

HAWAII, ISLAND OF MAUI

1

16599500 OPANA TUNNEL AT KAILIILI

LOCATION.--Lat 20°51'04", long 156°16'17", Old Hawaiian Datum, Hydrologic Unit 20020000, on left bank at tunnel outlet, 0.3 mi north of Kailili, and 2.7 mi east of Makawao.

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

GAGE.--Water-stage recorder and concrete control. Elevation of gage is 2,340 ft above mean sea level (from topographic map).

REMARKS.--Records computed by Matt Wong. Records good. Tunnel diverts water from Opana Gulch for agricultural and domestic use in the Kokomo, Makawao, and Pukalani areas.

AVERAGE DISCHARGE.--39 years (water years 1966-2004), 3.14 ft³/s (2,280 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 24 ft³/s, April 10, 2004; minimum daily, 0.11 ft³/s, November 5-10, 1973, October 5, 6, 25, 26, 1974.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 24 ft³/s, Apr. 10; minimum daily, 0.20 ft³/s, Sept. 8-10.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	0.69	0.34	5.1	2.4	4.9	2.5	11	2.8	4.4	1.3	0.43	0.36
2	0.64	0.33	7.2	2.4	3.8	4.2	9.3	2.5	4.0	1.6	2.4	0.33
3	0.62	0.33	5.6	8.1	2.6	9.5	8.7	3.9	3.6	1.4	6.5	0.30
4	0.58	0.50	7.7	6.8	2.2	6.0	6.6	9.3	3.4	1.2	2.7	0.27
5	0.58	0.48	8.7	3.9	2.1	3.4	5.2	10	3.1	1.1	1.4	0.24
6	0.56	0.37	6.2	3.0	2.1	2.6	4.2	11	3.0	0.99	1.0	0.24
7	0.62	0.34	4.8	2.5	2.3	2.4	3.6	7.6	3.1	0.93	1.5	0.23
8	0.73	0.30	7.8	2.4	3.6	8.0	3.2	6.5	3.7	0.90	1.1	0.21
9	0.86	0.28	8.5	2.2	4.2	6.5	5.3	6.0	4.0	1.0	0.85	0.21
10	0.63	0.31	9.7	2.1	2.4	4.9	24	5.8	4.7	0.87	0.70	0.21
11	0.76	0.43	8.1	2.0	2.0	5.9	20	5.7	4.3	0.81	0.61	0.22
12	0.72	0.45	6.8	1.9	1.9	5.0	23	5.7	3.4	0.82	0.60	0.28
13	0.69	2.8	7.6	1.8	1.8	6.8	16	5.5	2.9	1.1	0.57	0.30
14	2.4	8.3	6.5	1.7	1.6	13	13	5.2	2.6	1.2	0.52	0.77
15	8.2	7.0	5.8	1.6	1.6	8.8	13	5.0	2.4	2.1	0.48	0.42
16	3.9	8.9	5.0	1.6	3.4	7.3	17	8.9	2.3	1.6	0.45	0.29
17	5.1	4.8	6.1	1.6	2.2	6.3	18	6.4	2.1	1.2	0.42	0.30
18	1.9	3.1	6.8	1.5	1.8	5.4	13	5.7	2.0	0.93	0.38	0.38
19	1.2	7.7	5.2	1.4	1.5	4.7	12	5.3	1.9	0.80	0.36	0.81
20	0.88	5.6	4.3	1.4	1.4	4.3	9.9	5.1	1.9	0.72	0.34	0.62
21	0.71	4.4	3.9	1.4	1.3	6.9	7.9	4.8	1.9	0.65	0.32	0.34
22	0.61	3.2	3.6	1.3	1.2	20	6.1	4.5	1.8	0.63	1.2	0.27
23	0.60	2.2	3.3	2.9	1.1	16	5.5	4.2	1.7	0.59	6.3	1.3
24	0.54	1.8	3.1	1.7	1.1	12	4.8	4.1	1.7	0.56	2.2	0.71
25	0.51	1.6	3.0	1.9	1.4	20	3.8	4.4	1.6	0.53	1.2	0.42
26	0.48	1.7	2.7	4.7	1.1	13	6.4	4.0	1.5	0.52	0.97	0.33
27	0.44	1.5	2.5	4.0	1.4	11	6.9	4.8	1.4	0.54	1.1	0.29
28	0.43	3.1	3.7	2.0	8.7	14	4.5	6.4	1.4	0.83	0.75	0.24
29	0.43	8.0	2.7	7.8	3.2	15	3.6	5.0	1.6	0.58	0.56	0.24
30	0.38	6.0	2.4	5.7	---	18	3.1	6.2	1.5	0.50	0.46	0.24
31	0.35	---	2.4	7.5	---	13	---	5.4	---	0.47	0.40	---
TOTAL	37.74	86.16	166.8	93.2	69.9	276.4	288.6	177.7	78.9	28.97	38.77	11.37
MEAN	1.22	2.87	5.38	3.01	2.41	8.92	9.62	5.73	2.63	0.93	1.25	0.38
MAX	8.2	8.9	9.7	8.1	8.7	20	24	11	4.7	2.1	6.5	1.3
MIN	0.35	0.28	2.4	1.3	1.1	2.4	3.1	2.5	1.4	0.47	0.32	0.21
AC-FT	75	171	331	185	139	548	572	352	156	57	77	23

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1965 - 2004, BY WATER YEAR (WY)

MEAN	1.85	3.26	3.98	3.60	3.64	4.66	5.07	3.42	2.11	2.51	2.13	1.51
MAX	5.40	7.97	9.19	7.55	9.04	11.1	9.62	7.42	6.38	8.17	4.98	5.69
(WY)	(1984)	(1968)	(1971)	(1989)	(1969)	(1982)	(2004)	(1987)	(1997)	(1997)	(1969)	(1992)
MIN	0.14	0.25	0.65	0.22	0.36	0.51	0.27	0.54	0.50	0.40	0.19	0.15
(WY)	(1985)	(1992)	(1977)	(1977)	(1978)	(1983)	(1992)	(2003)	(1999)	(1981)	(1974)	(1984)

SUMMARY STATISTICS	FOR 2003 CALENDAR YEAR	FOR 2004 WATER YEAR	WATER YEARS 1965 - 2004
ANNUAL TOTAL	755.94	1,354.51	
ANNUAL MEAN	2.07	3.70	3.14
HIGHEST ANNUAL MEAN			5.34
LOWEST ANNUAL MEAN			1.45
HIGHEST DAILY MEAN	11	Feb 15	24
LOWEST DAILY MEAN	0.20	Jun 11	0.21
ANNUAL SEVEN-DAY MINIMUM	0.26	May 28	0.22
ANNUAL RUNOFF (AC-FT)	1,500	2,690	2,280
10 PERCENT EXCEEDS	5.6	8.4	7.7
50 PERCENT EXCEEDS	1.1	2.3	2.1
90 PERCENT EXCEEDS	0.36	0.38	0.38