

**State of Hawaii
COMMISSION ON WATER RESOURCE MANAGEMENT
Department of Land and Natural Resources**

022 03:43

07/24 P3:10

PETITION TO AMEND INTERIM INSTREAM FLOW STANDARDS

WEST WAILUAIKI STREAM, EAST MAUI

Instructions: Please print in ink or type and send completed petition with attachments to the Commission on Water Resource Management, P.O. Box 821, Honolulu, Hawaii 96809. Petition must be accompanied by a non-refundable filing fee of \$25.00 payable to the Dept. of Land and Natural Resources. The Commission may not accept incomplete applications. For assistance, call the Regulation Branch at 587-0225.

1. PETITIONER

Firm/Name Na Moku 'Aupuni o Ko'olau Hui c/o Native Hawaiian Legal Corporation
 Contact Person Alan Murakami, Attorney Ph: 521-2302
 Address 1164 Bishop Street, Honolulu, Hawai'i 96813

2. STREAMFLOW DATA

USGS stream gaging station 165180 Period of Record Data to follow.
 Location/Reach SEE ATTACHED
 (Attach a USGS map, scale 1"=2000', and a property tax map showing diversion location referenced to established property boundaries.)

TABLE 1. PERIOD OF RECORD AVERAGE MONTHLY STREAMFLOW WITHIN THE AFFECTED STREAM REACH, IN CFS

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	--------

STREAMFLOW DATA TABLES TO FOLLOW.

Annual Median flow in cfs =

TABLE 2. PROPOSED AVERAGE MONTHLY STREAMFLOW DIVERSION FROM AFFECTED STREAM REACH, IN CFS

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	--------

NONE. UNDETERMINED; SUFFICIENT FOR TARO FARMING AND/OR GATHERING.

Annual Median flow in cfs =

RESTORATION

TABLE 3. AVERAGE MONTHLY STREAMFLOW IN AFFECTED STREAM REACH AFTER ~~RESTORATION~~ (min release flow), IN CFS

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	--------

NATURAL STREAMFLOW EXCEPT FOR EXERCISE OF APPURTENANT WATER RIGHTS.

Annual Median flow in cfs =

3. EXISTING INSTREAM AND OFFSTREAM WATER USES FOR ENTIRE STREAM REACH

TMK	OWNER	USE
		RESEARCH IN PROGRESS.

(If more space is necessary, attach an extended list following above format)

4. ANTICIPATED IMPACTS ON STREAM AND BASIS FOR SUCH IMPACTS:

RESTORATION OF INSTREAM NATURAL HABITAT AND BIOTA, AND BENEFICIAL APPURTENANT AND GATHERING USES.

(Attach supporting documentation, plans, letters, etc.)

NATIVE HAWAIIAN LEGAL CORPORATION



Signature

Alan Murakami Partner
 Attorney for Na Moku 'Aupuni o Ko'olau Hui

May 24, 2001

Date

For Official Use

Date Received

Date Accepted

West and East Wailuaiki Streams

Although these streams do not converge, they are quite similar and hence will be discussed together in this section. Both streams are headed 6.6 mi inland at 6,000 ft altitude (plate 1). The streams rise steeply from sea level to 600 ft altitude 0.5 mi from the coast (a gradient of 1,130 ft/mi) and at this altitude, the valleys are incised 240 ft below the upland surface. The stream valleys lie on Kula Volcanics along much of their length but Honomanu Basalt can be found as far as 2,000 ft from the ocean (Stearns and Macdonald, 1942). Streamflow is captured by the Koolau Ditch diversion system at 1,300 ft altitude (table 4).

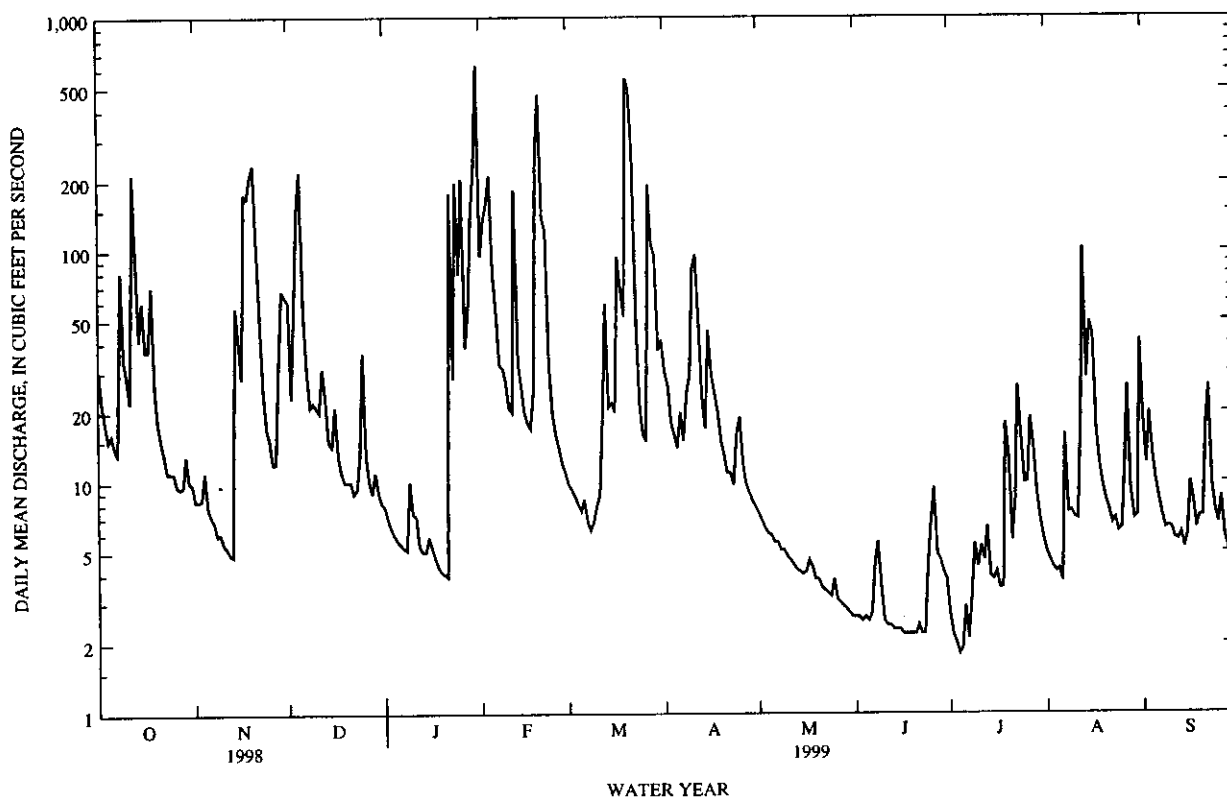
West Wailuaiki Stream (1921–97) and East Wailuaiki Stream (1922–58) have never been dry at the gaging stations (5180, 5170) upstream of the Koolau Ditch (table 2, plate 1). The average annual gains from ground water upstream of the gaging stations are about 4.53 and 4.82 Mgal/d, respectively (table 2, fig. 15M). A streamflow measurement made on June 25, 1962 at the West Wailuaiki gaging station shows a flow of 0.90 Mgal/d (table 17). About 82 percent of this flow was gained downstream of 3,000 ft altitude where a set of measurements were made on two stream branches (U.S. Geological Survey, 1962). Measurements made March 21, 1984 on a shorter stream section show that 72 percent of the flow at the gaging station was gained downstream of 2,565 ft altitude and the largest gains were between 2,565 ft and 2,400 ft altitude (Chinn, Tateishi, and Yee, 1985). Measurements made in March 1928 by EMI personnel at 500 ft altitude in both West and East Wailuaiki Streams show gains of 0.5 and 0.2 Mgal/d, respectively, downstream of 1,300 ft altitude (table 10).

The area upstream of gaging station 5180 is 3.67 mi² and in the water budget, 33.11 Mgal/d of rainfall and 9.28 Mgal/d of fog drip is apportioned into 18.75 Mgal/d of runoff, 5.05 Mgal/d of evapotranspiration, and 18.59 Mgal/d of recharge (table 1, fig. 6) (Shade, 1999). The estimated base flow at the gaging station is about 25 percent of the recharge to the subbasin. The results for the 3.11-mi² subbasin upstream of gaging station 5170 are similar; 30.20 Mgal/d of rainfall, 8.46 Mgal/d of fog drip, 14.90 Mgal/d of runoff, 4.33 Mgal/d of evapotranspiration, and 19.43 Mgal/d of recharge (table 1, fig. 6). Although this subbasin receives less total precipitation, it receives slightly more recharge

because less runoff and evapotranspiration occur. The base flow for the East Wailuaiki Stream subbasin is about 25 percent of the estimated recharge.

HAWAII, ISLAND OF MAUI
 16518000 WEST WAILUAIKI STREAM NEAR KEANAE--Continued

SUMMARY STATISTICS	FOR 1998 CALENDAR YEAR		FOR 1999 WATER YEAR		WATER YEARS 1914 - 1999	
ANNUAL TOTAL	9523.2		11835.6		35.0	
ANNUAL MEAN	26.1		32.4		67.3	
HIGHEST ANNUAL MEAN					14.5	
LOWEST ANNUAL MEAN					1980	
HIGHEST DAILY MEAN	234	Nov 20	632	Jan 31	2260	Jan 26 1948
LOWEST DAILY MEAN	1.4	Mar 20	1.8	Jul 4	.62	Jul 23 1922
ANNUAL SEVEN-DAY MINIMUM	1.5	Mar 15	2.2	Jun 14	.71	Oct 25 1984
ANNUAL RUNOFF (AC-FT)	18890		23480		25370	
10 PERCENT EXCEEDS	60		78		77	
50 PERCENT EXCEEDS	13		9.8		10	
90 PERCENT EXCEEDS	2.8		3.4		3.3	



Streamflow

Estimates of streamflow and base flow are based on streamflow records of varying length and from different times. The error associated with comparing these records is not considered significant because the average annual values used in the comparisons are expected to be within about 10 percent of the true value in most cases. A statistical analysis of five streamflow records, each with more than 60 years of record, shows that the average annual discharge for any 10-year period within that record has a standard error of 12 percent when compared with the whole record (Fontaine, 1996). When the length of the subset is increased to a 50-year period, the standard error only improves to 5 percent. Thirty nine of the streamflow records for the study area are equal to or greater than 10 years long.

For this study, the length of the period of record at each gaging station was determined to be unimportant by comparing each record to three reference records from the study area. The three longest streamflow records, 5080 (73 years), 5180 (76 years), and 5870 (85 years) were chosen as reference records. For each other individual record, a time period equal to the length of that record was chosen. A subset of a reference record was then selected from this same time period and the average flow during that time period was compared with the total reference record to estimate the ratio of flow during the subset period to the reference period. This analysis was made for all three reference records and the result was averaged to obtain a period-of-record scale factor for each of the other records. The scale factor ranged from 0.88 to 1.13 (table 2). This variability is consistent with the statistical analysis reported by Fontaine (1996). This range of accuracy is considered sufficient for the type of comparisons made in this study, and therefore, no corrections were made to any of the records to account for differences in length or period of record.

Table 17. Streamflow and temperature in West Wailuaiki Stream, northeast Maui, Hawaii

[ft. feet; Mgal/d, million gallons per day; °C, degrees Celsius; --, not determined; all altitudes estimated from U.S. Geological Survey topographic map, Keanae and Nahiku quadrangles; 1962 data from U.S. Geological Survey (undated[a]); 1984 data from Chinn and others (1985); gaging-station number is preceded by 16 and ends in 00]

Station number	Stream name	Altitude (ft)	Date	Stream-flow (Mgal/d)	Water temperature (°C)	Comments
5180	West Wailuaiki	1,343	6/25/62 3/21/84	0.90 1.55	-- --	Daily mean; upstream of Koolau Ditch diversion
West Wailuaiki 12	West Wailuaiki	2,400	3/21/84	0.92	20.5	
West Wailuaiki 13	West Wailuaiki	2,565	3/21/84	0.45	19.0	
West Wailuaiki 14	West Wailuaiki (east branch)	2,570	3/21/84	0.10	20.5	
West Wailuaiki 15	West Wailuaiki (west branch)	2,570	3/21/84	0.34	--	By subtraction
West Wailuaiki 16	West Wailuaiki (east branch)	3,040	6/25/62	0.06	--	
West Wailuaiki 17	West Wailuaiki (west branch)	3,080	6/25/62	0.10	--	

WAILUAIKI (West)

DVSTAT - DAILY VALUES STATISTICAL PROGRAM

STATION ID - 16518000
 West Waialuaiki Stream near Keanea, Maui, HI
 PARAMETER CODE - 00060 DISCHARGE
 STATISTIC CODE - 00003 MEAN

DURATION TABLE OF DAILY VALUES
 FOR PERIOD OCT TO SEP

CLASS	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	32	33	34	35			
WATER YEAR RANGE	1915	1915	1915	1915	1915	1915	1915	1915	1915	1915	1915	1915	1915	1915	1915	1915	1915	1915	1915	1915	1915	1915	1915	1915	1915	1915	1915	1915	1915	1915	1915	1915	1915	1915	1915	1915		
NUMBER OF DAYS IN CLASS	5	24	49	14	44	20	31	34	33	23	18	15	12	4	12	9	7	3	4	2	2	2	2	3	4	2	2	3	4	2	2	2	2	2	2	2		
1917 1917	8	5	8	20	23	42	22	51	23	34	23	24	11	13	4	14	6	9	5	4	2	1	3	1	1	1	3	1	1	1	1	1	1	1	1	1		
1923 1923																																						
1924 1924																																						
1925 1925																																						
1926 1926																																						
1927 1927																																						
1928 1928																																						
1929 1929																																						
1930 1930																																						
1931 1931																																						
1932 1932																																						
1933 1933	1	8	15	14	15	16	31	34	33	24	33	26	20	22	22	14	18	14	12	6	9	10	4	6	5	3	4	4	1	1	1	1	1	1	1	1	1	
1934 1934																																						
1935 1935																																						
1936 1936																																						
1937 1937																																						
1938 1938																																						
1939 1939																																						
1940 1940																																						
1941 1941																																						
1942 1942																																						
1943 1943																																						
1944 1944																																						
1945 1945																																						
1946 1946																																						
1947 1947																																						
1948 1948																																						
1949 1949																																						
1950 1950																																						
1951 1951																																						
1952 1952																																						
1953 1953																																						
1954 1954																																						

STATION ID - 16518000
 West Mauiwaiki Stream near Keanae, Maui, HI
 PARAMETER CODE - 00060 DISCHARGE
 STATISTIC CODE - 00003 MEAN

DVSTPT - DAILY VALUES STATISTICAL PROGRAM

DURATION TABLE OF DAILY VALUES

CLASS	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	32	33	34	35
WATER YEAR																																			
1990 1990																																			
1991 1991																																			
1992 1992																																			
1993 1993																																			
1994 1994																																			
1995 1995																																			
1996 1996																																			
1997 1997																																			
1998 1998																																			
1999 1999																																			
2000 2000																																			

CLASS	VALUE	TOTAL	ACCU	PERCT	CLASS	VALUE	TOTAL	ACCU	PERCT	CLASS	VALUE	TOTAL	ACCU	PERCT	CLASS	VALUE	TOTAL	ACCU	PERCT	CLASS	VALUE	TOTAL	ACCU	PERCT	CLASS	VALUE	TOTAL	ACCU	PERCT	CLASS	VALUE	TOTAL	ACCU	PERCT																														
1	0.00	0	29220	100.00	13	9.30	2482	15730	53.83	25	179.00	330	1155	3.95	26	229.00	265	825	2.82	27	293.00	187	560	1.92	28	375.00	120	373	1.28	29	479.00	104	253	0.87	30	613.00	68	149	0.51	31	784.00	34	81	0.28	32	1000.00	27	47	0.16	33	1280.00	12	20	0.07	34	1640.00	6	8	0.03	35	2100.00	2	2	0.01
2	0.62	11	29220	100.00	14	12.00	2257	13248	45.34	26	229.00	265	825	2.82	27	293.00	187	560	1.92	28	375.00	120	373	1.28	29	479.00	104	253	0.87	30	613.00	68	149	0.51	31	784.00	34	81	0.28	32	1000.00	27	47	0.16	33	1280.00	12	20	0.07	34	1640.00	6	8	0.03	35	2100.00	2	2	0.01					
3	0.79	57	29209	99.96	15	15.00	1958	10991	37.61	27	293.00	187	560	1.92	28	375.00	120	373	1.28	29	479.00	104	253	0.87	30	613.00	68	149	0.51	31	784.00	34	81	0.28	32	1000.00	27	47	0.16	33	1280.00	12	20	0.07	34	1640.00	6	8	0.03	35	2100.00	2	2	0.01										
4	1.00	93	29152	99.77	16	19.00	1845	9033	30.91	28	375.00	120	373	1.28	29	479.00	104	253	0.87	30	613.00	68	149	0.51	31	784.00	34	81	0.28	32	1000.00	27	47	0.16	33	1280.00	12	20	0.07	34	1640.00	6	8	0.03	35	2100.00	2	2	0.01															
5	1.30	214	29059	99.45	17	25.00	1297	7188	24.60	29	479.00	104	253	0.87	30	613.00	68	149	0.51	31	784.00	34	81	0.28	32	1000.00	27	47	0.16	33	1280.00	12	20	0.07	34	1640.00	6	8	0.03	35	2100.00	2	2	0.01																				
6	1.70	403	28845	98.72	18	32.00	1031	5891	20.16	30	613.00	68	149	0.51	31	784.00	34	81	0.28	32	1000.00	27	47	0.16	33	1280.00	12	20	0.07	34	1640.00	6	8	0.03	35	2100.00	2	2	0.01																									
7	2.10	986	28442	97.34	19	41.00	805	4860	16.63	31	784.00	34	81	0.28	32	1000.00	27	47	0.16	33	1280.00	12	20	0.07	34	1640.00	6	8	0.03	35	2100.00	2	2	0.01																														
8	2.70	1488	27456	93.36	20	52.00	782	4055	13.88	32	1000.00	27	47	0.16	33	1280.00	12	20	0.07	34	1640.00	6	8	0.03	35	2100.00	2	2	0.01																																			
9	3.50	1845	25968	88.87	21	67.00	665	3273	11.20	33	1280.00	12	20	0.07	34	1640.00	6	8	0.03	35	2100.00	2	2	0.01																																								
10	4.40	2566	24123	82.56	22	85.00	593	2608	8.93	34	1640.00	6	8	0.03	35	2100.00	2	2	0.01																																													
11	5.70	2863	21557	73.77	23	109.00	479	2015	6.90	35	2100.00	2	2	0.01																																																		
12	7.30	2964	18694	63.98	24	140.00	381	1536	5.26																																																							

DURATION CURVE STATISTICAL CHARACTERISTICS FOR ...
 STATION ID: 16518000 West Wailuiki Stream near Keanae, Maui, HI
 PARAMETER CODE = 00060
 STATISTIC CODE = 00003 MEAN

DURATION DATA VALUES ARE INTERPOLATED FROM DURATION TABLE:
 DATA ARE NOT ANALYTICALLY FITTED TO A PARTICULAR STATISTICAL DISTRIBUTION,
 AND THE USER IS RESPONSIBLE FOR ASSESSMENT AND INTERPRETATION.

ADDITIONAL CONDITIONS FOR THIS RUN ARE:
 STATISTICS ARE BASED ON LOGARITHMS (BASE 10).
 NUMBER OF VALUES IS REDUCED FOR EACH NEAR-ZERO OR ZERO VALUE.

NUMBER OF VALUES = 19 (NUMBER OF NEAR-ZERO VALUES = 0)
 LISTING OF DATA FOLLOWS:

PERCENT OF TIME VALUE EQUALED OR EXCEEDED	DATA VALUE	(LOG =
95.0	2.52	0.40064)
90.0	3.32	(LOG = 0.52148)
85.0	4.05	(LOG = 0.60764)
80.0	4.78	(LOG = 0.67929)
75.0	5.52	(LOG = 0.74183)
70.0	6.32	(LOG = 0.80047)
65.0	7.13	(LOG = 0.85327)
60.0	8.08	(LOG = 0.90763)
55.0	9.07	(LOG = 0.95760)
50.0	10.5	(LOG = 1.02195)
45.0	12.1	(LOG = 1.08392)
40.0	14.1	(LOG = 1.14840)
35.0	16.6	(LOG = 1.21908)
30.0	19.9	(LOG = 1.29816)
25.0	24.6	(LOG = 1.39128)
20.0	32.4	(LOG = 1.51068)
15.0	47.5	(LOG = 1.67686)
10.0	76.5	(LOG = 1.88367)
5.0	147.7	(LOG = 2.16931)

MEAN OF LOGS = 1.09859

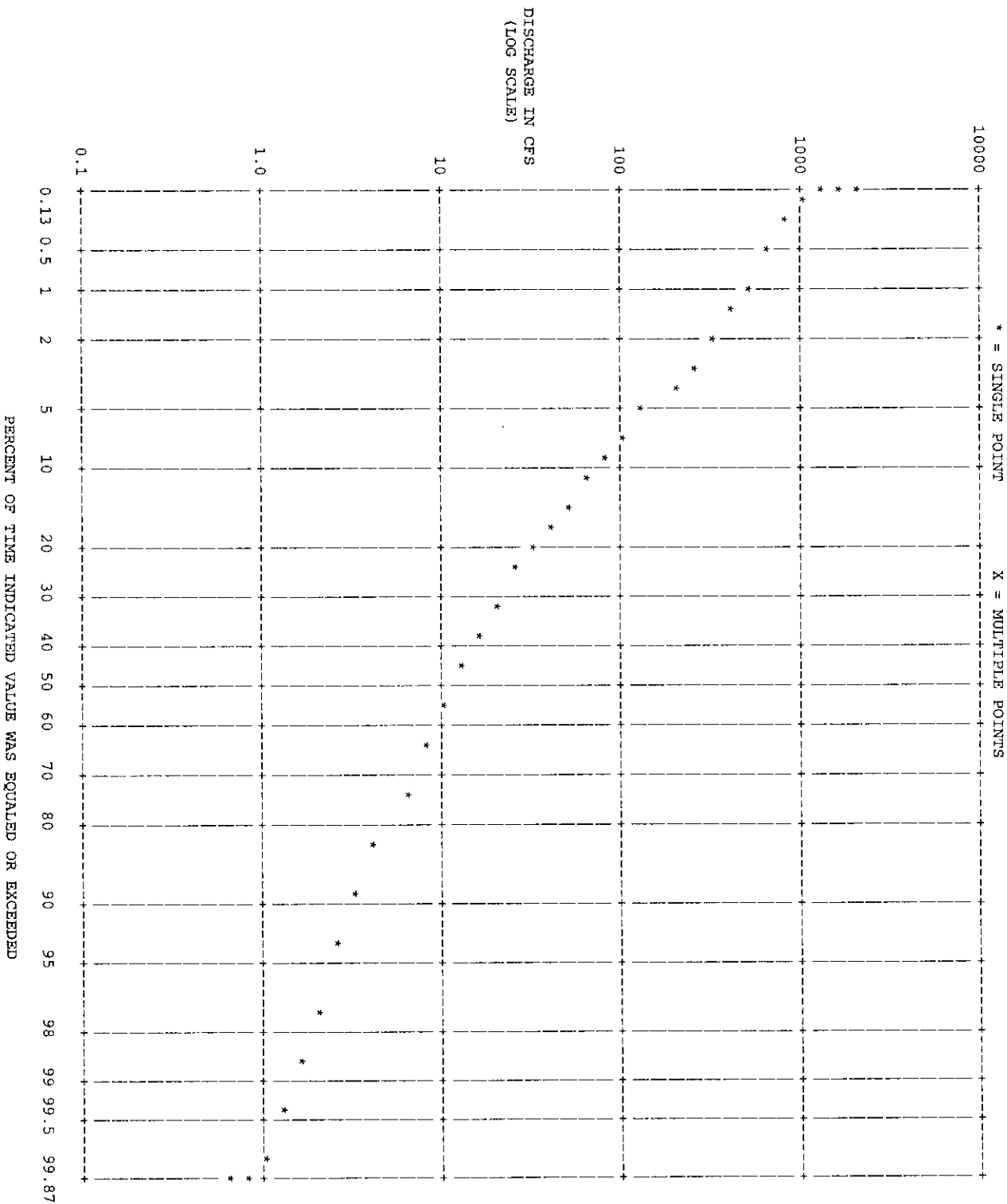
STANDARD DEVIATION OF LOGS = 0.47054 (VARIABILITY INDEX - SEE USGS WSP 1542-A)

COEFFICIENT OF VARIATION = 0.42831

COEFFICIENT OF SKEW = 0.70837

LOG-NORMAL DURATION PLOT FOR PERIOD OCT TO SEP
 STATION ID: 16518000 West Waiauiki Stream near Keanae, Maui, HI
 PARAMETER CODE - 00060 DISCHARGE
 STATISTIC CODE - 00003 MEAN

(YEARS 1914 - 2001)



DVSTAT - DAILY VALUES STATISTICAL PROGRAM

STATION ID - 16518000
 West Maui Waikoi Stream near Keanae, Maui, HI
 PARAMETER CODE - 00060 DISCHARGE
 STATISTIC CODE - 00003 MEAN

LOWEST MEAN VALUE AND RANKING FOR THE FOLLOWING NUMBER OF CONSECUTIVE DAYS
 FOR PERIOD OCT TO SEP

WATER YEAR RANGE	1	3	7	14	30	60	90	120	183
1915 1915	3.10 68	3.10 68	3.44 68	4.09 67	5.86 64	8.94 50	15.3 51	17.2 51	23.5 47
1917 1917	.93 6	.93 5	.93 4	1.37 8	1.78 8	3.34 9	4.21 5	5.65 5	12.4 11
1923 1923	2.80 67	3.00 67	3.37 67	3.55 64	5.10 61	13.2 64	16.7 58	16.4 48	22.5 40
1924 1924	2.00 35	2.27 48	2.47 46	2.90 46	3.92 42	6.88 38	14.1 47	13.0 34	23.1 45
1925 1925	3.40 72	3.60 72	3.94 72	4.81 71	5.94 65	11.1 55	19.2 64	20.0 59	35.5 71
1926 1926	1.10 10	1.20 11	1.31 10	1.53 10	1.66 4	3.24 7	3.91 4	6.28 8	8.80 2
1927 1927	2.20 45	2.20 40	2.44 44	2.77 43	3.98 44	16.5 70	18.8 63	23.8 71	31.0 65
1928 1928	1.60 22	1.77 26	1.84 22	2.18 25	3.54 36	19.6 75	29.6 78	32.9 78	34.1 68
1929 1929	1.40 17	1.40 16	1.63 19	2.19 26	4.70 57	8.33 46	10.3 33	15.0 43	19.8 31
1930 1930	1.20 12	1.33 13	1.44 15	1.75 17	2.33 16	25.7 80	29.8 79	31.7 77	53.7 80
1931 1931	1.90 33	2.03 35	2.24 36	2.60 39	4.38 51	12.2 61	12.1 38	15.3 45	27.1 58
1932 1932	3.30 71	3.57 71	4.66 76	5.86 78	9.49 75	12.0 60	22.1 72	20.2 62	36.2 72
1933 1933	.77 2	.88 3	.93 5	1.02 2	1.50 2	4.44 16	5.91 13	6.51 10	8.90 3
1934 1934	1.40 18	1.53 19	1.60 18	1.76 18	2.22 14	5.46 27	13.8 44	12.3 32	16.6 25
1935 1935	3.70 75	3.90 76	4.21 74	4.83 72	6.31 68	11.4 57	13.0 42	13.8 38	22.3 38
1936 1936	1.80 29	1.87 30	1.96 29	2.14 23	2.67 20	5.44 26	5.55 12	10.4 24	15.3 24
1937 1937	4.20 79	4.47 79	4.76 77	5.53 76	18.0 80	23.6 79	42.0 80	42.8 80	46.5 76
1938 1938	3.80 76	3.83 75	4.06 73	4.91 73	8.96 74	15.3 69	16.0 54	21.2 66	50.5 79
1939 1939	5.10 80	5.37 80	6.23 80	7.79 80	13.6 79	17.6 72	21.3 70	21.7 67	32.4 67
1940 1940	2.50 56	2.53 55	2.57 49	2.68 40	3.50 34	8.07 44	10.0 31	10.7 27	14.9 22
1941 1941	2.60 59	2.67 61	2.79 54	3.24 58	4.34 50	6.23 34	18.7 62	19.3 56	26.4 57
1942 1942	2.50 57	2.53 56	2.64 52	2.99 48	3.58 37	6.31 36	16.9 59	18.8 53	28.5 61
1943 1943	2.60 60	2.70 63	2.86 58	3.14 54	4.46 53	13.2 65	21.5 71	19.1 55	26.2 55
1944 1944	1.90 34	1.90 32	2.01 31	2.14 24	2.37 17	4.93 21	11.3 34	11.7 31	13.9 17
1945 1945	2.00 36	2.00 34	2.04 32	2.10 22	3.03 28	4.71 18	6.65 16	10.5 25	19.7 30
1946 1946	2.60 61	2.60 59	3.09 63	3.29 60	3.50 35	4.96 23	14.7 49	16.3 47	23.0 44
1947 1947	2.60 62	2.67 62	2.79 55	3.08 52	4.47 54	12.7 63	16.3 55	20.2 63	25.4 52
1948 1948	4.00 78	4.30 78	4.99 79	5.94 79	7.82 71	17.6 73	23.7 73	22.0 68	34.8 69
1949 1949	2.70 66	2.83 65	3.10 64	3.62 65	4.53 55	6.60 37	8.42 25	11.1 29	13.8 16
1950 1950	2.50 58	2.53 57	2.94 61	3.89 66	6.25 67	14.1 67	19.8 66	21.1 65	30.9 64
1951 1951	2.40 54	2.53 58	2.80 56	3.09 53	4.61 56	5.81 30	7.07 18	8.82 17	12.9 13
1952 1952	2.10 42	2.23 44	2.94 62	3.00 50	7.25 70	10.4 53	13.9 45	15.1 44	18.8 28
1953 1953	1.30 14	1.33 14	1.40 13	1.54 12	2.07 13	4.22 13	7.70 21	7.85 15	12.5 12
1954 1954	1.10 11	1.10 10	1.26 9	1.66 15	3.13 30	12.5 62	12.8 40	14.0 39	19.2 29
1955 1955	2.00 37	2.10 37	2.21 34	2.50 35	6.00 66	7.64 40	17.1 60	16.5 49	22.4 39

DVSTAT - DAILY VALUES STATISTICAL PROGRAM

STATION ID - 16518000
 West Wailuaiki Stream near Keanae, Maui, HI
 PARAMETER CODE - 00060 DISCHARGE
 STATISTIC CODE - 00003 MEAN

LOWEST MEAN VALUE AND RANKING FOR THE FOLLOWING NUMBER OF CONSECUTIVE DAYS
 FOR PERIOD OCT TO SEP

WATER YEAR	1	3	7	14	30	60	90	120	183
1956 1956	2.20 46	2.23 45	2.41 43	2.77 44	4.28 48	8.37 48	16.4 57	20.9 64	31.7 66
1957 1957	2.60 63	2.77 64	2.89 59	3.26 59	3.95 43	5.62 28	11.6 36	18.4 52	23.5 48
1958 1958	2.00 38	2.20 41	2.46 45	2.91 47	9.91 76	20.9 76	19.2 65	22.1 70	24.2 49
1959 1959	3.10 69	3.27 69	3.61 69	4.29 68	6.56 69	10.2 52	15.3 52	15.9 46	25.1 50
1960 1960	2.00 39	2.07 36	2.29 37	2.69 42	3.19 31	8.33 47	12.2 39	13.7 37	27.3 59
1961 1961	2.20 47	2.20 42	2.39 42	3.16 56	4.07 46	7.87 42	8.20 23	10.7 28	20.9 33
1962 1962	1.70 24	1.77 27	1.94 27	2.19 27	3.00 27	5.05 24	7.23 20	7.33 13	8.41 1
1963 1963	1.50 20	1.60 20	1.77 21	1.91 20	2.64 19	7.58 39	10.2 32	10.2 23	12.2 10
1964 1964	3.40 73	3.70 73	3.84 71	5.16 74	5.64 63	11.7 59	11.5 35	13.4 35	21.5 35
1965 1965	2.10 43	2.20 43	2.50 48	2.85 45	3.66 39	9.91 51	14.2 48	14.9 42	22.5 41
1966 1966	1.60 23	1.67 21	1.89 24	2.39 34	2.85 23	6.21 33	8.69 26	9.56 20	11.6 9
1967 1967	2.20 48	2.40 52	3.19 66	3.39 63	4.84 59	11.3 56	16.3 56	22.0 69	26.3 56
1968 1968	1.70 25	1.70 22	1.94 28	2.19 28	4.80 58	8.12 45	9.99 30	9.63 22	22.9 43
1969 1969	1.80 30	1.83 28	2.00 30	2.22 29	2.93 25	21.8 77	27.8 76	31.2 76	45.3 75
1970 1970	2.40 55	2.50 54	2.76 53	3.32 62	5.15 62	8.38 49	17.1 61	19.0 54	29.3 62
1971 1971	1.70 26	1.73 24	1.93 25	2.26 31	3.82 40	4.80 19	5.02 9	5.45 4	21.6 36
1972 1972	2.10 44	2.23 46	2.37 40	2.54 36	3.28 32	6.29 35	8.74 27	10.6 26	16.9 26
1973 1973	.94 7	1.08 9	1.36 11	1.60 14	1.80 10	2.61 4	4.22 6	5.04 2	10.4 6
1974 1974	.88 4	.89 4	.93 3	1.03 3	1.68 5	2.77 6	5.17 10	5.43 3	20.2 32
1975 1975	.80 3	.84 2	.91 2	1.03 4	3.12 29	3.95 11	4.87 8	7.25 12	9.70 5
1976 1976	2.20 49	2.37 50	2.37 41	2.55 37	3.63 38	5.80 29	6.77 17	6.47 9	14.5 20
1977 1977	1.20 13	1.20 12	1.36 12	1.53 11	1.82 11	2.32 2	3.88 3	9.53 19	25.2 51
1978 1978	1.70 27	1.73 25	1.86 23	1.93 21	2.96 26	4.86 20	14.0 46	12.9 33	17.1 27
1979 1979	2.20 50	2.23 47	2.33 38	2.68 41	4.17 47	7.71 41	11.7 37	14.5 41	14.5 21
1980 1980	2.00 40	2.17 39	2.49 47	3.15 55	5.09 60	16.6 71	28.0 77	29.1 74	48.0 77
1981 1981	1.00 9	1.00 8	1.07 7	1.28 7	1.68 6	1.90 1	2.44 1	4.94 1	9.64 4
1982 1982	3.60 74	3.77 74	4.37 75	5.50 75	10.5 77	18.0 74	27.6 75	36.8 79	39.8 73
1983 1983	1.30 15	1.40 17	1.41 14	1.46 9	1.73 7	2.50 3	3.07 2	6.25 7	13.9 18
1984 1984	1.30 16	1.37 15	1.50 16	1.54 13	1.87 12	4.47 17	5.45 11	5.68 6	13.3 15
1985 1985	.67 1	.68 1	.71 1	.75 1	.86 1	4.26 15	13.4 43	11.5 30	28.0 60
1986 1986	1.70 28	1.87 31	1.93 26	2.31 33	2.68 21	4.09 12	7.92 22	20.0 60	43.3 74
1987 1987	2.30 52	2.43 53	2.61 51	3.02 51	3.86 41	13.3 66	19.9 67	24.0 72	35.3 70
1988 1988	2.20 51	2.27 49	2.34 39	2.59 38	3.49 33	7.90 43	9.95 29	9.19 18	21.0 34
1989 1989	3.80 77	4.00 77	4.79 78	5.70 77	10.6 78	22.3 78	27.0 74	30.6 75	48.0 78
1990 1990	2.60 64	2.63 60	2.91 60	3.17 57	4.03 45	5.09 25	14.8 50	24.5 73	22.5 42
1991 1991	3.20 70	3.33 70	3.74 70	4.56 70	8.46 72	11.6 58	12.8 41	14.1 40	22.0 37
1992 1992	1.80 31	1.83 29	2.04 33	2.23 30	2.87 24	3.42 10	6.27 14	8.03 16	10.7 8

DVSTAT - DAILY VALUES STATISTICAL PROGRAM

STATION ID - 16518000
 West Wailuaiki Stream near Keanae, Maui, HI
 PARAMETER CODE - 00060 DISCHARGE
 STATISTIC CODE - 00003 MEAN

LOWEST MEAN VALUE AND RANKING FOR THE FOLLOWING NUMBER OF CONSECUTIVE DAYS
 FOR PERIOD OCT TO SEP

WATER YEAR RANGE	1	3	7	14	30	60	90	120	183
1993 1993	2.30 53	2.37 51	2.60 50	2.99 49	4.41 52	5.91 31	15.3 53	19.6 57	25.4 53
1994 1994	2.60 65	2.83 66	3.14 65	4.47 69	8.89 73	14.2 68	20.6 69	20.0 61	29.3 63
1995 1995	.96 8	.99 6	1.12 8	1.25 6	1.64 3	2.67 5	7.15 19	9.59 21	12.9 14
1996 1996	2.00 41	2.13 38	2.81 57	3.29 61	4.29 49	6.01 32	8.23 24	13.5 36	14.1 19
1997 1997	.89 5	.99 7	1.03 6	1.22 5	1.78 9	11.0 54	20.0 68	19.8 58	23.1 46
1998 1998	1.40 19	1.43 18	1.54 17	1.73 16	2.44 18	4.95 22	9.73 28	16.9 50	25.6 54
1999 1999	1.80 32	1.90 33	2.23 35	2.29 32	2.73 22	3.31 8	4.71 7	6.71 11	10.6 7
2000 2000	1.50 21	1.70 23	1.76 20	1.90 19	2.30 15	4.22 14	6.52 15	7.65 14	15.0 23

DVSTAT - DAILY VALUES STATISTICAL PROGRAM

STATION ID - 16518000
 West Maialaiki Stream near Keanae, Maui, HI
 PARAMETER CODE - 00060 DISCHARGE
 STATISTIC CODE - 00003 MEAN

HIGHEST MEAN VALUE AND RANKING FOR THE FOLLOWING NUMBER OF CONSECUTIVE DAYS
 FOR PERIOD OCT TO SEP

WATER YEAR RANGE	1	3	7	15	30	60	90	120	183
1915 1915	727 49	407 50	235 42	142 47	95.2 50	63.4 54	55.7 47	46.2 55	42.2 49
1917 1917	1130 24	835 12	446 18	280 19	167 20	110 19	82.3 23	65.3 31	50.8 34
1923 1923	591 58	410 48	406 23	338 7	177 16	108 22	87.9 20	72.1 22	58.2 25
1924 1924	1070 28	739 19	373 25	215 29	119 35	101 26	78.5 29	76.6 19	60.7 22
1925 1925	1830 4	814 17	359 27	241 24	180 13	103 24	76.6 31	64.6 32	62.3 20
1926 1926	452 73	196 75	196 75	95.7 77	43.0 79	27.6 80	23.9 80	21.8 80	16.4 80
1927 1927	1580 10	640 27	304 34	158 42	88.3 54	62.5 56	51.4 56	54.6 40	44.8 46
1928 1928	608 55	389 51	185 61	105 65	71.4 65	63.8 53	60.7 41	48.0 52	49.8 36
1929 1929	1200 20	708 22	437 19	255 23	176 18	110 18	91.5 18	82.2 15	66.3 17
1930 1930	1160 21	710 21	543 12	299 14	177 17	150 7	114 9	121 3	100 3
1931 1931	1100 26	622 28	318 31	174 35	98.4 47	60.7 59	52.7 52	45.2 58	47.1 43
1932 1932	955 34	682 23	422 20	330 9	216 8	130 10	110 10	96.8 12	81.7 10
1933 1933	976 33	517 32	258 38	131 53	86.2 56	56.9 61	51.6 55	45.2 59	35.1 66
1934 1934	1810 5	670 24	323 30	231 26	148 25	97.0 30	78.7 28	67.1 28	51.0 33
1935 1935	1860 3	1155 3	602 5	298 15	172 19	115 15	84.8 21	77.5 16	64.1 19
1936 1936	317 77	163 77	92.3 78	74.5 75	57.6 71	52.7 68	48.4 61	42.0 64	39.4 57
1937 1937	821 41	755 18	468 16	347 6	231 6	154 5	133 4	116 5	94.8 5
1938 1938	1870 2	1211 2	807 2	401 3	262 3	155 4	128 5	109 6	91.2 6
1939 1939	1040 30	480 35	331 28	182 32	100 45	88.5 33	69.9 35	69.1 27	55.9 29
1940 1940	860 37	536 30	301 36	176 34	124 32	71.4 44	52.6 53	42.9 63	35.8 63
1941 1941	815 43	377 54	215 49	126 54	73.8 63	55.7 62	45.2 68	48.7 51	42.2 50
1942 1942	1660 7	1138 4	870 1	509 1	334 2	213 2	156 3	120 4	99.6 4
1943 1943	520 69	221 74	120 74	87.1 74	59.5 70	45.9 71	39.0 71	37.4 68	34.1 68
1944 1944	305 78	154 79	81.1 80	57.8 79	40.1 80	31.7 78	27.6 79	24.5 78	21.6 78
1945 1945	402 75	266 68	175 63	137 50	86.1 57	58.7 60	40.9 70	32.8 72	32.3 70
1946 1946	1070 29	450 39	214 51	159 40	96.8 49	81.4 40	81.2 24	71.7 24	56.9 27
1947 1947	1450 14	956 9	639 4	333 8	211 9	125 11	92.9 15	73.3 21	61.8 21
1948 1948	2260 1	1488 1	650 3	310 13	166 21	122 12	121 6	104 8	87.3 7
1949 1949	764 44	408 44	236 41	170 36	130 30	87.0 35	75.6 32	60.3 36	48.7 40
1950 1950	736 46	459 38	325 29	230 27	144 28	109 20	84.2 22	70.2 26	55.6 30
1951 1951	817 42	466 37	215 48	155 44	98.0 48	81.6 39	75.5 33	66.1 29	49.0 39
1952 1952	538 67	254 72	170 65	125 57	89.9 52	54.7 67	47.4 64	47.6 53	40.7 54
1953 1953	572 60	264 69	142 72	91.6 70	83.3 60	66.2 48	47.8 62	36.7 70	32.3 71
1954 1954	507 71	298 65	134 73	88.9 72	68.6 66	54.9 66	50.8 58	45.7 56	42.1 51
1955 1955	1430 15	830 15	585 6	329 10	202 11	119 13	117 8	104 9	79.5 11

DVSTRT - DAILY VALUES STATISTICAL PROGRAM

STATION ID - 16518000
 West Waialuaiki Stream near Keanae, Maui, HI
 PARAMETER CODE - 00060 DISCHARGE
 STATISTIC CODE - 00003 MEAN

HIGHEST MEAN VALUE AND RANKING FOR THE FOLLOWING NUMBER OF CONSECUTIVE DAYS
 FOR PERIOD OCT 70 SEP

WATER YEAR	1	3	7	15	30	60	90	120	183
1956 1956	1340 16	829 16	418 21	292 16	158 23	102 25	80.8 25	71.2 25	59.1 23
1957 1957	569 62	376 55	234 43	122 60	91.8 51	55.3 63	51.0 57	43.7 62	35.6 64
1958 1958	851 38	449 40	230 44	163 38	147 27	91.5 32	72.5 34	60.6 35	49.6 38
1959 1959	657 51	484 34	311 32	189 31	117 36	92.0 31	78.8 27	65.6 30	57.8 26
1960 1960	1500 11	987 7	567 9	280 18	153 24	98.7 27	89.1 19	74.6 20	66.1 18
1961 1961	1220 17	653 26	307 33	227 28	123 33	97.7 28	66.6 37	58.1 37	48.5 41
1962 1962	416 74	232 73	159 71	118 62	74.0 62	50.0 70	38.3 72	33.6 71	34.2 67
1963 1963	597 57	277 67	192 57	154 45	114 38	75.2 42	58.5 46	51.2 46	39.2 58
1964 1964	534 68	312 63	164 70	131 51	103 43	63.2 55	52.8 51	49.9 48	39.8 55
1965 1965	922 35	525 31	410 22	236 25	147 26	84.0 38	60.0 43	54.3 41	50.1 35
1966 1966	476 72	310 64	188 59	126 56	117 37	74.8 43	61.4 40	56.2 38	41.8 52
1967 1967	564 63	355 60	188 58	126 55	85.2 58	51.3 69	50.4 60	49.9 49	44.4 47
1968 1968	570 61	417 46	218 47	146 46	109 40	86.8 36	62.1 39	52.1 44	58.7 24
1969 1969	1610 9	871 10	568 8	271 21	237 5	182 3	160 1	131 2	109 2
1970 1970	980 32	469 36	302 35	178 33	114 39	68.9 47	50.6 59	55.5 39	46.7 45
1971 1971	903 36	368 56	269 37	158 41	138 29	112 16	95.4 14	77.5 17	72.1 15
1972 1972	544 66	362 58	173 64	88.4 73	54.8 76	30.5 79	33.3 74	29.5 73	26.8 73
1973 1973	652 52	257 70	185 62	138 48	109 41	76.5 41	60.4 42	52.2 43	39.7 56
1974 1974	1680 6	831 14	363 26	205 30	121 34	65.6 49	52.1 54	45.6 57	47.1 44
1975 1975	673 50	292 66	166 69	92.3 69	63.4 69	55.0 64	47.6 63	44.0 61	37.5 61
1976 1976	1100 27	415 47	188 60	98.0 68	57.4 72	55.0 65	53.1 50	47.1 54	36.1 62
1977 1977	547 65	340 62	208 52	112 63	104 42	84.9 37	63.5 38	49.4 50	41.2 53
1978 1978	399 76	188 76	107 75	65.9 76	46.8 78	35.3 75	30.5 77	28.3 74	26.1 74
1979 1979	1160 22	869 11	578 7	383 4	205 10	142 8	110 11	101 10	72.8 13
1980 1980	1220 18	832 13	543 11	476 2	337 1	219 1	158 2	137 1	111 1
1981 1981	842 39	446 41	204 54	99.4 67	53.5 77	32.5 77	30.8 76	23.9 79	19.7 79
1982 1982	1470 12	1030 6	519 13	279 20	164 22	116 14	119 7	100 11	87.1 8
1983 1983	836 40	353 61	168 67	89.0 71	55.6 75	38.8 73	35.4 73	27.8 75	24.0 75
1984 1984	229 80	157 78	96.7 76	63.5 78	56.5 74	35.3 76	28.6 78	26.2 77	23.9 76
1985 1985	1020 31	589 29	448 17	292 17	178 15	106 23	92.7 16	71.8 23	56.3 28
1986 1986	1630 8	964 8	515 14	260 22	257 4	151 6	107 13	90.1 13	69.6 16
1987 1987	729 48	495 33	246 39	162 39	102 44	70.5 45	59.0 45	61.2 34	53.1 32
1988 1988	1110 25	441 42	197 56	109 64	84.4 59	62.5 57	54.6 49	51.4 45	49.8 37
1989 1989	1160 23	670 25	389 24	326 11	222 7	141 9	110 12	105 7	83.9 9
1990 1990	635 53	386 52	215 50	138 49	99.2 46	88.1 34	67.8 36	53.4 42	47.5 42
1991 1991	1210 19	732 20	498 15	352 5	195 12	112 17	80.3 26	89.3 14	77.8 12
1992 1992	513 70	418 45	239 40	131 52	81.9 61	70.2 46	54.9 48	44.7 60	33.0 69

DVSTAT - DAILY VALUES STATISTICAL PROGRAM

STATION ID - 16518000
 West Maitaiki Stream near Keanae, Maui, HI
 PARAMETER CODE - 00060 DISCHARGE
 STATISTIC CODE - 00003 MEAN

HIGHEST MEAN VALUE AND RANKING FOR THE FOLLOWING NUMBER OF CONSECUTIVE DAYS
 FOR PERIOD OCT TO SEP

WATER YEAR	1	3	7	15	30	60	90	120	183
1993 1993	576 59	423 44	207 53	104 66	65.0 68	45.6 72	45.0 69	40.9 65	38.5 60
1994 1994	1470 13	1073 5	560 10	319 12	180 14	108 21	92.0 17	76.9 18	72.2 14
1995 1995	250 79	142 80	91.3 79	63.9 77	57.1 73	38.6 74	32.4 75	26.3 76	22.4 77
1996 1996	602 56	363 57	169 66	120 61	72.2 64	60.8 58	46.0 66	37.5 67	32.0 72
1997 1997	750 45	383 53	168 68	125 58	88.2 55	65.0 51	59.8 44	50.5 47	43.4 48
1998 1998	562 64	256 71	204 55	156 43	88.6 53	65.4 50	47.4 65	37.3 69	38.9 59
1999 1999	632 54	437 43	229 45	164 37	126 31	97.2 29	78.0 30	62.3 33	54.8 31
2000 2000	736 47	356 59	223 46	125 59	67.5 67	64.2 52	45.9 67	38.0 66	35.4 65

DVSTAT - DAILY VALUES STATISTICAL PROGRAM

STATION ID - 16518000
 West Waialuaiki Stream near Keanae, Maui, HI
 PARAMETER CODE - 00060 DISCHARGE
 STATISTIC CODE - 00003 MEAN

ANNUAL AND/OR SEMI-ANNUAL VALUES

MEAN VALUE AND RANKING FOR PERIOD INCLUDED IN LOW-VALUE ANALYSIS (OCT-SEP)		MEAN VALUE AND RANKING FOR PERIOD INCLUDED IN HIGH-VALUE ANALYSIS (OCT-SEP)	
WATER YEAR RANGE		WATER YEAR RANGE	
1915 1915	34.2 46	1915 1915	34.2 35
1917 1917	30.4 34	1917 1917	30.4 47
1923 1923	39.6 58	1923 1923	39.6 23
1924 1924	43.1 64	1924 1924	43.1 17
1925 1925	45.2 67	1925 1925	45.2 14
1926 1926	15.6 3	1926 1926	15.6 78
1927 1927	33.0 41	1927 1927	33.0 40
1928 1928	37.9 54	1928 1928	37.9 27
1929 1929	40.1 60	1929 1929	40.1 21
1930 1930	63.7 76	1930 1930	63.7 5
1931 1931	38.4 55	1931 1931	38.4 26
1932 1932	53.7 71	1932 1932	53.7 10
1933 1933	20.1 7	1933 1933	20.1 74
1934 1934	33.1 42	1934 1934	33.1 39
1935 1935	39.7 59	1935 1935	39.7 22
1936 1936	26.5 23	1936 1936	26.5 58
1937 1937	65.4 78	1937 1937	65.4 3
1938 1938	56.2 74	1938 1938	56.2 7
1939 1939	37.7 53	1939 1939	37.7 28
1940 1940	26.7 24	1940 1940	26.7 57
1941 1941	31.1 37	1941 1941	31.1 44
1942 1942	64.2 77	1942 1942	64.2 4
1943 1943	26.3 22	1943 1943	26.3 59
1944 1944	15.5 2	1944 1944	15.5 79
1945 1945	24.0 17	1945 1945	24.0 64
1946 1946	35.6 49	1946 1946	35.6 32
1947 1947	41.5 63	1947 1947	41.5 18
1948 1948	55.7 73	1948 1948	55.7 8
1949 1949	30.6 35	1949 1949	30.6 46
1950 1950	37.0 51	1950 1950	37.0 30
1951 1951	30.6 36	1951 1951	30.6 45
1952 1952	27.1 25	1952 1952	27.1 56
1953 1953	22.4 12	1953 1953	22.4 69
1954 1954	28.6 28	1954 1954	28.6 53
1955 1955	46.4 68	1955 1955	46.4 13
1956 1956	37.0 50	1956 1956	37.0 31
1957 1957	29.9 31	1957 1957	29.9 50
1958 1958	39.5 57	1958 1958	39.5 24
1959 1959	37.2 52	1959 1959	37.2 29
1960 1960	38.8 56	1960 1960	38.8 25
1961 1961	29.3 30	1961 1961	29.3 51

DVSTAT - DAILY VALUES STATISTICAL PROGRAM

STATION ID - 16518000
 West Mauiwaiki Stream near Keanae, Maui, HI
 PARAMETER CODE - 00060 DISCHARGE
 STATISTIC CODE - 00003 MEAN

ANNUAL AND/OR SEMI-ANNUAL VALUES

MEAN VALUE AND RANKING FOR PERIOD INCLUDED IN LOW-VALUE ANALYSIS (OCT-SEP)		MEAN VALUE AND RANKING FOR PERIOD INCLUDED IN HIGH-VALUE ANALYSIS (OCT-SEP)	
WATER YEAR RANGE		WATER YEAR RANGE	
1962 1962	21.3	1962 1962	21.3
1963 1963	25.0	1963 1963	25.0
1964 1964	30.2	1964 1964	30.2
1965 1965	34.9	1965 1965	34.9
1966 1966	26.1	1966 1966	26.1
1967 1967	33.2	1967 1967	33.2
1968 1968	34.9	1968 1968	34.9
1969 1969	66.2	1969 1969	66.2
1970 1970	31.5	1970 1970	31.5
1971 1971	40.9	1971 1971	40.9
1972 1972	18.9	1972 1972	18.9
1973 1973	25.0	1973 1973	25.0
1974 1974	27.8	1974 1974	27.8
1975 1975	22.2	1975 1975	22.2
1976 1976	22.5	1976 1976	22.5
1977 1977	25.7	1977 1977	25.7
1978 1978	20.9	1978 1978	20.9
1979 1979	43.6	1979 1979	43.6
1980 1980	67.3	1980 1980	67.3
1981 1981	14.5	1981 1981	14.5
1982 1982	59.8	1982 1982	59.8
1983 1983	21.7	1983 1983	21.7
1984 1984	18.4	1984 1984	18.4
1985 1985	32.9	1985 1985	32.9
1986 1986	44.0	1986 1986	44.0
1987 1987	41.0	1987 1987	41.0
1988 1988	33.6	1988 1988	33.6
1989 1989	55.7	1989 1989	55.7
1990 1990	33.8	1990 1990	33.8
1991 1991	50.0	1991 1991	50.0
1992 1992	23.9	1992 1992	23.9
1993 1993	28.7	1993 1993	28.7
1994 1994	49.2	1994 1994	49.2
1995 1995	19.5	1995 1995	19.5
1996 1996	22.7	1996 1996	22.7
1997 1997	29.9	1997 1997	29.9
1998 1998	28.4	1998 1998	28.4
1999 1999	32.4	1999 1999	32.4
2000 2000	23.9	2000 2000	23.9

DVSTAT - DAILY VALUES STATISTICAL PROGRAM

STATION ID - 16518000
West Mailuiki Stream near Keanae, Maui, HI
PARAMETER CODE - 00060 DISCHARGE
STATISTIC CODE - 00003 MEAN

ANNUAL AND/OR SEMI-ANNUAL VALUES

MEAN VALUE AND RANKING FOR PERIOD INCLUDED IN LOW-VALUE ANALYSIS (OCT-SEP)	WATER YEAR RANGE	MEAN VALUE AND RANKING FOR PERIOD INCLUDED IN HIGH-VALUE ANALYSIS (OCT-SEP)	WATER YEAR RANGE
--	---------------------	---	---------------------