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STAFF SUBMITTAL

COMMISSION ON WATER RESOURCE MANAGEMENT

September 27, 2011  
Honolulu, Hawaii

Application for Stream Channel Alteration Permit (3232.8)  
Installation of a Weir in Ainako Branch Stream  
Hilo, Hawai'i, TMK: (3) 2-5-024:029

APPLICANT:  
Dr. David Jung  
118 Koula Street  
Hilo, HI 96720

LANDOWNER:  
Same.

SUMMARY OF REQUEST:

Application for Stream Channel Alteration Permit (SCAP.3232.8) Installation of a Weir in Ainako Branch Stream, in Hilo, Hawai'i at TMK: (3) 2-5-024:029.

LOCATION: See Exhibit 1a, 1b and 1c.

BACKGROUND:

This application is the result of an on-going dispute between the applicant and upstream property owners Ms. Leslie Aina Weight and Mr. (Robert) Scott Henderson. Mr. John Carroll, attorney for the applicant and other property owners along Ainako Branch Stream, filed Complaint/Dispute Resolution CDR. 2769.8 with the Commission on December 10, 2010. Following a March 10, 2011, field investigation by staff, Ms. Weight and Mr. Henderson submitted an after-the-fact Stream Channel Alteration Permit, SCAP.2898.8, Stream Diversion Works Permit (SDWP) and Petition to Amend Instream Flow Standard (PAIFS) for Ainako Branch Stream on May 11, 2011.

Ainako Stream originates at about the 820-foot elevation about 0.4 miles upstream from the Ainako Avenue Bridge. The source for Ainako Stream is roughly a half-mile of boggy scrub forest and grasslands immediately below Akolea Road. Numerous springs arise from the area and converge on the stream channel via a network of ill-defined meandering routes. The substrate under the entire length of the stream is dominated by pahoehoe lava flows dating to 5,000 to 10,000 years of age. Pahoehoe flows are very porous, and lava blisters, tumuli (elliptical, domed volcanic structures) and lava tubes are common. Less than a half-mile south of the stream origin area, an extensive lava tube system contains underground streams that flow most of the year. Similar subterranean systems likely feed the Ainako Stream springs.

Ainako Branch Stream extends from the sluice/flood control gate on Leslie Aina Weight's property ((3) 2-5-025:014) on Ainako Stream and flows across Ms. Weight's ((3) 2-5-025:014 and 005), Robert Scott Henderson's ((3) 2-5-025:006) and other properties and through culverts under Kokea, Koula and Kapaa

Streets. The applicant's property ((3) 2-5-024:029) on Koula Street is located downstream from the Weight/Henderson properties. Ainako Branch Stream flows across the applicant's and several other properties downstream before emptying into a large boggy area where the Ainako Branch Stream and Ainako Stream merge together again. This boggy area is also the source and origin of an intermittent tributary to the Wailuku River. The Ainako Branch Stream travels a total distance of about 0.4 mile from the sluice gate to the boggy area and varies in width from about one to 12 feet.

To provide a sufficient flow of water from Ainako Stream to the Ainako Branch Stream during low flow periods, a dam diversion was built of loosely-stacked rocks within a concrete half pipe topped by a length of railroad tie buried in the streambed. The dam diversion was most likely built by either the Hilo Sugar Plantation or by Ms. Weight's father who periodically repaired storm flow damage to the dam by recovering loose rocks in the stream and placing them back on the dam face to increase low flow diversions into the sluice gate.

#### DESCRIPTION:

The applicant proposes to build a rectangular weir approximately 18.5-inches wide, 9.75-inches deep and four to five inches long in Ainako Branch Stream. The sides and base of the weir will be constructed of native lava rock grouted with concrete. About 10 cubic feet of rock will be used to construct the weir, and construction will take approximately one day. This rectangular weir will have a rectangular section in the center with a removable PVC plate approximately 0.125-inches thick, 18.5-inches wide and 9.75-inches tall. The PVC plate will have a 90-degree, V-notch in the center where stream flow would be directed to. The PVC plate will be inserted for 10 minutes for each data collection period, and the flow measurement will be taken. The PVC plate will be removed after the measurement has been taken. By using a discharge table, the stream flow in gallons per minute (GPM) can be determined from the measurement taken in the field. The applicant will collect stream flow data on a weekly to monthly basis, and during high and low flow events. The applicant may also collect additional data at his choosing. See Exhibits 2-5.

#### ANALYSIS:

##### Agency Review Comments:

The U.S. Army Corps of Engineers (COE) is currently conducting its jurisdictional determination (JD) for the Weight/Henderson ATF SCAP.2898.8 in coordination with the Environmental Protection Agency (EPA) and the COE's Headquarters. An approved COE JD typically takes 45-60 days to complete.

Hawaii County Planning Department commented on SCAP.2898.8 that the subject parcel is not located in the Special Management Area (SMA) and is not subject to the County's regulatory permit or authority.

Office of Hawaiian Affairs had no objections or comments but asked how long the weir will be in place.

Department of Health (DOH) Clean Water Branch (CWB) commented:

- The data accuracy needs to be further evaluated.
- The COE should be contacted for its JD for any activities that may involve discharges into any waters of the U.S.
- There is no site-specific construction best management practices (BMPs) proposed. A BMP Plan must be established and properly implemented for this project.
- An Applicable Monitoring and Assessment Plan (AMAP) should be designed and implemented to ensure the adequacy of BMP measures implemented.
- The applicant should be informed that no person shall discharge any water pollutants into state waters, or cause, or allow any water pollutant to enter state waters except in compliance with HRS §342D-50(a), or a permit, or variance by the director.

University of Hawaii Environmental Center asked about the need for stream flow data at this location and what other stream flow data collection and flow estimation efforts are currently being conducted in this stream basin. The Environmental Center recommended:

- A data collection plan that specifies the data collection procedures including quality control measures.

- A monthly data report that includes data quality evaluation based on quality assurance/quality control measures specified in the data collection plan.
- Regular review of the overall data collection effort including any proposed changes to the data collection plan and procedures.

The U.S. Fish and Wildlife Service and Department of Hawaiian Home Lands did not submit comments as of the date of preparation of this submittal.

DLNR Review Comments:

- Land Division: no objections.
- Forestry and Wildlife: no objections.
- State Parks: not subject to its authority or permit.
- Engineering: The project is located in Flood Zone X according to the Flood Insurance Rate Map (FIRM). The Flood Insurance Program does not have any regulations for developments within Flood Zone X.

State Historic Preservation Division (SHPD) and Division of Aquatic Resources (DAR) did not submit comments as of the date of preparation of this submittal.

Chapter 343 Environmental Assessment (EA) Compliance Review:

EA Triggers: In accordance with HRS §343-5 (a), the applicant’s proposed action does not trigger the need for an EA because the proposed project is located on private land and will use private funds.

Staff Review

The proposed weir will collect short and long term stream flow data for Ainako Branch Stream. No short or long term impacts to Ainako Branch Stream are anticipated.

RECOMMENDATION:


That the Commission approve Stream Channel Alteration Permit (SCAP.3232.8) Installation of a Weir in Ainako Branch Stream, in Hilo, Hawai’i at TMK: (3) 2-5-024:029, subject to the standard conditions in Exhibit 6.

Respectfully submitted,

  
 W. ROY HARDY  
 Hydrologic Program Manager

- Exhibits:
- 1a. Location Map
  - 1b. GIS Map
  - 1c. TMK Map
  2. Site Plan
  3. Construction Details
  4. Discharge Table for Triangular Flow Weirs
  5. Site Photos
  6. Standard Stream Channel Alteration Permit Conditions

APPROVED FOR SUBMITTAL:

  
 WILLIAM J. AILA, JR.  
 Chairperson





Department of Land and Natural Resources  
 Commission on Water Resource Management  
 Stream Protection and Management Branch

## ISLAND OF HAWAII

★ TMK: (3) 2-5-024:029

### Streams

- ..... Ephemeral
- - - - Intermittent
- Perennial

This map was produced by the Department of Land and Natural Resources (DLNR), Commission on Water Resource Management for planning purposes. It should not be used for boundary interpretations or other spatial analysis beyond the limitations of the data. Information regarding compilation dates and accuracy of the data presented can be obtained from DLNR.

Datum: North American Datum 1983

Tax Map Key (TMK) layer is comprised of tax assessor parcels derived from paper plat maps with attributes from public tax assessor records and is updated by each respective county.

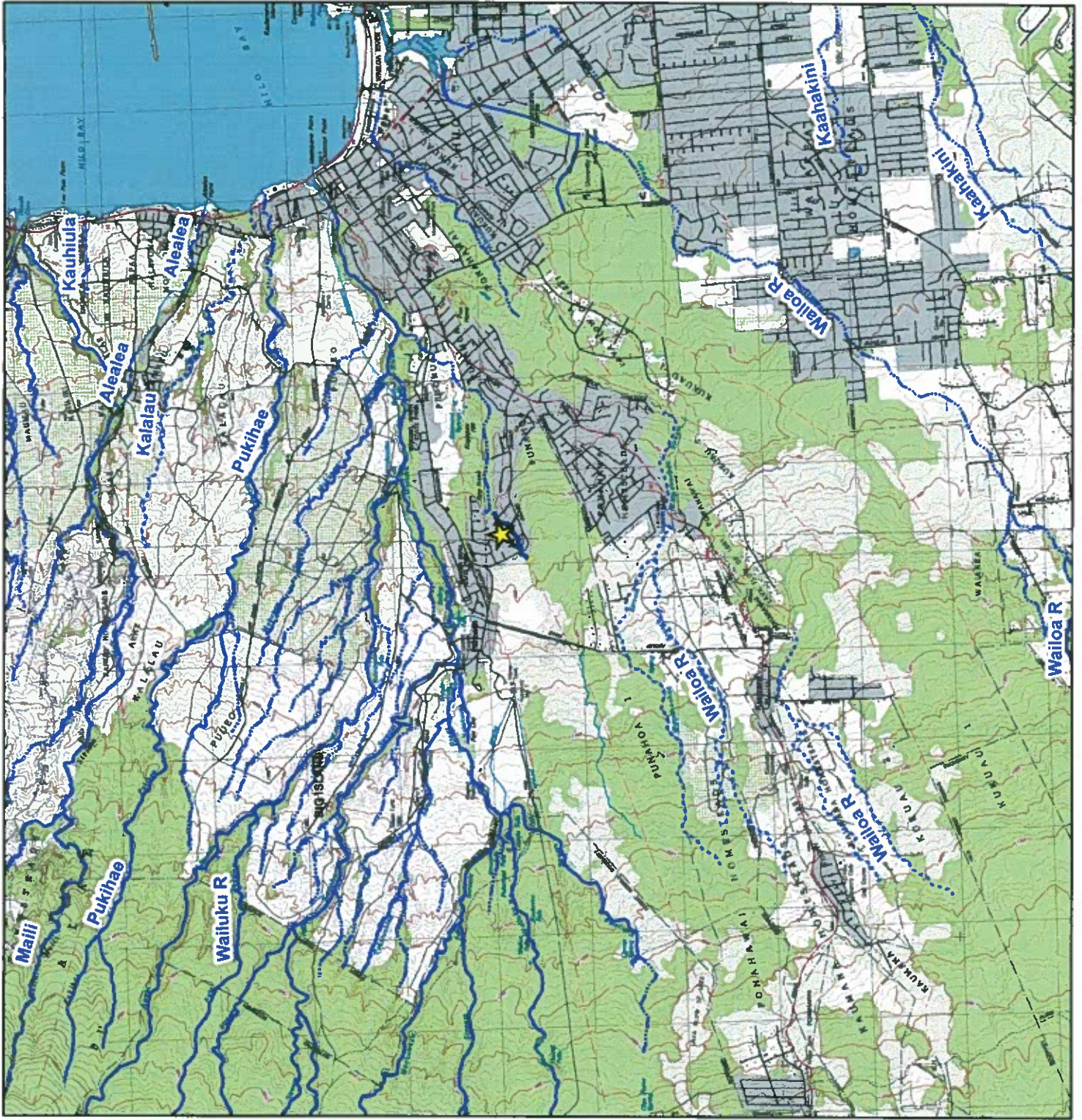


EXHIBIT 1a



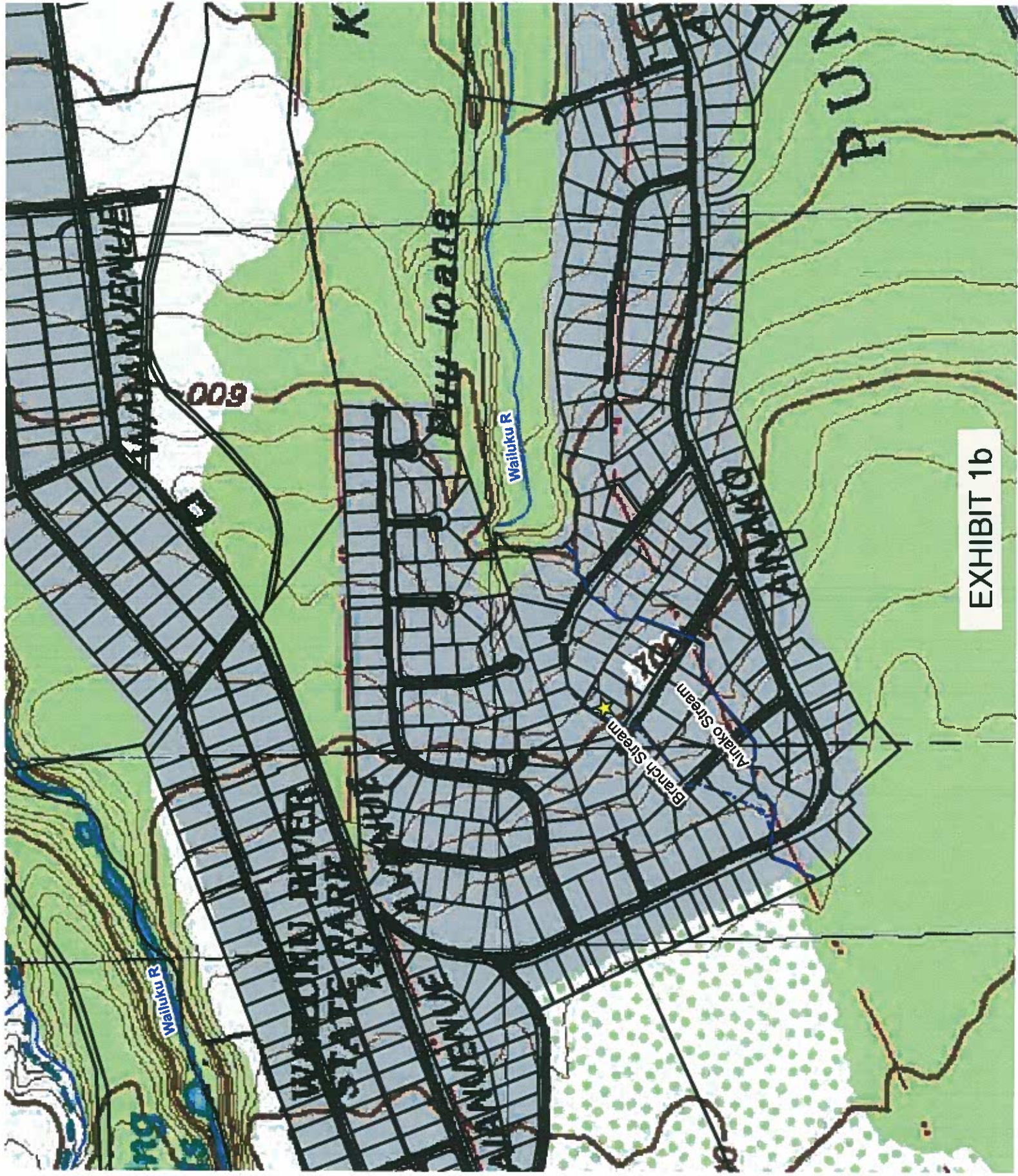


EXHIBIT 1b



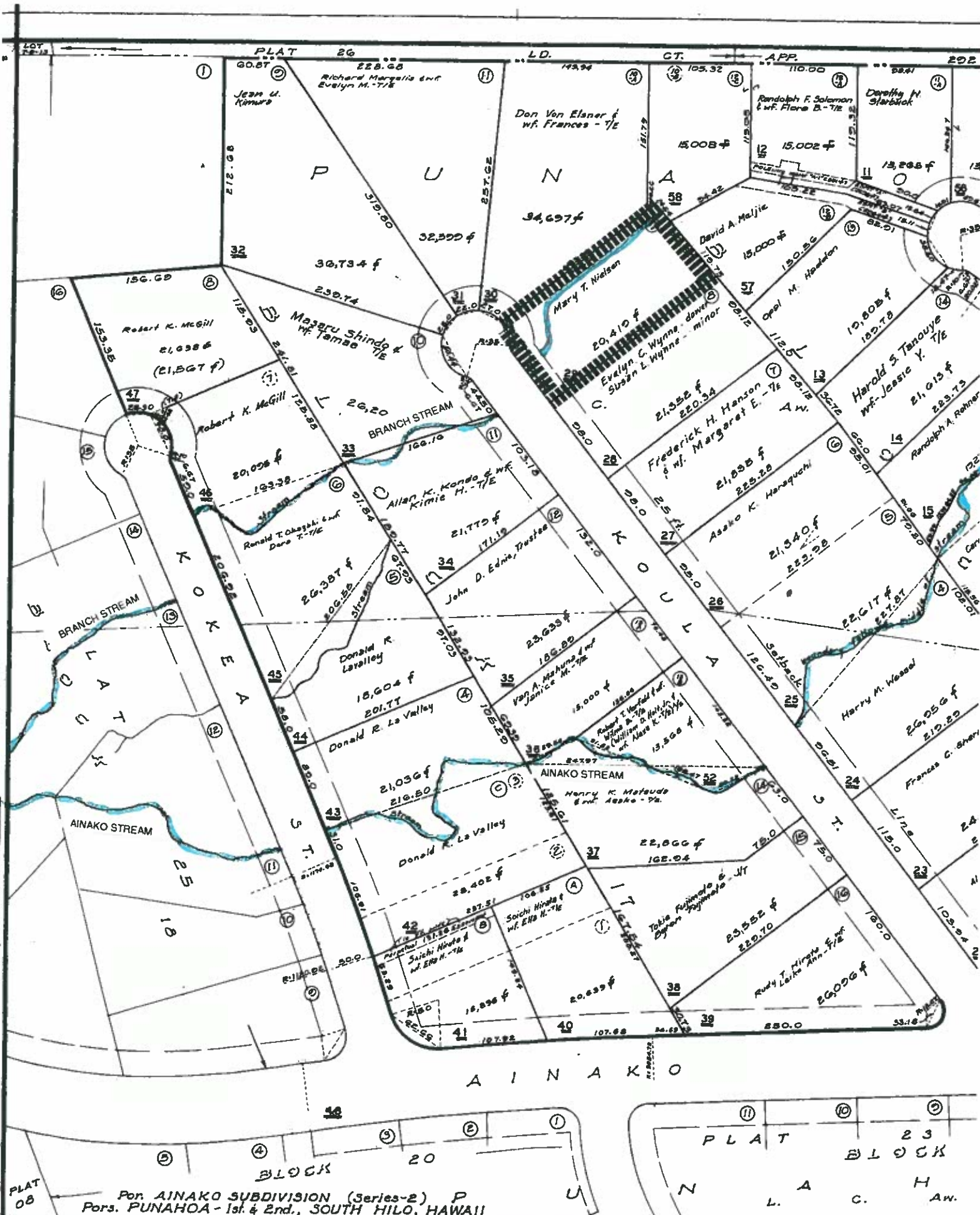
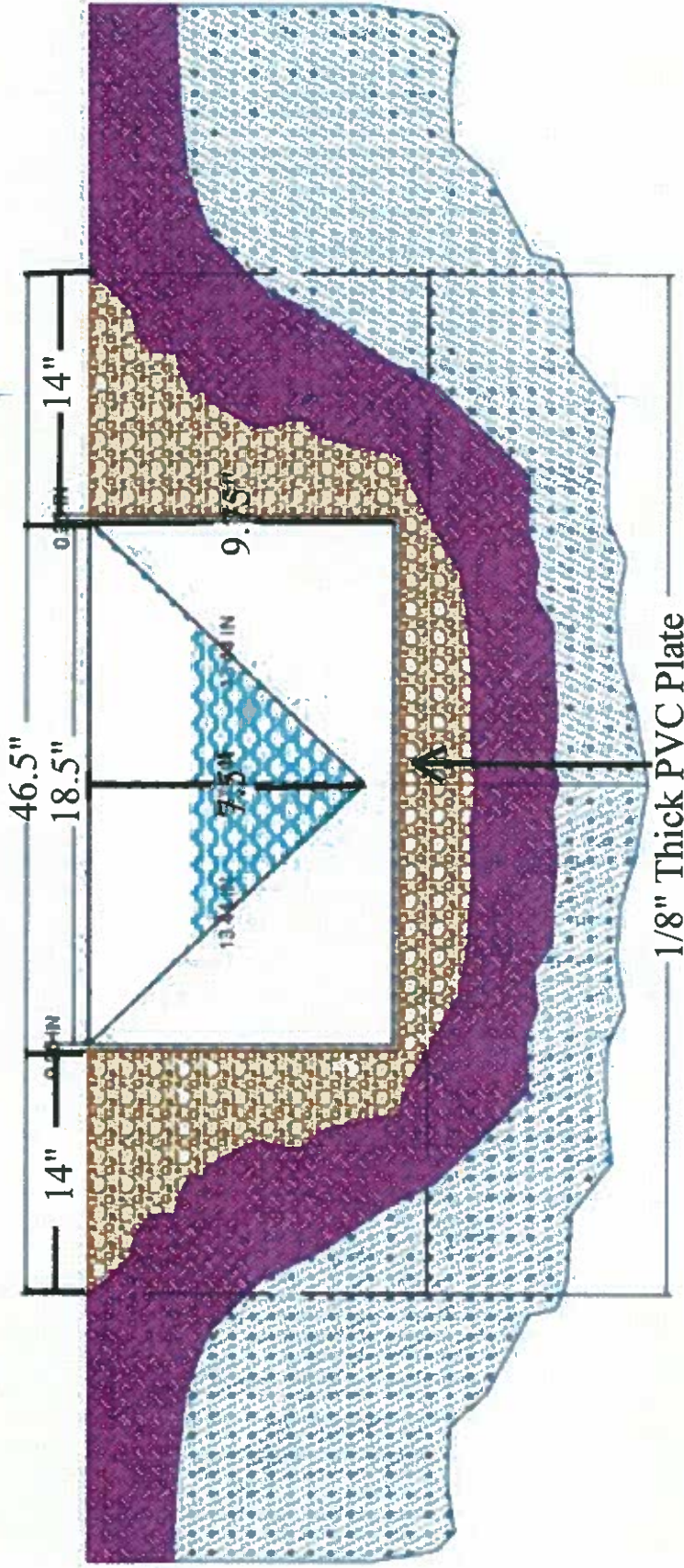


EXHIBIT 1c





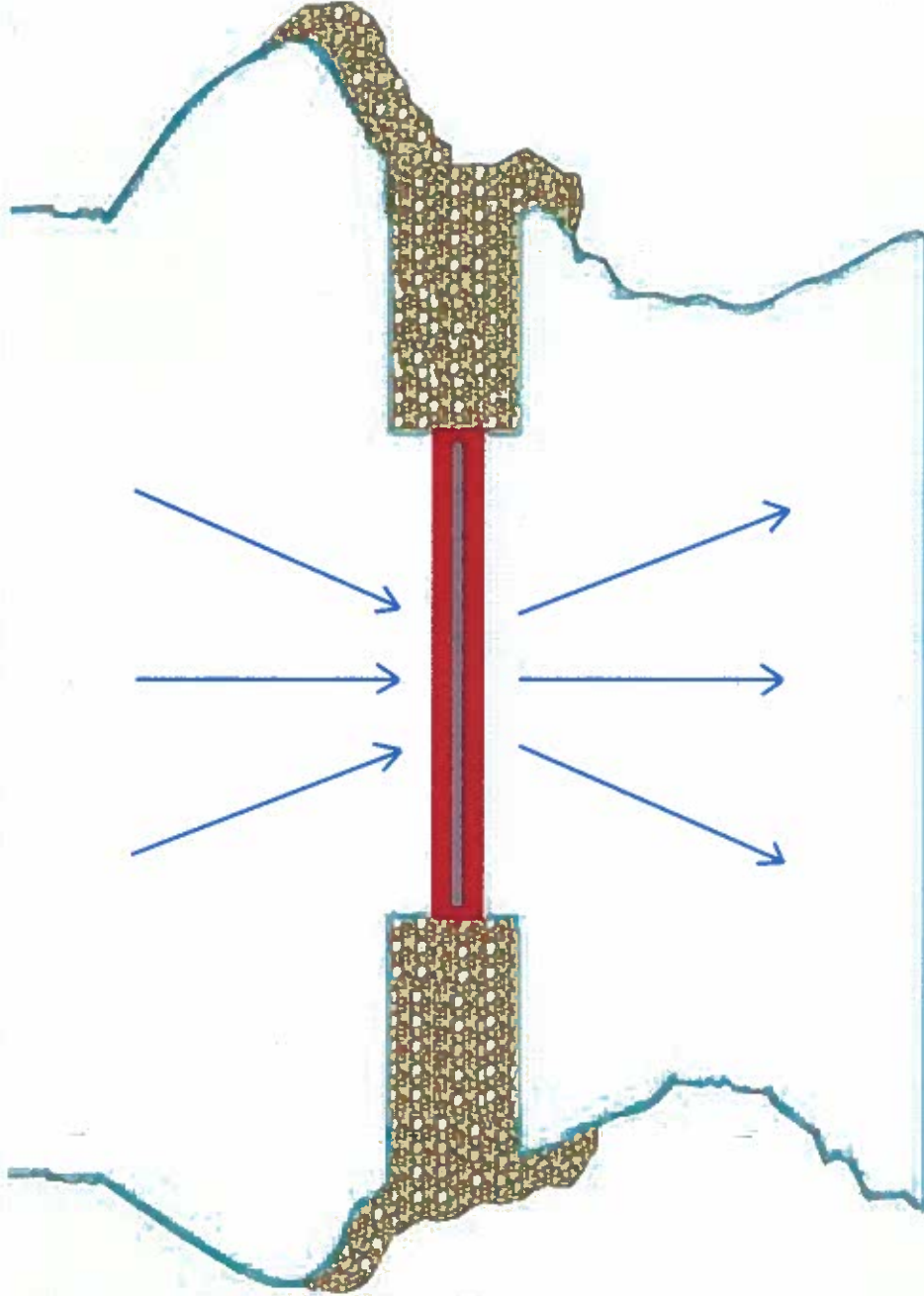
REMOVABLE WEIR  
 TMK (3)2-5-25:029  
 DR. JUNG PROPERTY



IN STREAM WEIR  
 KAUMANA- DR. JUN  
 HILO, HI

- WATER
- SMALL ROCK
- ROCK
- WEIR
- PLATE
- ROCK
- SOIL
- PLATE INSERTED IN STREAM BANK
- DOWNSTREAM FACE STRENGTHEND WITH 6" PLUS LAVA ROCKS (UNGROUTED)
- CENTER WEIR PLATE REMOVABLE FOR UPSTREAM POND CLEANING





WATER FLOW



REMOVABLE 8° 90 DEGREE V-NOTCH WEIR



LOOSE LAVA ROCK

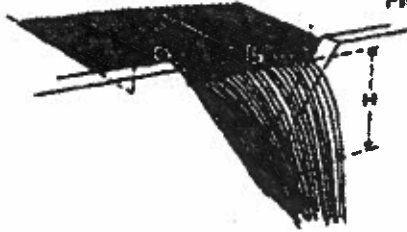


PVC PLATE



IN-STREAM WEIR  
KAUMANA- DR. JUN  
HILO, HI

Flow Data Weirs



Discharge from Triangular Notch Weirs with End Contractions

Head (H) in inches	Flow in gallons per min		Head (H) in inches	Flow in gallons per min		Head (H) in inches	Flow in gallons per min	
	90° notch	60° notch		90° notch	60° notch		90° notch	60° notch
1	2.19	1.27	6¾	260	150	15	1912	1104
1¼	3.83	2.21	7	284	164	15½	2073	1197
1½	6.05	3.49	7¼	310	179	16	2246	1297
1¾	8.89	5.13	7½	338	195	16½	2426	1401
2	12.4	7.16	7¾	367	212	17	2614	1509
2¼	16.7	9.62	8	397	229	17½	2810	1623
2½	21.7	12.5	8¼	429	248	18	3016	1741
2¾	27.5	15.9	8½	462	267	18½	3229	1864
3	34.2	19.7	8¾	498	287	19	3452	1993
3¼	41.8	24.1	9	533	308	19½	3684	2127
3½	50.3	29.0	9¼	571	330	20	3924	2266
3¾	59.7	34.5	9½	610	352	20½	4174	2410
4	70.2	40.5	9¾	651	376	21	4433	2560
4¼	81.7	47.2	10	694	401	21½	4702	2715
4½	94.2	54.4	10½	784	452	22	4980	2875
4¾	108	62.3	11	880	508	23	5268	3041
5	123	70.8	11½	984	568	23½	5565	3213
5¼	139	80.0	12	1094	632	24	5873	3391
5½	156	89.9	12½	1212	700	24½	6190	3574
5¾	174	100	13	1337	772	25	6518	3763
6	193	112	13½	1469	848			
6¼	214	124	14	1609	929			
6½	236	136	14½	1756	1014			

Based on Thompson formula:

$$Q = (C)(4/15)(L)(H) \sqrt{2gH}$$

in which

Q = flow of water in ft<sup>3</sup>/sec

L = width of notch in ft at H distance above apex

H = head of water above apex of notch in ft

C = constant varying with conditions, .57 being used for this table

a = should not be less than ¾L

For 90° notch the formula becomes

$$Q = 2.4381 H^{3/2}$$

For 60° notch the formula becomes

$$Q = 1.4076 H^{3/2}$$





EXHIBIT 5

STANDARD STREAM CHANNEL ALTERATION PERMIT CONDITIONS  
(Revised 9/19/07)

1. The permit application and staff submittal approved by the Commission at its meeting on September 27, 2011, shall be incorporated herein by reference.
2. The applicant shall comply with all other applicable statutes, ordinances, and regulations of the Federal, State and county governments.
3. The applicant, his successors, assigns, officers, employees, contractors, agents, and representatives, shall indemnify, defend, and hold the State of Hawaii harmless from and against any claim or demand for loss, liability, or damage including claims for property damage, personal injury, or death arising out of any act or omission of the applicant or his successors, assigns, officers, employees, contractors, and agents under this permit or related to the granting of this permit.
4. The applicant shall notify the Commission, by letter, of the actual dates of project initiation and completion. The applicant shall submit a set of as-built plans and photos of the completed work to the Commission upon completion of this project. This permit may be revoked if work is not started within six (6) months after the date of approval or if work is suspended or abandoned for six (6) months, unless otherwise specified. The proposed work under this stream channel alteration permit shall be completed within two (2) years from the date of permit approval, unless otherwise specified. The permit may be extended by the Commission upon showing of good cause and good-faith performance. A request to extend the permit shall be submitted to the Commission no later than three (3) months prior to the date the permit expires. If the commencement or completion date is not met, the Commission may revoke the permit after giving the permittee notice of the proposed action and an opportunity to be heard.
5. Before proceeding with any work authorized by the Commission, the applicant shall submit one set of construction plans and specifications to determine consistency with the conditions of the permit and the declarations set forth in the permit application.
6. The applicant shall develop site-specific, construction best management practices (BMPs) that are designed, implemented, operated, and maintained by the applicant and its contractor to properly isolate and confine construction activities and to contain and prevent any potential pollutant(s) discharges from adversely impacting state waters. BMPs shall control erosion and dust during construction and schedule construction activities during periods of low stream flow.
7. The applicant shall protect and preserve the natural character of the stream bank and stream bed to the greatest extent possible. The applicant shall plant or cover lands denuded of vegetation as quickly as possible to prevent erosion and use native plant species common to riparian environments to improve the habitat quality of the stream environment.
8. In the event that subsurface cultural remains such as artifacts, burials or deposits of shells or charcoal are encountered during excavation work, the applicant shall stop work in the area of the find and contact the Department's Historic Preservation Division immediately. Work may commence only after written concurrence by the State Historic Preservation Division.