	1401.3
MEAN	31.4	139	30.2	15.8	26.9	20.1	34.2	29.7	26.6	27.1	15.5	46.7
MAX	88	533	74	54	145	98	212	205	100	229	103	380
MIN	15	17	13	11	11	9.9	9.5	11	8.8	8.6	7.7	8.9
AC-FT	1930	6250	1860	974	1500	1230	2040	1830	1580	1670	954	2780

CAL YR 1986	TOTAL	22178.5	MEAN	60.6	MAX	1540	MIN	9.6	AC-FT	43990
WTR YR 1987	TOTAL	13402.0	MEAN	36.7	MAX	533	MIN	7.7	AC-FT	26580

e Estimated

16049000 HANAPEPE RIVER BELOW MANUAHI STREAM, NEAR ELEELE

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

DRAINAGE AREA.--18.5 mi^2.

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

REVISED RECORDS.--WSP 740: 1931. WSP 1719: 1929-31(M). WSP 1937: 1918, 1919(M), 1920, 1921(M), 1927-28(M), 1930, 1936-37(M), 1941(P), 1943-46(P), 1947(M), 1948-52(P), 1955(M), 1956-57(P), 1958(M), 1980(M). WSP 2137: Drainage area.

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

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

AVERAGE DISCHARGE.--63 years (water years 1918-20, 1928-87), 84.7 ft^3/s (61,370 acre-ft/yr).

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

EXTREMES FOR CURRENT YEAR.--Maximum discharge 1,860 ft^3/s Sept. 14, gage height 4.58 ft, no peak greater than base discharge of 3,600 ft^3/s; minimum 13 ft^3/s for many days.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	44	18	55	16	15	15	14	75	14	15	16	21
2	24	29	42	16	15	15	13	15	15	15	15	17
3	170	175	35	30	15	15	14	15	14	15	16	16
4	37	79	28	16	14	15	13	15	14	16	15	16
5	155	26	36	16	14	15	13	14	177	18	15	18
6	116	20	31	16	14	15	13	14	136	174	15	16
7	43	17	23	16	14	15	14	15	16	157	15	15
8	27	16	22	15	15	15	13	14	14	41	15	15
9	21	18	44	16	15	15	14	15	72	34	15	15
10	25	16	57	15	15	15	14	15	19	20	22	16
11	22	56	19	15	15	15	129	15	15	76	160	287
12	18	53	84	15	16	14	14	15	36	25	99	74
13	19	588	39	16	19	13	30	15	21	17	19	25
14	17	896	18	15	149	14	226	15	178	31	15	538
15	72	228	17	15	146	14	81	15	75	29	15	143
16	24	803	73	15	111	13	49	96	18	23	30	43
17	25	278	95	18	21	45	89	13	18	18	56	32
18	62	157	77	15	16	33	139	13	32	47	91	72
19	43	462	25	15	15	13	32	13	39	21	48	23
20	25	151	20	15	16	48	18	13	16	16	19	17
21	17	189	19	15	15	14	18	14	15	27	15	149
22	18	150	80	16	15	13	22	14	15	92	15	184
23	18	284	20	15	15	13	16	21	43	22	15	31
24	16	222	18	15	15	15	15	69	23	406	15	20
25	40	131	18	17	15	26	15	14	15	123	15	18
26	20	73	17	15	15	15	15	13	15	51	19	17
27	38	134	17	15	15	13	17	15	93	21	42	17
28	30	289	16	15	15	13	15	14	16	21	35	17
29	17	86	16	15	---	13	37	14	15	29	16	17
30	37	104	18	15	---	14	40	40	15	144	15	18
31	20	---	18	35	---	20	---	24	---	33	21	---
TOTAL	1256	5524	1073	512	790	541	1152	882	1204	1777	934	1903
MEAN	40.5	184	34.6	16.5	28.2	17.5	38.4	22.0	40.1	57.3	30.1	63.4
MAX	170	803	95	35	149	48	226	96	178	408	160	538
MIN	16	18	18	15	14	13	13	13	14	15	15	15
AC-FT	2490	10960	2130	1020	1570	1070	2280	1350	2390	3520	1850	3770

CAL YR 1986	TOTAL	28641	MEAN	78.5	MAX	1600	MIN	10	AC-FT	56810
WTR YR 1987	TOTAL	17348	MEAN	47.5	MAX	803	MIN	13	AC-FT	34410

16060000 SOUTH FORK WAILUA RIVER NEAR LIHUE

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

DRAINAGE AREA.--22.4 mi^2.

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

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

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

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

AVERAGE DISCHARGE.--70 years (water years 1913-18, 1920, 1922-24, 1926-56, 1959-87), 114 ft^3/s (82,590 acre-ft/yr).

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

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 11,280 ft^3/s July 23, gage height, 16.22 ft, no other peak greater than base discharge of 5,800 ft^3/s; minimum, 3.8 ft^3/s for few days.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	51	31	63	15	8.2	5.2	7.7	67	30	7.1	46	59
2	29	52	43	9.8	6.0	5.0	5.2	21	39	6.4	31	38
3	179	81	34	30	5.5	5.1	4.8	9.1	8.1	6.0	40	17
4	70	80	24	22	5.4	4.9	4.5	9.0	6.3	6.0	45	8.9
5	128	43	19	10	5.2	4.9	4.3	8.0	338	6.6	10	6.5
6	143	38	27	11	5.1	4.8	4.3	7.6	200	105	9.0	6.2
7	84	35	14	11	5.1	4.7	4.0	30	81	180	8.3	5.9
8	50	31	13	9.8	5.0	4.5	4.7	15	42	70	8.3	5.5
9	37	28	12	9.1	4.9	4.8	3.9	7.3	86	70	8.1	5.3
10	17	174	12	8.1	5.0	4.9	4.0	10	42	44	15	5.3
11	9.9	370	14	7.7	4.8	4.9	148	11	29	89	108	122
12	13	159	89	7.8	5.0	4.8	33	8.3	23	50	153	84
13	9.5	509	98	7.6	7.6	5.0	7.4	6.0	48	28	28	20
14	9.3	488	25	7.4	52	5.1	123	6.0	73	50	12	298
15	32	199	19	7.5	140	5.0	103	8.0	124	73	9.3	127
16	15	524	23	7.2	191	5.0	53	378	43	99	11	45
17	9.1	274	98	6.7	48	4.9	92	68	37	42	73	11
18	78	192	103	7.4	13	7.4	156	23	19	75	178	65
19	62	415	38	7.8	7.3	5.5	69	11	67	82	123	13
20	33	180	28	6.3	7.5	7.3	53	9.0	20	36	58	7.6
21	11	242	27	6.1	7.8	7.1	33	8.6	12	40	33	17
22	8.8	156	102	6.3	7.1	5.0	65	8.7	10	225	27	305
23	7.9	249	38	6.5	7.2	4.7	72	31	36	486	26	69
24	7.8	258	25	6.1	6.8	5.1	37	220	39	1480	15	45
25	49	145	28	8.5	5.8	13	12	54	24	344	7.7	44
26	11	90	25	8.6	5.7	23	13	9.3	11	161	14	55
27	27	76	19	6.2	5.5	11	82	20	80	93	45	35
28	20	223	19	6.3	5.3	5.2	25	33	27	71	37	28
29	14	84	15	6.2	---	4.1	16	28	18	53	18	22
30	11	101	11	5.9	---	4.2	13	57	7.1	238	8.1	32
31	13	---	11	11	---	5.8	---	67	---	66	13	---
TOTAL	1219.1	5523	1116	286.5	580.8	191.9	1232.8	1240.9	1595.5	4342.1	1215.8	1562.2
MEAN	39.3	184	36.0	9.24	20.7	8.19	41.1	40.0	53.2	140	39.2	52.7
MAX	179	524	103	30	191	23	158	378	338	1480	178	305
MIN	7.8	28	11	5.9	4.8	4.1	3.9	6.0	6.3	6.0	7.7	5.3
AC-FT	2420	10950	2210	568	1150	361	2450	2460	3160	8610	2410	3140

CAL YR 1986 TOTAL 30072.9 MEAN 82.4 MAX 1410 MIN 2.8 AC-FT 59650
WTR YR 1987 TOTAL 20128.4 MEAN 55.1 MAX 1480 MIN 3.9 AC-FT 39920

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 except for estimated daily discharges, which are fair. Ditch diverts from North Fork Wailua River and Waikoko Stream for power and irrigation in vicinity of Lihue. Periodic determinations of water temperature for the current year are published elsewhere in this report.

AVERAGE DISCHARGE.--22 years, 23.3 ft^3/s (16,880 acre-ft/yr).

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

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 33 ft^3/s Nov. 14; minimum daily, 14 ft^3/s Dec. 11.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	29	24	27	e23	20	20	25	27	26	23	21	23
2	28	26	26	e22	20	20	22	28	26	22	21	23
3	31	29	24	e26	e20	19	21	26	25	21	20	23
4	29	27	23	e23	e19	19	20	26	24	23	19	22
5	30	24	25	e22	e19	19	20	25	29	24	18	22
6	30	23	24	e22	e19	19	20	25	28	27	18	21
7	29	22	23	e21	e19	19	24	27	26	27	22	21
8	29	22	22	e20	e19	19	20	26	26	26	22	21
9	28	21	22	e20	e19	19	22	26	27	27	23	21
10	27	26	22	e20	e19	18	23	25	26	26	24	21
11	28	30	14	e20	e19	16	29	24	26	27	26	27
12	28	29	23	e21	e21	18	26	23	27	26	28	24
13	26	32	e30	e20	e24	16	27	23	27	26	25	23
14	27	33	e26	e20	e30	19	28	24	26	26	23	26
15	30	30	e27	e20	e32	19	27	23	27	26	23	24
16	28	32	e31	19	e29	19	27	30	26	27	25	23
17	29	30	e32	19	e25	20	27	27	26	27	27	25
18	31	29	e32	22	e24	22	27	26	26	28	28	26
19	30	32	e29	20	e24	21	26	25	26	27	25	24
20	29	30	e29	19	e22	24	26	25	25	27	24	23
21	29	30	e32	20	e22	20	27	23	24	27	23	25
22	26	30	e32	22	e23	19	26	22	24	29	22	30
23	26	31	e30	19	e25	19	26	26	26	32	22	26
24	25	30	e28	19	e23	24	26	28	26	32	22	24
25	30	29	e27	27	e22	25	25	26	24	28	22	25
26	29	28	e26	21	e22	25	27	26	24	24	23	24
27	29	26	e25	22	21	22	28	27	27	23	23	21
28	29	29	e26	22	20	20	26	26	25	22	23	20
29	27	27	e24	20	---	20	26	26	24	23	22	21
30	27	29	e24	20	---	21	26	27	24	27	21	23
31	25	---	e25	25	---	25	---	26	---	22	22	---
TOTAL	862	842	812	656	621	629	750	792	775	804	709	702
MEAN	28.5	28.1	26.2	21.2	22.2	20.3	25.0	25.5	25.8	25.9	22.9	23.4
MAX	31	33	32	27	32	25	29	30	29	32	28	30
MIN	25	21	14	19	19	16	20	22	24	21	18	20
AC-FT	1750	1670	1610	1300	1230	1250	1490	1570	1540	1590	1410	1390

CAL YR 1986	TOTAL	9734	MEAN	26.7	MAX	38	MIN	14	AC-FT	19310
WTR YR 1987	TOTAL	8974	MEAN	24.6	MAX	33	MIN	14	AC-FT	17800

e Estimated

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 1938 to current year.

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

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

AVERAGE DISCHARGE.--50 years (water years 1938-87), 11.0 ft^3/s (7,970 acre-ft/yr).

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

EXTREMES FOR CURRENT YEAR.--Maxiumum daily discharge, 45 ft^3/s Dec. 12; no flow for many days.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.80	28	.36	1.0	28	28	32	1.0	.65	.36	.00	.11
2	.80	29	.38	1.0	28	28	30	1.0	.85	4.5	.00	.11
3	.80	31	.36	1.0	28	28	30	1.0	.65	6.8	.00	.11
4	.80	30	.38	1.0	27	27	28	1.0	23	8.5	.00	.11
5	.80	30	.36	18	27	27	27	1.0	41	8.5	.00	.11
6	.80	28	.38	30	27	27	28	1.0	40	6.5	.00	.11
7	.85	10	.36	29	27	26	23	1.0	38	2.8	.00	.11
8	.85	1.2	.38	28	26	28	8.6	1.0	38	.50	.00	.11
9	.85	.80	.36	28	26	28	15	.80	12	.50	.00	.11
10	.65	28	22	28	26	28	31	.80	1.0	.50	.00	.11
11	.85	18	38	28	26	28	38	.80	1.0	.50	.00	27
12	.65	.80	45	29	28	28	32	.80	.80	.50	.01	21
13	.65	.80	40	28	30	28	34	.80	.85	.50	.00	17
14	.85	.65	38	28	38	28	12	.80	.50	.50	.00	5.9
15	.65	.85	34	28	40	28	1.8	15	.50	.50	.00	.80
18	.65	.85	10	28	38	28	1.6	32	.50	.36	.00	.85
17	.65	.65	1.2	28	34	28	1.6	28	.50	.36	.02	.50
18	.65	.50	1.2	33	32	30	1.6	28	.50	.36	1.7	.50
19	.80	.50	1.0	30	32	28	1.4	28	.50	.36	.11	.36
20	.65	.50	1.2	28	30	31	1.4	28	.50	.36	.11	.36
21	.65	.36	1.2	28	30	28	29	27	.50	.36	.11	.36
22	.65	.36	1.2	30	30	27	13	27	.50	.50	.11	.36
23	.65	.36	1.2	28	32	26	1.6	30	.50	1.4	.11	.36
24	.65	.38	1.0	28	30	31	1.4	32	.36	.22	.11	.36
25	.80	.36	1.0	38	30	30	1.4	9.6	.36	.11	.11	.36
26	.80	.36	1.0	30	29	33	1.6	1.2	.36	.05	.11	.22
27	26	.36	1.0	30	28	31	1.6	1.2	.36	.02	.11	.22
28	32	.36	1.0	30	25	30	1.4	1.2	.36	.01	.11	.22
29	29	.36	1.0	28	---	26	1.2	1.0	.36	.01	.11	.11
30	29	.36	1.0	26	---	29	1.0	1.0	.36	.05	.11	.11
31	28	---	1.0	32	---	34	---	.80	---	.02	.11	---
TOTAL	162.25	241.30	244.44	783.0	632	887	429.2	303.80	200.92	42.31	3.16	77.65
MEAN	5.23	8.04	7.69	25.3	29.7	28.6	14.3	9.80	6.70	1.36	.10	2.59
MAX	32	31	45	36	40	34	36	32	41	6.8	1.7	27
MIN	.65	.38	.36	1.0	25	26	1.0	.80	.36	.01	.00	.11
AC-FT	322	479	465	1550	1650	1760	851	603	399	64	6.3	154

CAL YR 1986	TOTAL	3462.80	MEAN	9.54	MAX	62	MIN	.12	AC-FT	6910
WTR YR 1987	TOTAL	4207.23	MEAN	11.5	MAX	45	MIN	.00	AC-FT	6350

16066000 EAST BRANCH OF NORTH FORK WAILUA RIVER NEAR LIHUE

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

DRAINAGE AREA.--6.27 mi^2.

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

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

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

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

AVERAGE DISCHARGE.--72 years (water years 1913-14, 1916-17, 1920-87), 48.0 ft^3/s (34,780 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 16,400 ft^3/s Nov. 12, 1955, gage height, 14.7 ft, from floodmarks, from rating curve extended above 2,700 ft^3/s; minimum, 6.8 ft^3/s July 3, 13, 1926.

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

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Nov. 10	2130	2,270	6.24	July 24	0200	*2,430	*6.38

Minimum discharge, 13 ft^3/s Feb. 11,12.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	40	28	57	20	16	17	26	54	44	27	40	29
2	38	39	48	19	15	17	17	34	40	25	38	31
3	49	38	44	24	15	18	15	33	35	24	37	24
4	34	38	40	20	15	16	14	29	32	23	31	20
5	85	28	38	18	14	16	14	28	88	26	29	20
6	53	26	36	18	14	16	14	41	87	46	28	18
7	37	24	32	18	14	15	18	91	47	57	28	17
8	51	22	30	17	14	15	14	37	40	34	24	16
9	43	21	29	17	14	15	15	30	40	32	28	15
10	34	303	28	18	14	15	14	29	37	30	27	15
11	43	268	27	17	13	14	118	26	34	37	49	43
12	32	126	34	16	17	14	32	25	66	29	66	31
13	32	142	32	18	27	14	78	24	51	27	31	34
14	30	111	28	16	101	14	139	27	50	32	26	37
15	50	93	24	15	125	14	86	25	43	35	24	28
16	32	169	38	15	103	14	57	84	37	33	34	23
17	38	112	40	15	38	16	78	40	35	32	67	23
18	73	82	43	51	29	21	84	30	36	37	51	31
19	142	119	27	21	26	18	44	27	37	38	44	23
20	95	87	26	16	36	18	40	26	31	29	30	19
21	45	101	44	16	46	15	73	25	30	36	27	81
22	38	74	52	18	27	14	84	23	29	153	27	121
23	34	89	29	16	27	14	42	94	38	319	25	37
24	32	102	28	15	23	14	34	195	32	649	23	31
25	121	74	25	70	21	18	30	52	29	124	21	47
26	48	60	24	23	20	42	143	54	28	75	24	30
27	61	77	22	20	18	21	118	68	70	57	29	35
28	47	104	24	18	18	14	51	48	32	46	27	32
29	36	60	21	23	---	14	41	38	27	54	21	32
30	32	98	20	17	---	14	35	80	32	82	19	76
31	30	---	21	18	---	58	---	49	---	48	21	---
TOTAL	1535	2713	1007	639	860	551	1526	1464	1255	2292	992	999
MEAN	49.5	90.4	32.5	20.6	30.7	17.8	50.9	47.2	41.8	73.9	32.0	33.3
MAX	142	303	57	70	125	58	143	195	88	649	67	121
MIN	30	21	20	15	13	14	14	23	28	23	19	15
AC-FT	3040	5380	2000	1270	1710	1090	3030	2900	2490	4550	1970	1980

CAL YR 1986	TOTAL	17600.5	MEAN	48.2	MAX	405	MIN	8.0	AC-FT	34910
WTR YR 1987	TOTAL	15833	MEAN	43.4	MAX	649	MIN	13	AC-FT	31400

16069000 WAILUA DITCH NEAR KAPAA

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

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

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

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

AVERAGE DISCHARGE.--50 years (water years 1938-87), 15.9 ft^3/s (11,520 acre-ft/yr).

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

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 37 ft^3/s for several days in Oct.; minimum daily, 2.6 ft^3/s Oct. 13.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	20	36	16	17	19	28	22	15	15	29	31	30
2	19	36	16	15	18	28	22	14	15	29	31	31
3	18	35	16	17	18	23	22	14	15	29	30	31
4	17	30	16	17	18	20	22	14	15	29	30	31
5	16	27	16	17	19	20	22	13	22	29	30	30
6	5.4	28	16	17	18	20	21	10	23	29	30	30
7	9.1	28	15	16	18	20	21	16	23	29	30	30
8	20	28	15	17	18	20	21	15	23	29	29	30
9	19	29	15	17	29	20	21	16	24	29	28	30
10	16	29	15	17	34	20	21	17	24	29	29	30
11	8.1	31	15	17	33	20	22	18	24	29	29	30
12	4.4	19	15	17	32	20	23	18	25	29	29	30
13	2.6	13	15	17	32	19	23	19	25	29	29	30
14	20	12	15	17	32	19	22	20	25	29	29	31
15	32	12	15	17	33	19	21	20	26	29	29	31
16	36	11	15	17	34	19	20	21	26	21	30	31
17	37	10	16	17	30	19	20	21	28	32	30	31
18	37	11	16	18	28	19	19	21	26	32	31	31
19	37	11	18	18	28	19	18	21	20	31	32	31
20	37	9.4	16	18	29	19	17	21	27	31	32	31
21	36	15	18	26	29	20	18	21	28	31	32	31
22	36	15	16	33	29	19	19	21	28	31	31	31
23	36	16	16	32	29	19	20	20	28	32	31	32
24	36	16	16	32	29	19	21	21	28	32	31	32
25	37	16	16	31	29	19	22	20	28	32	31	32
26	36	18	15	25	29	20	22	20	28	32	31	32
27	36	16	21	18	29	21	19	19	28	32	31	32
28	36	16	21	18	28	21	13	18	28	31	31	32
29	36	18	20	18	---	21	12	17	26	31	30	32
30	36	16	18	18	---	20	10	17	29	31	30	17
31	36	---	17	19	---	21	---	18	---	31	30	---
TOTAL	807.6	603.4	502	610	751	631	596	554	730	926	937	913
MEAN	26.1	20.1	16.2	19.7	26.8	20.4	19.9	17.9	24.3	29.9	30.2	30.4
MAX	37	36	21	33	34	28	23	21	29	32	32	32
MIN	2.6	9.4	15	15	18	19	10	10	15	21	28	17
AC-FT	1600	1200	996	1210	1490	1250	1180	1100	1450	1840	1860	1810

CAL YR 1986	TOTAL	8161.47	MEAN	22.4	MAX	37	MIN	.03	AC-FT	16190
WTR YR 1987	TOTAL	8563.0	MEAN	23.5	MAX	37	MIN	2.6	AC-FT	16980

16071000 NORTH FORK WAILUA RIVER NEAR KAPAA

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

DRAINAGE AREA.--17.9 mi^2.

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

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

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

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

AVERAGE DISCHARGE.--35 years, 122 ft^3/s (88,390 acre-ft/yr).

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

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 6,520 ft^3/s July 23, gage height, 8.44 ft, no other peak greater than base discharge of 4,100 ft^3/s; minimum, 6.8 ft^3/s for several days in Mar. and Apr.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	102	20	142	52	12	10	17	157	98	47	85	40
2	97	34	118	49	10	8.1	8.1	106	87	39	79	49
3	150	88	105	85	10	7.7	8.1	103	75	34	77	44
4	97	60	96	56	10	7.7	7.7	94	52	35	84	35
5	164	28	101	44	9.5	8.6	6.9	92	200	39	58	32
6	148	21	98	32	9.0	11	6.9	106	187	108	57	32
7	100	24	83	24	9.0	9.0	7.3	209	69	109	44	29
8	109	36	78	12	9.0	9.0	8.1	93	47	71	43	27
9	100	36	75	11	9.0	8.6	6.9	63	83	75	44	25
10	87	385	65	11	9.0	8.1	6.9	60	68	59	48	27
11	99	650	43	11	8.1	7.7	184	51	61	90	116	113
12	90	318	109	11	8.6	7.7	39	47	142	58	165	49
13	53	499	82	12	17	7.7	107	43	122	51	57	39
14	19	494	50	12	127	7.7	224	48	109	70	41	119
15	44	302	35	12	187	7.7	162	47	92	91	36	72
16	24	485	48	12	223	7.7	135	284	68	88	49	48
17	37	301	104	12	38	8.6	171	89	70	65	131	45
18	121	209	106	45	20	18	189	53	59	88	165	72
19	228	353	72	26	14	9.0	120	43	71	74	129	44
20	133	231	67	16	25	9.9	100	37	52	80	67	37
21	74	305	96	14	45	9.0	93	35	51	72	53	106
22	63	213	138	14	17	8.1	117	33	47	310	51	308
23	63	278	76	12	20	8.6	79	124	61	780	47	79
24	51	294	66	10	14	8.6	63	347	72	1580	42	61
25	199	193	64	72	12	9.9	55	120	52	325	39	70
26	79	158	63	18	11	30	217	138	46	177	46	57
27	96	167	63	11	9.9	9.0	266	185	140	136	52	62
28	44	249	86	11	9.0	6.9	144	127	61	108	46	82
29	32	146	63	11	---	6.9	124	110	49	116	37	52
30	26	208	54	11	---	6.9	107	182	54	223	32	124
31	23	---	53	15	---	50	---	133	---	110	31	---
TOTAL	2750	6763	2477	724	902.1	333.4	2799.9	3339	2465	5266	2033	1959
MEAN	88.7	225	79.9	23.4	32.2	10.6	93.3	108	82.2	170	65.6	65.3
MAX	228	650	142	72	223	50	286	347	200	1580	165	308
MIN	19	20	35	10	8.1	6.9	6.9	33	46	34	31	25
AC-FT	5450	13410	4910	1440	1790	661	5550	6620	4890	10450	4030	3890

CAL YR 1986	TOTAL	37733.0	MEAN	103	MAX	891	MIN	3.8	AC-FT	74840
WTR YR 1987	TOTAL	31611.4	MEAN	87.2	MAX	1580	MIN	6.9	AC-FT	63100

16071500 LEFT BRANCH OPAEKAA STREAM NEAR KAPAA

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

DRAINAGE AREA.--0.65 mi^2.

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

REVISED RECORDS.--WSP 2137: Drainage area.

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

REMARKS.--Records good. No diversion upstream. Recording rain gaga located at station. Periodic determinations of water temperature for the current year are published elsewhere in tha report.0

AVERAGE DISCHARGE.--27 years, 2.56 ft^3/s (1,850 acre-ft/yr).

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

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

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Nov. 10	2100	*194	*3.30	July 23	2200	75	2.35

Minimum discharge, 0.72 ft^3/s Apr. 9, 10.

DISCHARGE, IN CUBIC PEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.0	1.8	3.8	2.0	1.1	.93	.93	2.0	1.8	1.4	2.4	1.5
2	2.2	2.0	3.6	1.8	1.1	.86	.86	1.7	1.8	1.4	2.4	1.6
3	2.0	2.0	3.4	1.8	1.1	.86	.86	1.6	1.6	1.4	2.4	1.6
4	2.0	2.0	3.2	1.8	1.1	.86	.86	1.6	1.6	1.4	2.2	1.6
5	2.5	1.8	3.2	1.8	1.0	.86	.79	1.5	2.2	1.4	2.2	1.6
6	2.5	1.8	3.2	1.8	1.0	.86	.79	1.5	2.0	1.8	2.2	1.5
7	2.0	1.8	3.1	1.8	1.0	.86	.79	2.6	1.8	1.8	2.0	1.4
8	2.0	1.7	2.9	1.8	1.0	.79	.79	1.8	1.7	1.7	2.0	1.4
9	2.0	1.7	2.8	1.7	1.0	.79	.72	1.7	1.8	1.6	2.0	1.4
10	1.6	24	2.7	1.6	1.0	.79	.72	1.6	1.8	1.8	2.0	1.4
11	2.0	16	2.7	1.5	.93	.79	.79	1.6	1.5	1.8	2.4	1.8
12	1.8	6.6	2.8	1.5	.93	.79	1.2	1.6	1.5	1.7	2.5	1.6
13	1.8	5.3	2.7	1.5	1.3	.79	1.2	1.5	1.8	1.7	2.0	1.5
14	1.8	4.6	2.8	1.4	1.7	.79	1.6	1.5	1.7	1.8	1.8	1.5
15	2.0	4.3	2.6	1.4	2.2	.79	1.5	1.5	1.7	1.7	1.8	1.4
16	1.8	5.5	2.6	1.4	2.0	.86	1.1	2.7	1.8	1.7	1.7	1.4
17	1.8	4.8	2.7	1.5	1.5	.79	1.2	2.2	1.5	1.6	1.8	1.3
18	1.8	4.4	2.7	1.8	1.3	.79	1.5	1.8	1.6	1.6	2.0	1.3
19	2.2	5.0	2.5	1.8	1.2	.79	1.2	1.7	1.7	1.6	1.8	1.2
20	2.0	4.4	2.4	1.4	1.2	.86	1.2	1.7	1.4	1.6	1.7	1.2
21	1.8	4.1	2.2	1.4	1.2	.88	2.0	1.6	1.4	1.6	1.6	2.0
22	1.8	3.9	2.6	1.4	1.2	.79	2.2	1.6	1.4	2.9	1.6	2.6
23	1.8	4.3	2.2	1.4	1.1	.86	1.6	1.8	1.4	10	1.6	1.7
24	1.8	4.8	2.2	1.4	1.0	.93	1.4	2.8	1.4	8.7	1.6	1.6
25	3.9	4.3	2.2	1.7	.98	.93	1.4	1.8	1.3	4.1	1.6	1.7
26	2.2	3.9	2.0	1.4	.93	1.4	2.4	1.8	1.3	3.2	1.7	1.6
27	2.0	4.1	2.0	1.4	.93	.93	2.9	2.0	1.7	2.9	1.7	2.3
28	2.0	4.6	2.0	1.3	.93	.86	2.0	1.8	1.4	2.6	1.8	2.2
29	2.0	3.9	2.0	1.2	---	.79	1.8	1.8	1.3	2.5	1.5	1.8
30	1.8	4.1	2.0	1.1	---	.86	1.7	1.8	1.4	2.9	1.5	2.2
31	1.8	---	2.0	1.2	---	1.1	---	1.8	---	2.5	1.5	---
TOTAL	82.9	143.5	81.8	47.8	32.93	26.81	40.00	58.0	47.9	76.2	58.6	48.9
MEAN	2.03	4.78	2.83	1.54	1.18	.86	1.33	1.81	1.60	2.46	1.89	1.63
MAX	3.9	24	3.8	2.0	2.2	1.4	2.9	2.8	2.2	10	2.5	2.8
MIN	1.8	1.7	2.0	1.1	.93	.79	.72	1.5	1.3	1.4	1.5	1.2
AC-FT	125	285	162	95	65	53	79	111	95	151	116	97

CAL YR 1986	TOTAL	782.20	MEAN	2.14	MAX	24	MIN	.46	AC-FT	1550
WTR YR 1987	TOTAL	723.14	MEAN	1.98	MAX	24	MIN	.72	AC-FT	1430

18077000 MAKALEHA DITCH NEAR KEALIA

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

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

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

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

AVERAGE DISCHARGE.--50 years (water years 1938-86), 6.84 ft^3/s (4,960 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 31 ft^3/s Aug. 1, 1981, June 30, 1982; no flow at times.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 21 ft^3/s July 22; minimum daily, 0.60 ft^3/s July 7.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	14	7.4	1.2	8.6	5.6	5.9	11	e.90	1.4	10	11	14
2	14	10	1.0	6.3	5.4	5.8	8.5	e.80	1.2	8.5	12	15
3	15	12	2.9	7.5	5.3	5.8	8.1	e.72	.98	8.0	14	13
4	10	12	5.9	6.5	5.2	5.9	7.4	e.68	.86	8.0	11	11
5	13	9.2	7.0	6.3	5.1	5.7	6.6	e.66	.80	10	9.3	12
6	14	8.1	6.3	8.3	5.7	5.7	6.5	e.66	.65	17	8.8	9.0
7	10	7.5	5.7	5.9	5.0	5.6	6.9	e.66	.60	16	8.0	4.5
8	11	7.4	5.4	5.9	4.8	5.6	6.4	e.66	6.3	12	7.7	6.8
9	9.2	5.3	5.4	5.9	4.8	5.6	8.5	e.66	9.8	12	8.8	8.4
10	8.0	9.7	5.2	5.7	4.6	5.7	7.4	e.66	10	12	12	8.4
11	13	14	5.8	5.7	4.5	5.7	14	e.88	10	15	18	17
12	9.4	5.9	7.5	5.8	5.6	5.3	14	e.66	13	12	18	13
13	12	4.2	6.1	6.0	5.7	5.3	15	e.64	12	12	12	13
14	10	3.0	5.4	6.0	10	5.4	7.4	e.64	12	15	9.6	16
15	15	2.3	5.2	6.1	9.6	5.3	1.5	e.64	11	16	9.7	13
16	11	2.3	8.3	6.1	9.2	6.0	1.2	e5.0	11	14	15	10
17	13	2.0	12	5.8	8.6	6.4	1.0	e2.5	9.8	14	20	12
18	15	1.7	12	9.2	8.2	7.4	1.1	e1.1	9.8	14	18	14
19	16	1.6	10	7.7	7.5	6.9	.98	e.84	10	13	15	11
20	12	1.4	10	6.9	10	7.4	9.1	.70	7.8	9.9	11	9.0
21	9.8	1.3	9.2	6.9	9.7	6.0	14	.65	7.7	15	9.4	13
22	8.4	1.2	8.0	8.1	7.4	5.6	8.5	.55	8.1	21	9.4	20
23	7.5	1.2	6.9	6.6	6.9	5.4	3.2	.60	14	18	11	6.0
24	7.0	1.2	7.1	8.4	8.3	5.9	2.4	1.0	11	18	9.2	.98
25	15	1.2	7.8	12	6.0	5.7	2.0	.92	8.6	6.7	8.5	.86
26	11	1.1	6.9	7.4	5.0	9.5	3.0	11	6.1	4.9	13	.70
27	14	1.1	6.5	7.3	5.6	8.5	3.0	17	9.8	9.5	14	.75
28	14	1.2	8.5	7.5	5.9	5.2	1.7	10	4.1	11	9.3	.92
29	10	1.2	6.6	6.9	---	5.3	1.3	2.4	5.6	14	8.0	1.0
30	8.5	1.2	6.5	6.0	---	8.5	e1.1	2.1	11	19	7.7	1.9
31	8.1	---	7.1	6.0	---	15	---	1.6	---	13	10	---
TOTAL	357.9	138.9	209.4	209.3	183.2	197.0	182.78	68.26	224.79	398.5	358.4	276.21
MEAN	11.5	4.63	6.75	6.75	6.54	6.35	6.09	2.20	7.49	12.9	11.6	9.21
MAX	16	14	12	12	10	15	15	17	14	21	20	20
MIN	7.0	1.1	1.0	5.7	4.5	5.2	.98	.55	.80	4.9	7.7	.70
AC-FT	710	276	415	415	363	391	363	135	446	790	711	548

CAL YR 1986	TOTAL	2927.2	MEAN	8.02	MAX	22	MIN	1.0	AC-FT	5810
WTR YR 1987	TOTAL	2804.64	MEAN	7.68	MAX	21	MIN	.55	AC-FT	5560

e Estimated

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. 28, 1936, at site 61 ft upstream at datum 2.52 ft higher.

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

AVERAGE DISCHARGE.--69 years (water years 1918-20, 1922-87), 6.16 ft^3/s (4,480 acre-ft/yr).

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

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 22 ft^3/s Nov. 19, May 6; minimum daily, 0.14 ft^3/s Nov. 15, 17.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	e7.0	5.6	15	6.4	5.7	3.9	.31	.45	11	.38	2.3	.74
2	e15	8.8	19	5.9	5.0	3.8	.25	5.9	11	.38	2.3	.74
3	e9.0	10	15	8.4	4.9	3.6	.25	18	11	.38	3.5	.66
4	e10	9.9	10	6.8	4.9	3.6	.25	16	11	.38	5.7	.51
5	e10	6.1	8.6	5.7	4.6	3.6	.25	16	4.4	.45	4.9	.38
6	e16	5.0	10	5.4	4.6	3.9	.25	22	.38	.51	5.0	.95
7	e11	4.7	9.2	5.2	4.6	3.9	2.3	11	.31	1.3	4.7	3.7
8	14	4.4	8.6	5.0	4.6	3.9	3.0	2.2	.95	1.5	4.7	5.7
9	10	5.8	8.2	5.0	4.6	3.9	3.8	1.7	.74	1.2	4.9	3.8
10	8.2	9.0	8.0	5.0	4.6	3.6	2.9	1.3	.51	1.1	5.0	3.6
11	16	.95	9.8	4.7	4.6	3.2	4.9	.90	.51	1.1	3.1	12
12	11	.45	19	4.9	8.3	3.5	2.4	.82	.57	.90	2.2	8.3
13	9.4	.19	18	4.7	13	3.6	2.0	.86	.51	.82	1.9	7.5
14	7.4	.19	9.8	4.6	11	3.8	2.5	.51	.51	.66	1.7	6.5
15	16	.14	9.0	4.2	.83	3.8	1.9	.51	.51	.86	1.4	.74
16	9.4	.62	11	4.1	.45	3.8	1.5	1.1	.51	.66	1.4	.58
17	10	.14	6.8	4.4	.25	4.0	1.3	.45	2.8	.86	1.4	.51
18	17	7.8	3.5	12	.25	6.4	1.2	.38	5.2	3.8	1.2	.51
19	19	22	3.5	6.8	.25	6.6	.90	.38	2.7	6.1	.58	.51
20	13	21	3.3	2.0	.25	8.2	10	.38	.31	5.6	.51	.51
21	7.8	21	2.9	.25	8.4	4.4	13	.38	.31	5.6	.38	.77
22	6.4	21	2.9	.25	9.4	3.8	7.5	.38	2.6	5.7	.38	1.3
23	5.8	21	6.0	.25	8.0	3.8	.51	.86	5.4	4.0	.31	.45
24	5.2	8.4	9.0	.25	6.4	4.6	.51	.90	5.4	2.6	.25	.38
25	21	.25	9.8	.43	6.6	4.8	.45	7.3	5.8	.74	.25	.51
26	15	.25	7.8	.19	5.7	19	2.0	10	5.7	.51	.64	1.3
27	10	.38	6.8	.19	4.7	13	.58	11	5.1	.90	1.5	2.4
28	.51	.38	11	.19	3.9	6.1	.31	11	.74	1.1	.90	2.3
29	1.6	.19	6.6	.19	---	4.7	.31	11	.51	.58	.82	1.8
30	5.9	.25	6.1	3.7	---	6.6	.31	11	.45	.45	.74	1.7
31	6.1	---	7.8	7.7	---	6.9	---	11	---	.77	.74	---
TOTAL	323.51	195.88	280.0	124.59	140.38	182.3	67.64	175.46	97.23	51.49	65.30	71.35
MEAN	10.4	6.53	9.03	4.02	5.01	5.24	2.25	5.66	3.24	1.66	2.11	2.38
MAX	21	22	19	12	13	19	13	22	11	6.1	5.7	12
MIN	.51	.14	2.9	.19	.25	3.2	.25	.38	.31	.38	.25	.38
AC-FT	642	389	555	247	278	322	134	348	193	102	130	142

CAL YR 1986	TOTAL	2191.45	MEAN	6.00	MAX	28	MIN	.14	AC-FT	4350
WTR YR 1987	TOTAL	1755.13	MEAN	4.81	MAX	22	MIN	.14	AC-FT	3480

e Estimated

16088000 ANAHOLA DITCH ABOVE KANEHA RESERVOIR, NEAR KEALIA

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

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

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

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

AVERAGE DISCHARGE.--83 years (water years, 1923-25, 1928-87), 4.32 ft^3/s (3,130 acre-ft/yr).

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

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 44 ft^3/s Feb. 14; minimum daily, 0.97 ft^3/s for few days.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	14	5.5	1.0	4.0	2.9	3.2	5.1	17	7.9	5.5	6.2	7.7
2	10	17	.97	3.6	2.4	2.9	3.3	8.5	9.6	4.4	6.8	8.0
3	12	16	.97	4.3	2.2	2.8	2.9	16	5.7	3.9	6.6	7.1
4	6.2	9.8	.97	3.6	2.4	2.6	2.6	12	8.5	3.9	5.7	6.2
5	17	6.4	5.0	3.1	1.9	2.4	2.3	12	20	3.9	4.8	5.3
6	18	5.5	8.0	3.1	1.8	2.6	2.2	14	15	19	4.4	4.4
7	7.2	4.9	5.5	4.1	1.6	2.3	2.2	5.1	18	15	3.9	3.9
8	20	4.6	4.9	3.3	1.8	2.0	2.0	1.9	9.3	7.2	3.8	3.6
9	9.8	4.0	4.6	5.1	1.7	2.0	2.2	6.2	9.8	9.7	4.1	3.5
10	8.6	32	4.3	3.6	1.7	1.9	2.0	10	6.6	9.8	5.7	5.3
11	21	7.2	6.7	3.0	1.6	1.8	16	6.2	7.2	12	9.5	9.1
12	8.6	2.9	17	2.9	16	1.8	12	6.6	15	6.8	9.1	8.2
13	10	2.4	8.8	2.7	11	1.7	23	6.6	12	8.8	8.1	7.2
14	7.2	1.6	5.0	2.4	44	1.7	41	14	11	9.0	4.8	7.2
15	19	1.3	4.4	2.3	34	1.7	23	12	6.8	10	4.4	5.7
16	8.2	1.5	12	2.2	20	5.7	21	24	8.3	7.2	9.2	5.0
17	8.4	1.2	12	2.2	10	3.6	24	12	7.5	9.2	11	5.0
18	18	1.0	12	10	7.0	5.7	18	8.7	11	12	8.8	5.9
19	14	1.2	5.4	3.8	5.7	5.6	12	9.8	8.5	9.1	7.7	4.6
20	8.1	1.0	7.2	2.4	12	5.0	23	6.8	5.5	7.4	6.2	4.1
21	5.8	1.2	39	2.3	12	2.4	15	5.9	8.7	16	5.5	4.9
22	5.0	1.2	24	2.9	8.7	2.0	14	5.3	5.1	29	5.1	9.2
23	4.6	1.3	8.2	2.3	6.8	2.6	8.7	13	14	21	5.3	5.7
24	4.8	1.2	6.4	2.2	4.8	3.3	8.9	20	12	14	4.1	8.6
25	23	1.2	8.4	15	5.7	3.6	5.9	7.4	5.7	9.1	3.9	9.7
26	20	1.0	5.4	3.3	4.1	21	21	13	4.8	8.0	6.2	8.8
27	22	1.2	4.8	2.9	3.6	14	16	17	21	7.6	8.2	9.1
28	23	1.4	13	6.8	3.3	3.5	11	12	6.6	6.8	6.8	10
29	8.6	1.2	4.7	3.9	---	2.8	9.8	9.3	5.3	8.0	4.1	5.3
30	8.8	1.3	4.1	2.4	---	5.3	8.0	13	10	9.8	3.6	1.5
31	11	---	4.4	8.1	---	19	---	7.8	---	8.6	4.9	---
TOTAL	375.9	139.2	246.91	123.6	230.9	138.7	358.1	335.1	296.4	307.7	184.5	183.8
MEAN	12.1	4.64	7.96	3.99	8.25	4.47	11.9	10.8	9.88	9.93	5.95	6.13
MAX	23	32	39	15	44	21	41	24	21	29	11	10
MIN	4.6	1.0	.97	2.2	1.6	1.7	2.0	1.9	4.8	3.9	3.6	1.5
AC-FT	746	276	490	245	458	275	710	665	588	610	366	365

CAL YR 1986	TOTAL	2937.50	MEAN	8.05	MAX	39	MIN	.42	AC-FT	5830
WTR YR 1987	TOTAL	2920.81	MEAN	8.00	MAX	44	MIN	.97	AC-FT	5790

16091000 LOWER ANAHOLA DITCH NEAR KEALIA

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

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

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

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

AVERAGE DISCHARGE.--49 years (water years 1938-83, 1986-87), 2.73 ft^3/s (1,980 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 16.6 ft^3/s June 1, 1936; no flow at times.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 0.70 ft^3/s; no flow for most of the year.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
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	.01	.00	.00	.00	.00	.00	.00	.00	.00	.00
3	.00	.00	.01	.00	.00	.00	.00	.00	.00	.00	.00	.00
4	.00	.00	.01	.00	.00	.00	.00	.00	.00	.00	.00	.00
5	.00	.00	.01	.00	.00	.00	.00	.00	.00	.00	.00	.00
6	.01	.09	.01	.00	.00	.00	.00	.00	.00	.00	.00	.00
7	.03	.03	.01	.00	.00	.00	.00	.00	.00	.00	.00	.00
8	.02	.03	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
9	.00	.03	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
10	.00	.70	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
11	.00	.12	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
12	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
13	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
14	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
15	.00	.00	.00	.00	e.00	.00	.00	.00	.00	.00	.00	.00
16	.00	.00	.00	.00	e.00	.00	.00	.00	.00	.00	.00	.00
17	.00	.00	.00	.00	e.00	.00	.00	.00	.00	.00	.00	.00
18	.00	.00	.00	.00	e.00	.00	.00	.00	.00	.00	.00	.00
19	.00	.00	.00	.00	e.00	.00	.00	.00	.00	.00	.00	.00
20	.00	.00	.00	.00	e.00	.00	.00	.00	.00	.00	.00	.00
21	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
22	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
23	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
24	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
25	.01	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
26	.05	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
27	.05	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
28	.05	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
29	.05	.00	.00	.00	---	.00	.00	.00	.00	.00	.00	.00
30	.02	.00	.00	.00	---	.00	.00	.00	.00	.00	.00	.00
31	.00	---	.00	.00	---	.00	---	.00	---	.00	.00	---
TOTAL	.29	1.00	.06	.00	.00	.00	.00	.00	.00	.00	.00	.00
MEAN	.01	.03	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
MAX	.05	.70	.01	.00	.00	.00	.00	.00	.00	.00	.00	.00
MIN	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
AC-FT	.6	2.0	.1	.00	.00	.00	.00	.00	.00	.00	.00	.00

CAL YR 1986	TOTAL	155.86	MEAN	.43	MAX	6.4	MIN	.00	AC-FT	309
WTR YR 1987	TOTAL	1.35	MEAN	.00	MAX	.70	MIN	.00	AC-FT	2.7

e Estimated

16097500 HALAULANI STREAM AT ALTITUDE 400 FT, NEAR KILAUEA

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

DRAINAGE AREA.--1.9 mi^2.

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

REVISED RECORDS.--WSP 2137: Drainage area.

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

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

AVERAGE DISCHARGE.--29 years (water years 1959-87), 11.5 ft^3/s (8,330 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 2,070 ft^3/s Aug. 8, 1959, gage height, 8.30 ft, from rating curve extended above 190 ft^3/s on basis of slope-area measurement of peak flow; minimum, 1.8 ft^3/s Sept. 6-8, 1988.

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

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Nov. 10	1900	*1,510	*6.37	July 23	2030	1,480	8.32

Minimum discharge, 5.4 ft^3/s Feb. 11.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	7.4	8.0	11	7.4	6.2	6.5	7.1	16	9.2	8.9	10	17
2	7.2	18	9.9	7.3	5.8	6.6	6.3	9.4	9.7	8.5	11	14
3	8.0	15	9.1	7.5	5.8	8.3	6.2	13	8.6	8.3	11	18
4	7.0	11	8.7	7.1	5.8	6.2	6.0	12	13	8.5	8.9	10
5	19	9.0	9.3	8.9	5.6	6.1	8.0	10	38	8.5	8.5	9.2
6	17	8.4	9.9	6.7	5.6	6.2	5.8	34	22	22	8.2	8.6
7	9.4	8.0	8.4	8.8	5.5	5.9	5.8	18	14	19	8.0	8.2
8	11	7.8	7.9	7.0	5.5	5.9	5.7	11	14	15	7.8	7.9
9	8.4	7.4	7.7	7.1	5.5	5.8	5.8	9.7	25	18	8.1	7.9
10	7.6	198	7.5	6.7	5.5	5.8	6.0	9.2	14	14	9.1	9.0
11	15	127	8.4	8.5	5.5	5.7	13	8.7	11	12	29	37
12	8.6	51	14	6.4	10	5.8	11	8.3	25	10	23	18
13	8.0	40	9.4	6.4	11	5.6	23	8.2	18	9.5	11	16
14	7.8	25	8.0	6.2	71	5.7	52	10	17	9.3	9.2	18
15	9.4	18	7.7	6.1	53	5.7	28	12	12	9.1	8.9	12
16	8.0	36	17	8.1	24	5.6	18	21	10	8.9	19	9.8
17	8.6	20	13	6.0	11	5.7	24	12	9.5	8.9	32	9.8
18	15	19	12	8.4	9.1	6.0	24	9.8	18	13	23	11
19	9.8	23	8.9	5.9	8.2	6.1	16	10	11	11	14	9.2
20	8.8	18	8.8	5.8	9.0	7.2	21	9.0	10	9.0	10	8.7
21	8.0	18	30	5.9	9.7	5.8	51	9.8	10	21	9.4	13
22	7.6	18	25	5.9	9.7	5.7	27	8.9	11	45	9.2	21
23	7.4	20	12	5.8	8.7	6.1	16	13	17	201	8.8	9.6
24	7.8	19	9.8	5.7	7.8	6.7	13	21	14	58	8.3	12
25	18	14	9.8	7.2	8.1	5.9	10	10	9.7	19	8.4	24
26	9.2	11	8.7	5.9	7.2	18	89	11	10	13	8.6	11
27	10	17	8.2	5.8	8.9	9.9	21	13	22	11	9.1	20
28	14	22	9.8	7.9	6.7	6.6	13	11	10	9.7	8.9	12
29	8.4	12	8.0	6.4	---	6.2	11	11	9.3	15	8.0	11
30	8.0	17	7.7	5.9	---	6.4	9.5	13	10	19	7.6	14
31	13	---	7.8	8.6	---	13	---	11	---	11	11	---
TOTAL	309.8	833.8	333.2	205.3	333.4	208.5	529.2	384.0	432.0	650.1	367.0	402.9
MEAN	9.99	27.8	10.7	6.62	11.9	6.73	17.6	12.4	14.4	21.0	11.8	13.4
MAX	19	198	30	8.8	71	16	89	34	38	201	32	37
MIN	7.0	7.4	7.5	5.7	5.5	5.8	5.7	8.2	8.6	8.3	7.6	7.9
AC-FT	614	1650	661	407	661	414	1050	762	857	1290	728	799

CAL YR 1986	TOTAL	4582.5	MEAN	12.6	MAX	198	MIN	3.0	AC-FT	9090
WTR YR 1987	TOTAL	4989.0	MEAN	13.7	MAX	201	MIN	5.5	AC-FT	9900

16103000 HANALEI RIVER NEAR HANALEI

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

DRAINAGE AREA.--19.1 mi^2.

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

REVISED RECORDS.--WSP 1937: Drainage area. WSP 2137: 1962(M), 1963-65(P). WDR HI-77-1: 1970-76(M), 1975-78.

GAGE.--Water-stage recorder and crest-stage gage. Datum of gage is 35.6 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. 28 to Dec. 26, 1962, crest-stage gage at present site and datum.

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

AVERAGE DISCHARGE (since diversion to Hanalei tunnel).--24 years (water years 1964-87), 212 ft^3/s (153,600 acre-ft/yr).

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

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

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Nov. 10	2300	18,400	12.35	July 23	2300	*16,600	*12.45

Minimum discharge, 0.89 ft^3/s Feb. 11.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	e110	99	206	e95	86	90	170	228	128	100	184	156
2	e100	129	166	e90	e79	90	118	146	130	93	178	152
3	e200	188	148	e136	e75	87	103	207	108	93	176	160
4	e120	160	131	e98	e73	83	98	190	104	100	152	130
5	e300	110	140	e85	e72	82	92	240	470	106	143	118
6	e200	101	182	e82	72	83	89	540	301	249	137	112
7	e130	95	122	e81	72	80	109	558	158	238	130	107
8	e170	92	109	81	72	78	105	204	131	142	122	104
9	125	88	104	87	72	78	105	158	161	146	122	103
10	101	2710	100	82	72	77	86	148	134	125	148	114
11	126	1320	103	80	72	76	251	130	158	149	413	484
12	108	477	151	82	e137	75	195	118	485	110	316	212
13	101	1150	126	86	219	73	642	113	234	104	167	400
14	100	888	100	76	1120	73	977	146	256	119	144	556
15	156	372	95	75	1010	76	401	138	192	141	134	274
16	109	834	162	73	597	73	290	402	167	128	248	182
17	127	327	181	74	194	118	355	148	158	124	528	178
18	207	271	185	360	148	125	346	119	253	148	311	221
19	429	374	114	107	126	138	200	113	231	118	224	155
20	210	265	122	84	212	122	218	105	149	101	164	138
21	134	363	406	82	201	86	431	116	162	184	148	704
22	112	232	324	94	140	79	290	100	130	563	138	944
23	103	296	155	82	146	80	194	390	160	1380	138	259
24	98	271	128	80	113	107	162	694	134	3040	125	198
25	318	206	118	e675	125	92	142	167	108	389	120	244
26	188	182	107	e125	103	334	1410	237	102	246	130	182
27	216	289	107	97	98	200	572	334	221	210	146	190
28	198	537	175	98	93	102	226	204	108	182	149	168
29	131	210	e104	93	---	92	186	162	100	309	118	202
30	113	388	e94	84	---	97	155	231	124	438	110	394
31	110	---	e98	115	---	454	---	166	---	216	119	---
TOTAL	4928	12802	4541	3637	5597	3498	8718	6954	5437	9791	5578	7581
MEAN	159	427	146	117	200	113	291	224	181	316	180	252
MAX	429	2710	406	675	1120	454	1410	694	470	3040	526	944
MIN	98	88	94	73	72	73	86	100	100	93	110	103
AC-FT	9770	25390	9010	7210	11100	6940	17280	13790	10780	19420	11060	15000

CAL YR 1986	TOTAL	70124	MEAN	192	MAX	2710	MIN	40	AC-FT	139100
WTR YR 1987	TOTAL	79042	MEAN	217	MAX	3040	MIN	72	AC-FT	156800

e Estimated

18108000 WAINIHA RIVER NEAR HANALEI

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

DRAINAGE AREA.--10.2 mi^2.

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

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

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

AVERAGE DISCHARGE.--32 years (water years 1953-55, 1959-87), 138 ft^3/s (99,980 acre-ft/yr).

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

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

EXTREMES FOR CURRENT YEAR.--Maximum discharge 3,450 ft^3/s Sept. 14, gage height 5.18 ft, no peak greater than base discharge of 3,600 ft^3/s; minimum, 47 ft^3/s Mar. 12.

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

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	56	81	158	61	68	55	185	218	64	89	83	87
2	53	74	118	58	60	86	84	94	61	59	86	61
3	124	222	89	133	57	59	70	153	57	58	74	66
4	59	105	72	64	56	54	64	110	55	78	61	55
5	228	66	119	57	54	52	60	103	308	88	58	54
6	133	59	168	55	53	53	61	147	228	244	58	52
7	73	58	98	54	52	51	88	349	70	195	55	50
8	81	53	73	53	52	50	58	137	60	107	54	49
9	85	51	88	55	51	50	64	101	121	138	65	55
10	56	177	62	55	51	49	71	110	80	98	110	67
11	87	359	68	88	51	49	121	82	81	145	221	433
12	70	233	149	98	88	49	116	80	248	81	158	122
13	83	1070	87	75	100	49	458	82	147	74	67	197
14	83	873	82	57	608	54	720	114	250	103	57	813
15	196	221	58	55	519	86	248	96	140	77	56	215
16	91	789	166	54	347	52	261	285	103	81	125	101
17	123	240	181	53	130	104	274	83	93	85	219	108
18	171	166	141	204	85	83	239	68	118	125	140	157
19	404	387	74	88	78	82	125	62	105	78	94	81
20	162	241	78	64	268	163	134	57	70	65	64	62
21	85	208	227	75	188	64	152	54	75	124	58	319
22	67	133	202	113	94	55	162	53	72	295	55	459
23	81	278	88	70	81	56	128	557	128	118	54	132
24	58	206	71	70	68	118	88	715	70	561	52	87
25	248	129	70	629	86	72	71	118	60	129	51	78
26	126	125	83	114	65	140	355	235	81	88	91	89
27	157	346	60	90	60	95	401	319	195	77	118	74
28	137	452	85	86	56	83	137	161	88	74	108	65
29	83	148	82	71	---	59	123	96	60	184	83	61
30	91	340	58	63	---	89	97	154	91	231	56	157
31	70	---	66	137	---	481	---	91	---	91	62	---
TOTAL	3581	7668	3135	2979	3524	2582	5193	5080	3337	4000	2673	4386
MEAN	116	256	101	96.1	126	83.3	173	164	111	129	86.2	146
MAX	404	1070	227	629	608	481	720	715	308	561	221	813
MIN	53	51	58	53	51	49	58	53	55	58	51	49
AC-FT	7100	15210	6220	5910	6990	5120	10300	10080	6620	7930	5300	8700

CAL YR 1988	TOTAL	48501	MEAN	133	MAX	1470	MIN	34	AC-FT	96200
WTR YR 1987	TOTAL	48138	MEAN	132	MAX	1070	MIN	49	AC-FT	95480

16200000 NORTH FORK KAUKONAHUA STREAM ABOVE RIGHT BRANCH, NEAR WAHIAWA

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

DRAINAGE AREA.--1.38 mi^2.

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

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

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

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

AVERAGE DISCHARGE.--64 years (water years 1914-24, 1927-52, 1961-87), 16.3 ft^3/s (11,810 acre-ft/yr).

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

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 1,380 ft^3/s Mar. 24, gage height 6.41 ft, no other peak greater than base discharge of 1,300 ft^3/s; minimum, 0.35 ft^3/s Mar. 16, 23.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	12	3.8	11	4.4	2.1	1.0	7.7	e19	4.7	7.9	8.4	3.8
2	19	11	7.7	9.5	1.9	.94	2.3	6.3	3.3	7.4	19	7.3
3	73	9.2	6.7	21	1.8	.85	e28	e16	2.8	e19	9.0	4.4
4	11	9.3	6.1	5.3	1.7	.80	4.9	e90	10	9.9	8.2	3.3
5	11	4.4	6.1	4.2	1.5	.71	5.3	e35	97	e21	6.3	5.1
6	8.2	3.5	8.2	3.6	1.4	.67	2.8	e20	29	e77	5.7	3.1
7	6.5	30	5.7	3.3	1.4	.83	3.0	e23	7.4	15	5.1	3.0
8	5.9	5.7	4.9	3.2	1.3	.81	3.0	9.3	11	12	20	2.6
9	5.5	3.8	4.8	3.0	1.2	.55	7.3	7.7	30	13	9.7	2.5
10	4.7	44	4.4	3.3	1.2	.51	2.6	6.5	9.9	e21	21	8.9
11	4.4	48	4.4	2.6	1.1	.47	e22	5.9	5.9	e32	57	81
12	7.2	24	28	2.4	1.0	.44	e11	7.4	92	e29	18	23
13	15	96	6.7	5.8	1.0	.41	8.4	e13	42	e24	7.4	59
14	4.7	58	4.4	12	1.2	.41	5.3	5.1	28	e28	5.7	41
15	7.9	92	4.4	5.1	59	.38	7.4	5.1	17	e23	6.3	7.2
16	7.2	75	8.7	10	17	.44	5.5	4.4	46	15	23	12
17	22	34	6.3	6.5	4.6	e14	11	4.2	17	13	6.4	12
18	59	32	5.5	4.1	3.3	1.4	e20	3.6	24	e113	23	22
19	32	53	3.8	3.3	2.1	.90	e17	3.3	24	e19	9.7	11
20	25	22	4.6	2.5	5.4	2.0	e25	3.1	51	13	13	6.3
21	7.2	14	44	2.4	4.4	.75	e18	3.0	62	e124	11	5.3
22	5.9	22	29	2.4	2.1	.47	11	2.7	e32	e93	7.0	15
23	5.1	20	6.8	2.3	1.7	.38	6.5	15	e27	35	6.7	6.7
24	4.6	27	15	2.2	1.6	215	7.2	6.1	12	32	5.1	6.7
25	40	13	6.5	30	1.6	17	4.7	3.1	10	14	4.9	4.6
26	11	12	4.6	3.5	1.3	16	e15	17	e26	12	12	4.2
27	31	9.0	3.9	2.8	1.2	4.1	e24	18	e35	15	9.9	14
28	7.2	29	23	5.7	1.1	2.3	e15	4.2	9.6	11	6.8	4.6
29	5.1	10	5.9	2.5	---	1.8	5.7	3.9	e14	35	4.9	3.8
30	4.4	12	5.2	2.2	---	1.6	4.9	8.2	e16	19	4.2	3.6
31	4.1	---	20	2.4	---	14	---	4.9	---	10	3.9	---
TOTAL	466.8	828.7	306.1	173.5	126.2	301.52	309.5	374.0	799.6	912.2	362.3	387.0
MEAN	15.1	27.6	9.87	5.60	4.51	9.73	10.3	12.1	26.7	29.4	11.7	12.9
MAX	73	96	44	30	59	215	26	90	97	124	57	81
MIN	4.1	3.5	3.8	2.2	1.0	.38	2.3	2.7	2.8	7.4	3.9	2.5
AC-FT	926	1640	607	344	250	598	614	742	1590	1810	719	768

CAL YR 1986	TOTAL	7054.44	MEAN	19.3	MAX	314	MIN	.13	AC-FT	13990
WTR YR 1987	TOTAL	5345.42	MEAN	14.6	MAX	215	MIN	.38	AC-FT	10600

e Estimated.

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

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

DRAINAGE AREA.--4.04 mi^2.

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

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

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

AVERAGE DISCHARGE.--25 years (water years, 1961-62, 1965-87), 21.2 ft^3/s (15,360 acre-ft/yr).

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

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 920 ft^3/s Sept. 13, gage height, 4.78 ft, no peak above base of 1,100 ft^3/s; minimum, 0.55 ft^3/s Mar, 23, 24.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	17	5.3	21	7.3	2.8	1.7	23	9.3	4.3	14	11	5.6
2	13	5.7	14	17	2.4	1.7	4.1	9.8	4.2	16	27	12
3	42	7.5	11	33	2.2	1.6	8.8	28	3.5	67	22	12
4	11	9.3	10	9.2	2.1	1.5	10	137	4.0	26	13	5.2
5	7.9	6.4	9.8	6.8	2.0	1.4	5.4	59	91	28	9.1	5.0
6	8.0	4.8	13	5.6	1.8	1.3	2.7	29	14	88	8.2	4.7
7	8.2	30	9.6	5.2	1.7	1.3	1.9	33	14	30	7.6	4.1
8	5.6	12	7.9	4.9	1.7	1.2	1.6	17	5.8	23	8.3	3.9
9	5.1	5.4	7.3	4.7	1.6	.98	2.0	13	18	17	11	3.6
10	4.7	22	6.8	4.6	1.5	.85	2.3	10	10	30	17	4.4
11	4.2	60	6.4	4.3	1.4	.84	27	8.8	6.7	50	40	55
12	4.8	64	25	3.7	1.4	.87	19	8.0	128	61	10	16
13	24	57	9.6	3.6	1.5	.81	18	18	66	48	7.8	196
14	7.0	30	6.2	20	1.6	.71	9.4	8.6	63	83	6.6	67
15	20	73	5.7	10	67	.75	18	7.4	33	39	8.2	16
16	13	70	14	9.3	46	.73	14	7.2	136	23	34	14
17	8.7	36	9.5	18	14	.91	26	6.4	43	23	18	11
18	15	35	6.3	6.2	8.9	1.6	77	5.3	56	62	21	14
19	43	50	5.8	5.4	4.4	1.9	32	4.8	47	35	13	18
20	53	24	5.0	3.8	7.8	2.7	46	4.4	176	23	14	8.7
21	12	17	64	3.2	10	2.2	19	4.1	171	76	17	7.3
22	8.2	28	55	3.1	4.6	1.1	27	3.9	45	75	11	10
23	6.6	22	10	3.4	3.2	.61	11	7.7	54	109	9.8	14
24	6.1	32	11	3.0	2.9	79	9.7	15	28	24	7.2	8.3
25	48	17	8.3	54	3.0	60	7.8	4.8	23	18	5.4	6.3
26	24	17	6.7	11	2.4	11	11	17	20	15	24	5.4
27	42	13	5.5	4.6	2.1	9.8	56	31	55	15	21	12
28	19	77	20	4.6	1.9	2.8	16	7.5	19	14	28	6.5
29	8.1	23	14	3.9	---	1.8	9.3	5.0	17	27	9.2	4.8
30	6.6	22	5.7	3.1	---	1.4	6.7	8.8	29	26	6.8	4.1
31	5.9	---	23	3.2	---	15	---	5.3	---	12	5.7	---
TOTAL	499.7	873.4	429.1	279.9	201.9	210.26	521.7	532.1	1384.5	1197	451.9	552.9
MEAN	16.1	29.1	13.8	9.03	7.21	6.78	17.4	17.2	46.1	38.6	14.6	18.4
MAX	53	77	84	54	67	79	77	137	178	109	40	198
MIN	4.2	4.8	5.0	3.0	1.4	.81	1.6	3.9	3.5	12	5.4	3.6
AC-FT	991	1730	851	555	400	417	1030	1060	2750	2370	896	1100

CAL YR 1986	TOTAL	8020.97	MEAN	22.0	MAX	412	MIN	.00	AC-FT	15910
WTR YR 1987	TOTAL	7134.36	MEAN	19.5	MAX	198	MIN	.61	AC-FT	14150

16211600 MAKAHA STREAM NEAR MAKAHA

LOCATION.--Lat 21°30'18", long 158°10'59", Hydrologic Unit 20060000, on right bank 1.5 mi northeast of Kaneaki Heiau and 3.4 mi northeast of Makaha.

DRAINAGE AREA.--2.31 mi^2.

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

REVISED RECORDS.--WSP 1937: Drainage area.

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

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

AVERAGE DISCHARGE.--28 years, 1.88 ft^3/s (1,360 acre-ft/yr).

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

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

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 107 ft^3/s Mar. 26, gage height 2.88 ft, no peak greater than base discharge of 200 ft^3/s; minimum, 0.11 ft^3/s Oct. 13, 14.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.58	.49	2.1	1.1	1.6	.99	2.1	2.6	1.7	.40	.77	.67
2	.46	.35	1.1	3.1	1.2	.96	1.2	2.5	1.6	.43	.79	.68
3	.43	.29	.85	2.5	1.1	.89	1.0	2.2	1.5	.49	.77	.65
4	.35	.26	.69	1.6	1.0	.83	.91	1.9	1.3	.69	.79	.65
5	.32	.23	.83	1.3	.86	.79	.84	2.2	1.3	.52	.79	.65
6	.29	.20	8.1	1.1	.79	1.3	.78	8.3	1.2	.50	.79	.65
7	.25	8.8	2.3	.94	.79	1.0	.70	3.9	1.2	.52	.75	.65
8	.22	2.5	1.6	.83	.72	.82	.62	2.5	1.1	.46	.75	.65
9	.20	1.5	1.2	9.3	.72	.75	.58	2.1	.97	.39	.73	.65
10	.17	2.7	1.0	7.2	.66	.69	.54	2.0	.90	.39	.72	.85
11	.15	3.8	.87	2.7	.66	.65	.56	2.0	.86	.33	.72	1.4
12	.14	5.2	.94	2.0	1.0	.60	.59	3.3	2.1	.59	.71	.83
13	.13	2.0	.96	1.6	2.3	.56	.62	4.4	1.6	.99	.72	.80
14	.13	1.6	.75	4.0	1.5	.54	.73	2.2	1.7	.62	.72	.79
15	.85	1.6	.64	7.8	1.6	.54	2.1	2.2	1.1	.48	.72	.77
16	1.8	1.5	.61	8.4	3.1	.52	1.6	1.8	1.1	.39	.75	.76
17	1.8	1.2	.70	6.8	1.7	.51	2.1	1.7	.97	.33	1.0	.75
18	1.7	.83	.81	6.3	1.1	.47	1.7	1.5	.77	.32	.80	.71
19	3.9	.97	.59	4.0	1.3	.46	1.3	1.3	.68	.30	.79	.70
20	2.8	.75	.60	2.9	7.0	1.2	1.7	1.2	.63	.27	.75	.73
21	.75	.55	5.0	2.4	4.9	2.3	3.0	1.1	.93	.27	.72	.72
22	.49	.48	2.7	2.1	2.4	2.3	7.9	1.1	.74	.28	.72	2.0
23	.39	.47	1.5	1.8	1.9	1.0	2.9	3.3	.94	1.7	.79	1.4
24	.33	.48	1.1	1.8	2.8	.49	2.3	2.2	.65	1.7	.73	1.2
25	.78	.44	.90	9.4	2.1	.39	2.0	1.3	.57	1.0	.72	.96
26	.59	.74	.78	3.8	1.5	11	25	9.3	.54	.97	.72	3.1
27	.49	.87	.69	2.6	1.3	5.0	10	7.0	.48	.93	.71	1.6
28	.62	1.2	4.4	2.0	1.1	2.1	5.2	4.6	.46	.60	.70	1.0
29	.37	1.2	2.7	1.8	---	1.6	3.7	2.9	.44	.53	.70	.90
30	.31	2.4	1.5	1.6	---	1.3	2.9	2.3	.41	.78	.68	.77
31	.85	---	1.4	2.3	---	2.3	---	1.9	---	.79	.68	---
TOTAL	22.64	45.40	49.91	104.87	48.70	44.85	87.15	88.8	30.44	18.96	23.20	28.44
MEAN	.73	1.51	1.61	3.38	1.74	1.45	2.90	2.86	1.01	.61	.75	.95
MAX	3.9	8.8	8.1	9.4	7.0	11	25	9.3	2.1	1.7	1.0	3.1
MIN	.13	.20	.59	.83	.66	.39	.54	1.1	.41	.27	.68	.65
AC-FT	45	90	99	208	97	89	173	176	60	38	46	56

CAL YR 1986	TOTAL	539.26	MEAN	1.48	MAX	17	MIN	.10	AC-FT	1070
WTR YR 1987	TOTAL	593.38	MEAN	1.63	MAX	25	MIN	.13	AC-FT	1180

16212800 KIPAPA STREAM NEAR WAHIAWA

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

DRAINAGE AREA.--4.29 mi^2.

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

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

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

AVERAGE DISCHARGE.--30 years, 10.6 ft^3/s (7,680 acre-ft/yr).

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

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

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
June 12	1730	1,670	8.37	July 22	2230	*1,750	*8.50

Minimum discharge, 0.13 ft^3/s, Mar. 23, 24.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	8.8	2.2	13	2.8	1.5	.64	12	5.6	4.7	5.0	3.7	1.7
2	18	2.1	6.6	12	1.1	.59	3.6	3.6	7.5	4.3	10	6.3
3	17	5.8	5.4	8.3	.87	.54	6.1	4.5	2.6	16	6.4	5.2
4	6.1	7.2	4.5	3.7	.75	.42	6.6	21	1.9	6.6	4.7	2.4
5	4.3	3.1	4.7	2.6	.89	.35	5.0	9.1	35	4.7	3.2	2.6
6	4.3	2.1	9.1	2.0	.59	.32	3.1	21	8.4	41	2.8	2.0
7	3.2	23	4.7	1.8	.54	.30	2.1	18	3.1	9.9	2.4	1.5
8	2.5	7.7	3.6	1.5	.50	.32	1.9	5.6	3.2	5.6	2.4	1.3
9	2.2	3.7	3.2	1.4	.50	.35	2.4	4.3	16	5.0	3.9	1.1
10	2.0	35	2.9	1.7	.46	.32	1.6	3.4	4.5	8.5	3.7	1.1
11	1.7	61	2.9	1.6	.42	.30	28	3.1	2.9	15	11	62
12	4.8	40	17	1.1	.46	.27	13	2.6	148	27	5.9	6.4
13	13	62	5.2	1.1	.59	.25	6.1	8.3	29	16	2.8	35
14	3.1	28	2.9	16	2.1	.25	4.3	3.6	25	39	2.0	54
15	6.2	58	2.5	11	24	.27	7.4	2.8	11	16	1.7	7.2
16	5.9	61	4.5	5.4	26	.25	5.6	3.2	38	8.3	7.6	4.5
17	3.6	22	3.9	7.2	7.7	.27	10	5.0	11	6.1	9.9	3.6
18	6.9	22	2.6	3.2	3.6	.42	26	2.8	10	8.8	14	5.9
19	36	30	2.2	3.4	2.4	.46	7.4	1.8	8.6	5.9	7.4	3.4
20	32	13	1.9	1.8	13	.59	49	1.4	40	4.3	3.4	3.1
21	7.4	8.3	11	1.1	6.6	.32	10	1.4	113	42	3.7	2.9
22	4.7	21	23	1.1	3.1	.18	14	1.5	22	169	8.0	11
23	3.4	14	3.9	1.1	2.0	.18	5.4	2.3	29	65	7.2	8.4
24	2.9	18	5.6	.93	1.6	150	4.3	8.0	10	13	3.9	7.4
25	25	9.9	3.2	37	.69	43	3.6	2.5	7.2	7.7	2.0	3.6
26	8.3	8.0	2.2	6.4	1.1	9.9	22	13	6.1	5.9	6.7	2.2
27	13	6.1	1.8	2.8	.93	6.6	36	18	29	5.2	8.0	5.8
28	8.0	36	16	2.4	.75	3.2	7.2	6.4	6.6	6.1	19	2.6
29	3.9	7.4	5.8	2.0	---	2.2	4.3	6.0	5.4	13	4.3	1.7
30	3.1	11	2.2	1.6	---	1.8	3.4	5.6	8.6	11	2.6	1.2
31	2.6	---	6.9	2.0	---	12	---	3.2	---	4.3	2.0	---
TOTAL	263.9	628.6	184.7	148.03	104.54	236.68	311.4	198.6	643.3	595.2	176.3	256.9
MEAN	8.51	21.0	5.98	4.78	3.73	7.64	10.4	8.41	21.4	19.2	5.69	8.56
MAX	36	62	23	37	26	150	49	21	148	169	19	62
MIN	1.7	2.1	1.8	.93	.42	.18	1.6	1.4	1.9	4.3	1.7	1.1
AC-FT	523	1250	368	294	207	470	818	394	1280	1180	350	510

CAL YR 1986	TOTAL	3885.43	MEAN	10.6	MAX	128	MIN	.00	AC-FT	7710
WTR YR 1987	TOTAL	3748.33	MEAN	10.3	MAX	169	MIN	.18	AC-FT	7430

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

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

DRAINAGE AREA.--45.7 mi^2.

WATER-DISCHARGE RECORDS

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

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

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

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

AVERAGE DISCHARGE.--34 years (water years 1953-59, 1961-87), 37.6 ft^3/s (27,240 acre-ft/yr).

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

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

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
June 12	1900	*1,880	*5.38	July 23	0100	1,330	4.78

Minimum discharge, 5.9 ft^3/s May 18, 19.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	38	8.7	38	26	18	22	28	14	15	18	16	7.6
2	30	8.2	26	26	17	18	18	17	19	14	17	21
3	36	7.9	23	38	17	19	12	16	12	21	24	26
4	25	12	24	25	16	13	16	42	14	41	18	15
5	16	12	28	21	16	11	14	39	39	24	13	16
6	12	9.3	38	19	17	11	13	47	32	52	11	18
7	12	32	27	21	17	13	11	43	16	39	13	19
8	12	45	24	25	15	12	9.6	30	13	21	9.5	15
9	12	22	22	22	15	12	9.5	21	18	16	8.8	13
10	11	20	17	18	16	12	9.2	15	20	15	11	7.7
11	12	138	8.7	17	16	11	28	14	12	25	15	76
12	17	181	28	20	16	11	37	13	206	38	18	40
13	25	98	35	19	17	10	28	14	92	59	13	96
14	20	72	20	25	17	11	18	17	53	80	9.1	100
15	13	91	18	30	43	12	16	13	37	45	13	32
16	17	99	20	27	80	15	20	19	82	28	21	21
17	15	62	22	30	41	15	37	24	45	23	29	14
18	15	46	21	25	27	14	55	11	33	23	24	14
19	40	54	20	21	22	15	36	9.9	31	25	35	17
20	64	35	19	21	24	11	61	9.1	71	21	13	18
21	29	27	22	19	35	10	46	10	188	48	11	18
22	19	27	70	18	27	10	38	20	46	65	14	15
23	13	36	32	18	20	11	22	14	64	273	19	24
24	11	38	25	18	18	105	17	13	35	42	20	17
25	31	29	23	47	20	143	15	14	23	27	11	25
26	34	24	21	48	17	37	16	10	19	21	9.6	20
27	28	32	19	25	14	22	72	41	41	17	21	31
28	35	87	28	21	19	18	29	23	30	18	29	22
29	17	58	36	19	---	19	20	16	19	17	24	14
30	12	40	24	19	---	18	15	21	15	31	18	10
31	10	---	22	21	---	13	---	18	---	17	12	---
TOTAL	679	1449.1	798.7	749	637	872	764.3	828.0	1320	1202	520.0	782.3
MEAN	21.9	48.3	25.8	24.2	22.8	21.7	25.5	20.3	44.0	38.8	16.8	26.1
MAX	64	181	70	48	80	143	72	47	206	273	35	100
MIN	10	7.9	8.7	17	14	10	9.2	9.1	12	14	8.8	7.6
AC-FT	1350	2870	1580	1490	1260	1330	1520	1250	2620	2380	1030	1550

CAL YR 1986	TOTAL	10228.2	MEAN	28.0	MAX	299	MIN	5.8	AC-FT	20290
WTR YR 1987	TOTAL	10201.4	MEAN	27.9	MAX	273	MIN	7.6	AC-FT	20230

16213000 WAIKELE STREAM AT WAIPAHU--Continued

WATER-QUALITY RECORDS

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

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

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

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

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

EXTREMES FOR CURRENT YEAR.--
SEDIMENT CONCENTRATIONS: Maximum daily mean, 609 mg/L July 23; minimum daily mean, 7 mg/L for many days.
SEDIMENT DISCHARGE: Maximum daily, 882 tons June 12; minimum daily, 0.19 ton Mar. 13.

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	BAROMETRIC PRESSURE (MM OF HG)	STREAMFLOW, INSTANTANEOUS (CFS)	SPECIFIC CONDUCTANCE (US/CM)	PH (STANDARD UNITS)	TEMPERATURE WATER (DEG C)	TURBIDITY (FTU)	OXYGEN, DISSOLVED (MG/L)	OXYGEN, DISSOLVED (PERCENT SATURATION)
OCT									
14...	0945	768	22	290	7.10	23.5	6.0	6.9	81
DEC									
29...	0945	765	41	241	7.40	21.0	7.6	7.4	82
FEB									
09...	0930	761	18	489	7.40	22.0	1.9	7.2	82
APR									
20...	0930	762	66	187	6.90	22.0	7.5	7.0	80
JUL									
14...	0900	761	100	120	7.02	23.5	30	7.8	92
AUG									
25...	0845	764	12	360	6.80	23.5	5.9	7.0	82

DATE	TIME	COLIFORM, FECAL, 0.7 UM-MF (COLS./100 ML)	STREPTOCOCCI FECAL, KF AGAR (COLS. PER 100 ML)	HARDNESS TOTAL (MG/L AS CACO3)	HARDNESS NONCARBONATE MG/L AS CACO3	CALCIUM DISSOLVED (MG/L AS CA)	MAGNESIUM, DISSOLVED (MG/L AS MG)	SODIUM, DISSOLVED (MG/L AS NA)	SODIUM PERCENT	SODIUM ADSORPTION RATIO
OCT										
14...	0945	4500	2800	48	2	8.2	6.7	37	61	2
DEC										
29...	0945	7600	7500	40	3	6.8	5.6	30	61	2
FEB										
09...	0930	2200	2000	75	9	12	11	64	64	3
APR										
20...	0930	5700	5200	33	3	5.6	4.7	23	59	2
JUL										
14...	0900	5300	51000	18	0	3.4	2.4	12	57	1
AUG										
25...	0845	8400	4000	59	7	9.8	6.5	48	63	3

16213000 WAIKELE STREAM AT WAIPAHU--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	POTASSIUM, DISSOLVED (MG/L AS K)	BICARBONATE WATER TOTAL FIELD MG/L AS HCO3	ALKALINITY LAB (MG/L AS CACO3	ALKALINITY WH WAT TOTAL FIELD (MG/L AS CACO3	SULFATE DISSOLVED (MG/L AS SO4)	CHLORIDE, DISSOLVED (MG/L AS CL)	FLUORIDE, DISSOLVED (MG/L AS F)	SILICA, DISSOLVED (MG/L AS SIO2)	SOLIDS, RESIDUE AT 180 DEG. C DISSOLVED (MG/L)	SOLIDS, SUM OF CONSTITUENTS, DISSOLVED (MG/L)	SOLIDS, DISSOLVED (TONS PER AC-FT)
OCT												
14...	0945	2.2	56	45	46	15	46	0.10	38	184	181	0.25
DEC												
29...	0945	1.8	46	38	39	12	39	0.10	32	143	154	0.19
FEB												
09...	0930	2.6	81	66	66	23	89	0.20	62	301	312	0.41
APR												
20...	0930	1.5	36	31	30	9.5	30	<0.10	23	114	118	0.16
JUL												
14...	0900	1.2	26	20	21	14	13	<0.10	12	69	72	0.09
AUG												
25...	0845	2.5	64	54	52	15	63	0.10	47	225	231	0.31

DATE	NITROGEN, NO2+NO3 DISSOLVED (MG/L AS N)	NITROGEN, NITRITE DISSOLVED (MG/L AS N)	NITROGEN, AMMONIA TOTAL (MG/L AS N)	NITROGEN, AMMONIA DISSOLVED (MG/L AS N)	NITROGEN,AMMONIA + ORGANIC TOTAL (MG/L AS N)	PHOSPHOROUS TOTAL (MG/L AS P)	PHOSPHOROUS DISSOLVED (MG/L AS P)	PHOSPHOROUS ORTHO, DISSOLVED (MG/L AS P)
DEC								
29...	0.790	<0.010	0.020	<0.010	0.30	0.120	0.100	0.100
FEB								
09...	1.80	<0.010	0.020	0.020	0.50	0.190	0.220	0.200
APR								
20...	0.510	<0.010	0.050	0.040	0.20	0.080	0.080	0.050
JUL								
14...	0.180	<0.010	0.030	0.020	0.70	0.120	0.030	0.030
AUG								
25...	1.10	<0.010	0.040	0.020	0.70	0.150	0.140	0.090

DATE	ALUMINUM, DISSOLVED (UG/L AS AL)	ARSENIC DISSOLVED (UG/L AS AS)	BARIUM, DISSOLVED (UG/L AS BA)	BERYLLIUM, DISSOLVED (UG/L AS BE)	CADMIUM DISSOLVED (UG/L AS CD)	CHROMIUM, DISSOLVED (UG/L AS CR)	COBALT, DISSOLVED (UG/L AS CO)	COPPER, DISSOLVED (UG/L AS CU)	IRON, DISSOLVED (UG/L AS FE)	LEAD, DISSOLVED (UG/L AS PB)
OCT										
14...	50	<1	9	<0.5	<1	<1	<3	<1	76	<5
DEC										
29...	120	<1	5	<0.5	2	<1	<3	5	66	<5
FEB										
09...	10	<1	6	<0.5	<1	4	<3	1	23	<5
APR										
20...	80	<1	4	<0.5	1	<1	<3	<1	120	<5
AUG										
25...	40	<1	6	<0.5	<1	<1	<3	2	55	<5

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

16213000 WAIKELE STREAM AT WAIPAHU--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	LITHIUM DIS-SOLVED (UG/L AS LI)	MANGA-NESE, DIS-SOLVED (UG/L AS MN)	MERCURY DIS-SOLVED (UG/L AS HG)	MOLYB-DENUM, DIS-SOLVED (UG/L AS MO)	NICKEL DIS-SOLVED (UG/L AS NI)	SELE-NIUM, DIS-SOLVED (UG/L AS SE)	SILVER, DIS-SOLVED (UG/L AS AG)	STRON-TIUM, DIS-SOLVED (UG/L AS SR)	VANA-DIUM, DIS-SOLVED (UG/L AS V)	ZINC, DIS-SOLVED (UG/L AS ZN)
OCT											
14...	0945	<4	35	<0.1	<10	<1	1	<1.0	56	19	8
DEC											
29...	0945	<4	26	--	<10	2	<1	<1.0	47	17	7
FEB											
09...	0930	<4	58	<0.1	<10	<1	2	<1.0	61	36	<3
APR											
20...	0930	10	21	<0.1	<10	1	<1	<1.0	41	11	<3
AUG											
25...	0845	<4	41	<0.1	<10	<1	2	<1.0	68	25	<3

DATE	TIME	SEDI-MENT, SUS-PENDED (MG/L)	SEDI-MENT, DIS-CHARGE, SUS-PENDED (T/DAY)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM	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					APR				
14...	0945	11	0.65	100	20...	0930	14	2.5	100
DEC					JUL				
29...	0945	12	1.3	100	14...	0900	56	15	100
FEB					AUG				
09...	0930	100	6	0.29	25...	0845	100	8	0.26

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

16213000 WAIKELE STREAM AT WAIPAHU--Continued

SEDIMENT DISCHARGE, SUSPENDED (TONS/DAY), WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DAY	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)
		OCTOBER			NOVEMBER			DECEMBER	
1	38	19	1.9	8.7	11	.26	38	13	1.3
2	30	18	1.5	8.2	12	.26	26	18	1.3
3	38	19	1.8	7.9	12	.26	23	12	.74
4	25	18	1.2	12	12	.39	24	10	.65
5	16	14	.60	12	12	.39	28	20	1.5
6	12	13	.42	9.3	11	.28	38	27	2.8
7	12	12	.39	32	28	2.4	27	21	1.5
8	12	12	.39	45	36	4.4	24	22	1.4
9	12	15	.49	22	16	.95	22	14	.83
10	11	16	.48	20	14	.76	17	9	.41
11	12	12	.39	138	272	151	6.7	8	.19
12	17	13	.60	181	267	205	28	15	1.1
13	25	16	1.1	98	51	13	35	12	1.1
14	20	15	.81	72	32	6.2	20	10	.54
15	13	15	.53	91	50	12	18	12	.58
16	17	16	.73	99	52	14	20	10	.54
17	15	14	.57	62	24	4.0	22	9	.53
18	15	14	.57	46	19	2.4	21	9	.51
19	40	32	3.5	54	20	2.9	20	10	.54
20	64	39	6.7	35	12	1.1	19	9	.46
21	29	15	1.2	27	11	.80	22	9	.53
22	19	14	.72	27	14	1.0	70	31	5.8
23	13	13	.46	36	16	1.6	32	13	1.1
24	11	19	.56	38	15	1.5	25	11	.74
25	31	25	2.1	29	11	.86	23	10	.62
26	34	22	2.0	24	12	.78	21	10	.57
27	26	16	1.1	32	12	1.0	19	10	.51
28	35	16	1.5	87	42	9.9	26	15	1.1
29	17	14	.64	56	25	3.8	36	14	1.4
30	12	13	.42	40	12	1.3	24	14	.91
31	10	14	.38	---	---	---	22	12	.71
TOTAL	679.00	---	35.75	1449.1	---	447.49	798.7	---	32.41
		JANUARY			FEBRUARY			MARCH	
1	26	13	.91	18	12	.58	22	22	1.3
2	28	11	.77	17	15	.69	18	20	.97
3	38	14	1.4	17	14	.64	19	10	.51
4	25	12	.81	16	16	.69	13	9	.32
5	21	9	.51	16	12	.52	11	10	.30
6	19	8	.41	17	16	.73	11	7	.21
7	21	8	.45	17	13	.60	13	9	.32
8	25	7	.47	15	12	.49	12	7	.23
9	22	7	.42	15	10	.40	12	9	.29
10	18	8	.39	16	14	.60	12	7	.23
11	17	8	.37	16	14	.60	11	8	.24
12	20	9	.49	16	14	.60	11	8	.24
13	19	9	.46	17	15	.69	10	7	.19
14	25	13	.88	17	15	.69	11	7	.21
15	30	18	1.5	43	30	3.5	12	9	.29
16	27	18	1.2	80	40	8.6	15	12	.49
17	30	15	1.2	41	16	1.8	15	e10	.40
18	25	13	.88	27	14	1.0	14	e10	.38
19	21	13	.74	22	26	1.5	15	e10	.40
20	21	11	.62	24	17	1.1	11	e9	.27
21	19	13	.67	35	14	1.3	10	e9	.24
22	18	10	.49	27	10	.73	10	e9	.24
23	16	10	.49	20	11	.59	11	e8	.24
24	18	9	.44	18	11	.54	105	e226	260
25	47	32	4.1	20	18	.97	143	e272	164
26	48	42	5.4	17	17	.78	37	e35	3.5
27	25	15	1.0	14	17	.64	22	e25	1.5
28	21	16	.91	19	19	.98	18	e20	.86
29	19	13	.67	--	--	--	19	e20	1.0
30	19	12	.62	--	--	--	18	e15	.73
31	21	13	.74	--	--	--	13	e15	.53
TOTAL	749	--	30.41	637	--	32.55	672	--	440.63

e Estimated.

16213000 WAIKELE STREAM AT WAIPAHU--Continued

SEDIMENT DISCHARGE, SUSPENDED (TONS/DAY), WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

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	28	e30	2.3	14	12	.45	15	20	.81
2	18	e20	.97	17	19	.87	19	23	1.2
3	12	e15	.49	16	16	.69	12	25	.61
4	16	e15	.65	42	26	2.9	14	22	.83
5	14	e15	.57	39	21	2.2	39	60	6.3
6	13	e15	.53	47	24	3.0	32	77	6.6
7	11	e10	.30	43	18	2.1	16	36	1.8
8	9.6	e10	.26	30	17	1.4	13	28	.98
9	9.5	e10	.26	21	17	.96	18	31	1.5
10	9.2	e10	.25	15	14	.57	20	29	1.6
11	28	e30	.23	14	13	.49	12	28	.91
12	37	e30	3.0	13	13	.46	206	353	882
13	26	e25	1.6	14	13	.49	92	161	28
14	18	e20	.97	17	13	.60	53	59	8.4
15	16	e20	.86	13	15	.53	37	52	5.2
16	20	e15	.81	19	20	1.0	62	e55	9.2
17	37	e25	2.5	24	48	3.1	45	e30	3.6
18	55	e30	4.5	11	18	.54	33	e20	1.8
19	36	e25	2.4	9.9	15	.40	31	14	1.2
20	61	18	3.0	9.1	11	.27	71	36	6.9
21	46	22	2.7	10	20	.54	188	159	118
22	38	38	3.7	20	85	3.5	46	28	3.5
23	22	12	.71	14	40	1.5	64	25	4.3
24	17	13	.60	13	19	.87	35	14	1.3
25	15	12	.49	14	17	.64	23	12	.74
26	16	12	.52	10	15	.40	19	15	.77
27	72	37	7.2	41	22	2.4	41	22	2.4
28	29	17	1.3	23	18	1.1	30	19	1.5
29	20	15	.81	16	16	.69	19	13	.67
30	15	12	.49	21	19	1.1	15	13	.53
31	--	--	--	18	17	.83	--	--	--
TOTAL	764.3	--	45.17	628	--	38.39	1320.00	--	1103.15
		JULY			AUGUST			SEPTEMBER	
1	18	11	.54	16	19	.82	7.8	15	.31
2	14	9	.34	17	17	.78	21	213	31
3	21	15	.85	24	19	1.2	26	75	5.3
4	41	21	2.3	18	18	.78	15	34	1.4
5	24	14	.91	13	18	.63	16	21	.91
6	52	28	3.6	11	16	.48	18	21	1.0
7	39	30	3.2	13	15	.53	19	17	.87
8	21	21	1.2	9.5	16	.41	15	22	.89
9	16	17	.73	8.8	15	.36	13	24	.84
10	15	14	.57	11	13	.39	7.7	14	.29
11	25	19	1.3	15	14	.57	76	169	41
12	38	30	3.1	18	16	.78	40	45	4.9
13	59	45	7.2	13	15	.53	98	90	102
14	80	113	29	9.1	15	.37	100	195	81
15	45	70	8.5	13	17	.60	32	37	3.2
16	28	24	1.8	21	10	.57	21	27	1.5
17	23	23	1.4	29	15	1.2	14	28	1.1
18	23	27	1.7	24	18	1.2	14	25	.94
19	25	24	1.6	35	28	2.8	17	29	1.3
20	21	29	1.6	13	e15	.53	18	31	1.5
21	48	60	7.8	11	e15	.44	18	23	1.1
22	65	65	11	14	e15	.57	15	17	.69
23	273	809	818	19	e20	1.0	24	23	1.5
24	42	e22	2.5	20	e15	.81	17	20	.92
25	27	e20	1.4	11	e15	.44	25	30	2.0
26	21	e19	1.1	9.6	19	.49	20	35	1.9
27	17	e19	.87	21	19	1.1	31	35	2.9
28	16	18	.78	29	26	2.0	22	50	3.0
29	17	18	.83	24	22	1.4	14	27	1.0
30	31	27	2.3	18	19	.92	10	30	.81
31	17	18	.83	12	15	.49	--	--	--
TOTAL	1202	--	919.25	520	--	24.99	782.3	--	297.07
YEAR	10201.4		3445.36						

e Estimated.

16216000 WAIAWA STREAM NEAR PEARL CITY

LOCATION.--Lat 21°23'57", long 157°58'51", Hydrologic Unit 20060000, on left bank 100 ft upstream from lower bridge on Highway 90, 0.8 mi northwest of Pearl City, and 2.0 mi northeast of Waipahu.

DRAINAGE AREA.--26.4 mi^2.

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

REVISED RECORDS.--WSP 1569: Drainage area.

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

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

AVERAGE DISCHARGE.--35 years, 32.6 ft^3/s (23,620 acre-ft/yr).

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

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

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Nov. 11	2300	2,880	9.91	June 12	1730	*11,600	*16.13
Mar. 24	2330	4,320	11.36	June 21	0145	2,200	9.00
				July 22	2330	6,130	12.89

Minimum discharge, 1.4 ft^3/s Aug. 8, 14, and 15.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	22	2.2	20	9.5	2.1	1.9	4.1	4.3	2.0	6.6	3.4	1.6
2	11	1.9	14	9.1	2.0	1.9	4.3	6.1	1.7	3.3	2.8	14
3	39	1.6	8.8	17	1.9	1.9	2.5	4.0	1.6	8.5	6.8	2.4
4	12	1.9	5.9	11	1.9	1.9	7.5	9.8	1.6	19	7.8	1.7
5	5.3	2.3	11	5.8	1.9	1.8	4.7	14	3.1	14	3.0	1.7
6	5.7	2.6	13	3.9	1.9	1.8	3.6	13	6.3	51	1.8	1.7
7	2.9	6.2	7.0	2.9	1.9	1.7	2.6	22	2.2	19	1.5	1.7
8	2.1	23	4.4	2.5	1.9	1.7	2.0	12	1.7	9.8	1.5	1.7
9	1.7	18	3.4	2.2	1.9	1.7	1.8	6.1	1.6	5.7	5.4	1.7
10	1.5	121	2.7	2.1	1.9	1.7	1.7	3.9	1.6	15	3.4	1.7
11	1.5	505	2.3	2.0	1.8	1.7	41	2.8	1.6	55	2.7	160
12	1.6	288	23	2.0	1.6	1.7	21	2.2	1200	131	2.7	16
13	5.3	95	13	2.0	1.9	1.7	14	4.4	98	67	2.1	62
14	3.6	65	4.6	22	1.9	1.6	9.5	6.7	51	95	1.5	71
15	2.3	168	3.0	11	77	1.6	20	2.9	31	37	1.5	16
16	7.0	129	7.1	5.6	54	1.7	18	2.0	50	22	1.5	7.7
17	3.3	52	9.2	13	21	1.7	19	1.8	26	15	3.8	5.3
18	2.8	33	4.2	5.6	9.7	1.6	57	7.9	23	17	41	6.1
19	114	53	2.8	4.4	5.2	1.6	29	3.2	22	13	20	4.4
20	188	25	2.3	3.7	9.4	1.6	101	2.1	43	5.6	4.7	2.6
21	19	16	25	2.5	15	1.6	33	1.7	416	28	2.4	3.0
22	6.9	13	60	2.2	6.7	1.6	27	4.0	42	334	1.8	1.9
23	3.3	25	14	2.1	4.0	1.6	14	2.0	61	317	16	17
24	2.1	42	7.0	2.0	3.6	475	8.8	1.7	23	28	20	9.4
25	19	17	4.7	26	2.5	331	6.3	1.7	14	12	3.9	5.1
26	18	12	3.5	15	2.3	25	4.7	1.7	8.5	9.6	2.1	3.0
27	85	8.7	2.8	4.6	2.1	11	77	1.6	32	5.7	14	2.3
28	23	140	13	2.9	2.0	5.4	17	2.9	11	12	44	3.1
29	7.7	32	21	2.3	---	3.1	8.3	2.1	5.7	10	12	1.6
30	4.2	20	5.2	2.1	---	2.3	4.7	4.4	4.4	16	4.6	1.6
31	2.9	---	23	2.5	---	2.0	---	2.3	---	6.5	2.5	---
TOTAL	623.7	1919.6	341.1	201.5	241.2	894.1	565.1	157.3	2187.6	1388.3	246.2	449.2
MEAN	20.1	64.0	11.0	6.50	8.61	28.8	18.8	5.07	72.9	44.8	7.94	15.0
MAX	188	505	60	26	77	475	101	22	1200	334	44	180
MIN	1.5	1.8	2.3	2.0	1.6	1.6	1.7	1.6	1.6	3.3	1.5	1.6
AC-FT	1240	3810	677	400	476	1770	1120	312	4340	2750	488	891

CAL YR 1986	TOTAL	11663.1	MEAN	32.0	MAX	607	MIN	1.3	AC-FT	23130
WTR YR 1987	TOTAL	9214.9	MEAN	25.2	MAX	1200	MIN	1.5	AC-FT	18280

16226000 NORTH HALAWA STREAM NEAR AIEA

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

DRAINAGE AREA.--3.45 mi^2.

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

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

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

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

AVERAGE DISCHARGE.--37 years (water years 1930-32, 1954-87), 4.82 ft^3/s (3,490 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 6,650 ft^3/s Feb. 28, 1932, gage height, 13.38 ft, from rating curve extended above 420 ft^3/s; maximum gage height, 13.46 ft May 14, 1963; no flow at times each year.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 916 ft^3/s Nov. 10, gage height, 9.89 ft, no other peak greater than base discharge of 570 ft^3/s; no flow for several days in March.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	6.0	.70	3.5	2.4	.24	.04	7.8	2.1	.35	.78	.40	.16
2	3.9	.53	2.3	6.1	.14	.03	2.6	2.0	.19	.56	2.3	.07
3	3.3	.42	1.5	4.0	.08	.02	1.5	2.2	.08	9.0	4.4	.04
4	1.8	.32	1.1	2.2	.05	.02	1.6	9.3	.04	5.7	1.8	.02
5	1.2	.27	1.9	1.4	.03	.01	.99	9.6	.03	2.5	.89	.01
6	1.1	.19	5.3	.92	.02	.01	.66	13	.03	7.3	.44	.01
7	.65	2.5	1.8	.63	.02	.01	.48	8.6	.02	3.5	.28	.01
8	.47	1.4	1.1	.48	.01	.01	.32	4.2	.03	1.9	.17	.01
9	.36	.46	.71	.35	.01	.01	.22	2.4	.03	1.5	.11	.01
10	.30	43	.53	.29	.01	.01	.11	1.6	.03	2.2	.20	.01
11	.19	44	.41	.37	.01	.01	2.3	1.1	.03	3.4	2.2	1.2
12	.12	61	6.5	.24	.01	.01	2.5	.80	80	12	.93	1.1
13	.99	20	2.5	4.1	.01	.01	1.3	3.3	25	11	.49	1.7
14	.59	15	1.1	15	.01	.00	.79	1.5	21	15	.30	7.6
15	.44	22	.64	4.5	15	.00	1.7	.74	9.9	13	.16	1.8
16	.33	24	.98	10	23	.00	2.3	.57	16	4.5	1.0	.68
17	.27	12	.58	6.9	6.3	.00	2.5	.45	7.4	2.4	.75	.42
18	.87	7.5	.43	2.6	2.5	.00	16	.33	3.8	3.0	25	.30
19	20	13	.30	1.3	1.3	.00	8.0	.23	2.2	2.1	3.6	.16
20	27	6.1	.20	.72	2.4	.00	18	.12	5.7	1.3	.99	.07
21	5.2	3.9	16	.49	2.3	.00	5.8	.08	23	6.8	.48	.04
22	2.3	3.9	15	.37	1.3	.00	4.4	.06	6.9	17	.35	3.9
23	1.2	9.3	3.6	.26	.82	.00	2.2	.07	7.3	12	10	3.6
24	.73	7.9	2.1	.17	.58	26	1.4	.06	3.7	3.1	3.6	3.2
25	12	4.2	1.1	12	.40	31	1.0	.04	2.0	1.5	.77	.78
26	4.9	2.5	.69	5.0	.27	9.3	7.0	.06	1.4	.94	.77	.39
27	17	1.8	.51	1.8	.14	3.1	34	.91	4.2	.60	2.3	.24
28	7.0	14	17	1.0	.07	1.3	7.5	.72	1.4	.47	1.4	.09
29	3.0	4.6	4.8	.64	---	.72	3.6	1.7	.83	.53	1.0	.04
30	1.7	3.6	1.5	.48	---	.49	2.1	1.2	.97	1.5	.47	.04
31	1.1	---	10	.36	---	3.1	---	.50	---	.59	.32	---
TOTAL	126.01	330.09	105.66	87.07	57.03	75.21	140.67	69.54	203.56	147.67	87.67	27.70
MEAN	4.06	11.0	3.41	2.81	2.04	2.43	4.69	2.24	6.79	4.76	2.18	.92
MAX	27	61	17	15	23	31	34	13	60	17	25	7.6
MIN	.12	.19	.20	.17	.01	.00	.11	.04	.02	.47	.11	.01
AC-FT	250	655	210	173	113	149	279	138	404	293	134	55

CAL YR 1986	TOTAL	1879.06	MEAN	5.15	MAX	108	MIN	.00	AC-FT	3730
WTR YR 1987	TOTAL	1437.88	MEAN	3.94	MAX	61	MIN	.00	AC-FT	2850

16226200 NORTH HALAWA STREAM NEAR HONOLULU--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

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

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

INSTRUMENTATION.--Automatio 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, 292 mg/L Feb. 14, 1985; no flow for many days each year.
SEDIMENT DISCHARGE: Maximum daily, 155 tons Feb. 14, 1985; no flow for many days each year.

EXTREMES FOR CURRENT YEAR.--
SEDIMENT CONCENTRATIONS: Maximum daily mean, 292 mg/L Feb. 14; no flow for many days.
SEDIMENT DISCHARGE: Maximum daily, 155 tons Feb. 14; no flow for many days.

16226200 NORTH HALAWA STREAM NEAR HONOLULU--Continued

SEDIMENT DISCHARGE, SUSPENDED (TONS/DAY), WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DAY	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)
		OCTOBER			NOVEMBER			DECEMBER	
1	.00	.00	.00	.00	.00	.00	.13	e2	.00
2	.00	.00	.00	.00	.00	.00	.05	e1	.00
3	.00	.00	.00	.00	.00	.00	.04	e1	.00
4	.00	.00	.00	.00	.00	.00	.03	e1	.00
5	.00	.00	.00	.00	.00	.00	.01	e1	.00
6	.00	.00	.00	.00	.00	.00	.01	e1	.00
7	.00	.00	.00	.00	.00	.00	11	17	1.0
8	.00	.00	.00	.00	.00	.00	6.0	10	.16
9	.00	.00	.00	.00	.00	.00	4.0	e5	.05
10	.00	.00	.00	.00	.00	.00	1.8	e3	.01
11	.00	.00	.00	.00	.00	.00	1.0	e2	.01
12	.00	.00	.00	.00	.00	.00	.72	e2	.00
13	.00	.00	.00	.00	.00	.00	.41	e2	.00
14	.00	.00	.00	.00	.00	.00	.25	e1	.00
15	.00	.00	.00	.00	.00	.00	.17	e1	.00
16	.00	.00	.00	.00	.00	.00	.10	e1	.00
17	.00	.00	.00	.00	.00	.00	.08	e1	.00
18	.00	.00	.00	.00	.00	.00	.06	e1	.00
19	.00	.00	.00	.00	.00	.00	.06	e1	.00
20	.00	.00	.00	.00	.00	.00	.03	e1	.00
21	.00	.00	.00	.00	.00	.00	.03	e1	.00
22	.00	.00	.00	.00	.00	.00	.02	e1	.00
23	.00	.00	.00	.00	.00	.00	.02	e1	.00
24	.00	.00	.00	.00	.00	.00	3.2	26	5
25	.00	.00	.00	.00	.00	.00	85	65	27
26	.00	.00	.00	.00	.00	.00	11	10	.30
27	.00	.00	.00	39	56	10	4.6	5	.06
28	.00	.00	.00	4.2	e8	.09	2.5	e4	.03
29	.00	.00	.00	.84	e5	.01	1.4	e3	.01
30	.00	.00	.00	.35	e3	.00	.96	e2	.01
31	.00	.00	.00	---	---	---	.57	e2	.00
TOTAL	.00	---	.00	44.39	---	10.10	135.25	---	33.64
		JANUARY			FEBRUARY			MARCH	
1	.30	e2	.00	.08	e1	.00	12	e5	.16
2	.23	e2	.00	.07	e1	.00	6.8	e4	.01
3	.15	e2	.00	.06	e1	.00	4.0	e4	.04
4	.12	e2	.00	.19	e1	.00	3.7	e3	.03
5	.07	e1	.00	.71	e5	.01	7.9	9	.19
6	.05	e1	.00	1.2	e2	.01	11	8	.24
7	.03	e1	.00	.84	e2	.00	9.6	5	.13
8	.03	e1	.00	.54	e2	.00	5.6	5	.08
9	.03	1	.00	.32	e2	.00	3.6	3	.03
10	.02	e1	.00	.25	e2	.00	2.4	e3	.02
11	.03	e1	.00	.19	e1	.00	2.2	e3	.02
12	.02	e1	.00	2.9	13	4	2.6	e3	.02
13	.02	e1	.00	18	64	8	1.6	e2	.01
14	.02	e1	.00	102	292	155	1.2	e2	.01
15	.02	e1	.00	34	10	.92	1.0	e2	.01
16	.01	e1	.00	8.2	5	.11	.84	e1	.00
17	.01	e1	.00	4.1	e4	.04	.61	e1	.00
18	.01	e1	.00	2.4	e4	.03	.44	e1	.00
19	.01	e1	.00	1.4	e3	.01	.35	e1	.00
20	.01	e1	.00	1.0	e3	.01	.27	e1	.00
21	.01	e1	.00	.68	e3	.01	.23	e1	.00
22	.01	e1	.00	.41	3	.01	6.4	12	1.0
23	.01	e1	.00	1.4	e5	.02	6.7	5	.09
24	.00	e.00	.00	1.7	e4	.02	3.2	4	.03
25	3.3	7	.30	1.0	e3	.01	1.7	e3	.01
26	.91	e4	.01	33	47	10	1.1	e2	.01
27	.23	e3	.00	35	15	1.4	.92	e1	.00
28	.19	e2	.00	23	e8	.50	.76	e1	.00
29	.21	e2	.00	---	---	---	1.3	e3	.01
30	.15	e2	.00	---	---	---	5.8	6	.09
31	.09	e1	.00	---	---	---	6.8	4	.01
TOTAL	6.30	---	.31	274.64	---	180.11	112.82	---	112.82

e Estimated.

HAWAII, ISLAND OF OAHU

16226200 NORTH HALAWA STREAM NEAR HONOLULU--Continued

SEDIMENT DISCHARGE, SUSPENDED (TONS/DAY), WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

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	3.8	e3	.03	.57	e2	.01	.12	e1	.00
2	4.4	e3	.04	1.5	e3	.01	.10	e1	.00
3	3.1	e2	.02	.88	e2	.00	.07	e1	.00
4	2.0	e2	.01	.64	e1	.00	.06	e1	.00
5	1.4	e2	.01	.44	e1	.00	.05	e1	.00
6	1.1	e2	.01	86	e100	23	.03	e1	.00
7	.84	e1	.00	35	e15	1.4	.03	e1	.00
8	.57	e1	.00	e14	e5	.19	.02	e1	.00
9	.44	e1	.00	e5.0	e4	.05	.02	e1	.00
10	.38	e1	.00	e2.8	e4	.03	.02	e1	.00
11	.32	e1	.00	e2.0	e3	.02	.01	e1	.00
12	.30	e1	.00	e1.4	e3	.01	.01	e1	.00
13	.27	e1	.00	e1.4	e3	.01	.01	e1	.00
14	.25	e1	.00	e1.4	e3	.01	.01	e1	.00
15	.23	e1	.00	e6.0	e5	.08	.01	e1	.00
18	.23	e1	.00	e14	e5	.19	.01	e1	.00
17	5.1	e10	.14	e30	e10	.81	.01	e1	.00
18	8.6	3	.07	e13	e5	.18	.00	.00	.00
19	3.1	3	.03	e4.4	e4	.05	.00	.00	.00
20	3.0	e2	.02	e2.6	e3	.02	.00	.00	.00
21	3.0	e2	.02	1.8	e2	.01	.00	.00	.00
22	5.7	e5	.08	1.3	e2	.01	.00	.00	.00
23	7.2	5	.10	1.1	e2	.01	.00	.00	.00
24	13	11	.39	.88	e1	.01	.00	.00	.00
25	6.0	7	.11	1.4	e2	.01	.00	.00	.00
26	3.6	e6	.06	.88	e1	.02	.00	.00	.00
27	2.0	6	.03	.61	e1	.00	.00	.00	.00
28	1.3	e5	.02	.38	e1	.00	7.8	25	.53
29	1.0	4	.01	.27	e1	.00	.30	5	.00
30	.84	e3	.01	.23	e1	.00	.09	e2	.00
31	---	---	---	.13	e1	.00	---	---	---
TOTAL	83.07	---	1.21	232.01	---	26.14	8.78	---	.53
		JULY			AUGUST			SEPTEMBER	
1	.08	e1	.00	3.2	e4	.03	.00	.00	.00
2	.04	e1	.00	3.8	e4	.04	.00	.00	.00
3	.03	e1	.00	1.3	e3	.01	.00	.00	.00
4	.03	e1	.00	.96	e3	.01	.00	.00	.00
5	.02	e1	.00	1.1	e3	.01	.00	.00	.00
6	.01	e1	.00	.92	e3	.01	.00	.00	.00
7	.01	e1	.00	.64	e3	.01	.00	.00	.00
8	.01	e1	.00	.41	e3	.00	.00	.00	.00
9	.01	e1	.00	.27	e3	.00	.00	.00	.00
10	.01	e1	.00	.19	3	.00	.00	.00	.00
11	.01	e1	.00	.13	e2	.00	.00	.00	.00
12	.01	e1	.00	.09	e2	.00	.00	.00	.00
13	.00	.00	.00	.08	e1	.00	.00	.00	.00
14	.00	.00	.00	.06	e1	.00	.00	.00	.00
15	.00	.00	.00	.05	e1	.00	.00	.00	.00
18	.00	.00	.00	.04	e1	.00	.00	.00	.00
17	.00	.00	.00	.03	e1	.00	.00	.00	.00
18	.00	.00	.00	.03	e1	.00	.00	.00	.00
19	.00	.00	.00	.02	e1	.00	.00	.00	.00
20	.00	.00	.00	.02	e1	.00	.00	.00	.00
21	.00	.00	.00	.02	e1	.00	.00	.00	.00
22	.00	.00	.00	.01	e1	.00	.00	.00	.00
23	.00	.00	.00	.01	e1	.00	17	241	59
24	.00	.00	.00	.01	e1	.00	7.8	e25	.07
25	6.5	15	.28	.02	e1	.00	1.4	e10	.04
26	1.4	e10	.04	.02	e1	.00	10	e15	.40
27	.47	e2	.00	.01	e1	.00	5.9	e10	.16
28	.25	e1	.00	.01	e1	.00	1.6	e5	.02
29	.17	e1	.00	.00	.00	.00	.61	e3	.00
30	.09	e1	.00	.00	.00	.00	.30	e2	.00
31	4.6	5	.06	.00	.00	.00	---	---	---
TOTAL	13.75	---	.36	13.25	---	.12	44.61	---	59.89
YEAR	868.07		314.46						

e Estimated.

16226200 NORTH HALAWA STREAM NEAR HONOLULU

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

DRAINAGE AREA.--4.01 mi^2.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--February 1983 to current.

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

REMARKS.--Records fair.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 866 ft^3/s Oct. 20, 1985, gage height, 10.62 ft, no flow at times each year.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 868 ft^3/s Oct. 20, gage height, 10.62 ft, no other peak greater than base discharge of 750 ft^3/s; no flow for many days.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.13	.21	13	.01	.00	.00	1.4	2.8	.76	3.8	1.2	3.9
2	.08	.18	5.7	.01	.00	.00	1.2	1.5	.56	1.8	1.0	2.0
3	.26	.16	3.1	.01	.00	.00	17	1.4	.38	1.6	13	1.3
4	.26	.17	1.8	.01	.00	.00	19	20	.23	2.9	9.2	1.3
5	.17	.15	1.2	.00	.00	.00	16	12	.19	1.6	5.7	1.2
6	1.8	.13	.94	.00	.00	.00	17	4.8	.13	1.2	3.0	.82
7	.58	.10	.67	.00	.00	.00	8.1	2.8	.10	1.2	1.8	2.9
8	.28	.11	.46	.00	.00	.00	5.5	2.1	.08	1.3	1.2	2.9
9	.14	.14	.32	.00	.00	.00	17	1.6	.18	1.1	1.1	1.3
10	.07	4.3	.26	.00	.00	.00	39	12	15	1.0	9.3	.82
11	1.5	2.6	.21	.00	.00	.00	55	4.2	9.4	3.5	4.4	.63
12	4.0	2.6	.20	.00	.00	.00	15	2.6	5.7	3.8	2.6	.44
13	2.3	1.8	.17	.00	.00	.00	9.4	2.0	3.2	12	1.7	.35
14	2.0	.92	.13	.00	.00	.00	6.6	1.8	2.6	11	5.4	.89
15	.94	.70	.13	.00	.00	.00	4.4	2.3	2.1	5.4	8.1	.77
16	.55	.48	.13	.00	.00	2.2	3.5	4.1	1.4	3.8	4.5	.60
17	.48	.30	.09	.00	.00	18	2.6	2.3	1.1	10	8.6	.42
18	.63	.31	.07	.00	.00	3.5	1.9	1.7	.96	7.5	3.6	.28
19	19	2.5	.07	.00	.00	.76	1.5	1.3	.87	5.7	2.0	.23
20	133	.74	.07	.00	.00	89	1.2	1.0	.76	3.9	1.4	.19
21	13	.50	.06	.00	.00	113	1.0	.85	.60	2.4	1.1	5.3
22	5.2	.34	.05	.00	.00	37	.97	.71	.88	1.6	1.3	17
23	3.3	.27	.04	.00	.00	32	1.0	.54	.88	1.3	.96	6.0
24	6.0	.23	.04	.00	.00	44	1.3	.35	1.3	17	.76	3.3
25	6.3	2.8	.03	.00	.00	92	.99	.25	3.9	27	.84	2.8
26	2.2	3.7	.02	.00	.00	18	.86	.96	2.8	6.8	.54	2.1
27	1.3	11	.01	.00	.00	7.7	.70	1.6	1.6	4.2	.35	3.5
28	.88	12	.01	.00	.00	4.3	.53	1.4	3.8	3.1	10	43
29	.64	4.1	.01	.00	---	2.8	.51	.87	3.3	4.3	7.6	11
30	.38	3.9	.01	.00	---	2.2	1.5	1.9	5.3	2.2	6.8	9.0
31	.23	---	.01	.00	---	1.8	---	1.1	---	1.5	5.1	---
TOTAL	207.60	57.44	29.01	.04	.00	466.26	251.66	94.83	70.06	155.3	123.95	128.24
MEAN	6.70	1.91	.94	.00	.00	15.0	8.39	3.06	2.34	5.01	4.00	4.21
MAX	133	12	13	.01	.00	113	55	20	15	27	13	43
MIN	.07	.10	.01	.00	.00	.00	.51	.25	.08	1.0	.35	.19
AC-FT	412	114	58	.08	.00	925	499	188	139	308	246	250

CAL YR 1985	TOTAL	1083.28	MEAN	2.97	MAX	133	MIN	.00	AC-FT	2150
WTR YR 1986	TOTAL	1582.39	MEAN	4.34	MAX	133	MIN	.00	AC-FT	3140

16226200 NORTH HALAWA STREAM NEAR HONOLULU--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

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, 292 mg/L Feb. 14, 1985; no flow for many days each year.
SEDIMENT DISCHARGE: Maximum daily, 155 tons Feb. 14, 1985; no flow for many days each year.

EXTREMES FOR CURRENT YEAR.--
SEDIMENT CONCENTRATIONS: Maximum daily mean, 146 mg/L Oct. 20; no flow for many days.
SEDIMENT DISCHARGE: Maximum daily, 139 tons Oct. 20; no flow for many days.

16226200 NORTH HALAWA STREAM NEAR HONOLULU--Continued

SEDIMENT DISCHARGE, SUSPENDED (TONS/DAY), WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

DAY	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)
		OCTOBER			NOVEMBER			DECEMBER	
1	.13	e1	.00	.21	1	.00	13	10	.35
2	.08	e1	.00	.18	e1	.00	5.7	2	.03
3	.26	e2	.00	.16	e1	.00	3.1	e2	.02
4	.26	e2	.00	.17	e1	.00	1.8	e2	.01
5	.17	e2	.00	.15	e1	.00	1.2	e2	.01
6	1.8	e5	.01	.13	e1	.00	.94	e1	.00
7	.58	e3	.00	.10	e1	.00	.67	e1	.00
8	.28	e2	.00	.11	e1	.00	.46	e1	.00
9	.14	e1	.00	.14	e1	.00	.32	e1	.00
10	.07	e1	.00	4.3	15	.17	.26	e1	.00
11	1.5	e5	.02	2.6	e10	.07	.21	e1	.00
12	4.0	e10	.11	2.6	e5	.04	.20	e1	.00
13	2.3	e5	.03	1.8	e5	.02	.17	e1	.00
14	2.0	e3	.02	.92	e4	.01	.13	e1	.00
15	.94	e2	.01	.70	e4	.01	.13	e1	.00
16	.55	2	.00	.48	e3	.00	.13	e1	.00
17	.48	e2	.00	.30	e3	.00	.09	e1	.00
18	.63	e2	.00	.31	e2	.00	.07	e1	.00
19	19	48	46	2.5	e10	.07	.07	e1	.00
20	133	146	139	.74	e5	.01	.07	e1	.00
21	13	5	.18	.50	e3	.00	.06	e1	.00
22	5.2	6	.08	.34	e3	.00	.05	e1	.00
23	3.3	e3	.03	.27	e2	.00	.04	e1	.00
24	6.0	6	.10	.23	e2	.00	.04	e1	.00
25	6.3	6	.10	2.8	10	.08	.03	e1	.00
26	2.2	e3	.02	3.7	e15	.15	.02	e1	.00
27	1.3	e2	.01	11	26	3	.01	e1	.00
28	.68	e2	.00	12	10	.32	.01	e1	.00
29	.64	e1	.00	4.1	3	.03	.01	e1	.00
30	.38	e1	.00	3.9	3	.03	.01	e1	.00
31	.23	e1	.00	---	---	---	.01	e1	.00
TOTAL	207.60	---	185.72	57.44	---	4.01	29.01	---	.42
		JANUARY			FEBRUARY			MARCH	
1	.01	e1	.00	.00	.00	.00	.00	.00	.00
2	.01	e1	.00	.00	.00	.00	.00	.00	.00
3	.01	e1	.00	.00	.00	.00	.00	.00	.00
4	.01	e1	.00	.00	.00	.00	.00	.00	.00
5	.00	.00	.00	.00	.00	.00	.00	.00	.00
6	.00	.00	.00	.00	.00	.00	.00	.00	.00
7	.00	.00	.00	.00	.00	.00	.00	.00	.00
8	.00	.00	.00	.00	.00	.00	.00	.00	.00
9	.00	.00	.00	.00	.00	.00	.00	.00	.00
10	.00	.00	.00	.00	.00	.00	.00	.00	.00
11	.00	.00	.00	.00	.00	.00	.00	.00	.00
12	.00	.00	.00	.00	.00	.00	.00	.00	.00
13	.00	.00	.00	.00	.00	.00	.00	.00	.00
14	.00	.00	.00	.00	.00	.00	.00	.00	.00
15	.00	.00	.00	.00	.00	.00	.00	.00	.00
16	.00	.00	.00	.00	.00	.00	2.2	e15	.09
17	.00	.00	.00	.00	.00	.00	18	e30	1.4
18	.00	.00	.00	.00	.00	.00	3.5	e10	.09
19	.00	.00	.00	.00	.00	.00	.76	e3	.01
20	.00	.00	.00	.00	.00	.00	89	e100	24
21	.00	.00	.00	.00	.00	.00	113	e50	15
22	.00	.00	.00	.00	.00	.00	37	5	.50
23	.00	.00	.00	.00	.00	.00	32	7	.60
24	.00	.00	.00	.00	.00	.00	44	5	.60
25	.00	.00	.00	.00	.00	.00	92	89	65
26	.00	.00	.00	.00	.00	.00	16	6	.26
27	.00	.00	.00	.00	.00	.00	7.7	7	.14
28	.00	.00	.00	.00	.00	.00	4.3	5	.06
29	.00	.00	.00	---	---	---	2.8	e4	.03
30	.00	.00	.00	---	---	---	2.2	e3	.02
31	.00	.00	.00	---	---	---	1.8	e3	.01
TOTAL	.04	---	.00	.00	---	.00	466.26	---	107.81

e Estimated.

16228200 NORTH HALAWA STREAM NEAR HONOLULU--Continued

SEDIMENT DISCHARGE, SUSPENDED (TONS/DAY), WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

DAY	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)
		APRIL			MAY			JUNE	
1	1.4	e2	.01	2.8	e2	.02	.78	e1	.00
2	1.2	e2	.01	1.5	e1	.00	.56	e1	.00
3	17	11	1	1.4	e1	.00	.38	e1	.00
4	19	5	.26	20	8	.43	.23	e1	.00
5	18	3	.13	12	4	.13	.19	e1	.00
6	17	3	.14	4.8	2	.26	.13	e1	.00
7	8.1	2	.04	2.8	e2	.02	.10	e1	.00
8	5.5	2	.03	2.1	e1	.01	.08	e1	.00
9	17	5	.23	1.8	e1	.00	.18	e1	.00
10	39	4	.42	12	8	.28	15	9	.36
11	55	5	.74	4.2	e2	.02	9.4	3	.08
12	15	2	.08	2.6	e2	.01	5.7	2	.03
13	9.4	2	.05	2.0	e2	.01	3.2	e2	.02
14	6.8	1	.02	1.8	e1	.00	2.8	e2	.01
15	4.4	1	.01	2.3	e2	.01	2.1	e2	.01
16	3.5	e1	.01	4.1	2	.02	1.4	e1	.00
17	2.6	e1	.01	2.3	e2	.01	1.1	e1	.00
18	1.9	e1	.01	1.7	e2	.01	.96	e1	.00
19	1.5	e1	.00	1.3	e2	.01	.87	e1	.00
20	1.2	e1	.00	1.0	e2	.01	.76	e1	.00
21	1.0	e1	.00	.85	e1	.00	.60	e1	.00
22	.97	e1	.00	.71	e1	.00	.88	e1	.00
23	1.0	e1	.00	.54	e1	.00	.88	e1	.00
24	1.3	e1	.00	.35	e1	.00	1.3	e1	.00
25	.99	e1	.00	.25	e1	.00	3.9	4	.04
26	.86	e1	.00	.98	e2	.01	2.8	e3	.02
27	.70	e1	.00	1.6	e3	.01	1.6	e2	.01
28	.53	e1	.00	1.4	e2	.01	3.8	7	.07
29	.51	e1	.00	.87	e1	.00	3.3	e3	.03
30	1.5	e2	.00	1.9	e2	.01	5.3	3	.04
31	---		.01	1.1	e2	.01	---	---	---
TOTAL	251.66	---	3.21	94.83	---	1.29	70.06	---	.72
		JULY			AUGUST			SEPTEMBER	
1	3.8	e2	.02	1.2	e2	.01	3.9	e3	.03
2	1.8	e2	.01	1.0	e2	.01	2.0	e2	.01
3	1.6	e2	.01	13	15	1	1.3	e2	.01
4	2.9	e3	.02	9.2	7	.17	1.3	e2	.01
5	1.8	e2	.01	5.7	5	.08	1.2	e2	.01
6	1.2	e2	.01	3.0	e4	.03	.82	e1	.00
7	1.2	e1	.00	1.8	e3	.01	2.9	e3	.02
8	1.3	e1	.00	1.2	e2	.01	2.9	e3	.02
9	1.1	e1	.00	1.1	e1	.00	1.3	e2	.01
10	1.0	e1	.00	9.3	9	.22	.82	e1	.00
11	3.5	e4	.04	4.4	3	.04	.83	e1	.00
12	3.8	e3	.03	2.8	e2	.01	.44	e1	.00
13	12	11	1	1.7	e2	.01	.35	e1	.00
14	11	8	.18	5.4	4	.06	.89	e1	.00
15	5.4	4	.08	8.1	3	.07	.77	e1	.00
16	3.6	3	.03	4.5	e3	.04	.60	e1	.00
17	10	7	.19	8.6	6	.14	.42	e1	.00
18	7.5	3	.06	3.6	e4	.04	.28	e1	.00
19	5.7	3	.05	2.0	e3	.02	.23	e1	.00
20	3.9	e2	.02	1.4	e2	.01	.19	e1	.00
21	2.4	e2	.01	1.1	e2	.01	5.3	e30	.43
22	1.6	e1	.00	1.3	e2	.01	17	e50	2.3
23	1.3	e1	.00	.96	e1	.00	6.0	e10	.16
24	17	33	8	.76	e1	.00	3.3	e5	.04
25	27	15	1.1	.64	e1	.00	2.8	e3	.02
26	6.8	e4	.07	.54	e1	.00	2.1	e2	.01
27	4.2	3	.03	.35	e1	.00	3.5	e2	.02
28	3.1	e2	.02	10	30	4	43	e50	40
29	4.3	e5	.06	7.8	4	.08	11	20	.59
30	2.2	e4	.02	6.8	3	.05	9.0	5	.15
31	1.5	e3	.01	5.1	e4	.05	---	---	---
TOTAL	155.3	---	9.06	123.95	---	8.18	126.24	---	43.84
YEAR	1580.09		362.25						

e Estimated.

16226200 NORTH HALAWA STREAM NEAR HONOLULU

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

DRAINAGE AREA.--4.01 mi^2.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--February 1983 to current.

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

REMARKS.--Records fair.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,020 ft^3/s Nov. 10, 1986, gage height, 10.94 ft, no flow at times each year.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 1,020 ft^3/s Nov. 10, gage height, 10.94 ft, no other peak greater than base discharge of 750 ft^3/s; no flow Mar. 23-24.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	6.3	1.0	4.1	2.7	.22	.05	8.7	2.1	.27	.81	.38	.18
2	4.4	.84	2.8	5.7	.10	.04	3.4	2.0	.13	.53	1.5	.10
3	3.7	.65	1.9	4.5	.08	.04	1.9	2.2	.07	8.2	4.4	.06
4	2.3	.50	1.3	2.6	.06	.04	2.0	8.5	.05	6.4	2.4	.04
5	1.4	.37	1.6	1.8	.05	.04	1.2	8.9	.04	3.0	.81	.03
6	1.2	.29	5.6	.94	.04	.04	.72	12	.03	7.1	.44	.03
7	.88	1.7	2.2	.60	.03	.04	.50	8.3	.02	4.2	.24	.02
8	.88	2.0	1.3	.47	.03	.03	.33	4.4	.02	2.3	.10	.02
9	.52	.75	.80	.35	.02	.02	.15	2.6	.02	1.8	.06	.02
10	.64	44	.58	.18	.02	.02	.08	1.7	.02	2.0	.05	.02
11	.44	48	.44	.20	.02	.02	1.5	1.1	.02	3.8	1.9	.04
12	.32	78	5.5	.17	.02	.02	2.8	.70	79	12	1.0	.84
13	.80	22	3.0	2.8	.03	.01	1.5	2.9	27	11	.57	1.2
14	.96	16	1.3	17	.02	.01	.74	1.7	22	15	.33	7.2
15	.80	23	.66	5.2	13	.01	1.2	.69	11	14	.19	2.2
16	.81	25	.83	10	25	.01	2.4	.47	16	5.2	.51	.74
17	.44	14	.59	7.7	7.1	.01	2.5	.37	8.9	3.0	1.0	.43
18	.61	9.1	.43	3.0	3.2	.01	15	.19	4.9	3.2	26	.27
19	18	14	.31	1.6	1.7	.01	7.5	.09	3.0	2.6	4.6	.13
20	26	6.9	.19	.81	2.8	.01	19	.08	4.5	1.6	1.3	.08
21	8.0	4.8	14	.49	2.9	.01	8.1	.05	26	5.8	.57	.05
22	3.3	4.1	16	.38	1.7	.01	5.0	.04	7.3	18	.38	2.6
23	2.1	6.4	4.1	.24	.96	.01	2.6	.04	8.1	14	10	4.0
24	1.4	8.6	2.4	.12	.63	28	1.7	.03	4.5	3.6	4.8	3.6
25	10	4.6	1.3	12	.44	34	1.0	.02	2.6	1.7	1.1	.86
26	5.9	2.8	.68	6.0	.25	10	5.5	.05	1.7	.98	.54	.34
27	15	2.0	.48	2.4	.11	4.0	36	.05	4.4	.57	2.6	.16
28	8.0	14	16	1.3	.06	1.7	7.7	.51	1.8	.43	1.4	.07
29	4.0	5.4	5.5	.73	---	.82	4.0	1.2	.88	.32	1.2	.04
30	2.5	4.1	1.7	.54	---	.55	2.3	1.5	.82	1.4	.49	.03
31	1.5	---	9.6	.44	---	2.3	---	.45	---	.65	.34	---
TOTAL	130.70	366.90	107.17	92.56	60.59	81.88	145.02	64.91	235.09	155.19	71.20	25.40
MEAN	4.22	12.2	3.46	2.99	2.16	2.64	4.83	2.09	7.84	5.01	2.30	.85
MAX	28	78	16	17	25	34	36	12	79	18	26	7.2
MIN	.32	.29	.19	.12	.02	.01	.08	.02	.02	.32	.05	.02
AC-FT	259	728	213	184	120	162	288	129	466	308	141	50

CAL YR 1986	TOTAL	1893.11	MEAN	5.19	MAX	113	MIN	.00	AC-FT	3750
WTR YR 1987	TOTAL	1536.61	MEAN	4.21	MAX	79	MIN	.01	AC-FT	3050

16226200 NORTH HALAWA STREAM NEAR HONOLULU--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

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, 292 mg/L Feb. 14, 1985; no flow for many days each year.
SEDIMENT DISCHARGE: Maximum daily, 155 tons Feb. 14, 1985; no flow for many days each year.

EXTREMES FOR CURRENT YEAR.--
SEDIMENT CONCENTRATIONS: Maximum daily mean, 271 mg/L Nov. 10; 1 mg/l for many days.
SEDIMENT DISCHARGE: Maximum daily, 285 tons Nov. 10; minimum daily, less than 0.01 ton for many days.

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	BAROMETRIC PRESSURE (MM OF HG)	STREAMFLOW, INSTANTANEOUS (CFS)	SPECIFIC CONDUCTANCE (US/CM)	PH (STANDARD UNITS)	TEMPERATURE WATER (DEG C)	TURBIDITY (FTU)	OXYGEN, DISSOLVED (MG/L)	OXYGEN, DISSOLVED (PERCENT SATURATION)	COLIFORM, FECAL, 0.7 UM-MF (COLS./100 ML)	HARDNESS TOTAL (MG/L AS CACO3)	HARDNESS NONCARBONATE MG/L AS CACO3
JUL												
07...	0900	760	3.9	120	7.40	22.0	1.4	8.0	91	88	30	1
AUG												
31...	0920	756	e0.20	150	7.30	22.0	0.60	7.6	88	84	--	--
31...	0925	756	e0.20	150	7.30	22.0	0.40	7.6	88	--	--	--

DATE	CALCIUM DISSOLVED (MG/L AS CA)	MAGNESIUM, DISSOLVED (MG/L AS MG)	SODIUM, DISSOLVED (MG/L AS NA)	SODIUM PERCENT	SODIUM ADSORPTION RATIO	POTASSIUM, DISSOLVED (MG/L AS K)	SULFATE DISSOLVED (MG/L AS SO4)	CHLORIDE, DISSOLVED (MG/L AS CL)	FLUORIDE, DISSOLVED (MG/L AS F)	SILICA, DISSOLVED (MG/L AS SIO2)	SOLIDS, RESIDUE AT 180 DEG. C DISSOLVED (MG/L)	SOLIDS, SUM OF CONSTITUENTS, DISSOLVED (MG/L)
JUL												
07...	4.9	4.4	12	45	1	0.80	4.9	18	<0.10	20	83	83

DATE	SOLIDS, DISSOLVED (TONS PER AC-FT)	RESIDUE TOTAL AT 105 DEG. C, SUSPENDED (MG/L)	NITROGEN, NO2+NO3 TOTAL (MG/L AS N)	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)	PHOSPHOROUS TOTAL (MG/L AS P)	ALUMINUM, TOTAL RECOVERABLE (UG/L AS AL)	ALUMINUM, DISSOLVED (UG/L AS AL)	ARSENIC TOTAL (UG/L AS AS)	ARSENIC DISSOLVED (UG/L AS AS)	BARIUM, TOTAL RECOVERABLE (UG/L AS BA)	BARIUM, DISSOLVED (UG/L AS BA)	BERYLLIUM, TOTAL RECOVERABLE (UG/L AS BE)
JUL												
07...	0.11	<1	<0.100	0.80	<0.010	60	60	<1	<1	<100	<2	<10
AUG												
31...	--	3	<0.100	<0.20	<0.050	--	--	--	--	--	--	--

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

16226200 NORTH HALAWA NEAR HONOLULU --Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	BERYLLIUM, DISSOLVED (UG/L AS BE)	CADMIUM TOTAL RECOVERABLE (UG/L AS CD)	CADMIUM DISSOLVED (UG/L AS CD)	CHROMIUM, TOTAL RECOVERABLE (UG/L AS CR)	CHROMIUM, DISSOLVED (UG/L AS CR)	COBALT, TOTAL RECOVERABLE (UG/L AS CO)	COBALT, DISSOLVED (UG/L AS CO)	COPPER, TOTAL RECOVERABLE (UG/L AS CU)	COPPER, DISSOLVED (UG/L AS CU)	IRON, TOTAL RECOVERABLE (UG/L AS FE)	IRON, DISSOLVED (UG/L AS FE)	LEAD, TOTAL RECOVERABLE (UG/L AS PB)
JUL 07...	<0.5	<1	<1	10	1	1	<3	3	1	50	44	<5

LEAD, DISSOLVED (UG/L AS PB)	LITHIUM TOTAL RECOVERABLE (UG/L AS LI)	LITHIUM DISSOLVED (UG/L AS LI)	MANGANESE, TOTAL RECOVERABLE (UG/L AS MN)	MANGANESE, DISSOLVED (UG/L AS MN)	MERCURY TOTAL RECOVERABLE (UG/L AS HG)	MERCURY DISSOLVED (UG/L AS HG)	MOLYBDENUM, TOTAL RECOVERABLE (UG/L AS MO)	MOLYBDENUM, DISSOLVED (UG/L AS MO)	NICKEL, TOTAL RECOVERABLE (UG/L AS NI)	NICKEL, DISSOLVED (UG/L AS NI)	SELENIUM, TOTAL (UG/L AS SE)
<5	<10	<4	<10	<1	<0.10	<0.1	<1	<10	<1	1	<1

SELENIUM, DISSOLVED (UG/L AS SE)	SILVER, TOTAL RECOVERABLE (UG/L AS AG)	SILVER, DISSOLVED (UG/L AS AG)	STRONTIUM, DISSOLVED (UG/L AS SR)	VANADIUM, DISSOLVED (UG/L AS V)	ZINC, TOTAL RECOVERABLE (UG/L AS ZN)	ZINC, DISSOLVED (UG/L AS ZN)	CARBON, ORGANIC TOTAL (MG/L AS C)	ALDRIN, TOTAL (UG/L)	CHLORDANE, TOTAL (UG/L)	DDD, TOTAL (UG/L)	DDE, TOTAL (UG/L)
<1	<1	<1.0	33	<6	<10	4	1.1	<0.010	<0.1	<0.010	<0.010

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

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

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

HAWAII, ISLAND OF OAHU

16226200 NORTH HALAWA STREAM NEAR HONOLULU--Continued

SEDIMENT DISCHARGE, SUSPENDED (TONS/DAY), WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DAY	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)
		OCTOBER			NOVEMBER			DECEMBER	
1	6.3	2	.03	1.0	3	.01	4.1	3	.03
2	4.4	2	.02	.84	e2	.00	2.8	e2	.02
3	3.7	e1	.01	.65	2	.00	1.9	e2	.01
4	2.3	e1	.01	.50	e1	.00	1.3	e2	.01
5	1.4	e1	.00	.37	e1	.00	1.8	2	.01
6	1.2	e1	.00	.29	e1	.00	5.8	5	.08
7	.88	e1	.00	1.7	3	.01	2.2	e2	.01
8	.68	e1	.00	2.0	e2	.01	1.3	e1	.00
9	.52	e1	.00	.75	e1	.00	.80	e1	.00
10	.84	e2	.00	44	271	285	.56	e1	.00
11	.44	e1	.00	48	98	17	.44	e1	.00
12	.32	e1	.00	78	66	27	5.5	9	.13
13	.80	e2	.00	22	9	.53	3.0	e3	.02
14	.96	e1	.00	16	5	.22	1.3	e2	.01
15	.80	e1	.00	23	8	.50	.66	e1	.00
16	.61	e1	.00	25	15	1.0	.83	e1	.00
17	.44	e1	.00	14	5	.19	.59	e1	.00
18	.61	e1	.00	9.1	3	.07	.43	e1	.00
19	18	17	1	14	5	.19	.31	e1	.00
20	26	40	5	6.9	3	.06	.19	e1	.00
21	6.0	6	.10	4.8	2	.03	14	e30	1.1
22	3.3	e2	.02	4.1	3	.03	16	10	.43
23	2.1	e2	.01	8.4	13	.29	4.1	e3	.03
24	1.4	e1	.00	8.6	6	.14	2.4	e2	.01
25	10	22	1	4.6	2	.02	1.3	e2	.01
26	5.9	4	.06	2.8	2	.02	.68	e1	.00
27	15	8	.32	2.0	e2	.01	.48	e1	.00
28	8.0	4	.09	14	2	.09	16	e25	1.1
29	4.0	e4	.04	5.4	4	.06	5.5	e5	.07
30	2.5	e3	.02	4.1	3	.03	1.7	e3	.01
31	1.5	e3	.01	---	---	---	9.6	e15	.39
TOTAL	130.70	---	6.74	366.90	---	332.51	107.17	---	3.48
		JANUARY			FEBRUARY			MARCH	
1	2.7	e3	.02	.22	e1	.00	.05	e1	.00
2	5.7	e10	.15	.10	e1	.00	.04	e1	.00
3	4.5	e3	.04	.08	e1	.00	.04	1	.00
4	2.6	e2	.01	.06	e1	.00	.04	e1	.00
5	1.6	e2	.01	.05	e1	.00	.04	e1	.00
6	.94	e1	.00	.04	e1	.00	.04	e1	.00
7	.60	e1	.00	.03	e1	.00	.04	e1	.00
8	.47	e1	.00	.03	e1	.00	.03	e1	.00
9	.35	e1	.00	.02	e1	.00	.02	e1	.00
10	.18	e1	.00	.02	e1	.00	.02	e1	.00
11	.20	e1	.00	.02	e1	.00	.02	e1	.00
12	.17	e1	.00	.02	e1	.00	.02	e1	.00
13	2.8	e10	.07	.03	e1	.00	.01	e1	.00
14	17	e25	1.1	.02	e1	.00	.01	e1	.00
15	5.2	e5	.07	13	12	.42	.01	e1	.00
16	10	e15	.41	25	5	.34	.01	e1	.00
17	7.7	e5	.10	7.1	3	.06	.01	e1	.00
18	3.0	e3	.02	3.2	e2	.02	.01	e1	.00
19	1.6	e2	.01	1.7	e2	.01	.01	e1	.00
20	.81	e2	.00	2.8	e3	.02	.01	e1	.00
21	.49	e1	.00	2.9	e3	.02	.01	e1	.00
22	.38	e1	.00	1.7	e2	.01	.01	e1	.00
23	.24	e1	.00	.96	e1	.00	.01	e1	.00
24	.12	e1	.00	.63	e1	.00	28	54	23
25	12	23	2	.44	e1	.00	34	15	1.3
26	8.0	e3	.05	.25	e1	.00	10	6	.16
27	2.4	e2	.01	.11	e1	.00	4.0	5	.05
28	1.3	e2	.01	.06	e1	.00	1.7	e3	.01
29	.73	e1	.00	---	---	---	.82	e1	.00
30	.54	e1	.00	---	---	---	.55	e1	.00
31	.44	e1	.00	---	---	---	2.3	4	.02
TOTAL	92.56	---	4.08	60.59	---	.90	81.88	---	24.54

e Estimated.

16226200 NORTH HALAWA STREAM NEAR HONOLULU--Continued

SEDIMENT DISCHARGE, SUSPENDED (TONS/DAY), WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DAY	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)
		APRIL			MAY			JUNE	
1	6.7	6	.14	2.1	e2	.01	.27	e1	.00
2	3.4	e3	.03	2.0	e2	.01	.13	e1	.00
3	1.9	e2	.01	2.2	e2	.01	.07	e1	.00
4	2.0	2	.01	8.5	5	.11	.05	e1	.00
5	1.2	e1	.00	8.9	4	.10	.04	e1	.00
6	.72	e1	.00	12	2	.06	.03	e1	.00
7	.50	e1	.00	8.3	2	.04	.02	e1	.00
8	.33	e1	.00	4.4	2	.02	.02	e1	.00
9	.15	e1	.00	2.6	e2	.01	.02	e1	.00
10	.08	e1	.00	1.7	e1	.00	.02	e1	.00
11	1.5	e4	.02	1.1	e1	.00	.02	e1	.00
12	2.8	2	.02	.70	e1	.00	79	e153	177
13	1.5	e1	.00	2.9	2	.02	27	e15	1.1
14	.74	e1	.00	1.7	e2	.01	22	e15	.89
15	1.2	e1	.00	.69	e1	.00	11	4	.12
16	2.4	e2	.01	.47	e1	.00	16	5	.22
17	2.5	e2	.01	.37	e1	.00	8.9	3	.07
18	15	6	.24	.19	e1	.00	4.9	3	.04
19	7.5	3	.06	.09	e1	.00	3.0	e2	.02
20	19	10	.51	.06	e1	.00	4.5	5	.06
21	6.1	5	.08	.05	e1	.00	28	19	3
22	5.0	3	.04	.04	e1	.00	7.3	3	.06
23	2.6	e2	.01	.04	e1	.00	8.1	2	.04
24	1.7	e2	.01	.03	e1	.00	4.5	2	.02
25	1.0	e1	.00	.02	e1	.00	2.8	e2	.01
26	5.5	7	.10	.05	e1	.00	1.7	e1	.00
27	36	16	3	.05	e1	.00	4.4	3	.04
28	7.7	4	.08	.51	e2	.00	1.8	e2	.01
29	4.0	e2	.02	1.2	e3	.01	.88	e1	.00
30	2.3	e2	.01	1.5	e2	.01	.82	e1	.00
31	---	---	---	.45	e1	.00	---	---	---
TOTAL	145.02	---	4.41	64.91	---	.40	235.09	---	182.70
		JULY			AUGUST			SEPTEMBER	
1	.81	e1	.00	.38	e1	.00	.18	e2	.00
2	.53	e1	.00	1.5	4	.02	.10	e1	.00
3	8.2	13	.29	4.4	8	.10	.06	e1	.00
4	6.4	4	.07	2.4	4	.02	.04	e1	.00
5	3.0	e3	.02	.81	e4	.01	.03	e1	.00
6	7.1	5	.10	.44	4	.00	.03	e1	.00
7	4.2	2	.02	.24	e3	.00	.02	e1	.00
8	2.3	e2	.01	.10	e2	.00	.02	e1	.00
9	1.8	e2	.01	.06	e2	.00	.02	e1	.00
10	2.0	e2	.01	.05	6	.00	.02	e1	.00
11	3.8	4	.04	1.9	e11	.06	.04	e1	.00
12	12	10	.32	1.0	7	.02	.84	e3	.01
13	11	e7	.21	.57	e3	.00	1.2	e4	.01
14	15	7	.28	.33	e1	.00	7.2	13	.25
15	14	8	.30	.19	e1	.00	2.2	2	.01
16	5.2	9	.13	.51	e3	.00	.74	e1	.00
17	3.0	8	.06	1.0	e3	.01	.43	e1	.00
18	3.2	e9	.08	26	105	28	.27	e1	.00
19	2.6	e5	.04	4.6	e10	.12	.13	e1	.00
20	1.6	e3	.01	1.3	e3	.01	.08	e1	.00
21	5.8	10	.16	.57	e1	.00	.05	e1	.00
22	18	62	18	.38	e1	.00	2.6	e8	.06
23	14	35	4	10	e30	.81	4.0	7	.08
24	3.8	7	.07	4.6	e10	.13	3.6	e4	.04
25	1.7	e3	.01	1.1	e3	.01	.86	e2	.00
26	.98	e2	.01	.54	e1	.00	.34	e1	.00
27	.57	e1	.00	2.6	e3	.02	.16	e1	.00
28	.43	e1	.00	1.4	e2	.01	.07	e1	.00
29	.32	e1	.00	1.2	e2	.01	.04	e1	.00
30	1.4	e3	.01	.49	e1	.00	.03	e1	.00
31	.85	e2	.00	.34	e1	.00	---	---	---
TOTAL	155.19	---	24.16	71.20	---	29.36	25.40	---	.46
YEAR	1538.81		613.83						

e Estimated.

16229000 KALIHI STREAM NEAR HONOLULU

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

DRAINAGE AREA.--2.61 mi^2.

WATER-DISCHARGE RECORDS

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

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

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

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

AVERAGE DISCHARGE.--73 years (water years 1915-87), 8.59 ft^3/s (4,770 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, about 12,400 ft^3/s Nov. 18, 1930, gage height, 13.81 ft, from rating curve extended above 280 ft^3/s on basis of indirect measurements at gage heights 8.9 ft, 10.96 ft, and 11.27 ft; minimum, 0.09 ft^3/s Oct. 22, 1933, July 29, 1988.

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

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Nov. 10	1600	960	7.96	June 12	1600	*2,180	*9.74
Nov. 11	1030	930	7.90				

Minimum discharge, 1.1 ft^3/s for a few days in March and September.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	6.5	2.4	4.9	4.9	2.0	2.2	3.2	4.9	3.4	4.0	e3.2	1.4
2	5.4	2.2	4.4	4.4	1.9	2.2	2.3	4.2	3.0	3.8	e4.0	1.5
3	8.0	2.4	4.2	4.9	1.9	2.0	3.8	4.0	2.4	7.8	e3.0	1.4
4	4.2	2.3	4.0	4.0	1.9	2.0	3.2	6.5	2.3	5.9	e2.8	1.4
5	4.0	2.2	5.4	3.6	1.8	1.8	2.6	7.7	3.2	4.6	e2.7	1.4
6	3.8	2.0	4.4	3.4	1.8	1.8	2.3	14	2.4	11	e2.8	1.2
7	3.2	4.1	4.0	3.2	1.8	1.8	2.0	9.2	2.0	6.2	e2.4	1.2
8	3.0	2.4	3.8	3.0	1.6	1.6	2.3	6.5	2.0	4.9	e2.3	1.2
9	2.8	2.0	3.2	3.4	1.6	1.6	2.3	5.4	2.0	4.2	e2.2	1.5
10	2.6	57	3.0	3.2	1.5	1.6	2.3	4.9	1.9	5.4	e2.3	2.2
11	2.4	65	3.4	2.6	1.5	1.5	8.3	4.4	1.8	4.9	e2.1	3.2
12	3.8	68	10	2.4	1.5	1.4	4.6	4.9	105	8.6	e2.0	1.6
13	4.0	18	5.1	11	1.6	1.4	4.2	5.4	21	8.4	e2.2	1.8
14	2.8	16	3.8	9.0	1.8	1.3	3.4	4.4	11	19	e1.9	4.9
15	2.8	22	4.0	5.1	36	1.3	5.8	4.0	7.8	7.1	e1.9	1.8
16	2.4	15	3.8	10	17	1.4	4.4	3.8	11	5.9	e1.8	1.6
17	3.2	11	3.4	5.9	6.8	1.5	4.9	3.4	6.5	5.1	e1.8	1.9
18	3.4	9.1	3.2	4.4	5.1	1.4	11	3.2	6.5	5.1	e2.2	2.0
19	12	17	3.0	3.4	4.0	2.0	6.2	3.0	5.1	4.2	e2.0	1.3
20	20	9.1	3.0	3.0	4.4	1.6	8.4	2.8	9.2	4.0	e1.9	1.2
21	5.4	7.4	6.8	3.0	3.6	1.4	6.5	2.6	10	7.9	e1.8	1.1
22	4.0	8.0	8.2	2.8	3.2	1.2	5.6	2.6	6.8	20	e1.8	1.6
23	3.4	10	4.2	2.8	2.8	1.2	4.9	3.5	8.7	10	e4.5	1.9
24	3.0	8.4	3.6	3.4	4.7	26	4.2	3.2	5.9	5.4	e2.4	1.6
25	8.2	6.8	3.2	8.5	3.8	9.3	3.6	2.3	4.9	8.0	e1.9	1.4
26	4.4	6.2	2.8	4.0	3.2	4.2	7.9	5.4	6.1	4.4	e2.4	2.1
27	5.9	5.4	2.6	3.0	2.6	3.0	10	3.6	5.9	4.6	e2.0	1.4
28	4.0	9.7	13	2.8	2.3	2.4	5.9	3.0	4.6	4.9	1.9	1.2
29	3.0	5.6	5.1	2.4	---	2.2	4.4	5.9	4.2	e3.8	1.6	1.1
30	3.0	5.1	7.4	2.3	---	1.9	4.2	3.2	4.9	e3.5	1.5	1.1
31	2.6	---	15	2.2	---	4.0	---	2.8	---	e3.4	1.4	---
TOTAL	143.0	401.8	155.7	132.0	123.7	90.2	144.7	144.7	271.5	203.8	70.5	50.2
MEAN	4.81	13.4	5.02	4.26	4.42	2.91	4.82	4.67	9.05	6.57	2.27	1.67
MAX	20	68	15	11	36	28	11	14	105	20	4.5	4.9
MIN	2.4	2.0	2.8	2.2	1.5	1.2	2.0	2.3	1.8	3.4	1.4	1.1
AC-FT	284	797	309	262	245	179	287	287	539	404	140	100

CAL YR 1986	TOTAL	2185.60	MEAN	5.93	MAX	90	MIN	.41	AC-FT	4300
WTR YR 1987	TOTAL	1931.8	MEAN	5.29	MAX	105	MIN	1.1	AC-FT	3830

e Estimated.

16229000 KALIHI STREAM NEAR HONOLULU--Continued

WATER-QUALITY RECORDS

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

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

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH (STAND-ARD UNITS)	TEMPER-ATURE WATER (DEG C)	HARD-NESS TOTAL (MG/L AS CACO3)	HARD-NESS NONCARB-ONATE MG/L AS CACO3	CALCIUM DIS-SOLVED (MG/L AS CA)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG)	SODIUM, DIS-SOLVED (MG/L AS NA)	SODIUM PERCENT	SODIUM AD-SORP-TION RATIO
DEC												
29...	1255	4.4	132	7.80	20.0	31	5	5.0	4.6	13	46	1
MAR												
30...	0900	2.2	145	7.30	17.5	38	9	6.0	5.6	15	45	1
JUL												
29...	0830	3.4	140	7.30	21.5	32	4	5.1	4.7	13	46	1
SEP												
30...	1300	1.1	160	7.20	22.0	39	5	6.4	5.5	14	43	1

DATE	POTAS-SIUM, DIS-SOLVED (MG/L AS K)	ALKA-LINITY LAB (MG/L AS CACO3)	SULFATE DIS-SOLVED (MG/L AS SO4)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)	FLUO-RIDE, DIS-SOLVED (MG/L AS F)	SILICA, DIS-SOLVED (MG/L AS SIO2)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L)	SOLIDS, DIS-SOLVED (TONS PER AC-FT)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N)	IRON, DIS-SOLVED (UG/L AS FE)	MANGA-NESE, DIS-SOLVED (UG/L AS MN)
DEC											
29...	1.0	26	7.6	19	<0.10	13	79	0.11	<0.100	120	7
MAR											
30...	0.90	29	7.2	21	<0.10	13	86	0.12	<0.100	230	12
JUL											
29...	0.80	28	6.5	10	0.10	12	69	0.09	<0.100	87	2
SEP											
30...	0.90	34	7.1	21	0.10	13	89	0.12	<0.100	250	16

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

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

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

DRAINAGE AREA.--5.18 mi^2.

WATER-DISCHARGE RECORDS

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

GAGE.--Water-stage recorder and concrete control. Elevation of gage is 70 ft, from topographic map. Aug. 28, 1961, to June 30, 1962, crest-stage gage at site 800 ft downstream at different datum.

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

AVERAGE DISCHARGE.--25 years, 10.3 ft^3/s (7,460 acre-ft/yr).

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

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

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 2,590 ft^3/s June 12, gage height 6.19, no other peak greater than base discharge of 1,600 ft^3/s; minimum, 1.5 ft^3/s for several days in September.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	7.9	3.1	6.8	6.4	2.9	2.9	6.4	7.0	3.6	4.8	3.8	1.9
2	8.2	3.2	5.7	8.4	2.7	2.7	3.8	4.8	3.2	5.0	5.2	1.9
3	8.2	3.5	5.1	9.6	2.7	2.5	4.8	5.3	3.0	13	3.7	1.8
4	5.0	2.9	4.8	5.0	2.5	2.5	4.4	9.1	3.0	8.4	3.3	1.9
5	4.4	2.5	9.2	3.9	2.3	2.3	3.4	9.0	3.6	6.9	3.2	2.1
6	3.9	2.4	5.4	3.7	2.3	2.3	3.2	15	2.8	15	3.1	1.8
7	3.7	4.3	4.2	3.5	2.2	2.3	3.0	12	2.6	8.1	3.0	1.7
8	3.6	2.9	3.9	3.2	2.2	2.3	2.9	7.3	2.5	6.1	2.9	1.5
9	3.5	2.4	3.8	3.2	2.0	2.2	2.9	5.9	2.5	5.2	2.8	1.5
10	7.3	61	3.6	3.5	2.0	2.0	2.4	5.1	2.2	7.0	2.7	3.0
11	3.6	113	3.8	2.9	2.2	1.8	8.1	4.7	2.2	6.7	2.7	11
12	4.6	173	11	2.9	2.2	1.8	5.4	4.8	216	11	2.6	2.9
13	6.4	27	5.4	15	3.1	2.0	5.9	5.6	45	14	2.5	5.7
14	3.6	28	4.2	16	2.6	2.0	3.6	4.2	24	31	2.5	13
15	3.7	39	4.4	6.1	69	2.0	10	3.9	16	10	2.9	2.8
16	3.6	29	4.6	12	36	2.3	6.0	3.8	25	8.0	2.7	2.2
17	4.3	19	3.8	7.5	13	2.7	6.6	3.6	11	6.4	2.5	2.0
18	5.0	13	3.5	4.5	7.2	2.2	20	3.4	9.8	6.5	3.1	2.4
19	31	30	3.2	3.8	5.4	4.3	9.6	3.2	7.1	5.1	2.8	1.9
20	38	14	3.4	3.5	10	2.8	10	3.2	8.6	4.9	2.6	2.7
21	7.8	9.7	9.5	3.3	5.2	1.8	8.5	3.1	20	10	2.5	1.7
22	5.3	9.6	12	3.3	4.1	1.7	6.5	3.2	9.1	20	2.5	2.1
23	4.2	12	4.9	3.1	3.7	1.7	5.2	6.0	12	19	12	2.5
24	3.7	11	3.9	3.8	9.9	31	5.0	4.4	7.8	6.5	3.1	2.5
25	8.6	8.2	3.7	18	4.5	28	4.3	3.0	6.3	7.0	2.6	2.1
26	5.1	7.5	3.3	5.0	3.3	7.9	7.5	9.9	7.7	5.1	3.2	3.0
27	7.3	6.3	3.2	3.5	3.3	3.9	15	4.0	8.0	5.0	2.8	2.2
28	4.8	19	13	3.3	3.1	3.0	7.2	3.4	5.8	6.0	2.7	2.1
29	3.7	7.6	5.4	3.0	---	2.7	5.3	5.7	5.0	4.5	2.2	2.3
30	3.4	8.6	5.3	3.1	---	2.5	4.4	3.5	6.0	4.3	2.0	2.6
31	3.2	---	21	3.1	---	11	---	3.1	---	4.0	2.0	---
TOTAL	214.4	672.9	184.8	175.1	211.6	143.1	191.3	170.2	481.4	274.5	98.0	88.6
MEAN	6.92	22.4	5.96	5.65	7.56	4.62	6.38	5.49	16.0	8.85	3.16	2.95
MAX	38	173	21	18	69	31	20	15	216	31	12	13
MIN	3.2	2.4	3.2	2.9	2.0	1.7	2.4	3.0	2.2	4.0	2.0	1.5
AC-FT	425	1330	367	347	420	284	379	338	955	544	194	176

CAL YR 1986	TOTAL	3204.51	MEAN	8.78	MAX	173	MIN	.58	AC-FT	6360
WTR YR 1987	TOTAL	2905.9	MEAN	7.96	MAX	216	MIN	1.5	AC-FT	5760

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 1986 TO SEPTEMBER 1987

DATE	TIME	BAROMETRIC PRESSURE (MM OF HG)	STREAMFLOW, INSTANTANEOUS (CFS)	SPECIFIC CONDUCTANCE (US/CM)	PH (STANDARD UNITS)	TEMPERATURE WATER (DEG C)	TURBIDITY (FTU)	OXYGEN, DISSOLVED (MG/L)	OXYGEN, DISSOLVED (PERCENT SATURATION)
OCT									
14...	1225	765	3.1	206	7.50	24.5	5.2	8.0	98
FEB									
09...	1210	758	2.5	241	8.20	20.5	2.1	8.8	98
APR									
20...	1130	760	10	169	7.80	22.0	4.7	7.7	89
AUG									
25...	1100	763	2.3	260	7.40	25.0	2.9	8.0	97

DATE	COLIFORM, FECAL, 0.7 UM-MF (COLS./100 ML)	STREPTOCOCCI FECAL, KF AGAR (COLS. PER 100 ML)	HARDNESS TOTAL (MG/L AS CACO3)	HARDNESS NONCARBONATE MG/L AS CACO3	CALCIUM DISSOLVED (MG/L AS CA)	MAGNESIUM, DISSOLVED (MG/L AS MG)	SODIUM, DISSOLVED (MG/L AS NA)	PERCENT SODIUM	SODIUM ADSORPTION RATIO
OCT									
14...	13000	11000	53	5	10	6.9	19	43	1
FEB									
09...	11000	17000	65	7	12	8.4	22	42	1
APR									
20...	6400	3900	46	6	8.4	6.0	16	43	1
AUG									
25...	9600	16000	55	3	11	6.6	27	51	2

DATE	POTASSIUM, DISSOLVED (MG/L AS K)	BICARBONATE WATER WH FET FIELD (MG/L AS HCO3)	ALKALINITY LAB (MG/L AS CACO3)	ALKALINITY WH WAT TOTAL FIELD (MG/L AS CACO3)	SULFATE DISSOLVED (MG/L AS SO4)	CHLORIDE, DISSOLVED (MG/L AS CL)	FLUORIDE, DISSOLVED (MG/L AS F)	SILICA, DISSOLVED (MG/L AS SIO2)	SOLIDS, RESIDUE AT 180 DEG. C DISSOLVED (MG/L)	SOLIDS, SUM OF CONSTITUENTS, DISSOLVED (MG/L)	SOLIDS, DISSOLVED (TONS PER AC-FT)
OCT											
14...	1.4	58	49	48	9.7	27	<0.10	16	120	119	0.16
FEB											
09...	1.2	70	58	58	10	31	<0.10	18	141	138	0.19
APR											
20...	0.90	49	41	40	8.5	22	<0.10	15	101	102	0.14
AUG											
25...	1.6	63	52	52	11	38	0.10	17	141	144	0.19

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

16229300 KALIHI STREAM AT KALIHI--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	NITROGEN, NO2+NO3 DISSOLVED (MG/L AS N)	NITROGEN, NITRITE DISSOLVED (MG/L AS N)	NITROGEN, AMMONIA TOTAL (MG/L AS N)	NITROGEN, AMMONIA DISSOLVED (MG/L AS N)	NITROGEN, ORGANIC TOTAL (MG/L AS N)	NITROGEN,AMMONIA + ORGANIC TOTAL (MG/L AS N)	PHOSPHOROUS TOTAL (MG/L AS P)	PHOSPHOROUS DISSOLVED (MG/L AS P)	PHOSPHOROUS ORTHO, DISSOLVED (MG/L AS P)
FEB										
09...	1210	0.220	<0.010	0.020	0.020	0.48	0.50	0.050	0.040	0.040
APR										
20...	1130	0.170	0.010	0.020	0.020	0.18	0.20	0.040	0.040	0.020
AUG										
25...	1100	0.150	<0.010	0.040	0.020	0.76	0.80	0.060	0.040	<0.010

DATE	TIME	ALUMINUM, DISSOLVED (UG/L AS AL)	ARSENIC DISSOLVED (UG/L AS AS)	BARIUM, DISSOLVED (UG/L AS BA)	BERYLLIUM, DISSOLVED (UG/L AS BE)	CADMIUM DISSOLVED (UG/L AS CD)	CHROMIUM, DISSOLVED (UG/L AS CR)	COBALT, DISSOLVED (UG/L AS CO)	COPPER, DISSOLVED (UG/L AS CU)
OCT									
14...	1225	30	<1	9	<0.5	<1	<1	<3	2
FEB									
09...	1210	<10	<1	5	<0.5	<1	<1	<3	2
APR									
20...	1130	120	<1	5	<0.5	1	<1	<3	<1
AUG									
25...	1100	50	<1	6	<0.5	<1	<1	<3	1

DATE	IRON, DISSOLVED (UG/L AS FE)	LEAD, DISSOLVED (UG/L AS PB)	LITHIUM DISSOLVED (UG/L AS LI)	MANGANESE, DISSOLVED (UG/L AS MN)	MERCURY DISSOLVED (UG/L AS HG)	MOLYBDENUM, DISSOLVED (UG/L AS MO)	NICKEL, DISSOLVED (UG/L AS NI)	SELENIUM, DISSOLVED (UG/L AS SE)
OCT								
14...	160	<5	5	10	<0.1	<10	<1	<1
FEB								
09...	110	<5	<4	12	<0.1	<10	<1	<1
APR								
20...	200	<5	8	8	<0.1	<10	1	<1
AUG								
25...	210	<5	<4	25	1.2	<10	<1	1

DATE	SILVER, DISSOLVED (UG/L AS AG)	STRONTIUM, DISSOLVED (UG/L AS SR)	VANADIUM, DISSOLVED (UG/L AS V)	ZINC, DISSOLVED (UG/L AS ZN)	SEDIMENT, SUSPENDED (MG/L)	SEDIMENT, DISCHARGE, SUSPENDED (T/DAY)	SED SUSP. SIEVE DIAM. % FINER THAN .062 MM
OCT							
14...	<1.0	83	<6	17	5	0.04	100
FEB							
09...	<1.0	98	<6	50	2	0.01	100
APR							
20...	<1.0	69	<6	6	7	0.19	100
AUG							
25...	<1.0	87	<6	20	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 mi^2.

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

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

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

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

AVERAGE DISCHARGE.--71 years (water years 1915-16, 1916-20, 1922-87), 6.90 ft^3/s (5,000 acre-ft/yr).

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

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 1,440 ft^3/s June 12, gage height 5.75 ft, no other peak greater than base discharge of 240 ft^3/s; minimum, 1.4 ft^3/s Sept. 9.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3.5	3.0	7.1	6.5	4.0	3.7	3.4	3.9	2.8	4.3	3.8	2.5
2	3.6	3.1	6.9	6.1	3.9	3.8	3.1	3.3	2.6	4.1	4.2	2.6
3	3.9	3.0	6.7	7.3	3.8	3.6	3.7	3.2	2.5	4.9	3.6	2.5
4	3.5	2.9	6.5	5.9	3.8	3.2	3.3	4.7	2.4	4.4	3.7	2.2
5	3.4	2.8	9.3	5.6	3.7	3.3	3.0	4.3	5.6	4.7	8.6	2.4
6	3.2	2.8	7.1	5.5	3.7	3.4	2.9	9.1	2.6	9.5	14	2.4
7	3.2	3.3	6.3	5.3	3.5	3.3	2.8	5.2	2.4	5.1	6.1	2.5
8	3.1	3.0	5.9	5.2	3.5	3.3	2.7	3.9	2.6	4.2	3.8	2.4
9	3.1	2.8	6.0	5.7	3.5	3.3	2.7	3.6	2.5	4.1	3.7	2.0
10	3.0	29	5.8	5.4	3.4	3.2	2.6	3.6	2.3	4.4	3.9	2.5
11	3.0	36	6.6	5.0	3.4	3.1	4.3	3.5	2.3	4.2	3.4	3.5
12	3.3	45	11	4.6	3.3	3.1	3.3	3.5	127	5.3	3.4	2.6
13	3.5	16	6.6	7.3	3.5	2.6	2.9	3.5	13	5.7	3.3	3.3
14	2.9	22	6.1	14	3.4	3.0	2.7	3.3	7.2	22	3.2	6.1
15	3.0	28	5.9	7.6	38	2.9	3.5	3.2	6.7	5.5	3.2	2.6
16	3.0	18	5.7	12	14	2.9	3.0	3.1	8.1	5.2	3.7	2.5
17	4.0	12	5.6	7.8	6.2	3.1	3.2	3.1	6.6	5.0	3.3	2.7
18	3.4	11	5.6	5.7	5.1	3.0	4.4	3.0	6.7	5.3	3.2	2.6
19	6.9	14	5.4	4.7	4.9	3.0	3.6	2.9	6.7	4.8	3.1	2.5
20	6.4	12	5.4	4.9	5.0	2.9	3.3	2.8	8.2	4.7	3.0	2.3
21	3.5	10	6.1	4.9	4.5	2.6	3.3	2.8	12	5.7	3.0	2.0
22	3.3	10	6.6	4.9	4.2	2.6	3.5	2.7	7.0	5.0	2.9	2.7
23	3.1	10	5.2	4.4	4.1	2.6	3.3	3.0	6.5	5.8	3.0	2.4
24	3.1	9.6	5.2	4.7	4.9	5.8	3.0	2.8	5.2	4.7	2.8	2.2
25	6.8	8.6	5.2	7.3	4.0	5.5	3.0	2.7	4.9	4.3	2.8	2.2
26	4.0	8.6	4.9	4.9	3.8	4.2	4.5	4.0	5.4	3.6	2.9	2.3
27	3.4	8.2	4.9	4.5	3.8	3.0	6.6	3.2	5.0	4.2	2.7	2.1
28	3.2	9.2	11	4.4	3.8	2.8	4.0	2.8	4.5	4.3	2.8	2.0
29	3.1	8.1	5.8	4.2	---	2.8	3.4	2.6	4.4	3.9	2.6	2.0
30	3.1	8.1	6.9	4.2	---	2.5	3.3	2.6	4.6	4.0	2.6	2.0
31	3.0	---	16	4.3	---	4.2	---	2.5	---	3.8	2.6	---
TOTAL	112.5	358.3	209.3	185.0	156.7	102.5	102.3	108.6	280.3	166.9	118.9	76.6
MEAN	3.63	11.9	6.75	5.97	5.60	3.31	3.41	3.50	9.34	5.38	3.64	2.55
MAX	6.9	45	16	14	38	5.8	6.6	9.1	127	22	14	6.1
MIN	2.9	2.8	4.9	4.2	3.3	2.5	2.6	2.5	2.3	3.8	2.6	2.0
AC-FT	223	711	415	367	311	203	203	215	556	331	236	152

CAL YR 1988	TOTAL	1925.99	MEAN	5.28	MAX	48	MIN	.92	AC-FT	3820
WTR YR 1987	TOTAL	1977.9	MEAN	5.42	MAX	127	MIN	2.0	AC-FT	3920

16240500 WAIAKEAKUA STREAM AT HONOLULU

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

DRAINAGE AREA.--1.06 mi^2.

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

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

GAGE.--Water-stage recorder and combination Parshall flume and concrete weir. Datum of gage is 294.50 ft above mean sea level (Honolulu Board of Water Supply bench mark). Prior to May 20, 1914, nonrecording gage at site 200 ft upstream at different datum. May 20, 1914, to Jan. 16, 1921, water-stage recorder at site 30 ft upstream at different datum. Aug. 18, 1925, to Mar. 15, 1928, water-stage recorder at preaent 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.--69 yesrs (water years 1914-20, 1926-87), 5.01 ft^3/s (3,630 acre-ft/yr).

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

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 318 ft^3/s June 12, gage height 3.26 ft, no other peak greater than base discharge of 310 ft^3/s; minimum 2.6 ft^3/s for aeveral days in March, April, and June.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3.5	3.3	5.0	5.0	3.3	3.1	3.8	3.9	3.6	3.8	5.0	3.1
2	3.5	3.2	4.2	4.5	3.2	3.1	2.9	3.4	3.1	3.5	6.5	3.1
3	3.8	3.1	3.9	5.3	3.2	3.0	3.1	4.1	2.8	5.6	4.5	3.0
4	3.3	3.4	3.7	4.2	3.2	2.8	2.9	7.6	2.7	4.2	4.3	2.9
5	3.6	3.2	4.4	4.0	3.1	2.8	2.7	8.8	5.7	6.3	3.9	3.0
6	3.2	3.2	3.8	3.8	3.1	2.9	2.7	12	3.7	11	3.7	2.9
7	3.0	3.4	3.6	3.7	3.1	2.8	3.1	8.6	3.4	5.0	3.5	2.9
8	2.9	3.2	3.5	3.7	3.1	2.8	3.5	4.6	3.2	4.2	4.4	2.9
9	2.8	3.0	3.4	4.8	3.1	2.8	3.0	3.9	2.9	3.9	4.0	2.8
10	2.8	15	3.4	4.1	3.0	2.8	2.8	3.7	2.8	6.2	4.0	3.2
11	2.8	21	5.6	3.6	2.9	2.7	4.7	3.5	2.7	7.0	4.1	8.1
12	5.3	26	17	3.4	2.9	2.8	4.1	3.6	35	10	4.1	3.3
13	6.0	8.2	5.1	5.7	3.4	2.8	4.3	4.4	7.3	9.9	3.5	8.7
14	3.4	8.2	4.1	12	3.3	2.7	3.5	3.4	6.8	24	3.4	12
15	3.8	19	5.6	5.5	28	2.7	10	3.5	8.7	6.7	4.0	3.7
16	3.3	9.5	4.8	10	9.5	2.7	5.1	3.2	7.9	5.5	7.9	3.4
17	5.3	7.0	3.9	5.5	4.8	2.7	4.9	3.1	5.4	4.7	5.2	3.6
18	4.9	6.0	3.7	4.3	3.9	2.9	8.3	3.0	5.0	4.7	4.0	3.5
19	16	6.1	3.7	3.8	3.6	3.0	5.5	2.9	5.7	4.3	3.6	3.3
20	7.1	6.2	4.4	3.7	4.1	2.8	4.9	2.9	12	4.1	3.4	3.1
21	4.3	5.0	11	3.6	3.7	2.7	3.7	2.8	12	11	3.4	3.0
22	3.7	5.9	6.4	3.6	3.4	2.7	3.4	2.8	6.6	5.5	3.4	5.3
23	3.4	5.6	4.5	3.5	3.3	2.7	3.3	3.1	5.3	4.6	4.8	3.7
24	3.3	5.1	4.2	3.8	3.4	3.4	3.2	3.1	4.4	4.1	3.5	4.3
25	15	4.8	4.0	7.5	3.3	3.8	3.1	2.8	3.9	4.2	3.4	3.3
26	5.1	4.5	3.7	3.9	3.2	4.1	7.2	4.3	5.9	3.8	4.7	3.1
27	7.4	4.1	3.8	3.8	3.1	3.2	6.9	4.1	4.6	4.4	3.8	3.0
28	4.4	6.6	12	4.2	3.1	2.7	4.5	3.5	3.8	5.1	4.5	2.8
29	3.8	4.7	4.6	3.6	---	2.7	3.6	4.0	3.7	4.0	3.7	2.8
30	3.6	6.1	12	3.4	---	2.7	3.3	3.1	4.7	3.9	3.3	2.7
31	3.4	---	12	3.3	---	5.9	---	2.9	---	3.8	3.2	---
TOTAL	147.7	213.6	174.8	144.8	124.3	93.3	128.0	130.6	185.3	188.8	128.5	114.5
MEAN	4.76	7.12	5.64	4.67	4.44	3.01	4.27	4.21	6.18	6.09	4.15	3.82
MAX	16	26	17	12	28	5.9	10	12	35	24	7.9	12
MIN	2.8	3.0	3.4	3.3	2.9	2.7	2.7	2.8	2.7	3.5	3.2	2.7
AC-FT	293	424	347	287	247	185	254	259	368	374	255	227

CAL YR 1986	TOTAL	1776.6	MEAN	4.87	MAX	51	MIN	1.1	AC-FT	3520
WTR YR 1987	TOTAL	1774.2	MEAN	4.88	MAX	35	MIN	2.7	AC-FT	3520

16254000 MAKAWAO STREAM NEAR KAILUA

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

DRAINAGE AREA.--2.04 mi^2.

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

REVISED RECORDS.--WSP 1937: Drainage area.

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

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

AVERAGE DISCHARGE.--31 years (water years 1914-15, 1959-87), 4.93 ft^3/s (3,570 acre-ft/yr).

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

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

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Nov. 10	1630	*612	*5.72	Nov. 11	0300	545	5.50

Minimum discharge, 1.7 ft^3/s Sept. 9, 20.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	6.6	3.4	4.8	5.0	3.4	3.8	3.5	4.6	6.9	3.2	3.0	2.0
2	4.5	3.2	4.6	4.5	3.4	3.8	3.2	4.5	3.7	3.5	3.3	2.3
3	3.7	3.3	4.6	4.2	3.2	3.6	3.2	4.8	3.4	3.3	3.0	1.9
4	3.2	3.5	4.5	3.8	3.1	3.6	3.2	5.4	3.6	3.1	3.4	2.0
5	3.1	3.3	6.4	3.9	3.1	3.5	3.0	5.7	3.5	3.1	3.6	2.2
6	3.0	3.2	5.4	3.7	3.1	3.5	2.9	13	3.4	4.5	3.0	2.3
7	2.8	11	4.8	3.7	3.5	3.5	3.1	10	3.4	3.8	2.7	2.3
8	2.8	5.8	4.5	3.9	3.1	3.4	3.1	6.8	3.5	3.4	3.5	1.9
9	2.8	4.1	4.3	4.9	3.0	3.4	3.1	5.5	3.4	3.4	2.7	1.8
10	2.7	78	4.2	4.9	2.8	3.3	3.0	4.5	3.3	4.0	2.5	1.9
11	2.7	81	4.2	4.5	2.8	3.2	3.2	4.0	3.3	4.5	2.5	2.3
12	3.3	88	8.8	4.4	3.4	3.1	3.5	4.8	4.6	4.9	2.5	2.1
13	3.4	20	4.3	5.0	3.8	3.0	3.2	5.5	3.1	4.3	2.5	2.1
14	2.9	14	4.8	18	4.7	2.9	3.0	4.4	3.3	14	2.2	2.3
15	3.0	12	4.9	5.8	42	2.9	3.3	3.9	3.2	4.7	2.2	2.3
16	2.8	11	4.7	8.4	13	2.9	2.9	3.7	3.0	3.8	2.8	2.4
17	2.9	9.2	4.5	6.9	6.8	3.1	2.9	3.7	3.0	3.7	2.4	2.8
18	2.5	8.5	4.4	6.5	4.8	3.0	3.1	4.0	3.1	3.5	2.2	2.5
19	6.3	7.8	4.4	5.8	4.4	2.9	3.2	3.8	3.6	3.5	2.1	2.4
20	4.0	7.4	4.4	5.3	4.9	2.8	3.2	3.5	5.0	3.5	2.1	1.8
21	3.0	6.9	5.3	5.0	5.4	2.8	3.0	5.8	5.9	4.4	2.2	2.1
22	2.9	6.7	4.7	4.8	4.5	2.8	2.9	4.7	3.4	4.1	2.1	2.7
23	2.8	6.5	4.5	4.2	4.2	2.8	3.3	3.8	3.1	4.2	2.1	2.4
24	2.8	6.1	4.3	4.3	8.1	2.8	3.0	3.4	4.8	3.8	2.0	3.8
25	17	5.8	4.3	5.1	4.2	4.0	3.0	3.2	3.2	3.7	2.0	3.3
26	5.3	5.6	4.2	4.1	4.0	9.9	8.4	3.4	3.4	4.0	2.1	8.2
27	5.1	5.3	4.2	3.8	4.0	4.7	6.4	3.4	3.4	3.9	2.2	3.5
28	4.1	5.3	9.7	3.6	3.9	3.1	5.2	3.3	3.1	3.5	2.3	2.7
29	3.7	5.2	4.5	3.5	---	2.9	4.7	3.4	3.4	3.3	2.0	2.8
30	3.6	5.8	7.0	3.4	---	2.8	4.5	3.2	3.3	3.5	1.9	3.1
31	3.6	---	10	4.0	---	3.8	---	3.2	---	3.8	2.0	---
TOTAL	122.9	398.7	158.2	156.7	158.4	107.6	107.2	146.7	110.3	127.5	77.1	78.0
MEAN	3.96	13.2	5.10	5.05	5.86	3.47	3.57	4.73	3.68	4.11	2.49	2.53
MAX	17	78	10	16	42	9.9	8.4	13	8.9	14	3.8	8.2
MIN	2.5	3.2	4.2	3.4	2.8	2.8	2.9	3.2	3.0	3.1	1.9	1.8
AC-FT	244	787	314	311	314	213	213	291	219	253	153	151

CAL YR 1988	TOTAL	1542.8	MEAN	4.23	MAX	78	MIN	1.8	AC-FT	3060
WTR YR 1987	TOTAL	1745.3	MEAN	4.78	MAX	78	MIN	1.8	AC-FT	3460

16265600 RIGHT BRANCH KAMOOALII STREAM NEAR KANEOHE

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

DRAINAGE AREA.--1.11 mi^2.

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

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

REMARKS.--Records fair except for daily discharges above 10 ft^3/s, which are poor.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,160 ft^3/s, Nov. 10, 1986, gage height, 11.65 ft from rating curve extended above 100 ft^3/s on basis of slope-conveyance computation; minimum, 0.03 ft^3/s for several days in November, December 1984 and January 1985.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 1,160 ft^3/s Nov. 10, gage height, 11.65 ft; minimum, 0.37 ft^3/s Oct. 15.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.83	.40	.79	.77	.79	.87	.92	.79	5.2	.54	.59	.57
2	.51	.40	.81	.75	.83	.87	.87	.83	.71	.57	.62	.59
3	.45	.42	.81	.75	.83	.83	.63	.87	1.6	.71	.59	.57
4	.43	.41	.81	.75	.83	.83	.79	.92	.68	.65	.57	.57
5	.45	.40	6.5	.75	.79	.83	.75	.87	.71	.68	.62	.59
6	.45	.40	1.3	.79	.79	.83	.75	2.6	.68	.79	.57	.57
7	.43	15	.80	.75	.75	.83	.92	.92	.65	.65	.54	.54
8	.43	1.0	.82	.75	.75	.79	.87	.83	.68	.62	.54	.54
9	.43	.71	.85	.79	.75	.83	.87	.79	.65	.62	.57	.57
10	.41	139	.83	.71	.79	.83	.83	.79	.62	.65	.59	.59
11	.40	55	.82	.71	.83	.87	1.6	.83	.62	.62	.59	.85
12	.75	52	1.7	.75	1.1	.87	1.0	1.0	2.2	.65	.59	.65
13	.43	.98	.87	.75	1.2	.83	.83	.87	.65	.68	.57	.65
14	.40	.90	.87	.87	25	.79	.83	.75	.65	9.4	.54	.62
15	.41	.86	.90	.79	2.6	.79	.92	.75	.65	.65	.62	.59
16	.43	.87	.87	1.2	2.0	.79	.87	.71	.68	.62	.70	.62
17	.45	.90	.63	.92	.92	.75	.97	.79	.68	.62	.59	.62
18	.47	.92	.92	.87	.83	.83	.92	.71	.68	.65	1.9	.59
19	1.2	1.6	.87	.92	.87	.87	1.2	.68	.62	.65	.57	.57
20	2.2	.87	.87	.87	.92	.83	.97	.68	1.5	.68	.57	.59
21	.45	.91	1.7	.87	.92	.79	3.2	2.6	1.7	.98	.59	.75
22	.43	.94	1.1	.92	.87	.83	.83	.71	.65	.90	.59	1.8
23	.43	1.7	.90	.97	.83	.79	.83	.79	.62	1.6	.57	.83
24	.41	1.2	.87	1.2	2.1	.75	.79	.71	.57	.65	.54	.92
25	.92	.86	.87	1.7	.97	.79	.83	.68	.57	.62	.54	.65
26	.47	.82	.83	.97	.92	5.2	6.0	.83	.59	.59	.57	2.1
27	.57	.83	.87	.92	.87	.75	.97	.68	.59	.68	.57	.59
28	.43	1.0	6.4	.67	.87	.71	.83	.71	.57	.59	.57	.57
29	.42	.80	.85	.63	---	.75	.79	.68	.57	.62	.54	.59
30	.44	.78	1.1	.87	---	.79	.75	.65	.59	.59	.54	.65
31	.43	---	1.8	.87	---	1.0	---	.65	---	.57	.57	---
TOTAL	17.36	262.88	41.13	27.20	52.52	29.71	34.33	27.67	28.13	30.09	19.23	21.50
MEAN	.56	9.43	1.33	.88	1.88	.96	1.14	.89	.94	.97	.62	.72
MAX	2.2	139	6.5	1.7	25	5.2	8.0	2.6	5.2	9.4	1.9	2.1
MIN	.40	.40	.79	.71	.75	.71	.75	.65	.57	.54	.54	.54
AC-FT	34	561	82	54	104	59	68	55	56	60	38	43

CAL YR 1986	TOTAL	643.43	MEAN	1.76	MAX	139	MIN	.35	AC-FT	1280
WTR YR 1987	TOTAL	611.75	MEAN	1.68	MAX	139	MIN	.40	AC-FT	1210

16265600 RIGHT BRANCH KAMOOALII STREAM NEAR KANEOHE--Continued

WATER-QUALITY RECORDS

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

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

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

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

EXTREMES FOR PERIOD OF RECORD.--
SEDIMENT CONCENTRATIONS: Maximum daily mean, 1,230 mg/L Apr. 19, 1984; minimum daily mean, 3 mg/L for many days.
SEDIMENT DISCHARGE: Maximum daily, 452 tons Feb. 14, 1985; minimum daily, less than 0.01 ton for many days.

EXTREMES FOR CURRENT YEAR.--
SEDIMENT CONCENTRATIONS: Maximum daily mean, 328 mg/L Nov. 10; minimum daily mean, 7 mg/L for many days.
SEDIMENT DISCHARGE: Maximum daily, 414 tons Nov. 10; minimum daily, 0.01 ton for many days.

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	BAROMETRIC PRESSURE (MM OF HG)	STREAM-FLOW, INSTANTANEOUS (CFS)	SPECIFIC CONDUCTANCE (US/CM)	PH (STANDARD UNITS)	TEMPERATURE WATER (DEG C)	TURBIDITY (FTU)	OXYGEN, DISSOLVED (MG/L)	OXYGEN DISSOLVED (PERCENT SATURATION
DEC									
10...	1220	756	0.79	256	6.70	23.5	1.7	4.9	58
AUG									
31...	1400	754	0.20	220	6.50	26.0	1.8	7.2	90
31...	1405	754	0.20	220	6.50	26.0	1.8	7.2	90

DATE	COLIFORM, FECAL, 0.7 UM-MF (COLS./100 ML)	RESIDUE TOTAL AT 105 DEG. C, SUSPENDED (MG/L)	NITROGEN, NO2+NO3 TOTAL (MG/L AS N)	NITROGEN,AMMONIA +- ORGANIC TOTAL (MG/L AS N)	PHOSPHOROUS TOTAL (MG/L AS P)
DEC					
10...	530	3	0.600	0.30	0.030
AUG					
31...	620	6	0.400	0.80	<0.010

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

HAWAII, ISLAND OF OAHU

16285600 RIGHT BRANCH OF KAMOOALII STREAM NEAR KANEOHE--Continued

SEDIMENT DISCHARGE, SUSPENDED (TONS/DAY), WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DAY	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)
		OCTOBER			NOVEMBER			DECEMBER	
1	.83	15	.03	.40	9	.01	.79	e13	.03
2	.51	13	.02	.40	9	.01	.81	e13	.03
3	.45	13	.02	.42	12	.01	.81	e13	.03
4	.43	12	.01	.41	9	.01	.81	e13	.03
5	.45	9	.01	.40	11	.01	6.5	e95	1.7
6	.45	8	.01	.40	13	.01	1.3	e20	.07
7	.43	8	.01	15	135	32	.80	e15	.03
8	.43	8	.01	1.0	50	.14	.82	e15	.03
9	.43	10	.01	.71	15	.03	.85	e15	.03
10	.41	9	.01	139	328	414	.83	e15	.03
11	.40	9	.01	55	191	54	.82	e15	.03
12	.75	20	.04	52	138	54	1.7	e25	.11
13	.43	9	.01	.98	e25	.07	.87	e16	.04
14	.40	9	.01	.90	e20	.05	.87	e16	.04
15	.41	8	.01	.86	e15	.03	.90	e16	.04
16	.43	8	.01	.87	e15	.04	.87	e16	.04
17	.45	7	.01	.90	e18	.04	.83	e16	.04
18	.47	7	.01	.92	e18	.04	.92	e18	.04
19	1.2	e25	.08	1.6	e30	.13	.87	e16	.04
20	2.2	e40	.24	.87	e15	.04	.87	e16	.04
21	.45	9	.01	.91	e18	.04	1.7	e25	.11
22	.43	7	.01	.94	e18	.05	1.1	e23	.07
23	.43	7	.01	1.7	e25	.11	.90	e18	.04
24	.41	7	.01	1.2	e20	.08	.87	e15	.04
25	.92	15	.04	.86	e15	.03	.87	e15	.04
26	.47	7	.01	.82	e15	.03	.83	e13	.03
27	.57	10	.02	.83	e15	.03	.87	e15	.04
28	.43	9	.01	1.0	e20	.05	6.4	e95	1.6
29	.42	9	.01	.80	e13	.03	.85	e15	.03
30	.44	9	.01	.78	e13	.03	1.1	e20	.08
31	.43	9	.01	---	---	---	1.8	e25	.12
TOTAL	17.72	---	.72	282.88	---	555.13	41.13	---	4.65
		JANUARY			FEBRUARY			MARCH	
1	.77	e15	.03	.79	e15	.03	.87	e15	.04
2	.75	e15	.03	.83	e15	.03	.87	e15	.04
3	.75	e15	.03	.83	e15	.03	.83	e15	.03
4	.75	e15	.03	.83	e15	.03	.83	e15	.03
5	.75	e13	.03	.79	e15	.03	.83	e15	.03
6	.79	e15	.03	.79	e15	.03	.83	e15	.03
7	.75	e15	.03	.75	e13	.03	.83	e15	.03
8	.75	e13	.03	.75	e13	.03	.79	e13	.03
9	.79	e15	.03	.75	e13	.03	.83	e13	.03
10	.71	e13	.02	.79	e13	.03	.83	e13	.03
11	.71	e13	.02	.83	e15	.03	.87	e15	.04
12	.75	e13	.03	1.1	e20	.06	.87	e15	.04
13	.75	e13	.03	1.2	e20	.06	.83	e15	.03
14	.87	e16	.04	25	107	38	.79	e13	.03
15	.79	e13	.03	2.6	e30	.21	.79	e13	.03
16	1.2	e23	.07	2.0	e25	.14	.79	e13	.03
17	.92	e18	.04	.92	e15	.04	.75	e13	.03
18	.87	e15	.04	.83	e12	.03	.83	e15	.03
19	.92	e18	.04	.87	e13	.03	.87	e15	.04
20	.87	e15	.04	.92	e15	.04	.83	e15	.03
21	.87	e15	.04	.92	e15	.04	.79	e13	.03
22	.92	e18	.04	.87	e13	.03	.83	e15	.03
23	.97	e20	.05	.83	e12	.03	.79	e13	.03
24	1.2	e25	.08	2.1	e25	.14	.75	e13	.03
25	1.7	e30	.14	.97	e18	.05	.79	e15	.03
26	.97	e23	.06	.92	e16	.04	5.2	e90	1.3
27	.92	e20	.05	.87	e15	.04	.75	e15	.03
28	.87	e18	.04	.87	e15	.04	.71	e15	.03
29	.83	e15	.03	---	---	---	.75	e15	.03
30	.87	e18	.04	---	---	---	.79	e15	.03
31	.87	e18	.04	---	---	---	1.0	e20	.05
TOTAL	27.20	---	1.28	52.52	---	39.35	29.71	---	2.27

e Estimated

16265600 RIGHT BRANCH OF KAMOOALII STREAM NEAR KANEOHE--Continued

SEDIMENT DISCHARGE, SUSPENDED (TONS/DAY), WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

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	.92	e18	.04	.79	e15	.03	5.2	e90	1.3
2	.87	e15	.04	.83	e15	.03	.71	e15	.03
3	.83	e15	.03	.87	e15	.04	1.8	e25	.11
4	.79	e12	.03	.92	e18	.04	.68	e15	.03
5	.75	e12	.02	.87	e15	.04	.71	e15	.03
6	.75	e12	.02	2.8	e75	.53	.68	e15	.03
7	.92	e18	.04	.92	e25	.06	.65	e15	.03
8	.87	e15	.04	.83	e23	.05	.88	e15	.03
9	.87	e15	.04	.79	e20	.04	.65	e13	.02
10	.83	e15	.03	.79	e15	.03	.62	e12	.02
11	1.8	e30	.13	.83	e15	.03	.82	e12	.02
12	1.0	e25	.07	1.0	e25	.07	2.2	e70	.42
13	.83	e15	.03	.87	e15	.04	.85	e15	.03
14	.83	e15	.03	.75	e13	.03	.65	e15	.03
15	.92	e18	.04	.75	e13	.03	.85	e15	.03
16	.87	e15	.04	.71	e13	.02	.68	e15	.03
17	.97	e18	.05	.79	e13	.03	.68	e13	.03
18	.92	e18	.04	.71	e12	.02	.68	e13	.03
19	1.2	e25	.08	.88	e12	.02	.82	e12	.02
20	.97	e23	.08	.68	e12	.02	1.5	59	1.8
21	3.2	e80	.89	2.8	e75	.53	1.7	85	1.0
22	.83	e15	.03	.71	e15	.03	.85	e15	.03
23	.83	e15	.03	.79	e15	.03	.62	e12	.02
24	.79	e15	.03	.71	e15	.03	.57	e12	.02
25	.83	e15	.03	.68	e13	.02	.57	e12	.02
26	8.0	e95	1.5	.83	e13	.03	.59	e12	.02
27	.97	e23	.08	.68	e13	.02	.59	e12	.02
28	.83	e20	.04	.71	e13	.02	.57	e12	.02
29	.79	e18	.04	.68	e12	.02	.57	e12	.02
30	.75	e15	.03	.65	e12	.02	.59	e12	.02
31	---	---	---	.65	e12	.02	---	---	---
TOTAL	34.33	---	3.38	27.67	---	1.97	28.13	---	5.28
		JULY			AUGUST			SEPTEMBER	
1	.54	e12	.02	.59	10	.02	.57	e11	.02
2	.57	e12	.02	.82	10	.02	.59	e11	.02
3	.71	e15	.03	.59	10	.02	.57	e11	.02
4	.65	e15	.03	.57	10	.02	.57	e11	.02
5	.89	e15	.03	.82	10	.02	.59	e11	.02
6	.78	e15	.03	.57	10	.02	.57	e10	.02
7	.66	e15	.03	.54	10	.01	.54	e10	.01
8	.82	e15	.03	.54	10	.01	.54	e10	.01
9	.62	e15	.03	.57	11	.02	.57	e10	.02
10	.85	e15	.03	.59	11	.02	.59	e12	.02
11	.62	e15	.03	.59	11	.02	.85	e18	.04
12	.65	e15	.03	.59	11	.02	.65	e12	.02
13	.68	e15	.03	.57	11	.02	.85	e12	.02
14	9.4	100	9.6	.54	11	.02	.62	e10	.02
15	.65	15	.03	.62	50	.08	.59	e10	.02
16	.82	15	.03	.70	60	.11	.62	e10	.02
17	.62	15	.03	.59	30	.05	.62	e10	.02
18	.65	15	.03	1.9	135	3.1	.59	e10	.02
19	.85	15	.03	.57	25	.04	.57	e10	.02
20	.68	15	.03	.57	20	.03	.59	e10	.02
21	.98	33	.09	.59	15	.02	.75	e15	.03
22	.90	83	.22	.59	20	.03	1.8	e60	.29
23	1.6	79	.76	.57	20	.03	.83	e25	.08
24	.65	16	.03	.54	12	.02	.92	e30	.07
25	.82	10	.02	.54	12	.02	.65	e15	.03
26	.59	10	.02	.57	15	.02	2.1	e65	.37
27	.68	10	.02	.57	12	.02	.59	e10	.02
28	.59	10	.02	.57	10	.02	.57	e10	.02
29	.62	11	.02	.54	10	.01	.59	e10	.02
30	.59	13	.02	.54	11	.02	.65	e12	.02
31	.57	13	.02	.57	11	.02	---	---	---
TOTAL	30.10	---	11.39	19.23	---	3.90	21.50	---	1.33
YEAR	612.12		630.63						

e Estimated

16285600 RIGHT BRANCH KAMOOALII STREAM NEAR KANEOHE--Continued

PARTICLE-SIZE DISTRIBUTION OF SUSPENDED SEDIMENT, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SEDI-MENT, SUS-PENDED (MG/L)	SEDI-MENT, DIS-CHARGE, SUS-PENDED (T/DAY)	SED. SUSP. FALL DIAM. % FINER THAN .002 MM	SED. SUSP. FALL DIAM. % FINER THAN .004 MM
NOV						
10...	1615	1130	1500	4580	21	32

DATE	SED. SUSP. FALL DIAM. % FINER THAN .016 MM	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM	SED. SUSP. SIEVE DIAM. % FINER THAN .125 MM	SED. SUSP. SIEVE DIAM. % FINER THAN .250 MM	SED. SUSP. SIEVE DIAM. % FINER THAN .500 MM	SED. SUSP. SIEVE DIAM. % FINER THAN 1.00 MM
NOV						
10...	54	68	73	83	94	99

16270900 LULUKU STREAM AT ALTITUDE 220 FT, NEAR KANEOHE

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

DRAINAGE AREA.--0.44 mi^2.

WATER-DISCHARGE RECORDS

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

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

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

AVERAGE DISCHARGE.--7 years (water years 1968-71, 1985-87), 1.32 ft^3/s (956 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 651 ft^3/s Nov. 26, 1970 (gage height, 8.18 ft for datum and site then in use), from rating curve extended above 10 ft^3/s on basis of slope-area measurement at gage height 6.09 ft; minimum, 0.03 ft^3/s for many days 1984-85.

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

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Nov. 10	1600	270	3.74	July 22	2100	*299	*3.95

Minimum discharge, .44 ft^3/s for several days.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.75	e.50	1.1	.77	.67	.65	.82	.64	.94	e.50	.61	.64
2	.66	e.50	.99	.71	.69	.65	.63	.62	.71	e.50	.68	.57
3	.63	e.62	.95	.68	.67	.63	.65	.69	.73	.69	.63	.57
4	.61	e.58	.94	.70	.68	.62	.61	.71	.69	.53	.60	.58
5	.60	e.50	1.2	.88	.72	.62	.61	.75	.67	.52	.83	.55
6	.58	e.50	1.0	.60	.74	.67	.62	.91	.80	.60	.64	.54
7	.60	e1.5	.95	.65	.71	.62	.66	.81	.58	.53	.59	.54
8	.61	e1.0	.93	.63	.68	.62	.64	.72	.54	.52	.60	.55
9	.60	e.90	.90	.88	.68	.66	.65	.69	.54	.52	.59	.52
10	.60	e24	.81	.89	.68	.65	.82	.64	.53	.52	.80	.55
11	.62	e7.4	.83	.66	.74	.62	.77	.59	.52	.52	.59	.64
12	.79	9.6	1.1	.66	.74	.60	.71	.64	1.9	.57	.59	.54
13	.72	2.6	.83	.80	.78	.59	.65	.67	e.76	.52	.57	.53
14	.86	1.9	.81	.80	.79	.62	.63	.57	e.76	.60	.57	.53
15	.64	1.5	.79	.75	2.2	.66	.64	.54	e.76	.61	.57	.51
16	.64	1.4	.82	.92	1.3	.62	.84	.51	e.62	.59	.61	.53
17	.65	1.3	.66	.75	.84	.64	.64	.56	e.56	.58	.60	.52
18	.59	1.2	.70	.71	.77	.63	.61	.55	e.62	.58	2.4	.51
19	.67	1.3	.76	.73	.72	.63	.70	.50	e.82	.55	.82	.52
20	.80	1.3	.71	.73	.71	.61	.88	.52	e.76	.57	.73	.53
21	.65	1.3	.92	.71	.68	.60	.82	.68	e.62	.75	.73	.50
22	.65	1.2	.81	.89	.68	.59	.79	.79	e.56	22	.73	.61
23	.61	1.3	.74	.72	.68	.60	.72	.89	e.50	e1.9	1.5	.56
24	.56	1.4	.74	.75	.79	.87	.67	.92	e.56	e.92	.81	.56
25	.71	1.3	.73	.84	.88	.69	.68	.90	e.50	e.76	.73	.55
26	.59	1.2	.70	.74	.67	.84	.95	1.0	e.56	.64	.76	.56
27	.64	1.2	.69	.75	.67	.67	.81	.84	e.56	.60	.65	.52
28	.57	1.3	1.1	.73	.64	.64	.73	.82	e.50	.59	.62	.53
29	.51	1.2	.81	.71	---	.64	.66	2.2	e.56	.60	.59	.52
30	.58	1.1	.78	.72	---	.62	.67	.72	e.50	.61	.80	.54
31	e.58	---	.87	.74	---	.62	---	.82	---	.60	.57	---
TOTAL	19.65	72.58	26.67	22.38	22.00	19.99	20.68	23.23	19.83	41.09	22.51	16.40
MEAN	.83	2.42	.86	.72	.79	.64	.69	.75	.66	1.33	.73	.55
MAX	.80	24	1.2	.92	2.2	.87	.95	2.2	1.9	22	2.4	.64
MIN	.51	.50	.66	.60	.64	.59	.61	.50	.50	.50	.57	.50

CAL YR 1986	TOTAL	237.39	MEAN	.65	MAX	24	MIN	.10
WTR YR 1987	TOTAL	327.01	MEAN	.90	MAX	24	MIN	.50

e Estimated.

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

WATER-QUALITY RECORDS

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

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

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

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

EXTREMES FOR PERIOD OF RECORD.--
SEDIMENT CONCENTRATIONS: Maximum daily mean, 660 mg/L July 22, 1987; minimum daily mean, 2 mg/L Mar. 2-4, 1985.
SEDIMENT DISCHARGE: Maximum daily, 212 tons July 22, 1987; minimum daily, less than 0.01 ton for many days each year.

EXTREMES FOR CURRENT YEAR.--
SEDIMENT CONCENTRATIONS: Maximum daily mean, 660 mg/L July 22; minimum daily mean, 4 mg/L for many days.
SEDIMENT DISCHARGE: Maximum daily, 212 tons July 22; minimum daily, 0.01 ton for many days.

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	BAROMETRIC PRESSURE (MM OF HG)	STREAMFLOW, INSTANTANEOUS (CFS)	SPECIFIC CONDUCTANCE (US/CM)	PH (STANDARD UNITS)	TEMPERATURE WATER (DEG C)	TURBIDITY (FTU)	OXYGEN, DISSOLVED (MG/L)	OXYGEN, DISSOLVED (PERCENT SATURATION)
DEC									
09...	1230	756	0.87	174	7.60	21.0	0.60	8.2	92

DATE	COLIFORM, PECAL, 0.7 UM-MF (COLS./100 ML)	RESIDUE TOTAL AT 105 DEG. C, SUSPENDED (MG/L)	NITROGEN, NO2+NO3 TOTAL (MG/L AS N)	NITROGEN, AMMONIA +- ORGANIC TOTAL (MG/L AS N)	PHOSPHOROUS TOTAL (MG/L AS P)
DEC					
09...	K1600	6	0.600	0.50	0.020

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

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

SEDIMENT DISCHARGE, SUSPENDED (TONS/DAY), WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DAY	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)
		OCTOBER			NOVEMBER			DECEMBER	
1	.74	e4	.01	e.50	e4	.01	1.1	e5	.01
2	.66	e4	.01	e.50	e4	.01	.99	e5	.01
3	.63	e4	.01	e.62	e4	.01	.95	e5	.01
4	.61	e4	.01	e.56	e4	.01	.94	e5	.01
5	.60	e4	.01	e.50	e4	.01	1.2	e6	.02
6	.58	e4	.01	e.50	e4	.01	1.0	e5	.01
7	.60	e4	.01	e1.5	190	5.9	.95	e5	.01
8	.61	e4	.01	e1.0	e10	.03	.93	e5	.01
9	.60	e4	.01	e.9	e7	.02	.90	e5	.01
10	.80	e4	.01	e24	822	135	.81	e5	.01
11	.62	e4	.01	e7.4	281	12	.83	e5	.01
12	.79	e8	.01	9.6	233	19	1.1	e7	.02
13	.72	e5	.01	2.6	24	.17	.83	e5	.01
14	.66	e4	.01	1.9	e10	.05	.81	e5	.01
15	.64	e4	.01	1.5	e7	.03	.79	e5	.01
16	.64	e4	.01	1.4	e5	.02	.82	e5	.01
17	.65	e4	.01	1.3	e5	.02	.66	e5	.01
18	.59	e4	.01	1.2	e5	.02	.70	e5	.01
19	.87	e5	.01	1.3	e5	.02	.76	e5	.01
20	.80	e6	.01	1.3	e5	.02	.71	e5	.01
21	.65	e4	.01	1.3	e5	.02	.92	e5	.01
22	.65	e4	.01	1.2	e5	.02	.81	e5	.01
23	.61	e4	.01	1.3	e5	.02	.74	e5	.01
24	.56	e4	.01	1.4	e5	.02	.74	e5	.01
25	.71	e5	.01	1.3	e5	.02	.73	e5	.01
26	.59	e4	.01	1.2	e5	.02	.70	e5	.01
27	.64	e4	.01	1.2	e5	.02	.69	e5	.01
28	.57	e4	.01	1.3	e5	.02	1.1	e10	.03
29	.51	e4	.01	1.2	e5	.02	.81	e6	.01
30	.58	e4	.01	1.1	e5	.01	.78	e5	.01
31	e.56	e4	.01	---	---	---	.87	e5	.01
TOTAL	19.65	---	.31	72.58	---	172.55	26.67	---	.35
		JANUARY			FEBRUARY			MARCH	
1	.77	e4	.01	.67	e4	.01	.85	e4	.01
2	.71	e4	.01	.69	e4	.01	.65	e4	.01
3	.68	e4	.01	.67	e4	.01	.63	e4	.01
4	.70	e4	.01	.68	e4	.01	.62	e4	.01
5	.68	e4	.01	.72	e4	.01	.62	e4	.01
6	.60	e4	.01	.74	e4	.01	.67	e4	.01
7	.65	e4	.01	.71	e4	.01	.62	e4	.01
8	.63	e4	.01	.68	e4	.01	.62	e4	.01
9	.66	e4	.01	.68	e4	.01	.66	e4	.01
10	.69	e4	.01	.68	e4	.01	.65	e4	.01
11	.66	e4	.01	.74	e4	.01	.62	e4	.01
12	.66	e4	.01	.74	e4	.01	.80	e4	.01
13	.80	e5	.01	.78	e4	.01	.59	e4	.01
14	.80	e4	.01	.79	e4	.01	.62	e4	.01
15	.75	e4	.01	2.2	201	2.6	.66	e4	.01
16	.92	e5	.01	1.3	e15	.05	.62	e4	.01
17	.75	e4	.01	.84	e10	.02	.64	e4	.01
18	.71	e4	.01	.77	e4	.01	.63	e4	.01
19	.73	e4	.01	.72	e4	.01	.63	e4	.01
20	.73	e4	.01	.71	e4	.01	.61	e4	.01
21	.71	e4	.01	.68	e4	.01	.60	e4	.01
22	.69	e4	.01	.68	e4	.01	.59	e4	.01
23	.72	e4	.01	.68	e4	.01	.60	e4	.01
24	.75	e4	.01	.79	e5	.01	.87	e5	.01
25	.84	e5	.01	.68	e4	.01	.69	e4	.01
26	.74	e4	.01	.67	e4	.01	.84	e5	.01
27	.75	e4	.01	.67	e4	.01	.67	e4	.01
28	.73	e4	.01	.64	e4	.01	.64	e4	.01
29	.71	e4	.01	---	---	---	.64	e4	.01
30	.72	e4	.01	---	---	---	.62	e4	.01
31	.74	e4	.01	---	---	---	.62	e4	.01
TOTAL	22.38	---	.31	22.00	---	2.92	19.99	---	.31

e Estimated.

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

SEDIMENT DISCHARGE, SUSPENDED (TONS/DAY), WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

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	.62	e4	.01	.64	e4	.01	.94	e5	.01
2	.63	e4	.01	.62	e4	.01	.71	e4	.01
3	.65	e4	.01	.69	e4	.01	.73	e4	.01
4	.61	e4	.01	.71	e4	.01	.69	e4	.01
5	.61	e4	.01	.75	e4	.01	.67	e4	.01
6	.62	e4	.01	.91	e4	.01	.60	e4	.01
7	.66	e4	.01	.81	e4	.01	.58	e4	.01
8	.64	e4	.01	.72	e4	.01	.54	e4	.01
9	.65	e4	.01	.69	e4	.01	.54	e4	.01
10	.62	e4	.01	.64	e4	.01	.53	e4	.01
11	.77	e4	.01	.59	e4	.01	.52	e4	.01
12	.71	e4	.01	.64	e4	.01	1.9	e120	.03
13	.65	e4	.01	.67	e4	.01	e.76	e5	.01
14	.63	e4	.01	.57	e4	.01	e.76	e4	.01
15	.64	e4	.01	.54	e4	.01	e.76	e4	.01
16	.64	e4	.01	.51	e4	.01	e.62	e4	.01
17	.64	e4	.01	.58	e4	.01	e.56	e4	.01
18	.61	e4	.01	.55	e4	.01	e.62	e4	.01
19	.70	e4	.01	.50	e4	.01	e.62	e4	.01
20	.86	e5	.01	.52	e4	.01	e.76	e5	.01
21	.82	e4	.01	.68	e5	.01	e.62	e4	.01
22	.79	e4	.01	.79	e5	.01	e.56	e4	.01
23	.72	e4	.01	.89	e5	.01	e.50	e4	.01
24	.67	e4	.01	.92	e4	.01	e.56	e4	.01
25	.66	e4	.01	.90	e4	.01	e.50	e4	.01
26	.95	e5	.01	1.0	e4	.01	e.56	e4	.01
27	.81	e5	.01	.84	e4	.01	e.56	e4	.01
28	.73	e4	.01	.82	e4	.01	e.50	e4	.01
29	.66	e4	.01	2.2	146	5.1	e.56	e4	.01
30	.67	e4	.01	.72	e5	.01	e.50	e4	.01
31	---	---	---	.62	e4	.01	---	---	---
TOTAL	20.66	---	0.30	23.23	---	5.4	19.63	---	.32
		JULY			AUGUST			SEPTEMBER	
1	e.50	e4	.01	.61	e4	.01	.64	e4	.01
2	e.50	e4	.01	.68	e4	.01	.57	e4	.01
3	.69	e5	.01	.63	e4	.01	.57	e4	.01
4	.53	e4	.01	.60	e4	.01	.56	e4	.01
5	.52	e4	.01	.63	e4	.01	.55	e4	.01
6	.60	e4	.01	.64	e4	.01	.54	e4	.01
7	.53	e4	.01	.59	e4	.01	.54	e4	.01
8	.52	e4	.01	.60	e4	.01	.55	e4	.01
9	.52	e4	.01	.59	e4	.01	.52	e4	.01
10	.52	e4	.01	.60	e4	.01	.55	e4	.01
11	.52	e4	.01	.59	e4	.01	.64	e4	.01
12	.57	e4	.01	.59	e4	.01	.54	e4	.01
13	.52	e4	.01	.57	e4	.01	.53	e4	.01
14	.60	e4	.01	.57	e4	.01	.53	e4	.01
15	.61	e4	.01	.57	e4	.01	.51	e4	.01
16	.59	e4	.01	.61	e4	.01	.53	e4	.01
17	.58	e4	.01	.60	e4	.01	.52	e4	.01
18	.58	e4	.01	2.4	145	4.4	.51	e4	.01
19	.55	e4	.01	.82	e7	.02	.52	e4	.01
20	.57	e4	.01	.73	e4	.01	.53	e4	.01
21	.75	e5	.01	.73	e4	.01	.50	e4	.01
22	22	680	213	.73	e4	.01	.61	e4	.01
23	e1.9	e20	.10	1.5	38	.42	.56	e4	.01
24	e.92	e10	.02	.81	e5	.01	.56	e4	.01
25	e.76	e4	.01	.73	e4	.01	.55	e4	.01
26	.64	e4	.01	.76	e4	.01	.56	e4	.01
27	.60	e4	.01	.65	e4	.01	.52	e4	.01
28	.59	e4	.01	.62	e4	.01	.53	e4	.01
29	.60	e4	.01	.59	e4	.01	.52	e4	.01
30	.61	e4	.01	.60	e4	.01	.54	e4	.01
31	.60	e4	.01	.57	e4	.01	---	---	---
TOTAL	40.09	---	213.40	22.51	---	5.12	16.40	---	.30
YEAR	326.01		401.59						

e Estimated.

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

PARTICLE-SIZE DISTRIBUTION OF SUSPENDED SEDIMENT, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SEDI-MENT, SUS-PENDED (MG/L)	SEDI-MENT, DIS-CHARGE, SUS-PENDED (T/DAY)	SED. SUSP. FALL DIAM. % FINER THAN .002 MM	SED. SUSP. FALL DIAM. % FINER THAN .004 MM	SED. SUSP. FALL DIAM. % FINER THAN .008 MM	SED. SUSP. FALL DIAM. % FINER THAN .016 MM
NOV								
10...	1615	222	--	--	21	30	46	65

DATE	SED. SUSP. FALL DIAM. % FINER THAN .031 MM	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM	SED. SUSP. SIEVE DIAM. % FINER THAN .125 MM	SED. SUSP. SIEVE DIAM. % FINER THAN .250 MM	SED. SUSP. SIEVE DIAM. % FINER THAN .500 MM	SED. SUSP. SIEVE DIAM. % FINER THAN 1.00 MM	SED. SUSP. SIEVE DIAM. % FINER THAN 2.00 MM
NOV							
10...	74	79	86	90	94	97	100

16272200 KAMOOALII STREAM BELOW LULUKU STREAM NEAR KANEOHE

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

DRAINAGE AREA.--3.81 mi^2.

WATER-DISCHARGE RECORDS

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

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

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

AVERAGE DISCHARGE.--10 years, 10.5 ft^3/s (7,610 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,500 ft^3/s Mar. 18, 1980, gage height, 5.50 ft, from rating curve extended above 200 ft^3/s; minimum, 0.25 ft^3/s several days in October 1984.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 1,430 ft^3/s Nov. 10, gage height, 5.40 ft; minimum, 1.00 ft^3/s Oct. 22-24.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	9.6	6.8	11	10	10	7.6	7.7	7.4	14	6.8	7.3	6.5
2	8.0	6.8	11	9.8	10	7.7	7.1	7.4	10	6.8	8.0	6.6
3	7.3	7.2	11	9.5	9.3	7.5	6.9	7.8	9.0	8.6	7.7	6.4
4	6.3	6.7	11	9.2	7.8	7.4	7.1	8.1	8.3	7.4	7.4	6.3
5	6.3	6.6	17	9.2	7.3	7.4	6.8	8.4	8.1	7.2	7.7	6.3
6	6.0	6.6	15	9.7	7.4	7.5	6.6	11	7.7	9.2	7.3	6.0
7	5.4	30	12	9.7	7.4	7.4	7.4	9.2	7.4	7.9	7.0	6.0
8	5.4	12	11	8.9	7.4	7.4	8.2	7.6	7.4	7.5	7.1	6.0
9	5.4	8.1	11	9.2	7.3	7.4	7.2	7.4	7.1	7.5	7.4	5.9
10	5.4	313	10	8.8	7.1	7.4	6.7	7.2	6.7	7.4	7.2	6.4
11	5.4	116	10	8.4	7.0	7.3	9.7	7.1	6.7	7.2	7.2	7.9
12	9.0	100	15	8.4	9.0	7.3	9.2	8.2	20	7.9	7.0	6.3
13	9.2	24	11	9.2	9.7	7.1	7.7	9.4	12	7.7	6.7	6.3
14	7.3	19	10	10	27	7.0	7.0	7.7	9.2	16	6.7	6.0
15	6.9	17	10	9.0	21	7.0	7.4	7.4	8.2	8.3	6.9	5.8
16	7.1	16	10	11	17	7.1	7.1	7.1	8.7	7.4	7.6	5.8
17	7.5	15	9.8	10	10	7.3	7.4	7.7	7.7	7.1	7.3	8.0
18	7.1	14	9.5	9.2	9.2	7.2	7.7	7.1	7.8	7.3	13	5.8
19	9.0	16	9.5	8.5	8.8	7.7	8.4	6.9	7.4	6.9	7.7	5.8
20	12	14	9.6	8.4	9.1	6.9	11	6.8	8.4	6.7	7.0	5.6
21	9.7	13	12	8.4	8.6	6.7	9.7	10	11	8.8	7.0	5.5
22	15	13	11	8.4	8.2	8.8	10	8.8	8.3	44	7.3	8.8
23	1.0	15	9.8	8.4	7.8	7.0	8.3	10	8.4	29	8.7	8.6
24	3.6	15	9.4	9.8	12	7.8	7.9	8.3	7.7	9.4	7.1	8.1
25	9.8	14	9.3	11	9.6	7.7	7.5	7.1	7.4	8.3	6.7	6.9
26	8.1	12	9.0	9.1	8.2	14	15	8.0	7.6	7.9	7.2	7.0
27	8.9	12	8.9	9.0	8.0	9.5	11	7.3	7.8	8.0	6.9	6.2
28	7.6	14	16	8.6	7.8	7.0	8.5	7.1	7.1	7.8	6.6	6.0
29	7.2	12	12	9.0	---	6.9	7.7	16	7.0	8.0	6.5	5.9
30	6.8	12	11	10	---	7.0	7.4	8.6	7.9	7.7	6.4	7.5
31	6.9	---	13	11	---	8.2	---	7.4	---	7.3	6.4	---
TOTAL	230.2	886.8	345.8	288.8	279.0	235.2	247.3	255.5	262.0	305.0	228.0	194.0
MEAN	7.43	29.6	11.2	9.32	9.98	7.59	8.24	8.24	8.73	9.84	7.35	6.47
MAX	15	313	17	11	27	14	15	16	20	44	13	8.8
MIN	1.0	6.6	8.9	8.4	7.0	6.7	6.6	6.8	6.7	6.7	6.4	5.5
AC-FT	457	1780	688	573	553	467	491	507	520	605	452	385

CAL YR 1986	TOTAL	3640.7	MEAN	9.97	MAX	313	MIN	1.0	AC-FT	7220
WTR YR 1987	TOTAL	3757.6	MEAN	10.3	MAX	313	MIN	1.0	AC-FT	7450

16272200 KAMOOALII STREAM BELOW LULUKU STREAM NEAR KANEOHE--Continued

WATER-QUALITY RECORDS

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

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

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

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

EXTREMES FOR PERIOD OF RECORD.--
SEDIMENT CONCENTRATIONS: Maximum daily mean, 879 mg/L Mar. 18, 1980; minimum daily mean, 2 mg/L several days in 1981, 1983, 1984.
SEDIMENT DISCHARGE: Maximum daily, 1,380 tons Mar. 18, 1980; minimum daily, 0 ton Oct. 9-11, 1981.

EXTREMES FOR CURRENT YEAR.--
SEDIMENT CONCENTRATIONS: Maximum daily mean, 334 mg/L Nov. 10; minimum daily mean, 2 mg/L for many daya.
SEDIMENT DISCHARGE: Maximum daily, 844 tons Nov. 10; minimum daily, less than 0.00 ton for many days.

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	BAROMETRIC PRESSURE (MM OF HG)	STREAMFLOW, INSTANTANEOUS (CFS)	SPECIFIC CONDUCTANCE (US/CM)	PH (STANDARD UNITS)	TEMPERATURE WATER (DEG C)	TURBIDITY (FTU)	OXYGEN, DISSOLVED (MG/L)	OXYGEN, DISSOLVED (PERCENT SATURATION)	COLIFORM, FECAL, 0.7 UM-MF (COLS./100 ML)	HARDNESS TOTAL (MG/L AS CACO3)
NOV											
12...	1100	754	189	80	7.20	23.0	140	8.0	94	K2700	26
FEB											
23...	1215	755	6.4	173	7.90	23.5	1.6	8.4	100	K28	--

DATE	HARDNESS NONCARBONATE MG/L AS CACO3	CALCIUM DISSOLVED (MG/L AS CA)	MAGNESIUM, DISSOLVED (MG/L AS MG)	SODIUM, DISSOLVED (MG/L AS NA)	SODIUM PERCENT	SODIUM ADSORPTION RATIO	POTASSIUM, DISSOLVED (MG/L AS K)	ALKALINITY LAB (MG/L AS CACO3)	SULFATE DISSOLVED (MG/L AS SO4)	CHLORIDE, DISSOLVED (MG/L AS CL)	FLUORIDE, DISSOLVED (MG/L AS F)
NOV											
12...	5	5.0	3.3	5.7	30	0.5	2.1	21	11	6.6	<0.10

DATE	TIME	SILICA, DISSOLVED (MG/L AS SIO2)	SOLIDS, RESIDUE AT 180 DEG. C DISSOLVED (MG/L)	SOLIDS, SUM OF CONSTITUENTS, DISSOLVED (MG/L)	SOLIDS, DISSOLVED (TONS PER AC-FT)	RESIDUE TOTAL AT 105 DEG. C, SUSPENDED (MG/L)	NITROGEN, NO2+NO3 TOTAL (MG/L AS N)	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)	PHOSPHOROUS TOTAL (MG/L AS P)	ALUMINUM, TOTAL RECOVERABLE (UG/L AS AL)	ALUMINUM, DISSOLVED (UG/L AS AL)
NOV											
12...	1100	9.0	70	57	0.09	113	0.200	0.60	0.310	7100	1200
FEB											
23...	1215	--	--	--	--	2	0.300	0.40	0.010	--	--

< Actual value is known to be lesa 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 1986 TO SEPTEMBER 1987

DATE	ARSENIC TOTAL (UG/L AS AS)	ARSENIC DIS-SOLVED (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)	BERYL-LIUM, DIS-SOLVED (UG/L AS BE)	CADMIUM TOTAL RECOV-ERABLE (UG/L AS CD)	CADMIUM DIS-SOLVED (UG/L AS CD)	CHRO-MIUM, TOTAL RECOV-ERABLE (UG/L AS CR)	CHRO-MIUM, DIS-SOLVED (UG/L AS CR)	COBALT, TOTAL RECOV-ERABLE (UG/L AS CO)
NOV											
12...	3	1	<100	12	<10	<0.5	<1	1	30	<1	5

DATE	COBALT, DIS-SOLVED (UG/L AS CO)	COPPER, TOTAL RECOV-ERABLE (UG/L AS CU)	COPPER, DIS-SOLVED (UG/L AS CU)	IRON, TOTAL RECOV-ERABLE (UG/L AS FE)	IRON, DIS-SOLVED (UG/L AS FE)	LEAD, TOTAL RECOV-ERABLE (UG/L AS PB)	LEAD, DIS-SOLVED (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)
NOV											
12...	<3	21	4	12000	480	6	<5	<10	<4	140	26

DATE	MERCURY TOTAL RECOV-ERABLE (UG/L AS HG)	MERCURY DIS-SOLVED (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)	STRON-TIUM, DIS-SOLVED (UG/L AS SR)
NOV											
12...	<0.10	0.1	3	<10	23	<1	<1	<1	<1	<1.0	35

DATE	VANA-DIUM, DIS-SOLVED (UG/L AS V)	ZINC, TOTAL RECOV-ERABLE (UG/L AS ZN)	ZINC, DIS-SOLVED (UG/L AS ZN)	CARBON, ORGANIC TOTAL (MG/L AS C)	ALDRIN, TOTAL (UG/L)	CHLOR-DANE, TOTAL (UG/L)	DDD, TOTAL (UG/L)	DDE, TOTAL (UG/L)	DDT, TOTAL (UG/L)	DI-AZINON, TOTAL (UG/L)	DI-ELDRIN TOTAL (UG/L)
NOV											
12...		<6	20	7	8.1	<0.010	<0.1	<0.010	<0.010	<0.010	<0.01 <0.010

DATE	ENDO-SULFAN, TOTAL (UG/L)	ENDRIN, TOTAL (UG/L)	ETHION, TOTAL (UG/L)	HEPTA-CHLOR, TOTAL (UG/L)	HEPTA-CHLOR EPOXIDE TOTAL (UG/L)	LINDANE TOTAL (UG/L)	MALA-THION, TOTAL (UG/L)	METH-OXY-CHLOR, TOTAL (UG/L)	METHYL PARA-THION, TOTAL (UG/L)	METHYL TRI-THION, TOTAL (UG/L)	MIREX, TOTAL (UG/L)
NOV											
12...	<0.010	<0.010	<0.01	<0.010	<0.010	<0.010	<0.01	<0.01	<0.01	<0.01	<0.01

DATE	NAPH-THA-LENES, POLY-CHLOR. TOTAL (UG/L)	PARA-THION, TOTAL (UG/L)	PER-THANE TOTAL (UG/L)	PCB, TOTAL (UG/L)	TOX-APHENE, TOTAL (UG/L)	TOTAL TRI-THION (UG/L)	2,4-D, TOTAL (UG/L)	2, 4-DP TOTAL (UG/L)	2,4,5-T TOTAL (UG/L)	SILVEX, TOTAL (UG/L)
NOV										
12...	<0.10	<0.01	<0.1	<0.1	<1	<0.01	0.01	<0.01	<0.01	<0.01

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

16272200 KAMOOALII STREAM BELOW LULUKU STREAM NEAR KANEOHE--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	NAPH-THA-LENES, POLY-CHLOR. TOTAL (UG/L)	PARA-THION, TOTAL (UG/L)	PER-THANE TOTAL (UG/L)	PCB, TOTAL (UG/L)	TOX-APHENE, TOTAL (UG/L)	TOTAL TRI-THION (UG/L)	2,4-D, TOTAL (UG/L)	2, 4-DP TOTAL (UG/L)	2,4,5-T TOTAL (UG/L)	SILVEX, TOTAL (UG/L)
NOV										
12...	<0.10	<0.01	<0.1	<0.1	<1	<0.01	0.01	<0.01	<0.01	<0.01

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

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

SEDIMENT DISCHARGE, SUSPENDED (TONS/DAY), WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DAY	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)
		OCTOBER			NOVEMBER			DECEMBER	
1	9.6	11	.28	6.8	5	.09	11	12	.36
2	8.0	9	.17	6.8	5	.09	11	10	.30
3	7.3	6	.12	7.2	5	.10	11	7	.21
4	6.3	7	.12	6.7	4	.07	11	8	.24
5	6.3	6	.10	6.6	3	.05	17	14	1
6	8.0	8	.10	6.6	6	.11	15	9	.36
7	5.4	e5	.07	30	30	6	12	6	.19
8	5.4	e5	.07	12	6	.19	11	4	.12
9	5.4	e5	.07	8.1	4	.09	11	4	.12
10	5.4	e5	.07	313	334	844	10	2	.05
11	5.4	e5	.07	116	172	63	10	3	.08
12	9.0	e10	.22	100	117	46	15	6	.24
13	9.2	e10	.25	24	50	3.2	11	3	.09
14	7.3	e9	.18	19	31	1.6	10	9	.24
15	6.9	9	.17	17	25	1.1	10	9	.24
16	7.1	6	.12	16	20	.86	10	3	.08
17	7.5	5	.10	15	17	.69	9.8	3	.08
18	7.1	e5	.10	14	15	.57	9.5	4	.10
19	9.0	4	.10	16	14	.60	9.5	4	.10
20	12	5	.16	14	10	.38	9.6	3	.08
21	9.7	4	.10	13	7	.24	12	4	.13
22	15	9	.36	13	7	.24	11	5	.15
23	1.0	e5	.14	15	6	.24	9.8	6	.16
24	3.6	5	.05	15	7	.28	9.4	3	.08
25	9.8	7	.18	14	10	.38	9.3	3	.08
26	8.1	6	.13	12	7	.23	9.0	2	.05
27	8.9	4	.10	12	9	.29	8.9	3	.07
28	7.6	5	.10	14	9	.34	16	10	.43
29	7.2	5	.10	12	8	.28	12	3	.10
30	6.8	7	.13	12	9	.29	11	3	.09
31	6.9	4	.07	---	---	---	13	4	.14
TOTAL	230.2	---	4.10	886.8	---	971.58	345.8	---	5.76
		JANUARY			FEBRUARY			MARCH	
1	10	3	.08	10	7	.19	7.6	7	.14
2	9.8	2	.05	10	7	.19	7.7	7	.14
3	9.5	5	.13	9.3	5	.12	7.5	6	.12
4	9.2	2	.05	7.8	6	.13	7.4	8	.16
5	9.2	3	.07	7.3	8	.16	7.4	8	.16
6	9.7	5	.13	7.4	7	.14	7.5	6	.12
7	9.7	6	.16	7.4	9	.18	7.4	6	.12
8	8.9	6	.14	7.4	13	.26	7.4	6	.12
9	9.2	4	.10	7.3	10	.20	7.4	9	.18
10	8.8	6	.14	7.1	10	.19	7.4	7	.14
11	8.4	4	.09	7.0	9	.17	7.3	7	.14
12	8.4	5	.11	9.0	8	.22	7.3	6	.12
13	9.2	8	.20	9.7	9	.24	7.1	7	.13
14	10	7	.19	27	20	2	7.0	10	.19
15	9.0	11	.27	21	32	2	7.0	8	.15
16	11	7	.21	17	14	.64	7.1	7	.13
17	10	6	.16	10	9	.24	7.3	7	.14
18	9.2	5	.12	9.2	10	.25	7.2	8	.16
19	8.5	6	.14	8.8	10	.24	7.7	9	.19
20	8.4	8	.14	9.1	9	.22	6.9	7	.13
21	8.4	5	.11	8.6	9	.21	6.7	9	.16
22	8.4	5	.11	8.2	7	.15	6.8	7	.13
23	8.4	6	.14	7.8	8	.17	7.0	9	.17
24	9.8	5	.13	12	11	.36	7.8	11	.23
25	11	7	.21	9.6	7	.18	7.7	7	.14
26	9.1	6	.15	8.2	7	.15	14	8	.30
27	9.0	6	.14	8.0	5	.11	9.5	8	.20
28	8.6	5	.12	7.8	7	.15	7.0	7	.13
29	9.0	7	.17	---	---	---	6.9	6	.11
30	10	10	.27	---	---	---	7.0	7	.13
31	11	10	.30	---	---	---	8.2	8	.18
TOTAL	288.8	---	4.53	279.0	---	9.46	235.2	---	4.76

e Estimated.

16272200 KAMOOALII STREAM BELOW LULUKU STREAM NEAR KANEOHE--Continued

SEDIMENT DISCHARGE, SUSPENDED (TONS/DAY), WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

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	7.7	9	.19	7.4	8	.16	14	26	1
2	7.1	6	.12	7.4	6	.12	10	84	2.3
3	6.9	6	.11	7.8	6	.13	9.0	7	.17
4	7.1	6	.12	8.1	14	.31	8.3	8	.18
5	6.8	6	.11	8.4	15	.34	8.1	12	.26
6	6.6	8	.14	11	9	.27	7.7	30	.62
7	7.4	10	.20	9.2	9	.22	7.4	50	1.0
8	8.2	12	.26	7.8	10	.20	7.4	20	.40
9	7.2	14	.27	7.4	5	.10	7.1	19	.38
10	6.7	15	.27	7.2	4	.08	6.7	8	.14
11	9.7	10	.26	7.1	5	.10	6.7	10	.18
12	9.2	8	.15	8.2	6	.13	20	18	.86
13	7.7	6	.12	9.4	4	.10	12	14	.45
14	7.0	7	.13	7.7	5	.10	9.2	12	.30
15	7.4	8	.16	7.4	5	.10	8.2	10	.22
16	7.1	8	.15	7.1	6	.12	8.7	10	.23
17	7.4	8	.16	7.7	6	.12	7.7	8	.17
18	7.7	8	.17	7.1	7	.13	7.8	7	.15
19	8.4	9	.20	6.9	6	.11	7.4	10	.20
20	11	10	.30	6.6	9	.16	8.4	9	.20
21	9.7	9	.24	10	20	1	11	9	.27
22	10	5	.14	8.8	14	.33	8.3	10	.22
23	8.3	5	.11	10	8	.22	8.4	7	.16
24	7.9	6	.13	8.3	88	1.9	7.7	e9	.19
25	7.5	9	.18	7.1	165	3.2	7.4	11	.22
26	15	13	.53	8.0	171	3.7	7.6	10	.21
27	11	8	.24	7.3	68	1.3	7.8	9	.19
28	8.5	6	.14	7.1	101	1.9	7.1	8	.15
29	7.7	7	.14	16	106	8	7.0	e7	.13
30	7.4	5	.10	8.8	74	1.7	7.9	e8	.17
31	---	---	---	7.4	29	.58	---	---	---
TOTAL	247.3	---	5.54	255.5	---	24.93	262.0	---	11.30
		JULY			AUGUST			SEPTEMBER	
1	8.8	e5	.09	7.3	10	.20	6.5	3	.05
2	6.8	4	.07	8.0	7	.15	6.6	3	.05
3	8.6	4	.09	7.7	4	.08	6.4	2	.03
4	7.4	4	.08	7.4	6	.12	6.3	3	.05
5	7.2	4	.08	7.7	6	.12	6.3	3	.05
6	9.2	7	.17	7.3	6	.12	6.0	3	.05
7	7.9	7	.15	7.0	6	.11	6.0	3	.05
8	7.5	5	.10	7.1	5	.10	6.0	3	.05
9	7.5	4	.08	7.4	6	.12	5.9	3	.05
10	7.4	4	.08	7.2	6	.12	6.4	2	.03
11	7.2	4	.08	7.2	6	.12	7.9	2	.04
12	7.9	4	.08	7.0	6	.11	6.3	2	.03
13	7.7	5	.10	6.7	6	.11	6.3	2	.03
14	18	7	.30	6.7	5	.09	6.0	2	.03
15	8.3	6	.13	6.9	5	.09	5.8	2	.03
16	7.4	3	.06	7.6	4	.08	5.8	3	.05
17	7.1	2	.04	7.3	4	.08	6.0	3	.05
18	7.3	3	.06	13	115	6	5.8	2	.03
19	8.9	5	.09	7.7	8	.17	5.8	2	.03
20	6.7	5	.09	7.0	7	.13	5.6	e2	.03
21	8.8	5	.12	7.0	10	.19	5.5	e2	.03
22	44	257	129	7.3	10	.20	8.8	3	.07
23	29	33	2.6	8.7	8	.19	8.6	3	.07
24	9.4	15	.38	7.1	6	.12	8.1	2	.04
25	8.3	15	.34	6.7	5	.09	6.9	3	.08
26	7.9	15	.32	7.2	5	.10	7.0	4	.08
27	8.0	12	.26	6.9	5	.09	6.2	3	.05
28	7.8	14	.29	6.6	5	.09	6.0	4	.06
29	8.0	10	.22	6.5	6	.10	5.9	4	.06
30	7.7	8	.17	6.4	7	.12	7.5	5	.10
31	7.3	10	.20	6.4	e6	.10	---	---	---
TOTAL	305.0	---	135.92	228.0	---	9.61	194.0	---	1.43
YEAR	3756.3		1188.92						

e Estimated.

18272200 KAMOOALII STREAM BELOW LULUKU STREAM NEAR KANEOHE--Continued

PARTICLE-SIZE DISTRIBUTION OF SUSPENDED SEDIMENT, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SEDI-MENT, SUS-PENDED (MG/L)	SEDI-MENT, DIS-CHARGE, SUS-PENDED (T/DAY)	SED. SUSP. FALL DIAM. % FINER THAN .002 MM	SED. SUSP. FALL DIAM. % FINER THAN .004 MM	SED. SUSP. FALL DIAM. % FINER THAN .008 MM	SED. SUSP. FALL DIAM. % FINER THAN .016 MM
NOV								
10...	1700	1180	1330	4237	24	33	44	53
10...	1800	775	838	1335	25	40	--	58
10...	2000	750	381	772	--	--	--	--
12...	1015	269	133	98	50	72	--	90

DATE	SED. SUSP. FALL DIAM. % FINER THAN .031 MM	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM	SED. SUSP. SIEVE DIAM. % FINER THAN .125 MM	SED. SUSP. SIEVE DIAM. % FINER THAN .250 MM	SED. SUSP. SIEVE DIAM. % FINER THAN .500 MM	SED. SUSP. SIEVE DIAM. % FINER THAN 1.00 MM	SED. SUSP. SIEVE DIAM. % FINER THAN 2.00 MM
NOV							
10...	65	68	75	82	92	--	--
10...	--	66	73	43	44	45	100
10...	--	67	71	76	86	94	--
12...	--	95	98	100	--	--	--

16275000 HAIKU STREAM NEAR HEEIA

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

DRAINAGE AREA.--0.97 mi^2.

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

REVISED RECORDS (PISCAL 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).--39 years (water years 1944-77, 1984-87), 2.12 ft^3/s (1,540 acre-ft/yr).

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

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

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Nov. 10	1630	*743	*3.53	July 22	2130	430	3.19

Minimum, 1.4 ft^3/s for many days.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.5	1.6	2.0	2.1	1.6	1.5	1.5	1.7	1.8	1.7	2.0	1.6
2	2.5	1.5	2.0	2.0	1.6	1.5	1.5	1.7	1.8	1.6	2.0	1.6
3	2.2	1.5	2.0	2.0	1.6	1.5	1.5	1.7	1.7	2.2	2.0	1.6
4	2.1	1.5	1.9	1.9	1.6	1.5	1.5	1.7	1.7	2.1	2.0	1.5
5	2.0	1.5	2.1	1.8	1.6	1.5	1.5	1.8	1.7	1.9	1.9	1.5
6	1.9	1.5	2.0	1.8	1.6	1.5	1.5	1.9	1.7	1.8	1.8	1.5
7	1.9	2.8	1.9	1.8	1.6	1.5	1.5	1.9	1.7	1.8	1.8	1.5
8	1.8	1.9	1.9	1.8	1.6	1.5	1.5	1.9	1.7	1.8	1.8	1.5
9	1.8	1.7	1.9	1.7	1.6	1.5	1.5	1.8	1.7	1.7	1.8	1.5
10	1.8	41	1.8	1.7	1.6	1.5	1.6	1.8	1.7	1.7	1.8	1.6
11	1.7	17	1.8	1.7	1.6	1.5	1.6	1.8	1.7	1.7	1.8	1.7
12	1.7	19	1.8	1.7	1.7	1.5	1.6	1.7	5.2	1.8	1.8	1.6
13	1.6	7.3	1.8	1.7	1.7	1.5	1.6	1.6	3.1	2.1	1.7	1.7
14	1.8	4.3	1.8	1.8	1.9	1.5	1.8	1.6	2.6	2.0	1.7	1.8
15	1.8	3.2	1.8	1.8	3.2	1.5	1.6	1.5	2.3	2.5	1.7	1.7
16	1.6	2.9	1.8	1.9	3.4	1.5	1.6	1.5	2.0	2.0	1.8	1.7
17	1.7	2.7	1.8	2.0	2.3	1.5	1.5	1.5	1.8	1.8	1.9	1.7
18	1.6	2.6	1.8	1.8	1.9	1.5	1.5	1.6	1.8	1.7	9.6	1.6
19	1.8	2.5	1.8	1.7	1.8	1.5	1.6	1.6	1.7	1.7	3.3	1.6
20	2.3	2.4	1.8	1.7	1.8	1.5	2.1	1.6	2.2	1.7	2.1	1.6
21	1.8	2.2	2.2	1.7	1.7	1.5	1.7	1.6	2.6	1.9	1.9	1.6
22	1.7	2.2	2.8	1.7	1.7	1.5	1.6	1.6	2.1	31	1.8	1.6
23	1.6	2.4	2.1	1.7	1.7	1.5	1.5	1.7	1.9	8.0	4.0	1.6
24	1.6	2.5	1.9	1.7	1.7	2.9	1.5	1.7	1.8	3.4	2.2	1.6
25	1.6	2.3	1.8	1.7	1.7	2.7	1.5	1.7	1.7	2.6	1.8	1.5
26	1.6	2.2	1.8	1.6	1.7	1.7	1.7	1.7	1.7	2.3	1.7	1.5
27	1.8	2.1	1.8	1.7	1.6	1.6	2.2	1.8	1.8	2.2	1.7	1.5
28	1.8	2.1	3.0	1.7	1.6	1.5	1.9	1.8	1.8	2.1	1.6	1.5
29	1.6	2.1	2.6	1.6	---	1.5	1.8	1.8	1.8	2.1	1.6	1.5
30	1.6	2.1	2.2	1.6	---	1.5	1.7	1.8	1.7	2.1	1.6	1.6
31	1.6	---	2.1	1.6	---	1.5	---	1.8	---	2.0	1.6	---
TOTAL	56.0	142.4	61.8	54.7	50.7	49.4	48.5	52.9	60.5	97.0	67.6	47.6
MEAN	1.81	4.75	1.99	1.76	1.81	1.59	1.62	1.71	2.02	3.13	2.19	1.59
MAX	2.5	41	3.0	2.1	3.4	2.9	2.2	1.9	5.2	31	9.6	1.8
MIN	1.6	1.5	1.8	1.6	1.6	1.5	1.5	1.5	1.7	1.6	1.6	1.5
AC-FT	111	282	123	108	101	96	96	105	120	192	134	94

CAL YR 1986	TOTAL	774.4	MEAN	2.12	MAX	41	MIN	1.1	AC-FT	1540
WTR YR 1987	TOTAL	789.3	MEAN	2.16	MAX	41	MIN	1.5	AC-FT	1570

16275000 HAIKU STREAM NEAR HEEIA--Continued

WATER-QUALITY RECORDS

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

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	BAROMETRIC PRESSURE (MM OF HG)	STREAMFLOW, INSTANTANEOUS (CFS)	SPECIFIC CONDUCTANCE (US/CM)	PH (STANDARD UNITS)	TEMPERATURE WATER (DEG C)	TURBIDITY (FTU)	OXYGEN, DISSOLVED (MG/L)
AUG								
31...	1050	753	1.6	165	7.70	21.0	0.50	8.6
31...	1055	753	1.6	165	7.70	21.0	0.50	8.6

DATE	OXYGEN, DISSOLVED (PERCENT SATURATION)	COLIFORM, FECAL,B 0.7 UM-MF D (COLS./S 100 ML)	RESIDUE TOTAL AT 105 DEG. C, SUSPENDED (MG/L)	NITROGEN, NO2+NO3 TOTAL (MG/L AS N)	NITROGEN,AMMONIA + ORGANIC TOTAL (MG/L AS N)	PHOSPHOROUS TOTAL (MG/L AS P)
AUG						
31...	98	68	3	<0.100	<0.20	0.060
31...	98	--	--	--	--	--

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

16275000 HAIKU STREAM NEAR HEEIA--Continued

SEDIMENT DISCHARGE, SUSPENDED (TONS/DAY), WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

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)
		JULY			AUGUST			SEPTEMBER	
1				2.0	7	.04	1.6	3	.01
2				2.0	6	.03	1.6	3	.01
3				2.0	7	.04	1.6	3	.01
4				2.0	8	.04	1.5	3	.01
5				1.9	7	.04	1.5	e3	.01
6				1.8	7	.03	1.5	e3	.01
7				1.8	8	.04	1.5	e3	.01
8				1.8	7	.03	1.5	e3	.01
9				1.8	7	.03	1.5	6	.02
10				1.8	7	.03	1.6	e7	.03
11				1.8	9	.04	1.7	10	.05
12				1.8	7	.03	1.6	10	.04
13				1.7	7	.03	1.7	8	.04
14				1.7	7	.03	1.8	8	.04
15				1.7	7	.03	1.7	6	.03
16				1.8	14	.07	1.7	7	.03
17				1.9	8	.04	1.7	8	.04
18				10	179	22	1.6	8	.03
19				3.3	33	.29	1.6	10	.04
20	1.7	8	.04	2.1	19	.11	1.6	8	.03
21	1.9	5	.03	1.9	18	.09	1.6	5	.02
22	31	188	87	1.6	18	.09	1.6	e5	.02
23	8.0	50	1.1	4.1	42	1.5	1.6	3	.01
24	3.4	8	.07	2.2	20	.12	1.6	3	.01
25	2.6	6	.04	1.8	8	.04	1.5	3	.01
26	2.3	5	.03	1.7	4	.02	1.5	3	.01
27	2.2	6	.04	1.7	3	.01	1.5	4	.02
28	2.1	6	.03	1.6	5	.02	1.5	2	.01
29	2.1	6	.03	1.6	5	.02	1.5	3	.01
30	2.1	7	.04	1.6	4	.02	1.6	4	.02
31	2.0	7	.04	1.6	2	.01	---	---	---
TOTAL	---	---	---	68.3	---	24.96	47.6	---	.64
YEAR	---		---						

e Estimated

16263200 KAHALUU STREAM NEAR AHUIMANU

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

DRAINAGE AREA.--0.99 mi^2.

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

GAGE.--Water-stage recorder and concrete control. Elevation of gage is 150 ft, from topographic map. Honolulu Board of Water Supply).

REMARKS.--Records fair except for estimated daily discharges, which are poor. Honolulu Board of Water Supply has diverted ground water from tunnel in drainage area since 1947.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 450 ft^3/s Sept. 23, 1965, gage height, 5.10 ft; minimum, 0.58 ft^3/s aeveral days in September, October, November 1964.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base diacharge of 160 ft^3/s and maximum(*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Nov. 10	1730	*476	*5.24	July 22	2030	416	4.93

Minimum discharge, 1.3 ft^3/s for many days.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3.4	1.7	1.7	1.8	1.5	1.5	1.4	1.6	2.0	1.6	2.0	1.9
2	2.6	1.6	1.7	1.7	1.5	1.5	1.4	1.6	2.3	1.6	2.8	2.0
3	3.1	1.6	1.7	1.7	1.4	1.4	1.4	1.5	1.9	1.9	2.9	3.9
4	2.1	1.6	1.6	1.8	1.4	1.4	1.4	1.9	1.7	1.6	2.1	2.7
5	2.0	1.6	2.0	1.6	1.4	1.4	1.4	1.8	1.8	1.6	2.0	2.1
6	1.9	1.6	1.8	1.6	1.4	1.4	1.4	1.7	1.7	2.1	2.1	1.9
7	1.8	3.1	1.7	1.8	1.4	1.4	1.4	1.6	1.5	1.7	1.9	1.8
8	1.8	2.2	1.7	1.8	1.4	1.4	1.4	1.5	1.5	1.7	2.0	1.7
9	1.7	2.1	1.7	1.8	1.3	1.4	1.4	1.5	1.7	1.7	2.0	1.7
10	1.7	e25	1.6	1.6	1.3	1.4	1.4	1.5	1.5	1.7	1.9	1.9
11	1.7	e16	1.6	e1.6	1.3	1.4	1.4	1.5	1.5	1.9	2.0	4.3
12	2.0	16	2.1	e1.6	1.6	1.4	1.7	1.6	4.6	2.5	1.9	2.3
13	1.9	6.9	e1.6	e2.6	1.5	1.4	1.5	1.8	2.6	2.2	1.8	2.2
14	1.7	4.3	e1.8	e2.0	3.4	1.4	1.4	1.4	2.2	2.1	1.8	2.2
15	1.7	3.9	e1.8	1.7	4.3	1.4	1.4	1.5	1.8	2.1	1.8	1.9
16	1.7	3.1	e1.6	1.7	3.6	1.4	1.4	1.5	1.7	1.8	2.7	1.9
17	1.7	2.5	e1.8	1.7	2.5	1.4	1.4	1.5	1.6	1.8	2.0	1.9
18	1.7	2.5	e1.8	1.7	2.0	1.3	1.5	1.4	1.7	1.7	9.9	1.9
19	2.9	2.3	e1.6	1.8	1.8	1.3	1.6	1.4	1.4	1.8	3.3	1.8
20	2.7	2.1	e1.8	1.6	1.7	1.3	5.3	1.5	3.1	1.6	2.5	1.8
21	2.0	2.0	e2.4	1.6	1.6	1.3	2.5	1.4	3.5	3.3	2.8	1.8
22	1.8	2.0	e2.2	1.8	1.6	1.3	2.0	1.4	2.3	41	2.2	2.9
23	1.8	3.4	e1.6	1.6	1.6	1.3	1.8	1.8	2.7	7.7	3.9	3.4
24	1.7	2.1	e1.8	1.6	1.7	11	1.7	1.4	2.1	3.9	2.5	3.1
25	1.7	2.0	e1.6	1.7	1.5	3.1	1.8	1.3	1.8	2.9	2.1	2.3
26	1.7	1.9	e1.6	1.5	1.5	2.0	3.4	1.4	2.1	2.5	2.1	2.2
27	2.9	1.9	e1.8	1.5	1.5	1.6	2.8	1.3	2.2	2.3	2.1	2.1
28	2.0	1.8	e3.8	1.5	1.5	1.5	2.1	1.4	1.7	2.5	2.1	2.0
29	1.8	1.8	e2.9	1.5	---	1.4	1.8	3.1	1.6	2.9	1.9	2.0
30	1.8	1.7	2.0	1.5	---	1.4	1.7	1.7	1.7	2.5	1.9	2.2
31	1.7	---	1.9	1.6	---	1.4	---	1.5	---	2.1	1.8	---
TOTAL	62.7	124.3	56.9	51.4	50.2	55.2	54.0	48.8	61.5	110.1	76.6	87.6
MEAN	2.02	4.14	1.84	1.66	1.79	1.78	1.80	1.57	2.05	3.55	2.47	2.26
MAX	3.4	25	3.8	2.6	4.3	11	5.3	3.1	4.8	41	9.9	4.3
MIN	1.7	1.6	1.6	1.5	1.3	1.3	1.4	1.3	1.4	1.6	1.6	1.7
AC-FT	124	247	113	102	100	109	107	97	122	218	152	134

CAL YR 1986	TOTAL	758.06	MEAN	2.08	MAX	34	MIN	.65	AC-FT	1500
WTR YR 1987	TOTAL	819.5	MEAN	2.25	MAX	41	MIN	1.3	AC-FT	1630

e Estimated.

16283600 SOUTH FORK WAIHEE STREAM NEAR HEEIA

LOCATION.--Lat 21°26'47", long 157°52'12", Hydrologic Unit 20060000, on left bank 0.2 mi upstream from confluence with North Fork, 3.0 mi southwest of Waiahole School, and 4.0 mi northwest of Heeia.

DRAINAGE AREA.--0.03 mi^2.

PERIOD OF RECORD.--September 1982 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 good except for estimated discharges, which are poor. Honolulu Board of Water Supply diverts water from wells in drainage area.

AVERAGE DISCHARGE.--25 years, 1.48 ft^3/s (1,070 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 430 ft^3/s Oct. 28, 1981, gage height, 4.68 ft, from rating curve extended above 4.8 ft^3/s; no flow July 7, 1977.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 47 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Nov. 10	1630	68	2.43	July 22	2030	*167	*3.28

Minimum discharge, 0.80 ft^3/s for many days.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.3	.91	1.1	1.1	.98	1.0	1.0	.98	e.98	e.91	.85	.85
2	1.3	.91	1.1	1.1	.98	1.0	1.0	.98	e.98	e.91	.85	.80
3	1.4	.91	1.1	1.1	.98	1.0	1.0	.98	e.98	e.91	.85	.93
4	1.2	.91	1.1	1.0	.98	1.0	1.0	.98	e.98	e.91	.85	.85
5	1.2	.91	1.1	1.0	.98	1.0	1.0	.98	e.98	e.91	.80	.85
6	1.2	.91	1.1	1.0	.98	1.0	1.0	.98	e.98	e1.1	.80	.85
7	1.2	1.2	1.1	1.0	.98	1.0	1.0	.98	e.98	e.91	.80	.85
8	1.2	.98	1.1	1.0	.98	1.0	1.0	.98	e.98	.91	.85	.85
9	1.2	.91	1.1	1.0	.98	1.0	1.0	.98	e.98	.91	.85	.85
10	1.2	2.7	1.1	1.0	.98	1.0	1.0	.98	e.98	.91	.80	.85
11	1.2	2.7	1.1	.98	.98	1.0	1.0	.98	e1.1	1.0	.80	2.0
12	1.2	2.0	1.4	.98	.98	1.0	1.0	.98	e2.0	1.2	.80	.80
13	1.2	1.7	1.2	1.4	.98	1.0	1.0	1.0	e1.1	.91	.80	.80
14	1.2	1.3	1.2	1.1	1.2	1.0	1.0	1.0	e1.0	.98	.80	.80
15	1.2	1.7	1.2	.98	1.8	1.0	1.0	e.98	e.98	.98	.80	.80
16	1.2	1.4	1.1	.98	1.3	1.0	1.0	e.98	e.98	.91	.91	.80
17	1.2	1.2	1.1	.98	1.0	1.0	1.0	e.98	e.98	.91	.85	.80
18	1.2	1.2	1.1	.98	1.0	1.0	1.0	e.98	e.98	.91	1.8	.80
19	1.2	1.2	1.1	.98	1.0	.98	1.0	e.98	e.98	.91	.91	.80
20	1.4	1.2	1.1	.98	1.0	.98	1.1	e.98	e.98	.91	.91	.80
21	.98	1.2	1.6	.98	1.0	.98	1.0	e.98	e.98	1.0	.85	.80
22	.98	1.2	1.4	.98	1.0	.98	1.0	e.98	e.98	7.2	.85	.80
23	.98	1.4	1.3	.98	1.0	.98	1.0	e.98	e.98	1.4	2.0	.91
24	.98	1.3	1.3	.98	1.0	2.8	1.0	e.98	e.98	1.1	.98	.80
25	1.0	1.2	1.2	.98	1.0	1.1	1.0	e.98	e.98	.91	.91	.80
26	.98	1.2	1.2	.98	1.0	1.0	1.0	e.98	e.98	.91	.91	.80
27	1.2	1.2	1.2	.98	1.0	.98	1.0	e.98	e1.1	.91	.91	.80
28	.98	1.4	2.0	.98	1.0	.98	1.0	e.98	e.98	.85	.91	.80
29	.91	1.2	1.2	.98	---	.98	1.0	e.98	e.98	.85	.85	.80
30	.91	1.1	1.1	.98	---	.98	1.0	e.98	e1.1	.85	.85	.80
31	.91	---	1.1	.98	---	1.0	---	e.98	---	.85	.85	---
TOTAL	35.41	39.25	37.2	31.42	29.04	32.72	30.1	30.42	30.92	35.74	28.55	25.84
MEAN	1.14	1.31	1.20	1.01	1.04	1.06	1.00	.98	1.03	1.15	.92	.86
MAX	1.4	2.7	2.0	1.4	1.8	2.8	1.1	1.0	2.0	7.2	2.0	2.0
MIN	.91	.91	1.1	.98	.98	.98	1.0	.98	.98	.85	.80	.80
AC-FT	70	78	74	62	58	65	60	60	61	71	57	51

CAL YR 1986	TOTAL	390.85	MEAN	1.07	MAX	7.4	MIN	.70	AC-FT	775
WTR YR 1987	TOTAL	386.61	MEAN	1.06	MAX	7.2	MIN	.80	AC-FT	767

e Estimated.

16283700 NORTH FORK WAIHEE STREAM NEAR HEEIA

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

DRAINAGE AREA.--0.03 mi^2.

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

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

REMARKS.--Records good. Honolulu Board of Water Supply diverts water from wells in South Fork Waihee which affects the low flow at this station.

AVERAGE DISCHARGE.--25 years, 1.62 ft^3/s (1,170 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 376 ft^3/s Feb. 4, 1965, gage height, 3.38 ft, from rating curve extended above 19 ft^3/s; no flow July 7, 8, 1977.

EXTREMES FOR CURRENT YEAR.--Maximum discharge 74 ft^3/s July 22, gage height, 2.03 ft; minimum, 1.3 ft^3/a for many days.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.7	1.4	1.5	1.5	1.6	1.6	1.5	1.5	1.4	1.4	1.4	1.4
2	1.8	1.4	1.5	1.5	1.6	1.6	1.5	1.5	1.4	1.4	1.4	1.4
3	1.8	1.4	1.5	1.5	1.6	1.6	1.5	1.5	1.4	1.4	1.4	1.4
4	1.6	1.4	1.5	1.5	1.6	1.6	1.5	1.5	1.4	1.4	1.4	1.4
5	1.6	1.4	1.6	1.5	1.6	1.6	1.5	1.5	1.4	1.4	1.4	1.4
6	1.6	1.4	1.6	1.5	1.6	1.6	1.5	1.5	1.4	1.6	1.4	1.4
7	1.6	1.8	1.5	1.5	1.6	1.6	1.5	1.5	1.4	1.4	1.4	1.4
8	1.6	1.5	1.5	1.5	1.6	1.6	1.5	1.5	1.4	1.4	1.4	1.4
9	1.6	1.5	1.5	1.5	1.6	1.6	1.5	1.5	1.4	1.4	1.4	1.4
10	1.8	2.4	1.5	1.5	1.6	1.6	1.5	1.5	1.4	1.4	1.3	1.4
11	1.6	2.6	1.5	1.5	1.6	1.6	1.5	1.5	1.4	1.8	1.3	2.2
12	1.7	2.1	1.7	1.5	1.6	1.6	1.5	1.4	2.3	1.5	1.3	1.4
13	1.7	2.0	1.6	2.0	1.6	1.6	1.5	1.5	1.5	1.4	1.3	1.4
14	1.8	1.6	1.8	1.7	1.8	1.6	1.5	1.5	1.4	1.6	1.3	1.4
15	1.6	1.9	1.6	1.6	2.3	1.6	1.5	1.5	1.4	1.4	1.3	1.4
16	1.6	1.6	1.6	1.6	1.8	1.6	1.5	1.4	1.4	1.4	1.4	1.4
17	1.8	1.5	1.5	1.6	1.6	1.5	1.5	1.4	1.4	1.4	1.4	1.4
18	1.6	1.5	1.5	1.6	1.6	1.5	1.5	1.4	1.4	1.4	1.8	1.4
19	2.1	1.6	1.5	1.6	1.6	1.5	1.6	1.4	1.4	1.4	1.4	1.4
20	2.0	1.5	1.5	1.6	1.6	1.5	1.8	1.4	1.7	1.4	1.4	1.4
21	1.6	1.5	1.9	1.8	1.6	1.5	1.5	1.4	1.7	1.4	1.4	1.4
22	1.5	1.5	1.6	1.6	1.6	1.5	1.5	1.4	1.9	3.7	1.4	1.4
23	1.5	1.7	1.5	1.6	1.6	1.5	1.5	1.4	1.8	1.7	1.7	1.6
24	1.5	1.6	1.5	1.6	1.6	2.5	1.5	1.4	1.4	1.6	1.4	1.4
25	1.6	1.5	1.5	1.6	1.6	1.6	1.5	1.4	1.4	1.4	1.3	1.4
26	1.5	1.5	1.5	1.6	1.6	1.5	1.6	1.4	1.4	1.4	1.3	1.4
27	1.4	1.5	1.5	1.6	1.6	1.5	1.6	1.4	1.5	1.4	1.3	1.4
28	1.4	1.8	2.2	1.6	1.6	1.5	1.5	1.4	1.4	1.4	1.3	1.4
29	1.4	1.5	1.6	1.6	---	1.5	1.4	1.4	1.4	1.4	1.3	1.4
30	1.4	1.5	1.6	1.8	---	1.5	1.5	1.4	1.5	1.4	1.3	1.4
31	1.4	---	1.6	1.6	---	1.5	---	1.4	---	1.4	1.3	---
TOTAL	49.8	48.7	48.8	48.9	45.9	49.2	45.5	44.8	44.7	46.9	42.8	43.0
MEAN	1.61	1.62	1.57	1.58	1.64	1.59	1.52	1.45	1.49	1.51	1.38	1.43
MAX	2.1	2.6	2.2	2.0	2.3	2.5	1.8	1.5	2.3	3.7	1.8	2.2
MIN	1.4	1.4	1.5	1.5	1.6	1.5	1.4	1.4	1.4	1.4	1.3	1.4
AC-FT	99	97	97	97	91	98	90	89	89	93	85	85

CAL YR 1986	TOTAL	543.4	MEAN	1.49	MAX	4.5	MIN	1.2	AC-FT	1080
WTR YR 1987	TOTAL	559.0	MEAN	1.53	MAX	3.7	MIN	1.3	AC-FT	1110

16284200 WAIHEE STREAM NEAR KAHALUU

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

DRAINAGE AREA.--0.97 mi^2.

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

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

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

AVERAGE DISCHARGE.--13 years, 5.81 ft^3/s (4,210 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,180 ft^3/s Mar. 14, 1982, gage height, 7.52 ft, from rating curve extended above 100 ft^3/s; minimum, 1.1 ft^3/s Apr. 7, 1977.

EXTREMES FOR CURRENT YEAR.--Peak diacharges greater than base discharge of 150 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Nov. 10	1730	445	5.64	July 22	2100	*652	*6.78
Nov. 11	2100	176	4.49				

Minimum discharge, 5.4 ft^3/s Oct. 29, Apr. 14.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	6.6	5.6	5.9	5.9	6.4	6.3	5.9	5.8	5.6	6.1	7.0	6.0
2	6.3	5.6	5.9	5.9	6.4	6.3	5.9	5.8	5.8	6.1	7.0	6.0
3	7.2	5.7	5.9	5.9	6.4	6.3	5.9	5.7	5.6	6.3	7.2	6.4
4	5.8	5.6	5.9	5.9	6.4	8.3	5.9	5.9	5.6	6.2	7.0	6.1
5	5.8	5.6	6.1	5.9	6.4	6.3	5.9	5.8	5.7	6.1	7.2	6.0
6	5.6	5.6	5.9	5.9	6.4	6.3	5.9	5.8	5.6	6.8	7.2	5.9
7	5.6	7.6	5.9	5.9	6.4	6.3	5.9	5.8	5.6	6.2	7.2	5.9
8	5.6	6.0	5.8	6.2	6.4	6.3	5.9	5.8	5.6	6.1	7.9	5.9
9	5.6	5.7	5.8	6.4	6.4	6.3	5.9	5.8	5.6	6.1	7.4	5.9
10	5.6	25	5.8	6.4	6.4	6.3	5.9	5.7	5.6	6.2	7.2	5.9
11	5.8	25	5.9	6.4	6.4	6.3	6.0	5.7	5.6	6.7	7.2	13
12	6.2	18	6.4	6.4	6.4	6.3	5.9	5.8	14	7.3	7.0	6.1
13	6.1	12	5.9	10	6.4	6.3	5.8	6.1	7.0	6.4	7.0	5.9
14	6.1	8.2	5.9	7.6	8.5	6.3	5.8	5.6	6.8	6.9	7.0	5.9
15	6.1	9.5	5.9	6.3	11	6.3	5.8	5.9	6.5	6.6	7.0	5.6
16	6.1	7.1	5.9	6.3	7.8	6.3	5.8	5.8	6.4	6.4	7.2	5.8
17	6.3	6.7	5.8	6.3	6.9	6.3	5.8	5.8	6.3	6.3	7.2	5.8
18	6.2	6.4	5.8	6.3	6.6	6.4	5.9	5.8	6.2	6.1	14	5.7
19	7.5	6.2	5.8	6.2	6.5	6.4	6.0	5.7	6.1	6.1	7.2	5.6
20	7.8	6.1	5.8	6.1	6.6	6.4	7.2	5.8	7.9	6.6	6.8	5.6
21	5.9	6.0	6.8	6.2	6.4	6.4	6.1	5.8	9.9	6.8	6.8	5.7
22	5.9	5.9	6.3	6.3	6.4	6.4	6.1	5.7	7.6	74	6.8	6.0
23	5.8	6.6	5.9	6.3	6.3	6.4	5.9	5.7	8.1	17	9.7	6.6
24	5.8	6.3	5.9	6.3	6.3	14	5.9	5.8	6.6	9.4	6.5	6.2
25	5.9	6.0	5.9	6.4	6.3	6.9	5.8	5.8	6.4	8.1	6.3	5.8
26	5.9	5.9	5.6	6.3	6.3	6.3	6.5	5.8	6.4	7.6	6.2	5.8
27	7.5	5.9	5.8	6.3	6.3	6.1	6.5	5.7	6.6	7.4	6.2	5.8
28	5.8	6.3	11	6.3	6.3	6.0	6.0	5.8	6.2	7.2	6.5	5.8
29	5.6	5.9	6.5	6.4	---	5.9	5.9	5.9	6.1	7.2	6.1	5.8
30	5.6	5.9	6.1	6.4	---	5.9	5.8	5.8	6.5	7.2	6.1	5.8
31	5.6	---	6.2	6.5	---	5.9	---	5.7	---	7.0	6.0	---
TOTAL	189.2	243.9	190.2	197.9	187.7	202.5	179.5	179.6	199.7	286.5	223.1	184.5
MEAN	6.10	8.13	6.14	6.38	6.70	6.53	5.98	5.79	6.66	9.24	7.20	6.15
MAX	7.8	25	11	10	11	14	7.2	6.1	14	74	14	13
MIN	5.6	5.6	5.8	5.9	6.3	5.9	5.6	5.7	5.6	6.1	6.0	5.6
AC-FT	375	484	377	393	372	402	356	356	396	568	443	366

CAL YR 1986	TOTAL	2361.9	MEAN	6.47	MAX	54	MIN	4.9	AC-FT	4660
WTR YR 1987	TOTAL	2484.3	MEAN	6.75	MAX	74	MIN	5.6	AC-FT	4890

16294900 WAIKANE STREAM AT ALTITUDE 75 FT, AT WAIKANE

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

DRAINAGE AREA.--2.22 mi^2.

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

REVISED RECORDS.--WSP 1937: Drainage area.

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

REMARKS.--Records good except for estimated daily discharges, which are poor. Waiahole tunnel diverts from two tributaries upstream for irrigation in vicinity of Waipahu. Recording rain gage located at station.

AVERAGE DISCHARGE.--27 years (water years 1961-87), 8.37 ft^3/s (6,060 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 8,800 ft^3/s Feb. 4, 1965, gage height, 10.76 ft, from rating curve extended above 120 ft^3/s on basis of slope-area measurements at gage heights 4.88 ft, 9.46 ft, and 10.76 ft; minimum, 0.76 ft^3/s Oct. 27, 1975.

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

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Feb. 14	1530	1,940	6.91	July 22	2030	*4,930	*9.71

Minimum discharge, 2.7 ft^3/s Mar. 30, Apr. 2.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	52	4.8	5.9	8.4	4.0	4.4	3.2	5.4	6.2	6.7	7.5	4.2
2	27	4.4	5.4	8.6	3.8	4.4	3.0	5.1	5.9	6.2	10	e5.0
3	18	4.6	5.1	6.8	3.8	4.1	3.2	5.1	5.4	9.3	8.2	e4.6
4	13	4.6	5.0	6.1	3.8	4.0	3.9	14	5.1	7.1	6.8	4.4
5	12	4.3	5.8	5.8	3.6	3.9	3.4	9.0	21	6.4	6.3	4.4
6	10	4.1	5.7	5.5	3.6	3.9	3.2	19	7.1	28	6.1	3.9
7	8.9	43	4.9	5.2	3.6	3.8	3.2	16	8.1	9.5	5.7	3.8
8	8.1	e8.8	4.6	5.0	3.6	3.8	3.6	8.7	5.4	7.3	5.6	3.8
9	7.4	e5.9	4.4	5.5	3.6	3.7	3.2	7.4	6.1	6.7	5.9	3.7
10	6.9	e60	4.3	5.4	3.5	3.6	3.1	6.6	5.2	8.1	5.4	4.2
11	8.3	e38	4.2	4.8	3.4	3.4	6.3	6.3	4.8	6.0	6.8	30
12	8.0	e21	11	4.6	3.9	3.3	7.2	6.3	25	20	5.2	6.2
13	11	e45	5.2	6.6	3.9	3.2	4.4	8.0	10	13	5.0	7.7
14	6.0	e25	4.5	11	96	3.3	3.6	6.2	8.2	24	4.8	5.6
15	6.7	e22	4.3	7.8	33	3.2	3.5	5.9	7.0	12	4.8	4.5
16	5.7	e19	4.2	6.3	18	3.2	3.7	15	13	6.6	7.5	4.3
17	5.2	e13	4.1	7.4	10	3.2	4.2	10	7.5	7.8	5.6	4.1
18	5.2	e9.8	3.9	6.8	7.8	3.2	4.4	6.7	7.1	7.5	5.1	4.0
19	11	e13	3.8	5.8	7.0	3.1	6.2	5.5	6.8	6.7	4.6	3.8
20	8.2	e8.8	4.1	5.3	7.7	3.0	15	5.1	16	6.3	4.5	4.0
21	5.6	7.9	18	5.0	8.0	3.0	8.6	5.0	45	20	8.7	3.9
22	4.9	9.2	12	5.0	6.4	2.9	8.9	4.7	19	525	17	20
23	4.5	11	7.9	4.9	5.8	3.0	5.7	5.7	12	72	10	14
24	4.4	9.4	6.0	4.7	5.8	7.1	5.5	4.9	8.9	26	5.9	15
25	16	7.7	5.1	15	5.3	3.8	4.6	4.4	7.6	18	5.2	9.4
26	7.7	7.0	4.7	5.5	5.1	4.6	22	5.5	7.4	15	6.8	11
27	11	6.3	4.4	4.7	4.9	3.5	22	6.0	14	12	6.0	19
28	7.4	8.7	30	4.6	4.6	3.1	9.3	5.1	7.6	11	5.1	7.7
29	5.7	6.1	11	4.3	---	3.1	6.9	21	7.2	11	4.6	6.9
30	5.1	5.9	7.5	4.2	---	3.0	5.9	7.6	8.8	9.2	4.4	8.1
31	4.9	---	7.8	4.4	---	3.7	---	6.0	---	8.1	4.2	---
TOTAL	313.8	438.1	212.8	191.0	275.5	112.5	190.9	247.2	316.4	936.7	199.3	231.2
MEAN	10.1	14.5	6.86	8.16	9.84	3.83	6.36	7.97	10.5	30.2	6.43	7.71
MAX	52	60	30	15	98	7.1	22	21	45	525	17	30
MIN	4.4	4.1	3.8	4.2	3.4	2.9	3.0	4.4	4.8	6.2	4.2	3.7
AC-FT	622	865	422	379	546	223	379	490	628	1860	395	459

CAL YR 1986	TOTAL	3365.7	MEAN	9.28	MAX	378	MIN	1.4	AC-FT	6720
WTR YR 1987	TOTAL	3663.4	MEAN	10.0	MAX	525	MIN	2.9	AC-FT	7270

e Estimated

16296500 KAHANA STREAM AT ALTITUDE 30 FT, NEAR KAHANA

LOCATION.--Lat 21°32'37", long 157°53'07", Hydrologic Unit 20060000, on right bank 800 ft upstream from Kawa Stream, 1.1 mi southwest of Kahana, and 2.2 mi southwest of Swanzy Beach Park in Kaaawa.

DRAINAGE AREA.--3.74 mi^2.

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

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

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

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

AVERAGE DISCHARGE.--28 years (water years 1960-87), 38.0 ft^3/s (26,080 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 5,430 ft^3/s Apr. 15, 1983, gage height, 8.10 ft, from rating curve extended above 530 ft^3/s on basis of computation of peak flow over submerged weir; minimum, 10 ft^3/s Sept. 17, 18, 20, 1961.

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

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Nov. 10	2000	2,940	6.18	July 22	2100	*4,550	*7.47
June 5	0830	2,350	5.61				

Minimum diacharge, 13 ft^3/s March 21, 22.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	98	25	34	29	19	18	17	28	22	29	35	24
2	78	27	32	30	19	18	17	25	21	27	47	30
3	87	27	31	30	19	18	39	28	20	31	37	24
4	53	28	30	27	19	18	22	49	20	26	33	23
5	46	25	30	26	19	18	19	40	270	28	32	24
6	41	28	32	25	19	18	18	32	84	148	31	22
7	36	143	28	25	18	17	18	36	41	41	30	21
8	34	50	27	24	18	17	18	28	32	34	32	21
9	32	34	27	25	18	17	19	24	38	33	30	20
10	31	337	26	25	18	16	18	23	28	35	28	22
11	29	169	26	23	18	16	67	22	26	37	45	141
12	32	104	64	22	19	16	34	22	119	51	34	32
13	35	256	31	23	19	16	28	25	55	45	28	42
14	27	120	28	27	78	17	24	21	45	65	26	42
15	28	127	27	24	113	16	22	20	38	48	27	27
16	26	103	27	25	47	16	22	21	44	37	39	27
17	28	62	27	27	29	18	22	20	35	33	28	30
18	28	55	26	24	25	15	23	19	34	46	28	32
19	39	71	25	22	23	14	27	18	31	34	26	26
20	33	53	25	22	23	14	69	18	63	30	25	25
21	26	45	72	21	25	14	45	18	131	163	27	23
22	25	58	74	21	22	13	42	17	62	783	66	53
23	25	54	37	21	21	14	31	23	64	425	86	35
24	24	83	37	21	21	38	29	20	42	188	34	40
25	68	45	32	31	20	28	25	17	35	84	30	29
26	33	44	30	21	19	26	62	18	33	60	35	27
27	46	38	28	21	19	20	66	21	55	51	33	80
28	33	54	44	21	19	18	36	18	32	44	28	31
29	29	37	33	20	---	17	31	62	39	65	27	27
30	27	35	30	20	---	17	28	28	41	47	25	34
31	26	---	38	20	---	18	---	23	---	38	24	---
TOTAL	1201	2317	1058	743	744	554	938	778	1580	2806	1056	1034
MEAN	38.7	77.2	34.1	24.0	26.6	17.9	31.3	25.1	52.7	90.5	34.1	34.5
MAX	98	337	74	31	113	36	69	62	270	783	88	141
MIN	24	25	25	20	18	13	17	17	20	26	24	20
AC-FT	2380	4600	2100	1470	1480	1100	1860	1540	3130	5570	2090	2050

CAL YR 1986	TOTAL	16629	MEAN	45.6	MAX	685	MIN	12	AC-FT	32980
WTR YR 1987	TOTAL	14809	MEAN	40.6	MAX	783	MIN	13	AC-FT	29370

16302000 PUNALUU DITCH NEAR PUNALUU

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

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

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

GAGE.--Water-stage recorder. Elevation of gage is 200 ft, from topographic map.

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

AVERAGE DISCHARGE.--34 years, 7.03 ft^3/s (5,090 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 54 ft^3/s Oct. 31, 1964; no flow at times.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 1.7 ft^3/s July 6; minimum daily, 0.26 ft^3/s Nov. 15.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.73	5.0	4.0	2.0	1.3	6.0	4.1	7.0	3.8	7.0	14	9.0
2	.61	4.0	5.0	1.3	1.3	5.2	5.1	8.3	3.2	6.8	15	10
3	5.4	4.2	6.5	5.2	1.3	5.2	6.0	4.0	2.5	7.0	13	9.0
4	7.0	3.0	4.0	6.0	1.1	4.9	8.0	7.2	3.2	6.8	10	10
5	6.0	4.4	1.0	5.0	1.1	4.4	5.2	4.5	1.8	7.0	9.7	9.2
6	4.0	2.0	3.3	4.0	5.0	5.0	6.9	4.0	1.8	17	10	8.5
7	5.1	5.0	7.1	5.0	7.3	6.4	5.0	4.0	4.0	11	8.8	8.8
8	5.0	.46	7.3	6.3	6.9	7.2	5.0	8.0	3.5	13	7.0	8.6
9	5.0	.46	7.0	4.0	5.9	5.0	6.0	8.0	3.5	12	8.0	8.8
10	4.8	4.3	6.0	1.0	8.9	5.1	2.0	7.0	5.6	13	7.0	8.3
11	4.0	7.4	5.0	7.0	5.9	4.4	1.8	8.0	3.5	12	8.0	4.5
12	3.2	.85	3.6	6.8	6.3	4.6	2.6	8.0	1.6	6.8	8.1	12
13	2.4	.70	5.0	7.8	6.3	4.0	7.0	6.5	10	7.5	6.5	8.0
14	2.2	.31	5.8	8.5	8.0	4.0	9.0	7.3	8.0	9.6	6.5	4.5
15	2.0	.26	5.0	8.2	14	4.0	7.0	7.3	7.0	11	8.0	11
16	1.7	.28	5.0	8.0	12	4.3	7.0	3.0	12	12	6.8	9.0
17	1.5	3.3	5.2	10	12	6.2	8.0	3.5	10	12	4.8	10
18	5.0	4.5	3.0	11	11	5.4	5.0	7.0	2.0	11	7.2	10
19	4.0	3.2	2.1	6.0	10	5.0	4.0	5.6	2.0	13	7.0	8.0
20	2.0	1.7	3.9	4.0	8.0	5.0	13	3.6	1.5	9.7	6.2	4.5
21	1.8	3.2	8.2	4.2	9.8	6.2	1.8	4.0	2.0	8.0	7.2	6.0
22	3.5	2.0	5.0	5.1	10	4.3	6.5	2.5	5.0	6.0	3.0	8.0
23	5.3	2.0	5.8	5.2	8.0	3.0	6.5	2.0	5.0	7.0	6.2	5.0
24	4.8	2.2	5.0	6.3	6.0	6.1	7.0	1.2	8.0	14	10	6.0
25	2.2	1.3	4.0	8.2	7.1	6.9	9.0	3.8	7.5	9.5	6.4	5.0
26	1.8	1.5	2.5	7.1	6.0	6.1	1.8	2.2	7.2	9.0	7.8	2.0
27	5.0	2.0	3.8	7.1	7.0	7.0	7.4	1.2	6.8	9.0	9.7	4.5
28	8.0	3.0	5.0	5.2	7.0	5.0	11	1.1	7.0	8.0	9.9	9.0
29	5.2	5.0	4.0	4.0	---	4.3	10	6.0	6.5	10	9.0	2.0
30	4.3	2.7	3.5	2.8	---	4.5	7.0	2.0	6.8	10	9.0	1.0
31	5.2	---	2.3	2.3	---	5.0	---	4.0	---	11	8.0	---
TOTAL	116.74	80.22	141.9	172.6	192.5	159.7	183.7	151.8	152.3	306.7	257.8	220.2
MEAN	3.77	2.67	4.58	5.57	6.87	5.15	6.12	4.90	5.08	9.89	8.32	7.34
MAX	7.0	7.4	7.3	11	14	7.2	13	8.3	12	17	15	12
MIN	.61	.26	1.0	1.0	1.1	3.0	1.8	1.1	1.5	6.0	3.0	1.0
AC-FT	232	159	281	342	382	317	364	301	302	608	511	437

CAL YR 1986	TOTAL	1284.72	MEAN	3.52	MAX	9.2	MIN	.26	AC-FT	2550
WTR YR 1987	TOTAL	2136.16	MEAN	5.85	MAX	17	MIN	.26	AC-FT	4240

16303000 PUNALUU STREAM NEAR PUNALUU

LOCATION.--Lat 21°33'33", long 157°54'06", Hydrologic Unit 20060000, on left bank at Punaluu ditch diversion dam, 1.4 mi west of Kahana, and 1.8 mi southwest of Punaluu.

DRAINAGE AREA.--2.78 mi^2.

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

REVISED RECORDS.--WSP 1569: Drainage area. WRD Hawaii 1974: 1971-72(P), 1973(M). WDR HI-78-1: 1954(M), 1955-70(P).

GAGE.--Water-stage recorder and masonry control. Elevation of gage is 212 ft, from topographic map.

REMARKS.--Records good except for estimated discharges, which are poor. Records do not include flow of Punaluu ditch (see sta. 16302000).

AVERAGE DISCHARGE.--34 years, 17.7 ft^3/s (12,820 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 5,700 ft^3/s July 17, 1974, gage height, 7.60 ft, from rating curve extended above 170 ft^3/s on basis of slope-area measurements at gage heights 5.77 ft and 7.60 ft; no flow at times.

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

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Nov. 10	2000	1,420	4.18	July 22	2130	*1,870	*4.79
June 5	0830	1,150	3.78	Sept. 11	0430	950	3.45

Minimum discharge, 2.4 ft^3/s Sept. 21.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	55	14	21	19	15	10	11	15	13	12	16	9.7
2	43	18	18	22	15	11	10	13	13	12	21	12
3	44	18	16	17	15	11	15	16	14	13	16	9.7
4	28	19	18	15	15	11	9.1	19	14	13	15	11
5	23	17	21	15	15	11	11	20	154	15	15	11
6	23	26	20	15	11	10	9.1	19	34	80	15	10
7	21	69	15	14	7.7	9.1	11	17	22	16	15	10
8	19	32	14	13	8.1	7.7	11	12	21	14	18	9.7
9	18	25	14	15	9.1	9.1	9.1	11	21	12	16	9.1
10	18	e150	15	18	8.1	9.1	15	12	16	14	15	10
11	18	e95	16	12	9.1	9.1	85	10	16	14	19	62
12	22	e88	34	12	9.7	8.6	19	10	59	27	15	12
13	20	e105	18	14	9.7	9.4	12	15	20	19	14	20
14	19	e52	16	14	32	10	12	9.7	20	26	13	28
15	19	e58	16	9.7	38	9.7	12	9.7	19	16	14	5.2
16	18	e45	16	12	20	10	12	14	18	14	17	6.4
17	19	e35	16	11	13	11	13	13	18	12	16	11
18	15	e33	17	11	12	10	14	8.6	26	27	16	11
19	35	e42	17	13	12	8.6	20	10	23	12	14	12
20	23	e29	16	14	12	8.6	38	12	37	12	18	14
21	19	e23	30	12	11	8.1	47	12	53	89	16	10
22	16	39	33	11	9.7	9.1	27	13	26	259	30	30
23	15	33	18	12	9.7	10	17	21	26	240	18	20
24	16	31	17	11	11	57	15	15	14	62	15	18
25	30	26	18	15	10	15	13	11	14	35	16	16
26	25	25	17	12	9.7	29	53	14	14	26	15	13
27	24	24	15	12	8.6	11	30	18	19	23	14	19
28	17	30	27	13	9.1	9.7	17	15	15	22	12	6.3
29	17	22	19	14	---	9.7	15	18	16	30	11	12
30	16	22	18	14	---	8.6	16	14	19	22	10	32
31	16	---	24	15	---	11	---	11	---	19	11	---
TOTAL	711	1223	590	426.7	365.3	372.2	598.3	428.0	794	1207	484	460.1
MEAN	22.9	40.6	19.0	13.8	13.0	12.0	19.9	13.8	26.5	38.9	15.6	15.3
MAX	55	150	34	22	38	57	85	21	154	259	30	62
MIN	15	14	14	9.7	7.7	7.7	9.1	8.6	13	12	10	5.2
AC-FT	1410	2430	1170	846	725	738	1190	849	1570	2390	960	913

CAL YR 1986	TOTAL	7848.5	MEAN	21.5	MAX	220	MIN	5.5	AC-FT	15570
WTR YR 1987	TOTAL	7659.6	MEAN	21.0	MAX	259	MIN	5.2	AC-FT	15190

e Estimated.

16304200 KALUANUI STREAM NEAR PUNALUU

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

DRAINAGE AREA.--1.11 mi^2.

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

GAGE.--Water-stage recorder. Elevation of gage is 110 ft, from topographic map.

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

AVERAGE DISCHARGE.--20 years, 4.17 ft^3/s (3,020 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 2,390 ft^3/s Jan. 6, 1982, gage height, 11.90 ft, from rating curve extended above 14 ft^3/s on basis of slope-area measurements at gage heights 8.85 ft and 10.0 ft; no flow at times.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 500 ft^3/s and maximum(*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Nov. 10	1945	*885	*9.43	July 22	1145	772	9.18
Mar. 24	1230	680	8.95	Sept. 11	0515	569	8.64
Apr. 21	1430	502	8.44	Sept. 26	2315	541	8.56

Minimum discharge, 0.04 ft^3/s, Mar. 15-16.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	13	.66	2.7	1.5	.61	.30	.94	1.8	1.4	1.3	1.6	.51
2	6.7	2.0	1.3	13	.33	.28	.36	1.7	.81	2.1	4.3	.51
3	7.9	2.8	1.2	3.9	.27	.43	1.6	2.2	25	7.6	4.0	.69
4	2.3	1.5	.99	1.5	.33	.22	1.6	3.7	3.7	2.4	1.5	1.1
5	2.1	.78	3.3	1.3	.25	.17	1.9	8.9	50	4.7	1.2	1.6
6	2.1	4.9	8.5	.98	.17	.18	.68	14	7.0	30	1.1	.53
7	1.3	42	1.3	.83	.16	.27	.53	5.3	4.0	2.9	1.0	.36
8	1.1	6.1	.92	.72	.14	.16	1.2	1.8	3.3	2.8	1.4	.29
9	.94	2.3	.76	9.6	.13	.20	1.1	1.4	3.5	2.9	3.9	.26
10	.81	85	.68	3.8	.14	.12	6.2	1.3	1.6	9.5	2.7	2.9
11	.69	22	3.3	.75	.11	.09	9.8	1.3	2.3	4.2	5.6	35
12	6.6	26	22	.54	2.7	.07	5.0	4.0	29	17	2.2	1.9
13	5.0	32	1.9	.57	6.3	.06	2.2	13	4.8	8.2	1.2	4.2
14	1.0	8.4	1.1	7.8	21	.05	3.1	1.8	4.3	11	.86	18
15	3.4	11	1.2	4.4	26	.04	2.4	1.8	2.8	6.9	.75	1.6
16	1.3	14	2.0	11	8.1	.04	4.6	15	8.2	2.4	4.6	2.1
17	2.9	5.1	1.6	4.7	2.1	3.0	4.0	3.5	4.4	1.8	2.1	4.1
18	3.7	5.2	2.3	4.9	1.4	.67	3.6	1.4	5.7	5.7	2.0	2.6
19	22	15	.84	1.5	.88	.29	14	1.1	5.4	1.9	1.0	1.4
20	6.3	6.0	2.1	.81	3.8	.21	23	.89	19	1.4	.89	.88
21	1.5	2.9	23	.65	3.6	.17	44	.80	7.5	31	18	.66
22	1.1	9.2	11	.61	.93	.09	9.1	.68	7.9	98	13	17
23	.93	10	2.5	.55	.63	.83	7.3	2.8	5.7	26	4.0	13
24	.83	7.9	1.6	.50	3.3	42	4.5	1.7	2.2	7.3	1.2	7.5
25	18	2.9	1.8	11	1.6	2.4	2.3	.74	1.6	3.3	1.4	3.2
26	6.3	2.9	1.1	1.0	.68	29	46	6.3	2.9	2.5	3.1	14
27	12	1.9	.88	1.0	.48	2.2	8.6	5.5	7.7	2.1	3.7	12
28	2.1	9.6	37	3.3	.40	.82	3.0	1.3	1.5	1.9	1.5	1.6
29	1.2	2.1	2.8	.84	---	.49	2.1	2.7	1.3	6.9	1.1	1.3
30	.92	3.7	2.7	.49	---	.42	1.6	5.0	7.1	3.3	.76	27
31	.84	---	8.5	1.2	---	3.6	---	1.8	---	2.3	.60	---
TOTAL	136.86	345.84	152.87	95.24	86.54	88.87	216.31	115.01	231.51	311.3	92.28	177.79
MEAN	4.41	11.5	4.93	3.07	3.09	2.87	7.21	3.71	7.72	10.0	2.98	5.93
MAX	22	85	37	13	26	42	46	15	50	98	18	35
MIN	.69	.66	.68	.49	.11	.04	.36	.68	.91	1.3	.60	.28
AC-FT	271	686	303	189	172	176	429	228	459	617	183	353

CAL YR 1986	TOTAL	1823.01	MEAN	4.99	MAX	106	MIN	.00	AC-FT	3620
WTR YR 1987	TOTAL	2050.42	MEAN	5.62	MAX	98	MIN	.04	AC-FT	4070

16325000 KAMANANUI STREAM AT PUPUKEA MILITARY ROAD, NEAR MAUNAWAI

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

DRAINAGE AREA.--3.13 mi^2.

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

GAGE.--Water-stage recorder and combination pipe culverts and paved road control. Elevation of gage is 590 ft, from topographic map.

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

AVERAGE DISCHARGE.--24 years, 10.1 ft^3/s (7,320 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 3,390 ft^3/s Jan. 30, 1975, gage height, 10.06 ft, from rating curve extended above 42 ft^3/s on basis of slope-area measurement at gage height 10.06 ft; no flow at times.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 1,010 ft^3/s Nov. 10, gage height 7.40 ft, no other peak greater than base discharge of 950 ft^3/s; minimum, 0.90 ft^3/s, Mar. 23,24.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	9.4	2.6	8.1	7.1	4.9	1.7	3.9	5.2	2.4	4.1	5.1	2.0
2	5.6	2.5	6.2	15	2.9	1.6	1.6	5.8	2.3	3.7	8.2	1.9
3	9.2	3.0	5.6	8.5	2.5	1.7	1.8	4.7	2.2	20	5.8	1.9
4	4.2	3.6	5.2	5.9	3.3	1.4	4.4	4.8	2.0	8.4	5.1	1.8
5	3.5	2.5	5.4	4.8	2.6	1.3	2.0	21	9.8	6.2	4.1	2.0
6	4.2	2.1	32	4.3	2.2	1.4	2.8	10	5.7	39	3.8	1.8
7	3.2	23	6.3	4.0	2.0	1.4	1.6	15	3.0	10	3.5	1.7
8	2.7	14	6.0	3.7	2.0	1.2	1.2	5.9	2.4	7.7	3.4	1.7
9	2.5	6.1	5.3	4.6	2.0	1.2	1.2	4.3	5.4	6.1	5.6	1.7
10	2.3	143	5.0	13	1.9	1.1	1.6	4.0	3.3	11	4.6	2.3
11	2.3	31	7.4	4.1	1.8	1.1	20	3.8	4.8	11	6.2	15
12	2.8	27	21	3.5	2.2	1.1	7.6	3.6	48	25	7.0	6.7
13	6.6	36	7.4	3.4	8.2	1.0	5.3	17	13	16	3.7	4.5
14	3.4	21	5.0	5.3	15	1.0	3.1	5.1	10	21	2.8	45
15	5.6	26	4.5	7.5	39	1.1	2.4	3.7	6.0	11	2.7	6.0
16	4.0	37	6.7	11	13	1.0	2.4	7.1	9.9	7.8	8.1	3.6
17	2.9	17	5.9	15	6.1	1.1	6.6	12	8.7	7.2	6.1	3.8
18	9.1	18	4.6	8.0	3.4	1.2	13	3.7	16	18	6.7	10
19	23	51	3.7	5.9	2.7	1.2	7.9	2.9	9.8	9.0	4.5	3.9
20	20	18	4.1	3.8	8.7	1.3	39	2.6	19	6.2	2.7	3.0
21	4.9	12	29	3.3	6.3	1.1	19	2.4	31	82	2.7	2.1
22	3.2	12	32	3.1	3.2	.98	27	2.3	7.9	47	7.3	12
23	2.5	11	8.6	3.0	2.3	.95	7.6	2.6	15	25	4.5	14
24	2.2	13	6.3	2.9	2.9	35	9.9	4.9	6.6	12	2.5	16
25	13	6.9	5.6	23	2.7	15	5.0	2.5	4.9	9.8	2.2	4.7
26	10	8.7	4.8	7.9	2.0	11	47	3.2	4.3	8.2	2.9	3.7
27	17	7.7	4.2	4.9	2.1	6.8	19	9.8	8.4	7.3	4.5	11
28	8.5	21	32	5.1	2.0	2.8	7.9	5.1	4.5	6.7	3.9	3.8
29	4.1	9.1	13	4.1	---	1.7	6.1	3.2	3.8	7.1	4.0	2.7
30	3.2	8.5	6.4	3.2	---	1.5	4.7	2.5	5.2	8.0	3.3	11
31	3.1	---	19	4.8	---	2.0	---	2.3	---	5.6	2.1	---
TOTAL	198.4	592.3	318.3	203.7	149.9	103.93	282.4	182.8	275.5	466.9	135.6	201.1
MEAN	6.40	19.7	10.3	6.57	5.35	3.35	9.41	5.90	9.18	15.1	4.37	6.70
MAX	23	143	32	23	39	35	47	21	48	82	7.3	45
MIN	2.2	2.1	3.7	2.9	1.8	.95	1.2	2.3	2.0	3.7	2.1	1.7
AC-FT	394	1170	631	404	297	206	580	363	546	926	269	399

CAL YR 1986	TOTAL	3329.48	MEAN	9.12	MAX	170	MIN	.00	AC-FT	6600
WTR YR 1987	TOTAL	3110.83	MEAN	8.52	MAX	143	MIN	.95	AC-FT	6170

16330000 KAMANANUI STREAM AT MAUNAWAI

LOCATION.--Lat 21°38'20", long 158°03'27", Hydrologic Unit 20060000, on right bank 0.5 mi upstream from Kamehameha Highway, 4.9 mi northeast of Waialua School, and 7.3 mi southwest of Kahuku School.

DRAINAGE AREA.--12.36 mi^2, revised, including that of Elehaha Stream which is mostly diverted into Kamananui Stream since June 14, 1975.

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

REVISED RECORDS.--WSP 1937: 1958-60. WRD Hawaii 1974: 1971(P), 1972-73(M). WDR HI-81-1: Drainage area.

GAGE.--Water-stage recorder. Elevation of gage is 20 ft, from topographic map. Prior to May 13, 1965, at datum 2.00 ft higher and May 13, 1965, to May 17, 1966, at datum 1.00 ft higher.

REMARKS.--Records good. Small diversion upstream.

AVERAGE DISCHARGE.--29 years, 16.9 ft^3/s (12,240 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 8,540 ft^3/s Mar. 16, 1980, gage height, 11.46 ft, from rating curve extended above 150 ft^3/s on basis of slope-area measurementa at gage heights 5.68 ft and 11.46 ft; no flow at times.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 1,600 ft^3/s Nov. 10, gage height, 5.66 ft, no other peak greater than base discharge of 1,300 ft^3/s; minimum, 0.70 ft^3/s on Mar. 23, 24.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	13	4.2	14	14	8.2	3.0	4.4	8.1	2.5	6.2	7.3	2.1
2	7.7	3.5	9.7	22	4.5	2.8	2.6	9.4	2.5	4.9	7.7	1.9
3	9.7	3.3	8.3	16	3.5	2.7	1.9	7.7	2.4	22	8.7	1.9
4	6.5	5.1	7.2	11	3.9	2.4	4.3	7.2	2.1	16	6.9	2.2
5	4.5	3.8	7.0	8.3	3.6	2.2	2.7	33	14	9.8	5.9	1.8
6	4.5	2.7	78	7.0	2.9	2.1	2.8	16	10	95	5.2	1.7
7	3.8	34	16	6.1	2.6	2.1	2.5	25	4.4	21	4.7	1.5
8	3.0	23	10	5.5	2.5	1.9	1.6	12	2.9	12	4.6	1.4
9	2.7	11	8.1	6.3	2.3	1.7	1.3	8.1	4.7	9.5	5.7	1.2
10	2.4	407	7.1	20	2.3	1.7	1.4	6.6	4.7	15	7.3	1.3
11	2.2	120	8.3	7.6	2.2	1.5	24	5.8	3.7	18	6.7	13
12	2.3	56	30	5.1	2.5	1.4	13	5.2	132	42	8.1	13
13	5.2	90	14	4.7	9.6	1.3	10	19	35	33	5.6	4.9
14	4.7	38	7.6	5.8	38	1.2	5.2	11	17	36	3.8	95
15	4.5	52	6.2	8.0	126	1.1	3.7	6.2	13	18	3.4	12
16	6.3	105	7.5	10	24	1.1	3.2	5.2	15	13	4.4	5.3
17	3.3	43	9.0	27	13	1.1	5.8	22	15	11	11	4.2
18	7.7	27	6.6	13	7.2	1.2	17	7.4	19	35	6.8	15
19	30	139	5.4	8.9	5.4	1.3	12	4.9	17	15	7.4	6.0
20	35	32	5.4	5.8	9.2	1.3	71	4.1	13	9.1	3.8	4.4
21	9.8	21	52	4.5	13	1.1	26	3.7	102	269	3.1	2.9
22	5.4	19	76	4.0	7.2	.89	86	3.4	16	153	8.5	12
23	4.1	17	18	3.8	4.7	.79	17	3.3	22	63	6.4	20
24	3.4	19	11	3.7	4.3	70	17	5.7	13	24	3.5	21
25	13	14	9.1	43	6.0	25	10	4.1	8.4	17	2.6	7.7
26	17	12	7.5	18	4.2	9.5	110	3.5	6.7	14	2.8	5.3
27	19	12	6.3	7.5	4.0	11	40	10	11	12	4.4	17
28	18	34	42	6.9	3.8	5.5	16	8.8	8.0	10	4.4	6.8
29	7.4	17	27	5.6	---	2.9	12	5.0	5.4	10	4.9	3.8
30	5.2	13	11	4.4	---	2.1	8.5	3.3	5.7	11	4.1	8.7
31	5.0	---	27	5.8	---	2.1	---	2.8	---	8.5	2.7	---
TOTAL	266.1	1377.6	552.3	319.3	320.6	165.98	532.9	277.5	528.1	1033.0	172.4	295.0
MEAN	8.58	45.9	17.8	10.3	11.4	5.35	17.8	8.95	17.6	33.3	5.56	9.83
MAX	35	407	78	43	126	70	110	33	132	269	11	95
MIN	2.2	2.7	5.4	3.7	2.2	.79	1.3	2.8	2.1	4.9	2.6	1.2
AC-FT	528	2730	1100	633	636	329	1060	550	1050	2050	342	585

CAL YR 1986	TOTAL	5954.83	MEAN	16.3	MAX	458	MIN	.02	AC-FT	11810
WTR YR 1987	TOTAL	5840.76	MEAN	16.0	MAX	407	MIN	.79	AC-FT	11590

16345000 OPAEULA STREAM NEAR WAHIAWA

LOCATION.--Lat 21°33'55", long 158°00'10", Hydrologic Unit 200600000, on left bank 4.3 mi northeast of Leilehua High School in Wahiawa and 8.1 mi east of Waialua School.

DRAINAGE AREA.--2.98 mi^2.

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

REVISED RECORDS.--WSP 1937: 1960.

GAGE.--Water-stage recorder and concrete control. Elevation of gage is 1,120 ft, from topographic map.

REMARKS.--Records good. No diversion upstream.

AVERAGE DISCHARGE.--28 years, 13.5 ft^3/s (9,780 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 5,540 ft^3/s July 17, 1974, gage height, 11.94 ft from rating curve extended above 110 ft^3/s on basis of slope-area measurements at gage heights 6.74 ft and 10.12 ft; no flow at times.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 1,230 ft^3/s June 12, gage height 6.42 ft, no other peak greater than base discharge of 1,200 ft^3/s; minimum, 0.42 ft^3/s Mar. 16, 17.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	13	2.9	13	6.8	3.3	1.5	18	8.2	3.8	6.8	6.1	1.7
2	8.3	4.0	7.1	28	2.6	1.3	4.6	8.4	3.5	4.7	7.3	1.6
3	23	6.1	5.5	15	2.0	1.3	11	6.3	2.9	16	8.0	2.0
4	6.6	6.3	4.7	6.8	2.1	1.3	10	21	7.4	12	6.0	1.8
5	4.5	4.6	4.7	4.8	2.1	1.2	5.9	26	71	9.7	4.1	1.7
6	4.4	2.8	24	4.0	1.8	.99	5.4	46	19	100	3.6	2.8
7	3.9	63	6.9	3.4	1.5	.91	2.9	44	6.4	12	3.3	1.8
8	3.1	14	4.5	3.1	1.4	.87	2.3	10	6.2	8.1	3.1	1.3
9	2.7	6.3	3.9	2.9	1.3	.81	3.0	6.8	10	7.6	6.6	1.1
10	2.4	173	3.6	18	1.2	.70	3.2	5.8	5.9	16	6.4	1.0
11	2.2	42	3.3	4.3	1.2	.64	83	5.1	4.8	13	18	105
12	7.5	55	33	2.7	1.2	.60	13	5.4	138	45	8.7	12
13	19	106	8.8	2.5	1.4	.53	12	31	23	27	4.7	30
14	5.0	33	4.4	14	2.7	.49	7.1	7.9	17	36	3.2	55
15	5.2	49	3.5	28	54	.45	10	5.3	10	15	3.0	9.1
16	6.7	54	5.7	18	32	.43	12	22	22	8.3	4.8	4.7
17	5.0	19	5.3	21	12	.45	14	26	23	7.8	11	4.8
18	12	19	5.1	9.7	5.0	6.0	27	5.8	17	17	5.7	12
19	57	45	4.0	13	3.7	2.4	12	4.3	16	11	7.1	4.7
20	37	14	3.0	4.3	8.9	1.5	59	3.7	34	6.4	3.4	3.7
21	7.2	12	44	3.3	14	.88	84	3.5	81	85	2.8	2.7
22	4.5	16	42	3.0	4.8	.63	40	3.2	13	62	8.3	10
23	3.8	16	7.1	2.8	2.9	.54	10	3.4	36	93	5.2	24
24	3.1	25	4.8	2.7	2.3	114	14	11	9.6	21	2.9	22
25	47	12	5.1	67	4.8	37	6.9	4.4	6.5	9.0	2.4	5.4
26	16	9.2	5.4	11	3.6	46	56	22	5.5	7.3	3.1	3.6
27	30	8.5	3.4	4.4	2.4	12	62	30	17	8.0	12	27
28	12	36	46	10	1.8	3.9	14	7.5	7.2	5.8	4.7	5.4
29	5.1	11	16	5.4	---	2.4	10	4.6	4.8	7.8	2.9	3.2
30	3.9	12	5.0	3.3	---	1.8	6.0	7.5	16	17	2.3	5.7
31	3.4	---	21	3.1	---	28	---	5.1	---	8.5	1.9	---
TOTAL	384.3	876.7	353.8	328.3	178.0	271.52	618.3	401.2	837.5	699.6	172.6	366.8
MEAN	11.8	29.2	11.4	10.5	6.36	8.76	20.6	12.9	21.2	22.6	5.57	12.2
MAX	57	173	48	67	54	114	84	46	138	100	18	105
MIN	2.2	2.8	3.0	2.5	1.2	.43	2.3	3.2	2.9	4.7	1.9	1.0
AC-FT	723	1740	702	647	353	539	1230	796	1260	1390	342	728

CAL YR 1986	TOTAL	5545.28	MEAN	15.2	MAX	494	MIN	.00	AC-FT	11000
WTR YR 1987	TOTAL	5266.62	MEAN	14.4	MAX	173	MIN	.43	AC-FT	10450

16400000 HALAWA STREAM NEAR HALAWA
(National stream-quality accounting network station)

LOCATION.--Lat 21°09'31", long 156°45'53", Hydrologic Unit 20050000, on right bank 600 ft downstream from Hipuapua Stream and 1.5 mi west of Halawa.

DRAINAGE AREA.--4.62 mi^2.

WATER- DISCHARGE RECORDS

PERIOD OF RECORD.--July 1917 to July 1932, November 1937 to current year.

REVISED RECORDS.--WSP 1319: 1928, 1929(M), 1930-31, 1938-50(M), drainage area. WSP 1719: 1954.

GAGE.--Water-stage recorder. Elevation of gage is 210 ft, from topographic map. Prior to June 25, 1923, at site 350 ft upstream at different datum. June 25, 1923, to July 18, 1932, and Nov. 17, 1937, to Feb. 3, 1965, at present site at datum 2.00 ft higher.

REMARKS.--Records fair. No diversion upstream.

AVERAGE DISCHARGE.--83 years (water years 1918-31, 1939-87), 29.2 ft^3/s (21,160 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 28,900 ft^3/s Feb. 4, 1965, gage height, 19.91 ft, from floodmarks, from rating curve extended above 163 ft^3/s on basis of slope-area measurement of peak flow; minimum, 0.76 ft^3/s about Nov. 23, 1982.

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

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Nov. 7	2000	1,950	8.36	Jan. 14	0030	1,940	8.35
Dec. 5	2330	*2,620	*9.28	May 6	0800	2,060	8.52

Minimum discharge, 3.4 ft^3/s Oct. 11, 12.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	21	26	24	20	12	5.8	32	22	17	14	40	6.1
2	18	41	38	38	7.6	5.6	8.0	17	12	11	58	5.9
3	12	56	18	61	6.7	6.1	6.3	19	54	16	50	11
4	5.9	11	9.7	13	7.0	5.0	5.7	67	24	10	16	5.8
5	14	20	87	42	6.9	4.9	5.0	432	87	26	15	12
6	6.9	14	160	19	5.8	5.0	4.5	745	16	103	14	5.8
7	4.7	210	18	9.3	5.6	5.8	7.7	289	15	15	9.8	11
8	4.3	107	13	8.3	5.5	4.5	9.8	47	18	12	46	26
9	4.0	49	10	124	5.3	4.3	14	38	11	15	31	20
10	3.8	273	9.1	90	5.2	4.0	6.0	21	9.4	62	28	29
11	3.5	70	39	11	5.0	3.9	15	17	16	30	46	63
12	9.2	79	129	9.5	7.8	4.6	46	21	35	24	31	11
13	28	61	15	111	72	5.0	18	133	13	43	11	171
14	18	61	12	164	40	3.9	6.7	26	14	143	8.9	22
15	20	66	13	168	182	3.9	12	16	56	24	9.6	11
16	5.9	32	42	102	234	24	36	12	50	22	73	10
17	43	78	53	31	83	11	35	13	29	13	20	11
18	7.0	25	13	76	19	7.9	41	10	128	32	20	11
19	98	91	9.4	22	14	15	58	9.4	17	22	11	10
20	88	40	8.6	14	82	6.5	38	8.5	92	30	8.9	7.4
21	10	18	36	12	21	4.8	121	14	38	128	19	8.3
22	6.7	90	12	11	11	4.6	47	9.2	84	46	26	32
23	5.8	37	13	11	9.1	4.0	14	29	43	88	41	55
24	5.3	22	26	9.6	8.2	3.8	12	39	89	20	11	15
25	131	20	12	68	9.0	59	7.7	12	16	14	8.5	10
26	68	23	13	18	7.1	181	328	77	31	11	19	21
27	103	11	7.5	12	6.5	121	180	43	13	32	13	7.8
28	16	82	35	13	6.0	11	124	34	10	72	17	6.3
29	17	31	57	9.2	---	7.0	33	17	34	24	12	11
30	8.7	51	88	8.0	---	11	18	12	88	18	7.8	82
31	56	---	28	30	---	80	---	9.6	---	19	6.3	---
TOTAL	842.7	1797	1046.3	1334.9	884.3	623.7	1289.4	2258.7	1137.4	1135	727.8	706.4
MEAN	27.2	59.9	33.8	43.1	31.6	20.1	43.0	72.9	37.9	36.6	23.5	23.5
MAX	131	273	160	168	234	181	328	745	128	143	73	171
MIN	3.5	11	7.5	8.0	5.0	3.8	4.5	8.5	9.4	10	8.3	5.8
AC-FT	1670	3560	2080	2650	1750	1240	2560	4480	2260	2250	1440	1400

CAL YR 1986	TOTAL	12077.6	MEAN	33.1	MAX	384	MIN	2.8	AC-FT	23960
WTR YR 1987	TOTAL	13783.6	MEAN	37.8	MAX	745	MIN	3.5	AC-FT	27340

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 1986 TO SEPTEMBER 1987

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	TEMPER-ATURE WATER (DEG C)	DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	TEMPER-ATURE WATER (DEG C)
OCT				APR			
28...	1005	14	20.0	30...	0920	19	17.5
DEC				JUN			
16...	1100	33	20.5	10...	0900	9.0	21.0
FEB				JUL			
02...	1350	7.2	18.0	22...	1005	24	22.0
MAR				AUG			
18...	1115	3.7	20.0	24...	1105	12	24.0

DATE	TIME	BARO-METRIC PRES-SURE (MM OF HG)	STREAM-FLOW INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (US/CM))	PH (STAND-ARD UNITS)	TEMPER-ATURE WATER (DEG C)	TUR-BID-ITY (FTU)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION)
OCT									
28...	1215	759	14	45	6.80	20.0	5.7	9.0	99
DEC									
16...	1240	759	30	48	6.70	20.5	3.1	9.0	100
FEB									
02...	1445	758	7.2	62	6.90	18.0	2.6	9.5	101
APR									
27...	1040	764	303	53	6.20	17.5	8.4	9.8	102
AUG									
24...	1145	760	12	43	6.90	24.0	7.8	8.2	98

DATE	COLI-FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)	STREP-TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML)	HARD-NESS TOTAL (MG/L AS CACO3)	HARD-NESS NONCARB-ONATE MG/L AS CACO3	CALCIUM DIS-SOLVED (MG/L AS CA)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG)	SODIUM, DIS-SOLVED (MG/L AS NA)	SODIUM PERCENT	SODIUM AD-SORP-TION RATIO	POTAS-SIUM, DIS-SOLVED (MG/L AS K)
OCT										
28...	950	990	6	1	0.90	1.0	5.6	63	1	0.60
DEC										
16...	<1	470	6	3	0.80	0.90	6.2	67	1	0.80
FEB										
02...	<1	120	10	3	1.5	1.4	7.5	61	1	0.70
APR										
27...	--	--	7	5	0.90	1.2	6.9	65	1	0.80
AUG										
24...	67	1300	6	0	0.97	0.97	5.9	64	1	0.60

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

16400000 HALAWA STREAM NEAR HALAWA--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	BICARBONATE WATER WH FET FIELD MG/L AS HCO3	ALKALINITY LAB (MG/L AS CACO3) AS SO4	ALKALINITY WH WAT TOTAL FIELD (MG/L AS CACO3)	SULFATE DISSOLVED (MG/L AS CL)	CHLORIDE, DISSOLVED (MG/L AS F)	FLUORIDE, DISSOLVED (MG/L SIO2)	SILICA, DISSOLVED (MG/L AS (MG/L)	SOLIDS, RESIDUE AT 180 DEG. C DISSOLVED (MG/L)	SOLIDS, SUM OF CONSTITUENTS, DISSOLVED AC-FT)	SOLIDS, DISSOLVED (TONS PER AS N)	NITROGEN, NO2+NO3 DISSOLVED (MG/L AS N)
OCT											
28...	6	5	5	6.9	9.1	<0.10	4.5	37	32	0.05	<0.100
DEC											
16...	4	4	3	5.5	12	<0.10	6.3	48	34	0.06	--
FEB											
02...	8	6	7	6.9	12	<0.10	7.3	41	42	0.06	<0.100
APR											
27...	2	3	2	8.7	12	<0.10	2.0	34	34	0.05	<0.100
AUG											
24...	--	6	6	13	8.7	0.10	5.0	31	39	0.04	<0.100

DATE	TIME	NITROGEN, NITRITE DISSOLVED (ML/L AS N)	NITROGEN, AMMONIA TOTAL (MG/L AS N)	NITROGEN, AMMONIA DISSOLVED (MG/L AS N)	NITROGEN,AMMONIA + ORGANIC TOTAL (MG/L AS N)	PHOSPHOROUS TOTAL (MG/L AS P)	PHOSPHOROUS DISSOLVED (MG/L AS P)	PHOSPHOROUS ORTHO, DISSOLVED (MG/L AS P)
OCT								
28...	1215	<0.010	0.030	0.040	0.40	0.030	<0.010	<0.010
DEC								
16...	1240	--	<0.010	--	0.40	0.030	--	--
FEB								
02...	1445	<0.010	<0.010	<0.010	0.50	0.010	0.020	<0.010
APR								
27...	1040	<0.010	<0.010	<0.010	0.50	0.020	0.010	<0.010
AUG								
24...	1145	<0.010	0.020	0.030	0.80	0.070	0.030	0.030

DATE	ALUMINUM, DISSOLVED (UG/L AS AL)	ARSENIC DISSOLVED (UG/L AS AS)	BARIUM, DISSOLVED (UG/L AS BA)	BERYLLIUM, DISSOLVED (UG/L AS BE)	CADMIUM DISSOLVED (UG/L AS CD)	CHROMIUM, DISSOLVED (UG/L AS CR)	COBALT, DISSOLVED (UG/L AS CO)	COPPER, DISSOLVED (UG/L AS CU)	IRON, DISSOLVED (UG/L AS FE)	LEAD, DISSOLVED (UG/L AS PB)
OCT										
28...	150	<1	4	<0.5	<1	<1	<3	<1	160	<5
FEB										
02...	110	<1	5	<0.5	<1	<1	<3	1	150	<5
APR										
27...	200	<1	4	<0.5	2	<1	<3	2	210	<5
AUG										
24...	150	<1	6	<0.5	2	<1	<3	2	240	<5

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

16400000 HALAWA STREAM NEAR HALAWA--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	LITHIUM DIS-SOLVED (UG/L AS LI)	MANGA-NESE, DIS-SOLVED (UG/L AS MN)	MERCURY DIS-SOLVED (UG/L AS HG)	MOLYB-DENUM, DIS-SOLVED (UG/L AS MO)	NICKEL, DIS-SOLVED (UG/L AS NI)	SELE-NIUM, DIS-SOLVED (UG/L AS SE)	SILVER, DIS-SOLVED (UG/L AS AG)	STRON-TIUM, DIS-SOLVED (UG/L AS SR)	VANA-DIUM, DIS-SOLVED (UG/L AS V)	ZINC, DIS-SOLVED (UG/L AS ZN)
OCT										
28...	<4	1	2.0	<10	<1	<1	<1.0	13	<6	<3
FEB										
02...	4	4	<0.1	<10	<1	<1	<1.0	18	<6	6
APR										
27...	<4	6	0.2	<10	<1	<1	<1.0	15	<6	7
AUG										
24...	<4	9	0.2	<10	2	<1	<1.0	14	<6	8

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					APR				
28...	1215	4	0.15	100	27...	1040	13	11	100
DEC					FEB				
16...	1240	4	0.32	100	02...	1445	1	0.02	100

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

16404200 PILIPILILAU STREAM NEAR PELEKUNU

LOCATION.--Lat 21°08'08", long 158°53'09", Hydrologic Unit 20050000, on right bank 500 ft downstream from left-bank tributary, 1.9 mi south of former village of Pelekunu, and 5.8 mi north of Kamalo.

DRAINAGE AREA.--0.49 mi^2.

PERIOD OF RECORD.--August 1968 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 1,000 ft, from topographic map.

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

AVERAGE DISCHARGE.--19 years, 1.54 ft^3/s (1,120 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 835 ft^3/s Jan. 25, 1982, gage height, 4.25 ft, from rating curve extended above 6.2 ft^3/s on basis of slope-area measurement at gage height, 4.25 ft; minimum, 0.50 ft^3/s Sept. 2-8, 21-29, 1975, Nov. 26 to Dec. 3, 1977.

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

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Diacharge (ft^3/s)	Gage height (ft)
Nov. 7	1800	165	3.20	Apr. 26	0730	113	3.00
Feb. 16	0300	*335	*3.81	May 5	1500	165	3.20
Mar. 26	1700	105	2.96				

Minimum diacharge, 0.84 ft^3/s, for many days.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.94	1.1	2.4	1.3	2.0	2.3	7.1	3.0	2.9	1.9	1.3	.94
2	.98	1.1	3.0	1.7	2.0	2.3	2.9	2.8	2.7	1.9	1.3	.94
3	1.1	1.0	2.4	1.8	1.9	2.0	2.5	2.6	2.6	1.9	1.3	.94
4	.89	.99	1.8	1.5	1.9	2.0	2.2	2.6	2.5	1.8	1.2	.99
5	.89	.94	3.3	1.3	1.9	2.0	2.1	27	2.4	1.8	1.3	.99
6	.89	.94	5.3	1.3	1.8	2.0	2.0	29	2.4	1.9	1.2	.94
7	.84	3.4	2.4	1.2	1.8	2.0	1.9	20	2.4	1.7	1.2	.99
8	.84	2.9	2.1	1.2	1.7	1.9	1.8	7.0	2.4	1.7	1.2	1.1
9	.84	2.0	1.9	7.5	1.7	1.9	1.7	5.8	2.3	1.7	1.2	.99
10	.84	2.1	1.7	6.2	1.6	1.8	1.7	4.8	2.3	1.7	1.5	1.0
11	.84	2.3	1.6	2.4	1.6	1.8	1.8	4.5	2.3	1.6	1.3	1.2
12	.94	2.5	1.7	2.8	1.8	1.8	1.6	4.1	2.2	1.6	1.2	.99
13	.94	2.0	1.6	3.9	3.3	1.8	1.6	5.2	2.2	1.7	1.2	1.3
14	.94	1.7	1.5	11	2.2	1.9	1.5	4.0	2.2	2.5	1.2	1.0
15	.94	1.7	1.6	9.6	6.2	1.8	1.7	3.7	2.3	1.6	1.2	.99
16	.89	1.6	1.6	6.9	23	2.0	2.0	3.5	2.3	1.6	1.3	.99
17	.94	1.5	1.5	4.5	10	1.8	2.0	3.4	2.1	1.6	1.2	1.0
18	.89	1.4	1.3	8.7	4.5	1.8	1.8	3.2	2.1	1.6	1.2	.94
19	1.2	1.8	1.3	4.1	3.8	1.9	1.7	3.1	2.0	1.5	1.2	.94
20	4.1	1.3	1.6	3.4	6.2	1.7	1.6	3.0	2.1	1.6	1.1	.94
21	1.1	1.2	2.1	3.0	4.0	1.6	4.0	3.2	2.0	1.6	1.1	.94
22	.94	1.3	1.4	2.8	3.4	1.6	3.0	2.9	2.0	1.5	1.0	1.0
23	.89	1.2	1.3	2.5	3.0	1.6	2.1	4.2	2.0	1.4	1.0	1.0
24	.84	1.2	1.3	2.5	3.2	1.6	1.9	4.3	2.0	1.3	1.0	.99
25	5.0	1.1	1.3	4.6	2.9	1.6	2.0	3.2	2.0	1.3	1.0	.94
26	2.6	1.1	1.2	2.8	2.5	14	12	6.3	2.0	1.3	1.0	1.0
27	1.7	1.0	1.2	2.4	2.4	5.3	9.1	4.5	1.9	1.3	.99	.94
28	1.2	3.2	1.4	2.2	2.3	2.5	5.0	3.5	1.9	1.4	1.0	.94
29	1.1	1.8	1.5	2.0	---	2.1	3.7	3.1	2.0	1.3	.99	1.6
30	1.0	2.2	2.0	2.0	---	2.0	3.1	3.0	2.0	1.3	.99	1.2
31	1.1	---	1.5	2.7	---	3.5	---	3.0	---	1.3	.94	---
TOTAL	39.14	49.57	57.8	111.8	104.6	75.9	89.1	183.5	66.5	49.9	35.81	30.66
MEAN	1.26	1.65	1.86	3.61	3.74	2.45	2.97	5.92	2.22	1.61	1.16	1.02
MAX	5.0	3.4	5.3	11	23	14	12	29	2.9	2.5	1.5	1.6
MIN	.84	.94	1.2	1.2	1.8	1.6	1.5	2.6	1.9	1.3	.94	.94
AC-FT	78	98	115	222	207	151	177	364	132	99	71	61

CAL YR 1986	TOTAL	641.43	MEAN	1.76	MAX	12	MIN	.84	AC-FT	1270
WTR YR 1987	TOTAL	894.28	MEAN	2.45	MAX	29	MIN	.84	AC-FT	1770

16405100 MOLOKAI TUNNEL AT EAST PORTAL

LOCATION.--Lat 21°08'38", long 156°55'16", Hydrologic Unit 20050000, on left bank 100 ft downstream from the east portal, 5.3 mi southeast of Kalaupapa, and 7.5 mi northeast of Kaunakakai.

PERIOD OF RECORD.--July 1966 to current year.

GAGE.--Water-stage recorder and concrete control. Elevation of gage is 989 ft, from tunnel plans.

REMARKS.--Records good. Tunnel diverts from Waikolu Stream and two tributaries; diversion is augmented by water pumped from two wells and from the stream at elevation 728 ft in Waikolu Valley near the east portal. Water is used for irrigation in west-central Moloksi. Periodic determinations of water temperature for the current year are published elsewhere in this report.

AVERAGE DISCHARGE.--21 years, 3.97 ft^3/s (2,880 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 41 ft^3/s Mar. 19, 1986; no flow at times.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 40 ft^3/s May 6; minimum daily, 2.0 ft^3/s Jan.8.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	5.8	7.0	22	4.9	8.0	4.7	29	8.0	5.2	6.5	7.8	3.1
2	5.7	7.8	16	9.7	5.6	4.9	7.5	7.6	6.1	6.8	9.0	3.1
3	11	5.0	15	17	5.2	4.9	5.4	4.3	6.2	6.4	9.2	3.1
4	4.6	3.4	4.0	5.6	6.5	4.7	4.9	6.7	6.2	5.9	7.0	3.1
5	4.3	2.7	4.4	3.7	7.4	4.7	4.6	31	6.0	5.7	6.2	3.1
6	3.2	2.6	22	2.9	7.2	4.9	4.1	40	5.8	8.3	6.0	3.1
7	2.5	12	4.6	2.6	7.2	5.0	3.3	36	5.8	6.2	5.8	3.1
8	2.4	15	3.3	2.0	7.2	4.7	4.0	12	5.7	5.6	5.8	5.1
9	2.3	9.9	3.4	8.2	6.0	4.6	4.8	12	5.7	5.7	5.8	4.9
10	2.3	15	3.2	23	4.8	4.6	5.2	7.6	5.7	6.8	7.0	4.8
11	2.3	18	4.2	5.8	4.8	4.7	5.5	7.8	5.7	6.9	5.8	7.7
12	2.5	17	6.5	21	5.2	4.0	5.4	8.0	5.7	6.6	4.6	5.9
13	4.9	10	3.9	18	19	4.4	4.9	24	5.6	7.2	3.8	14
14	4.4	12	3.2	36	11	4.4	4.9	7.9	6.2	20	3.5	6.6
15	7.1	13	4.8	38	19	4.4	13	5.4	7.8	6.4	3.4	5.3
16	4.8	11	11	33	33	4.6	20	4.8	16	5.8	7.8	5.0
17	6.3	7.9	11	18	23	5.3	17	4.6	7.3	5.4	5.6	5.3
18	4.8	5.3	5.6	31	10	5.4	14	4.4	9.0	5.3	3.7	7.3
19	12	14	3.5	13	11	6.8	5.5	4.1	6.7	5.2	2.7	5.7
20	30	5.3	4.2	6.0	31	6.6	5.9	4.0	7.2	4.3	2.5	5.1
21	5.1	4.5	14	4.8	11	5.2	17	4.5	11	3.3	2.5	4.8
22	2.5	5.4	4.2	4.4	6.7	4.9	16	4.3	8.8	3.9	2.5	4.8
23	2.8	4.2	3.3	4.1	5.9	4.7	4.9	14	11	6.5	2.5	5.9
24	2.6	4.6	3.0	4.4	6.6	4.6	4.3	27	6.4	6.1	2.5	5.4
25	23	4.6	2.9	20	7.4	4.6	4.5	7.5	5.7	6.0	2.4	4.1
26	18	3.9	2.8	12	4.9	17	32	36	5.6	5.9	2.4	6.6
27	13	2.6	2.7	6.9	5.1	23	30	25	5.5	5.8	2.3	4.5
28	5.5	24	2.8	6.5	4.9	6.4	26	9.5	5.5	6.3	2.4	3.5
29	4.7	12	5.3	6.0	---	5.2	9.7	5.2	5.6	8.1	2.3	7.4
30	4.3	19	17	5.5	---	5.5	4.7	4.5	8.1	6.0	2.3	10
31	5.6	---	7.6	15	---	17	---	4.1	---	6.1	2.5	---
TOTAL	210.3	278.7	221.4	389.0	284.6	196.4	318.0	381.8	208.8	199.0	139.6	161.4
MEAN	8.78	9.29	7.14	12.5	10.2	6.34	10.6	12.3	6.96	6.42	4.50	5.38
MAX	30	24	22	38	33	23	32	40	16	20	9.2	14
MIN	2.3	2.6	2.7	2.0	4.8	4.0	3.3	4.0	5.2	3.3	2.3	3.1
AC-FT	417	553	439	772	565	390	631	757	414	395	277	320

CAL YR 1986	TOTAL	2948.7	MEAN	8.08	MAX	41	MIN	2.3	AC-FT	5850
WTR YR 1987	TOTAL	2989.0	MEAN	8.19	MAX	40	MIN	2.0	AC-FT	5930

16405300 MOLOKAI TUNNEL AT WEST PORTAL

LOCATION.--Lat 21°07'27", long 156°59'50", Hydrologic Unit 20050000, on left bank 50 ft upstream from the west portal, 2.5 mi northeast of Kaunakakai, and 4.7 mi south of Kalaupapa.

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

GAGE.--Water-stage recorder and concrete control. Elevation of gage is 970 ft, from tunnel plans.

REMARKS.--Records good. Tunnel diverts from Waikolu Stream and two tributaries; diversion is augmented by water pumped from two wells and from the stream at elevation 728 ft in Waikolu Valley near east portal and one well in the tunnel near east portal. Water is used for irrigation in west-central Molokai. Periodic determinations of water temperature for the current year are published elsewhere in this report.

AVERAGE DISCHARGE.--22 years, 6.38 ft^3/s (4,620 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 39 ft^3/s Apr. 8, 9, 1986; minimum daily, 1.8 ft^3/s Oct. 15, 1987.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 38 ft^3/s May 6; minimum daily, 4.5 ft^3/s Jan. 8.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	8.5	11	24	7.9	11	8.2	32	10	10	11	12	7.0
2	8.5	11	16	11	8.7	8.5	12	11	12	10	13	7.0
3	13	8.2	20	20	8.1	8.5	9.1	7.7	11	11	13	7.0
4	7.5	6.5	7.1	8.2	9.2	8.2	8.4	9.4	11	9.8	12	7.0
5	6.9	5.9	5.9	6.5	11	8.2	8.0	28	11	9.8	11	7.0
6	6.1	5.5	23	5.6	10	8.5	7.8	38	11	13	11	7.0
7	5.3	12	7.7	5.4	10	8.8	6.8	36	11	11	10	7.2
8	5.2	19	5.9	4.5	10	8.5	7.1	18	10	10	10	8.8
9	5.1	12	6.2	7.1	8.8	8.2	8.0	17	10	9.8	10	9.1
10	4.9	16	6.0	26	7.7	8.2	8.2	13	10	11	11	8.8
11	4.9	20	6.9	8.2	7.7	6.5	8.6	13	10	11	10	11
12	5.1	19	9.1	22	7.9	7.8	8.8	12	10	11	8.5	10
13	7.1	12	6.9	17	19	7.9	8.3	29	10	11	7.9	17
14	6.4	16	6.0	35	14	7.9	8.4	14	10	22	7.7	11
15	9.2	16	7.1	36	18	7.9	15	11	11	11	7.4	9.4
16	7.2	14	14	33	35	7.9	20	10	20	10	11	8.8
17	8.3	11	14	20	29	8.2	30	9.4	12	9.6	10	8.8
18	7.5	8.0	8.8	30	16	8.5	17	8.8	13	9.5	7.9	11
19	11	16	8.3	17	14	10	9.2	8.8	11	9.4	8.9	9.7
20	30	7.9	5.5	8.9	32	10	9.6	8.5	11	8.2	6.9	9.1
21	8.2	7.1	16	7.5	16	8.4	16	8.8	15	7.3	6.9	8.8
22	5.2	7.9	6.9	7.2	10	8.1	19	8.8	14	7.8	6.6	8.5
23	5.4	7.1	6.2	6.7	9.7	8.0	8.2	16	15	11	8.6	9.7
24	5.6	7.4	5.4	6.8	9.2	8.0	7.5	29	11	11	6.6	9.7
25	20	7.7	5.3	19	12	8.0	7.3	12	11	11	6.4	8.2
26	20	7.0	5.3	15	8.2	15	29	33	10	11	6.4	10
27	15	5.7	5.3	9.1	8.5	26	30	28	10	11	6.4	8.8
28	8.2	24	5.3	8.8	8.5	11	26	14	9.8	11	6.4	7.3
29	7.7	14	6.5	8.5	---	8.9	14	10	9.8	10	6.1	8.6
30	7.3	22	18	8.2	---	9.1	8.2	9.7	12	11	6.1	15
31	7.7	---	11	16	---	16	---	9.4	---	11	6.1	---
TOTAL	278.0	356.9	297.6	442.1	369.2	294.9	407.5	491.3	342.6	332.2	267.8	276.3
MEAN	8.97	11.9	9.60	14.3	13.2	9.51	13.6	15.8	11.4	10.7	8.64	9.21
MAX	30	24	24	36	35	28	32	38	20	22	13	17
MIN	4.9	5.5	5.3	4.5	7.7	7.8	6.8	7.7	9.8	7.3	6.1	7.0
AC-FT	551	708	590	877	732	585	808	974	680	659	531	548

CAL YR 1986	TOTAL	3954.3	MEAN	10.8	MAX	39	MIN	4.8	AC-FT	7840
WTR YR 1987	TOTAL	4156.4	MEAN	11.4	MAX	38	MIN	4.5	AC-FT	8240

16405500 WAIKOLU STREAM AT ALTITUDE 900 FT, NEAR KALAUPAPA

LOCATION.--Lat 21°08'43", long 156°55'18", Hydrologic Unit 20050000, on right bank 1.8 mi southwest of Haupu Bay, 2.3 mi upstream from mouth, and 5.2 mi southeast of Kalaupapa.

DRAINAGE AREA.--1.99 mi^2.

PERIOD OF RECORD.--May 1956 to October 1961, July 1962 to current year.

REVISED RECORDS.--WSP 1719: 1959. WSP 2137: 1965(P).

GAGE.--Water-stage recorder. Elevation of gage is 900 ft, from topographic map. Prior to July 1, 1962, at site 200 ft upstream at datum 6.14 ft higher.

REMARKS.--Recorda fair. Since Nov. 16, 1960, water diverted upstream at times, either into or from Molokai tunnel. Periodic determinations of water temperature for the current year are published elsewhere in this report.

AVERAGE DISCHARGE (since Molokai tunnel diversion began).--26 years (water years 1981, 1963-87), 6.79 ft^3/s (4,920 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 3,570 ft^3/s Jan. 25, 1982, gage height, 6.64 ft, from rating curve extended above 43 ft^3/s on basis of slope-area measurement at gage height 5.25 ft; no flow at times since 1984.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of Oct. 31, 1981, reached a stsge of 13.62 ft, from floodmarks, former site and datum, discharge, 6,220 ft^3/s, by slope-area measurement.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 590 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Nov. 7	1800	1,770	5.25	Feb. 16	0230	*1,970	*5.45
Jan. 9	2300	748	3.98	Apr. 26	0630	798	4.08
Jan. 14	0030	596	3.73	May 5	1430	912	4.26

Minimum discharge, 0.40 ft^3/s Oct. 24.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.66	1.1	11	1.4	1.8	1.3	58	2.8	2.5	1.9	1.2	1.4
2	.66	1.1	20	2.9	1.2	1.3	1.9	2.9	2.2	2.0	1.2	1.4
3	2.3	.80	7.3	5.9	1.2	1.2	1.3	1.9	2.3	1.6	1.1	1.4
4	.66	.66	1.6	1.6	1.2	1.1	1.2	2.3	2.3	1.8	.99	1.4
5	.66	.66	11	1.4	1.1	1.1	1.1	227	2.2	1.8	.85	1.5
6	.66	.66	31	1.3	1.1	1.2	1.2	214	2.2	2.7	.75	1.4
7	.66	77	1.9	1.2	1.1	1.1	1.3	114	2.2	1.8	.70	1.5
8	.66	6.0	1.4	1.3	1.1	1.1	1.4	4.6	2.2	1.7	.67	1.4
9	.66	3.3	1.2	73	1.1	1.2	1.4	4.5	2.0	1.6	.65	.90
10	.66	4.0	1.1	46	1.1	1.1	1.5	3.3	2.0	1.8	2.3	.66
11	.66	4.8	.98	1.2	1.2	1.2	1.5	3.3	1.9	1.8	.96	.90
12	.66	5.2	2.1	8.8	1.3	1.3	1.6	3.9	1.9	1.7	.87	.90
13	.80	2.3	1.3	26	9.2	1.1	1.6	19	1.9	1.9	.87	4.9
14	.66	3.2	1.0	65	2.7	1.2	1.5	3.7	1.9	11	.90	1.0
15	1.1	3.4	1.2	69	71	1.2	3.6	2.9	2.3	2.2	.96	1.2
16	.95	2.4	3.2	22	165	1.3	7.2	2.8	5.5	1.8	3.0	1.2
17	.94	2.6	3.2	4.1	54	1.1	5.3	2.7	2.4	1.7	1.2	1.3
18	.94	1.7	1.5	53	3.1	1.2	4.1	2.5	3.0	1.8	1.1	1.5
19	5.0	4.3	1.3	2.9	3.8	1.3	1.7	2.5	2.2	1.8	1.1	1.2
20	51	1.7	1.9	1.1	39	1.4	1.9	2.5	2.5	1.8	1.1	1.3
21	.94	1.4	8.2	1.1	3.4	1.4	22	2.7	3.9	2.2	1.2	1.2
22	.66	1.7	1.6	1.0	1.7	1.5	8.2	2.6	3.0	2.5	1.2	.64
23	.66	1.3	1.3	1.0	1.4	1.6	1.6	17	3.5	1.4	1.2	.88
24	.52	1.1	1.2	1.0	2.2	1.5	1.4	17	2.0	1.2	1.2	.85
25	60	1.1	1.0	37	2.7	1.4	1.5	3.6	1.8	1.2	1.2	.82
26	6.9	1.2	1.0	2.6	1.5	92	117	44	1.8	1.1	1.2	1.1
27	2.7	1.3	.99	1.2	1.3	24	62	9.2	1.8	1.1	1.2	.86
28	.66	25	.99	1.2	1.2	1.5	16	4.1	1.8	1.1	1.3	.94
29	.66	4.8	2.8	1.2	---	1.2	3.5	2.8	1.8	1.2	1.4	5.6
30	.66	8.6	8.7	1.2	---	1.2	2.0	2.5	2.7	1.2	1.4	2.7
31	.80	---	2.3	4.2	---	25	---	2.5	---	1.2	1.4	---
TOTAL	146.11	174.38	135.26	462.0	377.5	176.3	335.5	731.1	71.7	81.8	36.37	44.15
MEAN	4.71	5.81	4.36	14.9	13.5	5.69	11.2	23.6	2.39	1.99	1.17	1.47
MAX	60	77	31	85	165	92	117	227	5.5	11	3.0	5.6
MIN	.52	.66	.98	1.0	1.1	1.1	1.1	1.9	1.8	1.1	.65	.68
AC-FT	290	346	268	916	749	350	665	1450	142	123	72	88

CAL YR 1986	TOTAL	1558.00	MEAN	4.27	MAX	107	MIN	.00	AC-FT	3090
WTR YR 1987	TOTAL	2752.17	MEAN	7.54	MAX	227	MIN	.52	AC-FT	5460

16408000 WAIKOLU STREAM BELOW PIPELINE CROSSING, NEAR KALAUPAPA

LOCATION.--Lat 21°09'45", long 156°55'54", Hydrologic Unit 20050000, on left bank 0.7 mi upstream from mouth and 4.4 mi southeast of Molokai Lighthouse near Kalaupapa.

DRAINAGE AREA.--3.68 mi^2.

PERIOD OF RECORD.--July 1919 to November 1930, August 1931 to July 1932, September 1937 to January 1948, July 1948 to current year. Prior to August 1931, published as "at pipeline crossing, near Kalaupapa."

REVISED RECORDS.--WSP 1155: 1932(M), 1938-44(M), 1946-48(M). WSP 1319: 1923(M), 1930(M), 1932, 1936-40, 1945(M), 1974-81(M), drainage area.

GAGE.--Water-stage recorder. Datum of gage is 252 ft above mean sea level (hand levels by Bureau of Reclamation). Prior to Nov. 19, 1930, at site 500 ft upstream at different datums. Aug. 14, 1931, to July 20, 1932, and Sept. 20, 1937, to Jan. 26, 1948, at present site at datum 1.49 ft higher, and July 30, 1948, to June 30, 1962, at present site at datum 1.00 ft higher.

REMARKS.--Records fair. Diversion upstream for domestic use in Kalaupapa, and since Nov. 16, 1960, water has been diverted upstream both to and from Molokai tunnel. Periodic determinations of water temperature for the current year are published elsewhere in this report.

AVERAGE DISCHARGE (since Molokai tunnel diversion began).--27 years (water years 1961-87), 15.7 ft^3/s (11,370. acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 8,740 ft^3/s Mar. 31, 1982, gage height, 7.63 ft, from rating curve extended above 58 ft^3/s on basis of slope-area measurement at gage height 6.68 ft; minimum, 2.0 ft^3/s Nov. 1, 2, 1926, June 5, 1926.

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

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Oct. 20	0600	700	4.10	Jan. 25	1530	960	4.40
Oct. 25	1600	960	4.40	Feb. 16	0230	*4,130	*6.28
Nov. 7	1830	2,920	5.75	Mar. 26	2100	1,160	4.60
Dec. 5	2400	1,010	4.45	Apr. 1	0400	980	4.42
Jan. 9	2300	1,930	5.19	Apr. 26	0830	1,970	5.22
Jan. 14	0100	1,560	4.93	May 5	1500	3,130	5.85
Jan. 18	1800	828	4.28				

Minimum discharge, 4.8 ft^3/s on Oct. 18.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	5.4	14	27	7.4	10	13	221	26	27	18	14	13
2	5.1	14	36	14	8.8	14	21	24	26	18	14	13
3	6.5	10	23	18	8.8	14	18	20	41	18	14	12
4	5.4	9.8	10	8.4	8.8	14	16	19	30	17	14	12
5	5.1	9.4	21	8.0	7.7	13	18	912	26	17	13	12
6	6.2	9.0	80	8.4	7.1	14	18	920	26	18	13	12
7	7.1	151	12	8.0	7.1	13	16	382	26	17	12	12
8	7.1	34	9.6	8.0	7.1	13	18	43	26	17	12	13
9	7.1	17	8.8	186	7.7	13	14	37	25	17	12	12
10	7.1	15	8.6	145	8.8	13	14	33	25	17	23	12
11	7.1	15	9.6	9.6	7.7	13	14	32	25	16	15	12
12	7.4	14	12	19	8.8	14	14	33	24	16	14	12
13	7.4	9.1	8.6	61	26	13	14	78	24	18	14	21
14	6.5	10	8.6	266	12	13	13	33	24	36	14	13
15	5.6	10	8.0	166	282	13	19	30	24	19	14	11
16	5.4	8.5	9.6	62	403	13	23	30	29	16	22	11
17	5.4	9.4	9.6	16	163	13	22	30	23	16	15	11
18	5.4	9.4	7.4	139	20	13	16	29	23	16	14	11
19	9.2	13	7.7	12	18	13	15	29	21	16	14	10
20	135	9.4	8.0	10	85	13	15	28	23	17	13	10
21	9.2	9.0	19	10	19	13	55	29	24	18	13	10
22	7.7	9.2	8.4	10	15	13	34	28	22	16	13	11
23	7.4	9.0	7.7	9.6	13	13	18	59	22	16	13	12
24	7.4	7.5	7.7	9.6	14	12	16	63	19	16	13	11
25	177	6.6	7.7	144	16	13	16	31	19	16	13	11
26	38	7.6	7.7	15	14	233	351	121	19	15	13	11
27	18	8.4	7.7	9.6	14	91	226	43	16	15	13	11
28	10	60	8.0	9.6	13	16	103	32	16	15	13	11
29	7.7	18	9.6	9.6	---	15	31	30	16	14	13	16
30	7.0	26	29	8.8	---	14	21	29	20	14	13	16
31	8.9	---	11	15	---	106	---	28	---	14	13	---
TOTAL	554.8	552.3	449.2	1444.6	1225.4	804	1406	3261	717	533	433	365
MEAN	17.9	18.4	14.5	46.6	43.8	25.9	46.9	105	23.9	17.2	14.0	12.2
MAX	177	151	80	266	403	233	351	920	41	38	23	21
MIN	5.1	6.6	7.4	7.4	7.1	12	13	19	16	14	12	10
AC-FT	1100	1100	891	2870	2430	1590	2790	6470	1420	1060	859	724

CAL YR 1988	TOTAL	7101.5	MEAN	19.5	MAX	486	MIN	2.6	AC-FT	14090
WTR YR 1987	TOTAL	11745.3	MEAN	32.2	MAX	920	MIN	5.1	AC-FT	23300

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.--8.57 mi^2.

PERIOD OF RECORD.--December 1949 to current year. Prior to July 1958, published as Kaunakakai Stream at Kaunakakai.

REVISED RECORDS.--WSP 1289: 1950-51. WSP 1569: Drainage area.

GAGE.--Water-stage recorder. Elevation of gage is 240 ft, from topographic map.

REMARKS.--Records fair. Flow has been augmented by occasional spillage from Molokai tunnel since May 1985. Periodic determinations of water temperature for the current year are published elsewhere in this report.

AVERAGE DISCHARGE.--37 years (water years 1951-87), 1.71 ft^3/s (1,240 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 3,060 ft^3/s Oct. 31, 1961, gage height, 9.30 ft, from rating curve extended above 620 ft^3/s on basis of slope-area measurements at gage heights 7.22 ft and 9.30 ft; no flow most of the time each year.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 280 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Jan. 14	0230	480	5.20	Feb. 18	0330	*1,240	*6.78
Jan. 18	1900	460	5.15	May 6	0800	980	6.30

Minimum discharge, no flow for many days.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.00	6.7	.00	.00	.00	23	.00	.00	.00	.00	.00
2	.00	.00	7.1	.00	.00	.00	.52	.00	.00	.00	.00	.00
3	.00	.00	35	.00	.00	.00	.00	.00	.00	.00	.00	.00
4	.00	.00	.65	.00	.00	.00	.00	.00	.00	.00	.00	.00
5	.00	.00	.00	.00	.00	.00	.00	107	.00	.00	.00	.00
6	.00	.00	15	.00	.00	.00	.00	212	.00	.00	.00	.00
7	.00	.00	2.9	.00	.00	.00	.00	113	.00	.00	.00	.00
8	.00	1.4	.00	.00	.00	.00	.00	18	.00	.00	.00	.00
9	.00	.00	.00	.00	.00	.00	.00	5.7	.00	.00	.00	.00
10	.00	.00	.00	67	.00	.00	.00	2.4	.00	.00	.00	.00
11	.00	.00	.00	.50	.00	.00	.00	.38	.00	.00	.00	.00
12	.00	.09	.00	.01	.00	.00	.00	.01	.00	.00	.00	.00
13	.00	.01	.00	.08	.00	.00	.00	3.9	.00	.00	.00	.00
14	.00	.00	.00	112	.00	.00	.00	1.5	.00	.00	.00	.00
15	.00	.00	.00	188	12	.00	.00	.01	.00	.00	.00	.00
16	.00	.00	.00	72	203	.00	.00	.00	.00	.00	.00	.00
17	.00	.00	.00	17	84	.00	.00	.00	.00	.00	.00	.00
18	.00	.00	.00	58	8.4	.00	.00	.00	.00	.00	.00	.00
19	.00	.00	.00	24	1.4	.00	.00	.00	.00	.00	.00	.00
20	2.0	.00	.00	3.0	54	.00	.00	.00	.00	.00	.00	.00
21	.04	.00	.00	.24	15	.00	.00	.00	.00	.00	.00	.00
22	.00	.00	.00	.00	1.8	.00	22	.00	.00	.00	.00	.00
23	.00	.00	.00	.00	.14	.00	.01	.00	.00	.00	.00	.00
24	.00	.00	.00	.00	.00	.00	.00	1.6	.00	.00	.00	.00
25	4.3	.00	.00	3.5	1.2	.00	.00	.44	.00	.00	.00	.00
26	10	.00	.00	7.1	.01	.00	53	49	.00	.00	.00	.00
27	.00	.00	.00	.02	.00	20	71	23	.00	.00	.00	.00
28	.00	.00	.00	.00	.00	.00	7.7	4.9	.00	.00	.00	.00
29	.00	.00	.00	.00	---	.00	3.7	.18	.00	.00	.00	.00
30	.00	.00	.00	.00	---	.00	.05	.00	.00	.00	.00	.00
31	.00	---	.00	.00	---	.00	---	.00	---	.00	.00	---
TOTAL	16.34	1.50	67.35	552.45	380.95	20.00	180.98	543.02	.00	.00	.00	.00
MEAN	.53	.05	2.17	17.8	13.6	.65	6.03	17.5	.00	.00	.00	.00
MAX	10	1.4	35	188	203	20	71	212	.00	.00	.00	.00
MIN	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
AC-FT	32	3.0	134	1100	756	40	359	1080	.00	.00	.00	.00

CAL YR 1986	TOTAL	692.35	MEAN	1.90	MAX	133	MIN	.00	AC-FT	1370
WTR YR 1987	TOTAL	1762.59	MEAN	4.83	MAX	212	MIN	.00	AC-FT	3500

16419500 PAPIO GULCH AT HALAWA

LOCATION.--Lat 21°08'55", long 156°44'16", Hydrologic Unit 20050000, on left bank 200 ft downstream from wooden bridge on Highway 45 and 0.8 mi south of Halawa.

DRAINAGE AREA.--0.94 mi^2.

PERIOD OF RECORD.--July 1963 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 640 ft, from topographic map.

REMARKS.--Records fair. Diversion upstream for domestic use at Puu O Hoku Ranch. Periodic determinations of water temperature for the current year are published elsewhere in this report.

AVERAGE DISCHARGE.--24 years, 0.780 ft^3/s (565 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 2,720 ft^3/s Apr. 13, 1965, gage height, 11.25 ft, from rating curve extended above 37 ft^3/s on basis of slope-area measurements at gage heights 4.60 ft, 7.15 ft, and 11.25 ft; no flow at times.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 308 ft^3/s Dec. 5, gage height, 4.59 ft, no other peak greater than base discharge of 210 ft^3/s; no flow Oct. 12, 13.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.10	.48	.33	.33	.24	.24	.52	.44	.83	.60	.56	.30
2	.14	.27	.30	.30	.21	.24	.30	.38	.88	.48	1.1	.33
3	.08	.48	.30	.67	.24	.21	.24	.33	.64	.48	.85	.74
4	.03	.27	.21	.33	.21	.18	.24	.83	.83	.44	.52	.33
5	.03	.18	6.4	33	.24	.18	.24	19	.78	.48	.48	.30
6	.08	.14	8.8	2.4	.24	.24	.21	52	.68	1.9	.44	.30
7	.03	1.6	1.2	.40	.27	.24	.21	18	.60	.60	.40	.33
8	.03	2.7	.64	.27	.24	.27	.21	4.8	.56	.46	.73	.33
9	.03	.48	.44	.81	.24	.24	.21	2.8	.56	.44	.68	.40
10	.03	14	.40	5.1	.21	.24	.18	2.0	.52	1.0	.48	.38
11	.02	2.2	.44	.44	.18	.24	.18	1.6	.52	.94	.83	.64
12	.00	2.9	3.2	.30	.24	.24	.21	1.3	.52	.64	.52	.40
13	.00	.98	.64	2.8	1.1	.24	.21	3.6	.48	1.2	.40	4.8
14	.03	.73	.36	7.4	1.1	.24	.21	1.4	.48	4.1	.36	.60
15	.12	.60	.36	4.4	8.5	.24	.21	1.2	.48	1.1	.36	.36
16	.03	.44	.30	1.7	15	.27	.24	1.0	.83	.68	.86	.30
17	.38	.48	.60	.98	2.6	.27	.27	.98	.52	.60	.60	.30
18	.21	.48	.40	.73	1.0	.27	.30	.93	3.8	.60	.44	.30
19	1.0	.94	.30	.60	.68	.27	.30	.83	.73	.56	.36	.27
20	1.0	.52	.33	.40	1.8	.27	.79	.83	1.1	.52	.33	.27
21	.27	.33	.27	.40	.98	.24	3.0	.88	1.4	1.0	.38	.30
22	.12	.52	.21	.36	.56	.24	2.9	.78	1.6	.94	.33	.35
23	.08	.48	.21	.33	.44	.24	.44	.98	1.0	.60	.33	1.2
24	.08	.33	.21	.30	.36	.24	.33	.88	.83	.46	.30	.48
25	.81	.27	.24	.53	.33	1.1	.30	.73	.66	.48	.30	.48
26	.82	.27	.21	.44	.27	3.8	9.0	.78	.60	.44	.36	1.9
27	1.4	.24	.18	.27	.24	3.6	5.7	1.2	.60	.52	.38	.60
28	.48	.68	.30	.27	.24	.48	15	1.2	.52	1.0	.33	.40
29	.24	.40	.68	.24	---	.33	1.1	.73	.56	.56	.33	.33
30	.40	.68	.64	.24	---	.30	.60	.68	1.8	.48	.57	.89
31	.33	---	.74	.24	---	.30	---	.64	---	.44	.33	---
TOTAL	8.40	35.07	29.84	66.98	37.96	15.70	43.85	123.71	25.93	24.78	15.40	18.89
MEAN	.27	1.17	.96	2.16	1.36	.51	1.46	3.99	.86	.80	.50	.63
MAX	1.4	14	8.8	33	15	3.8	15	52	3.8	4.1	1.1	4.8
MIN	.00	.14	.18	.24	.18	.18	.18	.33	.48	.44	.30	.27
AC-FT	17	70	59	133	75	31	87	245	51	49	31	37

CAL YR 1986	TOTAL	197.84	MEAN	.54	MAX	14	MIN	.00	AC-FT	392
WTR YR 1987	TOTAL	446.51	MEAN	1.22	MAX	52	MIN	.00	AC-FT	886

16508000 HANAWI STREAM NEAR NAHIKU

LOCATION.--Lat 20°48'37", long 156°07'00", Hydrologic Unit 20020000, on left bank 200 ft upstream from Koolau ditch intake and trail, 1.9 mi southwest of Nahiku, and 4.5 mi southeast of Keanae.

DRAINAGE AREA.--3.49 mi^2.

PERIOD OF RECORD.--January 1914 to January 1916, November 1921 to current year. Monthly discharge only April to June 1915, published in WSP 1319.

REVISED RECORDS.--WSP 1045: 1922-43(M). WSP 1569: Drainage area. WSP 1719: 1915(M), 1922, 1924-25, 1927, 1930-35, 1937, 1939-40, 1942-43.

GAGE.--Water-stage recorder. Datum of gage is 1,318 ft above mean sea level (by vertical angles). Prior to Nov. 1, 1921, at site 50 ft downstream at datum 0.12 ft lower.

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

AVERAGE DISCHARGE.--65 years (water years 1923-87), 23.2 ft^3/s (16,810 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, about 5,570 ft^3/s Jan. 18, 1916, gage height, 11.6 ft, present site and datum, from rating curve extended above 814 ft^3/s by physical model of station site; minimum, 0.90 ft^3/s Oct. 28 to Nov. 1, 1984.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 1,700 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Oct. 26	1600	1,860	6.72	May 6	1530	*3,380	*9.25
Jan. 18	2030	3,310	9.18	Sept. 13	0200	2,860	8.50

Minimum discharge, 2.2 ft^3/s, Oct. 1.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.4	103	55	5.3	4.5	3.5	260	27	11	20	7.5	2.5
2	2.5	55	236	86	4.3	3.3	99	23	7.4	15	8.2	2.4
3	5.3	10	224	24	4.2	3.1	16	72	7.2	11	5.4	2.4
4	2.9	6.2	26	7.0	4.1	3.0	7.5	80	11	13	4.7	2.6
5	4.2	4.8	12	6.1	4.0	3.0	5.5	305	212	42	4.4	2.4
6	38	7.9	70	5.8	3.8	2.9	4.6	587	11	24	4.2	2.4
7	53	6.0	11	5.0	3.8	3.0	4.0	266	11	11	4.2	2.4
8	6.5	4.5	9.3	4.7	3.7	2.8	3.6	37	11	16	5.1	12
9	3.9	31	8.5	51	3.6	2.7	3.5	16	13	11	4.2	19
10	3.3	141	8.4	226	3.8	2.7	3.4	12	16	8.8	5.6	6.2
11	3.0	48	15	175	3.5	2.7	3.2	9.4	15	12	5.7	162
12	2.7	73	12	218	3.5	2.8	3.1	8.9	14	11	4.2	89
13	5.2	51	9.1	36	3.9	2.7	3.1	12	23	10	3.9	508
14	6.3	29	8.7	53	3.5	2.7	5.2	13	82	37	3.7	17
15	8.9	32	8.5	179	90	2.6	26	12	62	9.4	3.6	7.4
16	5.9	20	8.9	38	449	2.8	41	9.6	93	7.6	5.2	6.1
17	19	19	11	10	344	3.2	24	9.3	62	6.8	3.7	5.3
18	4.3	9.4	8.4	397	59	8.8	16	8.6	57	7.0	4.1	4.9
19	22	18	7.3	47	32	27	6.5	8.2	51	9.5	3.4	5.2
20	182	76	6.7	8.8	15	21	5.3	7.7	88	186	3.3	3.8
21	9.7	12	6.8	6.3	7.6	8.1	4.6	7.2	32	83	3.1	3.3
22	5.2	17	7.0	6.1	10	5.4	13	8.7	14	19	3.1	22
23	4.1	11	11	5.8	6.2	8.1	7.2	146	14	12	3.0	6.6
24	3.7	17	6.7	6.2	4.9	6.4	7.1	196	18	8.3	2.9	4.6
25	106	9.8	8.0	115	4.4	4.1	4.4	41	9.8	7.1	2.9	3.3
26	270	8.8	5.6	21	4.1	3.9	74	90	11	6.3	3.2	2.9
27	90	7.9	5.3	6.2	3.8	36	187	23	10	5.9	2.8	2.8
28	16	130	5.0	5.2	3.7	8.7	178	9.9	8.0	9.3	2.7	2.7
29	6.8	38	4.9	5.1	---	4.6	77	49	12	8.1	2.8	2.6
30	5.0	49	14	4.7	---	3.9	12	9.0	20	5.4	2.7	6.5
31	22	---	7.1	4.6	---	87	---	12	---	5.1	2.6	---
TOTAL	917.8	1045.1	835.2	1748.7	1087.7	280.5	1104.8	2113.5	1006.4	637.4	124.1	918.3
MEAN	29.6	34.8	26.9	56.4	38.8	9.05	36.8	68.2	33.5	20.8	4.00	30.6
MAX	270	141	236	397	449	87	260	587	212	186	7.5	506
MIN	2.4	4.5	4.9	4.6	3.5	2.6	3.1	6.7	7.2	5.1	2.6	2.4
AC-FT	1820	2070	1660	3470	2160	556	2190	4190	2000	1260	246	1820

CAL YR 1986	TOTAL	11592.0	MEAN	31.8	MAX	1050	MIN	1.6	AC-FT	22990
WTR YR 1987	TOTAL	11819.5	MEAN	32.4	MAX	587	MIN	2.4	AC-FT	23440

16518000 WEST WAILUAIKI STREAM NEAR KEANAE

LOCATION.--Lat 20°49'16", long 156°08'37", Hydrologic Unit 20020000, on left bank 500 ft upstream from Koolau ditch crossing and trail bridge and 2.8 mi south of Keanae Post Office.

DRAINAGE AREA.--3.66 mi^2.

PERIOD OF RECORD.--January 1914 to December 1915, May 1916 to October 1917, November 1921 to current year. Monthly discharge only for some periods, published in WSP 1319.

REVISED RECORDS.--WSP 1569. Drainage area. WSP 2137: 1915-16(M), 1923-25(M), 1929-31(M), 1934-35(M), 1937-39(M), 1941-43(M), 1946-47(M), 1948(P), 1949(M), 1952-53(M), 1955-56(M), 1959-60(M), 1960(P), 1961(M), 1963(M).

GAGE.--Water-stage recordar. Datum of gage is 1,343.1 ft above mean sea level (by vertical angles). Prior to Oct. 3, 1974, at present site at datum 0.50 ft higher.

REMARKS.--Records good. No diversion upstream. Water is diverted by Koolau ditch, 500 ft downstream, for domestic supply and irrigation of sugarcane in central Maui. Periodic determinations of water temperature for the current year are publiahed elsewhere in this report.

AVERAGE DISCHARGE.--67 years (water years 1915, 1917, 1923-87), 35.2 ft^3/s (25,500 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 9,900 ft^3/s Jan. 14, 1923, gage height, 13.5 ft, from floodmarks, from rating curve extended above 660 ft^3/s by logarithmic plotting; minimum, 0.5 ft^3/s July 26, 1922.

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

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Oct. 26	1600	2,960	8.99	Feb. 16	2400	2,250	8.15
Dec. 6	0130	2,170	8.05	May. 6	1600	4,190	10.19
Jan. 11	2200	2,610	8.60	Sept. 13	0430	3,280	9.33
Jan. 18	2030	*5,560	*11.29				

Minimum discharge, 2.2 ft^3/s Sept. 6, 7.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.4	134	71	6.8	9.0	5.8	313	37	21	24	9.0	2.7
2	2.8	79	288	78	7.8	5.4	96	33	17	27	8.8	2.7
3	7.0	21	252	36	7.2	5.2	22	71	12	18	6.0	2.6
4	3.8	14	42	11	6.9	5.0	13	84	22	19	5.4	2.8
5	8.1	11	23	9.2	6.8	4.8	10	407	124	41	5.2	2.5
6	70	12	134	8.2	6.2	4.6	8.6	729	21	27	4.9	2.3
7	107	10	23	7.2	6.0	5.3	7.5	348	19	17	4.6	2.5
8	13	9.6	18	6.8	5.7	5.1	6.7	51	16	20	8.8	19
9	6.9	49	14	51	5.4	4.2	6.4	27	20	14	4.6	31
10	5.2	70	12	294	5.2	3.9	6.0	21	21	11	7.5	10
11	4.5	36	20	265	5.0	4.0	5.4	17	22	16	8.8	85
12	4.1	73	14	310	4.8	4.2	5.2	14	18	14	5.1	70
13	12	46	11	51	6.9	4.3	8.5	19	30	14	4.6	493
14	11	32	9.6	61	5.4	6.1	20	22	73	54	4.3	17
15	14	34	9.6	148	100	4.6	34	20	84	14	4.3	10
16	13	26	9.8	59	583	4.1	42	18	102	11	7.5	8.0
17	35	24	17	23	567	4.0	34	14	57	9.8	4.2	7.0
18	8.2	16	9.4	548	82	13	19	11	59	9.8	4.3	6.3
19	41	21	8.0	71	38	36	13	11	53	14	3.6	6.4
20	230	60	7.4	22	22	19	14	10	93	247	3.7	5.0
21	22	18	7.8	17	15	13	12	9.2	44	105	3.4	5.0
22	11	19	7.6	16	34	8.7	32	8.4	24	25	3.3	9.4
23	8.3	14	14	14	13	11	17	144	22	15	3.2	11
24	6.9	18	7.4	16	9.8	8.1	16	240	22	11	3.0	9.3
25	133	14	8.8	126	8.4	16	10	49	16	9.5	3.0	5.7
26	416	14	6.4	38	7.4	10	84	106	14	8.5	5.8	4.7
27	113	20	6.0	17	8.8	51	218	36	14	8.0	3.5	4.4
28	32	160	8.0	14	6.2	12	197	20	11	11	3.1	4.3
29	17	54	6.2	11	---	8.2	95	27	18	10	3.3	3.9
30	12	57	22	10	---	8.9	24	14	26	7.0	2.8	9.8
31	34	---	9.0	9.6	---	108	---	21	---	6.5	2.7	---
TOTAL	1402.0	1185.6	1092.0	2372.8	1580.9	401.5	1389.3	2636.8	1075	838.1	145.9	853.5
MEAN	45.2	38.9	35.2	76.5	56.5	13.0	46.3	85.1	35.8	27.0	4.71	28.4
MAX	416	160	288	548	583	108	313	729	124	247	9.0	493
MIN	2.4	9.6	6.0	6.8	4.8	3.9	5.2	8.4	11	8.5	2.7	2.3
AC-FT	2780	2310	2170	4710	3140	796	2760	5230	2130	1660	289	1690

CAL YR 1986	TOTAL	16137.4	MEAN	44.2	MAX	1630	MIN	1.7	AC-FT	32010
WTR YR 1987	TOTAL	14955.2	MEAN	41.0	MAX	729	MIN	2.3	AC-FT	29660

16541000 KOOLAU DITCH AT HAIPUAENA, NEAR HUELO

LOCATION.--Lat 20°51'17", long 156°11'19", Hydrologic Unit 20020000, on right bank at Haipuaena Stream, 1,000 ft upstream from intake at Puohokamoa Stream, 3.3 mi southeast of Kailua, and 4.5 mi southeast of Huelo.

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

GAGE.--Water-stage recorder and Parshall flume. Elevation of gage is 1,240 ft, from topographic map. Prior to Mar. 21, 1933, at datum 1.94 ft lower, and Mar. 21, 1933, to Mar. 20, 1935, at datum 0.25 ft lower then present datum.

REMARKS.--Records good. Ditch is extension of Wailoa ditch east of Alo Stream; it receives water from Makapipi ditch at Hanawi Stream and diverts from nearly all streams from there west to the Alo. Water ia used for power, domestic supply, and irrigation in central Maui. Periodic determinations of water tsmperature for the current year are published elsewhere in this report.

AVERAGE DISCHARGE.--55 yesrs, 115 ft^3/s (83,320 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 300 ft^3/s July 1, 17, 1963; no flow at times.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 267 ft^3/s May 5; minimum daily, 27 ft^3/s Oct. 1.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	27	257	221	64	72	54	262	228	165	194	96	32
2	28	225	206	205	65	51	238	206	128	186	80	31
3	54	167	255	174	61	49	184	253	107	152	71	31
4	33	118	212	94	58	47	126	247	126	156	64	33
5	52	97	177	79	55	45	95	267	245	233	61	31
6	180	97	237	72	53	44	81	266	178	207	57	29
7	226	98	176	65	51	49	72	266	168	159	55	30
8	108	83	144	60	48	44	65	207	153	177	74	109
9	60	183	123	72	47	40	61	172	174	148	54	153
10	48	217	109	232	45	38	59	147	176	118	72	72
11	42	182	179	233	43	39	54	106	192	155	70	217
12	38	199	154	252	42	41	52	118	176	141	57	204
13	92	204	109	202	63	41	59	142	225	132	53	260
14	93	196	97	230	47	48	110	170	254	224	51	165
15	103	204	94	259	109	40	175	157	255	139	50	113
16	82	186	98	230	263	39	205	131	263	113	80	92
17	161	175	130	176	262	46	190	110	246	99	50	82
18	68	140	89	198	214	87	163	96	247	105	55	74
19	118	189	79	211	223	168	117	94	256	132	46	76
20	246	219	73	142	172	134	107	88	255	265	45	60
21	150	157	74	113	127	106	110	83	224	168	42	54
22	95	166	72	107	142	73	187	75	189	41	42	77
23	73	142	129	103	122	105	121	106	159	113	40	96
24	64	162	74	106	88	82	132	263	166	114	38	87
25	149	128	67	215	75	81	87	219	113	107	37	59
26	265	114	62	165	68	63	155	246	145	94	53	53
27	226	132	58	126	63	223	261	208	146	88	39	48
28	178	212	56	99	58	108	250	157	113	110	36	44
29	131	208	55	89	---	73	240	176	143	113	38	41
30	101	218	147	79	---	63	175	131	200	77	34	99
31	130	---	87	76	---	115	---	184	---	73	33	---
TOTAL	3421	5053	3843	4528	2736	2236	4193	5319	5589	4333	1673	2552
MEAN	110	168	124	146	97.7	72.1	140	172	186	140	54.0	85.1
MAX	265	257	255	259	263	223	262	267	263	265	96	260
MIN	27	83	55	60	42	38	52	75	107	41	33	29
AC-FT	6790	10020	7620	8980	5430	4440	8320	10550	11090	8590	3320	5060

CAL YR 1986	TOTAL	44332	MEAN	121	MAX	275	MIN	18	AC-FT	87930
WTR YR 1987	TOTAL	45476	MEAN	125	MAX	267	MIN	27	AC-FT	90200

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 Keilua.

DRAINAGE AREA.--0.64 mi^2.

PERIOD OF RECORD.--December 1910 to current year. Monthly discharge only for some periods, published in WSP 1319.

REVISED RECORDS.--WSP 1219: 1914(M), 1916-50(M). WSP 1249: 1948-50(P). WSP 1569: Drainage area.

GAGE.--Water-stage recorder and concrete control. Datum of gage is 1,208 ft above mean sea level (by vertical angles). Prior to June 19, 1914, nonrecording gage at same site and datum.

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

AVERAGE DISCHARGE.--76 years (water years 1912-87), 4.69 ft^3/s (3,400 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 5,710 ft^3/s Nov. 18, 1930, gage height, 7.28 ft from rating curve extended above 110 ft^3/s by test of model of station site; minimum, 0.02 ft^3/s several days in 1933, 1934

EXTREMES FOR CURRENT YEAR.--Peak discharge greater than base discharge of 270 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Feb. 15	2400	324	3.17	July. 20	0730	520	3.45
Mar. 26	2100	276	3.08	Sept. 13	0200	364	3.24
May 6	0430	*1,460	*4.46				

Minimum discharge, 0.35 ft^3/s Oct. 11,12.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.48	11	9.5	1.9	2.9	1.7	10	13	3.4	7.5	3.0	.69
2	.45	8.3	6.9	8.4	2.6	1.6	9.7	10	2.9	5.0	2.5	.66
3	.48	4.8	9.0	5.4	2.4	1.6	6.2	14	2.7	4.1	2.2	.63
4	.44	4.0	6.7	2.7	2.2	1.5	4.6	11	2.7	3.9	2.0	.64
5	.54	3.5	5.8	2.5	2.0	1.4	4.0	80	5.9	7.7	1.9	.62
6	1.1	3.4	31	2.4	1.9	1.6	3.6	146	3.0	5.8	1.8	.59
7	1.5	2.9	8.6	2.2	1.8	1.5	3.3	99	3.0	3.8	1.7	.57
8	.56	3.1	7.2	2.0	1.7	1.3	3.0	24	3.8	5.4	1.8	1.1
9	.48	8.5	6.2	2.3	1.6	1.2	2.8	16	3.0	4.0	1.5	1.3
10	.42	17	5.6	3.2	1.5	1.1	2.6	13	3.6	3.3	1.5	.75
11	.41	5.7	13	2.7	1.5	1.1	2.4	9.8	11	4.1	1.4	4.8
12	.40	5.2	8.5	5.4	1.4	1.1	2.1	8.1	5.9	3.4	1.4	10
13	1.3	6.8	5.6	3.9	1.6	1.1	2.1	7.8	8.8	3.9	1.3	38
14	1.4	5.8	4.9	18	1.8	1.0	2.1	6.3	12	14	1.2	4.0
15	1.5	6.6	4.7	24	8.1	.97	4.2	5.2	12	3.7	1.3	2.7
16	.96	6.1	4.5	13	18	1.1	5.9	4.5	20	3.4	3.4	2.2
17	1.6	6.2	4.7	7.3	6.1	.98	3.8	4.1	11	3.2	1.3	2.0
18	.71	4.8	3.7	15	4.0	1.2	2.8	3.7	16	3.9	1.1	1.8
19	2.1	5.7	3.3	8.0	4.0	1.8	3.3	3.3	13	3.1	1.0	1.6
20	11	9.2	3.1	6.4	3.4	1.6	2.8	3.1	24	57	1.0	1.5
21	2.1	5.0	3.2	5.6	2.8	1.1	11	2.8	12	14	.97	1.4
22	1.5	6.0	2.8	4.9	2.6	1.0	20	2.6	14	7.3	.95	1.4
23	1.2	4.9	3.5	4.4	2.5	1.6	5.0	5.9	11	8.1	.90	1.3
24	1.1	4.5	2.6	4.6	2.3	1.2	4.3	7.2	12	5.1	.85	1.2
25	1.7	4.0	2.3	12	2.2	.93	3.8	3.2	8.1	4.5	.80	1.1
26	26	3.8	2.1	4.6	2.0	18	10	7.6	7.6	4.1	.96	1.1
27	10	3.4	2.0	3.8	1.9	22	28	4.9	6.4	3.6	.81	1.0
28	4.5	21	2.0	3.5	1.9	3.4	33	3.5	5.3	3.9	.77	.98
29	3.5	8.0	1.9	3.3	---	2.6	16	6.2	5.5	3.6	.73	.91
30	3.0	7.7	4.4	2.9	---	2.4	10	3.4	5.1	2.9	.69	1.4
31	3.3	---	2.5	4.1	---	14	---	3.8	---	2.7	.69	---
TOTAL	85.73	194.9	181.8	190.4	88.7	94.68	222.4	533.0	254.5	208.2	43.42	87.94
MEAN	2.77	6.50	5.86	6.14	3.17	3.05	7.41	17.2	8.48	6.72	1.40	2.93
MAX	26	21	31	24	18	22	33	146	24	57	3.4	38
MIN	.40	2.9	1.9	1.9	1.4	.93	2.1	2.6	2.7	2.7	.69	.57
AC-FT	170	387	361	378	176	188	441	1060	505	413	86	174

CAL YR 1986	TOTAL	2273.52	MEAN	6.23	MAX	126	MIN	.40	AC-FT	4510
WTR YR 1987	TOTAL	2185.67	MEAN	5.99	MAX	146	MIN	.40	AC-FT	4340

16588000 WAILOA DITCH AT HONOPOU, NEAR HUELO

LOCATION.--Lat 20°53'20", long 156°15'19", Hydrologic Unit 20020000, on right bank 100 ft downstream from intake at Honopou Stream, 0.5 mi west of Lupi, and 2.2 mi southwest of Huelo.

PERIOD OF RECORD.--November 1922 to current year.

GAGE.--Water-stage recorder. Datum of gage is 1,208 ft above mean sea level (by vertical angles).

REMARKS.--Records good. Wailoa ditch receives water from Koolau ditch at Alo Stream and from all streams from there west to Halehaku Gulch at elevation of about 1,200 ft. Water is used for domestic supply, power, and irrigation in central Maui. Periodic determinations of water temperature for the current year are published elsewhere in this report.

AVERAGE DISCHARGE.--64 years (water years 1924-87), 171 ft^3/s (123,900 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 328 ft^3/s Nov. 24, 1981; no flow Jan. 24-27, 1923.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 308 ft^3/s Jan. 15; minimum daily, 44 ft^3/s Oct. 1.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	44	300	302	130	156	97	306	268	278	293	205	53
2	46	304	298	265	128	92	303	267	241	291	157	51
3	84	294	301	282	114	86	297	270	220	276	134	50
4	55	240	296	197	107	84	263	272	210	278	119	54
5	93	196	289	162	102	80	202	289	291	297	117	54
6	224	186	296	142	96	81	186	295	281	293	107	47
7	270	182	295	127	91	94	146	222	276	281	100	49
8	178	174	283	115	86	78	129	182	272	287	141	117
9	99	257	251	115	83	70	121	182	277	277	103	199
10	79	297	222	291	80	66	114	182	284	244	127	104
11	69	294	289	289	76	67	104	178	286	277	137	219
12	83	292	290	307	73	73	97	227	290	264	110	208
13	197	294	237	300	115	73	113	272	295	250	96	266
14	185	298	204	304	114	92	220	293	302	299	86	229
15	198	298	193	308	153	76	246	280	303	279	67	156
16	158	297	225	306	279	70	289	244	306	243	188	141
17	236	296	260	301	291	80	287	209	300	209	93	134
18	138	282	183	305	298	159	273	181	302	235	94	127
19	166	292	157	306	299	255	240	174	301	252	81	128
20	297	300	143	296	291	231	257	167	304	303	79	104
21	240	288	151	249	241	180	245	152	301	303	75	93
22	182	292	139	229	219	132	301	135	302	263	76	111
23	143	281	240	212	206	194	269	156	299	273	69	144
24	121	286	144	206	157	145	271	301	297	254	65	137
25	185	252	125	297	136	156	206	286	275	226	63	110
26	301	221	113	294	121	136	233	301	286	200	104	105
27	305	251	105	244	112	304	305	296	282	186	89	107
28	292	277	102	194	104	238	271	278	250	212	61	87
29	224	300	104	173	---	157	267	286	265	228	64	75
30	200	300	248	151	---	132	267	247	290	160	58	127
31	197	---	199	169	---	169	---	271	---	146	55	---
TOTAL	5269	8125	6686	7266	4326	3953	6810	7365	8466	7881	3122	3588
MEAN	170	271	216	234	155	128	227	238	282	254	101	120
MAX	305	304	302	308	299	304	306	301	306	303	205	268
MIN	44	174	102	115	73	86	97	135	210	146	55	47
AC-FT	10450	16120	13260	14410	8580	7840	13510	14610	16790	15630	6190	7120

CAL YR 1986	TOTAL	72436	MEAN	198	MAX	307	MIN	14	AC-FT	143700
WTR YR 1987	TOTAL	72857	MEAN	200	MAX	308	MIN	44	AC-FT	144500

16599500 OPANA TUNNEL AT KAILIILI

LOCATION.--Lat 20°51'04", long 156°16'17", Hydrologic Unit 20020000, on left bank at tunnel outlet, 0.3 mi north of Kailiili, and 2.7 mi east of Makawao.

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

GAGE.--Water-stage recorder and concrete control. Elevation of gage is 2,340 ft, from topographic map.

REMARKS.--Records good. No estimated daily discharges. Tunnel diverts from Opana Gulch for domestic use in the Kokomo, Makawao, and Pukalani areas. Periodic determinations of water temperature for the current year are published elsewhere in this report.

AVERAGE DISCHARGE.--22 years, 3.12 ft^3/s (2,260 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 18 ft^3/s Mar. 31, 1982, Apr. 12, 1988; minimum daily, 0.11 ft^3/s Nov. 5-10, 1973, Oct. 5, 6, 25, 28, 1974.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 12 ft^3/s on several days, minimum daily, 0.27 ft^3/s Oct. 5.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.32	8.4	9.4	2.0	4.9	3.7	12	7.2	4.9	3.1	1.6	.42
2	.32	8.6	9.4	4.7	4.2	3.4	9.4	7.3	4.5	3.6	1.4	.42
3	.32	6.0	12	6.2	3.9	3.2	7.2	7.9	4.2	3.2	1.4	.42
4	.32	4.6	8.6	3.3	3.7	3.1	5.7	7.5	3.9	3.1	1.4	.42
5	.27	3.9	7.7	2.6	3.4	3.0	4.8	11	3.8	3.8	1.4	.42
6	2.7	3.8	12	2.3	3.2	2.9	4.4	12	3.7	3.8	1.3	.37
7	3.8	3.2	8.4	2.0	3.1	2.8	3.8	12	3.4	3.0	1.2	.37
8	1.4	3.1	7.5	2.0	3.0	2.5	3.4	9.8	3.2	2.8	1.3	.52
9	.72	4.8	8.8	2.4	2.9	2.4	3.2	8.8	3.2	2.6	1.1	1.0
10	.52	4.8	6.5	9.6	2.6	2.3	3.1	8.4	3.2	2.3	1.2	.58
11	.42	5.7	6.2	10	2.5	2.2	2.9	7.9	3.2	2.5	1.2	3.8
12	.42	6.8	6.0	11	2.4	2.0	2.6	7.3	3.0	2.2	1.1	4.5
13	.79	8.0	5.2	8.2	2.6	2.0	3.1	7.2	3.2	2.2	1.1	9.4
14	.88	6.5	4.6	9.3	2.8	2.3	4.1	7.0	5.5	6.2	1.0	3.8
15	1.0	5.7	4.5	11	3.4	2.0	4.8	6.8	7.2	3.3	.94	2.3
16	1.1	5.1	4.2	9.8	12	1.8	5.8	6.2	9.2	2.8	1.0	2.0
17	3.9	4.9	4.2	8.2	12	1.8	6.8	5.5	6.5	2.2	.79	1.6
18	1.6	4.2	3.7	10	9.8	2.2	4.4	5.1	5.5	2.3	.79	1.3
19	1.4	3.9	3.4	9.8	8.8	4.4	4.5	4.8	4.4	2.5	.72	1.2
20	9.8	5.4	3.2	8.2	8.2	4.5	5.1	4.4	6.0	4.2	.72	1.1
21	5.8	4.2	3.1	7.5	6.8	3.0	6.4	4.1	6.8	6.8	.72	.94
22	2.8	4.2	2.9	7.2	8.2	2.3	10	3.8	6.2	4.4	.72	1.6
23	2.0	3.8	3.0	8.6	5.5	2.0	7.0	5.3	6.3	2.9	.65	2.6
24	1.4	3.7	2.8	6.5	4.9	1.8	8.2	11	4.5	2.4	.58	1.6
25	4.4	3.4	2.6	8.9	4.8	1.6	5.2	8.1	3.9	2.0	.58	1.2
26	10	3.3	2.5	8.6	4.4	2.5	5.8	11	3.6	2.0	.86	3.2
27	8.8	4.2	2.4	7.0	4.1	9.4	9.6	8.8	3.3	1.8	.65	4.7
28	6.2	9.0	2.3	6.2	3.9	5.8	9.8	7.0	3.1	2.0	.58	1.8
29	4.1	8.6	2.2	5.5	---	3.4	8.8	6.3	3.0	1.8	.52	1.6
30	3.2	8.2	2.8	4.9	---	2.9	7.5	5.7	3.1	1.8	.47	1.4
31	3.4	---	2.3	5.2	---	4.1	---	5.2	---	1.6	.42	---
TOTAL	84.08	157.8	162.4	206.7	139.8	93.3	177.4	230.0	135.5	90.8	29.41	58.58
MEAN	2.71	5.25	5.24	8.67	4.99	3.01	5.91	7.42	4.52	2.93	.95	1.89
MAX	10	9.0	12	11	12	9.4	12	12	9.2	8.8	1.6	9.4
MIN	.27	3.1	2.2	2.0	2.4	1.6	2.8	3.8	3.0	1.8	.42	.37
AC-FT	187	313	322	410	277	185	352	456	269	180	58	112

CAL YR 1986	TOTAL	1577.35	MEAN	4.32	MAX	18	MIN	.27	AC-FT	3130
WTR YR 1987	TOTAL	1583.37	MEAN	4.28	MAX	12	MIN	.27	AC-FT	3100

16604500 IAO STREAM AT KEPANIWAI PARK, NEAR WAILUKU

LOCATION.--Lat 20°53'08", long 156°32'32", Hydrologic Unit 20020000, on left bank of Maniania and Waikapu ditch intake, 0.3 mi upstream from Kepaniwai Park, 0.5 mi downstream from Iao Valley State Park, and 2.3 mi west of Wailuku Post Office.

DRAINAGE AREA.--5.98 mi^2.

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

GAGE.--Water-stage recorder. Elevation of gage is 780 ft, from topographic map.

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

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge 3,320 ft^3/s Oct. 18, 1985, gage height, 6.62 ft, from rating curve extended above 181 ft^3/s on basis of slope-area measurement at gage height 6.48 ft; minimum, 11 ft^3/s for several days in October and November 1984.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum diecharge known, 7,540 ft^3/s Dec. 3, 1950, from rating curve based on model study of site 2.3 mi downstream.

EXTREMES POR CURRENT YEAR.--Peak discharges greater than base discharge of 1,000 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Jan. 14	0300	1,020	3.73	May 5	1800	*3,130	*6.43
Feb. 16	0430	1,560	4.57	May 23	2100	1,270	4.15

Minimum discharge, 20 ft^3/s Oct. 1, Sept. 28-30.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	20	139	224	38	38	36	280	132	60	109	68	23
2	28	149	187	109	36	36	78	85	46	84	51	22
3	24	67	204	88	33	32	54	87	43	85	47	21
4	31	51	88	45	32	31	41	97	46	58	40	24
5	41	42	65	38	31	30	36	854	63	80	39	24
6	50	50	126	34	30	29	34	445	58	95	34	21
7	33	48	67	32	29	29	33	404	74	62	32	21
8	28	64	52	30	28	26	30	156	53	70	48	69
9	24	113	46	43	28	25	28	102	57	78	34	40
10	23	69	41	150	26	25	26	77	55	64	68	30
11	22	90	145	76	26	25	25	65	74	81	50	82
12	27	70	122	80	25	26	25	56	138	75	52	86
13	86	156	65	98	45	24	28	70	172	84	40	261
14	46	100	56	227	32	24	29	52	131	198	33	59
15	45	151	71	244	138	24	96	45	118	79	32	37
16	49	86	76	155	491	25	121	40	165	58	91	31
17	97	70	59	96	318	24	120	37	148	51	42	41
18	42	51	45	110	165	25	54	34	176	168	38	30
19	80	78	41	92	146	36	89	32	178	88	44	27
20	312	162	37	65	145	26	62	31	194	123	34	25
21	62	69	54	52	83	24	128	30	134	128	31	24
22	51	60	40	52	62	23	152	29	141	78	30	23
23	37	49	43	46	54	43	79	140	e112	61	28	23
24	31	42	37	81	69	30	55	209	e76	51	26	23
25	177	37	34	218	66	28	49	88	e74	46	26	21
26	285	34	33	113	46	32	179	294	88	42	33	22
27	217	32	32	69	41	31	300	210	72	44	26	21
28	101	208	31	54	38	24	268	92	62	54	25	21
29	62	112	30	51	---	24	168	70	77	62	24	20
30	48	192	81	43	---	25	92	59	108	45	23	26
31	60	---	43	42	---	100	---	64	---	41	22	---
TOTAL	2243	2641	2275	2671	2301	942	2759	4206	2991	2418	1211	1198
MEAN	72.4	88.0	73.4	86.2	82.2	30.4	92.0	136	99.7	76.0	39.1	39.9
MAX	312	208	224	244	491	100	300	854	194	198	91	261
MIN	20	32	30	30	25	23	25	29	43	41	22	20
AC-FT	4450	5240	4510	5300	4560	1870	5470	8340	5930	4800	2400	2360

CAL YR 1986	TOTAL	30948	MEAN	84.8	MAX	913	MIN	18	AC-FT	61390
WTR YR 1987	TOTAL	27658	MEAN	76.3	MAX	854	MIN	20	AC-FT	55250

e Partial daily estimate

16614000 WAIHEE RIVER AT DAM NEAR WAIHEE

LOCATION.--LAT 20°58'21", long 156°32'59", Hydrologic Unit 20020000, on right bank at dam 8 ft upstream from the abandoned Waihee canal intake, 2.6 mi southwest from Waihee Point, and 4.4 mi northwest from Wailuku Post Office.

DRAINAGE AREA.--4.20 mi^2.

PERIOD OF RECORD.--November 1910 to December 1913, November 1983 to current year. Low-flow records not equivalent prior to Dec. 31, 1913, due to Waihee canal diverted water upstream.

GAGE.--Water-stage recorder. Elevation of gage is 605 ft, from topographic map.

REMARKS.--Records fair, except for estimated daily discharges, Apr. 13 to May. 10, which are poor. No diversion upstream. Periodic determinations of water temperature for the current year are published elsewhere in this report.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge 7,550 ft^3/s Oct. 18, 1985, May 5, 1987 gage height, 6.70 ft, from rating curve extended above 280 ft^3/s on basis of slope-area measurement of peak flow; minimum, 22 ft^3/s Jan. 18-22, 24, 25, 1985.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 2,000 ft^3/s and maximum (*), from rating curve extended above 280 ft^3/s on basis as explained above:

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Oct. 20	0800	2,070	4.38	May 5	1700	*7,550	*6.70
Jan. 14	0230	3,310	5.08	May 23	2000	2,490	4.66
Feb. 16	0400	7,200	6.60				

Minimum discharge, 39 ft^3/s, Apr. 12.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	63	201	91	55	47	46	184	180	78	112	96	54
2	106	143	107	137	48	47	52	79	64	80	88	54
3	57	59	77	87	48	46	52	150	67	82	76	54
4	55	54	61	53	46	44	44	120	102	73	71	60
5	60	52	60	50	46	44	42	900	114	111	78	56
6	81	70	151	50	46	46	46	450	101	126	64	53
7	58	77	56	48	46	46	44	350	92	74	62	53
8	54	126	53	48	46	46	43	130	85	121	96	105
9	50	138	53	95	46	44	44	86	80	95	68	70
10	50	83	53	136	46	44	42	70	71	89	104	69
11	52	83	250	60	48	47	40	64	148	102	88	66
12	64	66	122	58	46	48	39	89	138	76	78	71
13	121	146	58	167	88	44	45	118	143	121	66	194
14	65	66	58	263	52	47	65	78	122	279	82	68
15	67	118	66	176	294	44	120	71	122	103	62	58
16	77	75	76	87	506	52	170	66	184	73	174	58
17	147	58	74	69	148	46	110	64	204	69	72	61
18	58	53	53	163	69	47	74	62	144	187	66	56
19	101	113	53	65	83	53	120	66	148	76	94	56
20	240	184	53	53	78	47	74	66	304	169	68	53
21	61	58	70	52	53	47	130	62	94	175	61	52
22	54	94	54	53	50	44	150	61	178	73	81	52
23	52	58	73	53	48	65	52	186	109	71	59	62
24	52	53	53	87	58	48	50	150	74	68	59	53
25	224	52	53	198	52	51	46	71	102	73	58	52
26	301	50	50	60	46	142	220	152	113	66	64	53
27	160	48	48	53	46	75	250	108	86	78	59	50
28	62	241	47	52	46	48	230	82	69	116	58	50
29	52	87	84	53	---	47	120	126	94	88	58	50
30	46	133	142	47	---	46	59	71	118	69	54	93
31	87	---	56	50	---	209	---	111	---	69	54	---
TOTAL	2779	2839	2335	2678	2270	1750	2757	4419	3546	3162	2274	1934
MEAN	89.6	94.6	75.3	88.4	81.1	58.5	91.9	143	118	102	73.4	64.5
MAX	301	241	250	263	506	209	250	900	304	279	174	194
MIN	48	48	47	47	46	44	39	61	64	66	54	50
AC-FT	5510	5630	4630	5310	4500	3470	5470	8770	7030	6270	4510	3840

CAL YR 1986	TOTAL	35320	MEAN	96.6	MAX	880	MIN	36	AC-FT	70060
WTR YR 1987	TOTAL	32743	MEAN	89.7	MAX	900	MIN	39	AC-FT	64950

16618000 KAHAKULOA STREAM NEAR HONOKOHAU

(National stream-quality accounting network station)

LOCATION.--Lat 20°58'54", long 156°33'28", Hydrologic Unit 20020000, on right bank 0.5 mi downstream from Kapuna Stream, 1.3 mi south of Kahakuloa, 2.0 mi west of Puu Makawana, and 4.3 mi southeast of Honokohau.

DRAINAGE AREA.--3.47 mi^2.

PERIOD OF RECORD.--July 1939 to August 1943, September 1947 to November 1970, December 1974 to current year. Records for January 1913 to December 1914 (fragmentary) at site 1.0 mi upstream not equivalent owing to difference in drainage areas.

REVISED RECORDS.--WSP 1319: 1948, 1949(M). WSP 1569: Drainage area.

GAGE.--Water-stage recorder and concrete control. Elevation of gage is 330 ft, from topographic map.

REMARKS.--Records fair. No diversion upstream.

AVERAGE DISCHARGE.--38 years (1940-42, 1948-70, 1976-87), 17.3 ft^3/s (12,530 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 3,800 ft^3/s Nov. 25, 1970, gage height, 10.57 ft from flood-marks, from rating curve extended above 510 ft^3/s, on basis of slope-area measurements at gage heights 6.70 ft, 8.48 ft, and 10.57 ft; minimum, 2.7 ft^3/s Jan. 22, 28, 29, Feb. 10, 12, 13, 1985.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 500 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Jan. 14	0230	1,110	6.31	May 5	1700	*2,630	*8.33
Feb. 16	0430	2,530	8.18	June 20	1700	580	5.36
Mar. 26	2000	1,360	6.62				

Minimum discharge, 6.0 ft^3/s Oct. 10-12, Mar. 10, 11, 13-16.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	12	78	23	9.2	10	6.8	53	30	17	25	17	7.9
2	12	59	23	38	7.2	6.6	11	11	12	15	18	8.2
3	9.9	12	26	31	7.0	6.5	9.0	19	11	13	18	8.2
4	6.7	9.1	13	9.2	8.8	6.4	7.6	26	16	11	10	8.5
5	8.1	8.0	9.6	7.7	6.7	6.4	6.9	496	24	13	13	9.2
6	17	7.8	88	7.4	6.6	6.7	6.4	298	15	37	10	7.8
7	8.4	8.7	11	7.0	8.4	8.4	6.5	204	19	11	9.5	7.6
8	6.9	35	9.2	7.0	6.4	6.5	8.3	31	12	25	18	24
9	6.6	59	8.6	14	6.4	6.2	9.9	21	14	17	11	15
10	6.3	66	7.7	62	6.3	6.1	7.0	15	11	20	13	12
11	6.2	34	79	8.3	6.2	6.2	7.9	14	31	21	15	11
12	6.3	20	51	8.0	6.8	6.8	6.9	15	18	13	15	9.2
13	49	24	11	30	39	6.4	6.4	63	23	33	10	61
14	15	13	9.5	95	16	6.3	7.5	21	24	116	9.0	9.8
15	15	26	9.2	54	81	6.3	18	15	23	22	8.8	7.4
16	15	18	13	35	209	6.0	37	11	67	14	48	7.2
17	22	10	14	25	44	6.8	23	11	42	11	10	8.9
18	9.2	8.7	8.3	66	23	8.1	9.5	10	52	26	10	6.9
19	28	26	7.7	19	21	10	46	12	27	14	9.0	6.7
20	75	59	7.2	10	30	7.9	30	16	109	43	9.2	6.7
21	12	11	19	8.8	13	8.2	54	12	26	64	8.8	8.5
22	8.2	38	8.3	8.5	9.7	6.9	58	9.7	64	14	8.9	7.2
23	7.2	11	17	9.3	8.7	9.6	11	51	33	11	8.7	18
24	7.0	9.3	9.2	13	8.4	7.3	9.5	44	16	10	8.4	13
25	66	8.3	8.3	64	15	10	7.9	14	17	9.5	8.3	7.0
26	80	7.6	7.2	16	7.6	151	107	52	33	9.5	8.4	6.6
27	57	7.3	7.0	9.0	7.1	61	157	35	21	11	8.2	6.5
28	13	71	7.8	8.0	6.9	11	115	40	11	25	8.1	6.4
29	9.0	21	28	9.1	---	7.9	29	64	22	23	8.1	6.7
30	7.8	51	47	7.5	---	8.4	14	14	33	10	8.1	54
31	21	---	12	15	---	60	---	14	---	9.5	7.9	---
TOTAL	622.8	816.8	597.8	711.0	622.2	478.7	880.2	1888.7	843	696.5	371.4	373.1
MEAN	20.1	27.2	19.3	22.9	22.2	15.4	29.3	54.5	28.1	22.5	12.0	12.4
MAX	80	78	86	95	209	151	157	496	109	116	48	61
MIN	6.2	7.3	7.0	7.0	6.2	6.0	6.4	9.7	11	9.5	7.9	6.4
AC-FT	1240	1620	1190	1410	1230	950	1750	3350	1670	1380	737	740

CAL YR 1986	TOTAL	8675.3	MEAN	23.8	MAX	322	MIN	4.8	AC-FT	17210
WTR YR 1987	TOTAL	8702.2	MEAN	23.8	MAX	496	MIN	6.0	AC-FT	17260

HAWAII, ISLAND OF MAUI

16618000 KAHAKULOA STREAM NEAR HONOKOHAU

WATER-QUALITY RECORDS

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

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	TEMPER-ATURE WATER (DEG C)	DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	TEMPER-ATURE WATER (DEG C)
OCT				APR			
06...	1030	16	21.5	06...	1140	6.4	20.0
NOV				MAY			
24...	1220	9.2	21.0	14...	1050	18	18.0
DEC				JUL			
08...	1110	8.9	18.5	09...	1145	14	21.5
JAN				AUG			
13...	1250	7.3	19.5	11...	1050	11	21.5
FEB							
17...	1045	31	18.5				

DATE	TIME	BARO-METRIC PRES-SURE (MM OF HG)	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH (STAND-ARD UNITS)	TEMPER-ATURE WATER (DEG C)	TUR-BID-ITY (FTU)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION)	COLI-FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)	STREP-TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML)
OCT											
06...	1130	752	16	61	7.30	21.5	6.0	8.7	100	220	2900
DEC											
08...	1150	750	9.2	76	7.50	18.5	0.90	9.4	102	20	810
FEB											
17...	1120	753	33	47	7.10	16.5	6.7	9.5	103	86	360
APR											
06...	1145	756	6.2	87	7.80	20.0	0.50	9.4	104	K9	380
AUG											
11...	1345	752	11	70	7.70	22.5	1.6	8.6	101	58	850

DATE	HARD-NESS TOTAL (MG/L AS CACO3)	HARD-NESS NONCARB WH WAT TOT FLD MG/L AS CACO3	CALCIUM DIS-SOLVED (MG/L AS CA)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG)	SODIUM, DIS-SOLVED (MG/L AS NA)	SODIUM PERCENT	SODIUM AD-SORP-TION RATIO	POTAS-SIUM, DIS-SOLVED (MG/L AS K)	BICAR-BONATE WATER WH FET FIELD MG/L AS HCO3	ALKA-LINITY LAB (MG/L AS CACO3)
OCT										
06...	14	0	2.8	1.8	5.9	45	0.7	0.80	18	14
DEC										
08...	18	0	3.4	2.4	7.1	44	0.7	0.80	26	20
FEB										
17...	10	2	1.8	1.3	4.8	49	0.7	0.80	10	8.0
APR										
08...	22	0	4.1	2.8	8.2	44	0.8	1.0	30	23
AUG										
11...	18	0	3.5	2.3	6.9	44	0.7	0.90	25	20

< 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).

16618000 KAHAKULOA STREAM NEAR HONOKOHAU--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	ALKALINITY WAT WH TOT FET FIELD 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)	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)	NITROGEN, NO2+NO3 DIS-SOLVED (MG/L AS N)	NITROGEN, NITRITE DIS-SOLVED (MG/L AS N)
OCT										
06...	15	7.1	8.5	<0.10	13	50	49	0.07	--	--
DEC										
06...	21	3.4	10	<0.10	17	80	57	0.08	0.110	<0.010
FEB										
17...	8	6.9	7.5	<0.10	8.7	34	38	0.05	0.240	<0.010
APR										
06...	24	3.0	10	<0.10	21	55	85	0.07	0.110	<0.010
AUG										
11...	21	4.5	7.9	0.10	17	46	58	0.06	<0.100	<0.010

DATE	NITROGEN, AMMONIA TOTAL (MG/L AS N)	NITROGEN, AMMONIA DIS-SOLVED (MG/L AS N)	NITROGEN,AMMONIA + ORGANIC TOTAL (MG/L AS N)	PHOSPHOROUS TOTAL (MG/L AS P)	PHOSPHOROUS DIS-SOLVED (MG/L AS P)	PHOSPHOROUS ORTHO, DIS-SOLVED (MG/L AS P)	ALUMINUM, DIS-SOLVED (UG/L AS AL)	ARSENIC DIS-SOLVED (UG/L AS AS)	BARIUM, DIS-SOLVED (UG/L AS BA)
OCT									
06...	--	--	--	--	--	--	100	<1	3
DEC									
08...	<0.010	<0.010	0.50	0.020	0.020	0.010	--	--	--
FEB									
17...	<0.010	<0.010	0.40	0.070	0.030	0.010	160	<1	3
APR									
06...	0.010	<0.010 9	0.80	0.040	0.030	0.020	30	<1	3
AUG									
11...	0.020	0.020	0.80	0.040	<0.010	0.010	60	<1	3

DATE	BERYLLIUM, DIS-SOLVED (UG/L AS BE)	CADMIUM DIS-SOLVED (UG/L AS CD)	CHROMIUM, DIS-SOLVED (UG/L AS CR)	COBALT, DIS-SOLVED (UG/L AS CO)	COPPER, DIS-SOLVED (UG/L AS CU)	IRON, DIS-SOLVED (UG/L AS FE)	LEAD, DIS-SOLVED (UG/L AS PB)	LITHIUM DIS-SOLVED (UG/L AS LI)	MANGANESE, DIS-SOLVED (UG/L AS MN)	MERCURY DIS-SOLVED (UG/L AS HG)
OCT										
06...	<0.5	<1	<1	<3	2	140	<5	<4	3	<0.6
FEB										
17...	<0.5	<1	<1	<3	3	200	<5	<4	3	<0.1
APR										
06...	<0.5	<1	2	<3	1	8	<5	4	1	<0.1
AUG										
11...	<0.5	<1	<1	<3	1	64	<5	<4	<1	0.2

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

16618000 KAHAKULOA STREAM NEAR HONOKOHAU--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	MOLYBDENUM, DISSOLVED (UG/L AS MO)	NICKEL, DISSOLVED (UG/L AS NI)	SELENIUM, DISSOLVED (UG/L AS SE)	SILVER, DISSOLVED (UG/L AS AG)	STRONTIUM, DISSOLVED (UG/L AS SR)	VANADIUM, DISSOLVED (UG/L AS V)	ZINC, DISSOLVED (UG/L AS ZN)
OCT							
06...	<10	<1	<1	<1.0	18	<6	5
FEB							
17...	<10	<1	<1	<1.0	13	<6	10
APR							
06...	<10	2	<1	3.0	27	<6	8
AUG							
11...	<10	<1	<1	<1.0	22	<6	4

DATE	TIME	SEDIMENT, SUSPENDED (MG/L)	SEDIMENT, DISCHARGE, SUSPENDED (T/DAY)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM
OCT				
06...	1130	5	0.22	100
DEC				
08...	1150	1	0.02	100
FEB				
17...	1120	5	0.45	100
APR				
06...	1145	1	0.02	100
AUG				
11...	1345	2	0.06	100

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

16620000 HONOKOHAU STREAM NEAR HONOKOHAU

LOCATION.--Lat 20°57'48", long 158°35'22", Hydrologic Unit 20020000, on right bank 1,000 ft upstream from intake of Honokohau ditch and 4.1 mi southeast of Honokohau.

DRAINAGE AREA.--4.11 mi^2.

PERIOD OF RECORD.--September, November, and December 1911 (combined flow of stream and ditch below point of diversion), March 1913 to September 1920, May 1922 to current year. Monthly discharge only for some periods, published in WSP 1319.

REVISED RECORDS.--WSP 1937: Drainage area. WDR HI-79-1: 1927-48(M), 1949-78(P).

GAGE.--Water-stage recorder and masonry control. Elevation of gage is 870 ft, from topographic map. Prior to Mar. 7, 1913, nonrecording gage at site just below Honokohau ditch intake at different datum.

REMARKS.--Records good except for estimated daily discharges, which are poor. No diversion upstream. All medium and low flow, together with the inflow from two development tunnels downstream of station, is diverted into Honokohau ditch. Periodic determinations of water temperature for the current year are published elsewhere in this report.

AVERAGE DISCHARGE.--71 years (water years 1914-19, 1923-87) 39.4 ft^3/s (28,540 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 7,120 ft^3/s revised, Dec. 14, 1942, gage height, 8.40 ft, from rating curve extended above 547 ft^3/s, on basis of slope-area measurement at gage height 6.76 ft; minimum, 8.4 ft^3/s May 1, 1945, Jan. 5, 1946.

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

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Jan. 14	0230	1,670	5.72	May 23	2030	1,130	5.17
Feb. 16	0430	2,960	6.62	Sept. 13	1530	1,190	5.23
May 5	1500	*5,270	*7.73				

Minimum discharge, 17 ft^3/s Apr. 11-12.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	27	136	69	21	22	19	175	84	35	56	45	21
2	63	96	65	89	20	19	37	32	25	41	37	22
3	33	27	64	60	19	19	29	65	24	33	33	21
4	30	21	28	22	19	19	21	51	27	31	27	22
5	39	20	23	20	19	19	18	779	66	81	26	24
6	48	29	97	20	19	19	21	281	34	74	25	21
7	24	27	23	20	19	19	22	221	44	31	24	21
8	20	45	22	19	19	18	18	39	45	48	50	55
9	19	68	21	46	19	18	19	32	37	44	26	37
10	19	33	21	117	19	18	18	28	35	46	95	31
11	19	40	88	35	19	18	18	27	60	52	41	52
12	19	30	71	40	18	19	17	27	82	40	42	55
13	75	113	23	48	23	18	21	56	88	58	29	229
14	34	40	23	158	21	21	29	32	90	164	24	30
15	33	116	40	137	132	19	59	27	84	33	25	23
16	36	48	50	54	377	24	90	25	148	30	85	21
17	94	32	36	34	127	21	45	25	87	30	27	34
18	23	24	22	123	46	22	32	24	93	125	30	23
19	49	73	21	36	57	36	54	24	116	36	29	23
20	188	139	20	23	55	25	31	24	189	109	26	20
21	26	26	30	22	26	21	60	23	51	83	24	20
22	21	48	22	24	22	19	69	23	85	31	24	20
23	20	30	27	23	21	38	20	126	53	27	23	24
24	19	23	22	43	30	24	19	112	29	26	22	22
25	134	21	21	139	33	20	18	31	33	26	22	20
26	167	20	20	34	20	84	113	126	58	26	29	20
27	81	20	20	22	20	45	133	69	44	29	24	19
28	29	181	20	21	19	20	128	31	27	38	22	19
29	22	49	24	21	---	18	44	47	34	55	22	19
30	20	88	92	20	---	19	23	32	54	30	22	25
31	28	---	30	27	---	126	---	48	---	27	21	---
TOTAL	1459	1663	1155	1518	1260	844	1401	2571	1877	1560	1001	993
MEAN	47.1	55.4	37.3	49.0	45.0	27.2	46.7	82.9	62.6	50.3	32.3	33.1
MAX	188	181	97	158	377	126	175	779	189	164	95	229
MIN	19	20	20	19	18	18	17	23	24	26	21	19
AC-FT	2890	3300	2290	3010	2500	1670	2780	5100	3720	3090	1990	1970

CAL YR 1986	TOTAL	18292	MEAN	50.1	MAX	655	MIN	13	AC-FT	36280
WTR YR 1987	TOTAL	17302	MEAN	47.4	MAX	779	MIN	17	AC-FT	34320

16638500 KAHOMA STREAM AT LAHAINA

LOCATION.--Lat 20°53'10", long 156°40'36", Hydrologic Unit 20020000, on right bank 0.2 mi west of Kelawea, 0.6 mi northeast of Lahaina, 0.6 mi downstream from Kanaha Stream, and 0.9 mi upstream from mouth.

DRAINAGE AREA.--5.22 mi^2.

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

REVISED RECORDS.--WSP 2137: 1963-65(P).

GAGE.--Water-stage recorder. Elevation of gage is 90 ft, from topographic map.

REMARKS.--Records poor. Diversions upstream by Pioneer Mill Co. for irrigation of sugarcane and from Kanaha Stream by Maui County Board of Water Supply for domestic uae. Recording rain gage located at station. Periodic determinations of water temperature for the current year are published elsewhere in this report.

AVERAGE DISCHARGE.--24 years (water yesrs 1964-87), 3.27 ft^3/s (2,370 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Msximum discharge, 2,490 ft^3/s July 11, 1965, gage height, 11.03 ft, from rating curve extended above 332 ft^3/s on bssis of slope-area measurements at gage heights 7.39 ft, 7.58 ft, 8.07 ft, 9.12 ft, and 11.03 ft; no flow many days each year.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of May 13, 1960, reached a discharge of 7,750 ft3/a, by slope-area measurement, 0.6 mi upstream from station.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 590 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Feb. 16	0100	590	7.10	Sept. 13	1500	*1,620	*9.03
May 5	1600	1,500	8.80				

Minimum discharge, no flow for many days.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.00	.00	.00	.00	.00	55	.00	.00	.00	.00	.00
2	.00	2.2	.42	.12	.00	.00	.00	.00	.00	.11	.00	.00
3	.00	.00	8.2	3.8	.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	200	.00	.00	.00	.00
6	.00	.00	.00	.00	.00	.00	.00	49	.00	.00	.00	.00
7	.00	.00	.00	.00	.00	.00	.00	26	.00	.00	.00	.00
8	.00	.00	.00	.00	.00	.00	.00	2.9	.00	.00	.00	.00
9	.00	.00	.00	.00	.00	.00	.00	.03	.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	1.2
12	.00	.00	.00	.67	.00	.00	.00	.00	.12	.00	.00	29
13	.00	.00	.00	.00	.00	.00	.00	.00	.11	.00	.00	159
14	.00	.00	.00	.00	.00	.00	.00	.00	11	.00	.00	3.8
15	.00	.00	.00	.54	1.2	.00	.00	.00	.32	.00	.00	.15
16	.00	.00	.00	.00	120	.00	4.4	.00	7.8	.00	.00	.00
17	.00	.00	.00	.00	50	.00	2.4	.00	.00	.00	.00	.00
18	.00	.00	.00	.00	24	.00	.00	.00	.00	1.4	.00	.00
19	.00	.00	.00	.00	.00	.01	.00	.00	.00	.00	.00	.00
20	31	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
21	.00	.00	.00	.00	.00	.00	.02	.00	.00	.00	.00	.00
22	.00	.00	.00	.00	.00	.00	.39	.00	.00	.00	.00	.00
23	.00	.00	.00	.00	.00	.00	.00	1.8	.00	.00	.00	.00
24	.00	.00	.00	.00	.00	.00	.00	2.3	.00	.00	.00	.00
25	.00	.00	.00	12	.00	.00	.00	.00	.00	.00	.00	.00
26	.00	.00	.00	.74	.00	.00	.00	.00	.00	.00	.00	.00
27	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
28	.00	27	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
29	.00	.65	.00	.00	---	.00	.00	.00	.00	.00	.00	.00
30	.00	.52	.00	.00	---	.00	.00	.00	.00	.00	.00	.00
31	.00	---	.00	.00	---	.26	---	.00	---	.00	.00	---
TOTAL	31.00	30.37	8.62	17.87	195.20	.27	62.21	282.03	19.35	1.51	.00	193.15
MEAN	1.00	1.01	.28	.58	6.97	.01	2.07	9.10	.64	.05	.00	6.44
MAX	31	27	8.2	12	120	.26	55	200	11	1.4	.00	159
MIN	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
AC-FT	61	60	17	35	387	.5	123	559	38	3.0	.00	383

CAL YR 1986	TOTAL	944.26	MEAN	2.59	MAX	178	MIN	.00	AC-FT	1870
WTR YR 1987	TOTAL	841.58	MEAN	2.31	MAX	200	MIN	.00	AC-FT	1670

16700000 WAIAKEA STREAM NEAR MOUNTAIN VIEW

LOCATION.--Lat 19°38'30", long 155°10'28", Hydrologic Unit 20010000, on left bank 200 ft upstream from Olaa Flume Road, 7.3 mi northwest of Mountain View, and 8.0 mi southwest of Hilo Post Office.

DRAINAGE AREA.--17.4 mi^2.

PERIOD OF RECORD.--September 1930 to current year. Prior to July 1960, published as "at middle flume house, near Mountain View."

REVISED RECORDS.--WSP 2137: 1939(M), 1942(M), 1944-45(M), 1947(M), 1949(P), 1950-51(M), 1952-53(P), 1955(P), 1956(M), 1957-58(P), 1960(M).

GAGE.--Water-stage recorder and combined Parshall flume and concrete-weir control. Datum of gage is 1,934 ft above mean sea level (by stadia survey). Prior to Jan. 21, 1938, at datum 0.23 ft lower.

REMARKS.--Records good except for estimated daily discharges, which are fair. No diversion upstream. Large part of flow comes from 3 tunnels. Periodic determinations of water temperature for the current year are published elsewhere in this report.

AVERAGE DISCHARGE.--57 years, 11.6 ft^3/s (8,400 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 565 ft^3/s Mar. 14, 1942, Aug. 26, 1970, from rating curve extended above 160 ft^3/s; maximum gage height, 4.45 ft Aug. 26, 1970; no flow at times.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 104 ft^3/s Nov. 13, gage height, 3.47 ft, no other peak greater than base discharge of 100 ft^3/s; minimum daily, 0.08 ft^3/s Mar. 16, 18, 19.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	14	12	17	2.5	5.7	1.1	15	5.3	14	14	13	1.4
2	15	12	16	2.9	5.3	1.0	13	6.2	13	14	12	1.6
3	15	13	16	2.5	5.0	.90	11	7.6	11	14	12	1.2
4	15	12	14	2.3	4.7	.80	9.9	16	11	14	11	1.6
5	15	12	13	2.4	4.3	.70	9.3	17	15	14	10	1.4
6	15	13	13	2.1	4.2	.56	8.8	17	14	15	9.6	1.0
7	16	18	12	2.0	4.0	.48	8.4	19	14	14	9.2	.85
8	15	18	11	1.9	3.8	.48	7.6	20	14	14	8.4	.75
9	15	19	10	1.7	3.6	.52	6.9	20	13	13	7.6	.75
10	14	21	9.3	4.5	3.4	.32	6.4	19	13	13	7.0	1.1
11	13	25	8.7	8.9	3.0	.28	6.0	17	14	12	6.5	8.1
12	12	43	8.8	37	2.9	.24	5.6	16	15	11	6.2	7.9
13	11	50	7.6	27	2.5	.20	5.3	14	16	11	5.6	6.1
14	10	56	7.0	27	2.4	.16	4.9	14	16	10	5.2	5.4
15	9.8	54	6.4	26	2.8	.12	5.0	13	18	10	5.0	4.3
16	9.2	50	6.0	23	2.5	.16	5.0	11	19	9.6	4.7	4.2
17	8.7	44	5.6	21	4.6	.16	4.7	10	18	9.0	4.5	5.2
18	7.8	36	5.2	19	5.0	.12	5.0	9.4	18	8.7	4.3	5.3
19	7.3	35	4.8	17	3.1	3.0	6.1	8.7	17	8.4	4.1	5.4
20	9.0	42	4.6	15	3.1	1.2	7.0	7.9	18	17	3.9	5.5
21	7.6	40	4.8	14	3.0	.90	6.4	7.1	e16	21	3.7	5.8
22	7.1	44	4.4	12	2.4	.75	6.1	6.4	e17	19	3.4	5.6
23	6.7	41	4.6	11	2.3	.80	5.8	5.8	e15	19	3.2	5.3
24	6.3	35	4.0	9.9	2.0	.80	5.4	13	e15	17	2.9	5.1
25	5.8	31	3.8	9.6	1.9	.75	5.2	8.7	e14	16	2.7	4.9
26	8.9	28	3.6	9.2	1.7	1.1	5.0	7.5	14	16	2.4	6.1
27	9.3	26	3.3	8.2	1.4	1.2	5.0	6.6	14	15	2.1	5.1
28	9.3	22	3.0	7.6	1.2	.90	8.1	8.2	13	15	2.0	5.1
29	8.9	20	2.9	7.3	---	.75	5.3	6.0	13	14	1.9	5.3
30	8.8	18	2.5	8.7	---	.65	4.9	5.7	14	14	1.7	6.5
31	8.7	---	2.5	6.3	---	.65	---	6.2	---	13	1.5	---
TOTAL	334.4	890	235.2	347.5	91.8	21.75	206.1	347.3	446	424.7	177.3	123.85
MEAN	10.8	29.7	7.59	11.2	3.28	.70	8.87	11.2	14.9	13.7	5.72	4.13
MAX	16	56	17	37	5.7	3.0	15	20	19	21	13	8.1
MIN	5.8	12	2.5	1.7	1.2	.12	4.7	5.3	11	8.4	1.5	.75
AC-FT	663	1770	467	689	182	43	409	689	885	842	352	246

CAL YR 1986	TOTAL	4538.21	MEAN	12.4	MAX	66	MIN	.00	AC-FT	9000
WTR YR 1987	TOTAL	3645.90	MEAN	9.99	MAX	56	MIN	.12	AC-FT	7230

e Estimate

16700900 OLAA FLUME SPRING NEAR KAUMANA

LOCATION.--Lat 19°41'59", long 155°11'13", Hydrologic Unit 20010000, on left bank 58 ft downstream from tunnel entrance, 3.3 mi northwest of Kaumana School, and 6.5 mi southwest of Hilo Post Office.

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

GAGE.--Water-stage recorder and concrete control. Elevation of gage is 1,970 ft, from topographic map.

REMARKS.--Records good. County of Hawaii, Department of Water Supply, diverts by 16-inch pipeline 50 ft upstream for domestic use in the Kaumana and Piihonua areas since Oct. 2, 1978. Periodic determinations of water temperature for the current year are published elsewhere in this report.

AVERAGE DISCHARGE.--13 years, 7.14 ft^3/s (5,170 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 43 ft^3/s Jan. 8, 1975; minimum daily, 0.02 ft^3/s Mar. 24, 26-30, Apr. 1, 1983, Sept. 19, 1984, and for many days in 1985.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 20 ft^3/s Nov. 13; minimum daily, 0.04 ft^3/s Feb. 16.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	12	3.6	10	.76	.07	.10	.28	.10	6.0	4.9	6.3	.36
2	8.8	6.0	8.3	.76	.07	.10	3.0	.52	8.3	6.3	6.3	.36
3	6.5	9.7	7.9	.84	.07	.10	8.2	3.2	8.3	6.1	5.4	.15
4	10	9.7	8.8	.84	.10	.10	11	5.8	6.5	7.2	4.6	.10
5	9.7	7.4	8.1	.84	.10	.10	7.4	10	5.4	7.2	4.0	.10
6	9.7	5.1	7.4	.44	.10	.10	5.1	10	6.5	8.1	3.2	.10
7	11	8.6	6.5	.10	.07	.10	3.5	10	7.2	9.4	1.9	.15
8	7.9	13	6.0	.10	.07	.10	2.8	12	7.0	8.3	1.4	.15
9	7.4	12	5.2	.10	.07	.10	2.6	10	6.3	7.6	.84	.15
10	7.0	12	4.7	.10	.07	.10	2.4	8.1	7.0	7.0	.68	.20
11	5.6	13	4.4	.15	.07	.10	2.4	8.1	5.4	5.8	.68	.28
12	4.4	19	4.4	7.1	.07	.07	2.4	5.1	5.6	5.1	.44	.44
13	4.0	20	5.1	11	.07	.07	1.1	4.2	5.2	4.7	.20	1.7
14	2.5	19	4.6	8.8	.07	.07	.60	3.8	4.9	4.6	.20	3.4
15	1.5	18	4.2	8.6	.10	.07	.28	3.6	8.1	5.1	.20	2.5
16	.84	15	4.1	8.3	.04	.07	.28	3.5	12	5.2	.20	1.9
17	.76	12	4.0	6.5	.05	.05	.44	3.2	12	4.6	.20	2.5
18	.60	13	4.0	5.2	.07	.05	.44	3.1	15	4.4	.20	2.8
19	.52	12	2.0	3.6	.20	.07	1.0	3.1	16	4.2	.20	3.2
20	.52	12	.84	2.7	.15	.07	2.5	3.0	13	7.6	.20	3.0
21	1.5	16	.84	2.5	.10	.15	2.8	3.0	15	13	.20	2.1
22	1.5	18	.84	2.4	.10	.60	2.1	3.0	15	12	.20	1.8
23	.84	16	.76	2.1	.10	.68	2.2	3.0	14	11	.20	1.0
24	.60	14	.76	2.0	.10	.52	1.3	3.0	13	12	.20	.44
25	.52	13	.76	1.9	.07	.60	.28	3.0	11	11	.20	4.7
26	.84	12	.68	1.8	.07	.44	.10	3.0	8.6	8.6	.28	6.0
27	6.5	12	.68	1.8	.10	.15	.10	3.0	9.4	6.5	.36	5.6
28	8.8	12	.68	.60	.10	.10	.10	2.8	8.3	4.9	.36	4.6
29	8.3	11	.60	.07	---	.10	.10	2.8	8.1	4.1	.36	4.7
30	8.1	11	.68	.10	---	.10	.10	3.2	5.4	5.4	.36	3.8
31	4.7	---	.68	.10	---	.10	---	3.6	---	6.0	.36	---
TOTAL	151.24	375.1	118.30	82.00	2.42	5.23	66.90	141.62	273.5	217.9	40.42	58.28
MEAN	4.88	12.5	3.82	2.85	.086	.17	2.23	4.57	9.12	7.03	1.30	1.94
MAX	12	20	10	11	.20	.68	11	12	16	13	6.3	6.0
MIN	.52	3.6	.60	.07	.04	.05	.10	.10	4.9	4.1	.20	.10
AC-FT	300	744	235	183	4.8	10	133	281	542	432	80	116

CAL YR 1988	TOTAL	2117.61	MEAN	5.80	MAX	22	MIN	.03	AC-FT	4200
WTR YR 1987	TOTAL	1532.91	MEAN	4.20	MAX	20	MIN	.04	AC-FT	3040

16700950 LYMAN SPRINGS NO. 2 NEAR PIIHONUA

LOCATION.--Lat 19°42'02", long 155°10'36", Hydrologic Unit 20010000, on right bank 3 ft downstream from tunnel entrance, 2.7 mi southwest of Piihonua, and 5.8 mi southwest of Hilo Post Office.

PERIOD OF RECORD.--February 1981 to current year.

GAGE.--Water-stage recorder and concrete control. Elevation of gage is 1,700 ft, from topographic map.

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

AVERAGE DISCHARGE.--6 years, 4.71 ft^3/s (3,410 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 23 ft^3/s Apr. 10, 1986; minimum daily, 0.03 ft^3/s Mar. 23, 24, 31, 1963.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 13 ft^3/s Nov. 12, 13, Jan. 12; minimum daily, 1.1 ft^3/s Mar. 15.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	5.3	8.7	5.4	4.3	3.5	2.8	7.8	4.9	5.7	5.8	8.0	2.4
2	5.8	5.7	5.3	4.2	3.2	2.7	6.8	5.8	7.0	5.4	5.2	2.3
3	6.1	5.3	5.3	3.9	3.5	2.4	5.7	5.6	5.3	6.1	4.9	2.2
4	5.3	4.9	5.2	3.8	3.4	2.3	5.5	9.5	5.1	5.4	4.8	2.0
5	5.4	4.8	5.1	3.8	3.2	2.1	5.3	8.5	7.2	5.7	4.8	1.9
6	5.8	5.7	4.9	3.5	3.2	1.9	5.2	8.0	5.6	6.1	4.5	2.0
7	6.6	8.0	4.9	3.4	3.1	1.7	5.0	5.7	5.3	5.3	4.4	2.2
8	5.8	6.1	4.8	3.3	3.1	1.7	4.8	5.4	5.6	5.4	4.4	2.0
9	5.1	6.0	4.8	3.2	3.0	1.8	4.8	5.3	5.7	5.4	4.3	1.8
10	5.0	8.3	4.5	4.6	3.0	1.6	4.8	5.1	5.7	5.0	4.2	2.0
11	4.8	7.8	4.7	4.8	2.8	1.5	4.6	4.9	5.7	4.9	4.2	5.7
12	4.6	13	5.4	13	2.7	1.4	4.8	4.8	5.7	4.7	4.3	6.3
13	4.5	13	4.8	6.2	2.5	1.3	4.8	4.7	6.0	4.9	4.2	5.7
14	4.5	10	4.5	6.0	2.3	1.2	4.6	4.7	6.1	5.2	4.0	5.3
15	4.5	9.5	4.4	5.4	3.3	1.1	4.7	4.7	6.9	4.9	4.0	4.7
16	4.5	7.4	4.4	5.2	2.5	1.2	5.0	4.3	7.4	4.7	3.9	4.5
17	4.7	7.0	4.3	5.0	2.7	1.6	4.5	4.3	6.0	4.5	3.8	5.1
18	4.4	6.3	4.2	4.8	3.9	1.4	4.7	4.2	5.8	4.5	3.6	5.1
19	4.2	7.6	4.0	4.8	3.3	3.1	4.6	4.0	5.6	4.9	3.5	4.9
20	5.3	10	4.0	4.5	3.6	4.1	5.1	4.0	6.3	12	3.5	5.1
21	4.5	7.4	3.9	4.3	3.7	4.3	4.5	3.9	6.0	8.2	3.5	4.7
22	4.3	10	4.0	4.3	3.6	4.3	4.5	3.9	5.8	7.6	3.3	4.4
23	4.2	7.0	4.7	4.1	3.5	4.2	4.3	3.9	5.8	6.7	2.9	4.3
24	4.2	7.0	4.2	4.0	3.2	4.2	4.3	8.8	5.4	5.8	2.8	4.9
25	4.2	6.3	4.0	4.1	3.1	4.2	4.1	4.7	5.2	5.4	3.1	4.9
26	6.9	6.0	4.0	4.5	3.0	4.1	4.1	4.2	5.7	5.4	3.2	5.8
27	5.6	5.8	3.9	4.0	2.9	4.1	4.1	4.2	6.3	5.2	3.1	4.9
28	5.2	5.6	3.8	3.9	2.8	4.1	4.9	4.2	5.2	5.4	3.0	5.2
29	4.9	5.7	3.8	4.4	---	4.0	4.2	5.6	5.4	5.3	2.9	4.9
30	4.8	5.6	3.6	4.0	---	4.0	4.0	4.5	6.2	5.3	2.6	5.4
31	4.7	---	3.7	3.9	---	3.8	---	5.4	---	5.2	2.7	---
TOTAL	155.7	217.5	138.5	143.2	87.6	84.2	145.9	157.5	176.7	176.3	119.6	122.6
MEAN	5.02	7.25	4.47	4.62	3.13	2.72	4.86	5.08	5.89	5.69	3.86	4.09
MAX	6.9	13	5.4	13	3.9	4.3	7.8	9.5	7.4	12	6.0	6.3
MIN	4.2	4.8	3.6	3.2	2.3	1.1	4.0	3.9	5.1	4.5	2.7	1.8
AC-FT	309	431	275	284	174	167	289	312	350	350	238	243

CAL YR 1986	TOTAL	1827.64	MEAN	5.01	MAX	23	MIN	.07	AC-FT	3630
WTR YR 1987	TOTAL	1725.5	MEAN	4.73	MAX	13	MIN	1.1	AC-FT	3420

16704000 WAILUKU RIVER AT PIIHONUA

LOCATION.--Lat 19°42'56", long 155°09'12", Hydrologic Unit 20010000, on right bank 0.2 mi downstream from Hookelekele Stream, 0.9 mi west of Piihonua, and 4.1 mi west of Hilo Post Office. Prior to Nov. 16, 1977, at opposite site on left bank.

DRAINAGE AREA.--230 mi^2, of which 81 mi^2 probably is noncontributing.

PERIOD OF RECORD.--July 1928 to July 1940, October 1940 to December 1947, April 1948 to current year. Monthly discharge only July 1928, published in WSP 1319. Prior to July 1960, published as "above Hilo Boarding School ditch intake, near Hilo."

REVISED RECORDS.--WSP 865: 1929-36(M). WSP 985: 1941. WDR HI-80-1: 1929-79(P). WDR HI-81-1: 1940(M).

GAGE.--Water-stage recorder. Elevation of gage is 1,090 ft, from topographic map. Prior to Nov. 16, 1977, at opposite site on left bank at same datum.

REMARKS.--Records fair except for estimated daily discharges, which are poor. Hawaii County Department of Water Supply diverts about 6 ft^3/s upstream for domestic supply. Kapehu ditch diverted from Kapehu Stream into Wailuku River upstream 1938-63. Periodic determinations of water temperature for the current year are published elsewhere in this report.

AVERAGE DISCHARGE.--56 years (water years 1929-39, 1942-47, 1949-87), 279 ft^3/s (202,100 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 80,200 ft^3/s, revised, Aug. 11, 1940, gage height, 28.8 ft, from floodmarks, from rating curve extended above 13,000 ft^3/s; minimum, 0.15 ft^3/s Jan. 20, 1981.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 8,700 ft^3/s and maximum (*), from rating curve extended as explained above:

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Nov. 10	2130	8,000	UNKNOWN	Nov. 13	2000	*11,700	UNKNOWN

Minimum discharge, 1.50 ft^3/s Mar. 16.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	e185	274	e175	e70	38	7.0	542	82	308	182	159	3.8
2	e165	489	e150	e60	29	6.3	679	312	415	148	116	4.2
3	358	203	e160	e50	23	5.6	268	402	217	298	90	4.0
4	172	138	e130	e30	22	4.2	156	752	143	291	74	8.5
5	178	105	e119	e35	20	3.5	99	729	579	220	83	9.5
6	228	144	105	e30	18	3.4	69	467	275	239	54	6.2
7	257	861	98	27	16	3.1	51	278	198	175	45	3.8
8	217	384	80	24	15	5.0	40	186	164	141	41	2.5
9	141	e600	69	20	13	5.7	36	136	244	140	35	2.5
10	111	e100	e50	91	12	4.7	33	120	199	100	31	9.8
11	89	e1200	e40	207	12	3.4	28	95	188	84	28	251
12	73	e3500	e100	1590	11	2.7	33	70	232	76	31	257
13	83	e4500	e70	907	10	2.2	65	58	319	79	25	228
14	58	e1300	e40	425	9.3	2.2	36	58	385	99	21	316
15	55	e900	e25	255	31	2.5	28	60	423	125	18	110
16	50	e800	e15	177	47	2.7	54	43	732	80	17	88
17	49	e700	e25	132	39	20	39	37	419	62	16	92
18	49	e450	e20	105	183	6.7	56	31	309	60	19	132
19	38	e700	e15	109	42	67	65	27	221	70	17	108
20	105	e2500	e20	74	26	313	156	24	251	724	17	97
21	90	e850	e25	60	26	63	97	20	298	796	15	75
22	50	e1100	e25	56	20	42	89	18	202	588	21	55
23	40	e700	e50	50	17	35	55	18	222	433	17	45
24	35	e600	e40	43	14	31	39	348	177	269	11	229
25	32	e400	e20	65	12	28	31	86	131	189	8.2	278
26	464	e350	e35	76	11	20	26	47	185	156	7.9	e250
27	285	e200	e25	47	9.9	18	26	35	249	122	7.1	e160
28	181	e180	e10	38	8.8	13	42	34	150	168	6.4	e130
29	117	e350	e20	45	---	11	37	389	135	129	5.4	e180
30	87	e200	e25	40	---	7.7	29	248	226	126	4.4	e120
31	70	---	e30	37	---	6.9	---	231	---	107	4.2	---
TOTAL	4092	25778	1809	4975	735.0	744.5	3004	5421	8196	6476	1024.6	3253.6
MEAN	132	859	58.4	160	26.2	24.0	100	175	273	209	33.1	108
MAX	464	4500	175	1590	183	313	679	752	732	796	159	316
MIN	32	105	10	20	8.8	2.2	26	18	131	60	4.2	2.5
AC-FT	8120	51130	3590	9870	1460	1480	5960	10750	16260	12850	2030	6450

CAL YR 1986	TOTAL	127966.96	MEAN	351	MAX	17000	MIN	.53	AC-FT	253800
WTR YR 1987	TOTAL	85508.7	MEAN	179	MAX	4500	MIN	2.2	AC-FT	129900

e Estimate

16713000 WAILUKU RIVER AT HILO

(National stream-quality accounting network station)

LOCATION.--Lat 19°43'43", long 155°05'40", Hydrologic Unit 20010000, on right bank 500 ft upstream from Wailuku bridge and 0.2 mi west of Hilo Post Office.

DRAINAGE AREA.--256 mi^2, of which 81 mi^2 probably is noncontributing.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--March 1977 to September 1979, June 1980 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 80 ft, from topographic map.

REMARKS.--Records good except for estimated daily discharges, which are fair. Hilo Electric Light Co. diverts upstream for Hydro-plant use.

AVERAGE DISCHARGE.--9 years (water years 1978, 1979, 1981-87), 386 ft^3/s (279,700 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 65,500 ft^3/s Nov. 17, 1979, gage height, 34.57 ft, from floodmarks and from rating curve extended above 6,840 ft^3/s on basis of slope-area measurements at gage heights 23.30 ft and 34.57 ft; minimum, 4.6 ft^3/s July 17, 1981.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 9,500 ft^3/s and maximum (*), from rating curve extended as explained above:

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Nov. 10	2200	18,000	16.45	Nov. 20	0130	16,100	15.80
Nov. 13	2030	*22,500	*18.40				

Minimum discharge, 12 ft^3/s, Mar. 29, 30.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	388	478	325	114	24	46	1100	99	612	410	322	40
2	334	795	286	105	39	43	1380	656	765	358	235	39
3	620	334	310	98	30	42	494	780	400	696	179	37
4	340	204	248	71	37	39	258	2460	262	660	141	42
5	355	148	186	74	45	37	144	1380	1130	491	114	50
6	e400	259	155	63	38	34	82	865	512	533	83	42
7	e420	1580	133	64	32	34	57	522	376	388	68	35
8	e370	797	100	58	31	44	43	370	316	304	57	32
9	e300	900	76	49	28	42	33	260	498	301	43	34
10	e250	2130	61	265	26	39	31	224	421	210	28	41
11	e175	2310	57	589	24	35	25	179	394	177	26	871
12	e150	5260	186	3830	45	32	24	123	507	157	27	726
13	e140	6790	120	1320	51	26	136	91	715	158	30	614
14	e130	2760	63	745	48	30	61	88	750	178	30	888
15	e120	1460	41	438	64	35	42	91	862	250	27	358
16	e110	1100	30	310	144	33	105	55	1560	144	25	301
17	e105	1090	45	226	113	83	71	39	810	99	23	289
18	e105	720	42	179	470	51	108	29	636	87	24	385
19	e 90	1140	28	214	136	137	139	31	488	117	25	340
20	e150	4750	30	116	88	690	340	27	516	1890	25	304
21	e100	1460	34	83	80	190	125	47	640	1760	24	280
22	e64	2190	45	67	71	141	123	64	432	1260	50	212
23	e48	1110	93	51	64	116	66	61	470	925	48	190
24	e35	985	71	33	60	79	27	1040	379	600	34	874
25	e28	680	46	87	54	26	22	316	280	435	26	597
26	e650	640	58	136	52	15	24	200	385	361	24	504
27	e400	540	38	42	51	17	38	157	540	272	23	325
28	334	435	24	26	48	14	79	148	334	355	22	266
29	194	620	38	49	---	12	76	1100	310	285	19	384
30	134	400	50	37	---	16	43	477	505	255	36	238
31	99	---	53	26	---	17	---	540	---	212	42	---
TOTAL	7134	44065	3074	9565	1993	2195	5296	12519	16805	14308	1880	9098
MEAN	230	1469	99.2	309	71.2	70.8	177	404	560	462	60.6	303
MAX	650	6790	325	3830	470	690	1380	2460	1560	1890	322	888
MIN	26	148	24	26	24	12	22	27	262	87	19	32
AC-FT	14150	87400	6100	18970	3950	4350	10500	24830	33330	28380	3730	18050

CAL YR 1986	TOTAL	214990.5	MEAN	589	MAX	21100	MIN	7.9	AC-FT	426400
WTR YR 1987	TOTAL	127932	MEAN	350	MAX	6790	MIN	12	AC-FT	253800

e Estimate

16713000 WAILUKU RIVER AT HILO--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--March 1977 to current year.

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	TEMPER-ATURE WATER (DEG C)	DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	TEMPER-ATURE WATER (DEG C)
OCT				APR			
24...	1345	34	20.0	24...	1430	26	19.0
DEC				MAY			
16...	1035	29	16.0	16...	1335	28	20.0
FEB				AUG			
04...	1450	28	19.0	12...	1330	30	20.0
MAR				26...	1330	22	19.5
28...	1035	15	19.0				

DATE	TIME	BARO-METRIC PRES-SURE (MM OF HG)	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH (STAND-ARD UNITS)	TEMPER-ATURE WATER (DEG C)	TUR-BID-ITY (FTU)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION)	COLI-FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)	STREP-TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML)	HARD-NESS TOTAL (MG/L AS CACO3)
OCT												
27...	0815	755	664	26	5.90	19.0	3.6	9.1	99	5700	2800	9
DEC												
08...	0900	755	105	56	7.20	17.0	0.30	9.4	98	33	340	23
FEB												
23...	0900	755	64	58	6.50	18.0	1.2	9.2	98	140	1200	21
APR												
20...	0800	755	488	44	6.10	19.0	0.50	9.0	98	K430	980	15
JUN												
22...	0700	755	428	49	6.20	18.5	1.0	9.1	98	90	610	15
AUG												
18...	0800	755	24	78	6.80	19.5	0.20	9.0	99	160	1900	32

DATE	HARD-NESS NONCARB-ONATE MG/L AS CACO3	CALCIUM DIS-SOLVED (MG/L AS CA)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG)	SODIUM, DIS-SOLVED (MG/L AS NA)	SODIUM PERCENT	SODIUM AD-SORP-TION RATIO	POTAS-SIUM, DIS-SOLVED (MG/L AS K)	BICAR-BONATE WATER WH FET FIELD MG/L AS HCO3	ALKA-LINITY LAB (MG/L AS CACO3)	ALKA-LINITY WAT WH TOT FET FIELD MG/L AS CACO3	SULFATE DIS-SOLVED (MG/L AS SO4)
OCT											
27...	2	1.7	1.1	1.8	29	0.3	0.50	9	9.0	7	5.2
DEC											
08...	1	5.0	2.5	3.6	25	0.3	0.50	28	20	22	3.2
FEB											
23...	1	4.1	2.6	3.4	28	0.3	0.50	24	20	20	0.30
APR											
20...	0	2.9	1.9	2.8	28	0.3	0.40	18	5.0	15	2.9
JUN											
22...	0	3.0	1.7	2.6	28	0.3	0.30	14	14	16	4.9
AUG											
18...	4	6.9	3.5	4.7	--	0.4	--	--	28	--	3.8

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

16713000 WAILUKU RIVER AT HILO--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	CHLORIDE, DISSOLVED (MG/L AS CL)	FLUORIDE, DISSOLVED (MG/L AS F)	SILICA, DISSOLVED (MG/L AS SIO2)	SOLIDS, RESIDUE AT 180 DEG. C DISSOLVED (MG/L)	SOLIDS, SUM OF CONSTITUENTS, DISSOLVED (MG/L)	SOLIDS, DISSOLVED (TONS PER AC-FT)	NITROGEN, NO2+NO3 DISSOLVED (MG/L AS N)	NITROGEN, NITRITE DISSOLVED (MG/L AS N)	NITROGEN, AMMONIA TOTAL (MG/L AS N)	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)	PHOSPHOROUS TOTAL (MG/L AS P)
OCT											
27...	2.1	<0.10	6.1	31	23	0.04	--	--	--	--	--
DEC											
08...	5.3	<0.10	14	51	48	0.07	0.140	<0.010	<0.010	<0.20	<0.010
FEB											
23...	4.4	<0.10	12	39	40	0.05	0.200	<0.050	0.040	0.90	0.050
APR											
20...	3.8	<0.10	8.6	42	32	0.06	<0.100	<0.010	0.070	0.40	0.010
JUN											
22...	3.5	<0.10	9.1	42	33	0.06	0.100	<0.010	0.100	0.60	0.010
AUG											
18...	5.6	0.20	17	57	59	0.08	0.170	<0.010	0.010	0.50	0.010

DATE	PHOSPHOROUS DISSOLVED (MG/L AS P)	PHOSPHOROUS ORTHO, DISSOLVED (MG/L AS P)	ALUMINUM, DISSOLVED (UG/L AS AL)	ARSENIC DISSOLVED (UG/L AS AS)	BARIUM, DISSOLVED (UG/L AS BA)	BERYLLIUM, DISSOLVED (UG/L AS BE)	CADMIUM DISSOLVED (UG/L AS CD)	CHROMIUM, DISSOLVED (UG/L AS CR)	COBALT, DISSOLVED (UG/L AS CO)	COPPER, DISSOLVED (UG/L AS CU)	IRON, DISSOLVED (UG/L AS FE)
DEC											
08...	0.010	<0.010	10	<1	5	<0.5	<1	<1	<3	2	29
FEB											
23...	0.020	0.010	20	<1	5	0.7	<1	<1	<3	2	61
APR											
20...	0.010	<0.010	--	--	--	--	--	--	--	--	--
JUN											
22...	0.030	<0.010	70	<1	6	0.5	1	<1	<3	1	90
AUG											
18...	0.010	<0.010	20	1	6	<0.5	<1	<1	<3	2	29

DATE	LEAD, DISSOLVED (UG/L AS PB)	LITHIUM DISSOLVED (UG/L AS LI)	MANGANESE, DISSOLVED (UG/L AS MN)	MERCURY DISSOLVED (UG/L AS HG)	MOLYBDENUM, DISSOLVED (UG/L AS MO)	NICKEL, DISSOLVED (UG/L AS NI)	SELENIUM, DISSOLVED (UG/L AS SE)	SILVER, DISSOLVED (UG/L AS AG)	STRONTIUM, DISSOLVED (UG/L AS SR)	VANADIUM, DISSOLVED (UG/L AS V)	ZINC, DISSOLVED (UG/L AS ZN)
DEC											
08...	<5	<4	3	0.1	<10	2	<1	<1.0	27	<6	10
FEB											
23...	--	<4	2	<0.1	<10	3	<1	<1.0	29	<6	5
JUN											
22...	<5	4	2	<0.1	<10	2	<1	<1.0	20	<6	7
AUG											
18...	<5	<4	4	<0.1	<10	<1	<1	<1.0	37	<6	39

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

16713000 WAILUKU RIVER AT HILO--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	SEDIMENT, SUSPENDED (MG/L)	SEDIMENT, DISCHARGE, SUSPENDED (T/DAY)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM
OCT				
27...	0815	9	16	100
DEC				
08...	0900	1	0.28	100
FEB				
23...	0900	1	0.17	100
APR				
20...	0800	1	1.3	100
JUN				
22...	0700	1	1.2	100
AUG				
18...	0800	1	0.06	100

16717000 HONOLII STREAM NEAR PAPAIKOU

(Hydrologic bench-mark station)

LOCATION.--Lat 19°46'00", long 155°09'16", Hydrologic Unit 20010000, on left bank 0.7 mi downstream from Pohakupaa Stream, 4.1 mi west of Papaikou, and 4.8 mi northwest of Hilo Post Office.

DRAINAGE AREA.--11.6 mi^2.

WATER- DISCHARGE RECORDS

PERIOD OF RECORD.--June 1911 to March 1913 (publiahed as "at Kaiwiki, near Hilo"), February 1967 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 1,540 ft, from topographic map. Prior to Aug. 27, 1911, nonrecording gage and Aug. 27, 1911 to Mar. 24, 1913, water-stage recorder, at site 0.5 mi upstream at different datum.

REMARKS.--Records fair. No diversion upstream. During period 1911-13, Honolii ditch diverted an average of about 3.2 ft^3/s upstream for fluming cane and domestic uae.

AVERAGE DISCHARGE.--21 years, 125 ft^3/s (90,560 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 22,600 ft^3/s May 23, 1978, gage height, 20.00 ft, from floodmarks and from rating curve extended above 4,610 ft^3/s on basia of alope-area measurement at gage height 20.00 ft; minimum, 0.8 ft^3/s Jan. 31, 1912.

EXTREMES FOR CURRENT YEAR.--Peak dischargea greater than bese discharge of 4,400 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/a)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Nov. 10	2100	5,980	13.48	Nov. 20	0100	*6,420	*13.92
Nov. 13	1900	6,280	13.78	Sspt. 11	1500	5,670	13.17

Minimum discharge, 12 ft^3/s, Mar. 6, 7, 13, 14.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	53	240	91	60	34	15	833	120	172	108	94	17
2	42	249	102	53	29	14	618	413	147	124	79	17
3	73	86	147	49	26	14	163	281	80	295	56	16
4	44	54	103	35	25	13	86	1020	64	170	47	16
5	69	42	69	40	23	13	52	292	410	130	42	17
6	168	75	62	31	22	13	42	120	107	165	36	17
7	149	592	59	34	21	12	35	94	90	100	33	16
8	92	151	48	28	20	16	30	73	103	87	37	15
9	55	133	46	25	19	22	34	62	143	84	28	16
10	43	818	42	274	18	18	35	64	130	63	26	47
11	36	573	42	633	18	15	33	59	128	60	28	657
12	30	1520	96	2090	17	13	37	49	155	64	30	177
13	27	1700	67	316	17	12	69	43	242	66	27	208
14	28	586	47	150	16	13	46	42	259	95	24	280
15	31	259	40	85	17	15	46	44	312	93	22	77
16	28	180	37	65	24	27	83	38	615	67	22	86
17	27	216	45	55	97	57	55	36	151	57	27	85
18	27	107	40	51	204	24	93	31	128	55	37	110
19	22	600	33	115	42	129	109	28	121	146	28	95
20	133	1460	29	51	28	269	164	27	172	683	31	91
21	75	262	31	43	24	66	71	25	160	551	25	59
22	36	530	41	44	21	52	70	23	104	248	32	48
23	26	136	66	44	18	48	52	23	127	154	26	40
24	23	146	47	38	17	51	39	536	106	103	22	83
25	22	105	42	103	17	39	33	104	82	77	20	98
28	600	142	51	116	16	37	29	57	128	69	20	70
27	179	136	36	60	15	51	33	45	134	57	20	50
28	122	115	28	44	15	29	70	41	84	67	19	67
29	61	148	25	55	---	23	73	287	86	72	18	64
30	44	98	23	45	---	20	57	119	140	68	17	211
31	37	---	37	41	---	19	---	202	---	61	17	---
TOTAL	2402	11459	1672	4873	860	1159	3190	4398	4880	4259	990	2850
MEAN	77.5	382	53.9	157	30.7	37.4	106	142	163	137	31.9	95.0
MAX	600	1700	147	2090	204	269	833	1020	615	683	94	657
MIN	22	42	23	25	15	12	29	23	64	55	17	15
AC-FT	4760	22730	3320	9670	1710	2300	6330	8720	9680	8450	1960	5650

CAL YR 1986	TOTAL	61063.0	MEAN	167	MAX	5640	MIN	5.4	AC-FT	121100
WTR YR 1987	TOTAL	42992	MEAN	118	MAX	2090	MIN	12	AC-FT	85270

16717000 HONOLII STREAM NEAR PAPAIKOU--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--September 1969 to current year.

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	TEMPER-ATURE WATER (DEG C)	DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	TEMPER-ATURE WATER (DEG C)
OCT				MAR			
02...	1405	38	19.0	13...	0930	12	17.0
DEC				APR			
08...	0855	47	17.0	08...	0935	32	19.0
JAN				AUG			
07...	1405	34	19.0	13...	0945	29	19.0
FEB				SEP			
23...	0900	18	16.5	08...	1005	15	18.5

DATE	TIME	BARO-METRIC PRES-SURE (MM OF HG)	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH (STAND-ARD UNITS)	TEMPER-ATURE WATER (DEG C)	TUR-BID-ITY (FTU)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION)	COLI-FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)	STREP-TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML)
OCT											
27...	0730	724	216	17	5.50	18.0	3.5	8.9	99	1600	1000
DEC											
08...	0800	724	46	46	6.90	16.0	0.50	9.2	98	K11	110
FEB											
23...	0800	724	18	73	6.70	18.5	0.60	9.2	99	41	930
APR											
20...	0700	724	202	24	5.60	17.0	2.2	9.0	98	160	590
AUG											
18...	0700	724	36	62	6.40	19.0	0.40	8.7	99	K32	1600

DATE	HARD-NESS TOTAL (MG/L AS CACO3)	HARD-NESS NONCARB-ONATE (MG/L AS CACO3)	CALCIUM DIS-SOLVED (MG/L AS CA)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG)	SODIUM, DIS-SOLVED (MG/L AS NA)	SODIUM PERCENT	SODIUM AD-SORP-TIOH RATIO	POTAS-SIUM, DIS-SOLVED (MG/L AS K)	BICAR-BONATE WATER WH FET FIELD MG/L AS HCO3	ALKA-LINITY LAB (MG/L AS CACO3)	ALKA-LINITY WAT WH TOT FET FIELD MG/L AS CACO3
OCT											
27...	5	1	1.0	0.70	1.2	31	0.2	0.40	--	4.0	--
DEC											
08...	16	1	3.8	2.0	2.5	23	0.3	0.40	21	18	17
FEB											
23...	31	1	6.4	3.6	3.5	20	0.3	0.40	37	32	30
APR											
20...	6	0	1.0	0.75	1.9	41	0.4	0.30	14	15	12
AUG											
18...	24	0	4.9	2.9	3.2	--	0.3	--	--	26	--

< 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).

16717000 HONOLII STREAM NEAR PAPAIKOU--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

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 AC-FT)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N)	NITRO- GEN, AM- MONIA + ORGANIC TOTAL (MG/L AS N)
OCT											
27...	--	1.6	<0.10	2.6	22	18	--	<0.100	<0.010	0.150	0.40
DEC											
08...	3.8	3.0	<0.10	11	40	37	0.05	<0.100	<0.010	0.080	<0.20
FEB											
23...	0.30	3.2	<0.10	17	50	53	0.07	<0.100	<0.010	<0.010	0.40
APR											
20...	--	3.1	<0.10	3.0	32	--	--	<0.100	<0.010	0.040	0.30
AUG											
18...	3.9	3.0	0.40	15	42	49	0.06	<0.100	<0.010	0.060	0.40

DATE	PHOS- PHOROUS TOTAL (MG/L AS P)	PHOS- PHOROUS DIS- SOLVED (MG/L AS P)	PHOS- PHOROUS ORTHO, DIS- SOLVED (MG/L AS P)	ALUM- INUM, DIS- SOLVED (UG/L AS AL)	ARSENIC DIS- SOLVED (UG/L AS AS)	BARIUM, DIS- SOLVED (UG/L AS BA)	BERYL- LIUM, DIS- SOLVED (UG/L AS BE)	CADMIUM DIS- SOLVED (UG/L AS CD)	CHRO- MIUM, DIS- SOLVED (UG/L AS CR)	COBALT, DIS- SOLVED (UG/L AS CO)	COPPER, DIS- SOLVED (UG/L AS CU)
OCT											
27...	<0.010	0.010	<0.010	200	<1	5	<0.5	<1	<1	<3	5
DEC											
08...	0.020	<0.010	<0.010	--	--	--	--	--	--	--	--
FEB											
23...	0.010	0.010	0.020	40	<1	4	0.7	<1	<1	<3	1
APR											
20...	0.010	0.020	<0.010	--	--	--	--	--	--	--	--
AUG											
18...	0.010	0.010	<0.010	40	<1	5	<0.5	<1	<1	<3	1

DATE	IRON, DIS- SOLVED (UG/L AS FE)	LEAD, DIS- SOLVED (UG/L AS PB)	LITHIUM DIS- SOLVED (UG/L AS LI)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	MERCURY DIS- SOLVED (UG/L AS HG)	MOLYB- DENUM, DIS- SOLVED (UG/L AS MO)	NICKEL, DIS- SOLVED (UG/L AS NI)	SELE- NIUM, DIS- SOLVED (UG/L AS SE)	SILVER, DIS- SOLVED (UG/L AS AG)	STRON- TIUM, DIS- SOLVED (UG/L AS SR)	VANA- DIUM, DIS- SOLVED (UG/L AS V)
OCT											
27...	330	<5	<4	11	<0.1	<10	1	<1	<1.0	10	<6
FEB											
23...	43	<5	<4	2	<0.1	<10	1	<1	<1.0	41	<6
AUG											
18...	110	<5	<4	2	<0.1	--	3	<1	<1.0	32	<6

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

16717000 HONOLII STREAM NEAR PAPAIKOU--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	ZINC, DIS-SOLVED (UG/L AS ZN)	GROSS ALPHA, DIS-SOLVED (UG/L AS U-NAT)	GROSS ALPHA, SUSP. TOTAL (UG/L AS U-NAT)	GROSS BETA, DIS-SOLVED (PCI/L AS CS-137)	GROSS BETA, SUSP. TOTAL (PCI/L AS CS-137)	GROSS BETA, DIS-SOLVED (PCI/L AS SR/YT-90)	GROSS BETA, SUSP. TOTAL (PCI/L AS SR/YT-90)	RADIUM 226, DIS-SOLVED, RADON METHOD (PCI/L)	URANIUM NATURAL DIS-SOLVED (UG/L AS U)	URANIUM DIS-SOLVED, EXTRAC-TION (UG/L)
OCT										
27...	6	--	--	--	--	--	--	--	--	--
DEC										
08...	--	<0.4	<0.4	0.7	<0.4	0.7	<0.4	0.03	--	<0.01
FEB										
23...	9	--	--	--	--	--	--	--	--	--
AUG										
18...	5	<0.4	<0.4	0.6	<0.4	0.6	<0.4	<0.02	0.01	--

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				
27...	0730	3	1.7	100
DEC				
08...	0800	0	0.0	100
FEB				
23...	0800	1	0.05	100
APR				
20...	0700	3	1.6	100
AUG				
18...	0700	1	0.10	100

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

16720000 KAWAINUI STREAM NEAR KAMUELA

LOCATION.--Lat 20°05'18", long 155°40'58", Hydrologic Unit 20010000, on left bank 250 ft upstream from Upper Hamakua ditch intake and 4.5 mi north of Kamuela.

DRAINAGE AREA.--1.58 mi^2.

PERIOD OF RECORD.--January 1964 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 4,060 ft, from topographic map.

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

AVERAGE DISCHARGE.--23 years, 14.8 ft^3/s (10,720 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 3,160 ft^3/s Nov. 18, 1979, gage height, 10.03 ft, from rating curve extended above 53 ft^3/s on basis of computations of peak flow over dam and slope-area measurement at gage height 10.03 ft; minimum, 0.01 ft^3/s Jan. 20, 21, 24-28, Feb. 20-22, 1977, Dec. 16-20, 1977, Feb. 23, 24, 1980.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 440 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Jan. 10	0530	514	5.28	Apr. 1	0430	550	5.40
Jan. 18	2330	*793	*6.18	Apr. 22	0230	737	6.02

Minimum discharge, 0.38 ft^3/s Oct. 1.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.56	16	50	5.2	2.7	1.2	187	51	8.3	43	39	.99
2	.93	12	140	54	2.2	4.0	68	65	3.5	26	8.4	.84
3	.67	3.8	136	17	1.8	10	41	30	2.5	40	3.6	.77
4	3.3	2.3	37	4.3	1.5	2.6	8.6	54	2.0	49	2.6	.74
5	7.0	1.8	7.8	6.1	1.5	1.9	4.1	51	3.9	58	2.0	.82
6	55	1.5	95	3.1	1.4	1.5	10	31	10	18	1.7	.70
7	59	1.8	9.3	2.2	1.3	1.4	6.5	112	8.9	8.2	1.6	.67
8	7.0	1.6	4.1	1.9	1.2	9.2	3.2	21	8.1	15	3.1	.70
9	3.1	10	5.9	1.6	1.1	4.4	2.6	6.4	9.2	41	2.5	1.5
10	2.1	7.0	6.8	198	.97	2.3	2.8	3.8	21	18	7.5	1.3
11	1.5	25	36	204	.88	1.7	2.6	3.0	53	17	13	5.2
12	1.2	62	18	178	.80	1.4	3.0	2.5	25	14	31	11
13	1.4	23	5.9	21	.75	1.2	4.5	2.1	28	34	5.6	54
14	8.4	31	5.9	28	2.5	1.2	19	2.0	10	107	2.8	5.7
15	8.7	28	4.8	30	3.2	3.3	58	2.1	57	23	2.0	2.9
16	16	22	3.0	28	4.9	11	44	1.8	84	7.5	2.2	2.2
17	12	26	9.6	6.8	78	6.0	24	1.6	20	5.4	2.1	1.9
18	3.3	5.7	6.6	104	48	16	35	1.4	7.1	5.8	2.1	17
19	2.6	37	3.3	47	25	28	19	1.3	10	9.8	1.7	14
20	28	67	2.3	6.8	21	19	24	1.2	57	66	1.9	5.3
21	12	15	26	4.3	5.0	15	20	1.1	37	23	8.3	2.7
22	3.4	18	9.3	21	2.9	11	117	1.1	27	8.8	4.9	1.9
23	2.3	5.9	15	7.3	2.1	18	7.0	1.1	27	3.9	2.4	2.1
24	1.8	9.0	5.7	4.3	1.7	6.4	3.7	95	5.7	2.8	1.8	2.6
25	30	5.2	8.1	46	5.5	4.0	2.7	23	3.9	2.2	1.7	1.7
26	94	7.8	3.8	45	3.2	3.2	4.9	44	22	1.9	4.2	1.3
27	26	27	2.6	7.0	2.0	6.5	51	18	37	3.6	2.7	1.1
28	21	27	2.1	3.4	1.5	7.7	34	10	9.1	12	1.9	.98
29	5.0	57	1.8	9.6	---	4.2	8.5	16	32	9.5	1.5	.81
30	2.7	59	1.8	6.4	---	8.1	3.9	13	47	12	1.3	1.0
31	2.2	---	4.8	2.8	---	13	---	34	---	11	1.1	---
TOTAL	422.16	615.4	668.3	1104.1	224.60	224.6	819.6	700.5	676.2	696.4	168.2	144.42
MEAN	13.6	20.5	21.6	35.6	8.02	7.25	27.3	22.6	22.5	22.5	5.43	4.81
MAX	94	67	140	204	78	28	187	112	84	107	39	54
MIN	.56	1.5	1.8	1.6	.75	1.2	2.6	1.1	2.0	1.9	1.1	.67
AC-FT	837	1220	1330	2190	445	445	1630	1390	1340	1380	334	286

CAL YR 1986	TOTAL	7577.41	MEAN	20.8	MAX	463	MIN	.16	AC-FT	15030
WTR YR 1987	TOTAL	6464.48	MEAN	17.7	MAX	204	MIN	.56	AC-FT	12820

16720300 KAWAIKI STREAM NEAR KAMUELA

LOCATION.--Lat 20°05'13", long 155°40'59", Hydrologic Unit 20010000, on right bank 0.2 mi upstream from Upper Hamakua ditch intake and 4.4 mi north of Kamuela.

DRAINAGE AREA.--0.45 mi^2.

PERIOD OF RECORD.--June 1968 to current year.

REVISED RECORDS.--WDR HI-80-1: 1969-79(P).

GAGE.--Water-stage recorder. Elevation of gage is 4,090 ft, from topographic map.

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

AVERAGE DISCHARGE.--19 years, 4.27 ft^3/s (3,090 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,470 ft^3/s Nov. 18, 1979, gage height, 8.32 ft, from rating curve extended above 33 ft^3/s on basis of slope-area measurement at gage height 8.32 ft; minimum, 0.01 ft^3/s Mar. 10-15, 1983.

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

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Dec. 3	0200	123	2.92	Jan. 18	2230	*202	*3.61
Dec. 6	0530	198	3.59	Apr. 1	0230	137	3.07
Jan. 10	0630	157	3.27	Apr. 22	0300	192	3.55

Minimum discharge, 0.14 ft^3/s Oct. 1, 4.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.24	6.2	11	1.1	.35	.20	54	13	1.9	9.1	8.4	.23
2	.28	2.7	38	15	.31	2.4	15	15	.63	6.2	1.9	.22
3	.23	.66	34	2.5	.27	2.3	7.4	6.2	.45	10	.64	.20
4	2.1	.44	7.0	.60	.23	.47	1.4	12	.37	12	.47	.21
5	3.6	.34	1.8	.96	.24	.32	.57	9.9	1.5	14	.38	.23
6	15	.30	29	.45	.23	.23	2.0	5.2	4.8	3.6	.33	.20
7	17	.37	2.2	.31	.22	.21	1.1	23	2.9	2.0	.39	.20
8	2.6	.30	.85	.27	.20	2.8	.47	3.7	3.0	3.6	.96	.21
9	1.0	2.2	2.2	.23	.20	1.1	.39	.97	3.4	9.6	.58	.57
10	.56	1.6	2.3	49	.19	.42	.46	.61	6.5	4.1	4.3	.44
11	.40	7.0	8.9	55	.18	.29	.44	.50	16	3.7	4.4	1.5
12	.34	13	3.3	45	.18	.22	.79	.43	6.0	3.4	8.7	2.6
13	.49	4.8	1.1	2.7	.18	.20	1.5	.35	6.2	9.3	1.4	8.5
14	5.0	6.2	1.6	7.6	.32	.20	4.3	.33	1.9	31	.51	1.1
15	3.6	6.5	.96	6.6	.38	1.0	16	.34	16	4.8	.39	.52
16	5.5	4.3	.67	4.4	.78	2.4	9.7	.31	19	1.8	.45	.39
17	2.4	4.7	2.0	.85	19	1.5	4.2	.27	4.1	1.5	.39	.38
18	.57	.96	1.1	30	11	3.7	5.9	.28	1.3	1.8	.37	5.0
19	.50	12	.55	7.8	5.3	5.7	5.1	.23	2.2	4.9	.33	3.4
20	7.5	11	.40	.67	3.4	3.1	5.2	.23	15	26	.52	1.3
21	2.4	3.1	4.6	.55	.71	3.3	3.6	.23	7.7	5.0	2.8	.53
22	.59	3.8	1.4	4.6	.41	2.3	27	.23	7.2	2.2	1.5	.35
23	.39	1.3	3.1	.96	.31	3.3	1.0	.28	5.2	.74	.51	.82
24	.30	2.1	.96	.75	.25	1.4	.51	26	.82	.53	.37	.80
25	4.3	1.0	1.4	11	1.6	.74	.38	4.3	.80	.44	.73	.46
26	23	1.7	.55	6.5	.48	.55	.72	9.9	8.8	.40	1.6	.33
27	5.0	6.3	.35	.96	.29	.66	12	3.8	9.1	1.0	.58	.27
28	5.2	8.8	.31	.50	.22	.83	7.1	3.0	2.2	3.4	.38	.23
29	.81	12	.27	2.7	---	.59	1.7	5.2	8.7	2.1	.30	.22
30	.46	19	.27	.67	---	2.1	.62	4.8	10	3.0	.27	.34
31	.38	---	.96	.45	---	4.2	---	8.3	---	2.9	.23	---
TOTAL	111.74	142.47	163.10	260.68	47.43	48.73	180.55	158.87	171.67	184.11	45.08	31.55
MEAN	3.60	4.75	5.26	8.41	1.69	1.57	6.35	5.12	5.72	5.94	1.45	1.05
MAX	23	19	38	55	19	5.7	54	26	19	31	8.7	8.5
MIN	.23	.30	.27	.23	.18	.20	.38	.23	.37	.40	.23	.20
AC-FT	222	283	324	517	94	97	378	315	341	365	89	63

CAL YR 1986	TOTAL	1920.52	MEAN	5.26	MAX	119	MIN	.13	AC-FT	3810
WTR YR 1987	TOTAL	1555.98	MEAN	4.26	MAX	55	MIN	.18	AC-FT	3090

16720500 UPPER HAMAKUA DITCH BELOW KAWAIKI STREAM, NEAR KAMUELA

LOCATION.--Lat 20°05'15", long 155°40'42", Hydrologic Unit 20010000, on right bank 800 ft downstream from Kawaiki Stream intake and 4.4 mi north of Kamuela.

PERIOD OF RECORD.--January 1964 to current year.

GAGE.--Water-stage recorder and concrete control. Elevation of gage is 4,020 ft, from topographic map.

REMARKS.--Records good except for estimated daily discharges, Dec. 11 to 22, which are fair. Ditch diverts from Kawainui and Kawaiki Streams for irrigation in vicinity of Kamuela. Recording rain gage located at station. Periodic determinations of water temperature for the current year are published elsewhere in this report.

AVERAGE DISCHARGE.--23 years, 7.10 ft^3/s (5,140 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 49 ft^3/s Nov. 2, 1967; no flow Nov. 18, 1979 to Oct. 23, 1980.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 20 ft^3/s Jan. 11; minimum daily, 0.45 ft^3/s Feb.13, Sept. 8.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.62	15	17	7.0	2.6	.78	19	15	9.9	16	16	.67
2	.89	13	18	13	1.8	1.8	17	16	3.6	16	11	.62
3	.78	4.4	18	14	1.3	9.7	16	16	2.3	16	4.1	.56
4	5.0	2.7	17	4.8	1.0	2.5	10	16	1.7	16	2.7	.56
5	11	1.8	10	7.7	.94	1.6	4.3	16	5.9	17	2.0	.67
6	17	1.4	16	3.5	.89	1.0	12	14	13	15	1.5	.50
7	17	1.8	11	2.3	.78	.89	8.4	17	10	11	1.6	.50
8	9.6	1.4	5.0	1.7	.67	11	3.4	14	8.9	11	4.0	.45
9	3.8	10	8.9	1.3	.67	5.6	2.4	7.1	13	16	2.7	1.5
10	2.3	8.9	9.3	17	.62	2.1	2.9	4.1	16	15	8.7	1.3
11	1.4	12	e15	20	.56	1.3	2.7	2.9	16	13	14	5.9
12	1.1	17	e10	19	.50	.94	3.8	2.3	15	14	16	11
13	1.3	14	e7.0	15	.45	.84	6.2	1.7	15	16	7.2	16
14	12	17	e7.0	15	1.9	.72	15	1.7	12	17	2.9	7.4
15	11	16	e5.5	15	2.9	3.6	16	1.8	16	16	2.0	2.9
16	9.1	13	e4.0	16	3.1	13	16	1.4	17	10	2.0	1.9
17	12	15	e10	8.0	17	8.0	15	1.2	15	7.1	1.9	1.7
18	3.8	7.0	e7.0	11	16	7.6	16	.94	8.6	8.2	1.9	7.0
19	2.9	12	e4.5	16	16	16	13	.89	12	11	1.4	15
20	12	17	e3.0	8.2	15	14	15	.89	15	17	1.8	7.2
21	12	15	e12	4.8	5.6	15	9.2	.84	16	16	11	2.9
22	4.1	15	e10	16	2.6	12	16	.78	15	11	6.6	1.6
23	2.3	8.2	13	9.3	1.7	14	8.0	1.7	15	4.7	2.3	2.2
24	1.6	12	7.0	5.0	1.3	8.0	3.6	17	6.4	3.1	1.4	3.2
25	4.0	6.5	10	16	6.3	4.3	2.5	14	4.3	2.3	1.7	1.6
26	17	10	4.1	16	3.0	3.2	5.6	15	15	2.0	6.0	1.1
27	16	16	2.6	8.2	1.6	7.4	16	14	16	4.6	2.7	.84
28	16	16	1.9	3.8	.94	8.8	16	8.4	10	13	1.5	.72
29	5.9	17	1.5	12	---	4.3	10	15	16	9.4	1.0	.62
30	3.0	17	1.4	5.0	---	10	4.1	14	16	14	.84	.89
31	2.1	---	6.9	2.7	---	5.9	---	16	---	12	.72	---
TOTAL	218.59	333.1	273.6	314.3	107.72	196.07	305.1	267.64	355.6	370.4	139.18	99.00
MEAN	7.05	11.1	8.83	10.1	3.85	6.32	10.2	8.63	11.9	11.9	4.49	3.30
MAX	17	17	18	20	17	16	19	17	17	17	16	18
MIN	.62	1.4	1.4	1.3	.45	.72	2.4	.78	1.7	2.0	.72	.45
AC-FT	434	661	543	623	214	389	605	531	705	735	276	196

CAL YR 1986	TOTAL	2893.41	MEAN	7.93	MAX	23	MIN	.24	AC-FT	5740
WTR YR 1987	TOTAL	2980.28	MEAN	8.17	MAX	20	MIN	.45	AC-FT	5910

e Estimated

16724800 UPPER HAMAKUA DITCH ABOVE ALAKAHI STREAM, NEAR KAMUELA

LOCATION.--Lat 20°04'31", long 155°40'26", Hydrologic Unit 20010000, on right bank 0.1 mi upstream from Alakahi Stream and 3.6 mi north of Kamuela.

PERIOD OF RECORD.--April 1968 to current year.

GAGE.--Water-stage recorder and concrete control. Elevation of gage is 3,880 ft, from topographic map.

REMARKS.--Records good. Ditch diverts from Kawainui and Kawaiki Streams for irrigation in vicinity of Kamuela. Periodic determinations of water temperature for the current year are published elsewhere in this report.

AVERAGE DISCHARGE.--19 years, 4.98 ft^3/s (3,610 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 41 ft^3/s Aug. 18, 1972; no flow at times.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 22 ft^3/s Jan. 11; no flow for many days.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	6.3	10	2.9	1.9	.01	18	8.4	5.5	9.7	7.5	.00
2	.00	5.3	15	6.5	1.2	.30	11	11	2.1	9.0	5.0	.00
3	.00	1.8	16	6.9	.80	3.5	9.1	9.2	1.1	9.9	2.2	.00
4	.57	.59	11	2.6	.54	.84	5.5	10	.63	10	1.3	.00
5	3.0	.17	6.5	3.5	.45	.23	2.5	11	1.9	11	.76	.00
6	7.6	.02	13	1.5	.29	.02	5.5	8.8	5.2	9.1	.38	.00
7	9.4	.09	7.7	.70	.17	.01	4.1	14	4.8	6.5	.32	.00
8	4.6	.01	3.7	.45	.08	3.2	1.6	9.9	3.9	6.4	1.5	.00
9	1.5	2.7	5.3	.16	.03	2.1	1.0	5.4	5.4	10	.90	.00
10	.47	3.2	5.4	13	.02	.42	1.1	3.2	7.2	8.6	1.9	.00
11	.10	4.6	10	22	.01	.04	1.0	2.2	10	7.3	4.6	.27
12	.00	8.4	8.9	21	.01	.00	1.3	1.6	8.1	7.6	6.7	1.4
13	.01	6.4	5.0	12	.01	.00	2.6	1.1	8.0	9.8	3.2	4.3
14	4.0	7.6	4.7	13	.11	.00	5.7	.83	5.8	15	1.1	2.1
15	4.0	7.5	4.0	12	.54	.40	8.6	.88	10	10	.48	.38
16	3.2	5.7	2.1	12	.50	3.5	8.8	.48	11	6.9	.49	.02
17	4.7	7.1	5.9	6.1	10	2.8	7.4	.25	8.7	4.7	.29	.00
18	1.3	3.2	4.6	12	9.6	2.5	7.9	.12	5.1	5.3	.27	.84
19	.64	6.1	2.3	13	8.0	5.7	7.3	.07	6.3	6.4	.05	3.2
20	4.4	8.9	1.2	6.5	7.4	5.5	8.1	.03	9.2	12	.19	1.7
21	4.9	6.9	7.7	4.0	3.1	5.7	4.8	.02	9.3	9.8	2.7	.28
22	1.6	7.1	5.4	9.6	1.3	4.6	12	.00	8.7	7.0	2.3	.00
23	.43	3.5	6.1	6.3	.64	5.7	5.0	.13	8.4	3.4	.53	.04
24	.08	5.0	3.8	3.8	.26	3.5	2.4	11	3.8	2.2	.11	.17
25	1.3	3.0	4.6	12	2.1	2.5	1.4	6.7	2.5	1.5	.07	.00
26	10	4.1	2.4	12	1.3	1.4	2.8	8.2	7.9	1.1	1.3	.00
27	7.2	7.4	1.2	6.1	.35	2.1	9.7	7.2	9.1	1.7	.41	.00
28	7.1	7.3	.70	3.1	.05	3.3	9.3	4.5	5.6	5.5	.07	.00
29	2.7	9.3	.40	6.9	---	1.8	5.9	7.5	9.2	3.9	.00	.00
30	.90	11	.28	3.6	---	3.5	2.7	7.0	9.7	5.8	.00	.00
31	.34	---	2.1	2.1	---	2.9	---	6.9	---	5.1	.00	---
TOTAL	86.04	150.28	176.98	237.31	50.76	67.87	174.1	159.59	194.13	222.2	46.62	14.70
MEAN	2.76	5.01	5.71	7.66	1.81	2.19	5.80	5.15	6.47	7.17	1.50	.49
MAX	10	11	16	22	10	5.7	18	14	11	15	7.5	4.3
MIN	.00	.01	.28	.16	.01	.00	1.0	.00	.63	1.1	.00	.00
AC-FT	171	298	351	471	101	135	345	317	385	441	92	29

CAL YR 1988	TOTAL	1933.71	MEAN	5.30	MAX	31	MIN	.00	AC-FT	3840
WTR YR 1987	TOTAL	1580.58	MEAN	4.33	MAX	22	MIN	.00	AC-FT	3140

16725000 ALAKAHI STREAM NEAR KAMUELA

LOCATION.--Lat 20°04'27", long 155°40'25", Hydrologic Unit 20010000, on right bank 25 ft upstream from upper Hamakua ditch intake and 3.5 mi north of Kamuela.

DRAINAGE AREA.--0.87 mi^2.

PERIOD OF RECORD.--January 1964 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 3,900 ft, from topographic map.

REMARKS.--Records good. Parker Ranch pipeline diverts from tributary 0.4 mi upstream for ranch use in Kamuela area. Periodic determinations of water temperature for the current year are published elsewhere in this report.

AVERAGE DISCHARGE.--23 years, 6.88 ft^3/s (4,980 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 2,170 ft^3/s Nov. 18, 1979, gage height, 9.90 ft, from rating curve extended above 28 ft^3/s on basis of computations of peak flow over dam and slope-area measurement at gage height 9.90 ft; minimum, 0.03 ft^3/s on several days in 1965.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 120 ft^3/s and maximum(*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Dec. 3	0200	130	4.51	Jan. 18	2300	*362	*5.96
Dec. 6	0730	143	4.63	Apr. 1	0230	190	5.00
Jan. 10	0730	120	4.47	Apr. 22	0230	336	5.82
Jan. 12	0730	159	4.77				

Minimum discharge, 0.70 ft^3/s Oct. 1.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.70	9.2	21	3.4	2.3	1.4	83	23	5.4	18	15	.99
2	.80	5.8	51	24	1.9	4.7	27	31	3.3	11	4.3	.97
3	.76	2.7	52	8.6	1.7	8.3	14	12	2.7	22	2.8	.93
4	2.0	2.0	16	3.2	1.5	2.9	4.9	21	2.3	20	2.2	.94
5	3.6	1.5	4.2	3.4	1.5	2.2	3.3	14	3.7	26	1.8	.93
6	17	1.2	37	2.6	1.4	1.7	4.0	6.3	8.4	7.8	1.6	.93
7	26	1.3	4.7	2.2	1.3	1.5	3.9	47	6.8	4.4	1.6	.93
8	4.1	1.1	2.9	1.8	1.2	5.3	2.8	10	6.8	6.5	2.6	.89
9	2.5	3.4	4.2	1.5	1.2	3.9	2.4	4.3	6.5	19	2.2	1.6
10	1.8	4.9	4.1	54	1.1	2.4	2.4	3.4	12	8.3	6.0	1.4
11	1.4	11	16	81	1.0	1.8	2.3	3.2	30	7.8	7.1	1.8
12	1.1	26	8.3	72	.99	1.5	2.7	2.8	12	7.4	16	3.0
13	1.1	8.2	3.9	8.7	1.0	1.3	4.0	2.4	12	18	3.8	11
14	6.2	12	3.9	18	1.3	1.2	8.7	2.2	3.9	53	2.6	3.3
15	4.0	11	3.7	9.7	1.5	1.6	29	2.1	26	11	1.9	2.3
16	5.7	6.1	2.7	13	1.5	7.5	20	2.0	33	4.8	1.8	1.6
17	5.3	8.4	3.6	4.0	33	5.3	9.8	1.8	8.7	4.1	1.7	1.4
18	2.5	3.2	3.3	45	24	6.5	10	1.7	4.0	4.6	1.5	6.5
19	1.9	17	2.7	23	9.6	11	12	1.6	4.3	5.8	1.4	6.3
20	13	18	2.3	3.9	8.6	6.9	13	1.5	24	31	1.5	3.8
21	5.8	4.9	14	2.9	3.4	5.9	6.3	1.4	16	11	3.3	2.5
22	2.7	6.6	4.8	8.4	2.6	5.0	46	1.4	12	5.0	3.3	1.7
23	1.9	3.2	6.3	4.0	2.1	6.6	4.3	1.7	11	3.0	2.1	1.3
24	1.4	3.7	3.6	3.0	1.8	4.3	3.1	42	3.2	2.5	1.5	1.7
25	5.5	2.9	3.7	24	3.7	3.4	2.6	9.6	2.6	2.1	1.4	1.3
26	37	2.7	2.9	20	3.0	2.9	3.0	21	13	1.9	2.5	1.2
27	7.5	10	2.2	4.1	2.1	2.5	23	9.9	21	2.6	2.0	1.0
28	11	9.4	1.9	2.9	1.7	2.7	17	7.4	5.0	5.8	1.5	.99
29	3.1	20	1.7	5.6	---	2.6	5.1	11	18	3.5	1.3	.96
30	2.3	31	1.6	3.5	---	4.0	3.3	8.8	22	4.7	1.2	.97
31	1.7	---	2.6	2.5	---	7.1	---	18	---	4.2	1.1	---
TOTAL	181.36	248.4	292.8	463.9	117.99	125.9	372.9	325.5	339.6	336.8	100.6	64.93
MEAN	5.85	8.28	9.45	15.0	4.21	4.06	12.4	10.5	11.3	10.9	3.25	2.16
MAX	37	31	52	81	33	11	83	47	33	53	16	11
MIN	.70	1.1	1.6	1.5	.99	1.2	2.3	1.4	2.3	1.9	1.1	.89
AC-FT	360	493	581	920	234	250	740	846	674	668	200	129

CAL YR 1986	TOTAL	3217.67	MEAN	8.82	MAX	175	MIN	.22	AC-FT	6380
WTR YR 1987	TOTAL	2970.68	MEAN	8.14	MAX	83	MIN	.70	AC-FT	5890

16726000 UPPER HAMAKUA DITCH ABOVE WAIMEA RESERVOIR DIVERSION, NEAR KAMUELA

LOCATION.--Lat 20°03'31", long 155°37'40", Hydrologic Unit 20010000, on left bank 120 ft upstream from diversion intake leading to Waimea Reservoir and 3.7 mi northeast of Kamuela Post Office.

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

GAGE.--Water-stage recorder and concrete control. Elevation of gage is 3,020 ft, from topographic map.

REMARKS.--Records fair except for periods when the control was partially submerged, which are poor. Ditch diverts from Kawainui, Kawaiki, and Alakahi Streams for use in vicinity of Kamuela. Periodic determinations of water temperature for the current year are published elsewhere in this report.

AVERAGE DISCHARGE.--13 years, 11.0 ft^3/s (7,970 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 57 ft^3/s Mar. 6, 1985; no flow at times.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 40 ft^3/s Apr. 1; minimum daily, 0.30 ft^3/s Sept. 29.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.48	26	29	3.4	15	1.5	40	23	20	32	29	.67
2	.61	25	32	16	14	1.5	35	32	19	28	24	.59
3	.53	18	32	18	5.3	20	29	27	7.7	31	18	.55
4	2.8	5.0	27	5.5	2.9	10	20	29	4.0	30	14	.54
5	16	2.2	25	3.9	2.6	2.8	14	32	15	32	11	.53
6	27	1.6	31	2.9	2.3	1.9	18	24	25	27	3.6	.46
7	33	1.5	19	2.4	2.0	1.4	18	36	23	23	6.7	.42
8	26	1.3	15	2.1	1.7	18	13	26	20	25	23	.50
9	14	17	19	1.8	1.4	12	7.7	20	23	32	11	1.1
10	3.1	21	20	24	1.3	5.9	9.0	18	29	28	9.9	.90
11	1.9	29	19	27	1.2	2.0	12	15	32	26	19	.95
12	1.3	37	17	23	1.1	1.4	14	12	27	29	29	3.0
13	1.8	27	15	24	1.1	1.2	18	9.8	27	32	16	20
14	29	33	14	35	1.7	1.0	22	15	19	36	9.8	5.3
15	23	31	12	30	2.3	1.0	31	11	29	28	3.6	2.4
16	20	23	4.7	28	3.8	17	35	3.0	34	25	3.2	1.3
17	28	28	10	20	33	20	29	2.5	28	19	2.8	1.1
18	9.8	13	7.1	27	31	13	29	2.1	19	23	2.8	6.4
19	3.0	24	3.8	33	29	23	30	1.8	19	26	2.1	22
20	23	33	2.8	22	28	20	32	1.5	27	32	2.4	5.8
21	31	23	18	16	15	16	19	1.2	31	30	12	2.5
22	17	26	15	27	14	14	31	1.1	25	25	14	1.3
23	3.9	14	15	23	4.5	18	20	1.9	27	19	3.7	.91
24	1.9	16	7.9	15	2.6	13	14	32	19	15	2.0	1.1
25	6.7	10	4.6	31	17	12	10	23	15	16	1.4	.74
26	37	9.8	3.3	32	17	7.5	13	29	29	14	3.0	.56
27	27	26	2.7	20	3.3	8.5	32	25	33	16	2.3	.47
28	31	28	2.4	15	2.1	19	31	19	24	20	1.4	.39
29	22	35	2.1	29	---	11	23	27	32	16	1.1	.30
30	10	37	1.9	19	---	24	16	24	32	25	.94	3.3
31	3.4	---	2.7	12	---	20	---	28	---	23	.80	---
TOTAL	455.22	621.4	430.2	588.0	256.2	337.8	684.7	551.9	713.7	785	283.34	86.08
MEAN	14.7	20.7	13.9	19.0	9.15	10.9	22.2	17.8	23.8	25.3	9.14	2.87
MAX	37	37	32	35	33	24	40	36	34	36	29	22
MIN	.48	1.3	1.9	1.8	1.1	1.0	7.7	1.1	4.0	14	.80	.30
AC-FT	903	1230	853	1170	508	670	1320	1090	1420	1580	562	171

CAL YR 1986	TOTAL	5949.30	MEAN	16.3	MAX	43	MIN	.00	AC-FT	11800
WTR YR 1987	TOTAL	5773.34	MEAN	15.8	MAX	40	MIN	.30	AC-FT	11450

16727000 UPPER HAMAKUA DITCH ABOVE PUUKAPU RESERVOIR, NEAR KAMUELA

LOCATION.--Lat 20°02'53", long 155°37'17", Hydrologic Unit 20010000, on right bank 25 ft downstream from pipe railed bridge and 4.0 mi northeast of Kamuela Post Office.

PERIOD OF RECORD.--October 1977 to current year.

GAGE.--Water-stage recorder and concrete control. Elevation of gage is 2,890 ft, from topographic map.

REMARKS.--Records good. Ditch diverts into Waimea Reservoir for use in vicinity of Kamuela. Periodic determinations of water temperature for the current year are published elsewhere in this report.

AVERAGE DISCHARGE.--10 years, 2.69 ft^3/s (1,950 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 42 ft^3/s Apr. 16, 1985; no flow at times.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 32 ft^3/s for several days; no flow for many days.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	22	6.5	.00	2.2	.02	30	3.5	.00	4.8	16	.00
2	.00	13	7.6	1.8	.60	.01	26	.03	.00	5.6	7.7	.00
3	.00	2.4	5.6	2.0	.47	6.3	13	.01	.00	6.9	2.8	.00
4	.00	.65	5.8	.96	.12	2.4	7.3	.01	.00	7.1	.80	.00
5	1.4	.00	9.2	.65	.17	.80	4.8	.04	.00	7.1	.21	.00
6	12	.00	10	.30	.00	.12	7.5	.08	.00	9.8	.01	.00
7	18	.00	8.6	.00	.00	.00	6.0	.30	.00	10	.41	.00
8	6.2	.00	8.9	.00	.00	8.3	1.4	.00	.00	10	3.0	.00
9	2.0	3.4	6.6	.00	.00	5.6	1.7	.00	.00	14	.40	.00
10	.30	3.7	8.8	14	.00	1.1	1.8	.00	.00	6.4	2.0	.00
11	.00	12	10	18	.00	.02	.60	.00	.02	4.6	6.0	.00
12	.00	32	4.8	14	.00	.00	3.8	.00	12	4.8	15	.00
13	.00	17	2.5	13	.00	.00	5.8	.00	22	4.6	4.1	3.1
14	6.8	22	1.9	27	.11	.00	10	.00	9.8	8.3	.60	.00
15	4.6	17	1.4	22	.00	.00	17	.00	22	10	.02	.00
16	3.6	10	.30	16	.10	2.3	19	.00	32	9.5	.01	.00
17	8.6	12	.27	7.7	28	3.2	7.7	.00	24	5.4	.01	.00
18	1.1	4.0	.44	7.5	32	3.9	7.7	.00	9.2	3.8	.01	1.6
19	.32	10	.10	8.3	22	13	8.0	.00	8.9	3.8	.00	4.0
20	12	18	.00	9.2	19	11	10	.00	14	7.7	.00	.00
21	12	9.5	3.4	6.2	4.8	7.5	8.6	.00	16	4.1	1.5	.00
22	1.6	9.8	1.2	12	2.4	6.2	9.2	.00	14	.01	1.5	.00
23	.38	4.6	1.9	8.6	.75	7.7	8.0	.00	16	.01	.02	.00
24	.00	5.2	.69	4.7	.21	4.1	4.6	.11	6.0	1.3	.02	.00
25	3.8	2.3	.98	14	3.7	2.6	2.4	.00	5.9	1.9	.01	.00
26	32	2.5	.47	8.0	4.8	2.2	3.8	.03	18	1.0	.00	.00
27	14	12	.00	8.6	1.2	3.0	12	.00	16	3.1	.00	.00
28	21	14	.00	5.3	.15	4.6	12	.00	12	8.9	.00	.00
29	4.2	18	.00	17	---	2.0	9.2	.00	8.6	4.7	.00	.00
30	1.7	18	.00	5.8	---	7.3	4.4	.00	5.0	7.7	.00	.53
31	.70	---	.00	2.8	---	3.5	---	.00	---	8.6	.00	---
TOTAL	168.30	295.05	105.75	255.21	122.78	108.77	282.90	4.11	271.42	183.32	62.13	9.23
MEAN	5.43	9.83	3.41	8.23	4.38	3.51	8.76	.13	9.05	5.91	2.00	.31
MAX	32	32	10	27	32	13	30	3.5	32	14	16	4.0
MIN	.00	.00	.00	.00	.00	.00	.60	.00	.00	.01	.00	.00
AC-FT	334	585	210	506	244	216	521	8.2	538	364	123	18

CAL YR 1986	TOTAL	2806.14	MEAN	7.14	MAX	33	MIN	.00	AC-FT	5170
WTR YR 1987	TOTAL	1848.97	MEAN	5.07	MAX	32	MIN	.00	AC-FT	3670

16756000 KOHAKOHAU STREAM NEAR KAMUELA

LOCATION.--Lat 20°02'38", long 155°41'10", Hydrologic Unit 20010000, on left bank 0.6 mi upstream from Oolamakapehu Gulch and 1.7 mi northwest of Kamuela.

DRAINAGE AREA.--2.51 mi^2.

PERIOD OF RECORD.--March 1956 to current year.

GAGE.--Water-stage recorder. Datum of gage is 3,273 ft above mean sea level (by stadia survey by State Department of Land and Natural Resources). Prior to Jan. 11, 1987, at site 0.5 mi upstream at different datum.

REMARKS.--Records good. Parker Ranch pipeline diverts upstream at elevation 4,250 ft. Hawaii Department of Water Supply diverts by pipeline 0.3 mi upstream at elevation 3,400 ft for domestic use in the Kamuela and Kawaihae areas since Aug. 20, 1973. Periodic determinations of water temperature for the current year are published elsewhere in this report.

AVERAGE DISCHARGE.--31 years, 8.49 ft^3/s (6,150 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 3,880 ft^3/s Aug. 7, 1958, gage height, 10.76 ft, site and datum then in use, from rating curve extended above 70 ft^3/s by test of model of station site; no flow at times in 1968, 1971-86.

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

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Jan. 18	2330	478	4.73	Apr. 22	0300	*660	*5.00

No flow for many days.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.00	33	.00	.05	.00	113	30	.43	26	20	.00
2	.00	.02	78	20	.04	1.2	47	57	.03	3.2	3.1	.00
3	.00	.00	111	13	.03	14	19	20	.02	23	.47	.00
4	.00	.00	37	.02	.02	.10	4.3	27	.02	23	.02	.00
5	.00	.00	8.1	.00	.03	.00	1.5	31	.03	41	.00	.00
6	1.8	.00	78	.00	.02	.00	.90	7.8	.56	7.6	.00	.00
7	32	.00	12	.00	.02	.00	.03	59	.37	.22	.00	.00
8	.04	.00	3.3	.00	.01	.02	.00	17	.18	.87	.00	.00
9	.00	.00	.99	.00	.01	.03	.00	4.7	.37	21	.00	.00
10	.00	.00	.62	72	.00	.01	.00	3.1	5.2	4.9	.00	.00
11	.00	3.8	9.5	124	.01	.01	.00	2.5	23	3.3	.00	.00
12	.00	40	13	118	.00	.00	.00	1.9	12	3.8	13	.00
13	.00	1.6	2.2	22	.00	.00	.00	1.5	3.7	18	1.5	.00
14	.00	8.7	.97	25	.01	.00	.82	1.2	.07	74	.07	.00
15	.00	5.8	.79	7.4	.03	.00	26	.84	22	18	.00	.00
16	.00	1.3	.08	20	.04	1.7	35	.03	53	.67	.00	.00
17	.00	8.9	.04	4.1	25	.88	15	.01	7.8	.24	.00	.00
18	.00	.02	.05	52	37	.02	14	.01	.15	.20	.00	.00
19	.00	11	.04	56	3.0	.42	7.2	.00	.04	.46	.00	.00
20	4.4	32	.01	5.8	7.5	5.1	16	.00	21	35	.00	.00
21	2.9	.08	6.9	.62	.03	.03	3.3	.00	23	12	.00	.00
22	.00	.45	1.2	4.6	.01	.00	109	.00	2.3	1.6	.00	.00
23	.00	.01	.70	.66	.00	.00	6.9	.00	11	.17	.00	.00
24	.00	.00	.08	.09	.00	.00	2.8	47	.06	.04	.00	.00
25	.00	.00	.01	31	8.2	.00	1.9	13	.03	.02	.00	.00
26	45	.00	.00	45	.84	.00	2.4	30	5.5	.01	.00	.00
27	1.4	3.7	.00	3.4	.03	.00	26	16	26	.01	.00	.00
28	4.8	5.3	.00	.34	.01	.00	29	2.8	.42	.60	.00	.00
29	.00	30	.00	3.4	---	.00	5.7	5.7	9.8	.15	.00	.00
30	.00	43	.00	.55	---	.00	2.8	2.3	33	.02	.00	.00
31	.00	---	.00	.07	---	.40	---	15	---	.04	.00	---
TOTAL	92.34	195.68	397.58	629.05	79.94	23.72	489.35	396.39	261.08	319.32	38.16	.00
MEAN	2.98	6.52	12.8	20.3	2.85	.77	16.3	12.8	8.70	10.3	1.23	.00
MAX	45	43	111	124	37	14	113	59	53	74	20	.00
MIN	.00	.00	.00	.00	.00	.00	.00	.00	.02	.01	.00	.00
AC-FT	183	388	789	1250	159	47	971	786	518	633	76	.00

CAL YR 1986	TOTAL	3805.22	MEAN	10.4	MAX	344	MIN	.00	AC-FT	7550
WTR YR 1987	TOTAL	2922.61	MEAN	8.01	MAX	124	MIN	.00	AC-FT	5800

16758000 WAIKOLOA STREAM AT MARINE DAM, NEAR KAMUELA

LOCATION.--Lat 20°02'48", long 155°39'58", Hydrologic Unit 20010000, on right bank 160 ft upstream from Marine Dam, 0.4 mi east of Puu Ohu, and 1.6 mi north of Kamuela.

DRAINAGE AREA.--1.18 mi^2.

PERIOD OF RECORD.--May 1947 to current year.

REVISED RECORDS.--WSP 1569: Drainage area. WSP 1937: 1948(M), 1949-51(P), 1952(M), 1954(M), 1955, 1956-57(P), 1958-80.

GAGE.--Water-stage recorder and concrete control. Elevation of gage is 3,460 ft, from topographic map.

REMARKS.--Records good. Diversion upstream for livestock and domestic use. Periodic determinations of water temperature for the current year are published elsewhere in this report.

AVERAGE DISCHARGE.--40 years, 9.00 ft^3/s (6,520 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 3,410 ft^3/s Nov. 18, 1979, gage height, 6.84 ft, from rating curve extended above 120 ft^3/s on basis of computations of flow over dam at gage heights 5.46 ft and 5.98 ft; minimum, 0.59 ft^3/s Oct. 3-6, 1965.

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

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Dec. 3	0630	223	3.47	Jan. 18	2330	*495	*4.21
Dec. 6	0730	272	3.84	Apr. 1	0430	215	3.44
Jan. 10	0830	218	3.45	Apr. 22	0300	189	3.34

Minimum discharge, 1.6 ft^3/s Oct. 1, 3, 4.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.0	7.8	32	5.1	5.6	3.2	111	29	9.6	34	19	3.0
2	1.9	6.7	94	20	4.5	4.3	35	49	5.8	15	8.6	3.0
3	1.7	3.6	104	11	3.9	8.8	13	15	4.6	31	6.1	3.1
4	2.5	3.0	26	4.8	3.6	4.4	7.5	24	4.2	34	5.4	3.1
5	3.0	2.7	9.5	4.3	3.4	3.6	5.6	21	6.9	39	4.9	3.0
6	12	2.4	62	3.9	3.3	3.3	6.1	11	11	18	4.5	3.2
7	28	2.7	11	3.4	3.4	3.4	5.3	49	9.5	11	5.0	3.0
8	5.2	2.6	7.1	3.1	3.0	12	4.2	17	10	15	6.7	2.9
9	3.3	3.3	8.8	3.0	2.8	6.3	3.9	8.4	9.6	35	5.4	3.5
10	2.7	5.0	8.0	101	2.7	4.1	3.9	6.5	17	19	5.2	3.2
11	2.5	12	15	135	2.7	3.3	4.0	5.5	42	15	7.0	3.3
12	2.2	28	13	110	2.6	3.0	4.5	4.8	19	18	23	4.0
13	2.1	9.4	6.9	17	2.7	3.0	5.6	4.3	13	27	7.5	7.1
14	8.9	13	6.2	34	3.3	3.2	5.7	4.0	7.8	89	5.4	4.4
15	4.6	13	5.9	13	3.0	3.1	23	3.9	34	24	4.8	3.5
16	4.2	7.6	4.7	22	3.7	5.6	24	3.6	42	12	4.7	3.4
17	5.3	9.2	4.5	9.7	39	8.5	11	3.3	17	10	4.1	3.3
18	3.3	4.7	4.1	59	29	6.3	12	3.0	9.5	10	3.9	3.4
19	2.7	20	3.9	42	15	8.8	17	2.9	8.2	13	3.8	5.5
20	9.2	25	3.7	8.8	15	7.6	18	2.9	27	43	4.0	5.3
21	7.7	6.3	14	6.6	6.0	5.7	9.7	2.9	19	20	5.6	3.9
22	3.7	6.5	6.4	8.8	4.3	4.9	56	2.8	14	12	5.6	3.4
23	2.8	4.3	7.8	6.7	3.7	5.5	6.4	3.3	15	8.9	4.1	3.2
24	2.6	3.7	5.6	6.2	3.4	4.5	5.8	73	8.2	7.6	3.8	3.2
25	4.1	3.4	5.5	45	7.9	4.2	4.5	15	7.7	6.8	3.7	3.0
26	49	3.2	4.3	45	5.2	3.8	5.5	41	21	6.3	3.5	3.2
27	7.8	6.2	3.6	9.1	3.8	4.0	37	19	35	7.3	3.5	2.8
28	13	8.6	3.2	6.7	3.7	4.8	29	11	13	10	3.4	2.6
29	4.7	18	3.0	16	---	4.2	9.1	15	28	8.8	3.3	2.5
30	3.3	39	2.8	7.5	---	8.4	5.8	13	35	9.4	3.6	3.1
31	2.9	---	4.6	6.0	---	8.3	---	22	---	8.6	3.2	---
TOTAL	208.9	280.9	491.1	773.7	190.2	162.1	491.1	486.1	503.6	615.7	182.3	105.1
MEAN	6.74	9.36	15.8	25.0	6.79	5.23	16.4	15.7	16.8	19.9	5.88	3.50
MAX	49	39	104	135	39	12	111	73	42	89	23	7.1
MIN	1.7	2.4	2.8	3.0	2.6	3.0	3.9	2.8	4.2	6.3	3.2	2.5
AC-FT	414	557	974	1530	377	322	974	964	999	1220	362	208

CAL YR 1986	TOTAL	4938.7	MEAN	13.5	MAX	372	MIN	1.5	AC-FT	9800
WTR YR 1987	TOTAL	4490.6	MEAN	12.3	MAX	135	MIN	1.7	AC-FT	8910

16759000 HAUANI GULCH NEAR KAMUELA

LOCATION.--Lat 20°02'28", long 155°39'05", Hydrologic Unit 20010000, on left bank 800 ft downstream from small tributary and 1.8 mi northeast of Kamuela.

DRAINAGE AREA.--0.47 mi^2.

PERIOD OF RECORD.--March 1956 to current year. Prior to July 1960, published as Hauani Stream near Kamuela.

GAGE.--Water-stage recorder. Concrete control since Feb. 27, 1963. Datum of gage is 3,117.42 ft above mean sea level (Hawaii County Department of Water Supply bench mark).

REMARKS.--Records good. Diversion upstream for livestock and domestic use. Periodic determinations of water temperature for the current year are published elsewhere in this report.

AVERAGE DISCHARGE.--31 years, 1.60 ft^3/s (1,160 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 822 ft^3/s Nov. 18, 1979, gage height, 4.56 ft, from rating curve extended above 11 ft^3/s on basis of slope-conveyance study; maximum gage height, 4.85 ft Oct. 23, 1957; no flow at times.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 78 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Dec. 6	0700	110	2.80	Jan. 18	2230	118	2.84
Jan. 10	0730	*124	*2.87	Apr. 1	0230	92	2.68

Minimum discharge, 0.25 ft^3/s Oct. 1 to 4.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.34	2.1	7.3	.57	.76	.48	32	5.4	1.8	6.3	3.0	.50
2	.31	1.4	27	3.3	.69	.91	7.8	10	1.0	2.5	1.3	.50
3	.28	.94	23	1.6	.58	.55	1.8	1.8	.86	7.3	1.1	.50
4	.37	.81	6.0	.69	.53	.49	.99	4.1	.81	9.8	.97	.51
5	.56	.75	2.0	.59	.50	.45	.80	4.3	1.2	8.1	.91	.50
6	1.7	.71	19	.51	.48	.42	.63	2.1	1.9	2.9	.88	.45
7	3.4	.72	2.2	.45	.45	.43	.71	11	1.6	1.7	.94	.45
8	.84	.87	1.4	.41	.45	1.5	.54	3.1	2.0	2.5	1.0	.50
9	.58	.80	1.9	.40	.44	.78	.49	1.4	1.4	7.6	.88	.57
10	.41	.83	1.5	36	.41	.51	.47	1.1	3.1	3.3	.81	.45
11	.37	1.6	2.2	37	.41	.45	.44	.90	10	2.5	1.1	.47
12	.37	5.5	1.7	31	.63	.42	.66	.80	3.3	2.7	4.5	.49
13	.41	1.8	.95	4.0	.54	.41	.72	.73	2.1	5.2	1.1	.65
14	1.1	2.3	.93	7.4	.48	.38	.51	.67	1.2	22	.88	.50
15	.67	2.3	.89	2.8	2.5	.39	5.7	.86	8.7	4.2	.82	.44
16	.72	1.6	.71	3.7	8.0	.39	4.6	.61	7.3	2.1	.79	.41
17	.84	1.7	.65	1.3	2.0	.39	1.7	.59	2.6	1.8	.77	.41
18	.56	1.1	.58	16	2.4	.43	1.6	.55	1.4	1.7	.74	.42
19	.45	4.8	.54	8.3	.94	.61	4.0	.55	1.2	2.0	.72	.47
20	1.7	5.6	.50	1.5	.68	.64	2.8	.54	6.5	7.0	.80	.54
21	1.1	1.4	1.8	1.0	.60	.56	1.3	.51	3.2	3.0	.88	.43
22	.67	1.2	.89	1.3	.55	.49	13	.52	1.9	1.7	.81	.39
23	.58	1.0	.93	.91	.85	.52	1.3	.58	2.0	1.4	.70	.37
24	.52	.92	.70	.82	.83	.45	.82	11	1.2	1.2	.87	.37
25	1.3	.84	.72	7.4	.55	.41	.67	2.3	1.3	1.2	.66	.37
26	13	.81	.56	9.3	.48	.39	.68	7.7	3.5	1.1	.65	.36
27	1.6	1.3	.49	1.4	.45	.36	6.1	2.8	7.3	1.3	.61	.34
28	2.4	1.5	.44	.97	.43	.39	4.9	3.8	2.0	1.5	.60	.34
29	1.1	3.8	.41	2.2	---	.37	1.3	3.0	5.2	1.2	.55	.33
30	.90	9.3	.42	1.0	---	.67	.88	2.4	5.3	1.2	.53	.44
31	.84	---	.60	.82	---	1.2	---	3.4	---	1.3	.50	---
TOTAL	39.97	60.10	108.91	184.64	26.61	16.84	100.11	88.91	92.67	119.3	31.17	13.47
MEAN	1.29	2.00	3.51	5.96	.95	.54	3.34	2.87	3.09	3.85	1.01	.45
MAX	13	9.3	27	37	6.0	1.5	32	11	10	22	4.5	.65
MIN	.28	.67	.41	.40	.41	.36	.44	.51	.81	1.1	.50	.33
AC-FT	79	119	216	366	53	33	199	176	184	237	62	27

CAL YR 1986	TOTAL	1020.04	MEAN	2.79	MAX	104	MIN	.12	AC-FT	2020
WTR YR 1987	TOTAL	882.70	MEAN	2.42	MAX	37	MIN	.28	AC-FT	1750

16764000 HILEA GULCH TRIBUTARY NEAR HONUAPO

LOCATION.--Lat 19°10'27", long 155°35'58", Hydrologic Unit 20010000, on right bank 0.5 mi upstream from mouth, 6.6 mi northwest of Honuapo, and 6.7 mi west of Punaluu.

DRAINAGE AREA.--9.17 mi^2.

PERIOD OF RECORD.--February 1968 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 2,940 ft, from topographic map.

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

AVERAGE DISCHARGE.--21 years, 7.47 ft^3/s (5,410 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum diacharge, 2,400 ft^3/s Mar. 18, 1980, gage height, 8.00 ft, from rating curve extended above 75 ft^3/s; no flow at times each year.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 742 ft^3/s Nov. 13, gage height, 5.33 ft, no other peak greater than base discharge of 800 ft^3/s; no flow for many days.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.40	.00	.00	.00	.00	.00	.00	.00	.00	.07	.11	.00
2	1.9	.00	.17	.00	.00	.00	.00	.03	.00	.01	.08	.00
3	1.3	.00	.11	.00	.00	.00	.00	.00	.00	.00	.05	.00
4	.39	.00	.09	.00	.00	.00	.00	6.1	.00	.00	.03	.00
5	.30	.00	.07	.00	.00	.00	.00	2.8	.00	.00	.11	.00
6	.20	.00	.07	.00	.00	.00	.00	.28	1.1	.00	.63	.00
7	50	.00	.03	.00	.00	.00	.00	.00	.17	.00	.65	.00
8	2.0	1.2	.00	.00	.00	.00	.00	.00	.42	.00	.33	.00
9	.40	20	.00	.00	.00	.00	.00	.00	11	.00	.13	.14
10	1.3	47	.00	.00	.00	.00	.00	.00	1.0	.00	.12	.07
11	4.0	33	.00	.00	.00	.00	.00	.00	1.6	.00	.05	.53
12	.46	37	.06	.00	.00	.00	.00	.00	1.8	.00	.00	.09
13	.72	94	.01	.00	.00	.00	.00	.00	2.2	.00	.00	6.7
14	.58	20	.00	.00	.00	.00	.00	.00	.42	.45	.00	2.3
15	.36	1.9	.00	.00	.00	.00	.00	.00	.14	.27	.00	.10
16	.23	.59	.00	.00	.00	.00	.00	.00	.09	.24	.00	.00
17	.33	.40	.00	.00	.00	.00	.00	.00	.02	.12	.00	.51
18	.22	.27	.00	.00	.00	.00	.00	.00	.02	.11	.00	4.1
19	.11	.19	.00	.00	.00	.00	.00	.00	.00	.05	.00	1.1
20	.00	41	.00	.00	.00	.00	.00	.00	.00	.00	.12	.62
21	.00	2.8	.00	.00	.00	.00	.00	.00	.00	24	.06	.32
22	.00	33	.00	.00	.00	.00	.00	.00	.00	.85	.02	18
23	.00	1.4	.00	.00	.00	.00	.00	.00	.00	.55	.00	.99
24	.00	.53	.00	.00	.00	.00	.00	.00	.02	.45	.00	.45
25	21	.37	.00	.00	.00	.00	.00	.00	.00	.26	.00	.22
26	.80	.29	.00	.00	.00	.00	.00	.00	.00	.20	.00	8.9
27	.11	.22	.00	.00	.00	.00	.00	.00	.00	.13	.00	.32
28	.00	.11	.00	.00	.00	.00	.00	.00	.00	.12	.14	.20
29	.00	.00	.00	.00	---	.00	.00	.00	.07	.39	.05	.13
30	.00	.00	.00	.00	---	.00	.00	.00	.30	.45	.00	.07
31	.00	---	.00	.00	---	.00	---	.00	---	.20	.00	---
TOTAL	87.11	335.07	.61	.00	.00	.00	.00	9.21	20.17	28.92	2.68	41.88
MEAN	2.81	11.2	.02	.00	.00	.00	.00	.30	.67	.93	.09	1.40
MAX	50	94	.17	.00	.00	.00	.00	8.1	11	24	.85	16
MIN	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
AC-FT	173	665	1.2	.00	.00	.00	.00	18	40	57	5.3	83

CAL YR 1986	TOTAL	2000.61	MEAN	5.48	MAX	330	MIN	.00	AC-FT	3970
WTR YR 1987	TOTAL	525.63	MEAN	1.44	MAX	94	MIN	.00	AC-FT	1040

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 collectad 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 simultaneoue discharge of a nearby stream where continuous recorda 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 1987

Station No.	Station name	Location	Drainage area mi^2	Period of record	Measurements: Date	Measurements: Diecharge (ft^3/s)
		Hawaii, Ialand of Oahu				
16214000	Pearl Harbor Springs at Waiawa, near Pearl City	Lat 21°23'36", long 157°59'11", 0.7 mi west of Pearl City and 1.5 mi east of Waipahu Post Office.	-	1931-34≠, 1937-64≠, 1967-68, 1970-87	6-26-87	11.8
16224000	Pearl Harbor Springs at Kalauao, near Aiea	Lat 21°23'05", long 157°56'46", 300 ft downstream from Highway 90 and 0.8 mi west of Aiea Post Office.		1931-62≠, 1964-65≠, 1968-68, 1970-87	6-25-87	13.0
16265700	Kamooalii Stream at altituda 220 ft, near Kaneohe	Lat 21°23'12", long 157°47'56", 0.5 mi southwest of Hawaiian Memorial Park Cemetary, 1.2 mi northwest of Pali Golf Course, and 1.5 mi southweat of Castle High Schoo1.	.46	1983-85, 1987	12-12-88	1.86
16267500	Hooleinaiwa Stream above confluence with Kamooalii Stream, near Kaneohe	Lat 21°23'15", long 157°48'19" 0.7 mi west of Hawaiian Memorial Park Cemetary, 1.3 mi northwsst of Pali Golf Course, and 1.5 southest of Castle High School.	.58	1983-85, 1987	12-16-86	1.29
		Hawaii, Island of Molokai				
16403400	Kapuhi Stream at altitude 1,000 ft, near Pelekunu	Lat 21°07'50", long 156°53'02", 500 ft upstream from Kawailena Stream, 2.2 mi south of former village of Pelekunu, and 5.4 mi north of Kamalo.	.51	1968-87	10-30-86 12-18-86 2-05-87 6-02-87 8-20-87	1.94 2.43 1.88 2.48 .84
16403500	Kawailena Stream near Pelekunu	Lat 20°07'52", long 156°53'05", 800 ft upstream from mouth, 2.2 mi south of former village of Pelekunu, and 5.5 mi north of Kamalo.	.65	1968-87	10-30-86 12-18-86 2-05-87 6-02-87 8-20-87	2.14 2.39 2.70 3.65 1.74
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≠, 1974-87	10-30-86 12-18-86 2-05-87 6-02-87 8-20-87	4.14 4.82 4.68 6.44 2.63
16403700	Kawainui Stream at altitude 1,000 ft, near Pelekunu	Lat 20°07'46", long 156°52'31", 400 ft upstream from Kawaipoko Stream, 2.4 mi aouth of former village of Pelekunu, and 5.4 mi north of Kamalo.	.79	1968-87	10-30-86 12-18-86 2-05-87 6-02-87 8-20-87	3.85 4.13 3.36 3.93 1.99
16403800	Kawaipoko Stream near Pelekunu	Lat 21°07'48", long 156°52'30", 300 ft upstream from mouth, 2.4 mi south of former village of Pelekunu, and 5.4 mi north of Kamalo.	.26	1968-87	10-30-86 12-18-86 2-05-87 6-02-87 8-20-87	1.54 1.54 0.87 0.87 0.60
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≠, 1980-86	10-30-86 12-18-88 2-05-87 6-02-87 8-20-87	7.34 7.10 4.26 7.41 2.70

≠ 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-atage 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 1987

Station no.	Station name	Location	Drainage area mi^2	Period of record	Annual maximum Date	Gage height (ft)	Discharge (ft^3/s)
		Hawaii, Island of Kauai					
16038000	Waimea River at Waimea	Lat 21°57'23", long 159°39'59", 150 ft upstream from highway bridge at Waimea and 0.2 mi upstream from mouth.	86.5	1944-87b	9-14-87	6.59	-
16052000	Hanapepe River at Hanapepe	Lat 21°54'47", long 159°35'33", 400 ft upstream from bridge on Highway 50 and 0.5 mi upstream from mouth.	28.8	1950-87b	9-14-87	2.53	-
16052500	Lawai Stream near Koloa	Lat 21°54'11", long 159°30'21", on right bank at private road bridge, 0.9 mi upstream from mouth, and 2.4 mi southwest of Koloa.	6.62	1962-63, 1964-72≠, 1973-87	9-14-87	3.59	795
16055000	Huleia Stream near Lihue	Lat 21°57'20", long 159°25'23", at highway bridge, 3.7 mi southwest of Lihue, and 4.5 mi upstream from mouth.	17.8	1912-15≠, 1962-67, 1968-70≠, 1971-87	9-14-87	8.19	1,710
16071800	Wailua River near Kapaa	Lat 22°03'00", long 159°20'26", at State Park 600 ft upstream from highway bridge, 850 ft upstream from mouth, and 2.5 mi southwest of Kapaa.	52.6	1962-87b	11-10-86	5.60	-
16073500	Konohiki Stream near Kapaa	Lat 22°04'01", long 159°20'21", at culvert on private road, 1.8 mi upstream from mouth, and 2.4 mi southwest of Kapaa High School.	3.38	1964-67, 1970-87	11-10-86	11.80	660
16080000	Kapaa Stream near Kapaa	Lat 22°06'15", long 159°22'29", on right bank at Kapahi ditch intake, 3.8 mi northwest of Kapaa, and 4.3 mi northwest of Wailua.	3.86	1936-85≠, 1986-87	11-10-86	3.83	3,500
16081200	Akulikuli Stream near Kapaa	Lat 22°06'25", long 159°22'07", at Kahuna road crossing, 800 ft upstream from mouth, and 3.5 mi northwest of Kapaa armory.	.40	1964-87	11-10-86	6.10	310
16084500	Kapaa Stream at old highway crossing, near Kealia	Lat 22°08'28", long 159°19'52", at abutment of old highway bridge, 100 ft upstream from road crossing, 1.4 mi northwest of Kealia, and 2.1 mi upstream from mouth.	14.0	1982-87	11-10-86	14.52	10,830
16085000	Homaikawaa Stream near Kealia	Lat 22°07'23", long 159°18'12", at culvert on Highway 56, 1.6 mi southeast of Anahola School, and 1.6 mi north of Kealia.	.85	1964-87	11-10-86	6.29	1,500
16097900	Puukumu Stream near Kilauea	Lat 22°13'01", long 159°25'18", at culvert on Highway 56, 0.8 mi northwest of Kilauea School, and 0.9 mi upstream from mouth.	.91	1964-68, 1971-87	7-23-87	5.38	1.8
16104200	Hanalei River at Highway 56 bridge near Hanalei	Lat 22°12'50", long 159°28'43", at highway bridge, 1.6 mi northeast of Hanalei, and 2.4 mi upstream from mouth.	21.0	1963-87b	11-10-86	11.64	-
16130000	Nahomalu Valley near Mana	Lat 22°02'41", long 159°45'17", on left bank 1.1 mi northeast of Mana, and 5.3 mi northwest of Kekaha School.	3.81	1962-63, 1964-71≠, 1972-87	12-5-86	3.94	424

≠ Operated as a continuous-record gaging station.
b Gage height only.

Annual maximum discharge at crest-stage partial-record stations during water year 1987--Continued

Station no.	Station name	Location	Drainage area mi^2	Period of record	Annual maximum Date	Gage height (ft)	Discharge (ft^3/s)
		Hawaii, Island of Oahu					
16210500	Kaukonahua Stream at Waialua	Lat 21°33'56", long 158°07'26", 0.2 mi upstream from Highway 99, 0.4 mi southeast of Waialua High School, and 1.3 mi southwest of Weed Circle.	38.7	1963, 1968-87	6-12-87	17.85	1,260
16211200	Poamoho Stream at Waialua	Lat 21°34'00", long 158°06'40", at culvert crossing of Kaheaka Road, 0.2 mi upstream from Highway 83, and 1.1 mi east of Waialua High School.	10.9	1967-87	6-12-87	12.99	e800
16211300	Makaleha Stream near Waialua	Lat 21°33'49", long 158°09'21", 1.0 mi southwest of Dillingham Ranch and 1.9 mi southwest of sugar mill at Waialua.	4.15	1958-63, 1964-65≠, 1986-87	4-26-87	5.37	408
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	1974-87	11-10-86	14.18	e200
16211500	Makua Stream at Makua	Lat 21°31'59", long 158°13'49", on left bank 20 ft upstream from old concrete highway ford, 140 ft downstream from Farrington Highway box culvert, 0.1 mi north of Makua cemetery, and 4.5 mi southeast of Kaena Point lighthouse.	4.24	1958-87	4-26-87	7.36	e90
16211700	Makaha Stream at Makaha	Lat 21°28'47", long 158°12'31", 0.9 mi upstream from Farrington Highway and 1.1 mi north of junction of Farrington Highway and Makaha Valley Road.	5.25	1966-87	4-26-87	7.19	e120
16211800	Kaupuni Stream at altitude 372 ft, near Waianae	Lat 21°28'20", long 158°09'26", at abandoned diversion dam, 2.6 mi northeast of Waianae cemetery, and 2.8 mi northeast of junction of Waianae Valley Road and Farrington Highway.	3.58	1961-72≠, 1973-87	11-10-86	-	e200
16212200	Mailiilii Stream near Waianae	Lat 21°27'34", long 158°08'05", at bridge at Lualualei Naval Reservation and 3.4 mi east of cemstery near Waianae.	1.51	1958-87	11-10-86	-	e20
16212300	Nanakuli Stream at Nanakuli	Lat 21°23'08", long 158°08'11", 0.7 mi upstream from Highway 90 and 0.6 mi northeast of Nanakuli Post Office.	3.98	1968-87	11-10-86	23.18	e700
16212450	Kaloi Gulch tributary near Honouliuli	Lat 21°22'41", long 158°03'45", at culvert on private road, 1.8 mi west of Honouliuli, and 2.8 mi northwest of Ewa Post Office.	1.70	1968-87	9-13-87	-	e10
16212500	Honouliuli Stream near Waipahu	Lat 21°22'40", long 158°02'10", at bridge on Farrington Highway and 1.8 mi west of Waipahu Post Office.	11.0	1956-87	9-13-87	.95	e40
16212601	Waikele Stream at Wheeler Field	Lat 21°28'44", long 158°03'07", at culvert 0.3 mi west of east-west runway at Wheeler Field and 1.9 mi southwest of Wahiawa Post Office.	6.35	1958, 1960-87	3-24-87	3.93	e20
16212700	Waikakalaua Stream near Wahiawa	Lat 21°27'50", long 158°01'38", 0.2 mi downstream from Kamehameha Highway and 2.4 mi south of Wahiawa Post Office.	7.49	1958-87	7-22-87	6.76	852
16212750	Huliwai Gulch near Kunia Camp	Lat 21°26'43", long 158°03'47", 200 ft upstream from Highway 75 and 1.2 mi south of Kunia Camp.	.84	1974-87	9-13-87	5.32	e2

≠ Operated as a continuous-record gaging station.
e Estimatsd.

Annual maximum discharge at crest-stage partial-record stations during water year 1987--Continued

Station no.	Station name	Location	Drainage area mi^2	Period of record	Annual maximum Date	Gage height (ft)	Discharge (ft^3/s)
		Hawaii, Island of Oahu--Continued					
16223000	Waimalu Stream near Aiea	Lat 21°23'48", long 157°56'56", 1,300 ft upstream from bridge on Moanalua Road and 1.2 mi northwest of Aiea High School.	5.97	1952-70≠, 1973-87	6-12-87	2.38	752
18224500	Kalauao Stream at Moanalua Road, at Aiea	Lat 21°23'07", long 157°58'22", 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≠, 1984-87	11-10-88	5.60	1,560
16228000	Moanalua Stream near Honolulu	Lat 21°22'53", long 157°52'22", on left bank 1.8 mi northeast of Tripler Hospital and 5.0 mi north of Honolulu Post Office.	2.73	1927-78≠, 1979-87	6-12-87	7.03	1,040
16228200	Moanalua Stream near Aiea	Lat 21°22'37", long 157°53'03", on right bank 1.1 mi northeast of Tripler Hospital and 2.9 mi east of Aiea sugar refinery.	3.34	1989-87	6-12-87	4.92	1,240
16228600	Moanalua Stream at Tripler Hospitsl	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	1971-87	6-12-87	15.79	1,580
18228900	Kalihi Stream near Kaneohe	Lat 21°22'35", long 157°49'32", on right bank 800 ft downstream from Likelike Highway and 2.8 mi southwest of Castle High School in Kaneohe.	.60	1967-71≠, 1972-87	8-12-87	-	e700
16235400	Waolani Stream at Honolulu	Lat 21°20'00", long 157°51'04", at Wyllie Street bridge and 1.8 mi northeast of Honolulu Post Office.	1.28	1958-87	6-12-87	1.65	285
16237500	Pauoa Stream at Honolulu	Lat 21°19'18", long 157°51'03", at Lusitana Street bridge and 1.1 mi northeast of Honolulu Post Office.	1.43	1958-87	8-12-87	-	e100
18247100	Manoa-Palolo Drainage Canal at Moiliili	Lat 21°17'24", long 157°49'17", on left bank at Kaimuki High School, 0.3 mi downstream from confluence of Manoa and Palolo Streams, and 0.6 mi upstream from point of discharge into Ala Wai Canal.	9.35	1968-87	11-10-88	85.04	1,060
18247500	Wailupe Gulch at Aina Haina	Lat 21°17'46", long 157°45'29", at Ani Street bridge and 1.0 mi upstream from Kalanianaole Highway in Aina Haina.	2.35	1958-87	11-10-88	.72	215
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, 1970-87	11-10-86	30.0	250
18248800	Inoaole Stream at Waimanalo	Lat 21°29'31", long 157°42'40", 30 ft upstream from culvert on Hihimanu Street and 0.8 mi northwest of Waimanalo Post Office.	1.21	1958-87	11-10-86	5.44	e150
16249000	Waimanalo Stream at Waimanalo	Lat 21°21'12", long 157°43'52", on right bank 40 ft upstream from Highway 72 and 2.3 mi northwest of Waimanalo Post Office.	2.18	1967-70≠, 1971-87	11-10-88	10.31	e1,800
16249100	Kaelepulu Stream tributary at Kailua	Lat 21°21'44", long 157°44'22", 30 ft upstream from Kalanianaole Highway, 1.8 mi northwest of Waimanalo School, and 2.4 mi south of Kailua Post Office.	.18	1983-87	11-10-88	3.03	105

≠ Operated as a continuous-record gaging station.
e Estimated.

Annual maximum discharge at crest-stage partial-record stations during water year 1987--Continued

Station no.	Station name	Location	Drainage area mi^2	Period of record	Annual maximum Date	Gage height (ft)	Discharge (ft^3/s)
		Hawaii, Island of Oahu--Continued					
16260500	Maunawili Stream at Highway 61, near Kailua	Lat 21°22'51", long 157°45'48", on right bank at downstream side of bridge on Highway 61, 0.6 mi west of Maunawili School, and 1.6 mi southwest of Kailua Post Office.	5.34	1958-67, 1968-71≠, 1972-87	11-10-86	9.2	1,670
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, 1967-86b	-	<1.11	-
16265000	Kawa Stream at Kaneohe	Lat 21°24'32", long 157°47'36", 50 ft upstream from bridge on Kaneohe Bay Drive at Kaneohe, 0.2 mi northeast of Castle High School, and 0.6 mi upstream from mouth.	1.19	1965, 1968-74, 1977-87	11-10-86	-	e300
16274499	Keaahala Stream at Kamehameha Highway, at Kaneohe	Lat 21°25'12", long 157°48'15", 35 ft upstream from bridge on Kamehameha Highway in Kaneohe.	.62	1959-87	11-10-86	5.27	691
16279500	Heeia Stream at Kaneohe	Lat 21°25'17", long 157°49'01", 80 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, 1968-87	11-10-86	5.35	960
16283480	Ahuimanu Stream near Kahaluu	Lat 21°27'04", long 157°50'13", at bridge on Ahuimanu Road and 0.8 mi south of Kahaluu.	2.31	1963-87	11-10-86	-	e900
16304500	Kaluanui Stream at Hauula	Lat 21°35'57", long 157°54'24", on left downstream wingwall of concrete bridge, 1.2 mi southeast of cemetery in Hauula, and 1.4 mi northeast of Sacred Falls.	2.12	1958-87	11-10-86	4.82	1,920
16310501	Malaekahana Stream at altitude 30 ft, near Kahuku	Lat 21°39'47", long 157°57'11", at abandoned plantation railroad bridge, 1.1 mi southwest of junction of plantation road and Highway 83, and 1.2 mi south of Kahuku Hospital.	4.05	1958-87	11-10-86	4.65	e200
16311000	Oio Stream near Kahuku	Lat 21°41'32", long 157°59'48", 0.6 mi southwest of junction of plantation road and Highway 83 and 2.7 mi west of Kahuku Hospital.	2.13	1958-87	11-10-88	-	e80
16317800	Kaunala Gulch near Sunset Beach	Lat 21°40'59", long 158°02'12", on downstream left bank wingwall of road bridge on Highway 83 near Sunset Beach and 2.9 mi northeast of Waimea.	1.98	1973-87	3-24-87	4.83	e80
16318000	Paumalu Gulch at Sunset Beach	Lat 21°40'19", long 158°02'28", 0.4 mi upstream from Highway 83 at Sunset Beach and 2.2 mi northeast of Waimea.	2.59	1968-87	3-24-87	3.20	195
16331000	Waimea Gulch near Kawailoa Camp	Lat 21°37'29", long 158°04'58", at culvert on Ashley Road, 0.1 mi upstream from Highway 83, and 1.1 mi north of Kawailoa Camp.	2.23	1968-87	6-12-87	1.41	20
16340000	Anahulu River near Haleiwa	Lat 21°35'28", long 158°04'45", 1.7 mi southeast of junction of Emerson Road and Kamehameha Highway and 2.5 mi east of Waialua School at Haleiwa.	13.5	1958-87	11-10-86	5.45	1,580
16350000	Opaeula Stream near Haleiwa	Lat 21°35'09", long 158°06'01", 0.6 mi upstream from Kamehameha Highway and 2.1 mi northeast of Waialua.	5.96	1956-87	8-12-87	10.93	579

≠ Operated as a continuous-record gaging station.
< Actual value is known to be less than the value shown.
e Estimated.
b Gage height only.

Annual maximum discharge at crest-stage partial-record stations during water year 1987--Continued

Station no.	Station name	Location	Drainage area mi^2	Period of record	Annual maximum Date	Gage height (ft)	Discharge (ft^3/s)
		Hawaii, Island of Molokai					
18411320	Kakaako Gulch above Kamakahi Gulch, near Mauna Loa	Lat 21°10'11", long 157°11'56", 0.1 mi upstream from Kamakahi Gulch, 1.7 mi downstream from Highway 46, and 2.5 mi northeast of Mauna Loa.	1.40	1964-87	5-21-87	-	e<1
18411400	Kakaako Gulch near Mauna Loa	Lat 21°10'39", long 157°12'31", on left bank 1.0 mi downstream from Kamakahi Gulch, and 3.0 mi north of Mauna Loa School.	5.34	1963-72≠, 1973-87	5-21-87	2.11	43
18411600	Kaunala Gulch near Mauna Loa	Lat 21°07'01", long 157°15'43", at Sand Haul Road, 3.2 mi east of Laau Point lighthouse, and 3.3 mi southwest of Mauna Loa.	.28	1964-87	2-15-87	.77	7.5
18411840	Halena Gulch near Mauna Loa	Lat 21°05'53", long 157°13'47", 2.7 mi southwest of Mauna Loa and 5.5 mi east of Laau Point.	2.07	1965-87	2-15-87	2.36	260
18411800	Kaluapeelua Gulch at Hoolehua	Lat 21°09'55", long 157°04'22", 0.4 mi south of Hoolehua and 2.1 mi west of Kualapuu.	1.46	1964-87	-	-	NO FLOW
18413500	Manawainui Gulch near Kualapuu	Lat 21°07'42", long 157°03'25", at bridge on Highway 46, 0.5 mi south of Holomua School, and 2.3 mi southwest of Kualapuu.	10.4	1965-87	2-16-87	8.07	1,010
18415400	Wawaia Gulch at Kamalo	Lat 21°03'25", long 158°52'20", at Highway 45, 0.3 mi upstream from mouth, and 0.5 mi northeast of Kamalo.	2.12	1964-87	2-16-87	1.21	301
18418000	Pohakupili Gulch near Halawa	Lat 21°07'59", long 156°44'15", at Highway 45, 0.5 mi upstream from mouth, and 1.9 mi south of Halawa.	.48	1964-87	5-06-87	6.71	194
		Hawaii, Island of Maui					
16500100	Kepuni Gulch near Kahikinui House	Lat 20°37'21", long 156°15'18", on right bank 120 ft upstream from bridge on Highway 31, 400 ftr upstream from Kamole Gulch, 1.1 mi east of Kahikinui House, and 8.5 mi west of Kaupo.	1.91	1963-72≠, 1973-87	12-06-86	4.35	176
16500300	Hawelewele Gulch near Kaupo	Lat 20°38'01", long 156°11'08", 700 ft upstream from Piilani Highway 31 and 3.9 mi west of Kaupo.	11.3	1967-87	12-08-86	9.42	3,380
16500800	Kukuiula Gulch near Kipahulu	Lat 20°39'18", long 156°04'44", at Highway 31, 1.3 mi west of Kipahulu, and 3.2 mi east of Kaupo.	.76	1963-68≠, 1969-87	1-16-87	6.49	1,190
16502400	Pukuilua Gulch near Hana	Lat 20°42'00", long 156°00'14", at Highway 31, 0.4 mi southwest of Puuiki, and 4.0 mi south of Hana.	.48	1963-87	12-02-86	5.97	390
16502600	Moomoonui Gulch at Hana	Lat 20°44'37", long 155°59'18", at Highway 31 just downstream from Moomooiki Gulch and 1.0 mi south of Hana.	.90	1963-87	1-18-87	13.95	1,420
18502900	Kawaipapa Gulch at Hana	Lat 20°46'08", long 156°00'04", 1,000 ft upstream from Highway 36 and 0.3 mi northwest of Hana Hospital.	5.83	1965-87	1-18-87	13.95	16,100

≠ Operated as a continuous-record gaging station.
e Estimated.
< Actual value is known to be less than the value shown.

Annual maximum discharge at crest-stage partial-record stations during water year 1987--Continued

Station no.	Station name	Location	Drainage area mi^2	Period of record	Annual maximum Date	Gage height (ft)	Discharge (ft^3/s)
		Hawaii, Island of Maui--Continued					
16603300	Unnamed gulch at Maliko Bay	Lat 20°58'26", long 156°21'04", at Hana Highway, 0.5 mi west of Maliko Bay, and 1.3 mi north of Hamakuapoko.	.43	1963-87	5-06-87	1.75	12
16603700	Kalialinui Gulch tributary near Pukalani	Lat 20°49'02", long 156°19'44", at Lower Kula Road and 1.4 mi south of Pukalani.	1.17	1967-87	12-06-86	6.25	300
16603800	Kaluapulani Gulch tributary near Pukalani	Lat 20°48'52", long 156°18'32", at Haleakala Highway, 1.5 mi west of Olinda Prison Camp, and 2.3 mi southeast of Pukalani.	.45	1963-87	12-06-86	3.16	89
16603850	Kalialinui Gulch near Kahului	Lat 20°52'47", long 156°26'06", 600 ft upstream from Hansen Road, 0.5 mi northeast of Puunene Hospital, and 2.5 mi southeast of Kahului Post Office.	17.9	1967-87	12-06-86	5.68	414
16607000	Iao Stream at Wailuku	Lat 20°53'36", long 156°30'27", 560 ft upstream from Market Street bridge at Wailuku and 1.9 mi upstream from mouth.	8.24	1951≠, 1952-87	5-05-87	5.77	4,720
16616500	Unnamed gulch at Maluhia Camp	Lat 20°57'26", long 156°31'41", at Kahekili Highway, 0.6 mi east of Maluhia Camp, and 1.8 mi northwest of Waihee.	.12	1964-87	5-05-87	-	e28
16619700	Poelua Gulch near Kahakuloa	Lat 21°00'56", long 156°34'58", at Highway 30 (bypass), 1.3 mi southeast of Nakalele Point lighthouse, and 2.2 mi northwest of Kahakuloa.	1.16	1965-87	5-05-87	13.20	624
16630200	Honokowai Stream at Honokowai	Lat 20°58'58", long 156°41'07", 0.5 mi southesst of Honokowai, and 1.1 mi northwest of Puukolii.	5.59	1962-63, 1965-87	5-05-87	5.95	1,050
16643300	Kauaula Stream near mouth, near Lahaina	Lat 20°52'09", long 156°39'43", 0.7 mi upstream from Honoapiilani Highway (bypass) and 1.3 mi southeast of Lahaina Lighthouse.	4.12	1960, 1962, 1964-87	5-05-87	4.88	702
16646200	Olowalu Stream at Olowalu	Lat 20°49'23", long 156°37'15", on downstream side of center pier of plantation road bridge, 0.6 mi northeast of Olowalu, and 5.5 mi southeast of Lahaina.	4.08	1962-72≠, 1973-87	5-05-87	4.77	902
16647500	Malalowaiaole Gulch near Maalaea	Lat 20°46'56", long 156°31'32", at Honoapiilani Highway, 200 ft upstream from mouth, 0.2 mi north of McGregor Point, and 1.2 mi southwest of Maalaea.	.84	1964-87	5-05-87	4.66	42
16650500	Waikapu Stream near Kihei	Lat 20°49'02", long 156°29'00", at railroad bridge beside Lower Maalaea Road, 2.5 mi northeast of Maalaea, and 2.5 mi northwest of Kihei.	6.97	1963-87	5-05-87	8.28	1,130

≠ Operated as a continuous-record gaging station.
e Estimated.

Annual maximum discharge at crest-stage partial-record stations during water year 1987--Continued

Station no.	Station name	Location	Drainage area mi^2	Period of record	Annual maximum Date	Gage height (ft)	Discharge (ft^3/s)
		Hawaii, Island of Maui--Continued					
16658500	Waiakoa Gulch tributary near Waiakoa	Lat 20°44'56", long 156°19'22", at Upper Kula Road, 1.0 mi southeast of Waiakoa, and 1.0 mi northeast of junction of Lower and Upper Kula Roads.	.98	1964-87	12-06-86	2.17	46
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	1963-87	12-06-86	8.73	276
16660000	Kulanihakoi Gulch near Kihei	Lat 20°46'06", long 156°27'03", on right bank 0.5 mi northeast of Lihue Cemetery, 0.8 mi upstream from mouth, and 1.3 mi southeast of Kihei.	14.4	1963-70*, 1971-87	12-06-86	.84	339
16663500	Kamaole Gulch at Kamaole	Lat 20°43'38", long 156°27'02", at Kihei Road, 350 ft upstream from mouth, and 0.2 mi south of Kamaole.	4.28	1972-87	-	-	NO FLOW
16664000	Liilioholo Gulch at Kamaole	Lat 20°43'04", long 156°26'55", on upstream side of Kihei Road, 300 ft upstream from mouth, and 0.8 mi south of Kamaole.	4.12	1972-87	-	-	NO FLOW
		Hawaii, Island of Hawaii					
16701300	Waiakea Stream at Hilo	Lat 19°42'38", long 155°05'02", 0.3 mi upstream from Kinoole Street bridge and 1.3 mi southeast of Hilo Post Office.	35.8	1968-87	11-13-86	3.10	110
16701400	Palai Stream at Hilo	Lat 19°40'58", 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	1965-87	11-13-86	2.80	68
16717400	Kalaoa Mauka Stream near Hilo	Lat 19°48'07", long 155°06'03", at culvert on Highway 19, 1.0 mi north of Papaikou, and 5.1 mi north of Hilo Post Office.	.24	1983-87	11-13-86	3.80	50
16717600	Alia Stream near Hilo	Lat 19°50'38", long 155°08'21", on left bank 10 ft downstream from culvert on Highway 19 at Pepeekeo, 2.0 mi south of Honomu, and 8.0 mi north of Hilo.	.58	1962-72*, 1973-87	11-13-86	4.12	388
16717650	Kapehu Stream near Pepeekeo	Lat 19°51'52", long 155°06'11", at culvert on Highway 19, 1.0 mi southeast of Honomu, 2.2 mi north of Pepeekeo, and 9.4 mi north of Hilo.	1.09	1963-87	11-13-86	5.41	375
16717800	Pohakupuka Stream near Papaaloa	Lat 19°57'20", long 155°11'20", on right bank 200 ft downstream from Highway 19, 2.8 mi northwest of Honohina, and 3.0 mi southwest of Papaaloa.	2.76	1963-80*, 1983-87	11-13-86	6.57	928
16717850	Keehia Gulch near Ookala	Lat 20°01'08", long 155°18'45", at culvert on Highway 19, 1.7 mi west of Ookala, and 4.1 mi southeast of Paauilo.	.62	1983-87	1-18-87	8.48	439
16717920	Ahualoa Gulch at Honokaa	Lat 20°05'12", long 155°29'17", at Highway 24, 1.1 mi northwest of Honokaa Hospitel, and 1.5 mi upstream from mouth.	2.27	1963-87	7-20-87	-	e5
16717950	Honokaia Gulch tributary near Honokaa	Lat 20°02'58", long 155°32'19", at culvert 4.8 mi southwest of Honokaa Hospital, and 5.5 mi southeast of Kukuihaele.	2.42	1963-87	7-20-87	1.30	21
16752600	Hapahapai Gulch at Kapaau	Lat 20°14'00", long 155°48'00", at Highway 27, 300 ft east of Kapaau Post Office.	1.52	1983-87	-	-	NO FLOW

* Operated as a continuous-record gaging station.
e Estimated.

Annual maximum discharge at crest-stage partial-record stations during water year 1987--Continued

Station no.	Station name	Location	Drainage area mi^2	Period of record	Annual maximum Date	Gage height (ft)	Discharge (ft^3/s)
		Hawaii, Island of Hawaii--Continued					
16755800	Luahine Gulch near Waimea	Lat 20§03'11", long 155§44'35", at culvert 5.1 mi northwest of Waimea and 5.7 mi east of Kawaihae.	.32	1963-87	1-18-87	3.70	156
16756500	Keanuiomano Stream near Kamuela	Lat 20°01'48", long 155°42'05", on left bank 150 ft upstream from Highway 25 at Waiaka and 2.0 mi west of Kamuela.	4.3	1964-72≠, 1973-87	1-18-87	8.39	1,210
16759040	Paiakuli Reservoir tributary near Waimea	Lat 20°02'16", long 155°38'08", at Highway 19, 2.1 mi west of Puukapu Reservoir, and 2.8 mi northeast of Waimea.	.27	1963-87	1-18-87	4.15	211
16759060	Kamakoa Gulch near Waimea	Lat 19°57'32", long 155°41'02", at bridge, 1.4 mi north of Saddle Road Junction, and 4.5 mi south of Waimea.	50.8	1963-87	10-01-86	4.62	306
16759080	Popoo Gulch near Waikii	Lat 19°52'11", long 155°43'51", at bridge on Highway 19, 2.0 mi north of Keamuku, and 5.2 mi west of Waikii.	33.1	1963-87	10-01-86	5.61	1,240
16759180	Keopu Stream near Kailua	Lat 19°38'54", long 155°58'15", at county road bridge, 1.9 mi east of Kailua, and 2.3 mi northwest of Holualoa Post Office.	2.81	1962, 1985-87	-	-	NO FLOW
16759300	Waiaha Stream at Luawai, near Holualoa	Lat 19°38'12", long 155°55'45", on right bank at Luawai, 1.8 mi northeast of Holualoa School, and 4.2 mi southeast of Honokohau School.	8.74	1961-71≠, 1972-87	5-08-87	2.68	50
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	1983-87	11-13-88	7.31	1,220
16767000	Ninole Gulch near Punaluu	Lat 19°10'44", long 155°33'46", on right bank 300 ft downstream from forest-reserve boundary, 4.8 mi northwest of Punaluu, and 6.0 mi north of Honuapo.	15.5	1968-82≠, 1983-87	11-13-88	4.61	345
16770000	Hionamoa Gulch at Pahala	Lat 19°11'45", long 155°29'11", at bridge, 0.6 mi southwest of Pahala, and 4.1 mi north of Punaluu.	9.41	1963-87	11-13-86	12.31	3,750
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≠, 1980-87	11-13-86	4.78	420

≠ Operated as a continuous-record gaging station.

Water-quality partial-record stations are particular sitea where chemical-quality, biological and or sediment data are collected systematically over a period of years for use in hydrologic analyses. A schematic diagram ehowing water-quality atations in Kamooalii Stream basin, Kaneohe, Oahu is shown in figure 15 and the data are listed in downstream order.

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

HAWAII, ISLAND OF OAHU

212335157482601 HOOMALUHIA RESERVOIR SEC 1-1 NEAR KANEOHE (LAT 21°23'35" LONG 157°48'26")

DATE	TIME	BAROMETRIC PRESSURE (MM OF HG)	SAMPLING DEPTH (FEET)	SPECIFIC CONDUCTANCE (US/CM)	PH (STANDARD UNITS)	TEMPERATURE WATER (DEG C)	OXYGEN, DISSOLVED (MG/L)	OXYGEN, DISSOLVED (PERCENT SATURATION)
DEC								
08...	1306	758	1.00	181	7.70	22.4	7.4	88
08...	1307	756	3.00	180	7.80	22.3	7.8	88
08...	1308	758	5.00	182	7.70	21.5	7.3	83
08...	1309	758	7.00	182	7.80	21.4	7.1	81
08...	1310	758	9.00	184	7.80	21.3	6.6	75
FEB								
23...	1011	754	1.00	172	7.90	22.2	7.5	87
23...	1012	754	3.00	171	7.90	22.2	7.5	87
23...	1013	754	5.00	172	7.80	22.1	7.5	87
23...	1014	754	7.00	173	7.80	22.0	7.4	86
23...	1015	754	9.00	174	7.70	21.9	7.2	83
JUL								
06...	1215	762	1.00	181	8.00	28.3	7.7	98
06...	1216	762	3.00	181	7.80	26.1	7.2	89
06...	1217	762	5.00	181	7.70	26.0	6.8	84
06...	1218	762	7.00	183	7.60	25.9	5.9	73
06...	1220	762	9.00	185	7.40	25.6	4.4	54

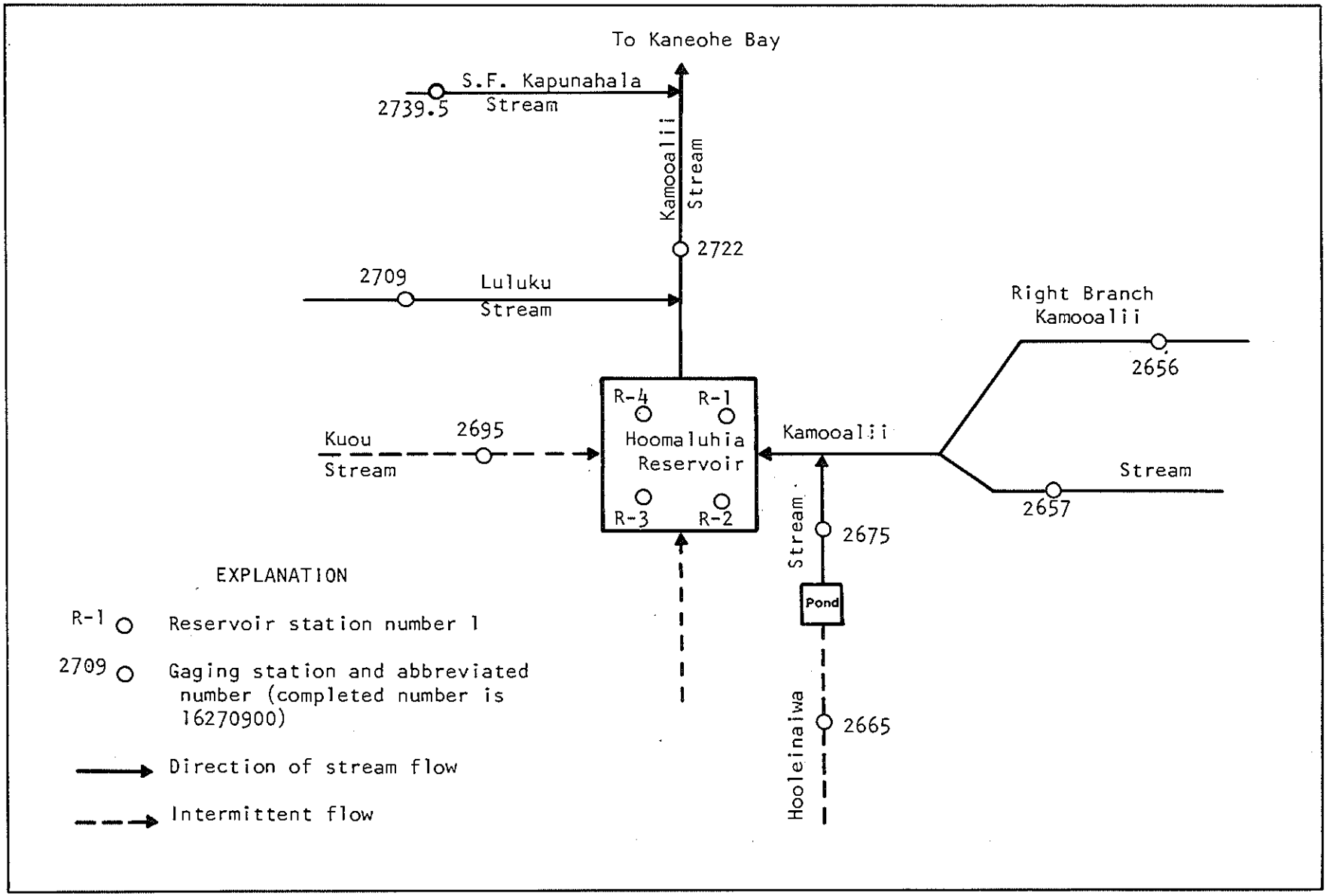


Figure 15.--Schematic diagram showing water-quality stations in Kamooalii Stream basin, Kaneohe, Oahu.

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

HAWAII, ISLAND OF OAHU--Continued

212335157482602 HOOMALUHIA RESERVOIR SEC 1-2 NEAR KANEOHE (LAT 21°23'35" LONG 157°48'26")

DATE	TIME	BAROMETRIC PRESSURE (MM OF HG)	SAMPLING DEPTH (FEET)	SPECIFIC CONDUCTANCE (US/CM)	PH (STANDARD UNITS)	TEMPERATURE WATER (DEG C)	OXYGEN, DISSOLVED (MG/L)	OXYGEN, DISSOLVED (PERCENT SATURATION)
DEC								
08...	1301	756	1.00	180	7.70	22.2	7.5	87
08...	1302	756	3.00	179	7.70	21.8	7.4	85
08...	1303	758	5.00	179	7.70	21.5	7.6	87
08...	1304	756	7.00	180	7.70	21.4	7.4	84
08...	1305	756	9.00	182	7.60	21.4	6.4	73
FEB								
23...	1005	754	1.00	172	7.90	22.2	7.6	88
23...	1006	754	3.00	172	7.80	22.1	7.5	87
23...	1007	754	5.00	172	7.80	22.0	7.5	87
23...	1008	754	7.00	174	7.70	21.9	7.5	87
23...	1010	754	9.00	174	7.70	21.9	7.3	84
JUL								
08...	1205	762	1.00	180	8.00	28.2	7.8	97
08...	1207	762	3.00	181	7.80	26.1	7.2	89
08...	1208	762	5.00	181	7.70	26.0	7.0	86
06...	1209	762	7.00	183	7.60	25.9	6.3	78
08...	1210	762	9.00	185	7.40	25.8	5.5	67

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

HAWAII, ISLAND OF OAHU--Continued

212335157482803 HOOMALUHIA RESERVOIR SEC 1-3 NEAR KANEOHE (LAT 21°23'35" LONG 157°48'26")

DATE	TIME	BAROMETRIC PRESSURE (MM OF HG)	SAMPLING DEPTH (FEET)	SPECIFIC CONDUCTANCE (US/CM)	PH (STANDARD UNITS)	TEMPERATURE WATER (DEG C)	TURBIDITY (FTU)	OXYGEN, DISSOLVED (MG/L)	OXYGEN DISSOLVED (PERCENT SATURATION	COLIFORM, FECAL, 0.7 UM-MF (COLS./100 ML)
DEC										
08...	1247	756	1.00	180	7.70	22.1	1.1	7.6	88	46
08...	1248	756	3.00	181	7.60	21.6	--	7.4	85	--
08...	1250	756	5.00	181	7.60	21.4	--	7.0	80	--
08...	1252	758	7.00	182	7.50	21.3	1.8	6.4	73	69
08...	1254	756	9.00	183	7.40	21.3	--	5.8	66	--
08...	1255	756	11.0	189	7.30	21.0	3.9	5.4	61	K640
08...	1257	756	12.0	189	7.30	20.9	--	5.0	56	--
08...	1300	756	--	184	7.50	21.5	2.5	6.5	74	--
			13.1 (bottom)							
FEB										
23...	0935	754	1.00	172	7.80	22.1	2.0	7.4	86	K3
23...	0936	754	3.00	173	7.70	21.9	--	7.6	88	--
23...	0937	754	5.00	175	7.60	21.9	--	7.4	85	--
23...	0938	754	7.00	175	7.60	21.9	1.5	7.3	84	K12
23...	0939	754	9.00	175	7.60	21.8	--	7.2	83	--
23...	0940	754	11.0	175	7.60	21.8	2.0	7.2	83	K12
23...	0942	754	12.0	175	7.60	21.8	--	7.2	83	--
			13.1 (bottom)							
JUL										
06...	1128	762	1.00	180	8.00	26.2	0.80	7.8	97	K5
06...	1130	762	3.00	180	7.90	26.2	--	7.7	95	--
06...	1133	762	5.00	181	7.50	26.1	--	6.8	84	--
06...	1135	762	7.00	182	7.50	25.9	1.0	6.3	78	K13
06...	1138	762	9.00	184	7.40	25.7	--	5.8	71	--
06...	1141	762	11.0	187	7.30	25.0	1.5	5.2	63	88
06...	1143	762	12.0	187	7.20	24.8	--	4.8	58	--
06...	1150	762	--	183	7.60	25.7	1.5	6.4	79	--
			13.1 (bottom)							

DATE	TIME	HARDNESS TOTAL (MG/L AS CACO3)	CALCIUM DISSOLVED (MG/L AS CA)	MAGNESIUM, DISSOLVED (MG/L AS MG)	SODIUM, DISSOLVED (MG/L AS NA)	SODIUM PERCENT	SODIUM ADSORPTION RATIO	POTASSIUM, DISSOLVED (MG/L AS K)	ALKALINITY LAB (MG/L AS CACO3)
DEC									
08...	1300	56	8.9	8.1	14	35	0.8	1.4	50
JUL									
06...	1150	55	7.9	8.5	15	37	0.9	1.0	52

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

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

HAWAII, ISLAND OF OAHU--Continued

212335157482603 HOOMALUHIA RESERVOIR SEC 1-3 NEAR KANEOHE--Continued

DATE	TIME	CHLORIDE, DISSOLVED (MG/L AS CL)	SULFATE DISSOLVED (MG/L AS SO4)	FLUORIDE, DISSOLVED (MG/L AS F)	SILICA, DISSOLVED (MG/L AS SIO2)	SOLIDS, RESIDUE AT 180 DEG. C DISSOLVED (MG/L)	SOLIDS, SUM OF CONSTITUENTS, DISSOLVED (MG/L)
DEC							
08...	1300	21	11	<0.10	20	107	115
JUL							
06...	1150	19	8.4	<0.10	21	112	112

DATE	TIME	RESIDUE TOTAL AT 105 DEG. C, SUSPENDED (MG/L)	NITROGEN, NO2+NO3 TOTAL (MG/L AS N)	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)	PHOSPHOROUS TOTAL (MG/L AS P)
DEC					
08...	1247	7	0.300	1.1	0.020
08...	1252	3	0.300	<0.20	0.020
08...	1255	12	0.400	0.60	0.020
FEB					
23...	0935	2	0.300	0.80	0.020
23...	0938	2	0.400	0.80	0.020
23...	0940	7	0.400	0.60	0.010
JUL					
06...	1128	1	0.200	1.1	<0.010
06...	1135	<1	0.200	1.0	0.010
06...	1141	<1	0.300	0.80	0.110

DATE	TIME	ALUMINUM, TOTAL RECOVERABLE (UG/L AS AL)	ALUMINUM, DISSOLVED (UG/L AS AL)	ARSENIC TOTAL (UG/L AS AS)	ARSENIC DISSOLVED (UG/L AS AS)	BARIUM, TOTAL RECOVERABLE (UG/L AS BA)	BARIUM, DISSOLVED (UG/L AS BA)	BERYLLIUM, TOTAL RECOVERABLE (UG/L AS BE)	BERYLLIUM, DISSOLVED (UG/L AS BE)	CADMIUM TOTAL RECOVERABLE (UG/L AS CD)
DEC										
08...	1300	110	<10	1	<1	<100	12	<10	<0.5	<1
JUL										
06...	1150	50	<10	<1	<1	<100	6	<10	<0.5	<1

DATE	CADMIUM DISSOLVED (UG/L AS CD)	CHROMIUM, TOTAL RECOVERABLE (UG/L AS CR)	CHROMIUM, DISSOLVED (UG/L AS CR)	COBALT, TOTAL RECOVERABLE (UG/L AS CO)	COBALT, DISSOLVED (UG/L AS CO)	COPPER, TOTAL RECOVERABLE (UG/L AS CU)	COPPER, DISSOLVED (UG/L AS CU)	IRON, TOTAL RECOVERABLE (UG/L AS FE)	IRON, DISSOLVED (UG/L AS FE)
DEC									
08...	<1	<10	<1	<1	<3	6	3	340	35
JUL									
06...	<1	<10	2	1	<3	2	2	160	12

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

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

HAWAII, ISLAND OF OAHU--Continued

212335157482603 HOOMALUHIA RESERVOIR SEC 1-3 NEAR KANEOHE--Continued

DATE	TIME	LEAD, TOTAL RECOVERABLE (UG/L AS PB)	LEAD, DISSOLVED (UG/L AS PB)	LITHIUM TOTAL RECOVERABLE (UG/L AS LI)	LITHIUM DISSOLVED (UG/L AS LI)	MANGANESE, TOTAL RECOVERABLE (UG/L AS MN)	MANGANESE, DISSOLVED (UG/L AS MN)	MERCURY TOTAL RECOVERABLE (UG/L AS HG)	MERCURY DISSOLVED (UG/L AS HG)	MOLYBDENUM, TOTAL RECOVERABLE (UG/L AS MO)	MOLYBDENUM, DISSOLVED (UG/L AS MO)
DEC											
08...	1300	5	<5	<10	<4	60	33	<0.10	0.1	6	<10
JUL											
06...	1150	<5	<5	<10	<4	70	11	<0.10	<0.1	<1	<10

NICKEL, TOTAL RECOVERABLE (UG/L AS NI)	NICKEL, DISSOLVED (UG/L AS NI)	SELENIUM, TOTAL (UG/L AS SE)	SELENIUM, DISSOLVED (UG/L AS SE)	SILVER, TOTAL RECOVERABLE (UG/L AS AG)	SILVER, DISSOLVED (UG/L AS AG)	STRONTIUM, DISSOLVED (UG/L AS SR)	VANADIUM, DISSOLVED (UG/L AS V)	ZINC, TOTAL RECOVERABLE (UG/L AS ZN)	ZINC, DISSOLVED (UG/L AS ZN)
2	<1	<1	<1	<1	<1.0	73	<6	10	<3
<1	1	<1	<1	<1	<1.0	77	<6	<10	<3

CARBON, ORGANIC TOTAL (MG/L AS C)	OIL AND GREASE, TOTAL RECOV. GRAVIMETRIC (MG/L)	PCB, TOTAL (UG/L)	ALDRIN, TOTAL (UG/L)	CHLORDANE, TOTAL (UG/L)	DDD, TOTAL (UG/L)	DDE, TOTAL (UG/L)	DDT, TOTAL (UG/L)	DIAZINON, TOTAL (UG/L)	DIELDRIN TOTAL (UG/L)
2.6	<1	<0.1	<0.010	<0.1	<0.010	<0.010	<0.010	<0.01	<0.010
3.9	<1	<0.1	<0.010	<0.1	<0.010	<0.010	<0.010	<0.01	<0.010

ENDOSULFAN, TOTAL (UG/L)	ENDRIN, TOTAL (UG/L)	ETHION, TOTAL (UG/L)	HEPTACHLOR, TOTAL (UG/L)	HEPTACHLOR EPOXIDE TOTAL (UG/L)	LINDANE TOTAL (UG/L)	MALATHION, TOTAL (UG/L)	METHOXYCHLOR, TOTAL (UG/L)	METHYL PARATHION, TOTAL (UG/L)	METHYL TRITHION, TOTAL (UG/L)
<0.010	<0.010	<0.01	<0.010	<0.010	<0.010	<0.01	<0.01	<0.01	<0.01
<0.010	<0.010	<0.01	<0.010	<0.010	<0.010	<0.01	<0.01	<0.01	<0.01

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

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

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

HAWAII, ISLAND OF OAHU--Continued

212336157482601 HOOMALUHIA RESERVOIR AT OUTLET, NEAR KANEOHE (LAT 21°23'36" LONG 157°48'26")

DATE	TIME	BAROMETRIC PRESSURE (MM OF HG)	SAMPLING DEPTH (FEET)	SPECIFIC CONDUCTANCE (US/CM)	PH (STANDARD UNITS)	TEMPERATURE WATER (DEG C)	OXYGEN, DISSOLVED (MG/L)	OXYGEN, DISSOLVED (PERCENT SATURATION)
DEC, 1986								
09...	1115	758	1.00	183	7.80	22.0	7.7	89
09...	1117	758	3.00	182	7.60	21.8	7.6	87
09...	1119	758	5.00	182	7.60	21.6	7.3	83
09...	1120	758	7.00	182	7.50	21.6	6.8	78
09...	1121	758	9.00	182	7.50	21.4	6.5	74
09...	1122	758	11.0	184	7.40	21.2	5.6	63
09...	1123	758	13.0	186	7.30	21.2	4.2	48
09...	1124	758	15.0	188	7.20	20.9	3.3	37
09...	1125	758	17.0	189	7.20	20.9	2.9	33
12...	1045	760	1.00	183	7.80	22.9	8.3	97
12...	1047	760	3.00	183	7.80	22.8	8.1	94
12...	1048	760	5.00	188	7.70	22.6	8.8	79
12...	1050	760	7.00	188	7.60	22.6	6.1	71
12...	1051	760	9.00	187	7.50	22.0	4.7	54
12...	1052	780	11.0	188	7.40	21.8	3.4	39
12...	1053	760	13.0	189	7.30	21.7	2.5	29
12...	1054	760	15.0	191	7.30	21.6	1.8	21
12...	1055	760	17.0	191	7.30	21.6	1.5	17
16...	1013	760	1.00	187	7.80	23.0	7.8	91
16...	1015	760	3.00	187	7.70	23.0	7.8	91
16...	1016	760	5.00	188	7.70	22.8	7.2	84
16...	1017	760	7.00	188	7.60	22.8	6.8	79
16...	1019	760	9.00	192	7.50	22.7	4.6	54
16...	1020	760	11.0	193	7.40	22.6	3.1	36
16...	1021	760	13.0	195	7.30	22.3	1.3	15
16...	1022	760	15.0	198	7.20	22.2	0.2	2
16...	1023	760	17.0	188	7.20	22.1	0	0
FEB, 1987								
23...	1021	754	1.00	170	7.90	22.3	7.5	87
23...	1023	754	3.00	171	7.80	22.3	7.6	88
23...	1024	754	5.00	172	7.80	22.0	7.8	88
23...	1025	754	7.00	173	7.80	21.9	7.5	87
23...	1026	754	9.00	173	7.70	21.9	7.4	85
23...	1027	754	11.0	173	7.70	21.8	7.4	85
23...	1028	754	13.0	173	7.70	21.9	7.3	84
23...	1029	754	15.0	173	7.70	21.9	7.3	84
23...	1030	754	17.0	173	7.70	21.9	7.2	83
JUL								
06...	1227	762	1.00	181	7.90	26.1	7.5	93
08...	1229	762	3.00	181	7.90	26.1	7.4	91
06...	1230	762	5.00	181	7.80	26.0	7.2	89
08...	1232	762	7.00	182	7.80	25.9	8.1	75
06...	1233	762	9.00	184	7.50	25.7	5.6	69
06...	1234	762	11.0	186	7.40	25.4	5.2	63
06...	1235	762	13.0	187	7.20	25.1	3.1	38
06...	1236	762	15.0	188	7.10	24.7	1.9	23
06...	1237	762	17.0	188	7.10	24.7	1.5	18
06...	1238	762	18.0	188	7.00	24.8	1.1	13
13...	1005	780	1.00	178	--	27.4	7.2	91
13...	1008	760	3.00	178	--	27.0	7.1	89
13...	1008	760	5.00	178	--	28.9	6.9	87
13...	1009	760	7.00	179	--	26.7	6.5	81
JUL								
13...	1011	760	9.00	182	--	26.4	5.7	71
13...	1012	760	11.0	183	--	26.1	5.1	83
13...	1014	780	13.0	185	--	25.8	3.8	44
13...	1015	760	15.0	187	--	25.4	2.8	34
13...	1016	760	17.0	187	--	25.4	2.8	34
13...	1017	760	18.0	187	--	25.3	2.9	35

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

HAWAII, ISLAND OF OAHU--Continued

16273950 - SF KAPUNAHALA STREAM AT KANEOHE (LAT 21°24'21" LONG 157°48'31")

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH (STAND-ARD UNITS)	TEMPER-ATURE WATER (DEG C)	TUR-BID-ITY (FTU)	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)	HARD-NESS TOTAL (MG/L AS CACO3)	HARD-NESS NONCARB WH WAT TOT FLD MG/L AS CACO3
JUL												
07...	1120	2.1	189	7.40	23.5	3.4	761	7.8	92	3300	57	0
AUG												
31...	1140	1.2	210	7.60	23.5	3.1	757	8.0	95	1000	--	0
31...	1145	E1.2	210	7.60	23.5	3.1	757	8.0	95	--	--	0

DATE	CALCIUM DIS-SOLVED (MG/L AS CA)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG)	SODIUM, DIS-SOLVED (MG/L AS NA)	SODIUM 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, 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)
JUL												
07...	12	6.6	16	0.9	1.2	5.0	21	<0.10	31	128	130	0.17

DATE	RESIDUE TOTAL AT 105 DEG. C, SUS-PENDED (MG/L)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N)	NITRO-GEN,AM-MONIA + ORGANIC TOTAL (MG/L AS N)	PHOS-PHOROUS TOTAL (MG/L AS P)	PHOS-PHOROUS ORGANIC TOTAL (MG/L AS P)	ALUM-INUM, TOTAL RECOV-ERABLE (UG/L AS AL)	ALUM-INUM, DIS-SOLVED (UG/L AS AL)	ARSENIC TOTAL (UG/L AS AS)	ARSENIC DIS-SOLVED (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)
JUL												
07...	<1	<0.100	0.60	0.020	0.02	230	<10	<1	1	<100	3	<10
AUG												
31...	8	<0.100	0.30	0.030	0.03	--	--	--	--	--	--	--

DATE	BERYL-LIUM, DIS-SOLVED (UG/L AS BE)	CADMIUM TOTAL RECOV-ERABLE (UG/L AS CD)	CADMIUM DIS-SOLVED (UG/L AS CD)	CHRO-MIUM, TOTAL RECOV-ERABLE (UG/L AS CR)	CHRO-MIUM, DIS-SOLVED (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)	COPPER, DIS-SOLVED (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)
JUL												
07...	<0.5	<1	<1	20	2	<1	<3	2	1	830	200	<5

DATE	LEAD, DIS-SOLVED (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)	MERCURY DIS-SOLVED (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)
JUL												
07...	<5	<10	<4	50	36	<0.10	<0.1	<1	<10	<1	<1	<1

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

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

HAWAII, ISLAND OF OAHU--Continued

16273950 - SF KAPUNAHALA STREAM AT KANEOHE--Continued

DATE	SELENIUM, DISSOLVED (UG/L AS SE)	SILVER, TOTAL RECOVERABLE (UG/L AS AG)	SILVER, DISSOLVED (UG/L AS AG)	STRONTIUM, DISSOLVED (UG/L AS SR)	VANADIUM, DISSOLVED (UG/L AS V)	ZINC, TOTAL RECOVERABLE (UG/L AS ZN)	ZINC, DISSOLVED (UG/L AS ZN)	CARBON, ORGANIC TOTAL (MG/L AS C)	ALDRIN, TOTAL (UG/L)	CHLORDANE, TOTAL (UG/L)	DDD, TOTAL (UG/L)	DDE, TOTAL (UG/L)
JUL 07...	<1	<1	<1.0	67	7	<10	9	1.8	<0.010	<0.1	<0.010	<0.010

DATE	DDT, TOTAL (UG/L)	DIAZINON, TOTAL (UG/L)	DIELDRIN TOTAL (UG/L)	ENDOSULFAN, TOTAL (UG/L)	ENDRIN, TOTAL (UG/L)	ETHION, TOTAL (UG/L)	HEPTACHLOR, TOTAL (UG/L)	HEPTACHLOR EPOXIDE TOTAL (UG/L)	LINDANE TOTAL (UG/L)	MALATHION, TOTAL (UG/L)	METHOXYCHLOR, TOTAL (UG/L)	METHYL PARATHION, TOTAL (UG/L)
JUL 07...	<0.010	<0.01	<0.010	<0.010	<0.010	<0.01	<0.010	<0.010	<0.010	<0.01	<0.01	<0.01

DATE	METHYL TRITHION, TOTAL (UG/L)	MIREX, TOTAL (UG/L)	NAPHTHALENES, POLYCHLOR. TOTAL (UG/L)	PARATHION, TOTAL (UG/L)	PERTHANE TOTAL (UG/L)	PCB, TOTAL (UG/L)	TOXAPHENE, TOTAL (UG/L)	TOTAL TRITHION (UG/L)	2,4-D, TOTAL (UG/L)	2, 4-DP TOTAL (UG/L)	2,4,5-T TOTAL (UG/L)	SILVEX, TOTAL (UG/L)
JUL 07...	<0.01	<0.01	<0.10	<0.01	<0.1	<0.1	<1	<0.01	<0.01	<0.01	<0.01	<0.01

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

PERIODIC DETERMINATIONS OF TEMPERATURES

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

HAWAII, ISLAND OF KAUAI

16010000 - KAWAIKOI STREAM NR WAIMEA, KAUAI, HI (LAT 22 08 09 LONG 159 37 22)

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	TEMPER-ATURE (DEG C)	DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	TEMPER-ATURE (DEG C)
OCT , 1986				APR , 1987			
16...	1005	17	17.0	02...	0905	19	12.0
DEC				MAY			
04...	0925	20	14.0	15...	0940	35	13.5
JAN , 1987				JUL			
12...	1040	14	13.0	02...	0905	9.7	17.5
FEB				AUG			
27...	0925	25	12.5	24...	1025	5.3	21.0

16036000 - MAKAWELI RIVER NR WAIMEA, KAUAI, HI (LAT 21 58 31 LONG 159 38 55)

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	TEMPER-ATURE (DEG C)	DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	TEMPER-ATURE (DEG C)
OCT , 1986				APR , 1987			
09...	1300	18	23.0	01...	1340	18	21.0
DEC				MAY			
03...	1320	24	18.0	18...	1340	12	23.0
JAN , 1987				JUN			
08...	1250	11	20.5	30...	1150	11	23.0
FEB				AUG			
23...	1340	13	21.0	21...	1155	9.3	23.0

16049000 - HANAPEPE RIVER BL MANUAHI STR NR ELEELE, KAUAI, HI (LAT 21 57 29 LONG 159 33 13)

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	TEMPER-ATURE (DEG C)	DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	TEMPER-ATURE (DEG C)
OCT , 1988				APR , 1987			
09...	1015	21	21.0	01...	0940	14	18.0
DEC				MAY			
03...	1010	34	18.0	18...	0955	12	20.5
JAN , 1987				JUN			
08...	0955	16	19.0	30...	0955	15	22.0
FEB				AUG			
23...	0940	18	18.0	21...	0955	15	22.0

16060000 - SF WAILUA RIVER NR LIHUE, KAUAI, HI (LAT 22 02 24 LONG 159 22 58)

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	TEMPER-ATURE (DEG C)	DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	TEMPER-ATURE (DEG C)
OCT , 1986				APR , 1987			
20...	1430	24	24.0	07...	1200	4.0	24.0
NOV				MAY			
24...	1320	243	22.0	21...	1245	9.0	22.0
JAN , 1987				JUL			
15...	1205	7.9	20.0	09...	1310	58	24.0
FEB				AUG			
26...	1150	5.7	20.5	20...	1240	55	24.5

18081200 - N WAILUA DITCH BL WAIKOKO STR NR LIHUE, KAUAI, HI (LAT 22 03 34 LONG 159 28 00)

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	TEMPER-ATURE (DEG C)	DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	TEMPER-ATURE (DEG C)
OCT , 1986				APR , 1987			
20...	1200	30	20.0	07...	0955	26	18.0
NOV				MAY			
24...	1100	30	20.0	21...	1035	22	17.5
JAN , 1987				JUL			
15...	1005	20	15.5	09...	1010	26	20.0
FEB				AUG			
28...	1000	22	15.0	20...	1020	24	20.0

18082000 - STABLE STORM DITCH NR LIHUE, KAUAI, HI (LAT 22 04 09 LONG 159 26 46)

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	TEMPER-ATURE (DEG C)	DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	TEMPER-ATURE (DEG C)
OCT , 1986				APR , 1987			
20...	1050	0.59	21.0	07...	0835	34	19.0
NOV				MAY			
24...	0935	0.36	21.0	21...	0905	27	18.0
JAN , 1987				JUL			
15...	0850	27	16.0	09...	0835	0.52	21.0
FEB				AUG			
26...	0850	29	15.0	20...	0830	0.08	21.0

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1986

HAWAII, ISLAND OF KAUAI--Continued

16068000 - EB OF NF WAILUA RIVER NR LIHUE, KAUAI, HI (LAT 22 04 19 LONG 159 25 05)

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	TEMPER-ATURE (DEG C)	DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	TEMPER-ATURE (DEG C)
OCT , 1986				APR , 1987			
29...	1010	37	20.5	28...	0925	50	18.0
NOV				MAY			
26...	0905	62	21.0	27...	0910	64	19.0
DEC				JUN			
29...	0820	21	18.0	26...	0910	25	22.0
JAN , 1987				JUL			
28...	0830	19	18.0	29...	0910	43	21.0
FEB				AUG			
25...	1100	22	18.5	27...	1335	30	23.0
MAR				SEP			
27...	0930	26	18.0	28...	0925	31	21.5

16069000 - WAILUA DITCH NR KAPAA, KAUAI, HI (LAT 22 04 34 LONG 159 24 04)

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	TEMPER-ATURE (DEG C)	DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	TEMPER-ATURE (DEG C)
OCT , 1986				APR , 1987			
15...	1125	32	25.0	16...	1245	20	22.5
NOV				MAY			
26...	1125	16	23.5	22...	1045	20	23.0
JAN , 1987				JUL			
14...	1030	17	20.0	01...	1130	28	25.0
FEB				AUG			
25...	1240	30	21.0	25...	0905	30	26.5

16071000 - NF WAILUA RIVER NR KAPAA, KAUAI, HI (LAT 22 03 08 LONG 159 22 22)

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	TEMPER-ATURE (DEG C)	DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	TEMPER-ATURE (DEG C)
OCT , 1986				APR , 1987			
15...	0845	39	23.0	16...	1050	121	20.0
NOV				MAY			
25...	0940	200	21.0	22...	0855	33	20.5
JAN , 1987				JUL			
14...	0910	12	18.5	01...	0935	48	22.0
FEB				AUG			
25...	0855	12	19.0	27...	1115	86	24.0

16071500 - LEFT BRANCH OPAEKAA STREAM NR KAPAA, KAUAI, HI (LAT 22 04 44 LONG 159 23 55)

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	TEMPER-ATURE (DEG C)	DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	TEMPER-ATURE (DEG C)
OCT , 1986				APR , 1987			
15...	1235	2.1	23.5	16...	1345	1.1	21.5
NOV				MAY			
25...	1255	4.2	21.0	22...	1120	1.5	21.0
JAN , 1987				JUL			
14...	1135	1.4	18.5	01...	1200	1.3	23.0
FEB				AUG			
25...	1330	0.84	19.0	25...	1020	1.5	23.0

16077000 - MAKALEHA DITCH NR KEALIA, KAUAI, HI (LAT 22 07 06 LONG 159 22 04)

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	TEMPER-ATURE (DEG C)	DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	TEMPER-ATURE (DEG C)
OCT , 1986				APR , 1987			
07...	1030	9.7	20.5	08...	1010	6.9	19.0
NOV				MAY			
21...	1035	1.3	21.0	19...	1005	0.84	19.5
JAN , 1986				JUL			
13...	1040	5.9	18.5	07...	1025	24	20.0
FEB				AUG			
20...	0900	14	18.0	19...	1025	14	21.0

16079000 - KAPAHI DITCH NR KEALIA, KAUAI, HI (LAT 22 06 09 LONG 159 22 28)

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	TEMPER-ATURE (DEG C)	DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	TEMPER-ATURE (DEG C)
OCT , 1986				APR , 1987			
07...	0905	12	21.5	06...	0850	0.30	19.5
NOV				MAY			
21...	0855	21	21.0	19...	0835	0.41	20.0
JAN , 1987				JUL			
13...	0905	5.3	18.5	07...	0905	1.8	21.0
FEB				AUG			
20...	1135	0.31	20.0	19...	0900	0.63	22.0

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

HAWAII, ISLAND OF KAUAI--Continued

16088000 - ANAHOLA DITCH AB KANEHA RES NR KEALIA, KAUAI, HI (LAT 22 08 10 LONG 159 22 28)

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	TEMPER-ATURE (DEG C)	DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	TEMPER-ATURE (DEG C)
OCT , 1986				APR , 1987			
07...	1300	6.7	21.0	06...	1200	2.3	18.5
NOV				MAY			
21...	1250	1.2	21.0	19...	1200	7.9	19.0
JAN , 1986				JUL			
13...	1250	2.9	19.0	07...	1205	24	21.0
FEB				AUG			
20...	1045	19	18.0	19...	1230	7.2	21.5

16091000 - LOWER ANAHOLA DITCH NR KEALIA, KAUAI, HI (LAT 22 08 14 LONG 159 19 31)

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	TEMPER-ATURE (DEG C)
OCT , 1986			
07...	1045	0.04	24.0

16097500 - HALAULANI STR AT ALT 400 FT NR KILAUEA, KAUAI, HI (LAT 22 10 54 LONG 159 25 17)

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	TEMPER-ATURE (DEG C)	DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	TEMPER-ATURE (DEG C)
OCT , 1986				MAR , 1987			
08...	1220	10	21.5	31...	1325	13	18.0
NOV				MAY			
19...	1250	21	22.0	14...	1150	12	19.0
JAN , 1987				JUN			
07...	1240	6.4	20.0	29...	1300	9.1	22.5
FEB				AUG			
18...	1200	9.2	19.5	18...	1330	15	23.0

16103000 - HANALEI RIVER NR HANALEI, KAUAI, HI (LAT 22 11 31 LONG 159 27 57)

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	TEMPER-ATURE (DEG C)	DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	TEMPER-ATURE (DEG C)
OCT , 1986				MAR , 1987			
08...	1025	133	22.0	31...	1045	1280	17.5
NOV				MAY			
19...	1020	536	21.0	14...	1000	153	18.5
JAN , 1987				JUN			
07...	1015	81	19.0	29...	1005	102	21.0
FEB				AUG			
18...	1005	149	19.0	18...	1010	276	21.0

16108000 - WAINIHA RIVER NEAR HANALEI, KAUAI, HI (LAT 22 08 20 LONG 159 33 38)

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	TEMPER-ATURE (DEG C)	DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	TEMPER-ATURE (DEG C)
OCT , 1986				APR , 1987			
14...	1135	73	19.0	03...	1040	65	16.0
DEC				MAY			
05...	1140	63	17.5	20...	1000	55	16.0
JAN , 1987				JUL			
09...	1130	49	17.0	08...	1120	97	18.0
MAR				AUG			
03...	1110	56	15.5	26...	1025	70	19.5

PERIODIC DETERMINATIONS OF TEMPERATURES

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

HAWAII, ISLAND OF MOLOKAI

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	TEMPER-ATURE (DEG C)	DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	TEMPER-ATURE (DEG C)
16404200 - PILIPILILAU STREAM NR PELEKUNU, MOLOKAI, HI (LAT 21 08 08 LONG 156 53 09)							
OCT , 1986				MAR , 1987			
30...	0855	1.1	19.5	18...	1115	2.1	18.5
DEC				JUN			
18...	1040	1.3	19.5	02...	1050	2.7	20.5
FEB , 1987				AUG			
05...	0915	1.9	17.0	20...	1115	1.1	22.0
16405100 - MOLOKAI TUNNEL AT EAST PORTAL, MOLOKAI, HI (LAT 21 08 38 LONG 156 55 16)							
OCT , 1986				APR , 1987			
29...	1020	4.0	19.0	29...	1040	10	18.0
DEC				JUN			
17...	1055	12	18.5	09...	1010	5.0	18.5
FEB , 1987				JUL			
04...	0920	5.2	16.0	21...	1115	0.46	21.0
MAR				AUG			
17...	1720	4.5	19.0	25...	0940	2.3	20.0
16405300 - MOLOKAI TUNNEL AT WEST PORTAL, MOLOKAI, HI (LAT 21 07 27 LONG 156 59 50)							
OCT , 1986				APR , 1987			
29...	1545	8.9	19.0	29...	1700	12	17.0
DEC				JUN			
17...	1715	13	18.5	09...	1835	9.7	19.0
FEB , 1987				JUL			
04...	1600	10	17.0	21...	1525	4.8	19.0
MAR				AUG			
19...	0950	9.6	18.5	25...	1620	6.4	19.0
16405500 - WAIKOLU STR AT ALT 900 FT NR KALAUPAPA, MOLOKAI, HI (LAT 21 08 43 LONG 156 55 18)							
OCT , 1986				APR , 1987			
29...	1300	0.60	20.0	29...	1335	3.2	18.0
DEC				JUN			
17...	1340	3.9	19.0	09...	1300	2.0	20.5
FEB , 1987				JUL			
04...	1230	1.3	18.0	21...	1325	4.4	21.0
MAR				AUG			
17...	1530	1.2	19.0	25...	1205	1.2	21.0
16408000 - WAIKOLU STR BL PIPE CROSS NR KALAUPAPA, MOLOKAI, HI (LAT 21 09 45 LONG 156 55 54)							
OCT , 1988				APR , 1987			
29...	1145	7.4	22.0	29...	1245	27	18.0
DEC				JUN			
17...	1300	10	21.0	09...	1120	24	21.0
FEB , 1987				JUL			
04...	1120	9.8	19.0	21...	1020	17	22.0
MAR				AUG			
17...	1050	13	20.0	25...	1125	12	22.5
16414000 - KAUNAKAKAI GULCH AT KAUNAKAKAI, MOLOKAI , HI (LAT 21 06 21 LONG 157 00 34)							
APR , 1987							
28...	0920	6.0	19.0				
16419500 - PAPIO GULCH AT HALAWA, MOLOKAI, HI (LAT 21 08 55 LONG 156 44 16)							
OCT , 1986				JUN , 1987			
27...	1335	2.4	22.0	10...	1135	0.52	21.5
DEC				JUL			
15...	1240	0.38	21.0	22...	1315	0.75	22.0
FEB , 1987				SEP			
03...	1245	0.25	18.0	15...	1430	0.36	23.5
MAR							
15...	1615	0.25	20.0				

PERIODIC DETERMINATIONS OF TEMPERATURES

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

HAWAII, ISLAND OF MAUI

16508000 - HANAWI STREAM NEAR NAHIKU, MAUI, HI (LAT 20 48 37 LONG 156 07 00)

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	TEMPER-ATURE (DEG C)
OCT , 1986			
07...	1250	56	19.0
NOV			
18...	1540	9.3	19.5
JAN , 1987			
06...	1155	5.7	18.0
FEB			
18...	1440	22	16.0
MAR , 1987			
02...	1330	3.3	20.0
31...	1130	3.7	17.0
MAY			
12...	1310	8.7	17.5
JUN			
30...	1210	17	19.5
AUG			
18...	1325	4.3	21.5

16516000 - WEST WAILUAIKI STREAM NEAR KEANAE, MAUI, HI (LAT 20 49 18 LONG 156 08 37)

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	TEMPER-ATURE (DEG C)
NOV , 1986			
18...	0930	15	19.0
19...	1350	21	19.0
JAN , 1987			
06...	0845	7.9	18.0
26...	1510	26	15.0
FEB			
18...	1230	47	16.0
MAR , 1987			
04...	1210	4.6	19.0
31...	0935	5.8	16.5
MAY			
12...	1015	14	16.0
JUN			
30...	0900	27	20.0
AUG			
18...	1055	5.2	22.0

16541000 - KOOLAU DITCH AT HAIPUAENA NR HUELO, MAUI, HI (LAT 20 51 17 LONG 156 11 19)

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	TEMPER-ATURE (DEG C)
OCT , 1986			
02...	1155	29	20.5
NOV			
19...	1250	189	19.0
JAN , 1987			
07...	1140	67	18.5
FEB			
19...	1215	193	16.0
APR , 1987			
03...	1140	212	18.0
MAY			
15...	1145	148	17.5
JUL			
07...	1320	155	20.0
AUG			
14...	1210	54	21.0

16587000 - HONOPOU STREAM NR HUELO, MAUI, HI (LAT 20 53 20 LONG 156 15 20)

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	TEMPER-ATURE (DEG C)
OCT , 1986			
02...	1225	0.43	24.0
NOV			
20...	1055	9.8	21.0
26...	1005	3.6	19.0
DEC			
29...	1120	1.9	19.0
JAN , 1987			
28...	0945	3.4	16.5
FEB			
24...	1020	2.3	20.0
APR , 1987			
03...	1420	6.7	19.0
28...	1350	15	18.0
MAY			
27...	1105	5.4	19.5
JUN			
26...	1150	7.5	23.0
JUL			
29...	1030	3.5	22.0
SEP			
28...	1010	1.0	21.0

16588000 - WAILOA DITCH AT HONOPOU NR HUELO, MAUI, HI (LAT 20 53 20 LONG 156 15 19)

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	TEMPER-ATURE (DEG C)
OCT , 1986			
02...	1105	46	22.0
NOV			
20...	1330	300	19.0
JAN , 1987			
08...	0955	118	18.0
FEB			
24...	1310	157	18.0
APR , 1987			
03...	1055	293	17.0
MAY			
15...	1120	288	18.0
JUL			
07...	1325	281	20.0
AUG			
14...	1110	99	21.0

16599500 - OPANA TUNNEL NR KAILIILI, MAUI, HI (LAT 20 51 04 LONG 156 16 17)

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	TEMPER-ATURE (DEG C)
OCT , 1986			
10...	1015	0.50	18.5
NOV			
25...	1220	3.4	18.0
JAN , 1987			
14...	1045	9.4	15.0
FEB			
25...	1120	4.9	16.0
APR , 1987			
07...	1105	3.9	17.5
MAY			
18...	1035	4.8	17.0
JUL			
08...	1030	2.7	19.0
AUG			
17...	1135	0.76	20.5

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

HAWAII, ISLAND OF MAUI--Continued

16604500 - IAO STREAM AT KEPANIWAI PARK NR WAILUKU, MAUI, HI (LAT 20 53 08 LONG 156 32 32)

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	TEMPER-ATURE (DEG C)	DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	TEMPER-ATURE (DEG C)
OCT , 1986				JUN , 1987			
01...	1130	20	21.0	01...	0940	63	22.0
NOV				17...	1115	105	19.5
18...	1055	48	19.0	25...	1330	57	21.0
JAN , 1987				JUL			
06...	1250	34	19.0	24...	1015	53	21.0
FEB				AUG			
20...	1430	131	19.0	19...	1115	33	21.0
APR				SEP			
02...	1040	76	18.0	02...	1025	22	23.0
MAY				29...	0940	19	21.5
08...	1050	154	18.0				

16814000 - WAIHEE RIVER AT DAM NR WAIHEE, MAUI, HI (LAT 20 56 20 LONG 156 32 58)

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	TEMPER-ATURE (DEG C)	DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	TEMPER-ATURE (DEG C)
OCT , 1986				MAR , 1987			
01...	1030	48	22.0	30...	1110	46	19.0
NOV				MAY			
17...	1040	57	19.0	11...	1105	65	17.5
DEC				JUN			
04...	1130	64	19.0	29...	0920	73	19.0
JAN , 1987				AUG			
05...	1015	53	19.5	10...	1140	63	20.5
FEB							
20...	0950	78	17.5				

16620000 - HONOKOHAU STREAM NR HONOKOHAU, MAUI, HI (LAT 20 57 48 LONG 156 35 22)

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	TEMPER-ATURE (DEG C)	DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	TEMPER-ATURE (DEG C)
OCT , 1986				APR , 1987			
03...	1150	25	21.0	08...	1140	19	19.0
NOV				MAY			
21...	1225	26	19.5	19...	1040	24	18.5
JAN , 1987				JUL			
09...	1030	20	18.0	13...	1130	37	21.0
FEB				AUG			
24...	1145	20	18.0	21...	1220	24	21.0

16638500 - KAHOMA STREAM AT LAHAINA, MAUI, HI (LAT 20 53 10 LONG 156 40 36)

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	TEMPER-ATURE (DEG C)	DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	TEMPER-ATURE (DEG C)
MAY , 1987				MAY			
06...	1215	32	20.5	07...	0915	60	20.0

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

HAWAII, ISLAND OF HAWAII

16700000 - WAIAKEA STREAM NR MOUNTAIN VIEW, HAWAII, HI (LAT 19 38 30 LONG 155 10 28)

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	TEMPER-ATURE (DEG C)	DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	TEMPER-ATURE (DEG C)
OCT , 1986				APR , 1987			
29...	1325	9.0	17.0	28...	1255	6.2	17.0
DEC				MAY			
23...	1450	4.7	16.0	28...	0745	6.1	17.0
JAN , 1987				JUN			
27...	1320	8.2	16.0	25...	1245	15	17.0
FEB				AUG			
25...	1315	1.9	17.0	26...	1345	2.2	17.0
MAR				SEP			
30...	0615	0.62	17.0	28...	0735	4.7	17.0

16700900 - OLAA FLUME SPRING NR KAUMANA, HAWAII, HI (LAT 19 41 59 LONG 155 11 13)

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	TEMPER-ATURE (DEG C)	DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	TEMPER-ATURE (DEG C)
OCT , 1986				APR , 1987			
02...	0750	9.7	17.0	03...	0950	7.4	17.0
NOV				MAY			
04...	0900	9.8	17.0	05...	0800	11	17.0
DEC				JUL			
04...	0935	8.5	17.0	08...	0900	8.8	17.0
JAN , 1987				AUG			
06...	0835	0.10	17.0	12...	0835	0.20	17.0

16700950 - LYMAN SPRINGS NO. 2 NEAR PIIHONUA, HAWAII, HI (LAT 19 42 02 LONG 155 10 36)

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	TEMPER-ATURE (DEG C)	DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	TEMPER-ATURE (DEG C)
OCT , 1986				APR , 1987			
08...	1025	5.9	17.0	16...	0940	4.8	17.0
DEC				JUN			
24...	0930	4.2	18.0	29...	0930	5.0	17.0
FEB , 1987				AUG			
11...	1430	2.8	16.0	19...	0900	3.6	17.0

16704000 - WAILUKU RIVER AT PIIHONUA, HAWAII, HI (LAT 19 42 56 LONG 155 09 12)

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	TEMPER-ATURE (DEG C)	DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	TEMPER-ATURE (DEG C)
OCT , 1986				APR , 1987			
24...	0935	35	18.0	10...	0935	34	19.0
JAN , 1987				MAY			
06...	0950	27	16.0	15...	1035	64	18.0
FEB				AUG			
04...	1330	22	19.0	12...	0740	34	17.0
MAR				SEP			
02...	0930	6.0	19.0	03...	0755	4.3	16.0

16720000 - KAWAINUI STREAM NR KAMUELA, HAWAII, HI (LAT 20 05 18 LONG 155 40 58)

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	TEMPER-ATURE (DEG C)	DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	TEMPER-ATURE (DEG C)
OCT , 1988				JUN , 1987			
17...	1135	11	15.0	08...	1235	3.4	15.0
DEC				JUL			
22...	1040	9.9	14.0	21...	1110	21	15.0
FEB , 1987				SEP			
10...	1115	1.0	15.0	09...	1120	1.6	15.0
MAR							
31...	1110	4.1	15.0				

18720300 - KAWAIKI STREAM NEAR KAMAUELA, HAWAII, HI (LAT 20 05 13 LONG 155 40 59)

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	TEMPER-ATURE (DEG C)	DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	TEMPER-ATURE (DEG C)
OCT , 1986				JUN , 1987			
17...	1035	2.4	15.0	08...	1045	0.70	15.0
DEC				JUL			
11...	1045	2.7	14.0	21...	1005	4.6	15.0
FEB , 1987				SEP			
10...	1030	0.19	14.0	09...	1020	0.72	15.0
MAR							
31...	1030	0.69	15.0				

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

HAWAII, ISLAND OF HAWAII--Continued

16720500 - UPPER HAMAKUA DITCH BL KAWAIKI STR NR KAMUELA, HAWAII, HI (LAT 20 05 15 LONG 155 40 42)

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	TEMPER-ATURE (DEG C)
OCT , 1986			
17...	0940	14	15.0
DEC			
22...	1220	11	14.0
FEB , 1987			
10...	1000	0.58	14.0
MAR			
31...	1000	4.5	15.0
MAY , 1987			
01...	1010	15	15.0
JUN			
08...	1000	3.8	15.0
JUL			
21...	0930	16	15.0
SEP			
09...	1215	1.9	15.0

16724800 - UP HAMAKUA DITCH AB ALAKAHI STR NR KAMUELA, HAWAII, HI (LAT 20 04 31 LONG 155 40 28)

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	TEMPER-ATURE (DEG C)
OCT , 1986			
07...	0825	11	14.0
NOV			
13...	0900	5.6	14.0
DEC			
11...	0855	7.6	14.0
FEB , 1987			
03...	0835	0.78	13.0
MAR			
31...	0930	1.9	13.0
MAY , 1987			
01...	0940	7.3	14.0
JUN			
08...	0915	1.7	15.0
JUL			
16...	0845	7.8	15.0
AUG			
27...	1035	0.57	16.0

16725000 - ALAKAHI STREAM NEAR KAMUELA, HAWAII, HI (LAT 20 04 27 LONG 155 40 25)

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	TEMPER-ATURE (DEG C)
OCT , 1986			
17...	1320	4.4	14.0
NOV			
13...	0930	4.9	14.0
DEC			
11...	0925	4.0	14.0
FEB , 1987			
03...	1000	1.7	13.0
MAR , 1987			
31...	0955	3.3	13.0
MAY			
20...	0900	1.5	15.0
JUL			
16...	0930	5.1	15.0
AUG			
27...	1130	2.0	15.0

16726000 - UP HAMAKUA DITCH AB WAIMEA RES DIV NR KAMUELA, HAWAII, HI (LAT 20 03 31 LONG 155 37 40)

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	TEMPER-ATURE (DEG C)
OCT , 1986			
06...	1150	24	16.0
DEC			
31...	1205	3.1	14.0
FEB , 1987			
03...	1450	4.1	15.0
MAR			
10...	1200	3.1	15.0
MAY , 1987			
20...	1150	1.3	15.0
JUL			
22...	0910	26	15.0
AUG			
24...	0950	1.8	15.0

16727000 - UPPER HAMAKUA D AB PUUKAPU RES NR KAMUELA, HAWAII, HI (LAT 20 02 53 LONG 155 37 17)

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	TEMPER-ATURE (DEG C)
OCT , 1986			
06...	1210	2.6	16.0
NOV			
12...	1305	33	14.0
FEB , 1987			
03...	1420	0.04	14.0
MAR			
10...	1225	0.73	15.0
APR , 1987			
15...	1200	20	15.0
JUN			
30...	1235	5.0	15.0
JUL			
22...	0955	0.01	15.0
AUG			
24...	1010	0.02	16.0

16756000 - KOHAKOHAU STREAM NEAR KAMUELA, HAWAII, HI (LAT 20 02 38 LONG 155 41 10)

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	TEMPER-ATURE (DEG C)
NOV , 1986			
12...	0955	38	18.0
FEB , 1987			
03...	1220	0.03	20.0
MAR , 1987			
10...	0930	0.02	19.0
APR			
15...	0825	0.12	19.0

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

HAWAII, ISLAND OF HAWAII--Continued

16758000 - WAIKOLOA STR AT MARINE DAM NR KAMUELA, HAWAII, HI (LAT 20 02 48 LONG 155 39 58)

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	TEMPER-ATURE (DEG C)	DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	TEMPER-ATURE (DEG C)
OCT , 1986				MAR , 1987			
06...	0950	4.6	15.0	10...	1035	4.5	13.0
NOV				APR			
12...	1100	24	14.0	15...	1000	11	15.0
DEC				MAY			
31...	1110	5.3	14.0	20...	1020	2.7	15.0
FEB , 1987				AUG			
03...	1205	4.0	14.0	14...	1035	5.4	15.0

18759000 - HAUANI GULCH NEAR KAMUELA, HAWAII, HI (LAT 20 02 28 LONG 155 39 05)

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	TEMPER-ATURE (DEG C)	DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	TEMPER-ATURE (DEG C)
OCT , 1986				MAY , 1987			
17...	1425	0.70	15.0	20...	0750	0.54	15.0
DEC				JUL			
11...	1105	0.87	14.0	18...	1040	2.0	15.0
FEB , 1987				AUG			
03...	1110	0.56	13.0	24...	0830	0.69	15.0
MAR							
10...	0850	0.52	13.0				
31...	1125	0.41	14.0				

18764000 - HILEA GULCH TRIBUTARY NEAR HONUAPO, HAWAII, HI (LAT 19 10 27 LONG 155 35 58)

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	TEMPER-ATURE (DEG C)	DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	TEMPER-ATURE (DEG C)
OCT , 1986				DEC , 1986			
10...	0955	0.26	17.0	03...	1225	0.14	17.0

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 copling, 166.70 ft above mean sea level.

PERIOD OF RECORD.--Occasional measurements June 1980 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured 15.71 ft above mean sea level Nov. 19, 1982; lowest measured, 13.39 ft above mean sea level, Aug. 25, 1980.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 07	14.08	JAN 13	13.95	APR 04	14.24	MAY 19	14.66	JUL 10	14.46	AUG 20	14.30
DEC 09	14.15	FEB 26	15.28								

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 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	9.24	8.88	9.08	9.47	8.90	9.05	8.71	9.24	8.70	8.68	8.75	9.18
10	9.00	9.18	9.13	9.42	8.88	8.85	8.70	9.30	8.68	8.68	8.73	8.97
15	8.91	9.38	9.02	9.45	9.27	8.83	8.75	8.89	8.68	8.68	8.72	9.12
20	8.84	9.44	9.33	9.13	9.24	8.72	9.23	8.89	8.64	8.67	8.65	9.34
25	8.76	9.44	9.38	8.88	9.47	8.73	9.36	8.93	8.71	8.85	8.63	8.86
EOM	8.83	9.47	9.45	8.98	9.58	8.64	9.30	8.71	8.84	8.65	8.73	8.85

WTR YEAR 1987 MAX 9.72 FEB 24 MIN 8.43 JUL 11

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.

REMARKS.-- Water from this well is used for public supply. Water level affected by pumping of nearby well.

PERIOD OF RECORD.--
WATER LEVEL: Occasional measurements, February 1960, June 1973 to current year.
WATER QUALITY: 1960, 1966, 1972-80, 1985 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 20.04 ft above mean sea level, Feb. 17, 1960; lowest measured, 3.31 ft below mean sea level, May 27, 1977.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 24	5.60	JAN 13	5.64	APR 07	6.98	MAY 19	7.43	JUL 10	7.23	AUG 20	7.06
DEC 16	5.84	FEB 24	7.55								

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	TEMPERATURE WATER (DEG C)	CHLORIDE, DISSOLVED (MG/L AS CL)	DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	TEMPERATURE WATER (DEG C)	CHLORIDE, DISSOLVED (MG/L AS CL)
OCT, 1986					APR, 1987				
07...	0935	398	24.0	45	07...	0930	350	23.5	41
DEC					MAY				
09...	0945	400	24.0	44	19...	0945	430	24.0	46
JAN, 1987					JUL				
13...	1020	370	23.5	43	10...	0940	420	24.0	44
FEB					AUG				
24...	0935	410	23.5	46	20...	1000	410	24.0	45

HAWAII, ISLAND OF KAUAI--Continued

215606159344301. Local number 2-5634-01.

LOCATION.--Lat 21°56'06", 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 well, depth 508 ft, casing diameter 8 in., cased to 507 ft.

DATUM.--Elevation of land-surface datum is 439 ft. Measuring point: Top of casing 440.62 ft above mean sea level.

PERIOD OF RECORD.--Water level recorder, February 1986 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 18.87 ft above mean sea level Dec. 5, 1986; lowest 15.82 ft above mean sea level Sept. 28, 1987.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	16.67	18.85	16.78	16.67	16.49	16.48	16.28	18.35	16.15	18.02	16.12	e15.97
10	16.64	16.65	16.72	16.62	16.54	16.48	16.29	16.39	18.08	16.12	16.12	e15.98
15	16.63	16.68	16.68	16.62	16.53	16.42	16.32	16.37	18.07	16.12	18.07	e15.98
20	16.64	16.70	16.68	16.52	16.54	16.37	16.38	16.34	16.10	16.02	e16.00	e16.00
25	16.61	16.72	16.66	18.49	16.52	18.39	16.41	16.32	16.13	15.98	e15.95	e15.95
EOM	16.82	16.70	16.68	16.49	16.50	16.33	16.32	16.23	16.03	16.05	e15.97	e15.90

WTR YEAR 1987 MAX 16.87 DEC 5 MIN 15.82 SEPT 28

e Estimated.

215959159214301. Local number 2-5921-01.

LOCATION.--Lat 21°59'59", 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, from County Department of Water.

PERIOD OF RECORD.--Occasional measurements, July 1980 to September 1985.
Water-level recorder, October 1985 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 17.69 ft Nov. 26, 1985; lowest measured, 13.39 ft Aug. 25, 1980.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	16.16	e18.15	e16.25	16.03	15.82	16.02	16.12	16.08	15.94	15.92	15.79	15.80
10	e16.14	e18.17	16.17	15.90	15.93	16.04	16.18	16.08	15.90	15.88	15.75	15.81
15	e16.13	e16.20	16.15	15.95	15.95	16.10	16.18	16.04	15.87	15.86	15.75	15.83
20	e16.13	e16.20	16.10	15.83	16.04	16.05	16.22	16.02	15.95	15.85	15.69	15.89
25	e16.11	e16.21	16.07	15.81	16.01	16.11	16.14	15.97	15.98	15.83	15.73	15.87
EOM	e16.13	e16.20	16.08	15.84	16.00	16.06	16.01	15.97	15.93	15.78	15.82	15.87

WTR YEAR 1987 MAX 16.31 APR 21 MIN 15.64 AUG 19

e Estimated.

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 1110 ft, 5-inch PVC casing, bottom 12 ft perforated.

DATUM.--Elevation of land surface datum is 6 ft. Measuring point: Top of 5-inch PVC casing, 6.40 ft above mean sea level.

REMARKS.--Geophyaical 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 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	-0.88	-0.80	-0.06	0.38	0.35	0.32	-0.14	-0.13	-0.40	-0.42	-0.77	-0.62
10	-1.03	-0.68	0.05	0.27	0.36	0.21	-0.23	-0.25	-0.49	-0.55	-0.81	-0.66
15	-1.05	-0.20	0.06	0.32	0.45	0.07	-0.20	-0.34	-0.10	-0.56	-0.87	-0.56
20	-1.01	-0.24	0.07	0.29	0.62	0.02	-0.10	-0.42	-0.40	-0.57	-0.75	-0.88
25	-0.98	-0.39	0.12	0.47	0.50	-0.08	-0.16	-0.36	-0.37	-0.67	-0.66	-0.71
EOM	-0.88	-0.28	0.26	0.42	0.48	-0.03	-0.23	-0.34	-0.41	-0.80	-0.82	-0.77

WTR YEAR 1987 MAX 0.82 FEB 22 MIN -1.23 OCT 16, 17

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 inch-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 flenge below petcock, 13.31 ft above mean sea level.

REMARKS.--Water-quality records for 1910-16, 1920-21, 1923-75, 1976-81, are available in files of district office.

PERIOD OP RECORD.--Occasional measurements, April 1910 to June 1921, September 1923 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level messured, 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 1986 TO SEPTEMBER 1987

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 17	13.08	JAN 16	15.63	MAY 5	14.47	JUN 30	14.23	AUG 7	13.39	SEPT 30	13.46
NOV 21	14.79	MAR 10	15.31								

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 1246 ft, 6-inch PVC casing, cased to 24 ft, perforated from 24 to 1246 ft. Well was modified and deepened August 1980.

DATUM.--Elevation of land-surface datum is 35 ft. Measuring point: Top of 6-inch PVC casing, 37.90 ft, revised, above mean sea level.

REMARKS.--Geophysical logs are available in files of district office.

PERIOD OF RECORD.--
WATER LEVEL: Water-level recorder, March 1981 to current year.
WATER QUALITY: 1985 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level, 22.53 ft above mean sea level Jan. 9, 1983; lowest 16.56 ft above mean sea level, July 24, 1987.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	17.09	18.98	17.66	18.02	18.10	18.18	17.95	17.79	17.46	17.43	16.91	16.87
10	16.87	17.06	17.72	18.01	18.11	18.09	17.86	17.63	17.42	17.33	16.90	16.90
15	16.95	17.35	17.82	18.05	18.28	17.98	17.82	17.64	17.52	17.41	16.92	17.07
20	16.99	17.50	e17.6	18.06	18.33	17.90	17.87	17.55	17.47	17.34	16.92	16.98
25	17.04	17.47	17.87	18.04	18.31	17.88	17.97	17.54	17.52	17.16	17.01	16.99
EOM	17.03	17.83	17.90	18.11	18.33	17.89	17.78	17.55	17.46	16.97	16.97	18.94

WTR YEAR 1987 MAX 18.46 Feb. 22 MIN 16.76 Aug. 8, 12, 14

e Estimated.

WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

DATE	TIME	SAMPLE DEPTH DISTANCE BELOW MSL FEET	SPECIFIC CONDUCTANCE LAB (US/CM)	CHLORIDE, DISSOLVED (MG/L AS CL)
MAY				
15...	j0900	300	797	210
15...	j0930	500	1480	400
15...	j1000	850	3560	1700
15...	j1030	700	9530	3200
15...	j1100	750	14900	5200
15...	j1130	800	27700	10000
15...	j1200	850	32600	12000
15...	j1230	900	37800	14000
15...	j1305	950	40300	15000
15...	j1335	1050	44500	17000
15...	j1415	1200	44900	17000
AUG				
28...	j1224	950	40100	15000
28...	j1410	1050	44700	16000
28...	j1440	1200	44900	16000
28...	j1039	750	15100	5200
28...	j1103	800	27600	10000
28...	j1130	850	32700	12000
28...	j1157	900	37500	14000
26...	j0852	300	630	150
26...	j0920	500	1340	360
28...	j0947	650	5520	1800
28...	j1014	700	9600	3200

j Collected by non-USGS agency.

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

HAWAII, ISLAND OF OAHU--Continued

212123157535501 - 3-2153-05 W156 MOANA, OAHU--Continued

DATE	TIME	SAMPLE DEPTH DIS-TANCE BELOW MSL FEET	SPE-CIFIC CON-DUCT-ANCE LAB (US/CM)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)
DEC, 1986				
17...	j1000	300	796	200
17...	j1020	500	1540	420
17...	j1045	650	5790	1800
17...	j1110	700	9970	3400
17...	j1130	750	15700	5800
DEC, 1986				
17...	j1150	800	28900	11000
17...	j1245	850	33700	13000
17...	j1315	900	38300	14000
17...	j1345	950	40800	16000
17...	j1410	1050	44900	17000
17...	j1425	1200	45000	17000

j Collected by non-USGS agency.

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 dietriot office.

PERIOD OF RECORD.--Occasional measurements, January 1928 to February 1931, September 1934 to August 1968. 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. 18, 1928; lowest, 12.97 ft above mean sea level, Oct. 5, 1978.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	14.15	14.17	14.86	15.30	15.34	15.36	15.03	14.90	14.51	14.53	13.94	14.02
10	14.02	14.24	14.95	15.25	15.35	15.27	14.85	14.84	14.42	14.33	13.95	14.02
15	14.08	14.55	15.00	15.27	15.41	15.18	14.88	14.65	14.63	14.34	13.92	14.15
20	14.13	14.84	14.98	15.26	15.54	15.05	14.95	14.58	14.59	14.30	14.00	14.12
25	14.14	14.65	15.15	15.39	15.52	15.00	14.92	14.66	14.52	14.20	13.95	14.07
EOM	14.12	14.79	15.24	15.43	15.55	15.02	14.87	14.65	14.48	14.04	13.98	14.09

WTR YEAR 1987 MAX 15.83 FEB 22, 23 MIN 13.78 AUG 7

HAWAII, ISLAND OF OAHU--Continued

212340158001901. Local number, 3-2300-18.

LOCATION.--Lat 21°23'40", long 158°00'19", Hydrologic Unit 20060000, 700 ft south of August Ahrens School, and 1400 ft northeast of L'Orange Park, Waipahu. Owner: Honolulu Board of Water Supply.

AQUIFER.--Basalt of Koolau Volcanic Series, Tertiary age.

WELL CHARACTERISTICS.--Drilled basal-water table well, depth 1090 ft, casing diameter 12 in., cased to 38 ft. Well was dsepened May 1980 and modified Feb. 1984. Prior to May 1980, well depth 205 ft.

DATUM.--Elevation of land-surface datum is 26 ft. Measuring point: Top of casing, 27.73 ft above mean sea level.

REMARKS.--Geophysical logs are available in files of district office.

PERIOD OF RECORD.--
WATER LEVEL: Water-level recorder, November 1982 to July 1983, March 1984 to current year.
WATER QUALITY: 1930, 1942-45, 1947-49, 1951-54, 1968, 1983, 1985 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level 22.40 ft above mean sea level, Jan. 4, 1983; lowest 14.01 ft above mean sea level, Sept. 14, 1985.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	15.03	15.06	16.23	16.93	16.94	16.67	15.89	15.91	15.51	15.40	14.91	15.19
10	14.85	15.33	16.56	16.84	16.90	16.50	15.73	15.65	15.37	15.29	14.83	15.04
15	14.78	e15.8	e16.6	16.87	17.09	16.26	15.78	15.53	16.04	15.22	14.75	15.13
20	14.79	e15.8	e18.6	16.92	17.17	16.19	15.93	15.49	15.50	15.23	14.93	14.97
25	14.79	15.70	16.60	17.19	17.01	15.99	15.79	15.60	15.58	15.05	14.88	14.90
EOM	14.94	15.89	16.83	17.05	16.97	16.16	15.72	15.87	15.47	14.86	14.68	14.82

WTR YEAR 1987 MAX 17.36 FEB. 21 MIN 14.61 AUG. 21, SEPT. 1

e Estimated.

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	SAMPLE DEPTH DISTANCE BELOW MSL FEET	SPECIFIC CONDUCTANCE LAB (US/CM)	CHLORIDE, DISSOLVED (MG/L AS CL)
DEC, 1986				
18...	j0935	400	714	180
18...	j0945	500	1720	480
18...	j1007	600	10100	3500
18...	j1025	650	16200	5800
18...	j1043	700	22300	7900
DEC, 1986				
18...	j1110	750	27500	9900
18...	j1120	800	31000	11000
18...	j1145	850	34900	13000
18...	j1205	900	38500	14000
18...	j1230	950	41900	16000
18...	j1255	990	43300	17000

j Collected by non-USGS agency.

HAWAII, ISLAND OF OAHU--Continued

212659158004102. Local number, 3-2600-04.

LOCATION.--Lat 21°26'59", long 158°00'41", Hydrologic Unit 20060000, 30 ft south of Waiahole ditch, and 1.1 mi east southeast of Kipapa School in Mililani. Owner: Honolulu Board of Water Supply.

AQUIFER.--Basalt of Koolau Volcanic Series, Tertiary age.

WELL CHARACTERISTICS.--Drilled basal water-table well, depth 815 ft, casing diameter 18 in., cased to 705 ft.

DATUM.--Elevation of land-surface datum is 665 ft. Measuring point: Top of 16-inch casing, 666.62 ft, revised, above mean sea level.

PERIOD OF RECORD.--Water-level recorder, October 1983 to September 10, 1987, recorder removed.

EXTREMES FOR PERIOD OF RECORD.--Highest water level 20.94 ft above mean sea level, Oct. 1, 1983; lowest 16.74 ft above mean sea level, Sept. 14, 1985.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	17.70	17.58	18.76	19.63	19.92	20.13	19.31	19.05	18.84	18.72	18.28	18.02
10	17.70	17.70	18.99	19.62	19.96	19.97	19.18	19.02	18.78	18.65	18.22	---
15	17.65	18.00	19.15	19.79	19.94	19.79	19.11	18.93	18.85	18.58	18.11	---
20	17.55	18.38	19.27	19.77	20.04	19.62	19.12	18.89	18.85	---	18.18	---
25	17.50	18.48	19.37	19.85	20.12	19.50	19.14	18.85	18.82	---	18.06	---
EOM	17.54	18.53	19.49	19.89	20.18	19.39	19.05	18.84	18.75	---	17.96	---

WTR YEAR 1987 MAX 20.26 FEB 28 MIN 17.46 OCT 31

Note: No record July 16-31, 1987, recorder malfunctioned.

HAWAII, ISLAND OF OAHU-Continued

212927158014801. Local number, 3-2901-07.

LOCATION.--Lat 21°29'27", long 158°01'48", Hydrologic Unit 20060000, across the main gage of Wheeler AFB, and 1200 ft south of Wahiawa bridge on Kaukonohua Stream. Owner: U.S. Army.

AQUIFER.--Basalt of Koolau Volcanic Series, Tertiary age.

WELL CHARACTERISTICS.--Dug high-level water-table well, size 8 x 8 ft, length of 30-degree inclined shaft 1,148 ft.

DATUM.--Elevation of land-surface datum is 850 ft. Measuring point: Top of pump chamber floor at recorder, 287.00 ft above mean sea level.

REMARKS.--Water-level recorder is located on the pump chamber floor at the bottom of shaft. Water from this well is used for public supply.

PERIOD OF RECORD.--
WATER LEVEL: Water-level recorder, November 1938 to current year.
WATER QUALITY: 1966-72, 1975 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level, 284.40 ft above mean sea level, May 12, 1969; lowest, 269.52 ft above mean sea level, Dec. 5, 1978.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MAXIMUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	271.42	271.57	271.92	272.02	*---	272.32	272.20	272.17	271.95	272.17	272.17	272.40
10	271.43	271.89	271.78	271.97	272.23	272.38	272.18	272.15	271.89	272.21	272.16	272.38
15	271.48	271.88	271.81	272.00	272.27	272.40	272.16	272.15	272.11	272.24	272.40	272.44
20	271.46	271.60	271.93	272.08	272.38	272.30	272.20	272.09	272.09	272.04	272.36	272.45
25	271.50	271.65	271.97	272.18	272.40	272.36	272.18	272.12	272.15	272.23	272.38	272.48
EOM	271.55	271.88	271.99	*---	272.44	272.27	272.04	272.15	272.29	272.24	272.26	272.58

* No record for these days, recorder malfunctioned.
Note: Well being pumped throughout the year.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
NONPUMPING VALUES

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 1	271.67	JUN 4	272.32	JUN 30	272.29	JUL 27	272.40	AUG 21	272.50	SEPT 30	272.58
MAR 9	272.58										

Note: Water levels are measured after all pumps being shut off for 2 hours.

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	TEMPERATURE WATER (DEG C)	CHLORIDE, DISSOLVED (MG/L AS CL)	DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	TEMPERATURE WATER (DEG C)	CHLORIDE, DISSOLVED (MG/L AS CL)
OCT					APR				
30...	0900	170	21.5	19	03...	0945	160	22.5	17
DEC					MAY				
19...	0950	165	22.0	18	27...	1030	165	22.5	20
FEB					JUL				
09...	1040	170	22.0	19	29...	1000	180	22.5	18

HAWAII, ISLAND OF OAHU--Continued

213327157524401. Local number, 3-3352-01.

LOCATION.--Lat 21°33'27", long 157°52'44", Hydrologic Unit 20060000, at mouth of Kahana Valley, and 700 ft southwest of Kamehameha Highway, Kahana. Owner: Mary E. Foster Estate.

AQUIFER.--Basalt of Koolau Volcanic Series, Tertiary age.

WELL CHARACTERISTICES.--Drilled artesian well, depth 441 ft, casing diameter 10 in., cased to 177 ft.

DATUM.--Elevation of land-surface datum is 6 ft. Measuring point: Top of "T", 7.31 ft above mean sea level.

PERIOD OF RECORD.--
WATER LEVEL: Occasional measurements, April 1935 to current year.
WATER QUALITY: 1935 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 21.3 ft above mean sea level, Mar. 29, 1966; lowest measured, 12.61 ft above mean sea level, July 5, 1984.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 21	13.67	DEC 1	14.31	JAN 15	14.91	MAR 9	14.62	MAY 20	14.25	JUL 13	14.03

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	SPECIFIC CONDUCTANCE (US/CM)	TEMPERATURE WATER (DEG C)	CHLORIDE, DISSOLVED (MG/L AS CL)	DATE	SPECIFIC CONDUCTANCE (US/CM)	TEMPERATURE WATER (DEG C)	CHLORIDE, DISSOLVED (MG/L AS CL)
OCT, 1986				MAR, ,1987			
21...	270	23.0	36	09...	275	22.5	37
DEC, 1987				MAY			
01...	260	23.0	37	20...	250	22.5	37
JAN				JUL			
15...	260	22.5	38	13...	250	22.5	36

HAWAII, ISLAND OF OAHU--Continued

213446158104901. Local number, 3-3410-08.

LOCATION.--Lat 21°34'46", long 158°10'49", Hydrologic Unit 20060000, 0.5 mi east of Dillingham Airfield, and 1.1 mi southeast of Mokuleia Beach Park. Owner: Waialua Sugar Co., Inc.

AQUIFER.--Basalt of Waianae Volcanic Series, Tertiary age.

WELL CHARACTERISTICS.--Drilled artesian well, depth 447 ft, casing diameter 1-inch, cased to 410 ft, perforated from 410 to 447 ft.

DATUM.--Elevation of land-surface datum is 12 ft. Measuring point: Top 12-inch stilling well, 20.53 ft above mean sea level.

PERIOD OF RECORD.--
WATER LEVEL: Water-level recorder, January 1963 to February 1972.
Occasional measurements, January 1929 to December 1962, March 1972 to current year.
W ATER QUALITY: 1929 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level, 19.98 ft above mean sea level, Jan. 5, 1969; lowest measured, 16.08 ft above mean sea level, Aug. 6, 1929.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 1	18.56	DEC 30	18.59	APR 7	18.19	MAY 22	16.06	JUL 16	17.69	SEP 9	16.23
NOV 22	18.53										

214125158013401. Local number, 3-4101-03.

LOCATION.--Lat 21°41'25", long 158°01'34", Hydrologic Unit 20060000, 1500 ft northeaat of UH agriculture experiment Station in Waialee and 1.9 mi northeast of Sunset Beach. Owner: State of Hawaii.

AQUIFER.--Basalt of Koolau Volcanic Series, Tertiary age.

WELL CHARACTERISTICS.--Drilled artesian well, depth 61 ft, casing diamter 6 in., cased to 36 ft.

DATUM.--Elevation of land-surface datum is 22 ft. Measuring point: Top of 4-inch 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 1986 TO SEPTEMBER 1987

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 21	12.37	NOV 26	12.63	JAN 15	12.54	MAY 19	12.63	JUL 10	12.66

HAWAII, ISLAND OF MOLOKAI

210425156483001. Local number, 4-0448-02.

LOCATION.--Lat 21°04'25", long 156°48'30", Hydrologic Unit 20050000, 100 ft north of Highway 45, and 0.8 mi west of Pukoo. Owner: P. Friel.

AQUIFER.--East Molokai Volcanic Series, Pliocene age.

WELL CHARACTERISTICS.--Dug basal water-table well, size 4 x 6 ft, depth 22 ft.

DATUM.--Elevation of land-surface datum is 19 ft. Measuring point: Top of 2 x 2 in. steel plate bolted to top of concrete wall of well, 21.23 ft above mean sea level.

REMARKS.-- Water-quality records for 1970-1973 are available in files of district office.

PERIOD OF RECORD.-- Water-level recorder, August 1970 to January 1973.
Occasional measurements, February 1973 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level, 6.11 ft above mean sea level, Nov. 26, 1970; lowest measured, 3.67 ft above mean sea level, Feb. 8, 1977.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 27	4.08	FEB 3	4.30	APR 28	4.14	JUN 8	4.14	JUL 20	4.08	AUG 23	3.99
DEC 12	4.17	MAR 15	4.12								

HAWAII, ISLAND OF MOLOKAI--Continued

210402156495801. Local number, 4-0449-01.

LOCATION.--Lat 21°04'02", long 156°49'58", Hydrologic Unit 20050000, 1,800 ft north of Ualapue Fishpond, and 0.5 mi northeast of Kilohana School. Owner: County of Maui.

AQUIFER.--East Molokai Volcanic Series, Pliocene age.

WELL CHARACTERISTICS.--Dug basal water-table well, size 4 x 6 ft, depth 42 ft, lined with concrete to 42 ft; two infiltration tunnels, total length 214 ft.

DATUM.--Elevation of land-surface datum is 42 ft. Measuring point: Top of steel plate, 42.42 ft above mean sea level.

REMARKS.--Water from this well is used for public supply.

PERIOD OF RECORD.--
WATER LEVEL: Occasional measurements, 1938-39, 1941-63, November 1972 to current year.
WATER QUALITY: 1948, 1952-56, 1970 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 6.05 ft above mean sea level, Jan. 19, 1950; lowest measured, 2.09 ft above mean sea level, Sept. 16, 1975.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 27	3.07	FEB 3	3.33	APR 27	3.30	JUN 8	3.24	JUL 20	3.23	AUG 23	3.16
DEC 15	3.26										

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	TEMPERATURE WATER (DEG C)	DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	TEMPERATURE WATER (DEG C)
OCT, 1986				MAR, 1987			
27...	1500	330	21.0	15...	1540	350	23.5
DEC				APR			
15...	1445	310	21.0	27...	1500	320	20.0
FEB, 1987				JUN			
03...	1410	320	21.5	08...	1130	320	20.5
				JUL			
				20...	1130	330	21.0

DATE	TIME	PH (STANDARD UNITS)	BENZENE TOTAL (UG/L)	BROMOFORM TOTAL (UG/L)	CARBON-TETRACHLORIDE TOTAL (UG/L)	CHLOROBENZENE TOTAL (UG/L)	CHLORODIBROMOMETHANE TOTAL (UG/L)	CHLOROETHANE TOTAL (UG/L)	2-CHLOROETHYLVINYLETHER TOTAL (UG/L)	CHLOROFORM TOTAL (UG/L)
MAR										
15...	1540	7.90	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20

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

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

HAWAII, ISLAND OF MOLOKAI--Continued

210402156195801 - 4-0449-01 S6 CNTY, UALAPUE MOLOKAI--Continued

DATE	CIS 1,3-DI-CHLORO-PROPENE TOTAL (UG/L)	1,2-DIBROMO ETHYL-ENE TOTAL (UG/L)	1,2-DI-CHLORO-BENZENE TOTAL (UG/L)	1,3-DI-CHLORO-BENZENE TOTAL (UG/L)	1,4-DI-CHLORO-BENZENE TOTAL (UG/L)	DI-CHLORO-BROMO-METHANE TOTAL (UG/L)	DI-CHLORO-DI-FLUORO-METHANE TOTAL (UG/L)	1,1-DI-CHLORO-ETHANE TOTAL (UG/L)	1,2-DI-CHLORO-ETHANE TOTAL (UG/L)	1,1-DI-CHLORO-ETHYL-ENE TOTAL (UG/L)
MAR										
15...	<0.20	<0.2	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20

DATE	1,2-DI-CHLORO-PROPANE TOTAL (UG/L)	1,3-DI-CHLORO-PROPENE TOTAL (UG/L)	ETHYL-BENZENE TOTAL (UG/L)	METHYL-BROMIDE TOTAL (UG/L)	METHYL-CHLO-RIDE TOTAL (UG/L)	METHYL-ENE CHLO-RIDE TOTAL (UG/L)	STYRENE TOTAL (UG/L)	1,1,2,2 TETRA-CHLORO-ETHANE TOTAL (UG/L)	TETRA-CHLORO-ETHYL-ENE TOTAL (UG/L)
MAR									
15...	<0.20	<0.20	<0.20	<0.20	<0.20	<1.0	<0.2	<0.20	<0.20

DATE	1,2-TRANSDI CHLORO-ETHENE TOTAL (UG/L)	TRANS-1,3-DI-CHLORO-PROPENE TOTAL (UG/L)	1,1,1-TRI-CHLORO-ETHANE TOTAL (UG/L)	1,1,2-TRI-CHLORO-ETHANE TOTAL (UG/L)	TRI-CHLORO-ETHYL-ENE TOTAL (UG/L)	TRI-CHLORO-FLUORO-METHANE TOTAL (UG/L)	TOLUENE TOTAL (UG/L)	VINYL CHLO-RIDE TOTAL (UG/L)	XYLENE TOTAL WATER WHOLE TOT REC (UG/L)
MAR									
15...	<0.20	<0.20	<0.20	<0.20	<0.2	<0.20	<0.20	<0.20	<0.2

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

HAWAII, ISLAND OF MOLOKAI--Continued

210419156570501. Local number, 4-0457-01.

LOCATION.--Lat 21°04'19", long 156°57'05", Hydrologic Unit 20050000, 0.5 mi northwest of Kakahaia Fishpond, and 0.5 mi northeast of Moku. Owner: County of Maui.

AQUIFER.--Basalt of East Molokai Volcanic Series, Pliocene age.

WELL CHARACTERISTICS.--Dug basal water-table well, size 4 x 4 ft, depth 38 ft, lined with concrete to 38 ft; two infiltration tunnels, total length 220 ft.

DATUM.--Elevation of land-surface datum is 38 ft. Measuring point: Top of steel plate, 37.37 ft, revised, above mean sea level.

REMARKS.--Water from this well is used for public supply.

PERIOD OF RECORD.--
WATER LEVEL: Occasional measurements, June 1947 to November 1960, January 1962 to February 1963, November 1972 to current year.
WATER QUALITY: 1948, 1954-56, 1960, 1962, 1971, 1973 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 2.66 ft above mean sea level, Dec. 5, 1950; lowest measured, 1.47 ft above mean sea level, June 24, 1955.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 27	1.92	FEB 3	2.03	APR 28	1.94	JUN 8	1.88	JUL 20	1.93	AUG 23	1.82
DEC 15	1.89	MAR 15	1.94								

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	TEMPERATURE WATER (DEG C)	DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	TEMPERATURE WATER (DEG C)
OCT, 1986				FEB, 1987			
27...	1555	260	23.0	03...	1500	270	22.5
DEC				MAR			
15...	1605	280	23.5	15...	1640	280	23.0

DATE	TIME	PH (STANDARD UNITS)	BENZENE TOTAL (UG/L)	BROMOFORM TOTAL (UG/L)	CARBON-TETRACHLORIDE TOTAL (UG/L)	CHLOROBENZENE TOTAL (UG/L)	CHLORODIBROMOMETHANE TOTAL (UG/L)	CHLOROETHANE TOTAL (UG/L)	2-CHLOROETHYLVINYLETHER TOTAL (UG/L)	CHLOROFORM TOTAL (UG/L)
MAR										
15...	1645	7.20	<0.20	4.0	<0.20	<0.20	3.2	<0.20	<0.20	0.50

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

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

HAWAII, ISLAND OF MOLOKAI--Continued

210419156570501 - 4-0457-01 S4 CNTY, KAWELA--Continued

DATE	CIS 1,3-DI-CHLORO-PROPENE TOTAL (UG/L)	1,2-DIBROMO ETHYL-ENE TOTAL (UG/L)	1,2-DI-CHLORO-BENZENE TOTAL (UG/L)	1,3-DI-CHLORO-BENZENE TOTAL (UG/L)	1,4-DI-CHLORO-BENZENE TOTAL (UG/L)	DI-CHLORO-BROMO-METHANE TOTAL (UG/L)	DI-CHLORO-DI-FLUORO-METHANE TOTAL (UG/L)	1,1-DI-CHLORO-ETHANE TOTAL (UG/L)	1,2-DI-CHLORO-ETHANE TOTAL (UG/L)	1,1-DI-CHLORO-ETHYL-ENE TOTAL (UG/L)
MAR 15...	<0.20	<0.2	<0.20	<0.20	<0.20	0.80	<0.20	<0.20	<0.20	<0.20

DATE	1,2-DI-CHLORO-PROPANE TOTAL (UG/L)	1,3-DI-CHLORO-PROPENE TOTAL (UG/L)	ETHYL-BENZENE TOTAL (UG/L)	METHYL-BROMIDE TOTAL (UG/L)	METHYL-CHLO-RIDE TOTAL (UG/L)	METHYL-ENE CHLO-RIDE TOTAL (UG/L)	STYRENE TOTAL (UG/L)	1,1,2,2 TETRA-CHLORO-ETHANE TOTAL (UG/L)	TETRA-CHLORO-ETHYL-ENE TOTAL (UG/L)
MAR 15...	<0.20	<0.20	<0.20	<0.20	<0.20	<1.0	<0.2	<0.20	<0.20

DATE	1,2-TRANSDI CHLORO-ETHENE TOTAL (UG/L)	TRANS-1,3-DI-CHLORO-PROPENE TOTAL (UG/L)	1,1,1-TRI-CHLORO-ETHANE TOTAL (UG/L)	1,1,2-TRI-CHLORO-ETHANE TOTAL (UG/L)	TRI-CHLORO-ETHYL-ENE TOTAL (UG/L)	TRI-CHLORO-FLUORO-METHANE TOTAL (UG/L)	TOLUENE TOTAL (UG/L)	VINYL CHLO-RIDE TOTAL (UG/L)	XYLENE TOTAL WATER WHOLE TOT REC (UG/L)
MAR 15...	<0.20	<0.20	<0.20	<0.20	<0.2	<0.20	<0.20	<0.20	<0.2

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

HAWAII, ISLAND OF MOLOKAI--Continued

210605157012001. Local number, 4-0601-01.

LOCATION.--Lat 21°06'05", long 157°01'20", Hydrologic Unit 20050000, 0.6 mi north of Kaunakakai School, and 0.9 mi east of Kalanianaole Colony. Owner: Molokai Ranch.

AQUIFER.--Basalt of East Molokai Volcanic Series, Pliocene age.

WELL CHARACTERISTICS.--Drilled basal water-table well, depth 59 ft, casing diameter 12 in., cased to 20 ft.

DATUM.--Elevation of land-surface datum is 51 ft. Measuring point: Top of 15-inch surface casing, 51.95 ft above mean sea level.

PERIOD OF RECORD.--
WATER LEVEL: Occasional measurements, May 1954 to current year.
WATER QUALITY: 1954 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 3.30 ft above mean sea level, Jan. 20, 1969; lowest measured, 1.60 ft above mean sea level, Dec. 5, 1964.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 29	2.60	FEB 03	2.72	APR 28	2.67	JUN 8	2.57	JUL 20	2.65	AUG 26	2.58
DEC 18	2.55	MAR 20	2.61								

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	TEMPERATURE WATER (DEG C)	CHLORIDE, DISSOLVED (MG/L AS CL)	DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	TEMPERATURE WATER (DEG C)	CHLORIDE, DISSOLVED (MG/L AS CL)
OCT, 1986					APR, 1987				
29...	1740	340	24.5	35	28...	1420	240	23.5	15
DEC					JUN				
18...	1605	270	24.0	22	08...	1340	200	23.5	12
FEB, 1987					JUL				
03...	1605	210	23.5	16	20...	1500	320	23.5	20
MAR					AUG				
20...	0910	250	23.5	18	26...	1025	310	23.5	22

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 Ksunakakai, 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.--Messuring point: Top of casing, 979.00 ft, land-surface datum.

REMARKS.--Water-quality records for 1973-75 are available in files of district office.

PERIOD OF RECORD.--Occasional meassurements, July 1976 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 975.40 ft below land-surface datum, Jan. 25, 1983; lowest measured, 976.23 ft below land-surface datum, SEPT. 10, 1986.

WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 29	976.22	FEB 4	976.03	APR 29	975.95	JUL 21	975.80

203908156041201. Local number, 6-3904-01.

LOCATION.--Lat 20°39'08", long 156°04'12", Hydrologic Unit 20020000, 1300 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-inch pipe nipple, 133.61 ft above mean sea level.

REMARKS.--Water-quality records for 1978 are available in files of district office.

PERIOD OF RECORD.--Occasional measurements, July 1978 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 2.73 ft above mean sea level, Jan. 9, 1985; lowest measured, 0.70 ft above mean sea level, July 2, 1986.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 7	2.40	JAN 7	2.05	APR 1	1.54	MAY 13	1.02	JUL 1	1.41	AUG 19	1.22
NOV 19	2.36	FEB 19	1.79								

203912156255901. Local number, 6-3925-01.

LOCATION.--Lat 20°39'12", long 158°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-inch pipe attached to the casing cover, 352.29 ft above mean sea level.

REMARKS.--Water-quality records for 1964 are available in files of district office.

PERIOD OF RECORD.--Occasional measurements, August 1964, June 1972 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 0.47 ft above mean sea level, Aug. 24, 1964; lowest measured, 0.41 ft below mean sea level, May 4, 1977.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 9	0.11	JAN 14	-0.02	APR 9	-0.02	JUL 14	-0.23

HAWAII, ISLAND OF MAUI--Continued

204827156242201. Local number, 6-4824-01.

LOCATION.--Lat 20°48'27", long 156°24'22", Hydrologic Unit 20020000, on Waiakoa Road 1,000 ft south of intersection with Kalaloa Gulch, and 4 mi east of Kihei. Owner: State of Hawaii.

AQUIFER.--Kula Volcanic Series, Pleistocene age.

WELL CHARACTERISTTCS.--Drilled basal water-table well, depth 647 ft, casing diameter 12 in., cased to 598 ft, screened from 598 to 638 ft.

DATUM.--Elevation of land-surface datum is 593 ft. Measuring point: Top of 3-inch pipe attached to the steel casing cover, 594.75 ft above mean sea level.

REMARKS.--Water-quality records for 1971, 1973 are available in files of district office.

PERIOD OF RECORD.--Occasional measurements, March 1971 and May 1972 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 5.20 ft above mean sea level, Jan. 17, 1974; lowest measured, 3.65 ft above mean sea level, Jan. 27, 1977.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 14	3.89	JAN 18	4.46	APR 10	4.22	MAY 21	4.60	JUL 15	4.57	AUG 28	4.18
NOV 28	4.35	FEB 27	4.55								

204818156310301. Local number, 6-4831-01.

LOCATION.--Lat 20°48'18", long 156°31'03", Hydrologic Unit 20020000, on sugar plantation road 0.7 mi north of Maalaea, and 0.9 mi southwest of intersection of Honoapoolani Highway and Kihei Road. Owner: State of Hawaii.

AQUIFER.--Wailuku Volcanic Series, Pliocene age.

WELL CHARACTERISTICS.--Drilled basal water-table well, depth 219 ft, casing diameter 8 in., cased to 187 ft.

DATUM.--Elevation of land-surface datum is 166 ft. Measuring point: Top of 8-inch casing, 166.60 ft above mean sea level.

REMARKS.--Water-quality records for 1965-67 are available in files of district office.

PERIOD OF RECORD.--Water-level recorder, January to July 1974.
Occasional measurements, September 1972 to December 1973, August 1974 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 5.76 ft above mean sea level, Nov. 30, 1983; lowest measured, 4.74 ft above mean sea level, Mar. 18, 1977.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 8	5.17	JAN 14	5.40	APR 9	5.39	MAY 18	5.51	JUL 2	5.43	AUG 13	5.41
NOV 24	5.39	FEB 23	5.53								

HAWAII, ISLAND OF MAUI--Continued

204909156281401. Local number, 6-4928-02.

LOCATION.--Lat 20°48'27", long 156°28'14", Hydrologic Unit 20020000, at Puunene Airport on Mokulele Highway 2.3 mi north of intersection with Kihei Road, Kihei. Owner: Hawaiian Commercial and Sugar Co.

AQUIFER.--Honomanu Volcanic Series, Pliocene age.

WELL CHARACTERISTICS.--Dug basal water-table well, 6 x 9 ft vertical shaft, depth 53 ft.

DATUM.--Elevation of land-surface datum is 50 ft. Measuring point: Top of angle iron at well, 50.08 ft above mean sea level.

REMARKS.--Water-quality records for 1973 are available in files of district office.

PERIOD OF RECORD.--Water-level recorder, March 1972 to September 1984.
Occasional measurements, October 1984 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level, 5.09 ft above mean sea level, Jan. 12, 1980; lowest, 3.05 ft above mean sea level, Mar. 5-8, 1977.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 9	3.60	JAN 14	4.01	APR 9	3.90	MAY 20	4.16	JUL 14	4.10	AUG 17	3.84
NOV 25	3.94	FEB 26	4.10								

205140156304501. Local number, 6-5130-01.

LOCATION.--Lat 20°51'40", long 156°30'45", Hydrologic Unit 20020000, 0.5 mi northwest of Waikapu, and 1.0 mi southeast of Wailuku Heights. Owner: State of Hawaii.

AQUIFER.--Wailuku Volcanic Series, Pliocene age.

WELL CHARACTERISTICS.--Drilled basal water-table well, depth 757 ft, casing diameter 8 in., cased to 569 ft, perforated from 569 to 609 ft.

DATUM.--Elevation of land-surface datum is 551 ft. Measuring point: Top of 8-inch pipe coupling, 551.33 ft above mean sea level.

PERIOD OF RECORD.--Occasional measurements, June 1974 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level, 30.90 ft above mean sea level, Oct. 13, 1982; lowest measured, 11.36 ft above mean sea level, Jan. 27, 1976.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 14	17.96	JAN 16	22.66	APR 10	21.53	MAY 21	24.94	JUL 15S	22.29	AUG 6	20.07
NOV 28	18.54	FEB 27	21.43								

HAWAII, ISLAND OF MAUI--Continued

205154156303801. Local number, 6-5130-02.

LOCATION.--Lat 20°51'54", long 156°30'38", Hydrologic Unit 20020000, 0.6 mi northwest of Waikapu, and 1.0 mi southeast of Wailuku Heights. Owner: State of Hawaii.

AQUIFER.--Wailuku Volcanic Series, Pliocene age.

WELL CHARACTERISTICS.--Drilled basal water-table well, depth 1020 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, 15.03 ft above mean sea level, Jul. 15, 1987; lowest, 13.48 ft above mean sea level, April 8, 1985.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 14	13.96	JAN 16	14.28	APR 10	14.69	MAY 21	14.79	JUL 15	15.03	AUG 28	14.77
NOV 28	14.12	MAR 27	14.51								

205419156304401. Local number, 6-5430-03.

LOCATION.--Lat 20°54'19", long 156°30'44", Hydrologic Unit 20020000, 2,000 ft north of Puuohala Village, and 0.5 mi northwest of Wailuku Sugar Mill reservoir. Owner: Wailuku Sugar Co.

AQUIFER.--Wailuku Volcanic Series, Pliocene age.

WELL CHARACTERISTICS.--Drilled basal water-table well, depth 580 ft, 1.5-inch PVC casing, cased to 400 ft, perforated from 400 to 580 ft.

DATUM.--Elevation of land-surface datum is 415 ft. Measuring point: Top of 1-inch galvanized pipe, 416.75 ft above mean sea level.

PERIOD OF RECORD.--Water-level recorder, August 1982 to February 1984.
Occasional measurements, March 1984 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level, 22.09 ft above mean sea level, Dec. 31, 1982; lowest measured, 14.67 ft above mean sea level, OCT. 11, 1985.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 9	15.60	JAN 13	16.95	APR 13	16.65	MAY 20	17.16	JUL 14	16.80	AUG 17	16.75
NOV 21	16.06	FEB 25	17.28								

205405156305401. Local number, 6-5430-05.

LOCATION.--Lat 20°54'59", long 156°30'56", Hydrologic Unit 20020000, 1.0 mi southwest of intersection of Malaihi Road and Highway 33, and 1.2 mi south of Waihee. Owner: State of Hawaii.

AQUIFER.--Wailuku Volcanic Series, Pliocene age.

WELL CHARACTERISTICS.--Drilled basal water-table well, depth 1400 ft, casing diameter 10 in., cased to 400 ft.

DATUM.--Elevation of land-surface datum is 380 ft. Measuring point: Top of 10-inch casing, 380.84 ft, revised, above mean sea level.

PERIOD OF RECORD.--
WATER LEVEL: Occasional measurements, August 1983 to MAY 1986. Water-level recorder, June 1986 to current year.
WATER QUALITY: 1982, 1985 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level messured, 16.68 ft above mean sea level, Aug. 5, 1983; lowest measured, 13.04 ft above mean sea level, Oct. 11, 1985.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	14.09	14.27	14.76	15.08	15.01	14.96	14.48	14.66	14.97	14.80	e14.7	14.49
10	14.07	14.41	14.87	15.07	14.90	14.87	14.39	14.83	14.85	14.77	e14.6	14.55
15	14.11	14.56	15.01	15.16	15.01	14.85	14.38	14.85	14.82	14.82	14.47	14.66
20	14.14	14.45	15.04	15.22	15.03	14.69	14.38	14.88	14.74	14.81	14.46	14.63
25	14.14	14.52	15.06	15.21	15.02	14.57	14.58	14.97	14.78	14.73	14.48	14.68
EOM	14.21	14.61	15.06	15.17	15.03	14.49	14.62	14.95	14.78	14.71	14.48	14.74

WTR YEAR 1987 MAX 15.29 JAN 18,19,22-24 MIN 14.00 OCT 16

e Estimated.

WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

DATE	TIME	SAMPLE DEPTH DISTANCE BELOW MSL FEET	SPECIFIC CONDUCTANCE (US/CM)	CHLORIDE, DISSOLVED (MG/L AS CL)
MAY, 1986				
21...	j0850	200	220	14
21...	j0920	400	583	140
21...	j1000	500	569	140
21...	j1035	600	683	180
21...	j1105	675	1280	340
MAY, 1986				
21...	j1140	750	3040	900
21...	j1215	800	23600	8500
21...	j1255	825	42700	16000
21...	j1330	850	46800	18000
21...	j1400	900	49200	18000
21...	j1440	1000	50200	18000

j Collected by non-USGS agency.

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

HAWAII, ISLAND OF MAUI--Continued

205405156305401 - 6-5430-05, WAIHEE, MAUI--Continued

DATE	TIME	SAMPLE DEPTH DIS-TANCE BELOW MSL FEET	SPE-CIFIC CON-DUCT-ANCE (US/CM)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)
OCT, 1986				
01...	j0913	200	225	13
01...	j0936	400	375	67
01...	j1000	500	619	180
01...	j1023	600	729	150
01...	j1050	675	1400	380
01...	j1115	750	3160	910
01...	j1140	800	26900	9800
01...	j1210	825	42300	16000
01...	j1240	850	47000	18000
01...	j1310	900	48300	19000
01...	j1343	1000	49400	19000
DEC				
11...	j0850	200	218	12
11...	j0915	400	595	140
11...	j0943	500	577	140
11...	j1010	600	704	180
11...	j1038	675	1410	380
11...	j1112	750	3270	950
11...	j1142	750	3240	950
11...	j1214	800	28300	11000
11...	j1242	825	43400	16000
11...	j1313	850	46600	18000
11...	j1342	900	48800	19000
11...	j1410	1000	49800	19000
JAN, 1987				
21...	j0904	200	219	13
21...	j0927	400	564	140
21...	j0952	500	595	140
21...	j1015	600	699	180
21...	j1042	675	1530	420
21...	j1115	750	3340	1000
21...	j1145	800	29400	11000
21...	j1215	825	43300	16000
21...	j1245	850	47000	18000
21...	j1320	900	49100	19000
21...	j1405	1000	50500	19000
FEB, 1987				
11...	j0820	200	221	14
11...	j0840	400	606	150
11...	j0905	500	608	150
11...	j0935	600	705	180
11...	j1005	675	1480	400
11...	j1030	750	3340	1000
11...	j1107	800	30200	11000
11...	j1143	825	43800	16000
11...	j1220	850	46400	18000
11...	j1300	900	49000	19000
11...	j1355	1000	50900	20000
MAR				
11...	j0904	200	219	13
11...	j0925	400	594	140
11...	j0950	500	583	140
11...	j1010	600	702	180
11...	j1035	675	1480	400
11...	j1100	750	3420	1000
11...	j1130	800	31400	12000
11...	j1200	825	44200	17000
11...	j1230	850	46900	18000
11...	j1300	900	48300	19000
11...	j1335	1000	50400	19000
AUG				
05...	j0930	200	--	12
05...	j0955	400	--	150
05...	j1040	500	--	160
05...	j1115	600	--	210
05...	j1135	675	--	440
05...	j1200	750	--	1100
05...	j1230	800	--	13000
05...	j1300	825	--	17000
05...	j1330	850	--	18000
05...	j1400	900	--	19000
05...	j1430	1000	--	19000

j Collected by non-USGS agency.

205437156310501. Local number, 6-5431-01.

LOCATION.--Lat 20°54'37", long 156°31'05", Hydrologic Unit 20020000, 0.5 mi southwest of Waiehu Village, and 1.4 mi southwest of intersection of Malaihi Road and Kahekili Highway. Owner: Wailuku Sugar Co.

AQUIFER.--Wailuku Volcanic Series, Pliocene age.

WELL CHARACTERISTICS.--Drilled basal water-table well, depth 555 ft, 1.5-inch PVC casing, cased to 515 ft, perforated from 515 to 555 ft.

DATUM.--Elevation of land-surface datum is 493 ft. Measuring point: Top of 1.5-inch PVC casing, 492.51 ft above mean sea level.

PERIOD OF RECORD.--Water-level recorder, August 1982 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level, 19.52 ft above mean sea level, Jan. 2, 1983; lowest 12.63 ft above mean sea level, OCT. 14-15, 1985.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	e13.6	13.84	14.39	14.80	14.72	14.71	14.25	14.47	14.67	14.40	14.26	14.05
10	13.57	14.00	14.55	14.79	14.69	e14.6	14.16	14.65	14.52	14.34	14.07	14.10
15	e13.6	14.16	14.68	14.93	e14.8	14.63	14.10	14.62	14.47	14.43	13.97	14.24
20	13.68	13.99	14.73	15.03	e14.8	14.44	14.09	14.61	14.38	e14.4	13.97	14.22
25	13.70	14.11	14.76	15.01	14.81	14.30	14.37	14.71	14.39	14.36	13.98	14.30
EOM	13.78	14.24	14.76	14.94	14.81	14.25	14.44	14.66	14.37	14.32	13.99	14.35

WTR YEAR 1987 MAX 15.10 JAN 19,20 MIN 13.50 OCT 11

e Estimated.

205617156311101. Local number, 6-5631-01.

LOCATION.--Lat 20°56'17", long 156°31'11", Hydrologic Unit 20020000, 2,000 ft southwest of Waihee Farm, and 1.3 mi northwest of Waiehu Golf Course. Owner: Wailuku Sugar Co.

AQUIFER.--Wailuku Volcanic Series, Pliocene age.

WELL CHARACTERISTICS.--Drilled basal water-table well, depth 300 ft, 1.5-inch PVC casing, cased to 260 ft, perforated from 260 to 300 ft.

DATUM.--Elevation of land-surface datum is 248 ft. Measuring point: Top of 1.5-inch PVC pipe, 248.05 ft above mean sea level.

PERIOD OF RECORD.--Water-level recorder, August 1982 to September 1984.
Occasional measurements, October 1984 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level, 16.83 ft above mean sea level, Dec. 6, 1982; lowest measured 14.51 ft above mean sea level, Oct. 11, 1985.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 9	15.58	JAN 13	16.12	APR 13	15.69	MAY 20	16.00	JUL 14	16.17	AUG 17	16.15
NOV 11	15.80	FEB 25	16.01								

HAWAII, ISLAND OF MAUI--Continued

205856156400101. Local number, 6-5840-01.

LOCATION.--Lat 20°58'56", long 156°40'01", Hydrologic Unit 20020000, on sugar plantation road 0.9 mi east of Kahana, and 1.5 mi southwest of Honokahua. Owner: State of Hawaii.

AQUIFER.--Honolua Volcanic Series, Pliocene age.

WELL CHARACTERISTICS.--Drillad 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 cament.

DATUM.--Elevation of land-surface datum is 257 ft. Measuring point: Top of 9-inch casing, 257.34 ft above mean sea level.

REMARKS.--Water-quality racords for 1964, 1980 are available in files of district office.

PERIOD OF RECORD.--Ocoasional 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 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	2.95	3.17	3.06	3.02	3.14	3.11	3.00	2.94	2.91	2.98	3.06	3.01
10	2.95	3.16	3.01	3.04	3.13	2.94	3.07	3.09	2.95	2.99	3.02	3.12
15	2.90	3.19	2.95	3.05	3.05	2.95	2.98	3.03	3.03	3.07	3.01	3.07
20	2.93	3.09	2.94	3.00	3.07	2.90	2.96	2.97	3.04	3.01	2.96	3.03
25	2.97	3.16	2.92	3.06	3.15	2.84	3.04	3.00	3.13	2.98	2.95	3.05
EOM	3.08	3.01	3.07	3.20	3.09	2.92	2.86	2.90	2.94	2.98	3.14	2.95

WTR YEAR 1987 MAX 3.35 NOV 7 MIN 2.70 MAY 1

HAWAII, ISLAND OF HAWAII

190602155325901. Local number, 8-0632-01.

LOCATION.--Lat 19°06'02", long 155°32'59", Hydrologic Unit 20010000, 0.9 mi north of Whittington Park, and 3.3 mi northeast of Naalehu. Owner: Kau Agribusiness (formerly Kau Sugar Company).

AQUIFER.--Ninole Volcanic Series, Pleistocene age.

WELL CHARACTERISTICS.--Drilled basal water-table, depth 140 ft, casing diameter 14 in., cased to 105 ft, perforated from 105 to 125 ft.

DATUM.--Elevation of land-surface datum is 102 ft. Measuring point: 1-inch hole in pump base, 103.26 ft above mean sea level.

REMARKS.--Water-quality records for 1972 and 1973 are available in files of district office.

PERIOD OF RECORD.--Occasional measurements, April 1972 to current year.

EXTREMES FOR PERIOD OF RECORD.--Higheat water leval measured, 2.39 ft above mean sea level, October 19, 1978; lowest measured, 0.50 ft below mean sea level, July 27, 1987.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
DEC 2	1.39	MAR 4	0.78	APR 24	0.83	JUN 1	0.74	JUL 27	0.50	SEP 26	1.19
JAN 26	1.10										

HAWAII, ISLAND OF HAWAII--Continued

192728154530101. Local number, 8-2783-01.

LOCATION.--Lat 19°27'28", long 154°53'01", Hydrologic Unit 20010000, 0.8 mi southeast of Pawai crater in Keahialaka, and 1.9 mi north of Opihikao road junction, south Pahoa. Owner: State of Hawaii.

AQUIFER.--Hilina Volcanic Series, Pleistocene age.

WELL CHARACTERISTICS.--Drilled basal water-table well, depth 319 ft, casing diameter 8 in., cased to 279 ft, perforated from 279 to 319 ft.

DATUM.--Elevation of land-surface datum is 273 ft. Measuring point: Top of casing, 273.00 ft above mean sea level.

PERIOD OF RECORD.--
WATER LEVEL: Occasional measurements, March 1972 to current year.
WATER QUALITY: 1982, 1972 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 2.87 ft above mean sea level, Sept. 17, 1985 and Nov. 5, 1986; lowest measured, 0.97 ft above mean sea level, July 28, 1976.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 5	2.87	MAR 2	2.35	APR 15	1.80	MAY 27	1.70	AUG 11	2.14	SEP 18	2.41
JAN 8	2.58										

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	TEMPERATURE WATER (DEG C)	CHLORIDE, DISSOLVED (MG/L AS CL)	DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	TEMPERATURE WATER (DEG C)	CHLORIDE, DISSOLVED (MG/L AS CL)
NOV, 1986					MAY, 1987				
05...	1110	12000	54.0	4000	17...	0925	16000	54.0	5400
JAN, 1987					AUG				
08...	1005	10800	53.0	3800	11...	1045	8800	53.0	2800
MAR					SEP				
02...	1205	12800	54.0	4200	04...	1100	12300	53.0	4600
APR									
15...	1020	14000	54.0	4800					

DATE	TIME	PH (STANDARD UNITS)	HARDNESS TOTAL (MG/L AS CACO3)	HARDNESS NONCARBONATE (MG/L AS CACO3)	CALCIUM DISSOLVED (MG/L AS CA)	MAGNESIUM, DISSOLVED (MG/L AS MG)	SODIUM, DISSOLVED (MG/L AS NA)	SODIUM PERCENT	SODIUM ADSORPTION RATIO	POTASSIUM, DISSOLVED (MG/L AS K)
SEP										
04...	1100	7.10	1200	1100	130	210	2500	80	32	140

ALKALINITY LAB (MG/L AS CACO3)	SULFATE DISSOLVED (MG/L AS SO4)	FLUORIDE, DISSOLVED (MG/L AS F)	SILICA, DISSOLVED (MG/L AS SIO2)	SOLIDS, SUM OF CONSTITUENTS, DISSOLVED (MG/L)	NITROGEN, NO2+NO3 DISSOLVED (MG/L AS N)	IRON, DISSOLVED (UG/L AS FE)	MANGANESE, DISSOLVED (UG/L AS MN)	MERCURY DISSOLVED (UG/L AS HG)
128	510	0.30	1.2	8170	0.420	40	100	<0.1

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

HAWAII, ISLAND OF HAWAII--Continued

193017154502101. Local number, 8-3080-02.

LOCATION.--Lat 19°30'17", long 154°50'21", Hydrologic Unit 20010000, 0.5 mi south of intersection of Highway 132, and Highway 137 near Pahoa. Owner: County of Hawaii.

AQUIFER.--Puna Volcanic Series, Holocene age.

WELL CHARACTERISTICS.--Dug basal water-table well, depth 46 ft, casing diameter 66 in., with two horizontal infiltration tunnels 2 x 50 ft extending in opposite directions from 3 ft above bottom of well.

DATUM.--Elevation of land-surface datum is 39 ft. Measuring point: Top of steel manhole cover at 1-inch hole, 39.50 ft above mean sea level.

REMARKS.--Water from this well is used for public supply and at times, water level affected by pumping.

PERIOD OF RECORD.--
WATER LEVEL: Occasional measurements, March 1972 to current year.
WATER QUALITY: 1972-81, 1983 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 4.16 ft above mean sea level, Dec. 6, 1982; lowest measured, 1.18 ft above mean sea level, June 3, 1985.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	WATER LEVEL
APR 4	3.58

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	TEMPERATURE WATER (DEG C)	CHLORIDE, DISSOLVED (MG/L AS CL)
NOV, 1986				
05...	1005	1550	25.5	300
JAN, 1987				
08...	1140	1250	25.5	220
MAR				
02...	1105	1530	25.5	300
MAY				
27...	0815	1450	25.5	300
JUL, 1987				
23...	0950	650	25.0	82
SEP				
08...	0900	1250	25.5	220
18...	1320	1150	25.0	190

DATE	TIME	PH (STANDARD UNITS)	HARDNESS TOTAL (MG/L AS CACO3)	HARDNESS NONCARBONATE (MG/L AS CACO3)	CALCIUM DISSOLVED (MG/L AS CA)	MAGNESIUM, DISSOLVED (MG/L AS MG)	SODIUM, DISSOLVED (MG/L AS NA)	SODIUM PERCENT	SODIUM ADSORPTION RATIO
SEP									
08...	0900	7.10	310	28	62	38	150	50	4

POTASSIUM, DISSOLVED (MG/L AS K)	ALKALINITY LAB (MG/L AS CACO3)	SULFATE DISSOLVED (MG/L AS SO4)	FLUORIDE, DISSOLVED (MG/L AS F)	SILICA, DISSOLVED (MG/L AS SIO2)	SOLIDS, SUM OF CONSTITUENTS, DISSOLVED (MG/L)	NITROGEN, NO2+NO3 DISSOLVED (MG/L AS N)	IRON, DISSOLVED (UG/L AS FE)	MANGANESE, DISSOLVED (UG/L AS MN)
11	283	30	0.30	55	749	3.00	9	3

HAWAII, ISLAND OF HAWAII--Continued

193339154594801. Local number, 8-3389-01.

LOCATION.--Lat 19°33'39", long 154°59'48", Hydrologic Unit 20010000, 3.5 mi northwest of Pahoa airstrip, and 5.5 mi southeast of Keaau. Owner: County of Hawaii.

AQUIFER.--Puna Volcanic Series, Holocene age.

WELL CHARACTERISTICS.--Drilled basal water-table well, depth 475 ft, casing diameter 8 in., cased to 403 ft, perforated from 403 to 475 ft.

DATUM.--Elevation of land-surface datum is 427 ft. Measuring point: Top of casing, 428.14 ft above mean sea level.

REMARKS.--Water-quality records for 1981 are available in files of district office.

PERIOD OF RECORD.--Occasional measurements, September 1974 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 26.37 ft above mean sea level, Mar. 26, 1979; lowest measured, 15.99 ft above mean sea level, Apr. 25, 1978, Mar. 10, 1986.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 5	18.64	MAR 2	18.65	MAY 27	17.29	JUN 3	17.27	JUL 23	16.54	SEP 16	18.38
JAN 8	20.12	APR 16	17.61								

HAWAII, ISLAND OF HAWAII--Continued

194134155005601. Local number, 8-4100-01.

LOCATION.--Lat 19°41'34", long 155°00'56", Hydrologic Unit 20010000, 5.5 mi southeast of Hilo Post Office, and 5.0 mi northeast of Keaau. Owner: Hawaiian Paradise Park Corporation.

AQUIFER.--Kau Volcanic Series, Holocene age.

WELL CHARACTERISTICS.--Drilled basal water-table well, depth 55 ft, casing diameter 10 in., cased to 39 ft, perforated from 39 to 55 ft.

DATUM.--Elevation of land-surface datum is 45 ft. Measuring point: Top of casing, 46.84 ft above mean sea level.

REMARKS.--Water-quality records for 1971, 1973-1986 are available in files of the district office.

PERIOD OF RECORD.--WATER LEVEL: Occasional measurements, November 1971 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 5.99 ft above mean sea level, Oct. 10, 1986; lowest measured, 2.24 ft above mean sea level, Mar. 9, 1972.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 10	5.99	FEB 2	5.04	APR 7	4.40	JUN 23	5.02	AUG 13	4.72	SEP 22	4.42
DEC 8	5.35										

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	TEMPERATURE WATER (DEG C)	DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	TEMPERATURE WATER (DEG C)
OCT, 1986				JUN, 1987			
09...	0900	1300	19.5	23...	0830	1280	19.5
DEC				AUG			
08...	1345	1250	19.0	13...	1235	1260	20.0
FEB, 1987				SEP			
02...	1100	1200	19.0	22...	0955	1250	19.0
APR							
07...	0855	1250	19.0				

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-inch nipple above casing; 46.54 ft above mean sea level.

REMARKS.--Water-quality records for 1961 are available in files of district office. Water level affected by pumping of nearby industrial wells.

PERIOD OF RECORD.--Occasional measurements, July 1973 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 9.67 ft above mean sea level, Mar. 11, 1979; lowest measured, 5.80 ft above mean sea level, Mar. 12, 1986.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 17	8.99	MAR 3	6.98	APR 28	6.30	JUN 9	6.18	JUL 13	6.54	SEP 15	6.78
JAN 13	7.64										

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 266 ft, casing diameter 10 in., cased to 246 ft, screened from 246 to 266 ft.

DATUM.--Elevation of land-aurface datum is 244 ft. Measuring point: Hole in pumpbase, 246.47 ft above mean sea level.

REMARKS.--Water from this well is used for irrigation.

PERIOD OF RECORD.--
WATER LEVEL: Occasional measurements, April 1970, March 1973 to current year.
WATER QUALITY: 1970, 1973 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level meaaured, 4.50 ft above mean sea level, Sept. 26, 1984; lowest measured, 1.40 ft, above mean sea level, June 22, 1973, June 3, 1974.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 11	a4.23	JAN 14	a4.27	MAR 12	a3.82	MAY 1	a3.76	JUN 16	a3.99	JUL 31	a4.08

a Well being pumped.

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	TEMPERATURE WATER (DEG C)	CHLORIDE, DISSOLVED (MG/L AS CL)	DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	TEMPERATURE WATER (DEG C)	CHLORIDE, DISSOLVED (MG/L AS CL)
NOV, 1986					MAY, 1987				
19...	1320	1750	26.0	460	01...	1105	1750	26.0	470
JAN, 1987					JUN				
14...	1125	1750	26.0	470	16...	1115	1750	26.0	470
MAR					JUL				
12...	1020	1750	26.0	470	31...	0950	1750	26.0	480

HAWAII, ISLAND OF HAWAII--Continued

200132155471001. Local number, 8-6147-01.

LOCATION.--Lat 20°01'32", long 155°47'10", Hydrologic Unit 20010000, on Highway 28, 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 1963-84 are available in files of district office.

PERIOD OF RECORD.--Occasional measurements, June to July 1983, June 1973 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 6.23 ft above mean sea level, May 1, 1987, lowest measured, 4.82 ft above mean sea level Sept. 20, 1976.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 18	6.11	JAN 14	6.14	MAR 12	5.84	MAY 1	6.23	JUN 16	5.76	JUL 20	5.78

HAWAII, ISLAND OF HAWAII--Continued

201603155521801. Local number, 8-7652-01.

LOCATION.--Lat 20°16'03", long 155°52'18", Hydrologic Unit 20010000, 0.3 mi west of Upolu Point Airfield, 3.1 mi northwest of Hawi, and 1.9 mi west of Hoea Camp. Owner: Kohala Corporation.

AQUIFER.--Pololu Volcanic Series, Pleistocene age.

WELL CHARACTERISTICS.--Dug basal water-table well, with horizontal infiltration tunnels from pump sump.

DATUM.--Elevation of land-surface datum is 33 ft. Measuring point: Top of 4-inch steel I-beam placed across sump, 7.75 ft above mean sea level.

PERIOD OF RECORD.--
WATER LEVEL: Occasional measurements, March 1973 to current year.
WATER QUALITY: 1973 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 3.09 ft above mean sea level, Aug. 22, 1974; lowest measured, 1.45 ft above mean sea level, July 9, 1975, Jan. 16, 1980.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 16	2.90	JAN 28	2.45	MAR 25	2.31	MAY 5	2.18	JUN 18	2.27	JUL 24	1.87

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	TEMPERATURE WATER (DEG C)	CHLORIDE, DISSOLVED (MG/L AS CL)	DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	TEMPERATURE WATER (DEG C)	CHLORIDE, DISSOLVED (MG/L AS CL)
NOV, 1986					MAY, 1987				
18...	0950	2400	22.0	640	05...	1205	2300	21.5	620
JAN, 1987					JUN				
28...	1155	2250	21.5	610	18...	0930	2300	21.5	620
MAR					JUL				
25...	1005	2300	21.5	620	24...	1120	2300	22.0	630

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

STATION NUMBER	LOCAL IDENT-I-FIER	LAT-I-TUDE	LONG-I-TUDE	DATE	TIME	SPE-CIFIC CON-DUCT-ANCE (US/CM)	TEMPER-ATURE WATER (DEG C)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)
			HAWAII, ISLAND OF KAUAI					
220018159444702	2-0044-13 W34 KEKAHA	22 00 18 N	159 44 47 W	10-17-86	1000	550	24.0	94
				12-10-86	1320	490	24.0	89
				01-27-87	1020	500	24.0	90
				03-04-87	1120	560	21.0	91
				04-08-87	0850	500	22.5	87
				06-02-87	1310	530	24.0	92
				07-15-87	1320	520	24.0	98
				08-19-87	1310	470	24.0	62
220016159442701	2-0044-15 S14 KEKAHA	22 00 16 N	159 44 27 W	10-15-86	0935	4000	24.5	1200
				12-10-86	0940	2400	24.0	680
				01-26-87	1005	2000	24.0	480
				03-02-87	0930	1200	24.0	260
				04-06-87	0930	3800	24.0	1200
				06-01-87	0925	3800	25.0	1100
				07-13-87	0930	5000	24.5	1400
				08-17-87	0930	4400	25.0	1400
220136159205501	2-0120-01 W7 WAILUA	22 01 36 N	159 20 55 W	02-26-87	1330	900	25.5	150
				07-14-87	1345	850	25.5	160
				08-20-87	0950	850	26.0	150
220134159205401	2-0120-02 W8 WAILUA	22 01 34 N	159 20 54 W	10-07-86	0915	--	25.0	120
				12-08-86	1400	780	25.0	130
				01-14-87	1430	700	25.0	130
				04-08-87	0730	740	25.0	110
				05-19-87	1005	790	26.0	110
220148159453501	2-0145-10 W45F MANA	22 01 48 N	159 45 35 W	10-15-86	0940	1050	24.5	230
				12-10-86	0955	980	24.0	230
				04-08-87	0930	995	24.0	210
				06-01-87	0935	820	25.5	180
				07-13-87	0940	1100	25.0	280
				08-17-87	0950	860	25.0	200
220341159453901	2-0345-04 S16 SAKIMA	22 03 41 N	159 45 39 W	10-15-86	1020	1100	24.5	220
				12-10-86	1050	1000	24.0	230
				01-28-87	1115	1350	24.0	300
				03-02-87	1035	730	24.0	150
				04-06-87	1115	1720	24.0	420
				06-01-87	1120	1180	25.0	240
				07-13-87	1120	1100	24.5	260
				08-17-87	1125	1100	25.0	240
220530159450401	2-0545-01 W59 KAULAU	22 05 30 N	159 45 07 W	10-15-86	1055	830	24.5	140
				12-10-86	1120	975	24.0	230
				01-26-87	1150	820	24.0	150
				03-02-87	1100	780	24.0	150
				04-06-87	1100	650	24.0	140
				06-01-87	1110	760	24.5	90
				07-13-87	1115	560	24.5	92
				08-17-87	1145	540	24.5	91
220827159185401	2-0818-01 W90A ANAHO	22 08 27 N	159 18 54 W	04-06-87	1050	220	24.0	20
				05-19-87	1100	240	24.0	20
				08-20-87	1100	280	24.0	22
220826159185401	2-0818-02 W90B ANAHO	22 08 26 N	159 18 54 W	10-07-86	1050	226	24.0	20
				12-09-88	1050	350	24.0	25
				01-13-87	1110	220	23.5	20
				02-24-87	1115	395	24.0	26
				07-10-87	1110	240	24.0	20

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

STATION NUMBER	LOCAL IDENT-I-FIER	LAT-I-TUDE	LONG-I-TUDE	DATE	TIME	SPE-CIFIC CON-DUCT-ANCE (US/CM)	TEMPER-ATURE WATER (DEG C)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)
			HAWAII, ISLAND OF KAUAI--Continued					
21038159203801	2-1020-03 W78 MOLOAA	22 10 38 N	159 20 38 W	10-07-86	1135	228	24.0	20
				12-09-86	1105	340	23.5	24
				01-13-87	1135	360	23.5	44
				02-24-87	1145	210	23.5	20
				04-07-87	1145	220	24.0	26
				05-19-87	1130	235	24.0	20
				07-10-87	1130	220	23.5	18
				08-20-87	1145	220	23.5	34
221141159252501	2-1125-01 N1 KILAUEA	22 11 41 N	159 25 25 W	10-07-86	1140	172	24.5	18
				12-09-86	1140	180	24.0	16
				04-07-87	1210	180	24.0	16
				05-19-87	1200	170	24.5	15
				07-10-87	1200	190	24.0	16
				08-20-87	1200	170	24.0	16
221141159252502	2-1125-02 N2 KILAUEA	22 11 41 N	159 25 25 W	01-13-87	1235	150	24.0	15
				02-24-87	1220	160	24.0	15
221150159264501	2-1126-01 KALIHIWAI	22 11 50 N	159 26 45 W	12-05-86	0825	180	22.5	17
				01-09-87	0850	180	22.5	17
				03-03-87	0840	180	22.5	17
				04-03-87	0825	190	23.5	18
				05-20-87	0825	190	23.5	17
				07-08-87	0850	190	23.5	17
221151159265001	2-1126-02 KALIHIWAI	22 11 51 N	159 26 50 W	10-14-86	0910	170	24.5	16
				08-27-87	0840	165	24.5	16
221201159293401	2-1229-03 W73 HANALE	22 12 01 N	159 29 34 W	10-07-86	1215	200	24.0	21
				12-09-86	1220	280	24.0	18
				01-13-87	1300	220	23.5	20
				03-03-87	1325	220	23.5	26
				04-03-87	1330	230	23.5	27
				05-20-87	1325	230	23.5	26
				07-10-87	1245	220	24.0	18
				08-27-87	0920	228	25.0	36
221247159324801	2-1232-01 W87 WAINIH	22 12 47 N	159 32 48 W	10-07-86	1350	220	24.0	20
				01-13-87	1330	140	23.5	14
				02-24-87	1350	140	23.5	20
				04-07-87	1345	170	23.5	16
				05-19-87	1330	170	24.0	18
				07-10-87	1330	190	24.0	20
				08-20-87	1330	170	24.0	19
221318159335901	2-1333-01 W68 HAENA	22 13 18 N	159 33 59 W	10-07-88	1430	170	24.0	19
				12-09-88	1400	180	23.5	15
				01-13-87	1425	160	23.5	14
				02-24-87	1420	210	23.5	21
				04-07-87	1330	220	23.5	26
				05-19-87	1415	190	24.0	20
				07-10-87	1400	225	24.0	18
				08-20-87	1415	218	24.0	34
215454159274201	2-5427-01 W16A KOLOA	21 54 54 N	159 27 42 W	10-24-86	1115	233	24.0	24
				12-11-86	0805	230	24.0	26
				01-15-87	0810	220	23.5	25
				02-19-87	0750	230	22.5	26
				04-09-87	0730	239	23.0	27
				05-21-87	0745	225	23.0	25
				07-15-87	0815	220	23.5	25
				08-19-87	0820	240	24.0	26

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

STATION NUMBER	LOCAL IDENT-I-FIER	LAT-I-TUDE	LONG-I-TUDE	DATE	TIME	SPE-CIFIC CON-DUCT-ANCE (US/CM)	TEMPER-ATURE WATER (DEG C)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)
		HAWAII, ISLAND OF KAUAI--Continued						
215536159263501	2-5526-01 KOLOA	21 55 36 N	159 26 35 W	12-16-86	0940	220	23.5	25
				01-27-87	0830	210	24.0	22
				04-08-87	1020	190	24.0	18
				05-15-87	1430	230	23.5	22
215528159303001	2-5530-02 W23 LAWAI	21 55 28 N	159 30 30 W	10-23-86	1010	240	24.0	25
				12-11-86	1010	250	23.5	28
				01-15-87	1000	220	23.5	25
				02-19-87	1005	230	23.5	25
				04-09-87	0845	130	23.0	15
				05-21-87	1010	230	23.5	25
				07-09-87	1030	250	23.5	28
				08-19-87	0830	270	24.5	28
215535159302601	2-5530-03 W22 LAWAI	21 55 35 N	159 30 26 W	10-23-86	1020	230	24.0	28
				12-11-86	1020	220	23.5	26
				01-27-87	0945	220	23.5	22
				02-19-87	1000	252	22.5	29
				05-21-87	1000	220	23.5	24
				07-09-87	1020	220	23.5	26
				08-19-87	0840	245	24.0	25
215522159342601	2-5534-03 W25-1 HANA	21 55 22 N	159 34 26 W	10-23-86	1050	500	23.5	44
				12-11-86	1050	280	24.0	30
				01-15-87	1100	260	23.5	30
				02-19-87	1030	265	23.5	30
				04-09-87	1010	240	24.0	30
				05-21-87	1100	260	24.0	29
				07-15-87	1020	270	24.0	32
215635159355001	2-5835-01 S7 HANAPEP	21 56 35 N	159 35 50 W	10-16-86	0845	700	24.0	140
				12-16-86	0910	700	23.5	140
				01-12-87	0905	690	23.5	150
				02-19-87	1115	750	23.0	150
				04-01-87	1145	750	23.0	140
				05-16-87	1145	850	23.0	140
				07-09-87	0900	790	23.0	140
				08-19-87	1010	660	23.5	140
215803159401201	2-5840-01 W26 WAIMEA	21 58 03 N	159 40 12 W	10-23-86	1250	710	24.0	--
				12-11-86	1250	780	24.0	--
				01-15-87	1300	700	24.0	--
				02-19-87	1405	670	24.0	--
				04-09-87	1140	650	24.5	--
				05-21-87	1250	690	24.5	--
				07-15-87	1215	705	24.5	--
				08-19-87	1210	695	24.0	--
215854159424601	2-5842-02 S11 KEKAHA	21 58 54 N	159 42 46 W	10-15-86	1255	780	24.5	140
				12-10-86	1310	760	24.0	140
				01-26-87	1335	770	24.0	140
				03-02-87	0845	650	24.0	95
				04-06-87	1325	640	24.0	140
				06-01-87	1310	510	25.0	88
				07-13-87	1310	550	24.5	90
				08-17-87	1315	550	25.0	92

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

STATION NUMBER	LOCAL IDENT-I-FIER	LAT-I-TUDE	LONG-I-TUDE	DATE	TIME	SPE-CIFIC CON-DUCT-ANCE (US/CM)	TEMPER-ATURE WATER (DEG C)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)
			HAWAII, ISLAND OF KAUAI--Continued					
215643159422901	2-5842-03 S10 KEKAHA	21 58 43 N	159 42 29 W	10-15-86	1310	1100	24.5	220
				12-10-86	1330	1050	24.0	230
				01-26-87	1400	1230	24.0	240
				03-02-87	0825	825	24.0	160
				04-06-87	1320	991	24.0	210
				06-01-87	1330	830	25.0	180
				07-13-87	1330	1100	24.5	250
				08-17-87	1340	1700	25.0	430
215901159235301	2-5923-01 KILOHANA A	21 59 01 N	159 23 53 W	10-07-86	0805	170	24.0	19
				12-09-88	0805	280	23.5	18
				01-13-87	0830	260	23.5	18
				02-24-87	0800	200	23.5	22
				04-07-87	0745	180	23.5	21
				05-19-87	0730	170	23.5	18
				07-10-87	0730	220	23.5	18
				08-20-87	0850	220	24.0	34
215901159235201	2-5923-07 KILOHANA I	21 59 01 N	159 23 52 W	10-07-86	0825	190	24.0	20
				12-09-86	0820	180	23.5	19
				01-13-87	0845	200	23.5	22
				02-24-87	0905	190	23.5	20
				04-07-87	0715	180	23.5	20
				05-19-87	0750	190	23.5	19
				07-10-87	0750	190	23.5	20
				08-20-87	0800	170	24.0	21
215906159395601	2-5939-01 S9 WAIMEA	21 59 06 N	159 39 56 W	10-23-86	1215	730	23.5	180
				12-11-86	1220	740	23.5	140
				01-15-87	1225	700	23.5	150
				02-19-87	1435	900	23.5	200
				04-09-87	1100	1050	24.5	240
				05-21-87	1310	1000	24.0	240
				07-15-87	1300	1100	24.5	280
				08-19-87	1300	880	24.5	200
215937159434201	2-5943-01 S13 KEKAHA	21 59 37 N	159 43 42 W	10-15-86	1125	1300	24.5	240
				12-10-86	1130	1000	24.0	230
				01-26-87	1230	1250	24.0	240
				03-02-87	0915	1050	24.0	240
				04-06-87	1235	1050	24.0	240
				06-01-87	1240	1230	24.5	240
				07-13-87	1230	1200	24.5	250
				08-17-87	1235	1100	25.0	250

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

STATION NUMBER	LOCAL IDENT-I-FIER	LAT-I-TUDE	LONG-I-TUDE	DATE	TIME	SPE-CIFIC CON-DUCT-ANCE (US/CM)	TEMPER-ATURE WATER (DEG C)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)
		HAWAII, ISLAND OF OAHU						
211646157465201	3-1646-01 W1-B WAIAL	21 16 46 N	157 46 52 W	11-20-86	1325	750	21.0	--
				01-27-87	1345	720	21.0	--
				03-02-87	0840	890	21.0	--
				05-06-87	0940	800	21.0	--
				07-01-87	0850	910	21.0	--
				08-10-87	1125	1000	21.0	--
211832157515501	3-1851-19 W102 TUBEA	21 18 32 N	157 51 55 W	10-17-86	1610	28000	23.5	10000
				12-02-86	0800	28000	23.0	10000
				01-28-87	0730	28000	23.0	10000
				03-04-87	0720	29000	23.0	11000
				05-06-87	0825	29000	23.0	11000
				07-01-87	0705	29000	23.0	11000
				08-11-87	1500	30000	23.0	11000
211832157515502	3-1851-19 W102 TUBEB	21 18 32 N	157 51 55 W	10-17-86	1620	5600	23.0	--
				12-02-86	0810	5850	23.0	--
				01-28-87	0720	5800	23.0	--
				03-04-87	0730	5850	23.0	--
				05-06-87	0815	6050	23.0	--
				07-01-87	0715	8300	23.0	--
				08-11-87	1450	6500	23.0	--
212038157422501	3-2042-13 W420-1A WA	21 20 02 N	157 42 06 W	07-08-87	1110	14000	25.5	4400
212133158035501	3-2103-03 S14 MAKAKI	21 21 33 N	158 03 55 W	10-17-86	0825	1120	23.0	240
				11-21-86	0840	1120	23.0	250
				01-16-87	0830	1120	23.0	240
				03-10-87	0930	1120	23.0	240
				05-05-87	0820	1120	23.0	240
				06-30-87	0845	1130	23.0	250
				08-11-87	0815	1120	23.0	240
				09-30-87	0815	1120	23.0	250
212106157533701	3-2153-02 W153 MOANA	21 21 06 N	157 53 37 W	10-16-86	1440	400	21.5	73
				11-18-86	1530	400	21.5	76
				01-28-87	1450	400	21.5	77
				03-10-87	1450	410	21.5	78
				05-05-87	1400	420	21.5	79
				06-03-87	1420	420	21.5	79
				08-07-87	1435	420	21.5	79
212259157554201	3-2255-35 W189-3A	21 22 59 N	157 55 42 W	12-01-86	0940	1070	21.5	--
				03-03-87	1430	1090	21.5	--
				08-07-87	1400	1100	21.5	--
212238157561102	3-2258-12 W187-C	21 22 39 N	157 56 09 W	10-17-86	1430	790	24.0	200
				11-19-86	1445	740	24.5	200
				01-15-87	0900	780	22.5	200
				03-03-87	1450	750	22.5	200
				04-30-87	1045	795	23.0	200
				06-30-87	1350	800	24.5	200
				08-07-87	1410	800	25.0	200
212300158004801	3-2300-06 W253 WAIPH	21 23 00 N	158 00 48 W	01-28-87	1340	580	21.5	--
				03-10-87	1125	850	21.0	--

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

STATION NUMBER	LOCAL IDENT-I-FIER	LAT-I-TUDE	LONG-I-TUDE	DATE	TIME	SPE-CIFIC CON-DUCT-ANCE (US/CM)	TEMPER-ATURE WATER (DEG C)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)
			HAWAII, ISLAND OF OAHU--Continued					
212343158001001	3-2300-11 W238 WAIPH	21 23 43 N	158 00 10 W	10-17-86	1120	900	22.0	--
				12-01-86	1330	900	22.0	--
				01-28-87	1430	890	22.0	--
				03-10-87	1430	890	22.0	--
				05-05-87	1050	900	22.0	--
				06-30-87	1335	900	22.0	--
				08-07-87	1125	920	22.0	--
				09-30-87	1100	920	22.0	--
212332157582201	3-2358-02 W201	21 23 32 N	157 58 22 W	10-17-86	1235	7300	20.0	--
212342157584301	3-2358-22 W204-4	21 23 42 N	157 58 43 W	10-17-86	1135	950	20.0	--
				12-01-88	1030	1040	20.0	--
				01-30-87	0950	1190	20.0	--
				03-10-87	1230	1200	20.0	--
				05-05-87	1105	1100	20.0	--
				07-01-87	1205	1100	20.0	--
				08-07-87	1135	1020	20.0	--
				09-30-87	1110	1000	20.0	--
212343157584701	3-2358-29 W204-9	21 23 43 N	157 58 47 W	10-17-86	1130	1120	20.0	--
				12-01-86	1035	1300	20.0	--
				01-30-87	1000	2000	20.0	--
				03-10-87	1235	2200	20.0	--
				05-05-87	1100	1600	20.0	--
				07-01-87	1210	1400	20.0	--
				08-07-87	1140	1250	20.0	--
				09-30-87	1115	1200	20.0	--
212336157591801	3-2359-05 W204-11	21 23 36 N	157 59 18 W	10-17-86	1145	2200	22.0	--
				12-01-86	1050	2300	22.0	--
				01-30-87	1010	2550	22.0	--
				03-10-87	1245	2600	22.0	--
				05-05-87	1115	2500	22.0	--
				07-01-87	1225	2450	22.0	--
				08-07-87	1150	2300	22.0	--
				09-30-87	1125	2270	22.0	--
212422157485601	3-2448-01 W416	21 24 22 N	157 48 58 W	07-14-87	0835	180	21.0	20
212556157500301	3-2550-01 W407-16	21 25 58 N	157 50 03 W	05-21-87	1100	135	23.5	18
				07-14-87	0810	130	23.5	18
				09-15-87	1030	135	23.5	--
212617158033801	3-2603-01 W330-8	21 26 17 N	158 03 38 W	11-21-86	1025	355	22.0	49
				03-10-87	1015	355	22.0	51
				06-30-87	1000	350	22.0	49
				09-30-87	1015	355	22.0	48
212656158071801	3-2807-01 W277-97	21 26 56 N	158 07 18 W	02-09-87	1345	355	24.5	--
				04-14-87	0850	370	24.5	--
				06-04-87	1035	380	25.0	--
				07-30-87	0905	355	24.5	--
212803158000701	3-2800-01 W250-4A	21 28 03 N	158 00 06 W	04-09-87	1600	155	22.0	18
				08-24-87	1000	155	21.5	18
				07-31-87	1500	180	22.0	18

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

STATION NUMBER	LOCAL IDENT-I-FIER	LAT-I-TUDE	LONG-I-TUDE	DATE	TIME	SPE-CIFIC CON-DUCT-ANCE (US/CM)	TEMPER-ATURE WATER (DEG C)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)
HAWAII, ISLAND OF OAHU--Continued								
212813156080201	3-2808-01 W277-92	21 28 13 N	158 08 04 W	10-29-86	1130	1200	26.5	160
				12-18-86	1055	1250	27.0	160
				02-09-87	1415	1280	26.5	160
				04-10-87	1400	1230	26.5	150
				06-04-87	1130	1260	26.5	150
212828158092001	3-2809-06 TU WAIANAE	21 28 27 N	158 09 20 W	10-29-86	1340	370	23.0	--
				02-05-87	0925	350	23.0	--
				05-29-87	1000	360	23.0	--
				07-21-87	1045	355	23.0	--
				09-29-87	1040	360	23.0	--
212859158124301	3-2812-01 S1	21 28 59 N	158 12 43 W	10-29-86	1430	650	25.5	--
				12-17-88	1100	630	25.5	--
				04-10-87	1145	700	25.5	--
				05-29-87	1145	600	25.5	--
				07-21-87	1250	660	25.5	--
				09-30-87	1215	635	25.5	--
212945158014301	3-2901-09 W330-6	21 29 45 N	158 01 43 W	12-29-86	1745	185	22.0	20
				04-09-87	1630	190	22.0	22
				07-29-87	1635	190	22.0	21
212939158112301	3-2911-02 TU MAKAHA	21 29 39 N	158 11 23 W	10-27-86	1430	245	21.5	26
				02-05-87	1450	245	21.5	26
				05-29-87	1520	250	22.0	26
				07-21-87	1500	250	21.5	26
213224158135901	3-3213-06 W277-101	21 32 24 N	158 13 59 W	10-28-86	1000	820	23.5	200
				12-17-86	0940	810	24.0	210
				02-09-87	1240	850	23.5	210
				04-10-87	1115	850	23.5	200
				05-29-87	1050	845	24.0	200
				07-21-87	1215	850	24.0	200
				09-30-87	1120	830	24.0	200
213243157510001	3-3251-01 W406	21 32 43 N	157 51 00 W	10-21-86	1245	900	22.5	230
				12-01-86	1410	900	22.5	240
				01-15-87	1500	950	22.5	230
				05-20-87	1345	850	22.5	220
				07-13-87	1510	840	22.5	230
				09-14-87	1520	820	22.5	--
213429158055501	3-3405-01 W323-1	21 34 29 N	158 05 55 W	02-03-87	1530	480	23.0	--
				05-26-87	1615	570	22.5	--
213427158055501	3-3405-02 W323-2	21 34 27 N	158 05 55 W	12-29-86	1655	560	22.5	--
				04-13-87	1630	605	22.5	--
213411158074501	3-3407-25 W320	21 34 11 N	158 07 45 W	10-31-86	0915	2400	23.0	--
				12-29-86	1000	2200	23.0	--
				02-11-87	0910	2130	23.0	--
				04-14-87	0925	2300	22.5	--
				06-03-87	1535	2350	22.5	--
213444158075501	3-3407-30 W318-2	21 34 44 N	158 07 55 W	10-30-86	1400	8250	25.0	2200
				04-14-87	1010	7700	24.5	2300
				06-03-87	1300	7000	25.0	2200
				07-29-87	1420	7000	25.0	2000
213512158061601	3-3506-03,04 W329 A,B	21 35 12 N	158 06 16 W	10-31-88	0935	550	22.5	--
				04-13-87	1000	550	22.0	--
				05-28-87	1155	555	22.5	--

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

STATION NUMBER	LOCAL IDENT-I-FIER	LAT-I-TUDE	LONG-I-TUDE	DATE	TIME	SPE-CIFIC CON-DUCT-ANCE (US/CM)	TEMPER-ATURE WATER (DEG C)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)
HAWAII, ISLAND OF OAHU--Continued								
213636158053701	3-3605-03 W334-C	21 36 36 N	158 05 37 W	10-31-86	1140	2500	21.5	--
				12-10-86	1000	2000	21.5	--
				01-29-87	0920	1750	22.0	--
				04-13-87	1150	2050	21.5	--
				07-23-87	0850	1750	21.5	--
				09-29-87	1530	2500	22.0	--
213636158053702	3-3605-21 W334-U	21 36 35 N	158 05 40 W	10-31-86	1155	1320	21.5	--
				12-10-86	1025	1600	21.5	--
				01-29-87	0940	1500	22.0	--
				04-13-87	1210	1580	21.5	--
				07-23-87	0910	1600	21.5	--
				09-29-87	1600	1610	21.5	--
213656157550401	3-3655-01 W394	21 36 56 N	157 55 04 W	10-21-86	1100	230	21.5	34
				12-01-86	0930	230	21.0	35
				01-15-87	1400	230	21.0	36
				05-19-87	1415	230	21.0	36
				07-10-87	1520	230	21.5	35
213902157561601	3-3956-04 W366	21 39 02 N	157 56 16 W	10-21-86	1100	650	21.0	--
				11-26-86	1410	650	21.0	--
				03-09-87	1230	650	21.0	--
				07-10-87	1500	660	21.0	--
214157158000101	3-4100-01 W338	21 41 57 N	158 00 01 W	05-19-87	1110	310	21.0	56
214131158011601	3-4101-08 W337-6	21 41 31 N	158 01 16 W	01-15-87	1140	230	20.5	35
				07-10-87	1400	210	21.0	34
214233157583501	3-4258-04 W345	21 42 33 N	157 58 35 W	10-21-86	0940	1900	23.0	500
				11-26-86	1015	1900	23.0	510
				01-15-87	0945	1900	23.0	520
				05-19-87	1000	1820	23.0	520
				08-25-87	1130	1800	23.0	--
HAWAII, ISLAND OF MOLOKAI								
210856157011201	4-0801-01 W16	21 08 56 N	157 01 12 W	07-18-87	j1425	324	--	66
210857156010701	4-0801-02	21 08 57 N	157 01 07 W	10-28-86	j1300	338	--	70
				12-16-86	j0955	331	--	68
				02-02-87	j0838	340	--	72
				03-19-87	j0830	333	--	70
				04-28-87	j0800	332	--	69
				06-09-87	j0815	333	--	69
				08-25-87	j0815	335	--	69
210903157013001	4-0901-01 W17	21 09 03 N	157 01 30 W	10-29-86	j0830	269	--	50
				12-15-86	j0900	215	--	36
				02-02-87	j0930	277	--	54
				03-18-87	j0845	377	--	54
				04-29-87	j0830	282	--	53
				06-09-87	j0830	290	--	56
				07-20-87	j1330	216	--	36
				08-26-87	j0840	236	--	42

j Collected by non-USGS agency

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

STATION NUMBER	LOCAL IDENT-I-FIER	LAT-I-TUDE	LONG-I-TUDE	DATE	TIME	SPE-CIFIC CON-DUCT-ANCE (US/CM)	TEMPER-ATURE WATER (DEG C)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)
HAWAII, ISLAND OF MAUI								
203835156085001	6-3808-01 PUNAHOU SP	20 38 35 N	156 06 50 W	01-07-87	1405	800	20.5	220
				02-19-87	1435	880	21.0	180
				05-13-87	0910	720	19.5	190
				07-01-87	1005	730	21.0	190
				08-19-87	0940	870	21.0	220
203947156281201	6-3926-03 WAILEA 8	20 39 47 N	156 26 13 W	10-09-86	1030	2900	18.5	850
				01-14-87	1250	3600	--	1000
				04-09-87	0835	3200	18.5	960
				07-14-87	1415	3500	19.0	1000
204601156001501	6-4600-01 W55	20 46 01 N	156 00 15 W	10-07-86	1645	580	21.5	110
				11-19-86	0715	550	--	100
				01-06-87	1550	530	22.0	92
				02-18-87	1740	550	21.5	99
				03-31-87	1345	570	21.5	100
				05-12-87	1450	550	21.5	100
				07-01-87	0645	530	22.0	88
				08-16-87	1520	540	21.5	88
204638156002601	6-4600-02 WAKIU A	20 46 36 N	156 00 26 W	10-08-86	0935	610	19.0	140
204633156003201	6-4600-03 WAKIU B	20 46 36 N	156 00 30 W	10-08-86	0930	420	19.5	100
				11-19-86	0645	390	19.0	97
				01-06-87	1620	210	19.5	40
				02-19-87	0740	230	19.5	46
				03-31-87	1450	280	19.0	61
				05-12-87	1615	430	19.0	100
				07-01-87	0730	150	20.0	26
				08-19-87	0645	160	19.0	24
204635156270101	6-4627-14 W226	20 46 35 N	156 27 01 W	10-09-86	1200	1800	24.0	340
				01-14-87	1430	1500	23.5	350
				04-09-87	1120	1460	23.5	350
				07-14-87	1100	1800	23.5	360
204845156255001	6-4825-01	20 48 45 N	156 25 50 W	10-14-86	1030	1550	24.5	--
				02-11-87	1150	1220	23.0	--
				03-24-87	1015	1300	23.5	--
				04-10-87	1030	1340	24.0	--
				08-28-87	1115	1550	23.5	--
204931156371201	6-4937-01 S10	20 49 31 N	156 37 12 W	10-08-86	1005	2040	24.0	500
				03-12-87	1310	840	24.5	160
				06-13-87	1310	1400	24.5	320
205014156212701	6-5021-01 PUKALANI	20 50 14 N	156 21 27 W	10-13-86	0845	1700	--	440
				04-07-87	1345	1900	21.5	560
				05-21-87	1430	2000	--	560
				07-08-87	1315	2000	21.0	560
				08-20-87	1300	1900	--	550
205243156243201	6-5224-02 S22	20 52 43 N	156 24 32 W	10-14-86	1325	1500	24.0	300
				02-11-87	1040	1240	23.0	240
				03-24-87	1055	1400	23.0	300
				04-10-87	1140	1380	23.0	280
				08-28-87	0830	1440	23.0	300
205329156305502	6-5330-09 W15A	20 53 29 N	156 30 55 W	10-08-86	1305	780	22.5	--
				08-28-87	1330	560	22.0	--

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

STATION NUMBER	LOCAL IDENT-I-FIER	LAT-I-TUDE	LONG-I-TUDE	DATE	TIME	SPE-CIFIC CON-DUCT-ANCE (US/CM)	TEMPER-ATURE WATER (DEG C)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)
HAWAII, ISLAND OF MAUI--Continued								
205330156305401	6-5330-11 W15F	20 53 30 N	156 30 54 W	10-08-86	1315	650	22.5	--
				11-21-86	1345	630	22.5	--
				01-13-87	0905	640	22.5	--
				02-25-87	1255	620	22.5	--
				04-13-87	0830	630	22.5	--
				05-20-87	1335	580	23.0	--
				07-02-87	1130	590	23.0	--
				08-28-87	1335	580	22.0	--
205322156394501	6-5339-01 W291	20 53 22 N	156 39 45 W	02-23-87	1135	880	21.5	--
205320156394501	6-5339-02 W292	20 53 20 N	156 39 45 W	02-23-87	1125	790	21.0	--
				04-09-87	0930	760	21.0	--
205343156401101	8-5340-01 S5	20 53 43 N	156 40 11 W	10-03-86	1030	1580	24.0	--
				01-08-87	1025	1260	22.5	--
				02-23-87	1200	1240	22.0	--
				04-07-87	1140	1750	22.0	--
				07-01-87	1120	1020	22.0	--
				08-13-87	1045	1150	23.0	--
205416156244301	6-5424-01 S24	20 54 16 N	156 24 43 W	08-28-87	1000	2200	24.5	--
205511156222101	6-5522-01 S31	20 55 11 N	156 22 21 W	10-14-86	1340	1400	23.0	290
				08-28-87	0935	1150	22.0	270
205837156384601	8-5838-01 NAPILI A	20 58 37 N	156 38 46 W	10-03-88	1240	740	20.5	180
				01-08-87	1355	780	21.0	190
				02-23-87	1340	770	20.5	180
				04-07-87	1330	730	20.5	190
				05-13-87	1050	770	21.0	190
				07-01-87	1350	750	20.5	190
				08-12-87	1425	750	21.0	180
205838156383101	6-5838-02 NAPILI B	20 58 38 N	156 38 31 W	01-08-87	1410	320	--	62
				07-01-87	1405	330	--	53
205848156383601	8-5838-04 NAPILI	20 58 48 N	156 38 36 W	10-03-86	1300	950	20.0	240
				11-20-86	1315	890	20.5	220
				01-08-87	1430	830	20.5	210
				04-07-87	1355	760	20.0	200
				05-13-87	1115	780	20.5	190
				07-01-87	1420	750	20.0	190

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

STATION NUMBER	LOCAL IDENT-I-FIER	LAT-I-TUDE	LONG-I-TUDE	DATE	TIME	SPE-CIFIC CON-DUCT-ANCE (US/CM)	TEMPER-ATURE WATER (DEG C)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)
		HAWAII, ISLAND OF HAWAII						
190347155354301	8-0335-01	19 03 47 N	155 35 43 W	04-24-87	1115	142	19.0	10
				08-10-87	1030	135	19.0	10
				09-28-87	1520	155	19.0	10
190832155310901	8-0831-02	19 08 32 N	155 31 09 W	12-02-86	1010	720	18.5	180
				01-26-87	1030	720	19.5	180
				03-27-87	0850	750	18.5	190
				06-10-87	1000	700	18.5	180
				07-27-87	1020	680	18.5	170
				09-28-87	1425	720	18.5	180
191108155281701	8-1128-02 PALIMA	19 11 08 N	155 28 17 W	01-26-87	0925	115	19.0	12
				08-10-87	0910	115	19.0	12
191114155294801	8-1129-01	19 11 14 N	155 29 48 W	03-04-87	1205	87	18.0	4.5
				04-24-87	0945	90	18.0	4.0
				06-10-87	0935	88	18.0	4.5
191219155291601	8-1229-01 PAHALA	19 12 25 N	155 29 22 W	01-26-87	0855	88	17.5	4.0
				03-04-87	1140	87	17.5	4.5
				04-24-87	0900	90	17.5	4.0
192108155021201	8-2102-01 W9-10	19 21 08 N	155 02 12 W	11-05-86	0900	700	26.0	--
				01-06-87	1100	1100	26.0	--
				03-02-87	0925	1150	25.5	--
				04-16-87	1015	1150	25.5	--
				08-01-87	1430	1150	26.5	--
				07-14-87	0935	1170	25.5	--
				09-18-87	0925	--	25.0	--
192646155532001	8-2653-01 KEEI C	19 26 46 N	155 53 20 W	10-14-88	1345	205	19.5	30
				12-02-86	1310	270	19.5	45
				01-26-87	1400	310	19.0	60
				03-05-87	1240	325	19.5	66
				04-30-87	1100	340	19.5	69
				06-10-87	1200	340	19.5	69
				07-27-87	1255	330	19.5	65
				09-28-87	1630	340	19.0	87
192738155534201	8-2753-01 W12-4	19 27 31 N	155 53 41 W	10-14-86	1315	780	19.5	190
				12-02-86	1340	690	19.5	170
				01-26-87	1435	680	19.5	170
				03-05-87	1200	640	19.5	160
				06-11-87	0805	650	19.5	160
				09-28-87	1710	670	19.5	160
192731155534101	8-2753-02 W12-8	19 27 22 N	155 53 38 W	04-30-87	1045	1050	19.0	280
192923154564701	8-2986-01 W9-5A	19 29 23 N	154 56 47 W	11-05-86	1200	115	23.0	6.0
				01-08-87	0815	112	23.0	7.0
192924154564701	8-2986-02 W9-5B	19 29 24 N	154 56 47 W	01-08-87	0835	112	21.5	7.0
				02-09-87	1235	118	22.0	7.5
				04-06-87	1325	120	23.0	7.0
				05-26-87	1400	120	23.0	7.5
				07-23-87	0835	118	23.0	6.5

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

STATION NUMBER	LOCAL IDENT-I-FIER	LAT-I-TUDE	LONG-I-TUDE	DATE	TIME	SPE-CIFIC CON-DUCT-ANCE (US/CM)	TEMPER-ATURE WATER (DEG C)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)
HAWAII, ISLAND OF HAWAII--Continued								
193113154555801	8-3185-01 W9-11	19 31 13 N	154 55 58 W	11-05-86	1315	130	21.0	18
				01-08-87	1230	125	21.0	18
				03-02-87	1300	130	21.0	18
				05-27-87	1015	130	21.0	17
				07-23-87	1030	125	21.0	16
193510155570801	8-3557-01 W12-5	19 35 10 N	155 57 08 W	03-05-87	1440	175	20.0	24
				04-30-87	0825	190	20.0	24
				06-11-87	0910	170	20.0	20
				07-28-87	1315	300	20.0	55
				09-29-87	0900	290	20.0	50
193508155570701	8-3557-03 KAHALUU C	19 35 08 N	155 57 07 W	12-03-86	1200	150	20.0	16
				01-27-87	1050	170	20.0	24
				03-05-87	1415	175	20.5	24
				04-30-87	0815	220	20.0	32
				06-11-87	0925	210	20.0	32
				09-29-87	0850	250	20.5	39
193505155570701	8-3557-04 KAHALUU D	19 35 05 N	155 57 07 W	10-15-86	0840	300	20.5	53
				12-03-86	1140	300	20.5	52
				01-27-87	1115	280	20.5	50
193659155571701	8-3657-01 N KONA	19 38 59 N	155 57 01 W	03-05-87	1040	420	20.5	88
193805155020201	8-3802-03 KEAAU 1	19 38 05 N	155 02 02 W	11-17-86	0815	82	19.0	5.0
				01-13-87	0830	80	19.0	5.0
				03-02-87	1420	82	19.0	5.0
				04-15-87	1320	82	19.0	5.0
				05-27-87	1115	82	19.0	5.0
				07-13-87	1055	82	19.0	4.0
194037155035301	8-4003-01 W8-1	19 40 37 N	155 03 53 W	11-17-86	0840	85	20.0	5.5
				03-03-87	1100	84	20.0	5.5
				04-27-87	1245	83	20.0	6.0
				05-27-87	1330	80	20.0	5.0
				07-13-87	1030	80	20.0	5.0
				09-22-87	0805	78	20.0	5.0
194040155035201	8-4003-02 PANAEWA 2	19 40 40 N	155 03 52 W	11-17-86	0850	82	20.0	5.0
				01-13-87	0750	82	20.0	5.0
				03-03-87	1055	84	20.0	5.5
				05-27-87	1325	80	20.0	5.0
				07-13-87	1025	80	20.0	5.0
				09-22-87	0800	80	20.0	5.5
194039155035601	8-4003-03 PANAEWA 3	19 40 32 N	155 03 54 W	11-17-86	0855	82	20.0	5.0
194222155034801	8-4203-06 W8-2B	19 42 22 N	155 03 48 W	11-17-86	0930	103	23.5	12
				01-13-87	0905	108	24.5	14
				03-03-87	1030	110	24.5	15
				04-28-87	0825	122	25.5	18
				06-09-87	1005	122	25.5	18
				07-13-87	1310	115	21.5	14
194337155041801	8-4304-01	19 43 37 N	155 04 18 W	10-09-86	1025	9610	22.0	3000
				12-05-86	1320	9500	22.5	3000
				01-13-87	0935	20000	22.0	7000
				03-03-87	1135	8300	21.0	2600
				04-28-87	0735	20500	20.5	7000
				06-08-87	1030	8870	22.0	2600
				07-13-87	1335	7900	22.0	2600

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

STATION NUMBER	LOCAL IDENT-I-FIER	LAT-I-TUDE	LONG-I-TUDE	DATE	TIME	SPE-CIFIC CON-DUCT-ANCE (US/CM)	TEMPER-ATURE WATER (DEG C)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)
HAWAII, ISLAND OF HAWAII--Continued								
194320155081701	8-4306-02 PIIHONUA 2	19 43 20 N	155 06 17 W	04-14-87	1010	95	17.0	3.5
194846155501801	8-4850-01 PUUANAHULU	19 48 58 N	155 50 12 W	05-29-87	0955	390	26.0	43
194818155582301	8-4858-02	19 48 18 N	155 58 23 W	10-14-88	0950	2300	20.5	450
				12-03-86	1400	2300	20.5	450
				01-27-87	1325	2300	20.5	470
				08-11-87	1425	2250	20.5	450
				09-29-87	1030	2200	20.5	440
195035155054501	8-5005-01 W7-1	19 50 35 N	155 05 45 W	11-17-86	1045	175	21.5	14
				01-13-87	1025	210	21.0	15
				03-03-87	0755	210	20.5	14
				04-28-87	1040	185	20.0	12
				07-14-87	1315	205	21.0	14
195043155053801	8-5005-02	19 50 43 N	155 05 38 W	11-17-88	1035	180	22.5	16
				01-13-87	1010	220	22.0	20
				03-03-87	0805	240	21.5	24
				04-28-87	1025	245	21.5	27
				08-09-87	1300	230	22.0	22
				07-14-87	1325	225	22.0	18
195051155051501	8-5005-05 SALT WTR 3	19 50 51 N	155 05 15 W	11-17-86	1015	16000	18.0	5800
				01-13-87	1040	18000	18.0	5500
				03-03-87	0820	16000	18.0	5500
				07-14-87	1340	12500	18.0	4000
195546155480301	8-5548-01 PARKER 1	19 55 48 N	155 48 03 W	06-18-87	1305	2200	28.5	600
				07-29-87	0835	2200	28.5	590
195724155455301	8-5745-01 PARKER 5	19 57 24 N	155 45 53 W	03-19-87	1035	280	28.5	28
				05-11-87	1200	280	27.0	26
				06-16-87	1405	280	26.5	28
				07-29-87	1015	280	27.0	26
195722155455201	8-5745-02 PARKER 4	19 57 22 N	155 45 52 W	11-19-86	0950	290	28.5	26
				01-28-87	0930	290	26.5	28
				05-11-87	1215	300	28.5	26
				06-16-87	1355	310	26.5	32
195929155462501	8-5946-01 LALAMILO A	19 59 30 N	155 46 30 W	11-19-86	1215	490	28.5	88
				01-14-87	1240	460	28.0	88
				06-18-87	1025	480	26.0	84
				07-20-87	1120	490	26.5	67
				09-29-87	1225	490	26.5	90
195912155464201	8-5946-02 LALAMILO B	19 59 14 N	155 48 39 W	08-16-87	1040	330	26.0	42
				07-20-87	1155	350	26.0	48
				09-29-87	1155	370	26.0	52
195939155464201	8-5946-03 LALAMILO C	19 59 34 N	155 46 45 W	11-19-88	1200	530	26.0	100
				01-14-87	1255	520	26.0	99
				03-12-87	1135	520	26.0	99
				05-01-87	1220	520	26.0	97

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

HAWAII, ISLAND OF KAUAI

215747159253401 - 2-5725-01 TU9 CNTY KIPU KAUAI

DATE	TIME	SPE-CIFIC CON-DUCT-ANCE (US/CM)	TEMPER-ATURE WATER (DEG C)	PH (STAND-ARD UNITS)	BENZENE TOTAL (UG/L)	BROMO-FORM TOTAL (UG/L)	CARBON-TETRA-CHLO-RIDE TOTAL (UG/L)	CHLORO-BENZENE TOTAL (UG/L)	CHLORO-DI-BROMO-METHANE TOTAL (UG/L)	CHLORO-ETHANE TOTAL (UG/L)
MAR										
10...	0800	200	21.0	7.50	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20

DATE	2-CHLORO-ETHYL-VINYL-ETHER TOTAL (UG/L)	CHLORO-FORM TOTAL (UG/L)	CIS 1,3-DI-CHLORO-PROPENE TOTAL (UG/L)	1,2-DIBROMO ETHYL-ENE TOTAL (UG/L)	1,2-DI-CHLORO-BENZENE TOTAL (UG/L)	1,3-DI-CHLORO-BENZENE TOTAL (UG/L)	1,4-DI-CHLORO-BENZENE TOTAL (UG/L)	DI-CHLORO-BROMO-METHANE TOTAL (UG/L)	DI-CHLORO-DI-FLUORO-METHANE TOTAL (UG/L)	1,1-DI-CHLORO-ETHANE TOTAL (UG/L)
MAR										
10...	<0.20	<0.20	<0.20	<0.2	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20

DATE	1,2-DI-CHLORO-ETHANE TOTAL (UG/L)	1,1-DI-CHLORO-ETHYL-ENE TOTAL (UG/L)	1,2-DI-CHLORO-PROPANE TOTAL (UG/L)	1,3-DI-CHLORO-PROPENE TOTAL (UG/L)	ETHYL-BENZENE TOTAL (UG/L)	METHYL-BROMIDE TOTAL (UG/L)	METHYL-CHLO-RIDE TOTAL (UG/L)	METHYL-ENE CHLO-RIDE TOTAL (UG/L)	STYRENE TOTAL (UG/L)	1,1,2,2 TETRA-CHLORO-ETHANE TOTAL (UG/L)
MAR										
10...	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<1.0	<0.2	<0.20

DATE	TETRA-CHLORO-ETHYL-ENE TOTAL (UG/L)	1,2-TRANSDI CHLORO-ETHENE TOTAL (UG/L)	TRANS-1,3-DI-CHLORO-PROPENE TOTAL (UG/L)	1,1,1-TRI-CHLORO-ETHANE TOTAL (UG/L)	1,1,2-TRI-CHLORO-ETHANE TOTAL (UG/L)	TRI-CHLORO-ETHYL-ENE TOTAL (UG/L)	TRI-CHLORO-FLUORO-METHANE TOTAL (UG/L)	TOLUENE TOTAL (UG/L)	VINYL CHLO-RIDE TOTAL (UG/L)
MAR									
10...	<0.20	<0.20	<0.20	<0.20	<0.20	<0.2	<0.20	<0.20	<0.20

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

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

HAWAII, ISLAND OF OAHU

212358158010901 - 3-2301-09, 10 W247-I, J, OAHU

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	TEMPERATURE WATER (DEG C)	DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	TEMPERATURE WATER (DEG C)
OCT, 1986				MAY, 1987			
17...	1045	430.0	21.50	05...	1005	590.0	21.50
DEC				JUN			
01...	1320	540.0	21.50	30...	0935	500.0	21.50
JAN, 1987				AUG			
28...	1320	555.0	21.50	07...	1050	490.0	21.50
FEB				SEP			
18...	1100	524.0	21.50	30...	1045	525.0	21.50
MAR							
10...	1150	570.0	21.50				

DATE	TIME	PH (STANDARD UNITS)	LEAD, TOTAL RECOVERABLE (UG/L AS PB)	OIL AND GREASE, TOTAL RECOV. GRAVIMETRIC (MG/L)
FEB				
18...	1100	7.300	7.000	<0.500

DATE	TIME	BENZENE TOTAL (UG/L)	BROMOFORM TOTAL (UG/L)	CARBON-TETRACHLORIDE TOTAL (UG/L)	CHLOROBENZENE TOTAL (UG/L)	CHLORODIBROMOMETHANE TOTAL (UG/L)	CHLOROETHANE TOTAL (UG/L)	2-CHLOROETHYLVINYLETHER TOTAL (UG/L)	CHLOROFORM TOTAL (UG/L)	CIS 1,3-DICHLOROPROPENE TOTAL (UG/L)
FEB										
18...	1100	<0.500	<5.000	<0.500	<0.500	<1.000	<5.000	<5.000	<0.500	<2.000

DIBROMOCHLOROPROPANE WATER WHOLE TOT.REC (UG/L)	1,2-DIBROMOETHANE WATER WHOLE TOTAL (UG/L)	1,2-DICHLOROBENZENE TOTAL (UG/L)	1,3-DICHLOROBENZENE TOTAL (UG/L)	1,4-DICHLOROBENZENE TOTAL (UG/L)	DICHLOROBROMOMETHANE TOTAL (UG/L)	DICHLORODIFLUOROMETHANE TOTAL (UG/L)	1,1-DICHLOROETHANE TOTAL (UG/L)	1,2-DICHLOROETHANE TOTAL (UG/L)	1,1-DICHLOROETHYLENE TOTAL (UG/L)
<0.010	<0.010	<0.500	<0.500	<0.500	<1.000	<1.000	<0.500	<1.000	<0.500

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

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

HAWAII, ISLAND OF OAHU--Continued

212358158010901 - 3-2301-09, 10 W247-I, J, OAHU--Continued

DATE	1,2-DI-CHLORO-PROPANE TOTAL (UG/L)	ETHYL-BENZENE TOTAL (UG/L)	METHYL-BROMIDE TOTAL (UG/L)	METHYL-CHLO-RIDE TOTAL (UG/L)	METHYL-ENE CHLO-RIDE TOTAL (UG/L)	M-XYLENE WATER WHOLE TOTAL (MG/L)	O-XYLENE WATER WHOLE TOTAL (MG/L)	P-XYLENE WATER WHOLE TOTAL (UG/L)	1,1,2,2 TETRA-CHLORO-ETHANE TOTAL (UG/L)
FEB									
18...	<1.000	<0.500	<5.000	<5.000	<5.000	<0.500	<0.500	<0.500	<1.000

TETRA-CHLORO-ETHYL-ENE TOTAL (UG/L)	TOLUENE TOTAL (UG/L)	1,2-TRANSDI CHLORO-ETHENE TOTAL (UG/L)	TRANS-1,3-DI-CHLORO-PROPENE TOTAL (UG/L)	1,1,1-TRI-CHLORO-ETHANE TOTAL (UG/L)	1,1,2-TRI-CHLORO-ETHANE TOTAL (UG/L)	TRI-CHLORO-ETHYL-ENE TOTAL (UG/L)	TRI-CHLORO-FLUORO-METHANE TOTAL (UG/L)	VINYL CHLO-RIDE TOTAL (UG/L)
<0.500	<0.500	<0.500	<0.500	<0.500	<1.000	<1.000	<1.000	<1.000

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

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

HAWAII, ISLAND OF OAHU--Continued

212328158031201 - 3-2303-02 HONOULIULI B, NEAR WAIPAHU OAHU

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	PH (STANDARD UNITS)	TEMPERATURE WATER (DEG C)	HARDNESS TOTAL (MG/L AS CACO3)	HARDNESS NONCARBONATE (MG/L AS CACO3	CALCIUM DISSOLVED (MG/L AS CA)	MAGNESIUM, DISSOLVED (MG/L AS MG)	SODIUM, DISSOLVED (MG/L AS NA)
DEC									
03...	1140	650	6.90	23.5	170	97	26	26	52
03...	1142	650	6.90	23.5	--	--	--	--	
03...	1300	1700	7.20	24.0	300	230	51	43	190
03...	1302	1700	7.20	24.0	--	--	--	--	
19...	1530	1710	7.33	22.5	310	240	52	44	200

DATE	SODIUM PERCENT	SODIUM ADSORPTION RATIO	POTASSIUM, DISSOLVED (MG/L AS K)	CHLORIDE, DISSOLVED (MG/L AS CL)	ALKALINITY LAB (MG/L AS CACO3)	SULFATE DISSOLVED (MG/L AS SO4)	FLUORIDE, DISSOLVED (MG/L AS F)	SILICA, DISSOLVED (MG/L AS SIO2)	SOLIDS, SUM OF CONSTITUENTS, DISSOLVED (MG/L)
DEC									
03...	39	2	4.2	140	75	22	0.20	76	396
03...	57	5	7.7	460	73	63	0.20	69	931
19...	57	5	8.5	450	74	61	0.20	68	931

DATE	NITROGEN, NO2+NO3 DISSOLVED (MG/L AS N)	NITROGEN NITRITE DISSOLVED (MG/L AS N	NITROGEN, AMMONIA DISSOLVED (MG/L AS N)	NITROGEN,AMMONIA + ORGANIC DIS. (MG/L AS N)	PHOSPHOROUS DISSOLVED (MG/L AS P)	IRON, DISSOLVED (UG/L AS FE)	MANGANESE, DISSOLVED (UG/L AS MN)
DEC							
03...	0.940	--	--	--	--	3	3
03...	0.930	<0.010	<0.010	0.20	0.120	--	--
03...	0.720	--	--	--	--	5	14
03...	0.720	<0.010	<0.010	0.30	0.090	--	--
19...	0.680	--	--	--	--	--	--

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

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

HAWAII, ISLAND OF OAHU--Continued

212408158002601 - 3-2400-02 W241-1B, OAHU

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	TEMPERATURE WATER (DEG C)	PH (STANDARD UNITS)	LEAD, TOTAL RECOVERABLE (UG/L AS PB)	OIL AND GREASE, TOTAL RECOV. GRAVIMETRIC (MG/L)
MAR						
17...	1005	370.0	22.50	6.900	<2.000	<0.500
17...	1015	370.0	22.50	6.900	<2.000	<0.500

DATE	BENZENE TOTAL (UG/L)	BROMOFORM TOTAL (UG/L)	CARBON-TETRACHLORIDE TOTAL (UG/L)	CHLOROBENZENE TOTAL (UG/L)	CHLORODIBROMOMETHANE TOTAL (UG/L)	CHLOROETHANE TOTAL (UG/L)	2-CHLOROETHYLVINYLETHER TOTAL (UG/L)	CHLOROFORM TOTAL (UG/L)	CIS 1,3-DICHLOROPROPENE TOTAL (UG/L)	DIBROMOCHLOROPROPANE WATER WHOLE TOT.REC (UG/L)	1,2-DIBROMOETHANE WATER WHOLE TOTAL (UG/L)	1,3-DICHLOROBENZENE TOTAL (UG/L)
MAR												
17...	<0.500	<5.000	<0.500	<0.500	<1.000	<5.000	<5.000	<0.500	<2.000	<0.015	0.056	<0.500
17...	<0.500	<5.000	<0.500	<0.500	<1.000	<5.000	<5.000	<0.500	<2.000	<0.015	0.068	<0.500

1,4-DICHLOROBENZENE TOTAL (UG/L)	DICHLOROBROMOMETHANE TOTAL (UG/L)	DICHLORODIFLUOROMETHANE TOTAL (UG/L)	1,1-DICHLOROETHANE TOTAL (UG/L)	1,2-DICHLOROETHANE TOTAL (UG/L)	1,1-DICHLOROETHYLENE TOTAL (UG/L)	1,2-DICHLOROPROPANE TOTAL (UG/L)	ETHYLBENZENE TOTAL (UG/L)	METHYLBROMIDE TOTAL (UG/L)	METHYLCHLORIDE TOTAL (UG/L)	METHYLENE CHLORIDE TOTAL (UG/L)	M-XYLENE WATER WHOLE TOTAL (MG/L)
<0.500	<1.000	<1.000	<0.500	<1.000	<0.500	<1.000	<0.500	<5.000	<5.000	<5.000	<0.500
<0.500	<1.000	<1.000	<0.500	<1.000	<0.500	<1.000	<0.500	<5.000	<5.000	<5.000	<0.500

O-XYLENE WATER WHOLE TOTAL (MG/L)	P-XYLENE WATER WHOLE TOTAL (UG/L)	1,1,2,2 TETRACHLOROETHANE TOTAL (UG/L)	TETRACHLOROETHYLENE TOTAL (UG/L)	TOLUENE TOTAL (UG/L)	1,2-TRANSDICHLOROETHENE TOTAL (UG/L)	TRANS-1,3-DICHLOROPROPENE TOTAL (UG/L)	1,1,1-TRICHLOROETHANE TOTAL (UG/L)	1,1,2-TRICHLOROETHANE TOTAL (UG/L)	TRICHLOROETHYLENE TOTAL (UG/L)	TRICHLOROFLUOROMETHANE TOTAL (UG/L)	VINYL CHLORIDE TOTAL (UG/L)
<0.500	<0.500	<1.000	<0.500	<0.500	<0.500	<0.500	<0.500	<1.000	<1.000	<1.000	<1.000
<0.500	<0.500	<1.000	<0.500	<0.500	<0.500	<0.500	<0.500	<1.000	<1.000	<1.000	<1.000

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

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

HAWAII, ISLAND OF OAHU--Continued

212414158005302 - 3-2400-06, OAHU

DATE	TIME	SAMPLING DEPTH (FEET)	SPECIFIC CONDUCTANCE (US/CM)	TEMPERATURE WATER (DEG C)	PH (STANDARD UNITS)	LEAD, TOTAL RECOVERABLE (UG/L AS PB)	OIL AND GREASE, TOTAL RECOV. GRAVIMETRIC (MG/L)
MAR							
09...	1415	270	400	23.0	7.00	<2	<0.5
09...	1500	310	380	23.0	7.00	<2	<0.5
16...	1025	190	340	23.5	7.80	2	<0.5

DATE	BENZENE TOTAL (UG/L)	BROMOFORM TOTAL (UG/L)	CARBON-TETRACHLORIDE TOTAL (UG/L)	CHLOROBENZENE TOTAL (UG/L)	CHLORODIBROMOMETHANE TOTAL (UG/L)	CHLOROETHANE TOTAL (UG/L)	2-CHLOROETHYLVINYL ETHER TOTAL (UG/L)	CHLOROFORM TOTAL (UG/L)	CIS 1,3-DICHLOROPROPENE TOTAL (UG/L)	DIBROMOCHLOROPROPANE WATER WHOLE TOT.REC (UG/L)	1,2-DIBROMOETHANE WATER WHOLE TOTAL (UG/L)	1,3-DICHLOROBENZENE TOTAL (UG/L)
MAR												
09...	<0.500	<5.000	<0.050	<0.500	<1.000	<5.000	<5.000	<0.500	<2.000	<0.015	0.079	<0.500
09...	<0.500	<5.000	<0.500	<0.500	<1.000	<5.000	<5.000	<0.500	<2.000	<0.015	0.054	<0.500
16...	<0.500	<5.000	<0.500	<0.500	<1.000	<5.000	<5.000	<0.500	<2.000	<0.015	<0.024	<0.500

1,4-DICHLOROBENZENE TOTAL (UG/L)	DICHLOROBROMOMETHANE TOTAL (UG/L)	DICHLORODIFLUOROMETHANE TOTAL (UG/L)	1,1-DICHLOROETHANE TOTAL (UG/L)	1,2-DICHLOROETHANE TOTAL (UG/L)	1,1-DICHLOROETHYLENE TOTAL (UG/L)	1,2-DICHLOROPROPANE TOTAL (UG/L)	ETHYLBENZENE TOTAL (UG/L)	METHYLBROMIDE TOTAL (UG/L)	METHYLCHLORIDE TOTAL (UG/L)	METHYLENE CHLORIDE TOTAL (UG/L)	M-XYLENE WATER WHOLE TOTAL (MG/L)
<0.500	<1.000	<1.000	<0.500	<1.000	<0.500	<1.000	<0.500	<5.000	<5.000	<5.000	<0.500
<0.500	<1.000	<1.000	<0.500	<1.000	<0.500	<1.000	<0.500	<5.000	<5.000	<5.000	<0.500
<0.500	<1.000	<1.000	<0.500	<1.000	<0.500	<1.000	<0.500	<5.000	<5.000	<5.000	<0.500

O-XYLENE WATER WHOLE TOTAL (MG/L)	P-XYLENE WATER WHOLE TOTAL (UG/L)	1,1,2,2 TETRACHLOROETHANE TOTAL (UG/L)	TETRACHLOROETHYLENE TOTAL (UG/L)	TOLUENE TOTAL (UG/L)	1,2-TRANSDICHLOROETHENE TOTAL (UG/L)	TRANS-1,3-DICHLOROPROPENE TOTAL (UG/L)	1,1,1-TRICHLOROETHANE TOTAL (UG/L)	1,1,2-TRICHLOROETHANE TOTAL (UG/L)	TRICHLOROETHYLENE TOTAL (UG/L)	TRICHLOROFLUOROMETHANE TOTAL (UG/L)	VINYL CHLORIDE TOTAL (UG/L)
<0.500	<0.500	<1.000	<0.500	<0.500	<0.500	<0.500	<0.500	<1.000	<1.000	<1.000	<1.000
<0.500	<0.500	<1.000	<0.500	<0.500	<0.500	<0.500	<0.500	<1.000	<1.000	<1.000	<1.000
<0.500	<0.500	<1.000	<0.500	<0.500	<0.500	<0.500	<0.500	<1.000	<1.000	<1.000	<1.000

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

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

HAWAII, ISLAND OF OAHU--Continued

212426158010801 - 3-2401-01 W251-1, OAHU

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	TEMPERATURE WATER (DEG C)	PH (STANDARD UNITS)	LEAD, TOTAL RECOVERABLE (UG/L AS PB)	OIL AND GREASE, TOTAL RECOV. GRAVIMETRIC (MG/L)
APR 07...	1030	725.0	24.00	6.100	<2.000	<0.500

BENZENE TOTAL (UG/L)	BROMOFORM TOTAL (UG/L)	CARBON-TETRACHLORIDE TOTAL (UG/L)	CHLOROBENZENE TOTAL (UG/L)	CHLORODIBROMOMETHANE TOTAL (UG/L)	CHLOROETHANE TOTAL (UG/L)	2-CHLOROETHYLVINYLETHER TOTAL (UG/L)	CHLOROFORM TOTAL (UG/L)	CIS 1,3-DICHLOROPROPENE TOTAL (UG/L)	DIBROMOCHLOROPROPANE WATER WHOLE TOT.REC (UG/L)	1,2-DIBROMOETHANE WATER WHOLE TOTAL (UG/L)	1,3-DICHLOROBENZENE TOTAL (UG/L)
<0.500	<5.000	0.830	<0.500	<1.000	<5.000	<5.000	<0.500	<2.000	<0.015	<0.024	<0.500

1,4-DICHLOROBENZENE TOTAL (UG/L)	DICHLOROBROMOMETHANE TOTAL (UG/L)	DICHLORODIFLUOROMETHANE TOTAL (UG/L)	1,1-DICHLOROETHANE TOTAL (UG/L)	1,2-DICHLOROETHANE TOTAL (UG/L)	1,1-DICHLOROETHYLENE TOTAL (UG/L)	1,2-DICHLOROPROPANE TOTAL (UG/L)	ETHYLBENZENE TOTAL (UG/L)	METHYLBROMIDE TOTAL (UG/L)	METHYLCHLORIDE TOTAL (UG/L)	METHYLENE CHLORIDE TOTAL (UG/L)	M-XYLENE WATER WHOLE TOTAL (MG/L)
<0.500	<1.000	<1.000	<0.500	<1.000	<0.500	<1.000	<0.500	<5.000	<5.000	<5.000	<0.500

O-XYLENE WATER WHOLE TOTAL (MG/L)	P-XYLENE WATER WHOLE TOTAL (UG/L)	1,1,2,2 TETRACHLOROETHANE TOTAL (UG/L)	TETRACHLOROETHYLENE TOTAL (UG/L)	TOLUENE TOTAL (UG/L)	1,2-TRANSDICHLOROETHENE TOTAL (UG/L)	TRANS-1,3-DICHLOROPROPENE TOTAL (UG/L)	1,1,1-TRICHLOROETHANE TOTAL (UG/L)	1,1,2-TRICHLOROETHANE TOTAL (UG/L)	TRICHLOROETHYLENE TOTAL (UG/L)	TRICHLOROFLUOROMETHANE TOTAL (UG/L)	VINYL CHLORIDE TOTAL (UG/L)
<0.500	<0.500	<1.000	<0.500	<0.500	<0.500	<0.500	<0.500	<1.000	<1.000	<1.000	<1.000

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

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

HAWAII, ISLAND OF OAHU--Continued

212410158020201 - 3-2402-01 W256-4A, OAHU

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	TEMPERATURE WATER (DEG C)	PH (STANDARD UNITS)	LEAD, TOTAL RECOVERABLE (UG/L AS PB)	OIL AND GREASE, TOTAL RECOV. GRAVIMETRIC (MG/L)
FEB 18...	0910	636.0	22.50	7.060	8.000	<0.500

DATE	BENZENE TOTAL (UG/L)	BROMOFORM TOTAL (UG/L)	CARBON-TETRACHLORIDE TOTAL (UG/L)	CHLOROBENZENE TOTAL (UG/L)	CHLORODIBROMOMETHANE TOTAL (UG/L)	CHLOROETHANE TOTAL (UG/L)	2-CHLOROETHYLVINYLETHER TOTAL (UG/L)	CHLOROFORM TOTAL (UG/L)	CIS 1,3-DICHLOROPROPENE TOTAL (UG/L)	DIBROMOCHLOROPROPANE WATER WHOLE TOT.REC (UG/L)
FEB 18...	<0.500	<5.000	<0.500	<0.500	<1.000	<5.000	<5.000	<0.500	<2.000	<0.010

1,2-DIBROMOETHANE WATER WHOLE TOTAL (UG/L)	1,2-DICHLOROBENZENE TOTAL (UG/L)	1,3-DICHLOROBENZENE TOTAL (UG/L)	1,4-DICHLOROBENZENE TOTAL (UG/L)	DICHLOROBROMOMETHANE TOTAL (UG/L)	DICHLORODIFLUOROMETHANE TOTAL (UG/L)	1,1-DICHLOROETHANE TOTAL (UG/L)	1,2-DICHLOROETHANE TOTAL (UG/L)	1,1-DICHLOROETHYLENE TOTAL (UG/L)
<0.010	<0.500	<0.500	<0.500	<1.000	<1.000	<0.500	<1.000	<0.500

1,2-DICHLOROPROPANE TOTAL (UG/L)	ETHYLBENZENE TOTAL (UG/L)	METHYLBROMIDE TOTAL (UG/L)	METHYLCHLORIDE TOTAL (UG/L)	METHYLENE CHLORIDE TOTAL (UG/L)	M-XYLENE WATER WHOLE TOTAL (MG/L)	O-XYLENE WATER WHOLE TOTAL (MG/L)	P-XYLENE WATER WHOLE TOTAL (UG/L)	1,1,2,2 TETRACHLOROETHANE TOTAL (UG/L)
<1.000	<0.500	<5.000	<5.000	<5.000	<0.500	<0.500	<0.500	<1.000

TETRACHLOROETHYLENE TOTAL (UG/L)	TOLUENE TOTAL (UG/L)	1,2-TRANSDICHLOROETHENE TOTAL (UG/L)	TRANS-1,3-DICHLOROPROPENE TOTAL (UG/L)	1,1,1-TRICHLOROETHANE TOTAL (UG/L)	1,1,2-TRICHLOROETHANE TOTAL (UG/L)	TRICHLOROETHYLENE TOTAL (UG/L)	TRICHLOROFLUOROMETHANE TOTAL (UG/L)	VINYL CHLORIDE TOTAL (UG/L)
<0.500	<0.500	<0.500	<0.500	<0.500	<1.000	<1.000	<1.000	<1.000

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

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

HAWAII, ISLAND OF OAHU--Continued

212426157595201 - 3-2459-23 WAIPIO HTS 3, OAHU

DATE	TIME	SPE-CIFIC CON-DUCT-ANCE (US/CM)	TEMPER-ATURE WATER (DEG C)	PH (STAND-ARD UNITS)	LEAD, TOTAL RECOV-ERABLE (UG/L AS PB)	OIL AND GREASE, TOTAL RECOV. GRAVI-METRIC (MG/L)
FEB						
18...	1020	717.0	21.70	7.240	<2.000	<0.500

BENZENE TOTAL (UG/L)	BROMO-FORM TOTAL (UG/L)	CARBON-TETRA-CHLO-RIDE TOTAL (UG/L)	CHLORO-BENZENE TOTAL (UG/L)	CHLORO-DI-BROMO-METHANE TOTAL (UG/L)	CHLORO-ETHANE TOTAL (UG/L)	2-CHLORO-ETHYL-VINYL-ETHER TOTAL (UG/L)	CHLORO-FORM TOTAL (UG/L)	CIS 1,3-DI-CHLORO-PROPENE TOTAL (UG/L)	DIBROMO CHLORO-PROPANE WATER WHOLE TOT.REC (UG/L)
<0.500	<5.000	<0.500	<0.500	<1.000	<5.000	<5.000	<0.500	<2.000	<0.010

1,2-DIBROMO ETHANE WATER WHOLE TOTAL (UG/L)	1,2-DI-CHLORO-BENZENE TOTAL (UG/L)	1,3-DI-CHLORO-BENZENE TOTAL (UG/L)	1,4-DI-CHLORO-BENZENE TOTAL (UG/L)	DI-CHLORO-BROMO-METHANE TOTAL (UG/L)	DI-CHLORO-DI-FLUORO-METHANE TOTAL (UG/L)	1,1-DI-CHLORO-ETHANE TOTAL (UG/L)	1,2-DI-CHLORO-ETHANE TOTAL (UG/L)	1,1-DI-CHLORO-ETHYL-ENE TOTAL (UG/L)
<0.010	<0.500	<0.500	<0.500	<1.000	<1.000	<0.500	<1.000	<0.500

1,2-DI-CHLORO-PROPANE TOTAL (UG/L)	ETHYL-BENZENE TOTAL (UG/L)	METHYL-BROMIDE TOTAL (UG/L)	METHYL-CHLO-RIDE TOTAL (UG/L)	METHYL-ENE CHLO-RIDE TOTAL (UG/L)	M-XYLENE WATER WHOLE TOTAL (MG/L)	O-XYLENE WATER WHOLE TOTAL (MG/L)	P-XYLENE WATER WHOLE TOTAL (UG/L)	1,1,2,2 TETRA-CHLORO-ETHANE TOTAL (UG/L)
<1.000	<0.500	<5.000	<5.000	<5.000	<0.500	<0.500	<0.500	<1.000

TETRA-CHLORO-ETHYL-ENE TOTAL (UG/L)	TOLUENE TOTAL (UG/L)	1,2-TRANSDI CHLORO-ETHENE TOTAL (UG/L)	TRANS-1,3-DI-CHLORO-PROPENE TOTAL (UG/L)	1,1,1-TRI-CHLORO-ETHANE TOTAL (UG/L)	1,1,2-TRI-CHLORO-ETHANE TOTAL (UG/L)	TRI-CHLORO-ETHYL-ENE TOTAL (UG/L)	TRI-CHLORO-FLUORO-METHANE TOTAL (UG/L)	VINYL CHLO-RIDE TOTAL (UG/L)
<0.500	<0.500	<0.500	<0.500	<0.500	<1.000	<1.000	<1.000	<1.000

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

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

HAWAII, ISLAND OF OAHU--Continued

212522158003001 - 3-2500-01 WAIPIO 1, OAHU

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	TEMPERATURE WATER (DEG C)	DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	TEMPERATURE WATER (DEG C)
FEB				MAY			
18...	0950	244.0	21.70	19...	0930	244.0	21.70

DATE	TIME	PH (STANDARD UNITS)	LEAD, TOTAL RECOVERABLE (UG/L AS PB)	OIL AND GREASE, TOTAL RECOV. GRAVIMETRIC (MG/L)
FEB				
18...	0950	7.200	4.000	<0.500

DATE	BENZENE TOTAL (UG/L)	BROMOFORM TOTAL (UG/L)	CARBON-TETRACHLORIDE TOTAL (UG/L)	CHLOROBENZENE TOTAL (UG/L)	CHLORODIBROMOMETHANE TOTAL (UG/L)	CHLOROETHANE TOTAL (UG/L)	2-CHLOROETHYLVINYLETHER TOTAL (UG/L)	CHLOROFORM TOTAL (UG/L)	CIS 1,3-DICHLOROPROPENE TOTAL (UG/L)
FEB									
18...	<0.500	<5.000	<0.500	<0.500	<1.000	<5.000	<5.000	<0.500	<2.000

DATE	DIBROMOCHLOROPROPANE WATER WHOLE TOTAL.REC (UG/L)	1,2-DIBROMOETHANE WATER WHOLE TOTAL (UG/L)	1,2-DICHLOROBENZENE TOTAL (UG/L)	1,3-DICHLOROBENZENE TOTAL (UG/L)	1,4-DICHLOROBENZENE TOTAL (UG/L)	DICHLOROBROMOMETHANE TOTAL (UG/L)	DICHLORODIFLUOROMETHANE TOTAL (UG/L)	1,1-DICHLOROETHANE TOTAL (UG/L)	1,2-DICHLOROETHANE TOTAL (UG/L)	1,1-DICHLOROETHYLENE TOTAL (UG/L)
FEB										
18...	<0.010	0.027	<0.500	<0.500	<0.500	<1.000	<1.000	<0.500	<1.000	<0.500
MAY										
19...	<0.010	<0.010	--	--	--	--	--	--	--	--

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

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

HAWAII, ISLAND OF OAHU--Continued

212522158003001 - 3-2500-01 WAIPIO 1, OAHU--Continued

DATE	1,2-DI-CHLORO-PROPANE TOTAL (UG/L)	ETHYL-BENZENE TOTAL (UG/L)	METHYL-BROMIDE TOTAL (UG/L)	METHYL-CHLO-RIDE TOTAL (UG/L)	METHYL-ENE CHLO-RIDE TOTAL (UG/L)	M-XYLENE WATER WHOLE TOTAL (MG/L)	O-XYLENE WATER WHOLE TOTAL (MG/L)	P-XYLENE WATER WHOLE TOTAL (UG/L)	1,1,2,2 TETRA-CHLORO-ETHANE TOTAL (UG/L)
FEB									
18...	<1.000	<0.500	<5.000	<5.000	<5.000	<0.500	<0.500	<0.500	<1.000

TETRA-CHLORO-ETHYL-ENE TOTAL (UG/L)	TOLUENE TOTAL (UG/L)	1,2-TRANSDI CHLORO-ETHENE TOTAL (UG/L)	TRANS-1,3-DI-CHLORO-PROPENE TOTAL (UG/L)	1,1,1-TRI-CHLORO-ETHANE TOTAL (UG/L)	1,1,2-TRI-CHLORO-ETHANE TOTAL (UG/L)	TRI-CHLORO-ETHYL-ENE TOTAL (UG/L)	TRI-CHLORO-FLUORO-METHANE TOTAL (UG/L)	VINYL CHLO-RIDE TOTAL (UG/L)
<0.500	<0.500	<0.500	<0.500	<0.500	<1.000	<1.000	<1.000	<1.000

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

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

HAWAII, ISLAND OF OAHU--Continued

212506157582301 - 3-2558-10 S16, OAHU

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	TEMPERATURE WATER (DEG C)	DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	TEMPERATURE WATER (DEG C)
OCT, 1986				MAR, 1987			
17...	1215	360.0	21.00	10...	1420	335.0	21.00
DEC				MAY			
01...	1110	340.0	21.00	05...	1130	330.0	21.00
JAN, 1987				JUL			
30...	0840	335.0	21.00	01...	1050	325.0	21.00
FEB				AUG			
18...	1155	325.0	21.00	11...	0930	320.0	21.00

DATE	TIME	PH (STANDARD UNITS)	LEAD, TOTAL RECOVERABLE (UG/L AS PB)	OIL AND GREASE, TOTAL RECOV. GRAVIMETRIC (MG/L)
FEB				
18...	1155	7.400	4.000	<0.500

BENZENE TOTAL (UG/L)	BROMOFORM TOTAL (UG/L)	CARBON-TETRACHLORIDE TOTAL (UG/L)	CHLOROBENZENE TOTAL (UG/L)	CHLORODIBROMOMETHANE TOTAL (UG/L)	CHLOROETHANE TOTAL (UG/L)	2-CHLOROETHYLVINYLETHER TOTAL (UG/L)	CHLOROFORM TOTAL (UG/L)	CIS 1,3-DICHLOROPROPENE TOTAL (UG/L)	DIBROMOCHLOROPROPANE WATER WHOLE TOT.REC (UG/L)
<0.500	<5.000	<0.500	<0.500	<1.000	<5.000	<5.000	<0.500	<2.000	<0.010

1,2-DIBROMOETHANE WATER WHOLE TOTAL (UG/L)	1,2-DICHLOROBENZENE TOTAL (UG/L)	1,3-DICHLOROBENZENE TOTAL (UG/L)	1,4-DICHLOROBENZENE TOTAL (UG/L)	DICHLOROBROMOMETHANE TOTAL (UG/L)	DICHLORODIFLUOROMETHANE TOTAL (UG/L)	1,1-DICHLOROETHANE TOTAL (UG/L)	1,2-DICHLOROETHANE TOTAL (UG/L)	1,1-DICHLOROETHYLENE TOTAL (UG/L)
<0.015	<0.500	<0.500	<0.500	<1.000	<1.000	<0.500	<1.000	<0.500

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

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

HAWAII, ISLAND OF OAHU--Continued

212506157582301 - 3-2558-10 S16, OAHU--Continued

DATE	1,2-DI-CHLORO-PROPANE TOTAL (UG/L)	ETHYL-BENZENE TOTAL (UG/L)	METHYL-BROMIDE TOTAL (UG/L)	METHYL-CHLO-RIDE TOTAL (UG/L)	METHYL-ENE CHLO-RIDE TOTAL (UG/L)	M-XYLENE WATER WHOLE TOTAL (MG/L)	O-XYLENE WATER WHOLE TOTAL (MG/L)	P-XYLENE WATER WHOLE TOTAL (UG/L)	1,1,2,2 TETRA-CHLORO-ETHANE TOTAL (UG/L)
FEB									
18...	<1.000	<0.500	<5.000	<5.000	<5.000	<0.500	<0.500	<0.500	<1.000

TETRA-CHLORO-ETHYL-ENE TOTAL (UG/L)	TOLUENE TOTAL (UG/L)	1,2-TRANSDI CHLORO-ETHENE TOTAL (UG/L)	TRANS-1,3-DI-CHLORO-PROPENE TOTAL (UG/L)	1,1,1-TRI-CHLORO-ETHANE TOTAL (UG/L)	1,1,2-TRI-CHLORO-ETHANE TOTAL (UG/L)	TRI-CHLORO-ETHYL-ENE TOTAL (UG/L)	TRI-CHLORO-FLUORO-METHANE TOTAL (UG/L)	VINYL CHLO-RIDE TOTAL (UG/L)
<0.500	<0.500	<0.500	<0.500	<0.500	<1.000	<1.000	<1.000	<1.000

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

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

HAWAII, ISLAND OF OAHU--Continued

212601158004101 - 3-2600-02 W251-2, OAHU

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	TEMPERATURE WATER (DEG C)	PH (STANDARD UNITS)	LEAD, TOTAL RECOVERABLE (UG/L AS PB)	OIL AND GREASE, TOTAL RECOV. GRAVIMETRIC (MG/L)
MAR						
04...	1120	240.0	22.60	7.190	<6.000	0.800

BENZENE TOTAL (UG/L)	BROMOFORM TOTAL (UG/L)	CARBON-TETRACHLORIDE TOTAL (UG/L)	CHLOROBENZENE TOTAL (UG/L)	CHLORODIBROMOMETHANE TOTAL (UG/L)	CHLOROETHANE TOTAL (UG/L)	2-CHLOROETHYLVINYLETHER TOTAL (UG/L)	CHLOROFORM TOTAL (UG/L)	CIS 1,3-DICHLOROPROPENE TOTAL (UG/L)	DIBROMOCHLOROPROPANE WATER WHOLE TOT.REC (UG/L)	1,2-DIBROMOETHANE WATER WHOLE TOTAL (UG/L)	1,3-DICHLOROBENZENE TOTAL (UG/L)
<0.500	<5.000	<0.500	<0.500	<1.000	<5.000	<5.000	<0.500	<2.000	<0.015	<0.012	<0.500

1,4-DICHLOROBENZENE TOTAL (UG/L)	DICHLOROBROMOMETHANE TOTAL (UG/L)	DICHLORODIFLUOROMETHANE TOTAL (UG/L)	1,1-DICHLOROETHANE TOTAL (UG/L)	1,2-DICHLOROETHANE TOTAL (UG/L)	1,1-DICHLOROETHYLENE TOTAL (UG/L)	1,2-DICHLOROPROPANE TOTAL (UG/L)	ETHYLBENZENE TOTAL (UG/L)	METHYLBROMIDE TOTAL (UG/L)	METHYLCHLORIDE TOTAL (UG/L)	METHYLENE CHLORIDE TOTAL (UG/L)	M-XYLENE WATER WHOLE TOTAL (MG/L)
<0.500	<1.000	<1.000	<0.500	<1.000	<0.500	<1.000	<0.500	<5.000	<5.000	<5.000	<0.500

O-XYLENE WATER WHOLE TOTAL (MG/L)	P-XYLENE WATER WHOLE TOTAL (UG/L)	1,1,2,2 TETRACHLOROETHANE TOTAL (UG/L)	TETRACHLOROETHYLENE TOTAL (UG/L)	TOLUENE TOTAL (UG/L)	1,2-TRANSDICHLOROETHENE TOTAL (UG/L)	TRANS-1,3-DICHLOROPROPENE TOTAL (UG/L)	1,1,1-TRICHLOROETHANE TOTAL (UG/L)	1,1,2-TRICHLOROETHANE TOTAL (UG/L)	TRICHLOROETHYLENE TOTAL (UG/L)	TRICHLOROFLUOROMETHANE TOTAL (UG/L)	VINYL CHLORIDE TOTAL (UG/L)
<0.500	<0.500	<1.000	<0.500	<0.500	<0.500	<0.500	<0.500	<1.000	<1.000	<1.000	<1.000

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

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

HAWAII, ISLAND OF OAHU--Continued

212701158004101 - 3-2600-03 CNTY, MILILANI III WELL 1 OAHU

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	SAMPLING DEPTH (FEET)	TEMPERATURE WATER (DEG C)	PH (STANDARD UNITS)	LEAD, TOTAL RECOVERABLE (UG/L AS PB)	OIL AND GREASE, TOTAL RECOV. GRAVIMETRIC (MG/L)
MAR							
09...	1020	200.0	745.0	22.00	7.200	<2.000	<0.500
09...	1200	200.0	785.0	22.50	7.100	<2.000	<0.500
17...	1300	195.0	644.0	23.00	8.000	<2.000	<0.500

BENZENE TOTAL (UG/L)	BROMOFORM TOTAL (UG/L)	CARBON-TETRACHLORIDE TOTAL (UG/L)	CHLOROBENZENE TOTAL (UG/L)	CHLORODIBROMOMETHANE TOTAL (UG/L)	CHLOROETHANE TOTAL (UG/L)	2-CHLOROETHYLVINYLETHER TOTAL (UG/L)	CHLOROFORM TOTAL (UG/L)	CIS 1,3-DICHLOROPROPENE TOTAL (UG/L)	DIBROMOCHLOROPROPANE WATER WHOLE TOT.REC (UG/L)	1,2-DIBROMOETHANE WATER WHOLE TOTAL (UG/L)	1,3-DICHLOROBENZENE TOTAL (UG/L)
<0.500	<5.000	<0.500	<0.500	<1.000	<5.000	<5.000	<0.500	<2.000	0.016	<2.000	<0.500
<0.500	<5.000	<0.500	<0.500	<1.000	<5.000	<5.000	<0.500	<2.000	<0.015	<2.000	<0.500
<0.500	<5.000	<0.500	<0.500	<1.000	<5.000	<5.000	<0.500	<2.000	<0.015	<2.000	<0.500

1,4-DICHLOROBENZENE TOTAL (UG/L)	DICHLOROBROMOMETHANE TOTAL (UG/L)	DICHLORODIFLUOROMETHANE TOTAL (UG/L)	1,1-DICHLOROETHANE TOTAL (UG/L)	1,2-DICHLOROETHANE TOTAL (UG/L)	1,1-DICHLOROETHYLENE TOTAL (UG/L)	1,2-DICHLOROPROPANE TOTAL (UG/L)	ETHYLBENZENE TOTAL (UG/L)	METHYLBROMIDE TOTAL (UG/L)	METHYLCHLORIDE TOTAL (UG/L)	METHYLENE CHLORIDE TOTAL (UG/L)	M-XYLENE WATER WHOLE TOTAL (MG/L)
<0.500	<1.000	<1.000	<0.500	<1.000	<0.500	<1.000	<0.500	<5.000	<5.000	<5.000	<0.500
<0.500	<1.000	<1.000	<0.500	<1.000	<0.500	<1.000	<0.500	<5.000	<5.000	<5.000	<0.500
<0.500	<1.000	<1.000	<0.500	<1.000	<0.500	<1.000	<0.500	<5.000	<5.000	<5.000	<0.500

O-XYLENE WATER WHOLE TOTAL (MG/L)	P-XYLENE WATER WHOLE TOTAL (UG/L)	1,1,2,2 TETRACHLOROETHANE TOTAL (UG/L)	TETRACHLOROETHYLENE TOTAL (UG/L)	TOLUENE TOTAL (UG/L)	1,2-TRANSDICHLOROETHENE TOTAL (UG/L)	TRANS-1,3-DICHLOROPROPENE TOTAL (UG/L)	1,1,1-TRICHLOROETHANE TOTAL (UG/L)	1,1,2-TRICHLOROETHANE TOTAL (UG/L)	TRICHLOROETHYLENE TOTAL (UG/L)	TRICHLOROFLUOROMETHANE TOTAL (UG/L)	VINYL CHLORIDE TOTAL (UG/L)
<0.500	<0.500	1.100	1.100	<0.500	<0.500	<0.500	<0.500	<1.000	<1.000	<1.000	<1.000
<0.500	<0.500	1.100	1.100	<0.500	<0.500	<0.500	<0.500	<1.000	<1.000	<1.000	<1.000
<0.500	<0.500	<1.000	<0.500	<0.500	<0.500	<0.500	<0.500	<1.000	<1.000	<1.000	<1.000

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

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

HAWAII, ISLAND OF OAHU--Continued

213224158135801 - 3-3213-07 MAKUA, WAIANAE OAHU

DATE	TIME	SPECIFIC CONDUCTANCE LAB (US/CM)	PH LAB (STANDARD UNITS)	HARDNESS TOTAL (MG/L AS CACO3)	HARDNESS NONCARBONATE (MG/L AS CACO3)	CALCIUM DISSOLVED (MG/L AS CA)	MAGNESIUM, DISSOLVED (MG/L AS MG)	SODIUM, DISSOLVED (MG/L AS NA)	SODIUM PERCENT	SODIUM ADSORPTION RATIO	POTASSIUM, DISSOLVED (MG/L AS K)
APR											
16...	1100	829	7.47	100	23	14	17	110	69	5	2.7

ALKALINITY LAB (MG/L AS CACO3)	SULFATE DISSOLVED (MG/L AS SO4)	CHLORIDE, DISSOLVED (MG/L AS CL)	FLUORIDE, DISSOLVED (MG/L AS F)	SILICA, DISSOLVED (MG/L AS SIO2)	SOLIDS, SUM OF CONSTITUENTS, DISSOLVED (MG/L)	NITROGEN, NO2+NO3 DISSOLVED (MG/L AS N)	ALUMINUM, TOTAL RECOVERABLE (UG/L AS AL)	ARSENIC TOTAL (UG/L AS AS)
82	29	180	0.20	74	480	0.750	60	<1

BARIUM, TOTAL RECOVERABLE (UG/L AS BA)	BERYLLIUM, TOTAL RECOVERABLE (UG/L AS BE)	CADMIUM TOTAL RECOVERABLE (UG/L AS CD)	CHROMIUM, TOTAL RECOVERABLE (UG/L AS CR)	COBALT, TOTAL RECOVERABLE (UG/L AS CO)	COPPER, TOTAL RECOVERABLE (UG/L AS CU)	IRON, TOTAL RECOVERABLE (UG/L AS FE)	IRON, DISSOLVED (UG/L AS FE)	LEAD, TOTAL RECOVERABLE (UG/L AS PB)
<100	<10	<1	<10	<1	9	810	10	<5

LITHIUM TOTAL RECOVERABLE (UG/L AS LI)	MANGANESE, TOTAL RECOVERABLE (UG/L AS MN)	MANGANESE, DISSOLVED (UG/L AS MN)	MERCURY TOTAL RECOVERABLE (UG/L AS HG)	MOLYBDENUM, TOTAL RECOVERABLE (UG/L AS MO)	NICKEL, TOTAL RECOVERABLE (UG/L AS NI)	SELENIUM, TOTAL (UG/L AS SE)	SILVER, TOTAL RECOVERABLE (UG/L AS AG)	ZINC, TOTAL RECOVERABLE (UG/L AS ZN)
<10	27	27	0.10	<1	<1	<1	<1	40

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

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

HAWAII, ISLAND OF MOLOKAI

210857157011701 - 4-0801-03 KUALAPUU MOLOKAI

DATE	TIME	SPECIFIC CONDUCTANCE LAB (US/CM)	PH LAB (STANDARD UNITS)	HARDNESS TOTAL (MG/L AS CACO3)	HARDNESS NONCARBONATE (MG/L AS CACO3	CALCIUM DISSOLVED (MG/L AS CA)	MAGNESIUM, DISSOLVED (MG/L AS MG)	SODIUM, DISSOLVED (MG/L AS NA)	SODIUM PERCENT	SODIUM ADSORPTION RATIO	POTASSIUM, DISSOLVED (MG/L AS K)
SEP 26...	0800	324	8.20	69	30	9.6	11	33	50	2	3.0

ALKALINITY LAB (MG/L AS CACO3)	SULFATE DISSOLVED (MG/L AS SO4)	CHLORIDE, DISSOLVED (MG/L AS CL)	FLUORIDE, DISSOLVED (MG/L AS F)	SILICA, DISSOLVED (MG/L AS SIO2)	SOLIDS, SUM OF CONSTITUENTS, DISSOLVED (MG/L)	NITROGEN, NO2+NO3 DISSOLVED (MG/L AS N)	ALUMINUM, TOTAL RECOVERABLE (UG/L AS AL)	ARSENIC TOTAL (UG/L AS AS)
39	11	64	0.20	46	202	0.280	<10	<1

BARIUM, TOTAL RECOVERABLE (UG/L AS BA)	BERYLLIUM, TOTAL RECOVERABLE (UG/L AS BE)	CADMIUM TOTAL RECOVERABLE (UG/L AS CD)	CHROMIUM, TOTAL RECOVERABLE (UG/L AS CR)	COBALT, TOTAL RECOVERABLE (UG/L AS CO)	COPPER, TOTAL RECOVERABLE (UG/L AS CU)	IRON, TOTAL RECOVERABLE (UG/L AS FE)	IRON, DISSOLVED (UG/L AS FE)	LEAD, TOTAL RECOVERABLE (UG/L AS PB)
<100	<10	<1	<10	<1	4	<10	20	<5

LITHIUM TOTAL RECOVERABLE (UG/L AS LI)	MANGANESE, TOTAL RECOVERABLE (UG/L AS MN)	MANGANESE, DISSOLVED (UG/L AS MN)	MERCURY TOTAL RECOVERABLE (UG/L AS HG)	MOLYBDENUM, TOTAL RECOVERABLE (UG/L AS MO)	NICKEL, TOTAL RECOVERABLE (UG/L AS NI)	SELENIUM, TOTAL (UG/L AS SE)	SILVER, TOTAL RECOVERABLE (UG/L AS AG)	ZINC, TOTAL RECOVERABLE (UG/L AS ZN)
30	<10	<10	0.20	<1	2	<1	<1	<10

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

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

HAWAII, ISLAND OF MAUI

205458156205401 - 6-5420-01 W35, NEAR HAMAKUAPOKO MAUI

DATE	TIME	SPE-CIFIC CON-DUCT-ANCE (US/CM)	TEMPER-ATURE WATER (DEG C)	PH (STAND-ARD UNITS)	BENZENE TOTAL (UG/L)	BROMO-FORM TOTAL (UG/L)	CARBON-TETRA-CHLO-RIDE TOTAL (UG/L)	CHLORO-BENZENE TOTAL (UG/L)	CHLORO-DI-BROMO-METHANE TOTAL (UG/L)	CHLORO-ETHANE TOTAL (UG/L)
MAR										
11...	1040	530	22.0	7.80	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20

2-CHLORO-ETHYL-VINYL-ETHER TOTAL (UG/L)	CHLORO-FORM TOTAL (UG/L)	CIS 1,3-DI-CHLORO-PROPENE TOTAL (UG/L)	1,2-DIBROMO ETHYL-ENE TOTAL (UG/L)	1,2-DI-CHLORO-BENZENE TOTAL (UG/L)	1,3-DI-CHLORO-BENZENE TOTAL (UG/L)	1,4-DI-CHLORO-BENZENE TOTAL (UG/L)	DI-CHLORO-BROMO-METHANE TOTAL (UG/L)	DI-CHLORO-DI-FLUORO-METHANE TOTAL (UG/L)	1,1-DI-CHLORO-ETHANE TOTAL (UG/L)
<0.20	<0.20	<0.20	<0.2	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20

1,2-DI-CHLORO-ETHANE TOTAL (UG/L)	1,1-DI-CHLORO-ETHYL-ENE TOTAL (UG/L)	1,2-DI-CHLORO-PROPANE TOTAL (UG/L)	1,3-DI-CHLORO-PROPENE TOTAL (UG/L)	ETHYL-BENZENE TOTAL (UG/L)	METHYL-BROMIDE TOTAL (UG/L)	METHYL-CHLO-RIDE TOTAL (UG/L)	METHYL-ENE CHLO-RIDE TOTAL (UG/L)	STYRENE TOTAL (UG/L)	1,1,2,2 TETRA-CHLORO-ETHANE TOTAL (UG/L)
<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<1.0	<0.2	<0.20

TETRA-CHLORO-ETHYL-ENE TOTAL (UG/L)	1,2-TRANSDI CHLORO-ETHENE TOTAL (UG/L)	TRANS-1,3-DI-CHLORO-PROPENE TOTAL (UG/L)	1,1,1-TRI-CHLORO-ETHANE TOTAL (UG/L)	1,1,2-TRI-CHLORO-ETHANE TOTAL (UG/L)	TRI-CHLORO-ETHYL-ENE TOTAL (UG/L)	TRI-CHLORO-FLUORO-METHANE TOTAL (UG/L)	TOLUENE TOTAL (UG/L)	VINYL CHLO-RIDE TOTAL (UG/L)
<0.20	<0.20	<0.20	<0.20	<0.20	<0.2	<0.20	<0.20	<0.20

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

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

HAWAII, ISLAND OF HAWAII

193502155572301 - 8-3557-05 KAH SHAFT, KEALAKEKUA HAWAII

DATE	TIME	SPE-CON-DUCT-ANCE (US/CM)	TEMPER-ATURE WATER (DEG C)	CHLO-DIS-SOLVED (MG/L AS CL)
CT, 1986				
15...	0745	710	20.0	180
DEC				
03...	1245	710	20.0	170
JAN, 1987				
27...	1025	760	20.0	200
MAR				
05...	1330	800	20.0	200
23...	1050	810	20.0	220
APR, 1987				
30...	0930	680	20.0	170
JUN				
11...	0955	760	20.0	190
JUL				
27...	1345	680	20.0	160
SEP				
29...	0810	750	20.0	190

DATE	TIME	PH (STAND-ARD UNITS)	DI-CHLORO-BROMO-METHANE TOTAL (UG/L)	CARBON-TETRA-CHLO-RIDE TOTAL (UG/L)	1,2-DI-CHLORO-ETHANE TOTAL (UG/L)	BROMO-FORM TOTAL (UG/L)	CHLORO-DI-BROMO-METHANE TOTAL (UG/L)	CHLORO-FORM TOTAL (UG/L)	TOLUENE TOTAL (UG/L)	BENZENE TOTAL (UG/L)
MAR										
23...	1050	7.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20

DATE	CHLORO-BENZENE TOTAL (UG/L)	CHLORO-ETHANE TOTAL (UG/L)	ETHYL-BENZENE TOTAL (UG/L)	METHYL-BROMIDE TOTAL (UG/L)	METHYL-CHLO-RIDE TOTAL (UG/L)	METHYL-ENE CHLO-RIDE TOTAL (UG/L)	TETRA-CHLORO-ETHYL-ENE TOTAL (UG/L)	TRI-CHLORO-FLUORO-METHANE TOTAL (UG/L)	1,1-DI-CHLORO-ETHANE TOTAL (UG/L)	1,1-DI-CHLORO-ETHYL-ENE TOTAL (UG/L)
MAR										
23...	<0.20	<0.20	<0.20	<0.20	<0.20	<1.0	<0.20	<0.20	<0.20	<0.20

DATE	1,1,1-TRI-CHLORO-ETHANE TOTAL (UG/L)	1,1,2-TRI-CHLORO-ETHANE TOTAL (UG/L)	1,1,2,2 TETRA-CHLORO-ETHANE TOTAL (UG/L)	1,2-DI-CHLORO-BENZENE TOTAL (UG/L)	1,2-DI-CHLORO-PROPANE TOTAL (UG/L)	1,2-TRANSDI CHLORO-ETHENE TOTAL (UG/L)	1,3-DI-CHLORO-PROPENE TOTAL (UG/L)	1,3-DI-CHLORO-BENZENE TOTAL (UG/L)	1,4-DI-CHLORO-BENZENE TOTAL (UG/L)
MAR									
23...	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20

DATE	2-CHLORO-ETHYL-VINYL-ETHER TOTAL (UG/L)	DI-CHLORO-DI-FLUORO-METHANE TOTAL (UG/L)	TRANS-1,3-DI-CHLORO-PROPENE TOTAL (UG/L)	CIS 1,3-DI-CHLORO-PROPENE TOTAL (UG/L)	1,2-DIBROMO ETHYL-ENE TOTAL (UG/L)	VINYL CHLO-RIDE TOTAL (UG/L)	TRI-CHLORO-ETHYL-ENE TOTAL (UG/L)	STYRENE TOTAL (UG/L)	XYLENE TOTAL WATER WHOLE TOT REC (UG/L)
MAR									
23...	<0.20	<0.20	<0.20	<0.20	<0.2	<0.20	<0.2	<0.2	<0.2

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

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

HAWAII, ISLAND OF HAWAII--Continued

193812155041701 - 8-3804-01 KEAU, HILO HAWAII

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	PH (STANDARD UNITS)	TEMPERATURE WATER (DEG C)	HARDNESS TOTAL (MG/L AS CACO3)	HARDNESS NONCARBONATE (MG/L AS CACO3	CALCIUM DISSOLVED (MG/L AS CA)	MAGNESIUM, DISSOLVED (MG/L AS MG)	SODIUM, DISSOLVED (MG/L AS NA)	SODIUM PERCENT
SEP										
15...	1340	89	7.60	18.5	23	0	6.0	2.0	5.7	33

SODIUM ADSORPTION RATIO	POTASSIUM, DISSOLVED (MG/L AS K)	ALKALINITY LAB (MG/L AS CACO3)	SULFATE DISSOLVED (MG/L AS SO4)	FLUORIDE, DISSOLVED (MG/L AS F)	SILICA, DISSOLVED (MG/L AS SIO2)	SOLIDS, SUM OF CONSTITUENTS, DISSOLVED (MG/L)	NITROGEN, NO2+NO3 DISSOLVED (MG/L AS N)	IRON, DISSOLVED (UG/L AS FE)	MANGANESE, DISSOLVED (UG/L AS MN)
0.5	1.5	25	5.2	0.10	34	73	0.100	47	2

INDEX

Page

Access to WATSTORE data..... 27
Accuracy of field data and computed results... 24
Acre-foot, definition of..... 4
Ahualoa Gulch at Honokaa, Hawaii..... 171
Ahuimanu Stream near Kahaluu, Oahu..... 168
Akulikuli Stream near Kapaa, Kauai..... 165
Alakahi Stream near Kamuela, Hawaii..... 157,189
Alapai Gulch at Naalehu, Hawaii..... 172
Algae, definition of..... 4
Alia Stream near Hilo, Hawaii..... 171
Anahola ditch above Kaneha Reservoir, near
Kealia, Kauai..... 47,184
Anahulu River near Haleiwa, Oahu..... 168
Aquifer, definition of..... 4
Artesian, definition of..... 4
Ash mass, definition of..... 4
Bacteria, definition of..... 4
Biochemical oxygen demand, definition of..... 4
Biomass, definition of..... 4
Bottom material, definition of..... 5
Cells/volume, definition of..... 5
Cfs-dey, definition of..... 5
Chlorophyll, definition of..... 5
Coliform organisms, definition of..... 5
Collection and computation of data..... 22
Collection and examination of data..... 25
Collection of the data..... 26
Color unit, definition of..... 5
Contents, definition of..... 5
Continuing record station, definition of..... 5
Control, definition of..... 5
Control structure, definition of..... 5
Cooperation..... 1
Cubic foot per second, definition of..... 5
Definition of terms..... 4
Discharge, definition of..... 5
Dissolved, definition of..... 5
Downstream order and station number..... 8
Drainage area, definition of..... 8
Drainage basin, definition of..... 6
Dry mass, definition of..... 4
Explanation of ground-water level records..... 26
Explanation of stage and water-discharge
records..... 22
Explanation of water-quality records..... 25
Fecal coliform bacteria, definition of..... 4
Fecal streptococcal bacteria, definition of... 4
Gage height, definition of..... 6
Gaging station, definition of..... 6
Ground-water records..... 191-257
Haiku Stream near Heeia, Oahu..... 101-103
Halaulani Stream at altitude 400 ft, near
Kilauea, Kauai..... 49,184
Halawa Stream, near Halawa, Molokai..... 116-119
North Halawa Stream, near Aiea, Oahu..... 63
North Halawa Stream, near Honolulu, Oahu... 64-75
Halena Gulch nesr Mauna Loa, Molokai..... 169
Hanalei River, at Highway 56 bridge near
Hanalei, Kauai..... 185
near Hanalei, Kauai..... 50,184
Hanapepe River, at Hanapepe, Kauai..... 165
below Manuahi Stream, near Eleele, Kauai... 37,182
Hanawi Stream near Nahiku, Maui..... 127,186
Hapahapai Gulch at Kapaau, Hawaii..... 171
Hardness, definition of..... 6
Hauani Gulch near Kamuela, Hawaii..... 162,190

Page

Hawaii, island of, crest-stage partial-record
stations in..... 171-172
gaging-station records in..... 141-163
ground-water records in..... 216-224
map of.....18-19,21
water-quality records, at ground-water
sites in.....235-237,256-257
periodic determinations of temperture... 189-190
Hawelewele Gulch near Kaupo, Maui..... 169
Heeia Stream at Kaneohe, Oahu..... 168
Hilea Gulch tributary near Honuapo, Hawaii.... 163,190
Hionamoa Gulch at Pahala, Hawaii..... 172
Homaikawaa Stream near Kealia, Kauai..... 165
Honokaia Gulch tributary near Honokaa,
Hawaii..... 171
Honokohau Stream near Honokohau, Maui..... 139,187
Honokowai Stream at Honokowai, Maui..... 170
Honolii Stream near Papaikou, Hawaii..... 149-152
Honopou Stream near Huelo, Maui..... 130,186
Honouliuli Stream near Waipahu, Oahu..... 166
Hooleinaiwa Stream above confluence with
Kamooalii Stream near Kaneohe, Oahu..... 164
Hoomaluhia Reservoir, sec 1-1 near Kaneohe,
Oahu..... 173
sec 1-2 near Kaneohe, Oahu..... 175
sec 1-3 near Kaneohe, Oahu..... 176-178
at Outlet near Kaneohe, Oahu..... 179
Huleia Stream near Lihue, Kauai..... 165
Huliwai Gulch near Kunia Camp, Oahu..... 166
Hydrologic bench-mark station, definition of.. 22
Hydrologic unit, definition of..... 6
Iao Stream at Kepaniwai Park, near Wailuku,
Maui..... 133,187
at Wailuku, Maui..... 170
Illustrations.....3,10-21,174
Inoaole Stream at Waimanio, Oahu..... 167
Instantaneous discharge, definition of..... 5
Introduoiton..... 1
Kaelepulu Stream tributary at Kailua, Oahu.... 167
Kahakuloa Stream near Honokohau, Maui..... 135-138
Kahaluu Stream near Ahuimanu, Oahu..... 104
Kahana Stream at altitude 30 ft, near
Kahana, Oahu..... 109
Kahoma Stream at Lahaina, Maui..... 140,187
Kakaako Gulch, above Kamakahi Gulch, near
Mauna Loa, Molokai..... 169
near Mauna Loa, Molokai..... 169
Kalaoa Mauka Stream near Hilo, Hawaii..... 171
Kalauao Stream at Moanalua Road, at Aiea,
Oahu..... 167
Kalialinui Gulch, near Kahului, Maui..... 170
tributary near Pukalani, Maui..... 170
Kalihi Stream, at Kalihi, Oahu..... 78-80
near Honolulu, Oahu..... 76-77
near Kaneohe, Oahu..... 167
Kaloi Gulch tributary near Hoonuliuli, Oahu... 166
Kaluanui Stream, at Hauula, Oahu..... 168
near Punaluu, oahu..... 112
Kaluapeelua Gulch at Hoolehua, Molokai..... 169
Kaluapulani Gulch tributary near Pukalani,
Maui..... 170
Kamakoa Gulch near Waimea, Hawaii..... 172
Kamananui Stream, at Maunawai, Oahu..... 114
at Pupukea Military Road, near Maunawai,
Oahu..... 113
Kamaole Gulch at Kamaole, Maui..... 171

Page
Kamooalii Stream:
at altitude 220 ft, near Kaneohe, Oahu..... 164
below Luluku Stream, near Kaneohe, Oahu.... 94-100
right branch, near Kaneohe, Oahu..... 84-88
Kapaa Stream, at Kapahi ditch intake, near Kapaa, Kauai..... 165
at old highway crossing, near Kealia, Kauai..... 165
Kapahi ditch near Kealia, Kauai..... 46,183
Kapehu Stream near Pepeekeo, Hawaii..... 171
Kapuhi Stream, at altitude 1,000 ft, near Pelekunu, Molokai..... 164
near Pelekunu, Molokai..... 164
Kapunahala Stream
South Fork at Kaneohe, Oahu..... 180-181
Kauai, island of, crest-stage partial-record stations in..... 165
gaging-station records in..... 30-51
ground-water records in..... 191-193
map of..... 10-11
water-quality records, at ground-water sites in..... 225-228,238
periodic determinations of temperature.. 182-184
Kauaula Stream near mouth, near Lahaina, Maui..... 170
Kaukonahua Stream, at Waialua, Oahu..... 166
North Fork, above Right Branch, near Wahiawa, Oahu..... 52
South Fork, at East Pump Reservoir, near Wahiawa, Oahu..... 53,167
Kaunakakai Gulch at Kaunakakai, Molokai..... 125,185
Kaunala Gulch, near Mauna Loa, Molokai..... 169
near Sunset Beach, Oahu..... 168
Kaupuni Stream at altitude 372 ft, near Waianae, Oahu..... 166
Kawa Stream at Kaneohe, Oahu 168
Kawaiki Stream near Kamuela, Hawaii..... 154,188
Kawaikoi Stream near Waimea, Kauai..... 30,182
Kawailena Stream near Pelekunu, Molokai..... 164
Kawainui Canal at Kailua, Oahu..... 168
Kawainui Stream, at altitude 1,000 ft, near Pelekunu, Molokai..... 164
near Kamuela, Hawaii..... 153,188
near Pelekunu, Molokai..... 164
Kawaipapa Gulch at Hana, Maui..... 169
Kawaipoko Stream near Pelekunu, Molokai..... 164
Keaahala Stream at Kamehameha Highway, at Kaneohe, Oahu..... 168
Keanuiomano Stream near Kamuela, Hawaii..... 172
Keehia Gulch near Ookala, Hawaii..... 171
Keopu Stream near Kailua, Hawaii..... 172
Kepuni Gulch near Kahikinui House, Maui..... 169
Kipapa Stream near Wahiawa, Oahu..... 55
Kohakohau Stream near Kamuela, Hawaii..... 160,189
Konohiki Stream near Kapaa, Kauai..... 165
Koolau ditch, at Haipuaena, near Huelo, Maui.. 129,186
Kukuiula Gulch near Kipahulu, Maui..... 169
Kulanihakoi Gulch near Kihei, Maui..... 171
Kuliouou Valley at Kuliouou, Oahu..... 167
Lawai Stream near Koloa, Kauai..... 165
Liilioholo Gulch at Kamaole, Maui..... 171
Lower Anahola ditch near Kealia, Kauai..... 48,184
Luahine Gulch near Waimea, Hawaii..... 172
Luluku Stream at altitude 220 ft, near Kaneohe, Oahu..... 89-93
Lyman Springs No. 2 near Piihonua, Hawaii..... 143,188
Mailiilii Stream near Waianae, Oahu..... 166
Makaha Stream, at Makaha, Oahu..... 166
near Makaha, Oahu..... 54
Makaleha ditch near Kealia, Kauai..... 45,183

Page
Makaleha Stream near Waialua, Oahu..... 166
Makawao Stream near Kailua, Oahu..... 83
Makaweli River near Waimea, Kauai..... 36,182
Makua Stream at Makua, Oahu..... 166
Malaekahana Stream at altitude 30 ft, near Kahuku, Oahu..... 168
Malalowaiaole Gulch near Maalaea, Maui..... 170
Manawainui Gulch near Kualapuu, Molokai..... 169
Manini Gulch at Kaena, Oahu..... 166
Manoa-Palolo Drainage Canal at Moiliili, Oahu..... 167
Maui, island of, crest-stage partial-record stations in..... 169-171
gaging-station records in..... 127-140
ground-water records in..... 209-216
map of..... 16-17
water-quality records at ground-water sites in..... 233-234,255
periodic determinations of temperature.. 186-187
Maunawili Stream at Highway 61, near Kailua, Oahu..... 168
Mean concentration, definition of..... 7
Mean discharge, definition of..... 5
Microgram per gram, definition of..... 6
Microgram per liter, definition of..... 6
Milligram per liter, definition of..... 6
Moanalua Stream, at Tripler Hospital, Oahu.... 167
near Aiea, Oahu..... 167
near Honolulu, Oahu.....
Molokai, island of, crest-stage partial record stations in..... 169
gaging-station records in..... 116-126
ground-water records in..... 202-208
low-flow partial-record stations in..... 164
map of..... 14-15
water-quality records, at ground-water sites in..... 232,254
observations of physical parameters..... 185
Molokai tunnel, at east portal, Molokai..... 121,185
at west portal, Molokai..... 122,185
Moomoonui Gulch at Hana, Maui..... 169
Nahomalu Valley near Mana, Kauai..... 165
Nanakuli Stream at Nanakuli, Oahu..... 166
National stream-quality-accounting network, definition of..... 22
Ninole Gulch near Punaluu, Hawaii..... 172
North Wailua ditch, below Waikoko Stream, near Lihue, Kauai..... 39,182
Numbering system for wells and miscellaneous sites..... 9
sketch of..... 20
Nuuanu Stream below reservoir 2 wasteway, near Honolulu, Oahu..... 81
Oahu, island of, crest-stage partial-record stations in..... 168-188
gaging-station records in..... 52-115
ground-water records in..... 194-201
low-flow partial-record stations in..... 164
map of..... 12-13
water-quality records, at ground-water sites in.....229-232,239-253
at partial-record stations in.....173,175-181
Oio Stream near Kahuku, Oahu..... 168
Olaa flume Spring near Kaumana, Hawaii..... 142,188
Olowalu Stream at Olowalu, Maui..... 170
Opaekaa Stream, Left Branch, near Kapaa, Kauai..... 44,183
Opaeula Stream, near Haleiwa, Oahu..... 168
near Wahiawa, Oahu..... 115
Opana tunnel at Kailiili, Maui..... 132,186

	Page
Organic mass, definition of	4
Other data available	24
Paauau Gulch at Pahala, Hawaii	172
Paiakuli Reservoir tributary near Waimea, Hawaii	172
Palai Stream at Hilo, Hawaii	171
Papio Gulch at Halawa, Molokai	128,185
Partial-record station, definition of	8
Particle size, definition of	8
Particle-size classification, definition of	6
Paumalu Gulch at Sunset Beach, Oahu	168
Pauoa Stream at Honolulu, Oahu	167
Pearl Harbor Springs, at Kalauao, near Aiea, Oahu	164
at Waiawa, near Pearl City, Oahu	184
Percent composition, definition of	6
Periodic determinations of temperature	182-190
Pesticides, definition of	6
Picocurie, definition of	6
Pilipililau Stream near Pelekunu, Molokai	120,185
Poamoho Stream at Waialua, Oahu	166
Poelua Gulch near Kahakuloa, Maui	170
Pohakupili Gulch near Halawa, Molokai	189
Pohakupuka Stream near Papaaloa, Hawaii	171
Polychlorinated biphenyls, definition of	6
Popoo Gulch near Waikii, Hawaii	172
Publications	24,26
Publications on techniques of water-resources investigations	28-29
Pukuilua Gulch near Hana, Maui	169
Punaluu ditch near Punaluu, Oahu	110
Punaluu Stream near Punaluu, Oahu	111
Puukumu Stream near Kilauea, Kauai	165
Records of discharge collected by agencies other than the Geological Survey	24
Recoverable from bottom material, definition of	5
Sediment	25
Sediment, definition of	7
Solute, definition of	7
Special networks and programs	22
Specific conductance, definition of	7
Stable storm ditch near Lihue, Kauai	40,182
Stage-discharge relation, definition of	7
Streamflow, definition of	7
Summary of hydrologic conditions	2
Suspended, definition of	7
Suspended recoverable, definition of	7
Suspended-sediment concentration, definition of	7
Suspended sediment, definition of	7
Suspended-sediment discharge, definition of	7
Suspended-sediment load, definition of	7
Suspended, total, definition of	7
Time-weighted average, definition of	8
Tons per acre-foot, definition of	8
Tons per day, definition of	8
Total, definition of	8
Total coliform bacteria, definition of	4
Total in bottom material, definition of	5
Total load, definition of	8
Total, recoverable, definition of	8
Total-sediment discharge, definition of	7
Turbidity, definition of	8
Unnamed gulch, at Maliko Bay, Maui	170
at Maluhia Camp, Maui	170
Upper Hamakua ditch, above Alakahi Stream, near Kamuela, Hawaii	156,189
above Puukapu Reservoir, near Kamuela, Hawaii	159,189
above Waimea Reservoir diversion, near Kamuela, Hawaii	158,189
below Kawaiki Stream, near Kamuela, Hawaii	155,189
Waiaha Stream at Luawai, near Holualoa, Hawaii	172
Waiakea Stream, at Hilo, Hawaii	171
near Mountain View, Hawaii	141,188
Waiakeakua Stream at Honolulu, Oahu	82
Waiakoa Gulch, at Kihei, Maui	171
tributary near Waiakoa, Maui	171
Waialae Stream at altitude 3,820 ft, near Waimea, Kauai	31-32
Waiawa Stream near Pearl City, Oahu	62
Waihee River at dam, near Waihee, Maui	134,187
Waihee Stream, near Kahaluu, Oahu	107
North Fork, near Heeia, Oahu	106
South Fork, near Heeia, Oahu	105
Waikakalaua Stream near Wahiawa, Oahu	166
Waikane Stream at altitude 75 ft, at Waikane, Oahu	108
Waikapu Stream near Kihei, Maui	170
Waikele Stream, at Waipahu, Oahu	58-61
at Wheeler Field, Oahu	166
Waikoloa Stream at Marine Dam, near Kamuela, Hawaii	161,190
Waikolu Stream, at altitude 900 ft, near Kalaupapa, Molokai	123,185
below pipeline crossing, near Kalaupapa, Molokai	124,185
Wailoa ditch at Honopou, near Huelo, Maui	131,186
Wailua ditch near Kapaa, Kauai	42,183
Wailua River, East Branch of North Fork, near Lihue, Kauai	41,183
near Kapaa, Kauai	165
North Fork, near Kapaa, Kauai	43,183
South Fork, near Lihue, Kauai	38,182
Wailupe Gulch at Aina Naina, Oahu	167
Wailuku River, at Hilo, Hawaii	145-148
at Piihonua, Hawaii	144,188
Waimalu Stream near Aiea, Oahu	167
Waimanalo Stream at Waimanalo, Oahu	167
Waimea Gulch near Kawailoa Camp, Oahu	168
Waimea River, at Waimea, Kauai	165
near Waimea, Kauai	33-35
Wainiha River near Hanalei, Kauai	51,184
Waolani Stream at Honolulu, Oahu	167
Water analysis	25
Water temperature	25
Wawaia Gulch at Kamalo, Molokai	169
WDR, definition of	8
Weighted average, definition of	8
West Wailuaiki Stream near Keanae, Maui	128,186
Wet mass, definition of	4
WRD, definition of	8
WSP, definition of	8

THIS PAGE INTENTIONALLY LEFT BLANK

THIS PAGE INTENTIONALLY LEFT BLANK

October 1, 1978

FACTORS FOR CONVERTING INCH-POUND UNITS TO INTERNATIONAL SYSTEM UNITS (SI)

The following factors may be used to convert the inch-pound units published herein to the International System of Units (SI).

Multiply inch-pound units	By	To obtain SI units
	Length	
inches (in)	2.54×10^{1}	millimeters (mm)
	2.54×10^{-2}	meters (m)
feet (ft)	3.048×10^{-1}	meters (m)
miles (mi)	1.609×10^{0}	kilometers (km)
	Area	
acres	4.047×10^{3}	square meters (m^2)
	4.047×10^{-1}	square hectometers (hm^2)
	4.047×10^{-3}	square kilometers (km^2)
square miles (mi^2)	2.590×10^{0}	square kilometers (km^2)
	Volume	
gallons (gal)	3.785×10^{0}	liters (L)
	3.785×10^{0}	cubic decimeters (dm^3)
	3.785×10^{-3}	cubic meters (m^3)
million gallons	3.785×10^{3}	cubic meters (m^3)
	3.785×10^{-3}	cubic hectometers (hm^3)
cubic feet (ft^3)	2.832×10^{1}	cubic decimeters (dm^3)
	2.832×10^{-2}	cubic meters (m^3)
cfs-days	2.447×10^{3}	cubic meters (m^3)
	2.447×10^{-3}	cubic hectometers (hm^3)
acre-feet (acre-ft)	1.233×10^{3}	cubic meters (m^3)
	1.233×10^{-3}	cubic hectometers (hm^3)
	1.233×10^{-6}	cubic kilometers (km^3)
	Flow	
cubic feet per second (ft^3/s)	2.832×10^{1}	liters per second (L/s)
	2.832×10^{1}	cubic decimeters per second (dm^3/s)
	2.832×10^{-2}	cubic meters per second (m^3/s)
gallons per minute (gal/min)	6.309×10^{-2}	liters per second (L/s)
	6.309×10^{-2}	cubic decimeters per second (dm^3/s)
	6.309×10^{-5}	cubic meters per second (m^3/s)
million gallons per day	4.381×10^{1}	cubic decimeters per second (dm^3/s)
	4.381×10^{-2}	cubic meters per second (m^3/s)
	Mass	
tons (short)	9.072×10^{-1}	megagrams (Mg) or metric tons

POSTAGE AND FEES PAID
U.S. DEPARTMENT OF THE INTERIO
INT 413

U.S. MAIL

U.S. DEPARTMENT OF THE INTERIOR
Geological Survey, Room 6110
300 Ala Moana Boulevard, P.O. Box 50166
Honolulu, HI 96850

OFFICIAL BUSINESS
PENALTY FOR PRIVATE USE $300

SPECIAL 4TH CLASS BOOK RATE