STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT
Stream Protection and Management Branch

FIELD INVESTIGATION REPORT

FI2008102902 (East Maui, Wailuanui IIFS Site)

Date of Field Investigation: October 28, 2008 **Time** (24-hour)**:** 1230 - 1600	
CWRM Staff:	Ed Sakoda, Dean Uyeno, and Chui Ling Cheng
Individuals Present:	
Hydrologic Unit:	Wailuanui (6056)
Stream Name:	Wailuanui Stream

Findings:

At approximately 1230 hours, CWRM staff arrived at the Hana Highway bridge that crosses Wailuanui Stream. CWRM staff hiked down from the bridge to the stream via a small trail that begins on the right bank of the stream, on the downstream side of the bridge. The trail condition was hazardous because of the loose rocks and large boulders on the hill. Staff continued to hike downstream until reaching the top of Waikani Falls, about 700 feet from the bridge. There was a concrete structure near the top of Waikani Fall which may be remnants of a previous gaging station or weir. On the right bank of the stream, Ed Sakoda found an old stilling well, as well as a concrete-reinforced masonry (CRM) wall that may have been for a staff gage previously installed. CWRM staff found a location suitable for measuring streamflow, about 10 feet from the top of Waikani Falls. Staff considered the possibility of establishing this location as the IIFS Site for Wailuanui Stream. However, staff realized that access to this location may be difficult during high flows, so no measurements were made. Staff hiked back to the bridge.

During a previous field visit, Matt Wong from the USGS-Maui Office found a location on Wailuanui stream that may be suitable for flow measurement (refer to Field Investigation Report FI2008102404 for more information). The location was directly below the bridge. Matt did not find any locations suitable for gage height reading.

CWRM staff prepared the site for flow measurement. The site was flagged with yellow tape, labeled with the stream name, IIFS site, and the date. Staff completed the entire flow measurement in 40 minutes. In addition to flow measurement, staff crew also recorded wind velocity, air temperature, water temperature and weather conditions. As computed back in the Honolulu Office, the flow at IIFS Site was 2.293 cubic feet per second (1.482 million gallons per day), with no gage height readings.

CWRM staff concluded the field investigation at 1600 hours.

Image Listing: (Attach PDF of image contact sheet)

File Name:	Brief Description:
20081029008	Wailuanui Stream near the top of Waikani Falls.
20081029010	Concrete structure near the top of Waikani Fall that may have been remnants of a previous gaging station or weir.
20081029011	Top of Waikani Falls on Wailuanui Stream.
20081029013	Wailuanui Stream upstream from Waikani Falls.
20081029014	Top of Waikani Falls on Wailuanui Stream.
20081029015	Wailuanui Stream upstream from Waikani Falls.
20081029016	Concrete structure near the top of Waikani Fall that may have been remnants of a previous gaging station or weir.
20081029017	Looking down the cliff from the top of Waikani Falls on Wailuanui Stream.
20081029018	Top of Waikani Falls on Wailuanui Stream.
20081029019	Wailuanui Stream upstream from Waikani Falls.
20081029021	Top of Waikani Falls on Wailuanui Stream.
20081029022	CRM wall on the right bank of Wailuanui Stream near the top of Waikani Falls.
20081029028	Top of Waikani Falls on Wailuanui Stream.
20081029041	Old stilling well on the right bank of Wailuanui Stream near the top of Waikani Falls.
20081029046	Old stilling well on the right bank of Wailuanui Stream near the top of Waikani Falls.
20081029048	CWRM staff at the top of Waikani Falls on Wailuanui Stream.
20081029053	CWRM staff conducting flow measurement at IIFS Site on Wailuanui Stream.

GPS Listing:

Shapefiles: (List file names of all shapefiles created and a brief description of each)

File Name:	Brief Description:
East_Maui_POI.shp	Points of interest (POI) recorded with the GPS unit during the field visit. The file includes POI recorded from all the East Maui field investigations.

Waypoints: (List all waypoints in decimal degrees and provide a brief description of each)

WP No.	Latitude	Longitude	Brief Description:
0	20.832394	-156.138458	IIFS Site Flow Measurement on Wailuanui Stream
4	20.833606	-156.13696	Parking area near IIFS Site on Wailuanui Stream

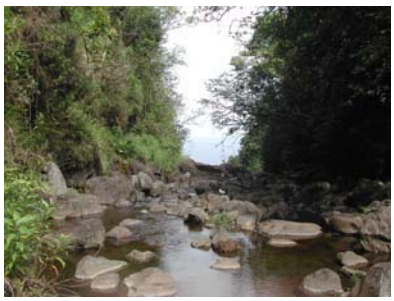
Attachments:

Brief Description:

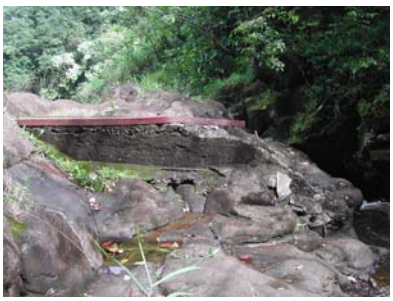
1. Image Contact Sheet
2. Discharge Measurement and Gage Inspection Notes

Recommendations:

IMAGE CONTACT SHEET



20081029008.JPG



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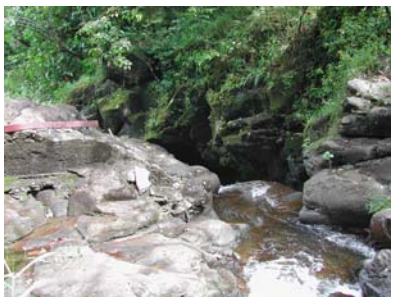

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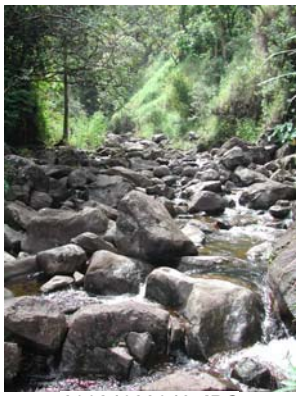
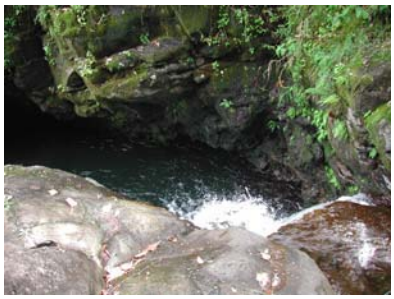


20081029013.JPG

20081029014.JPG



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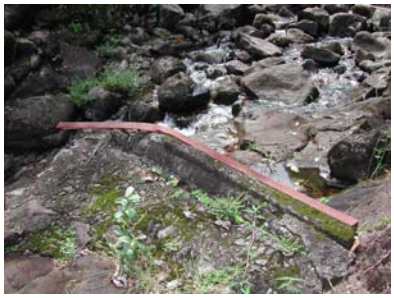

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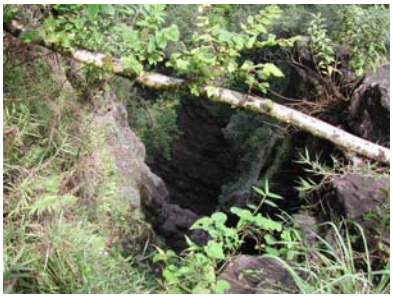

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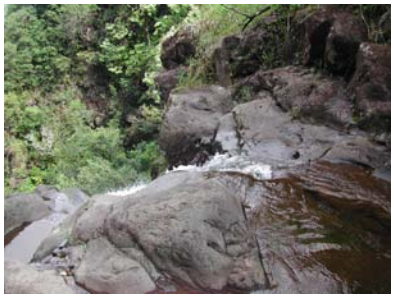

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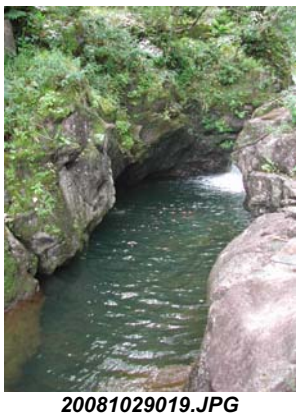
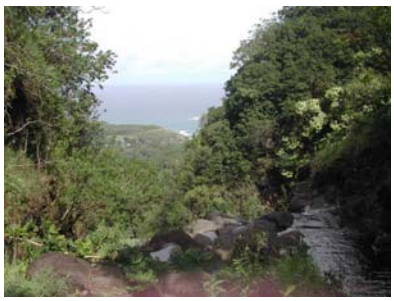


20081029019.JPG

20081029021.JPG

20081029022.JPG

IMAGE CONTACT SHEET



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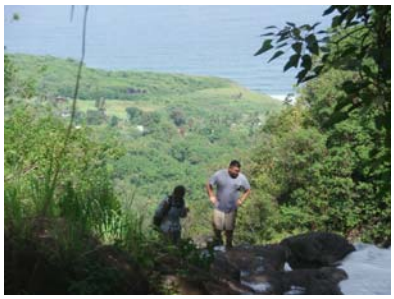
20081029041.JPG

20081029046.JPG



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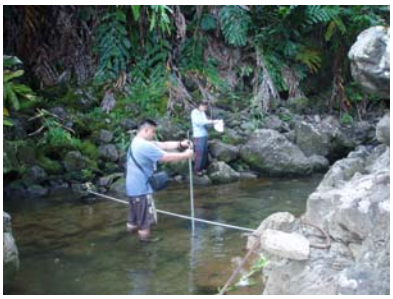

20081029053.JPG

Form 9-275F
(Apr. 2001)

U.S. DEPARTMENT OF THE INTERIOR
U.S. Geological Survey
WATER RESOURCES DIVISION
DISCHARGE MEASUREMENT AND GAGE INSPECTION NOTES

Meas. No. _____

Comp. by Chui

Checked by DDW

Sta. No. WAILUANUI IIFS SITE

Sta. Name _____

Date 10/29 , 20 08 Party Chui , Deem (1) , Ed

Width 10.6 Area 8.906 Vel. 0.257 G.H. _____ Disch. 2.293 CFS

Method Wading No. secs. 40 G.H. change _____ in _____ hrs.

Method coef. _____ Horiz. angle coef. _____ Susp. _____ Tags checked _____

Meter Type _____ Meter No. _____ Meter _____ ft. above bottom of wt.

Rating used _____ Spin test before meas. _____ ; after _____

Meas. plots _____ % diff. from rating no. _____ Indicated shift _____

GAGE READINGS						
Time					Inside	Outside
	Start	LEW @ 14:37				
	Finish	REW	@ 15:13			
Weighted MGH						
GH correction						
Correct MGH						

Samples collected: water quality, sediment, biological, other _____

Measurements documented on separate sheets: water quality, aux./base gage, other _____

Rain gage serviced/calibrated ____

Weather: Sunny

Air Temp. 21 °C at 14:37

Water Temp. 21.5 °C at 14:48

Check bar/chain found _____

Changed to _____ at _____

Correct _____

Wading, cable, ice, boat, upstr., downstr., side bridge, 10 (ft), mi. upstr., downstr. of ~~gage~~ cascade.

Measurement rated excellent (2%), good (5%), fair (8%), poor (> 8%); based on following conditions: Flow: Not uniform, laminar at sections, edge very slow.

Cross section: bedrock, uneven, boulders, large section

Gage operating: _____ Record Removed _____

Battery voltage: _____ Intake/Orifice cleaned/purged: _____

Bubble-gage pressure, psi: Tank _____ , Line _____ ; Bubble-rate _____ /min.

Extreme-GH indicators: max _____ , min _____ .

CSG checked: _____ HWM height on stick _____ Ref. elev. _____ HWM elev. _____

HWM inside/outside: _____

Control: _____

Remarks: Measuring point directly below bridge on Hana Highway

GH of zero flow = GH _____ - depth at control _____ = _____ ft., rated _____

Sheet No. _____ of _____ sheets

.0 .10 .20 .30 .40 .50 .60 .70 .75

River at -

ANGLE COEF-FICIENT	DIST. FROM INITIAL POINT	WIDTH	DEPTH	OBSERVATION DEPTH	REVOLUTIONS	TIME IN SECONDS	VELOCITY AT POINT	VELOCITY MEAN IN VERTICAL	ADJUSTED FOR HOR. ANGLE OR	AREA	DISCHARGE	
	LEW	@	14:37									.80
												.85
	4.2	0.2	0									
	4.6	0.4	0.6	.6		40		0.13		.240	.031	
	5.0	0.4	0.86	.6		40		0.12		.344	.041	.90
	5.4	0.4	1.16	.6		40		0.03		.464	.014	.92
	5.8	0.4	1.19	.6		40		0.01		.476	.005	
	6.2	0.4	0.97	.6		40		0.08		.388	.031	.94
	6.6	0.4	0.97	.6		40		0.08		.388	.031	.96
	7.0	0.4	1.00	.6		40		0.15		.400	.060	.97
	7.4	0.4	1.03	.6		40		0.30		.412	.124	.98
	7.8	0.4	1.08	.6		40		0.32		.432	.138	.99
	8.2	0.4	1.13	.6		40		0.26		.452	.118	
	8.6	0.4	1.21	.6		40		0.26		.484	.126	
⊙	9.0	0.4	0.92	.6		40		0.21		.368	.077	1.00
	9.4	0.4	0.99	.6		40		0.28		.396	.111	
	9.8	0.4	1.04	.6		40		0.40	5.66	.416	.166	
	10.2	0.4	1.03	.6		40		0.27		.412	.111	.99
	10.6	0.4	1.12	.6		40		0.29		.448	.130	.98
	11.0	0.4	0.86	.6		40		0.38	6.864	.344	.131	.97 1.445
	11.4	0.4	0.87	.6		40		0.43		.348	.150	.96
	11.8	0.4	0.55	.6		40		0.50		.220	.110	
	12.2	0.4	0.55	.6		40		0.45		.220	.099	.94
	12.6	0.4	0.60	.6		40		0.37		.240	.089	.92 1.893
	13.0	0.4	0.56	.6		40		0.48		.224	.108	.90 2.001
	13.4	0.4	0.55	.6		40		0.35		.220	.077	
	13.8	0.4	0.56	.6		40		0.34	8.56	.224	.076	
	14.2	0.4	0.67	.6		40		0.40		.268	.107	.85
	14.6	0.3	0.39	.6		40		0.41		.078	.032	
	14.8	0.1	0									
	10.6	10.6					AVE=	.257		8.906	2.293	.80
	REW	@	15:13									