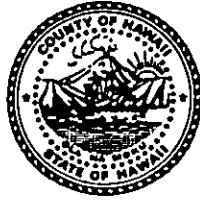


Kohala Coastal Trail

Stephen K. Yamashiro  
Mayor



Virginia Goldstein  
Director

Norman Olesen  
Deputy Director

RECEIVED

'94 NOV -1 11:44

## County of Hawaii

### PLANNING DEPARTMENT

25 Aupuni Street, Room 109 • Hilo, Hawaii 96720-4252  
(808) 961-8288 • Fax (808) 961-9615

OFFICE OF ENVIRONMENTAL QUALITY CONTROL

October 28, 1994

Mr. Brian J. J. Choy, Director  
Office of Environmental Quality Control  
220 South King Street, 4th Floor  
Honolulu, HI 96813

Dear Mr. Choy:

Final Environmental Assessment-Negative Declaration for the  
Construction & Operation of a Private 8.6-Mile Long  
Multi-Purpose Trail for Recreational Purposes Including  
Access Roads, Parking Areas and Restrooms  
Applicant: Chalon International of Hawaii, Inc.  
Tax Map Key: 5-3-06: Portion 21; 5-3-07: Portions 1 and 10;  
5-4-08: Portion 1; 5-4-09: Portion 1 and 5-5-08: Portion 13

The County of Hawaii Planning Department has reviewed the comments received during the 30-day public comment period which began on June 23, 1994. The County of Hawaii Planning Department has determined that this project will not have significant environmental effect and has issued a negative declaration. Please publish notice of this determination in the November 23, 1994, OEQC Bulletin.

We have enclosed a completed OEQC Bulletin Publication Form and four copies of the Final Environmental Assessment as required.

Please contact Daryn Arai or Rodney Nakano of this office at 961-8288 should you have any questions.

Sincerely,

  
VIRGINIA GOLDSTEIN  
Planning Director

DSA:mjh  
5446D

Enclosures (4 copies of Final EA and OEQC Publication Form)

xc/attach: West Hawaii Office  
Chalon International of Hawaii, Inc.

1994-11-23-HI-PEA-Kohala Coastal  
Trail

NOV 23 1994

**FINAL**  
**ENVIRONMENTAL ASSESSMENT**  
**FOR THE**  
**KOHALA COASTAL TRAIL**  
**NORTH KOHALA DISTRICT, ISLAND OF HAWAII**

**Prepared By: Chalon International of Hawaii, Inc.**

**September 1994**

FINAL ENVIRONMENTAL ASSESSMENT  
FOR THE  
KOHALA COASTAL TRAIL  
NORTH KOHALA, HAWAII

TMK'S:      5-03-06: 21 portion  
              5-03-07: 01 and 10 portion  
              5-04-08: 01 portion  
              5-04-09: 01 portion  
              5-05-08: 13 portion

**APPLICANTS:**

Chalon International of Hawaii, Inc.  
P.O. Box 249  
Hawi, Hawaii 96719  
Contact Person:      Matthew Grady, Planner, 889-6257  
                                 Duane Kanuha, Vice-President, 934-7033

**APPROVING AGENCY:**

County of Hawaii Planning Department

**AGENCIES CONSULTED  
IN MAKING ASSESSMENT:**

State Department of Agriculture,  
State Department of Health  
    Environmental Management Division  
State Department of Land and Natural Resources  
    Division of Historic Preservation  
    Environmental Division  
    Division of Parks  
Mauna Kea Soil & Water Conservation District  
County of Hawaii  
    Planning Department  
    Department of Parks and Recreation  
Na Maka'ala 'O Kohala  
North Kohala Hawaiian Civic Club  
Na Ala Hele  
North Kohala Greenways

TABLE OF CONTENTS

	<u>Page No.</u>
<b>1. INTRODUCTION</b> .....	<b>1</b>
1.1 Purpose and Content of the Final Environmental Assessment .....	1
<b>2. GENERAL DESCRIPTION OF THE ACTION'S TECHNICAL, ECONOMIC, SOCIAL AND ENVIRONMENTAL CHARACTERISTICS</b> .....	<b>1</b>
2.1 General Description .....	1
2.2 Technical Aspects of the Proposed Project .....	2
2.3 Social/Economic Aspects of the Proposed Project .....	4
<b>3. SUMMARY DESCRIPTION OF THE AFFECTED ENVIRONMENT</b> .....	<b>9</b>
3.1 Physical Environment .....	9
3.2 Natural Environment .....	10
3.3 Natural Hazards .....	11
3.4 Historical and Archaeological Resources .....	12
3.5 Social/Economic Environment .....	13
3.6 Infrastructure .....	15
3.7 Public Services .....	16
3.8 Relationship of Action to Existing Land Use Plans .....	17
<b>4. IDENTIFICATION AND SUMMARY OF MAJOR IMPACTS AND ALTERNATIVES CONSIDERED</b> .....	<b>20</b>
4.1 Major Impacts .....	20
4.2 Irreversible or Irretrievable Commitment of Resources .....	21
4.3 Alternatives to the Proposed Action .....	21
<b>5. PROPOSED MITIGATION MEASURES</b> .....	<b>21</b>
<b>6. DETERMINATION</b> .....	<b>22</b>
<b>7. PUBLIC INVOLVEMENT</b> .....	<b>23</b>
<b>8. REFERENCES</b> .....	<b>24</b>

LIST OF FIGURES

<u>Figure</u>	<u>Follows</u>
	<u>Page No.</u>
1a, 1b - Location Map . . . . .	1
2 - Tax Map Keys (Parcel Map) . . . . .	1
3 - Trail Dimensions . . . . .	2
4a- Concept Plan . . . . .	3
4b- Concept Plan . . . . .	3
5 - Flood Insurance Rate Map . . . . .	12
6 - Access Locations . . . . .	15

APPENDICES

APPENDIX A	Botanical Survey
APPENDIX B	Avifauna & Feral Mammal Survey
APPENDIX C	Archaeological Survey

## **1. INTRODUCTION**

### **1.1 Purpose and Content of the Final Environmental Assessment**

This Final Environmental Assessment (FEA) has been prepared to describe the potential environmental impacts of a proposed coastal trail located between the areas of Hawi and Halawa on the northern tip of the North Kohala District on the Island of Hawaii. This FEA has been prepared in compliance with the provisions of Hawaii Revised Statutes (HRS) Chapter 343 Environmental Impact Statements, Title 11, Chapter 200 of the Hawaii Administrative Rules, Department of Health.

The FEA describes the proposed trail; the existing conditions of the trail corridor and the surrounding area; the probable environmental impacts that might result from the proposed project; the mitigation measures that would be employed to minimize potential adverse environmental impacts; and the alternatives to the proposed project that have been investigated. This FEA supports a declaration of no significant impact (Negative Declaration).

The proposed project is subject to Chapter 343 because it utilizes lands within the State Land Use Conservation District.

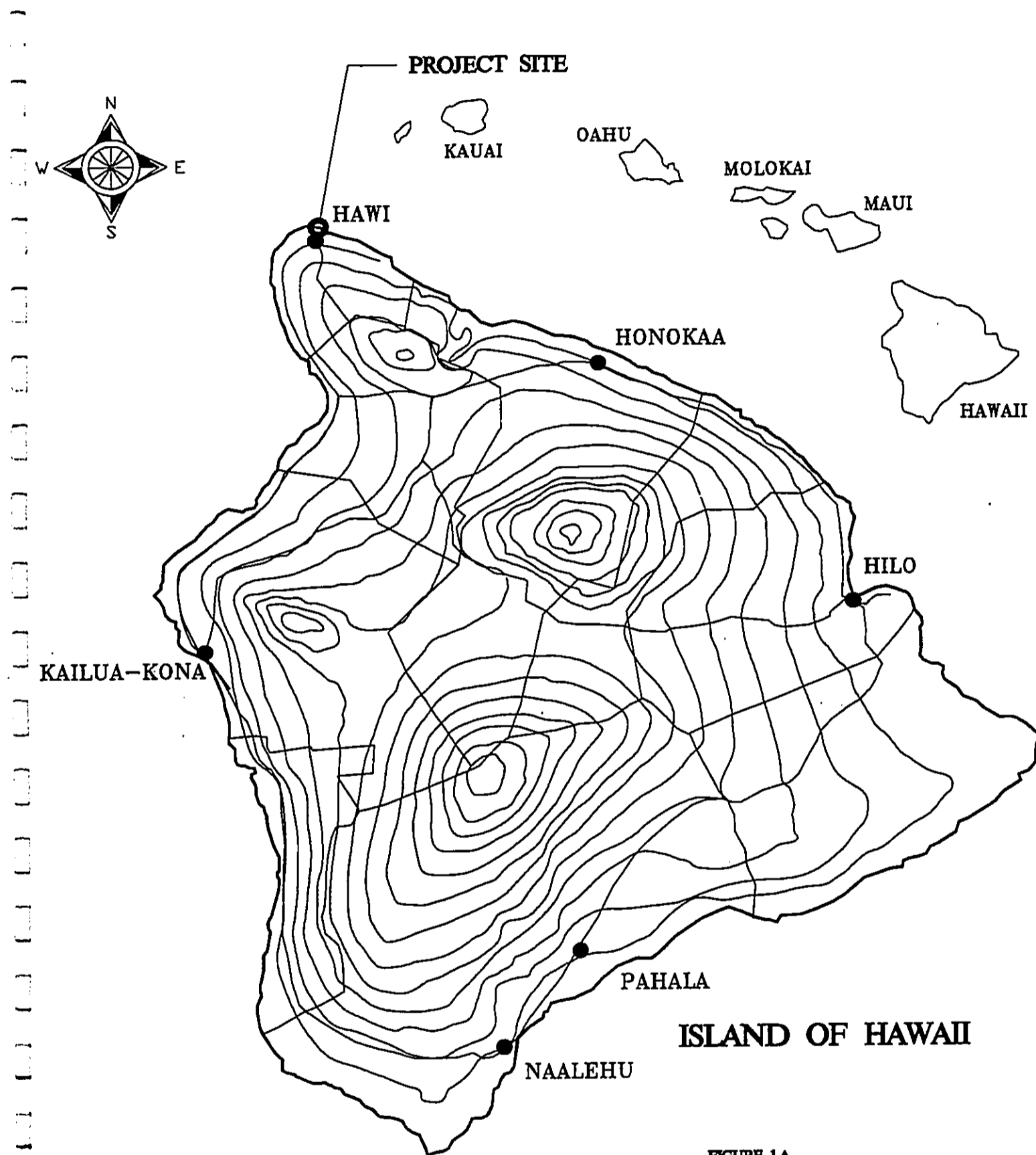
## **2. GENERAL DESCRIPTION OF THE ACTION'S TECHNICAL, ECONOMIC, SOCIAL AND ENVIRONMENTAL CHARACTERISTICS**

### **2.1 General Description**

The proposed action involves the establishment of a privately owned and maintained multipurpose trail located on portions of Tax Map Keys: 5-03-06:21, 5-03-07:01 & 10, 5-04-08:01, 5-04-09:01 and 5-05-08:13 encompassing approximately 8.6 miles of land in the North Kohala District on the island of Hawaii. The land is owned in fee by Chalon International of Hawaii, Inc. (refer to Figures 1a, 1b and 2).

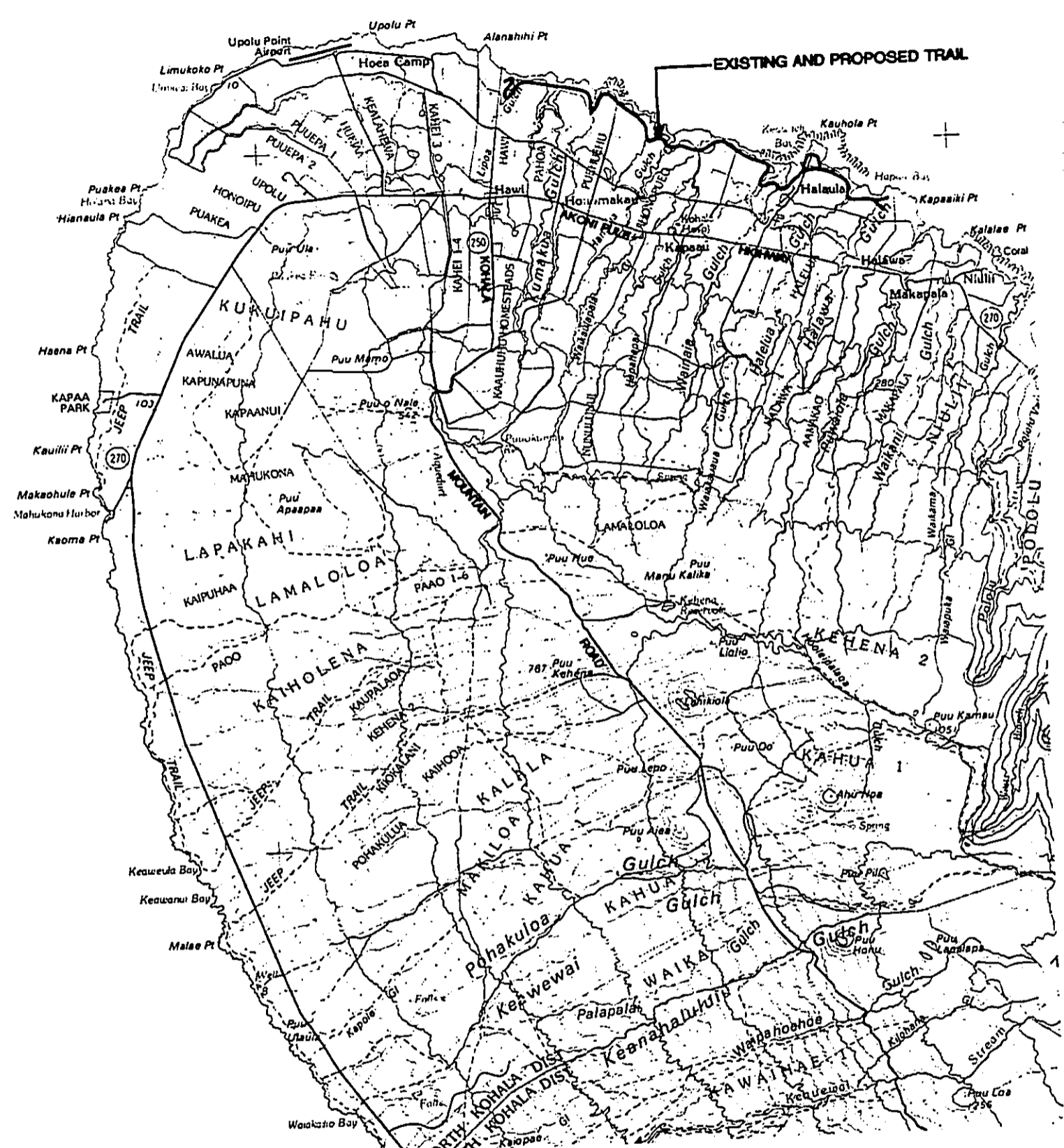
The coastal trail, located about one mile from the main towns of Hawi and Kapaau on the Akoni Pule Highway, extends from Lipoa Gulch to Halawa Gulch. Access to the trail will be from secondary roadways connecting to the Akoni Pule Highway in five locations. Chalon intends to own and operate the proposed trail for the general public on a daily basis. Much of the trail exists in the form of overgrown cane haul roads. New sections will be created to link the field roads together. In a few areas the trail splits so that pedestrians can enjoy a closer view of the ocean while the multipurpose (horse and mountain bikes) trail follows an easier grade further inland.

The project requires a Conservation District Use Application (CDUA) granted by the Board of Land and Natural Resources and a Special Management Area Permit (SMAP) issued by



**FIGURE 1A**  
**ISLAND LOCATION MAP**  
**ENVIRONMENTAL ASSESSMENT**  
**KOHALA COASTAL TRAIL**





**FIGURE 1B  
REGIONAL LOCATION MAP  
ENVIRONMENTAL ASSESSMENT  
KOHALA COASTAL TRAIL**





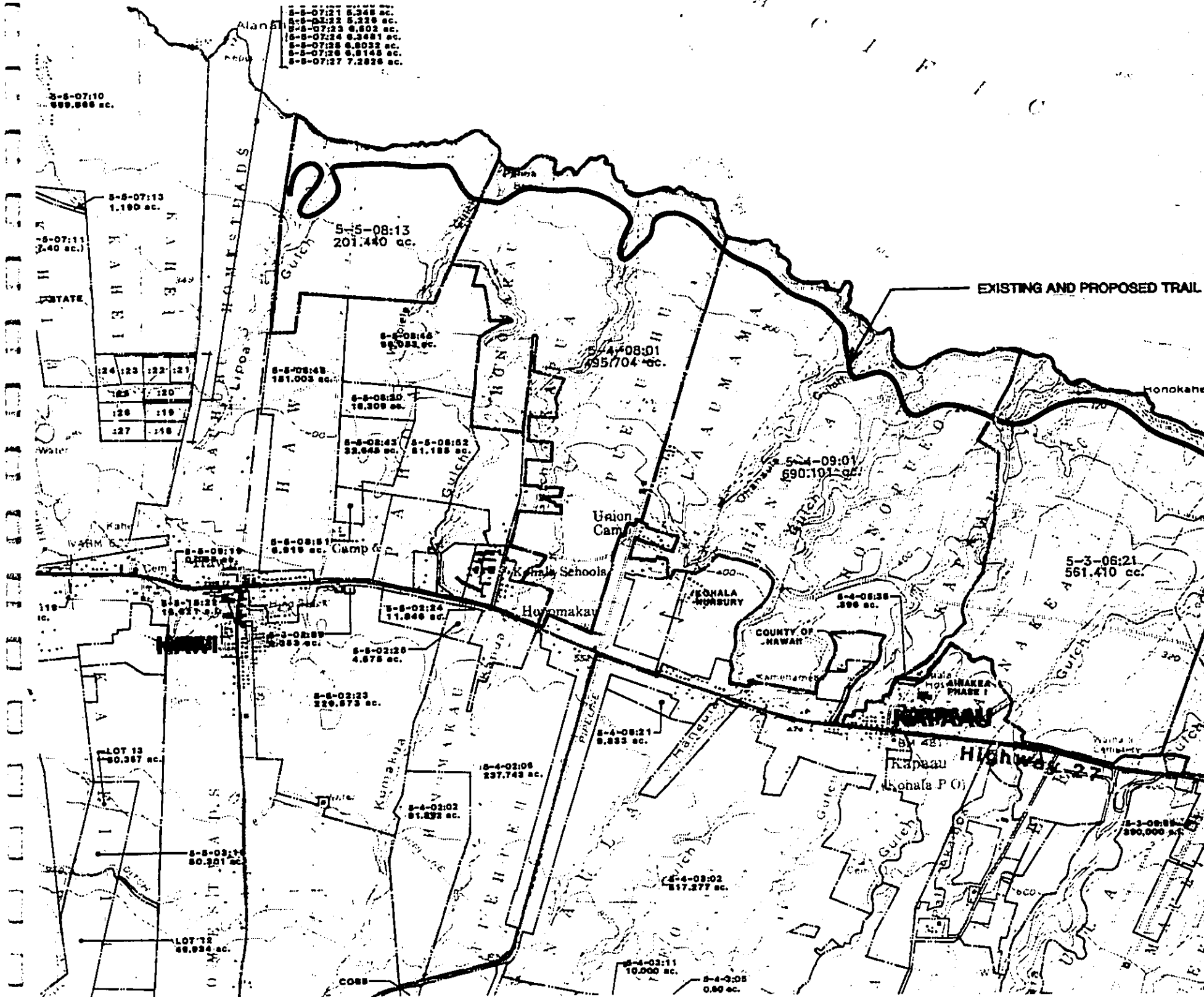
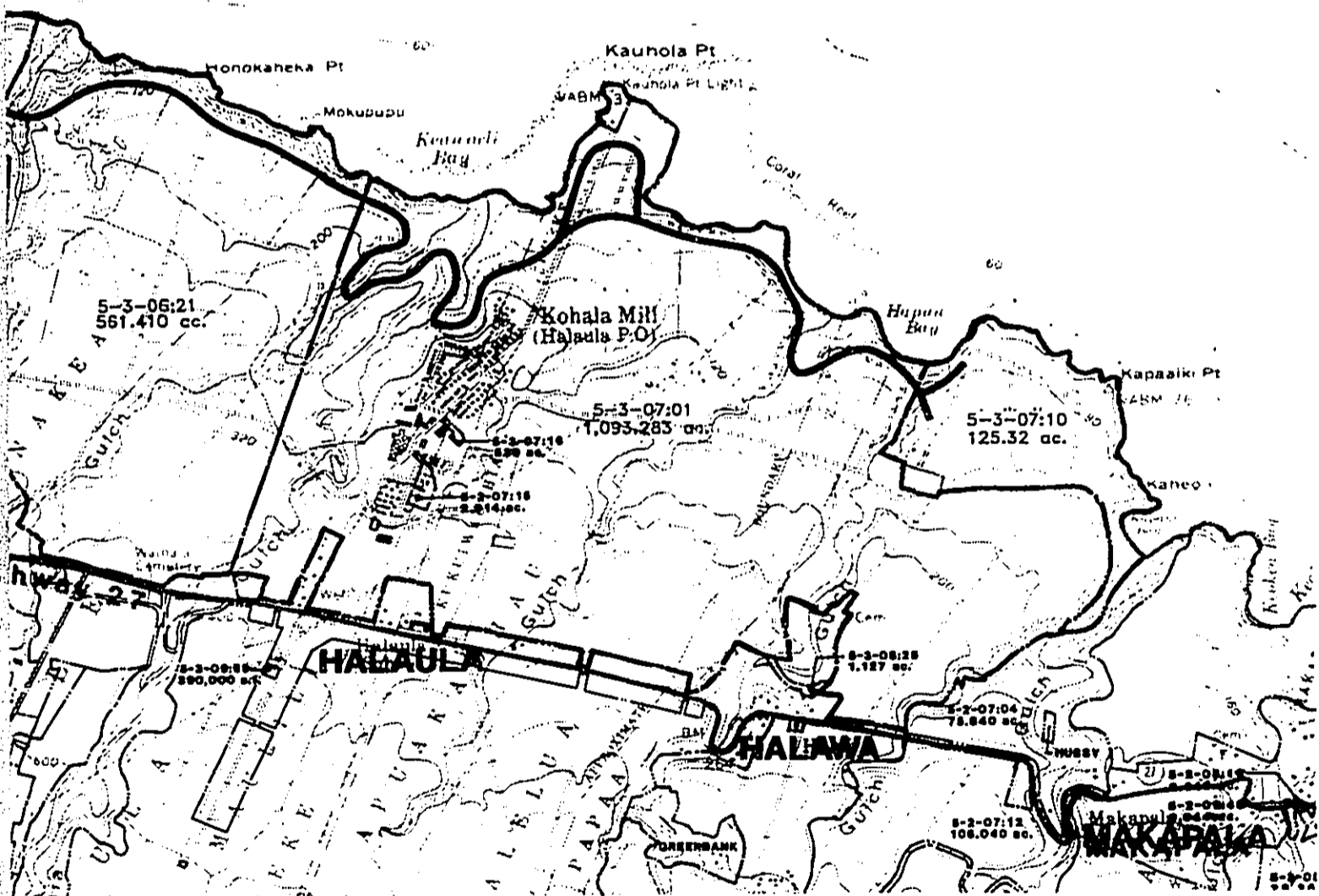


FIGURE 2  
 TAX MAP KEYS  
 ENVIRONMENTAL ASSESSMENT  
**KOHALA COASTAL TRAIL**  
 CHALON INTERNATIONAL OF HAWAII

O C E A N

EXISTING AND PROPOSED TRAIL



NORTH KOHALA, ISLAND OF HAWAII

County of Hawaii Planning Department/Commission. This FEA provides information to augment each of the permit applications.

## 2.2 Technical Aspects of the Proposed Project

### Trail Specifications

The proposed trail entails the refurbishment of existing overgrown cane haul roads and the establishment of new trails to link the cane haul roads together. The intent is to ultimately create a multipurpose trail for mountain bicycles, horseback riding, hiking and jogging. The first phase improvements will focus on preparing the trail for pedestrian use. As time and management permits, the trail will be improved to allow safe passage of horses and mountain bikes. The trail corridor will follow trail specifications used by Na Ala Hele:

TABLE 1  
TRAIL SPECIFICATIONS

<u>Multipurpose*</u>	
Tread width:	3 - 4 feet
Clearing width:	2 feet either side of tread
Total width:	8 feet
Vertical:	9 - 10 feet
Tread surface:	Natural and packed clinker (decomposed basaltic rock)

### Hiking Trail

Tread width:	2 - 3 feet
Clearing width:	2 feet either side of tread
Total width:	7 feet
Vertical:	7 - 8 feet
Tread surface:	Natural, packed clinker and/or wood chips

(\*) Indicates that a multipurpose trail guideline was not available so the largest "wildland" dimensions for horses and bicycles were used.

Figure 3 indicates visual sketches of the dimensions.

### Trail Type

The trail will be a "wildland" trail, as defined in Na Ala Hele Hawaii Trail & Access System Program Plan, by the Department of Land and Natural Resources, Division of Forestry and Wildlife, dated May 1991, pg. IV-5:

"Trails or accesses in "primitive areas" which are without permanent improvements or human habitation and are protected and managed so as to preserve their natural condition. These areas should be scenic and wild, not highly sensitive to human presence,



FIGURE 3  
 TRAIL DIMENSIONS  
 ENVIRONMENTAL ASSESSMENT  
**KOHALA COASTAL TRAIL**  
 CHALON INTERNATIONAL OF HAWAII

and will generally be managed for multiple uses."

Overall the trail will be about 8.6 miles in length. Of this 8.6 miles, about 6.9 miles are existing cane haul roads and 1.7 miles will be constructed (refer to Figures 4a and 4b).

TABLE 2  
TRAIL TYPE - EXISTING AND PROPOSED

<u>Existing Trail/ Cane Road</u>	<u>Proposed New Trails</u>		<u>Total</u>
	<u>Multi</u>	<u>Hiking Only</u>	
6.9 miles	1.3 miles	0.4 miles	8.6 miles

The trail meanders back and forth between the State Land Use Conservation and Agriculture Districts with about 5 miles of trail in the Conservation District and 3.6 in the Agriculture District. The new trail improvements take place predominantly within 6 of the 11 gulches, which are bisected by the State Land Use Boundary line.

TABLE 3  
LENGTH OF NEW TRAIL LOCATED BY  
STATE LAND USE DISTRICT (LINEAL FEET)

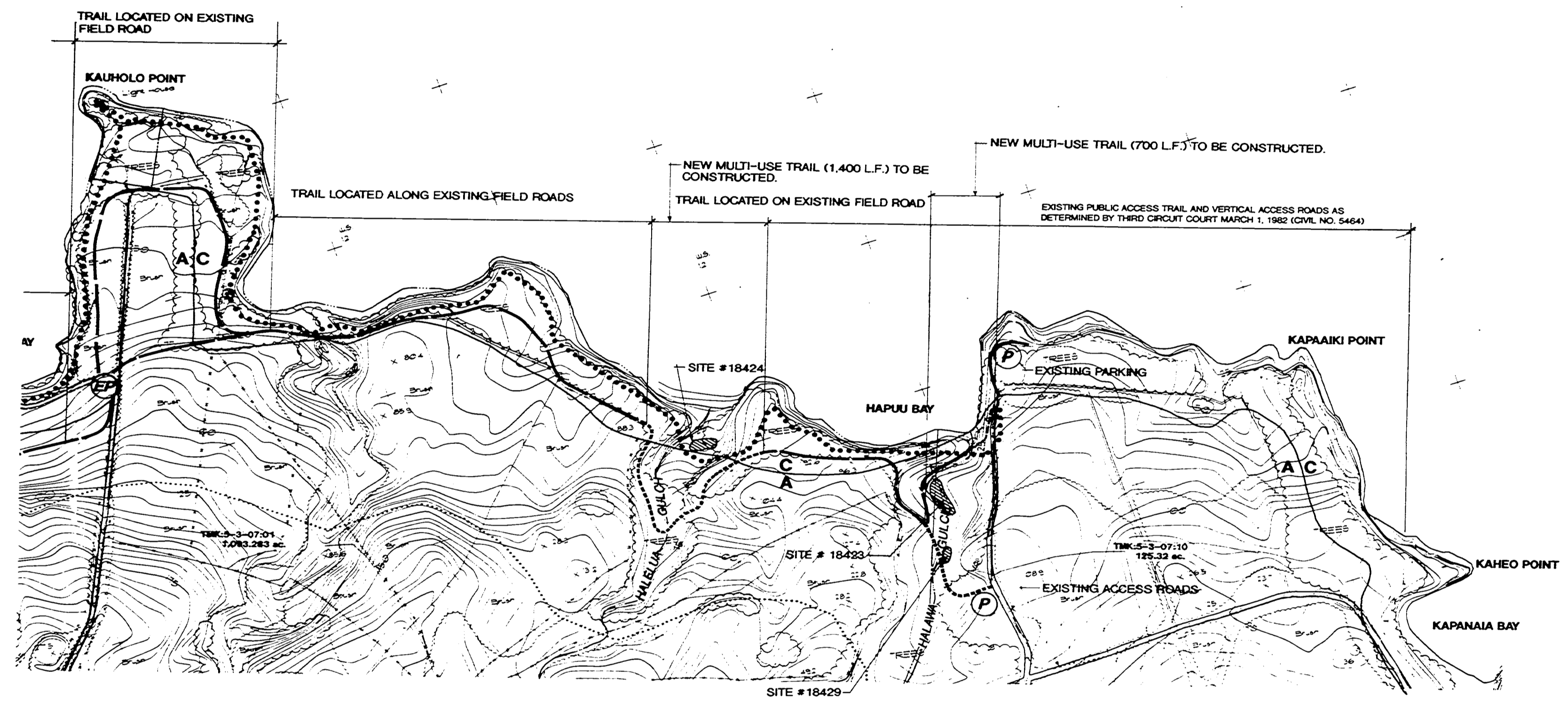
<u>Gulch Name</u>	<u>Land Use District (feet)</u>		<u>Total</u>
	<u>Conservation</u>	<u>Agriculture</u>	
Lipoa	---	---	---
Waipele	400'	1,000'	1,400'
Kumukua	---	---	---
Kapua	1,000'	2,400'	3,400'
Ohanaula	---	---	---
Hanaula	---	---	---
Kapaau	---	---	---
Pali Akamoa	1,000'	---	1,000'
Wainaia	100'	---	100'
Halelua	200'	1,200'	1,400'
Halawa	---	700'	700'
Unnamed Gulch	400'	800'	1,200'
Totals:	<u>3,100'(0.58 m.)</u>	<u>6,100'(1.2 m.)</u>	<u>9,200'(1.7 m.)</u>

Refurbishment of the existing 6.9 miles of cane haul road requires limited grading to level ruts and clearing branches and trees overhead to a height of about 10 feet. Creation of the new 1.7 miles of trail requires clearing of vegetation, grading to the specified widths, importation of clinker (decomposed basaltic rock), and erection of water bars to divert runoff where necessary.

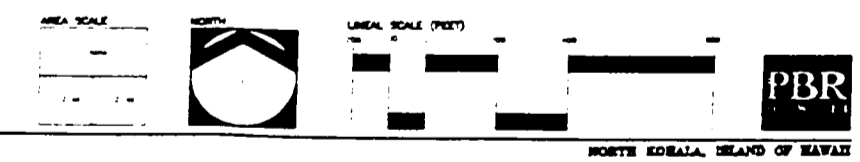
**OVERSIZED  
DRAWING/MAP**

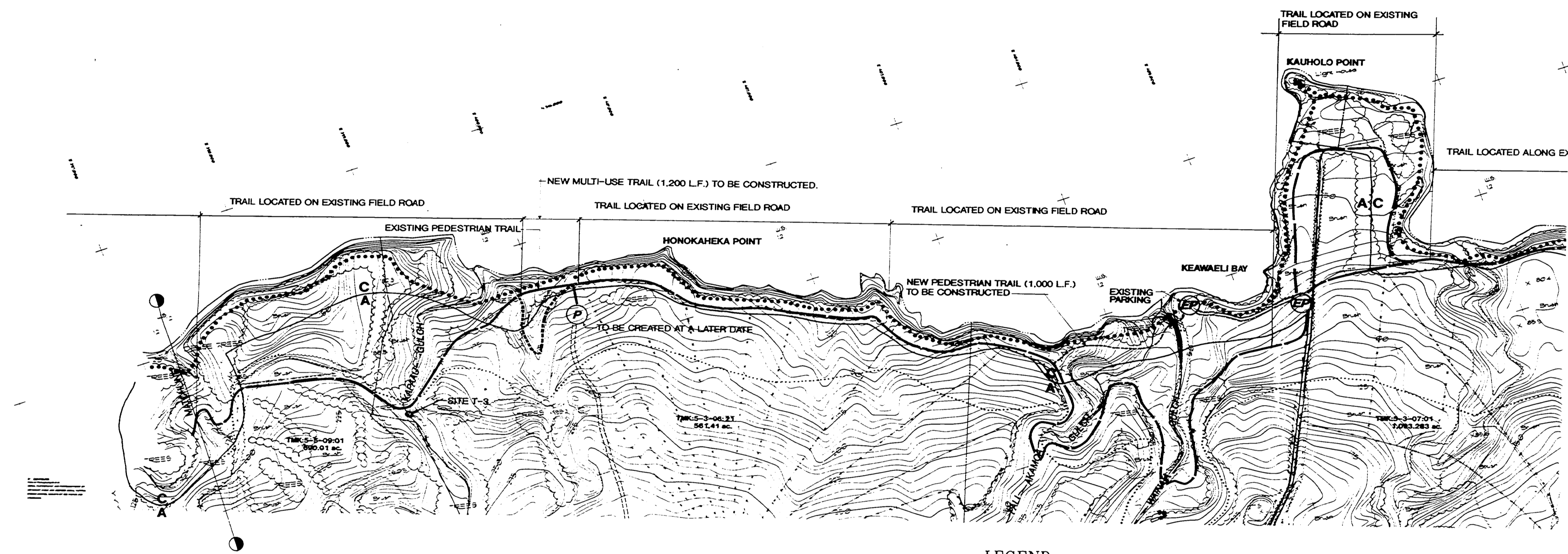
**PLEASE SEE  
35MM ROLL**

0068



EXISTING CONDITIONS	PROPOSED CONDITIONS
TAX MAP KEY BOUNDARY	PROPOSED MULTI-USE TRAIL
EXISTING UNIMPROVED FIELD ROAD	PROPOSED PEDESTRIAN TRAIL
EXISTING PARKING	PROPOSED UNIMPROVED ACCESS ROAD
HISTORIC SITES	PROPOSED PARKING AREA
ESTIMATED 40' SETBACK FROM SHORELINE	





SITE PLAN  
**KOHALA COASTAL TRAIL**

SCALE: 1" = 100'

LEGEND		
<b>EXISTING REGULATORY</b>	<b>EXISTING CONDITIONS</b>	<b>PROPOSED CON</b>
• STATE LAND USE BOUNDARY	▬ TAX MAP KEY BOUNDARY	▬ PROPOSED 3'
▭ A AGRICULTURE	▬ EXISTING UNIMPROVED FIELD ROAD	▬ PROPOSED 1'
▭ C CONSERVATION	⊙ EXISTING PARKING	▬ PROPOSED 1'
▭ SPECIAL MANAGEMENT AREA	▭ HISTORIC SITES	⊙ PROPOSED 1'
▭ SPECIAL MANAGEMENT BOUNDARY	••• ESTIMATED 40' SETBACK FROM SHORELINE	

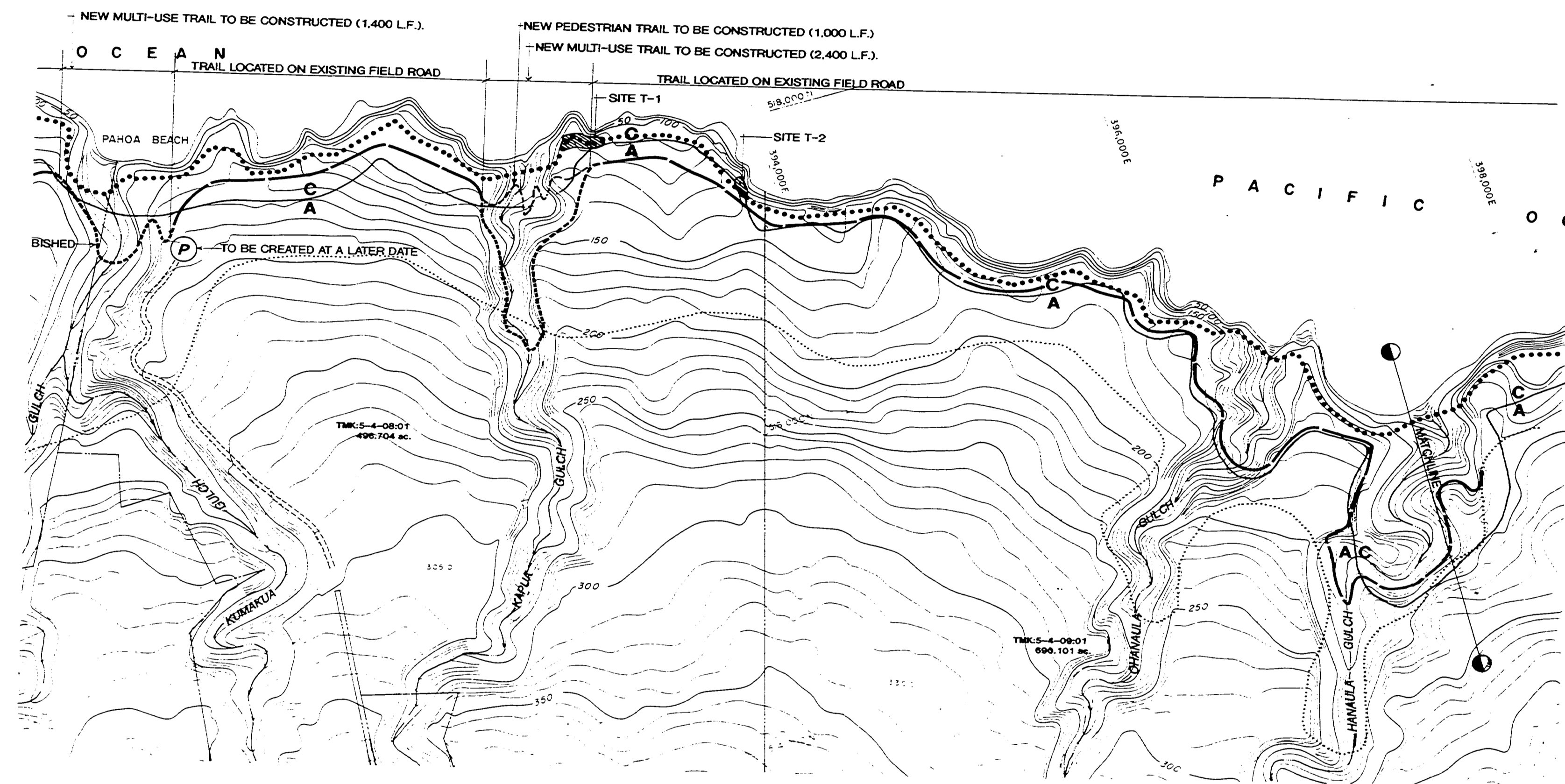
• INTERPRETATION NO. 92 431



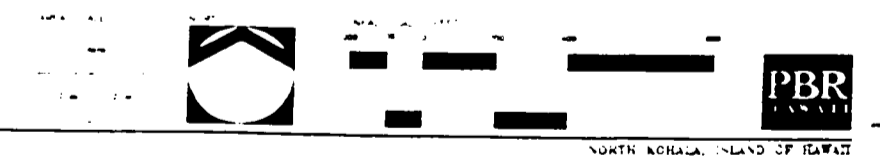
**OVERSIZED  
DRAWING/MAP**

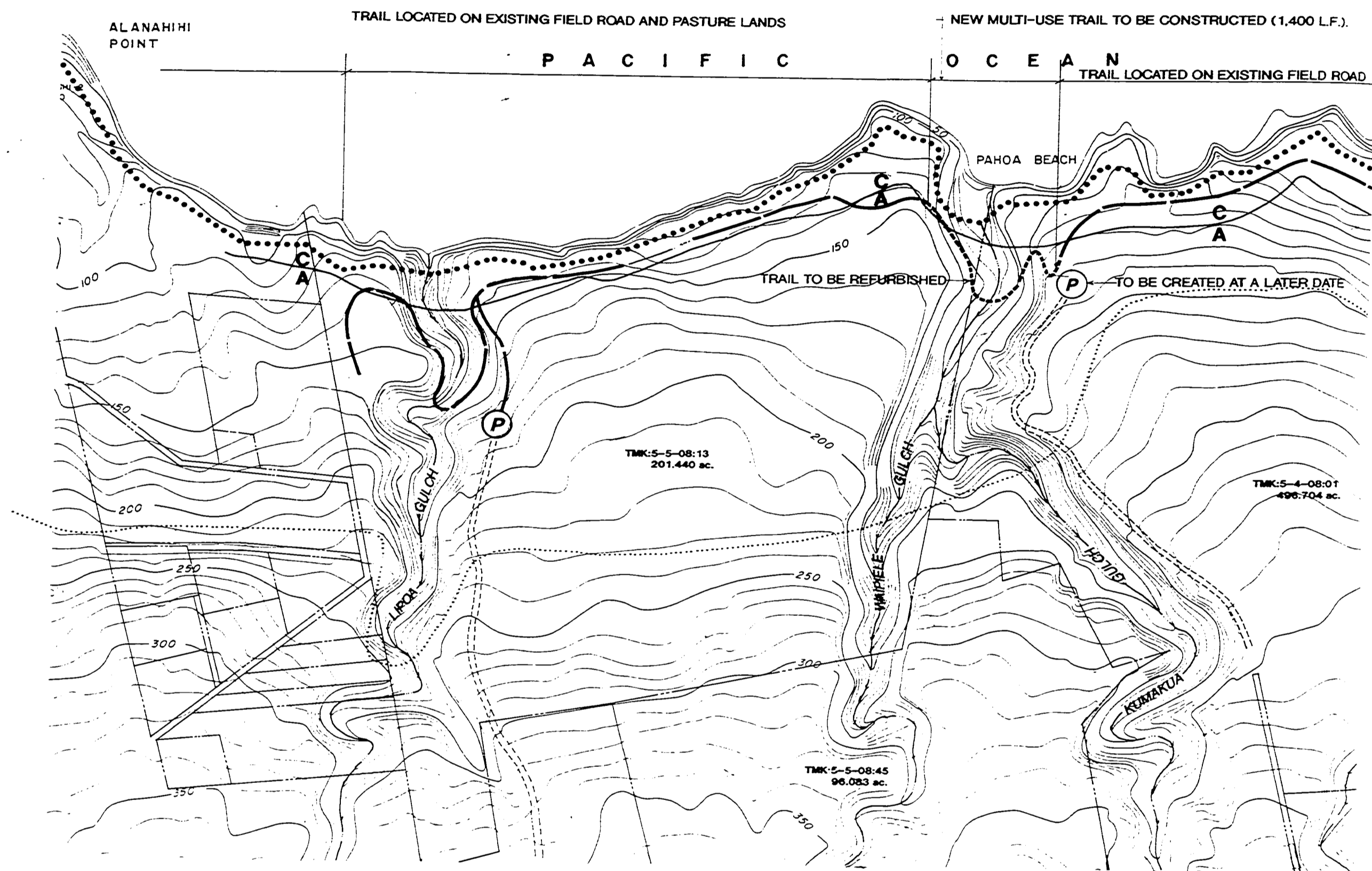
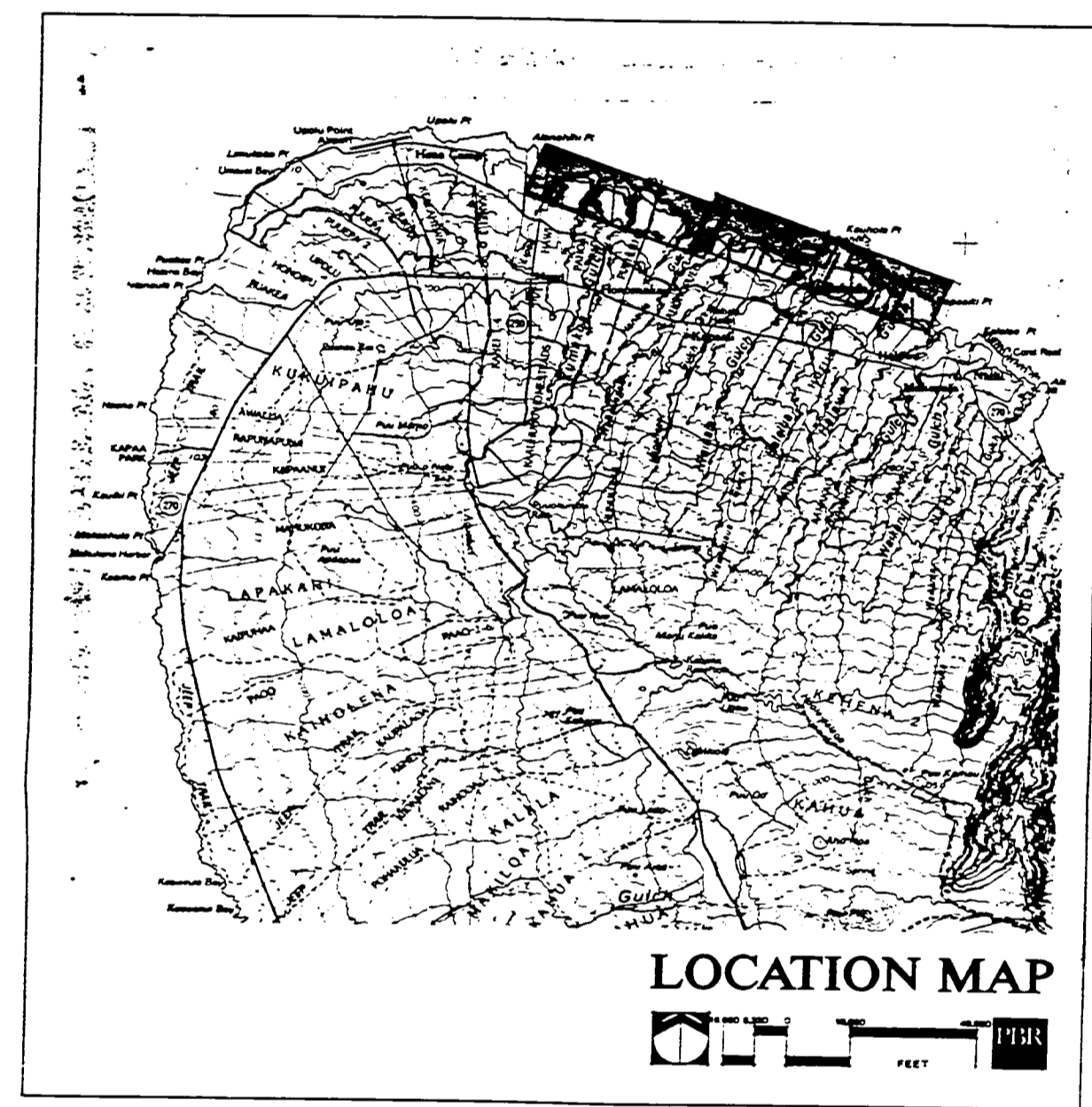
**PLEASE SEE  
35MM ROLL**

0069



EXISTING CONDITIONS		PROPOSED CONDITIONS	
	TAX MAP KEY BOUNDARY		PROPOSED MULTI-USE TRAIL
	EXISTING UNIMPROVED FIELD ROAD		PROPOSED PEDESTRIAN TRAIL
	EXISTING PARKING		PROPOSED UNIMPROVED ACCESS ROAD
	HISTORIC SITES		PROPOSED PARKING AREA
	ESTIMATED 40' SETBACK FROM SHORELINE		





**LEGEND**

EXISTING REGULATORY	EXISTING CONDITIONS	PROPOSED CONDITIONS
STATE LAND USE BOUNDARY	TAX MAP KEY BOUNDARY	PROPOSED
A AGRICULTURE	EXISTING UNIMPROVED FIELD ROAD	PROPOSED
C CONSERVATION	EXISTING PARKING	PROPOSED
SPECIAL MANAGEMENT AREA	HISTORIC SITES	PROPOSED
SPECIAL MANAGEMENT BOUNDARY	ESTIMATED 40' SETBACK FROM SHORELINE	PROPOSED

**SITE PLAN**  
**KOHALA COASTAL TRAIL**

• INTERPRETATION NO. 92 431

Additionally, the extreme bottom of some of the gulches may require a cement ford crossing at existing grade, to reduce erosion caused by the trail users.

Pali Akamoa and Wainaiia Gulches are relatively flat on the floor with very narrow 12- to 15-foot deep channels that convey runoff on a periodic basis. Establishment of the trail within the deep channels will require the refurbishment of earthen ramps on either side of the defined gulch to permit trail users safe passage across them.

#### Parking

Six parking areas will be used at total buildout. Four areas will be used immediately: 1) one on the Hawi end to be constructed adjacent to the Hawi Road by Lipoa Gulch; 2) two existing just mauka of Kauhola Point; and 3) one at the Halawa end to be constructed near Halawa Gulch and Hapuu Bay. Two other parking areas will be constructed at a later point in time located near: 1) Paho Beach; and 2) Honokaheka Point. The improvements at each parking area require grading and compaction of clinker covering an area of about 4,000 square feet permitting up to 15 parking stalls.

This means that up to 90 stalls may be provided when all the parking lots have been constructed at total buildout. Based on the County of Hawaii Zoning Code (Chapter 25) parking stall dimensions are 9' x 18', with a 12' back-up maneuvering isle, requiring about 4,000 square feet for each parking area. Each parking area will contain: 1) a trash receptacle; 2) a gate, to open the parking lot in the day time and close the parking lot at night; 3) trailhead sign informing the user of their location and responsibilities; and 4) a perimeter fence around each parking area.

The access roads leading from the existing secondary roads will be 12 feet wide and surfaced with a compacted 6-inch layer of clinker.

#### Facilities

Aside from the access roads and parking areas, the only facilities provided will be two portable rest rooms (discussed in Section 3.6). The rest rooms will be located at the western and eastern most trail terminus points.

#### Hours of Operation

The trail will be open to the public daily from dawn until dusk. Nighttime fishermen will be permitted through arrangements with Chalon's Hawi office.

### 2.3 Social/Economic Aspects of the Proposed Project

The social and economic aspects of the proposed action are largely positive. The trail will provide a safe recreational amenity to residents and visitors currently unavailable. The trail will:

- Open up access to coastal regions in the North Kohala District previously unavailable.

- Provide added recreational amenities within the North Kohala District.
- Effectuate State and County planning goals and objectives to increase public access to the coastal areas.
- Promote economic diversity for the North Kohala District.
- Preserve and maintain natural conditions, topography, ecosystems, historic sites and view corridors along the scenic coastline.

Coastal users will not be impacted with the exception that Chalon's pasture lessees may be asked to relinquish small portions of their leased lands to eliminate cattle interference with trail users.

This trail will meet recreational needs of two user groups, the local residents and visitors. According to the State Recreational Functional Plan, Technical Reference Document, by DLNR, dated December 1990 Kohala (North and South) residents participate in "walking/running" 11 percent on the weekends and 6 percent on week-days. Residents on the entire island would participate 7 to 8 percent of the time once a week in "walking/jogging/running." Participation of visitors on any given day in the Kohala area (North and South) for "hiking" is 21 percent. Given this statistical information gathered through surveys, the trail will be utilized. Furthermore, greenway groups in Waimea and Kohala have been advocating the establishment of trails throughout the region to expand the recreation amenities.

Based on trail studies and discussions with State Parks' planners and staff at Na Ala Hele, user projections are conducted after a trail is constructed and operating. The user counts are then used for trail management purposes. User estimates contained in this document should be considered rough guidelines only because no entity on the Big Island has proposed and operated an 8.6 mile long coastal trail, with six access points. Moreover, extrapolation of trail use from other trails in the State will produce inaccurate and misleading information because there is no similar trail in operation.

Table 4 provides 1990 resident user estimates for the North and South Kohala Districts. Table 5 provides resident and visitor user estimates for the Island of Hawaii from 1990 to year 2010. Based on the calculations, the trail could expect 28 hikers (residents and visitors) on an islandwide, daily basis in 1990 and 79 hikers daily in the year 2010.

TABLE 4  
 COASTAL TRAIL USER ESTIMATES  
 FOR RESIDENTS OF NORTH AND SOUTH KOHALA, 1990

1990 Resident Population	Participation Rates		No. of People Participating Daily in Walking and Running (c)		Estimated No. of People Using Proposed Coastal Trail (Daily) (d)	
	Week-day	Week-end	Week-day	Week-end	Week-day	Week-end
13,431 (a)	6% (b)	11% (b)	805	1,477	8	15

Notes:

- (a) The Population of Hawaii 1990, Statistical Report 219, DBED, Research and Economic Analysis Division, July 1991, Table 10, pg.19.
- (b) State Recreational Functional Plan, Technical Reference Document, Department of Land and Natural Resources, December 1990, Table 3-5, pg. 29.
- (c) Note, percentages are for "walking/running." Survey results had only five responses for "hiking" category out of 222 respondents, therefore no participation percentage was assigned to the "hiking" category and "walking/running" was used as a substitute.
- (d) No. of people participating is derived by multiplying the participation rate percentages with the 1990 population. Estimated people using the proposed coastal trail is derived by taking one percent of those people participating on the week-days and week-ends. The primary assumptions are: 1) walking and running is conducted on a regular basis, whereas hiking is less regular and more event related; 2) not every one engaged in hiking will be hiking on Chalon's proposed coastal trail, they will hike at other locations within North and South Kohala; 3) The coastal trail will require transportation to one of the trailheads ranging in time from 10 minutes for those in North Kohala to 40 minutes for those in South Kohala - this distance/time factor will tend to reduce the amount of users compared to a trail within an urbanized center that is close to populations and leads from one town to another.

**TABLE 5**  
**COASTAL TRAIL USER ESTIMATES**  
**FOR RESIDENTS AND VISITORS FOR ISLAND OF HAWAII, 1990 TO YEAR 2010**

Year	Population (a)	Participation Rates	No. of People Participating in Hiking Island-wide (Daily) (e)	Estimated No. of Hikers Using Proposed Coastal Trail (Daily) (f)
1990	Resident 124,600	(c) 1%	1,246	12
1990 (b)	Visitor 9,800	(d) 16%	1,568	15
2000	Resident 160,400	(c) 1%	1,604	16
2000 (b)	Visitor 22,600	(d) 16%	3,616	36
2010	Resident 206,100	(c) 1%	2,061	20
2010 (b)	Visitor 36,900	(d) 16%	5,904	59

**Notes:**

- (a) Data Book 1993, County of Hawaii, Department of Research and Development, Table 6, pg.5.
- (b) Visitor populations are calculated by subtracting resident population from De Facto population. Note, this is a very rough estimate only for the visitor population for an average 12-month period.
- (c) State Recreational Functional Plan, Technical Reference Document, Department of Land and Natural Resources, December 1990, Table 3-3, pg. 27. Table lists 1% as the residential participation rate for "hiking" on an islandwide basis for weekends. The participation percentage for weekdays is less than 0.5%.
- (d) State Recreational Functional Plan, Technical Reference Document, Department of Land and Natural Resources, December 1990, Table 3-10, pg. 38. Table lists "hiking" at a 16% participation rate for visitors.
- (e) Figure computed by multiplying the population times the participation rate.
- (f) Estimate is derived by taking 1 percent of all those hiking on the Island of Hawaii at any one time. Assumptions include: 1) not everyone will be hiking on Chalton's proposed trail, as there are other locations on the island to support hiking, particularly the Volcano National Park; 2) Trailheads are not quickly accessible from urban cores, therefore require vehicle transportation. This factor leads to fewer trail users having to make a special trip and allocate time devoted to this trail use.

Based upon a literary search, no economic study on trail benefits has been conducted in Hawaii. A mainland source identifies the results of three trails, which in concept could be applied to the Kohala Coastal Trail. The Impacts of Rail-Trails, by the U.S. Department of the Interior National Park Service, Rivers and Trails Conservation Program, dated 1992 reaches the following conclusions about the economic impacts of three trails ranging in length from 7.6 miles to 26 miles located in Iowa, Florida and California:

- "The use of the sample trails generated significant levels of economic activity. These economic benefits were from two major sources: total trip-related expenditures and additional expenditures made by users on durable goods related to their trail activities."
- "Users spent an average of \$9.21, \$11.02, and 3.97 per person per day as a result of their trail visits to the Heritage, St. Marks, and Lafayette/Moraga Trails, respectively. This resulted in a total annual economic impact of over \$1.2 million in each case. Expenditures on durable goods generated an additional \$130 to \$250 per user annually depending upon the trail."
- "The amount of "new money" brought into the local trail county(s) by trail visitors from the outside the county(s) was \$630,000, \$400,000 and \$294,000 annually for the Heritage, St. Marks, and Lafayette/Moraga Trails, respectively."
- "Restaurant and auto-related expenditures were the largest categories of trip-related expenses and visitors that spent at least one night in the local area were the biggest spenders. Equipment (such as bicycles) was the largest category of durable expenditure."

This concept can be applied to the proposed North Kohala Trail. The North Kohala District provides day time activities for the tourists visiting South Kohala and North and South Kona. These activities range from viewing historic sites at Lapakahi State Park, or visiting any one of the state our county beach parks, to viewing the Kamehameha Statue in Kapaaau or hiking into Pololu Valley. Visitor's business in any one of the 79 registered merchants within Hawi and Kapaaau creates a multiplier effect from the direct, indirect and induced expenditures. The proposed Kohala Coastal trail will create an additional activity to those already existing in the District. This provides visitors another mechanism in which to spend their time. The longer time period people reside within the district, the higher the propensity will be to spend money, thereby benefitting existing businesses.

Discussions about the proposed trail with fisherman and surfers who frequent the shoreline area indicated concern about controlled access: 1) at night and; 2) not being able to drive vehicles north, out to the Kauhola Lighthouse Point and east, to the "swimming pool" area. Other fisherman expressed concern that the trail may increase shoreline fishing thereby deplete their favorite fishing areas.

The cost of construction and maintenance of the trail will be borne by Chalon International. Consequently, no funds from the County or State will be required.



Potential negative aspects of this action include the possibility of overuse and conflicts between multiple users (i.e., bikers and horseback riders). Additionally, illegal and undesirable activities may occur in the parking areas.

### 3. SUMMARY DESCRIPTION OF THE AFFECTED ENVIRONMENT

#### 3.1 Physical Environment

##### Soils/Topography

The Soil Survey, Island of Hawaii, State of Hawaii, dated December 1973, indicates the soils on the flat pasture lands to be Kohala Silty Clay (KhA, KhC, KhD) with slopes ranging from 3 to 20 percent. Characteristics of the Kohala Silty Clays are moderate shrink-swell potential, moderately rapid permeability, slow runoff and a slight erosion hazard. The soils found in the gulch areas, of which there are 11, are comprised of Kohala Silty Clay (KhE) with slopes 20 to 35 percent and Rough Broken Land (RB). These soils are characterized as having steep slopes broken by intermittent drainage channels.

The topography of the North Kohala Coast is best described as rugged. Elevations range from sea level to about 175 feet above sea level. In many areas, the coast is cliff-like, rising vertically from the ocean up 100 feet. There are no beaches. Instead the area is boulderous and steep. Eleven gulches run down to the ocean, which transmit runoff (when heavy and for long durations), from the flatter pastures and upland areas. The gulches span 200 to 300 feet across from rim to rim near the ocean and are over 100 feet deep.

The proposed project is not expected to adversely impact the soils or the topography of the area. The trail corridor will utilize and retain all existing soils and maintain the existing topography. The trail is situated 50 to 80 feet mauka from the top of the cliffs.

##### Climate

The Kohala Corporation (former sugar plantation) records indicate precipitation increases from 37 inches annually at the Hoesa area (west end of trail) to about 50 inches annually at the Halawa area (east end of trail). Temperatures range from 64 to 77 degrees Fahrenheit in February to 68 to 83 degrees Fahrenheit in September at the Upolu Airport, which is the closest recording station at sea level near the proposed trail. Winds are predominantly from the east, northeast, east southeast and east northeast.

The proposed project is not anticipated to alter the climate in any manner. The amount of rainfall on the eastern end (Halawa area), may potentially increase the possibilities of trail erosion.

### Air/Noise/Visual Qualities

With the exception of the proposed parking areas, the project is for nonmotorized vehicles, therefore the operation of the trail will not contribute to the air quality in any manner. Due to adequate amounts of precipitation, airborne particulates from construction/refurbishment and operation are expected to be minimal.

The noise in the area is comprised of natural sounds emanating from the wind, waves crashing along the coast and animals. In terms of sound pressure measured in "decibels," this natural sound roughly translates to 40 to 70 dBA, where 0 is the threshold of hearing and 140 is the threshold for pain.

The proposed trail takes advantage of spectacular long-range views to Maui and the Kohala Mountain, as well as, short-range views comprised of pasture, open space and a variety of vegetation.

No adverse impacts to air, noise or visual attributes is anticipated.

### Land Use Designations

The subject property is zoned the following designations:

- State Land Use Commission - Agriculture and Conservation (Resource subzone).
- County General Plan - Open, Intensive Agriculture and Extensive Agriculture
- County Zoning - Agriculture A-20a
- Coastal Zone Management - entire trail is within the Special Management Area (SMA)

Given these land use designations, the implementation of this trail requires compliance with Chapter 343, Hawaii Environmental Rules and Regulations, approval of a Conservation Use District Application and a Special Management Area Permit.

## 3.2 Natural Environment

### Flora

Char and Associates conducted a corridor survey the entire length of the proposed trail dated October 1992 (Appendix A). The survey covered a corridor of 100 to 150 feet wide.

The survey identifies three types of general vegetation: 1) Pasture; 2) Gulch; and 3) Coastal. The pasture lands include clumps of Guinea grass, scattered Lantana shrubs and in some areas California grass. Rows of Ironwood trees line most of the old cane haul roads along which the trail is planned.

Gulch vegetation is characterized by large, dense stands of ironwood trees from 25 to 45 feet tall located along the rims and upper slopes of the gulches. The midslope supports dense thickets of Christmas berry or a mix of Christmas berry, koa-haole and ekoa. Along the bottoms of the gulches the vegetation is more variable containing Java plum, kukui, kiawe, Guinea grass, California grass, lilikoi, taro, noni, ginger and mango.

Coastal vegetation occurs along a narrow band aside the rugged cliffs. This land is windswept and often exposed to saltspray. Plant cover is patchy and sparse and includes Bermuda grass, Henry's crabgrass and kipukai. Small clumps of beach naupaka are also found.

A total of 122 species were inventoried. Of these, the majority, 100 (82%) are introduced or alien species; 7 (6%) are originally of Polynesian introduction; and 15 (12%) are native. Of the natives, 13 are indigenous, that is, native to the Hawaiian Islands and elsewhere, and 2 are endemic, that is, they are found only in the Hawaiian Islands. None of the plants found during the field studies are officially listed as threatened and endangered species, nor are any proposed or candidate for such status.

The report concludes that the proposed trail is not expected to have a significant negative impact on the botanical resources given the limited nature of the project and because it follows along existing cane field roads.

#### Fauna

An avifauna and feral mammal survey was conducted along the trail corridor by Phillip L. Bruner dated January 23, 1992 (Appendix B). Field observations were concentrated during the peak bird activity periods which are the early morning and late afternoon/early evening. The report notes that: "... due to the monotypic ironwood/ grass habitat and the exposure to wind makes this area less desirable for birds."

No endemic (found only in Hawaii) birds were recorded, however, the Hawaiian hawk and pueo do occur in this region. Migratory plover, turnstone and tattler are common inhabitants of this area. The house finch and common myna were the most abundant exotic species recorded. No unique wildlife habitat was found on this property.

The proposed trail is not anticipated to impact the existing fauna.

### 3.3 Natural Hazards

#### Seismicity

The entire island is in Seismic Zone III of the Uniform Building Code. The zone scale ranges from 0 to IV, with a classification of IV indicating the highest level of risk from seismic activity. The Hawaii County Building Code requires that new structures be able to withstand the amount of stress which can be expected in a Zone III area.

### Volcanic Activity

According to the 1992 map of Lava-Flow Hazard Zones, published by the U.S. Geological Survey, Hawaiian Volcano Observatory and the Hawaii Office of State Planning the Kohala area is located in Zone 9, indicating that the last eruption occurred over 60,000 years ago.

### Tsunami and Flooding

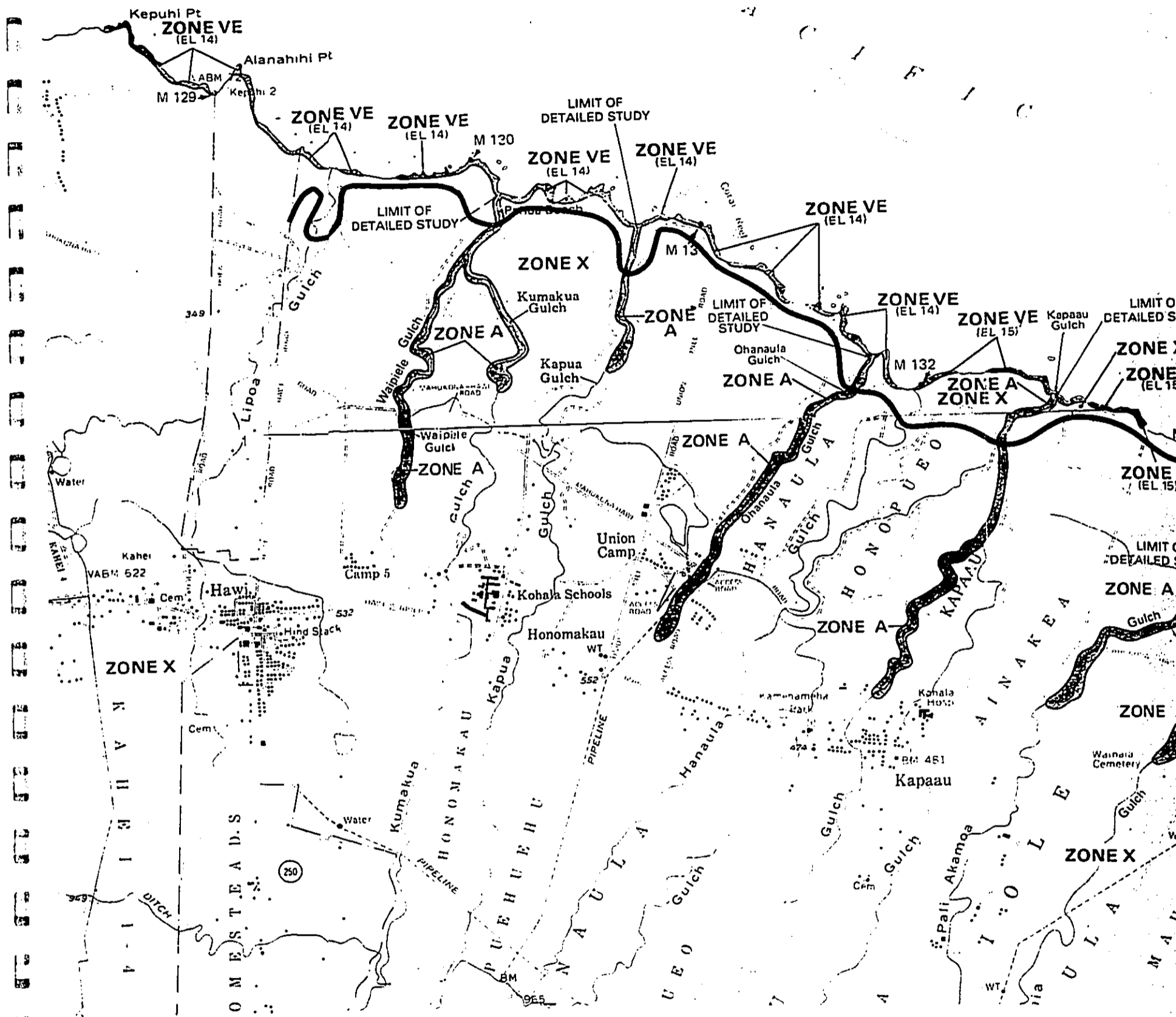
Tsunami and coastal flooding according to the U. S. Army Corps of Engineers and the Hawaii Institute of Geophysics Tsunami Research Program, indicates a small inundation area on Kauhola Point and Keawaele Bay. Panel numbers 155166 0050C and 155166 0100C, dated Sept. 16, 1988 of the Flood Insurance Rate Maps (refer to Figure 5) reveal two designations within the 100-year flood zone: 1) Zone A (No base flood elevations determined), is found in all the gulches except Lipoa Gulch and; 2) Zone VE (Coastal flood with velocity hazard (wave action); base flood elevations determined), is found along the coast affecting limited areas from 15 to 25 feet in elevation. All other areas are in Zone X, defined as "areas determined to be outside the 500-year flood plain."

The proposed trail and users could potentially be impacted by flooding from wave action or through drainage from the gulches. There appears to be no hazard from wave action because the trail is located at higher elevations than the predicted 25-foot inundation. Flooding in the gulches is possible, however, the trail will be virtually unaffected by inundation. Should the gulches be transmitting substantial runoff, Chalon will most likely have the trail closed for use, thereby eliminating the potential hazards to trail users.

### 3.4 Historical and Archaeological Resources

Archaeological Consultants of Hawaii, Inc. conducted a corridor reconnaissance survey to determine the presence or absence of cultural remains along the entire trail area. The report entitled Archaeological Inventory Survey Along the North Kohala Trail Corridor, From Ka'auhuhu to Halawa Ahupua'a, North Kohala District, Island of Hawaii, dated February 1994 is printed in full in Appendix C. Appendix C also contains letters dated August 4, 1993 and February 15, 1994 detailing the State Department of Land and Natural Resources, Historic Preservation Division's comments and acceptance of the report.

The surface inventory was conducted along a 100-foot wide path for the coastal trail which traverses 18 ahupua'a in the North Kohala District on the Big Island. A number of features associated with activities relating to sugar cane production were identified along the course of the trail (Figures 4a and 4b). These features included boulder scatters, poorly defined low earthen mounds, historic dumps, former railroad beds, and a blast hole underneath a former railway line. The structure, composition, and location of these features suggested that they were associated with sugarcane cultivation and its related activities. The boulder scatters and low earthen mounds were located makai of cleared fields, bore evidence of mechanical disturbance,



**FIGURE 5**  
**FLOOD INSURANCE RATE MAP**  
**ENVIRONMENTAL ASSESSMENT**  
**KOHALA COASTAL TRAIL**  
 CHALON INTERNATIONAL OF HAWAII

# LEGEND

## 100 YEAR FLOOD ZONES

- ZONE A** NO BASE FLOOD ELEVATION DETERMINED.
- ZONE AE** BASE FLOOD ELEVATION DETERMINED.
- ZONE V** COASTAL FLOOD WITH VELOCITY HAZARD (WAVE ACTION); NO BASE FLOOD ELEVATIONS DETERMINED.
- ZONE VE** COASTAL FLOOD WITH VELOCITY HAZARD (WAVE ACTION); BASE FLOOD ELEVATION DETERMINED.

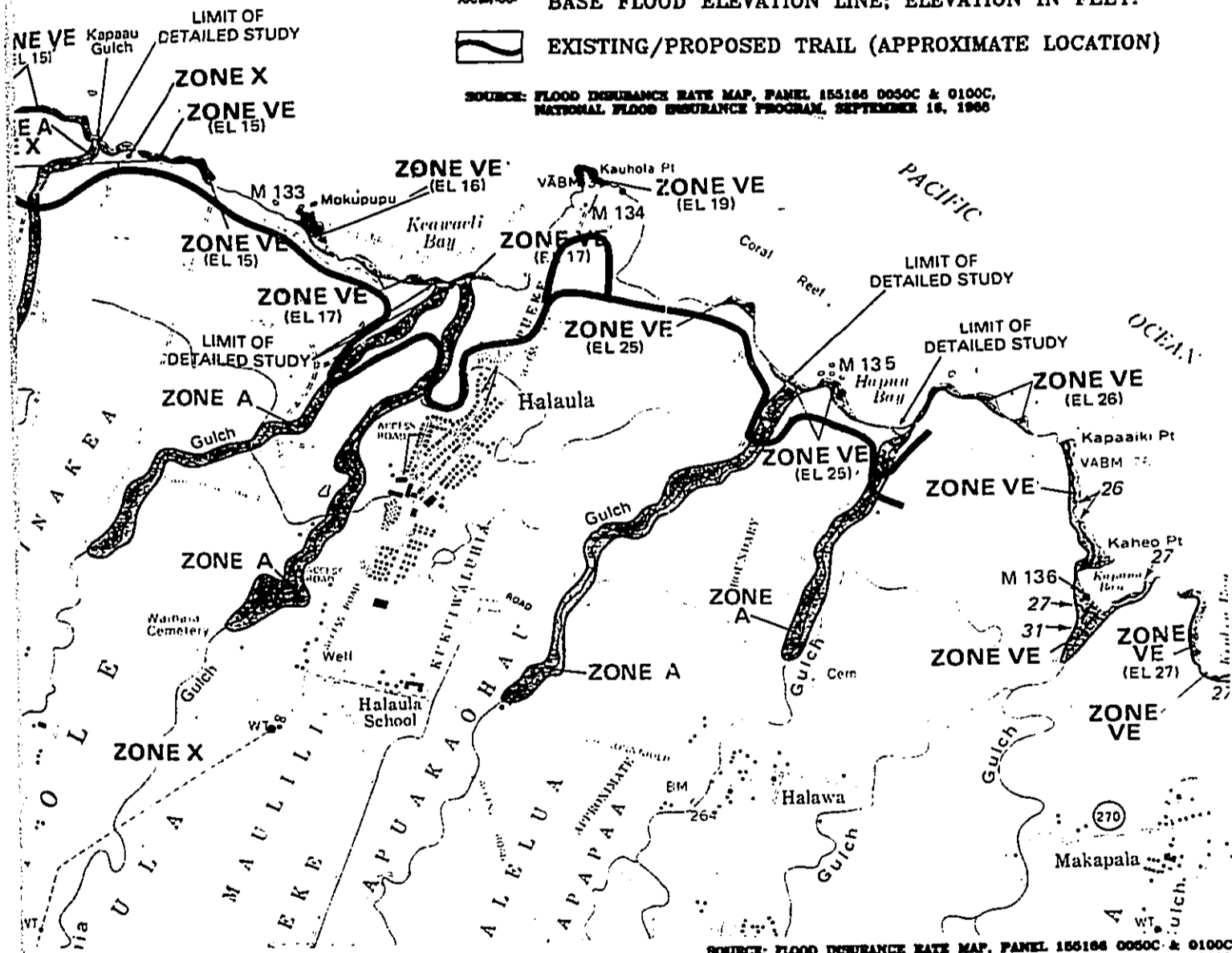
## OTHER AREAS

- ZONE X** AREAS DETERMINED TO BE OUTSIDE 500 YEAR FLOOD PLAIN.

~~~~~ BASE FLOOD ELEVATION LINE; ELEVATION IN FEET.

▬ EXISTING/PROPOSED TRAIL (APPROXIMATE LOCATION)

SOURCE: FLOOD INSURANCE RATE MAP, PANEL 155165 0050C & 0100C, NATIONAL FLOOD INSURANCE PROGRAM, SEPTEMBER 15, 1985



SOURCE: FLOOD INSURANCE RATE MAP, PANEL 155165 0050C & 0100C, NATIONAL FLOOD INSURANCE PROGRAM, SEPTEMBER 15, 1985



NORTH KOHALA, ISLAND OF HAWAII

and were associated with historic materials. The location of these features relative to former sugarcane fields, roads, and railways, reinforced the above interpretation. These historic sites are not significant to the interests of historic preservation.

The notable absence of sites in most of the gulches can largely be attributed to activities associated with sugarcane cultivation. Agriculture clearing, harvesting with bulldozers, and other activities disturbed the gentler slopes. Activities associated with sugarcane cultivation also impacted the gulch sides and slopes, albeit differently.

Two sites of historic significance were encountered in Halawa Gulch: Site 18423 consisted of a terrace complex, and Site 18429 consisted of two terraces, only one of which was probably agricultural. Site 18423 is being investigated by Dr. Ross Cordy of the State Historic Preservation Division, and thus is not described fully in this study. The trail passes close to both sites, but it does not cross either of them. Both sites are to be preserved for interpretation.

Given the findings encountered, the proposed trail poses no adverse impacts to cultural or historic remains.

### 3.5 Social/Economic Environment

The 1990 Census information indicates a residential population in North Kohala of 4,291. Of this total population, 1,083 (25%) reside in Kapaau, 924 (21.5%) in Hawi and 496 (11.5%) in Halaula, the remaining 1,802 (42%) are scattered throughout the district. There are no major commercial activities in North Kohala. Small businesses dominate the district. The largest single employer is the Kohala Nursery, employing at times up to 60 people. The majority of the work force travels out of the district to Waimea or the resorts in South Kohala. The proposed project will not impact the existing population or its distribution. The project will prove beneficial by providing a unique recreational amenity for residents, as well as, visitors. It is possible that because of an established trail in such a unique location, that more people will be attracted to the area thereby increasing the potential to spend more money in the North Kohala District.

Chalon's investigations along the coastline where the Kohala Coastal Trail is proposed has been surveyed for traditional and cultural uses (summarized on Table 6). It is for this reason that the trail is proposed along the coast to help restore ancient practices that have been curtailed throughout the Plantation era. Shoreline fishing and collection of shellfish occur along the entire coast, however this is limited because the users must seek permission from the lessees of the property. We find the heaviest use occurs at Paho Beach and near Honokeheka Point. This is why Chalon has proposed parking areas in these locations to facilitate access. Diving, spearing, and netting of fish takes place in limited locations due to the strong currents and rough conditions. Surfing, boogie boarding and fishing take place at Keawaeli Bay (Kauhola Lighthouse). For this reason Chalon will maintain the existing access point and two parking areas for this purpose.

TABLE 6  
 TRADITIONAL AND CULTURAL USES OF THE  
 SHORELINE AREA FROM LIPOA GULCH TO  
 HAPUU BAY, NORTH KOHALA, ISLAND OF HAWAII

| USE/ACTIVITY                       | LOCATIONS                                                                                  |
|------------------------------------|--------------------------------------------------------------------------------------------|
| <u>Land Based Activities</u>       |                                                                                            |
| Pole Fishing(1)                    | Pahoa Beach, Honoheheka Point, Kauhola Point, Keawaeli Bay                                 |
| Netting(1)                         | All along the coast                                                                        |
| Collection of Plant and Animals(1) | All along the coast                                                                        |
| Camping(1)                         | Associated with Pole Fishing at Pahoa Beach, Honoheheka Point, Kauhola Point, Keawaeli Bay |
| Picnicking(1)                      | Kauhola Point and Keawaeli Bay                                                             |
| Hiking(1)                          | All along with coast                                                                       |
| Hunting                            | None                                                                                       |
| <u>Water Based Activities</u>      |                                                                                            |
| Spear Fishing(1)                   | All along the coast                                                                        |
| Swimming/Snorkeling(2)             | Keawaeli Bay                                                                               |
| Kayaking/Canoeing                  | All along the coast (only when seas are calm)                                              |
| Boogie Boarding(2)                 | Keawaeli Bay                                                                               |
| Surfing(2)                         | Keawaeli Bay                                                                               |
| Wind Surfing                       | None                                                                                       |
| Boat Launching                     | None                                                                                       |
| Boat Moorages                      | None                                                                                       |

Notes:

- (1) These activities take place on a limited basis and only when the users obtain permission from Chalon's lessees.
- (2) Keawaeli Bay is and has been a regularly used location for surfers, boogie boarders, fisherman and occasional swimmers. This area is frequently called "Kauhola Point" or "Light House Point." Chalon has permitted virtually unrestricted access to this area since their purchase of the property in 1988.



The trail is proposed on land owned in fee by Chalon International. Portions of these lands are leased to others for cattle grazing. The lease agreements provide Chalon with the right to construct easements, roadways and withdraw portions of the leased land. Four lessees will be affected. Possible scenarios include: 1) the withdrawing of leased lands along the coast, thereby reducing the lessees acreage slightly; and 2) the establishment of the trail as an easement through the lessees land. In either case, the lessee would be marginally affected because the land area for the trail amounts to 10 or 15 acres per lessee, where each lessee controls over 100 acres.

### 3.6 Infrastructure

The primary access to the proposed trail will be from the Akoni Pule Highway (Hwy. 270). Access from the Akoni Pule Highway will be from existing secondary roadways and then on to lands owned by Chalon. Secondary access are as follows (also refer to Figure 6):

TABLE 7  
ACCESS ROADWAYS

| <u>Road Name</u>  | <u>Ownership/<br/>Maintenance</u> | <u>Location/Description</u>                                                                                                                 |
|-------------------|-----------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------|
| Hawi              | County                            | Western end of trail on east side of Lipoa Gulch. Paved 18-foot wide, with grassed swales.                                                  |
| Honomakau         | County                            | Adjacent to Kumakua Gulch. Paved 12 to 16-foot wide with, grassed swales.                                                                   |
| Ainakea Drive     | County                            | 60' right-of-way, paved two-lane parking and sidewalk on two sides.                                                                         |
| Kauhola Lt. House | Chalon                            | Leads from the Halaula area to Kauhola Point. Paved two-lane road from Akoni Pule Hwy first half mile. Then single-lane dirt road to coast. |
| Unnamed           | State                             | Adjacent to Halawa Gulch leading to Hapuu Bay and Kapanai Bay. 20-foot wide dirt road maintained by the State <sup>1</sup> .                |

<sup>1</sup> Civil Case No. 5464, dated March 1, 1982 resulted in a quiet title action and public vehicular access to Hapuu and Kapanai Bay and pedestrian access along the shore from Hapuu to Kapanai Bay. The Stipulated agreement calls for 20-foot wide vehicular access and the "...State claims in fee and reserves, and the Plaintiff grants, releases, relinquishes and forever

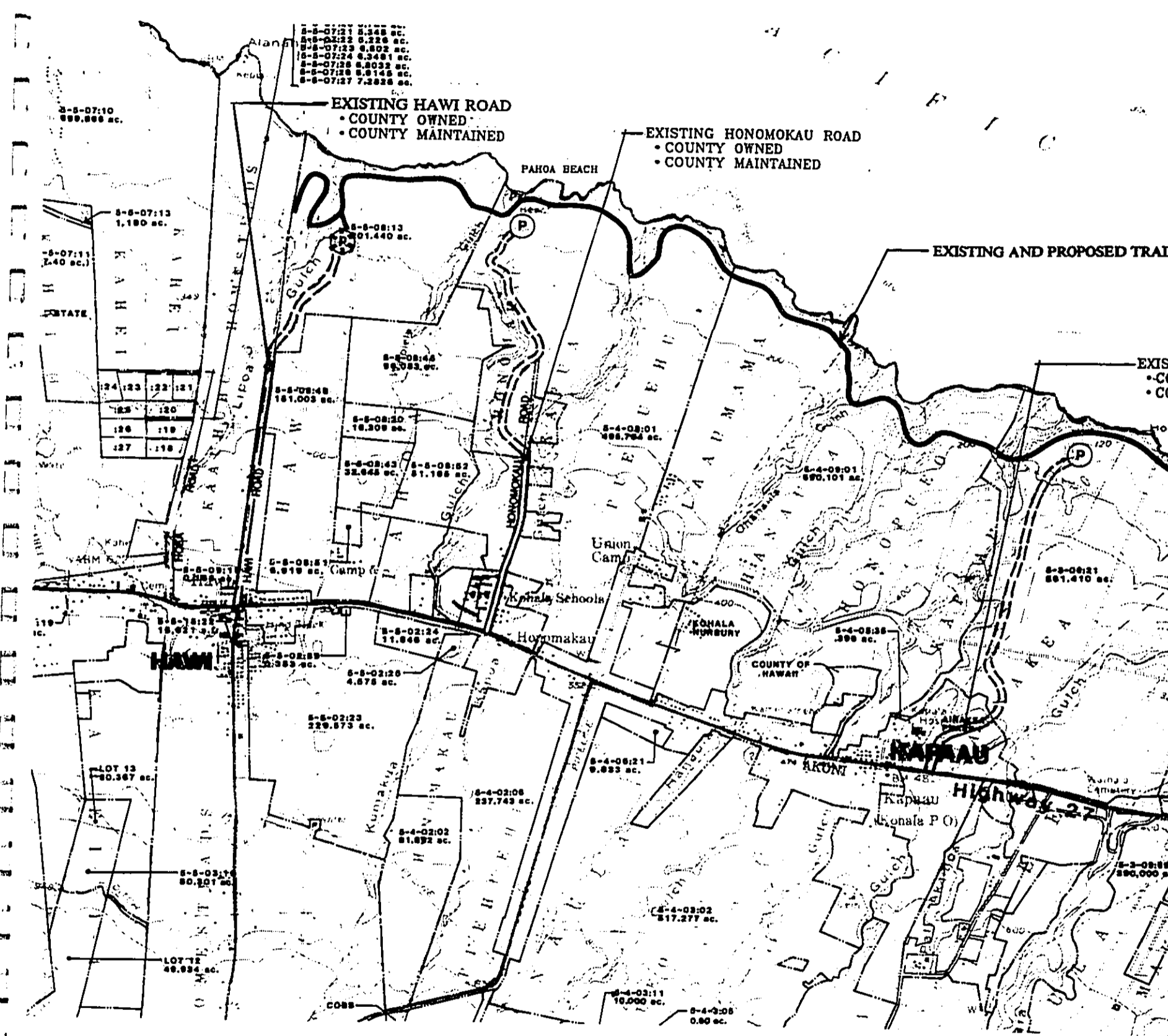





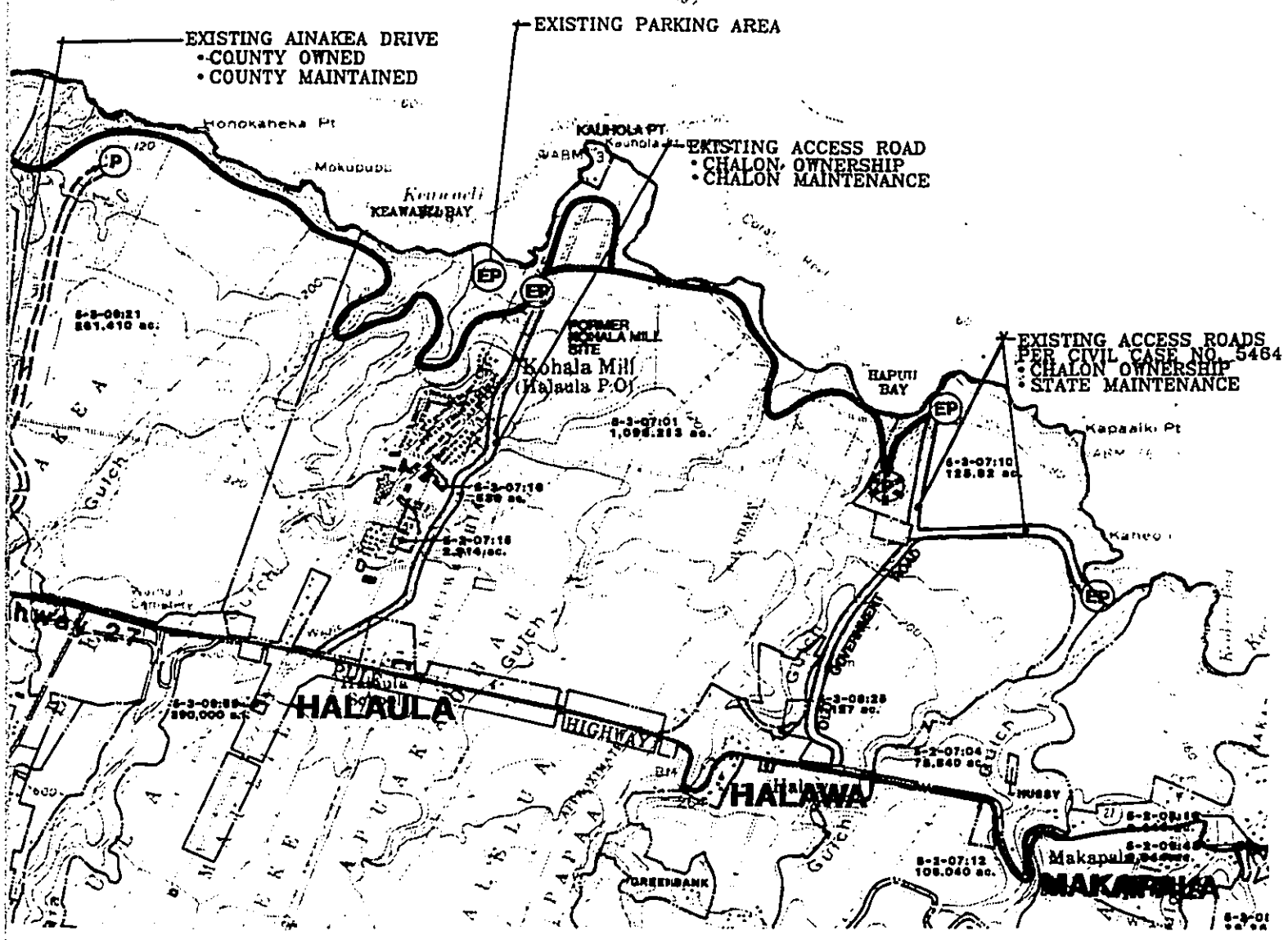


FIGURE 6  
 ACCESS LOCATION  
 ENVIRONMENTAL ASSESSMENT  
**KOHALA COASTAL TRAIL**  
 CHALON INTERNATIONAL OF HAWAII

# LEGEND

-  EXISTING ROAD
-  PROPOSED ROAD
-  EXISTING PARKING
-  PROPOSED PARKING
-  PROPOSED PARKING (FIRST PHASE IMPROVEMENTS)

AND PROPOSED TRAIL



NORTH KOHALA, ISLAND OF HAWAII

Chalon intends to utilize all five access points when the trail becomes fully established, which may take several years. Access points to be used immediately are from Hawi Road Road, Kauhola Light House Road and the unnamed old government road to Hapuu Bay. Chalon does not intend to improve any of the existing access roads. Chalon will improve those portions of roadways on Chalon property that are needed to connect from roadways to parking lots.

Impacts from the proposed trail to the existing access system appear to be minimal. Construction (grading and removal of vegetation) will be on Chalon's property on agriculture zoned lands. The connector access roads leading to the parking areas will be 12 feet wide, surfaced with a 6-inch compacted base of clinker.

The proposed trail is not expected to generate traffic. The trail is expected to capture existing traffic that is already within the district and those who would normally visit the North Kohala District for tourist activities.

The proposed trail will not utilize potable or irrigation water, electrical and communication services. Solid waste will be collected at a trash receptacle located in each of the proposed parking lots. Refuse is expected to be minimal and will be transported by Chalon's staff to the transfer station in Hawi. Rest room facilities will be provided in accordance with user volumes and the State Department of Health's rules and regulations governing waste water disposal. It is anticipated that two portable units, one at either end of the trail, would be employed to calculate user need. Over time, it is likely that the portable systems would be replaced with permanent units.

### 3.7 Public Services

The existing hospital, police and fire stations are located in Kapaau centrally located midway and mauka of the trail corridor. The proposed project is not expected to burden these existing services any more so than existing hiking trails in the district or State.

The proposed parking lots are a candidate site for undesirable activity such as drinking, vandalism and other illegal actions. Chalon will conduct random patrolling of the parking lots throughout each day. The patroller(s) will be charged with subduing offenders' actions and contacting the police department to report such activities. Chalon will pay for this ongoing monitoring as part of the overall trail operation. It is anticipated that such unwanted and illegal activities will take place primarily at night. The parking areas will be closed during evening

---

quitclaims all of its interest, right claim and title to the Old County Roadway twenty feet in width, in favor of the State...". The agreement further states: "Plaintiff shall have no duty to maintain the rights-of-way and easement hereby granted nor shall it be liable for any injury or damage arising out of their use." pg.5.

hours. If monitoring indicates persistent problems, Chalon may reassess use of the parking area and possibly eliminate it.

### 3.8 Relationship of Action to Existing Land Use Plans

The applicable plans, goals and objectives have been referenced as they relate to the proposed action.

#### Hawaii State Plan

The Hawaii State Plan provides a broad framework in three parts: 1) overall theme, goals, objectives and policies; 2) planning coordination and implementation; and 3) priority guidelines. Within Part I, "goals," the proposed trail meets the intent of Section 226-12 environment-scenic, natural beauty and historic resources and Section 226-23 socio-cultural advancement-leisure.

#### Functional Plans

The State Plan is implemented through a series of functional plans that act as guidelines for action. The most applicable functional plan is that on Recreation. The proposed trail specifically carries out Policy II-A(3), on proceeding with planning, acquisition, and development of trails.

#### State Land Use Plan (Chapter 205 HRS)

All lands in the State of Hawaii are zoned either urban, agriculture, rural or conservation regardless of ownership.

The proposed trail lies within the State Land Use agriculture and conservation districts. Within the agriculture district, permissible uses include (Section 205-4.5(6)):

"(6) Public and private open area types of recreational uses including day camps, picnic grounds, parks, and riding stables..."

The proposed trail lies within the Resource Subzone of the conservation district. According to the Department of Land and Natural Resources Administrative Rules, Title 13, subsection 2-11 the trail is a permitted use listed under:

"(1) Research, recreational, and educational use which require no physical facilities;"

"(2) Establishment and operation of marine, plant, and wildlife, sanctuaries and refuges, wilderness and scenic areas, including habitat improvements."

Much of the trail exists in the form of old cane haul roads. Only small portions will be created to link the field roads together. As such, the trail is for recreation and requires no physical facilities other than the trail itself and five parking areas (located outside of the conservation lands). The trail will function as a wilderness and scenic area.

### Coastal Zone Management (CZM)/Special Management Area (SMA)

The proposed trail falls within the Coastal Zone Management Zone, which is the entire State and the Special Management Area (SMA) zone located along the coastal areas of the island. The trail conforms most specifically to objectives and policies regarding two sections of Chapter 205A: 1) recreation and; 2) scenic and open space.

Applicable sections of the Objectives and Policies of Chapter 205A are discussed below followed by a commentary section.

#### RECREATIONAL RESOURCES

##### Objective

Provide coastal recreational opportunities accessible to the public.

##### Policies

- Protecting coastal resources uniquely suited for recreational activities that cannot be provided in other areas.
- Requiring replacement of coastal resources having significant recreational value, including but not limited to surfing sites and sandy beaches, when such resources will be unavoidably damaged by development.
- Providing and managing adequate public access, consistent with conservation of natural resources, to and along shorelines with recreational value.
- Providing an adequate supply of shoreline parks and other recreational facilities suitable for public recreation.
- Encouraging expanding public recreational use of county, State, and federally owned or controlled shoreline lands and waters having recreational value.
- Developing new shoreline recreational opportunities, where appropriate, such as artificial lagoons, artificial beaches, artificial reefs for surfing and fishing.

##### Comments

The creation of this trail opens up a new recreational resource, while at the same time respects and protects the surroundings. Further, this area is uniquely suited to be enjoyed by everyone.

#### SCENIC AND OPEN SPACE RESOURCES

##### Objective

Protect, preserve, and where desirable, restore or improve the quality of coastal scenic and open space resources.

Policies

- Identify valued scenic resources in the coastal zone management area.
- Insure that new developments are compatible with their visual environment by designing and locating such developments to minimize the alteration of natural landforms and existing public views to and along the shoreline.
- Preserve, maintain, and where desirable, improve and restore shoreline open space and scenic resources.

Comments

The proposed trail maintains and preserves the coastal scenic open space resources; and is compatible with the surrounding environment and minimizes alterations to the landforms.

County of Hawaii General Plan

The Hawaii County General Plan, adopted by Ordinance No. 89-142, spells out the overall 20-year development plan through a written text and a land use pattern allocation guide map. The proposed trail fulfills goals and policies within Section "G. Natural resources and shoreline", and Section "K. Recreation". No specific goals and policies are mentioned for the North Kohala District relative to coastal trails. The land use pattern allocation guide map indicates the trail corridor to be located within the "open," "intensive agriculture" and "extensive agriculture" districts.

North Kohala Community Development Plan

Adopted by resolution by the County Planning Commission in 1984, the plan sets forth to implement the General Plan for the North Kohala District. Section 10.3 specifically addresses public access and the community's desire to establish a permanent walking trail along the entire North Kohala coastline.

Draft Northwest Hawaii Regional Plan

The draft plan with revisions, dated October 1993, is intended to supersede the North Kohala Community Development Plan upon its adoption. This plan, like the development plan is to implement the General Plan under a shorter (10 to 15-year) time frame. The plan indicates a coastal trail around the entire coast including the location of the subject trail.

State and County Zoning

The lands within the State Land Use agriculture district are controlled by the State and the County, with the County's regulations being more restrictive than the State's. The State Land Use agriculture district permits open area recreational facilities. The County Zoning Code (Section 25-152) permits open area recreational uses where none of the recreational features are entirely closed in a building.

The County zoning does not have jurisdiction on the State conservation land which is controlled by the Board of Land and Natural Resources.

#### **4. IDENTIFICATION AND SUMMARY OF MAJOR IMPACTS AND ALTERNATIVES CONSIDERED**

##### **4.1 Major Impacts**

The proposed trail involves minor grading and limbing of brush and trees along the existing field roads. In areas where parking lots and new trails are created, there will be removal of vegetation by clearing with chainsaws and machetes, then digging and grading with a small trenching machine (4-foot wide tread) and hand tools. Some of the new sections may require the addition of clinker to stabilize the soil.

Short-term impacts are associated with the refurbishment of the existing cane roads and the creation of the new trail sections.

##### Noise

There will be an increase in the ambient noise throughout the construction phase. Increased noise levels will be generated from motorized equipment (chainsaws, weed eaters and diggers) which will be limited to daylight hours. These noises will be sporadic and fluctuate throughout the day. It is expected that the noise will primarily influence those involved in equipment operation, reaching peaks of 100 decibels (dBA).

##### Air Quality

There will be no significant affects to the air quality during construction.

##### Water Quality

No adverse affects are anticipated on the water quality. The areas where water quality could potentially be impacted are those new sections of trail which will be constructed along the banks of Waipiele, Kumukua, Kapua, Pali Akamoa, Wainaia, Halelua and Halawa Gulches. None of these gulches are perennial streams and therefore water flows into the ocean only during times of extreme rainfall for long durations of time. It is anticipated that the new sections of trail will be stabilized with water bars and drainage features to reduce the possibilities of erosion. Furthermore, the new trail improvements comprise 1.6 acres compared to the area of all the gulches (100's of acres) that the



impact is deemed insignificant.

Long-term impacts result from the trail operation. The predominant impact is that of providing a useful and unique recreational resource for the district and the island. Noise, air and water quality are not expected to be affected in any manner.

#### 4.2 Irreversible or Irretrievable Commitment of Resources

The irreversible resources committed would be the vegetation cleared during trail construction on the 1.7 miles of new trails and the commitment of labor and capital by Chalon.

#### 4.3 Alternatives to the Proposed Action

An alternative was considered reasonable if it was economically feasible, within the control of the applicant or decisionmaker to implement, and could be accomplished within an expeditious period of time.

##### No Action

The no action alternative means the trail would not be created and residents and visitors would continue to seek other trails which do not include the 8.6 miles of trail along this section of the North Kohala coastline.

The disadvantage of this alternative is that it does not effectuate those applicable policies and plans to increase recreational activities and promote public access to and along the shoreline areas. It also does not permit the general public to access this stretch of shoreline.

The advantage of this option is that Chalon will not have to expend funds to create and maintain the trail. It also keeps the issue of liability to Chalon and its lessees to a minimum level.

##### Alternate Trail Locations

A possible alternative is to create the coastal trail in similar length in another location on Chalon's property or property owned by others. This option has been rejected because Chalon's coastal property is limited. Where the trail is currently proposed is the single longest contiguous stretch of coast owned by Chalon. Any other section of Chalon's coastal property provides only about one mile in length. Furthermore, these short sections have limited access roads requiring substantial investments to make them safe for the general public. Additionally it appears no other property owner, at this time, in North Kohala, desires to lease, sell, convey or permit the use of a coastal trail.

## 5. PROPOSED MITIGATION MEASURES

Proposed mitigative measures are those associated with the 1.7 miles of new trail to reduce the

potential for erosion. Such measures include minimizing the amount of grading and digging to just the trail tread of four feet wide, establishment of water bars in appropriate locations to divert overland runoff from cutting through the trail, application of clinker to strengthen and stabilize tread surface, possible construction of cement pad at the bottom of gulches to eliminate erosion and sedimentation caused by trail users.

Additional mitigative measure are: 1) to eliminate the proposed parking area and access road from Hoesa Road and relocate this access road and parking area to Hawi Road (this measure will eliminate additional traffic on a county road which is deemed unsafe and dangerous by residents on Hoesa Road) and; 2) to provide monitoring of the parking areas by Chalon as a means to curtail illegal and undesirable activities from taking place.

## **6. DETERMINATION**

Based on the information gathered during the preparation of this draft environmental assessment and the public review period, it is anticipated that the proposed coastal trail will not create any adverse environmental impacts. As such, it is therefore anticipated that a Negative Declaration is appropriate for the proposed action.

## 7. PUBLIC INVOLVEMENT

The Draft Environmental Assessment (DEA) was officially transmitted by Chalon to the Hawaii County Planning Department on March 9, 1994. The County of Hawaii Planning Department reviewed the document and transmitted it to the Office of Environmental Quality Control (OEQC) on June 9, 1994. OEQC published the availability of the DEA in the June 23, 1994 issue of the "OEQC Bulletin" and again on July 8, 1994. On June 23, 1994 Chalon distributed the DEA along with a notice for written comments by July 23, 1994 to the following organizations:

- Kohala Greenways
- Kohala Senior Citizens
- Kohala Foundation
- Kohala Merchant's Association
- Na Maka'ala 'O Kohala
- Kohala Hawaiian Civic Club
- Citizens for the Protection of the North Kohala Shoreline

The above organizations were invited to attend an informational meeting which was held on July 14, 1994.

Chalon conducted an informational meeting with Hoesa Road residents on July 13, 1994. The meeting focussed on the impacts and mitigation measures regarding the proposed Hoesa Road parking lot and access way.

Chalon held an informational meeting with fisherman and surfers on August 18, 1994 to gain further insight as to potential impacts to existing shoreline users.

Comment letters received during the 30-day public review period, as well as, corresponding responses are attached.

DOCUMENT CAPTURED AS RECEIVED

Virginia Goldstein  
Director  
Norman Olsen  
Deputy Director



County of Hawaii

PLANNING DEPARTMENT  
25 August Street, Room 109 - Hilo, Hawaii 96720-4131  
(808) 941-3134 - Fax (808) 941-9615

Stephen K. Yamashiro  
Mayor

July 7, 1994

Ms. Jojo Tanimoto, President  
Kawaihae Hawaiian Homes Homeowners  
Community Association  
P. O. Box 44337  
Kawaihae, HI 96743

Dear Ms. Tanimoto:

Special Management Area Use Permit Application  
Applicant: Chalton International of Hawaii, Inc.  
Request: Construction & Operation of a Private 8.5 Mile  
Long Multi-Purpose Trail for Recreational Purposes  
including Access Roads, Parking Areas and Restrooms.  
Tax Map Key: 5-3-06: Por. 21, 5-3-07: Pors. 1 & 10,  
5-4-08: Por. 1, 5-4-09: Por. 1 and 5-5-08: Por. 13

We are in receipt of your letter dated June 27, 1994, expressing your concerns regarding the establishment of the above-described multi-purpose trail.

In reviewing your letter, we feel that you have confused the location of the trail site with the location of the proposed Mahukona Resort development to be located approximately 6 miles to the southwest. The applicant is proposing to establishing an 8.6 mile long multi-purpose coastal trail approximately 1 mile makai of the town of Hawi and extending from Lipoa Gulch near Hawi to Halawa Gulch near Halawa town. This trail system is not associated with the proposed Mahukona Resort development and its shoreline access concepts.

The current proposal intends to provide a multi-purpose trail for mountain bicycles, horseback riding, hiking and jogging. The proposed coastal trail would consist of 6.9 miles of existing cane haul roads with the remaining 1.7 miles to be constructed to provide a continuous alignment by linking these cane haul roads together. The trail alignment will be located a minimum of 50 feet mauka of the cliff edges.

RECEIVED JUL 08 1994

KAWAIIHAE HAWAIIAN HOMES HOMEOWNERS  
COMMUNITY ASSOCIATION  
P. O. BOX 44337  
KAWAIIHAE, HI 96743  
PHONE: 326-7182 (O)

July 6, 1994

Mr. Matthew Grady  
Chalton International of Hawaii, Inc.  
P. O. Box 245  
Hawi, HI 96719

RE: HAWAII CONSTRUCTION AND OPERATION OF A PRIVATE 8.5 MILE LONG  
MULTI-PURPOSE TRAIL-Draft EA.

Dear Mr. Grady:

Is there any way that you can resolve the impacts to the native Hawaiians and communities of the South Kohala District in your plans? As we have testified in the past, we would like to support your projects, but we cannot until the impacts are addressed.

Your organization does not seem to want to recognize the needs in the South Kohala District which accommodates the traffic to and from your proposed resort, and now your coastal trail and future plans. Your organization does not seem to want to recognize the needs in the "food gathering rights" that we natives of the Hawaiian lands need for food sustenance. What are the alternatives to "arrangements" can be made to "allow" access for nighttime fishermen.

1. Will Chalton provide and guarantee the food for the native Hawaiian families to eat, even if the natives do not work for your company?
2. What alternatives and compensations will Chalton provide for the culture, education, history and recreation of HAWAIIAN people's rights?
3. When is the completion date of "total buildout" (for the trail or for North Kohala)? What happens in the interim?
4. Who is and will be responsible for the liabilities of this trail and the access law?

As we have testified in the past, it is a duty and a responsibility for those of us who are here and aware now; to protect and preserve what belongs to us and our generations. In a few short years, infrastructure in the North and South Kohala Districts will provide such a convenient access for all people that the "public" will come to Kawaihae and pass the time and/or the "aged communities" of Kawaihae. It is imperative that we keep our basic food supply. Nighttime is one of those times when only certain fishes "run" in certain seasons.

We sincerely await your prompt reply. Mhelo.

Sincerely,  
Jojo Tanimoto, President

Jojo Tanimoto, President

Ms. Jojo Tanimoto, President  
Page 2  
July 7, 1994

Six parking areas at points along the coastal trail will be provided at total buildout of the project. The coastal trail will be open to the public daily from dawn to dusk. Arrangements with the applicant can be made to allow access for nighttime fishermen. Associated improvements, such as improved access roads and portable restroom facilities, will also be provided.

The Department is in the process of complying with the requirements of Chapter 343, HRS relating to Environmental Impact Statements prior to processing the applicant's Special Management Area Use Permit to allow the proposed development. A copy of the Environmental Assessment is available at the Planning Department's Hilo or Kona offices for your review.

Please contact Daryn Arai or Rodney Nakano of this office should you have any questions.

Sincerely,

  
VIRGINIA GOLDSTEIN  
Planning Director

DSA:mjh  
Lcha1006.DSA

xc: County Council  
Office of Environmental Quality Control (OEQC)  
West Hawaii Office  
Chalon International of Hawaii, Inc.

CHALON INTERNATIONAL of Hawaii, Inc.  
P.O. BOX 249 HAWAII, HAWAII 96719 • TELEPHONE: (808) 859-5257 • FAX: (808) 859-5252

August 25, 1994

Ms. Jojo Tanimoto, President  
Kawaihae Hawaiian Homes Homeowners  
Community Association  
P.O. Box 44337  
Kawaihae, Hawaii 96743

SUBJECT: DRAFT ENVIRONMENTAL ASSESSMENT FOR THE KOHALA  
COASTAL TRAIL, NORTH KOHALA, HAWAII

Dear Ms. Tanimoto:

Thank you for your letter dated July 6, 1994 regarding the proposed 8.6 mile long multi-purpose trail on lands owned by Chalon International of Hawaii Inc. We understand the County of Hawaii Planning Department has responded to your letter on July 7, 1994, however, as part of the Environmental Impact Statement Rules, Title 11, Chapter 200 of the Department of Health Administrative Rules, Section 22 (c), we are obligated to respond to your concerns. We have the following responses to your statements regarding the proposed trail:

1. The shoreline area in which the trail will be created is and has been in private ownership for decades; thus access to this coastal region has been gained on a case by case basis, if not at all. The Draft Environmental Assessment (DEA) states on page five (5) that:  
"The trail will be open to the public daily from dawn until dusk.  
Nighttime fisherman will be permitted through arrangements with Chalon's Hawaii office."  
This means that Chalon will be allowing access on a daily basis to this stretch of North Kohala Coast, which has been subject to a restricted access policy.
2. Access to the coastline will provide an opportunity for people to gather foods that are found in the coastal region. Shoreline access is not contingent upon employment with Chalon.
3. Access to the coastal trail will: 1) help restore traditional Hawaiian food gathering by allowing people to gather foods from the sea and land in this coastal region; 2) include interpretive signs along the way to describe historic areas and specific historic sites, thereby educating the trail users; and 3) provide a recreational resource.
4. The completion date for the trail is dependent upon gaining land use approvals from the County of Hawaii Planning Commission and the Board of Land and Natural Resources. Should approval be granted by the end of 1994, the trail can be constructed and ready for pedestrian use within four to five months (May 1995).
5. The interim plans for this coastal region are to continue the existing ranching activities and to provide no public access unless special arrangements are made with the lessees and Chalon.

23-C

Ms. Jojo Tanimoto, President  
DRAFT ENVIRONMENTAL ASSESSEMENT FOR THE  
KOHALA COASTAL TRAIL  
August 25, 1994  
Page 2

6. The State of Hawaii will be responsible for liability pursuant to provisions set forth in Hawaii Revised Statutes (HRS) Chapter 520. Chalon would be liable only if a fee was charged to the user in connection with the use of the trail.

This response along with your letter will be included in the Final Environmental Assessment. Thank you for participating in the EIS process.

Sincerely,

*Matthew Grady*

Matthew Grady, AICP  
Planner  
CHALON INTERNATIONAL OF HAWAII, INC.

cc: County of Hawaii Planning Department  
OEQC

44444-1

Virginia Goldstein, Planning Director  
County of Hawaii Planning Department

We are writing concerning the proposed Kohala Coastal Trail. We live at the end of Hoesa Road. The trail is being proposed by Chalton International of Hawaii. The trail is a wonderful concept, but there are some safety concerns that were not addressed by Chalton. The parking lot proposed at the end of Hoesa Road is not necessary. The parking lot will increase traffic on Hoesa. Hoesa is a one lane, narrow, winding road. Hoesa is not ready for increased traffic, specifically traffic unfamiliar with the peculiarities of Hoesa Road.

Hoesa Road is a narrow, winding, one lane road. The distance to the proposed parking lot, from the highway, is about two miles. Along that distance are four totally blind spots; on coming traffic cannot be seen. They are dangerous spots that require great care, but only if you are aware of these spots. Hoesa has no shoulders. The road is bordered by steep embankments that do not allow for sudden pull overs. In heavy rains the sides of the road are washed out with run-off, leaving deep muddy ditches that are very dangerous. Hoesa is a tricky road to drive, especially to visitors looking for a parking lot or ocean access. The parking lot is not needed.

The parking lot will increase the traffic on Hoesa Road. Hoesa is a busy road now. Residents and businesses that use Hoesa are keenly aware of the peculiarities of Hoesa and are adept at accommodating one another. Visitors using the road are cautioned by residents to take care when visiting. To add a parking lot at the end of Hoesa invites increased traffic. Traffic, not only for the parking lot, but also traffic to obtain ocean access. Traffic that in most cases will be totally unfamiliar with the difficult road they will be using. For the safety of all, the parking lot is not needed.

The parking lot will offer young adults a place to "hang out". Regardless of security precautions, we feel the parking area will be a hang out.

Already the end of Hoesa is used by young adults because it is off the beaten track. Authorities make periodic checks but primarily, as needed checks. The parking lot would offer a perfect place for the kids to hang out...Not a promising idea to residents or authorities.

The trail is a terrific idea. To offer the beautiful Kohala coastline is a terrific gesture of Aloha by Chalton. The parking lot is the concern. The parking lot is just not needed. The trail could be dead-ended. The trail head could be clearly marked and identified; hikers would know however far you walk out, you must walk that distance back. The parking lot is an unnecessary gesture and quite possibly a gesture that would create more difficulty for Chalton than they want. Safety must be the concern and the parking lot does not realistically address the safety issues of Hoesa Road.

Thank You for Your Consideration  
Sincerely Yours,

John and Rose Mae Watterson

*John and Rose Mae Watterson*

cc.: Matthew Grady  
Chalton International of Hawaii, Inc.

CHALON INTERNATIONAL of Hawaii, Inc.  
P.O. BOX 249 HAWAII, HAWAII 96719 • TELEPHONE: (808) 889-6257 • FAX: (808) 889-5252

August 25, 1994

Rose Mae and John Watterson  
P.O. Box 736  
Kapaa, Hawaii 96755

SUBJECT: DRAFT ENVIRONMENTAL ASSESSMENT FOR THE KOHALA  
COASTAL TRAIL, NORTH KOHALA, HAWAII

Dear Mr. and Mrs. Watterson:

Thank you for your letter dated July 23, 1994 regarding the proposed 8.6 mile long multi-purpose trail on lands owned by Chalon International of Hawaii, Inc. We offer the following response to your comments:

Chalon appreciates and understands your concerns about safety on the use of Hoesa Road for one of the trail access points and parking lots. Based upon this concern Chalon will not propose the use of Hoesa Road for an access road to the trail. Chalon will terminate the trail as planned, just to the west of Lipoa Gulch, however, there will be no parking lot and access road extending from Hoesa Road. Chalon will consider the Hoesa Road as an alternative access road to the proposed parking lot and trail.

We appreciate your participation in the environmental review process. Your letter and this response will be included in the final Environmental Assessment.

Sincerely,

*Matthew Grady*  
Matthew Grady, AICP  
Planner

CHALON INTERNATIONAL OF HAWAII, INC.

cc: County of Hawaii Planning Department  
OEQC

4-1000-31



RECEIVED JUL 25 1994

ANGELA ROSA

RECEIVED JUL 25 1994

Box 43

HAWAII, HI 96719

July 20 1994

Chalon International  
To whom it may concern;

As a 16 year resident and business owner of Hawaii, I am pleased to see that Chalon is interested in opening a trail along our beautiful coastline. I hope it will be for the use of all members of our community, not just for Chalon's material gain.

I am, however, concerned about one of the access roads, a part of the trail, being Hohea Road. Hohea Road is a very narrow road, which has no shoulders virtually. The little shoulder it does have is rutted deeply. There are many winding areas of the road that are blind spots to traffic coming in the opposite direction. All of this makes it a very dangerous option. I think safety needs to be one of the primary considerations in this project. Without major repairs and improvements, Hohea Road remains an unsafe choice.

I think using Heawi Road as an access point would be a better option. It has a straight, well paved wide road with two marked lanes. Traffic is visible and the road is developed for residential traffic already. It seems a safer choice to me.

It is my hope that Chalon will continue to gain approval for use of the Upolu airport road which is a safer choice as well, well paved with wide shoulders and not much regular traffic. There are facilities at the site already and this would link Chalon's Trail to the 'Kungs Trail' as well. Thank you for your time and consideration.  
Yours Truly,  
Angele Rose (ANGELA ROSA)

CHALON INTERNATIONAL of Hawaii, Inc.  
P.O. BOX 249 HAWAII, HAWAII 96719 - TELEPHONE: (808) 889-6257 - FAX: (808) 889-5232

August 25, 1994

Ms. Angela Rosa  
P.O. Box 43  
Hawaii, Hawaii 96719

SUBJECT: DRAFT ENVIRONMENTAL ASSESSMENT FOR THE KOHALA COASTAL TRAIL, NORTH KOHALA, HAWAII

Dear Ms. Rosa:

Thank you for your letter dated July 20, 1994 regarding the proposed 8.6 mile long multi-purpose trail on lands owned by Chalon International of Hawaii, Inc. We offer the following responses to your comments:

1. The trail will be available to all members of the community. The draft Environmental Assessment states the trail will be available to the public daily from dawn until dusk (page 5).
2. Chalon appreciates and understands your concerns about safety on the use of Hohea Road for one of the trail access points. Based upon this concern Chalon will not propose the use of Hohea Road for an access road to the trail. Chalon will consider the Hawi Road as an alternative access road to the proposed trail.
3. Chalon will continue to investigate the trail extension to Upolu Point as part of a phase II coastal trail project.

We appreciate your participation in the environmental review process. Your letter and this response will be included in the final Environmental Assessment.

Sincerely,

*Matthew Grady*  
Matthew Grady, AICP  
Planner

CHALON INTERNATIONAL OF HAWAII, INC.

cc: County of Hawaii Planning Department  
OEQC

Page 2

Ms. Virginia Goldstein  
Planning Director, Hawaii County  
25 Aupuni Street  
Hilo, Hawaii 96720

July 15, 1994

RECEIVED JUL 15 1994

RE: SMA application for Kohala Coastal Trail, by Chalon  
Dear Ms. Goldstein;

I have reviewed the Draft Environmental Assessment for the project and wish to make the following comments:

In my mind the furtherance of this project is appropriate within the framework of those activities which Chalon presented to the community during their CPC meetings several years ago. Our Committee on the Environment gave a positive recommendation to the implementation of this trail project.

In regard to the completeness of the EA, it seems to me that the primary people currently making use of the area covered by the trail are the surfers who use the lighthouse area. I do not foresee any specific negative impacts on that group, but I believe that Chalon should make some outreach in their direction and report the sentiments received in the final EA document.

As to the appropriateness of a negative declaration, I think the key lies in the long term objectives. If this were an initial increment of a substantially larger undertaking, then an EIS should be required at this time. But it seems that the plans they have presented in the past are generally similar to what is here being proposed, hence I think a negative declaration may well be justified. Based on the specifics of this project, I don't think the environmental or traffic impacts would be very large.

However, since the project is of interest and importance to the community, I believe you should treat this as a "major" SMA action, and hold the appropriate public hearing.

Sincerely,

*Bill Graham*  
Bill Graham  
P.O. Box 155  
Hawi, HI 96719

cc: Matt Grady (Chalon), OEQC.

CHALON INTERNATIONAL of Hawaii, Inc.  
P.O. BOX 249 HAWAII, HAWAII 96719 - TELEPHONE: (808) 889-6257 - FAX: (808) 889-5252

August 25, 1994

Mr. Bill Graham  
P.O. Box 155  
Hawi, Hawaii 96719

SUBJECT: DRAFT ENVIRONMENTAL ASSESSMENT FOR THE KOHALA  
COASTAL TRAIL, NORTH KOHALA, HAWAII

Dear Mr. Graham:

Thank you for your letter dated July 15, 1994 regarding the proposed 8.6 mile long multi-purpose trail on lands owned by Chalon International of Hawaii, Inc. We offer the following response to your comments:

1. Chalon will make an effort to discuss the proposed trail with surfers and others who frequent the Kauhola Light House area. A summary of their concerns will be included in the final environmental assessment.
2. Thank you for your comments regarding the appropriateness of a negative declaration.
3. We understand your concern about the public being informed of the proposed project and the decision to determine a "major" or "minor" Special Management Area Permit will be determined by the Hawaii County Planning Department.

We appreciate your participation in the environmental review process. Your letter and this response will be included in the final Environmental Assessment.

Sincerely,

*Matt New Grady*  
Matthew Grady, AICP  
Planner

CHALON INTERNATIONAL OF HAWAII, INC.

cc: County of Hawaii Planning Department  
OEQC



# University of Hawai'i at Mānoa

Environmental Center  
A Unit of Water Resources Research Center  
Crawford 317 • 2550 Campus Road • Honolulu, Hawai'i 96822  
Telephone: (808) 956-7361 • Facsimile: (808) 956-3980

July 22, 1994  
EA-0073

Ms. Virginia Goldstein  
County of Hawaii  
Planning Department  
25 Aupuni Street  
Hilo, Hawaii 96720

Dear Ms. Goldstein:

Draft Environmental Assessment (EA)  
Kohala Coastal Trail  
North Kohala, Hawaii

23-H

The reference document describes the development of an 8.6 mile multi-purpose coastal trail. The proposed trail would consist of 6.9 miles of existing cane haul roads with the remaining 1.7 miles to be constructed. Activities on the trail would consist of hiking, jogging, horse back riding, and mountain biking.

We have reviewed the document with the assistance of Chris Welch, Environmental Center.

The EA of the proposed trail adequately describes parts of the project and its impacts. However, the document needs clarification in several areas pertaining to the project and its impacts so that the project can be fully evaluated.

## 2. General Description of the Action's Technical, Economic, Social, and Environmental Characteristics

### 2.2 Technical Aspects of the Proposed Project

This section of the referenced document adequately addresses the construction of the trail. However, it needs a more in depth analysis of the six proposed parking areas. How many people are expected to use the trail? How many parking stalls will be constructed to accommodate the potential trail users? What facilities will be available for trail users (restrooms, water fountains, shelter, benches, etc.)?

Ms. Virginia Goldstein  
July 22, 1994  
Page 2

### 2.3 Social/Economic Aspects of the Proposed Project:

The referenced document states that the trail will primarily be a positive benefit to the community of Hawaii. One of the assertions made is that the trail will promote economic diversity. However, no evidence is given to support this statement. Is this trail intended to have impacts that include further development in the North Kohala area? What is the number of projected users for this project now and into the future? Will the trail eventually be marketed as a tourist attraction?

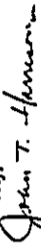
Another element that needs discussion is the impact upon traditional and cultural uses of the coastal area. Section 2.2 states that overnight fishing will be permitted through arrangements with Chalton's Hawai office. Has Chalton surveyed the local communities that the trail will most likely affect for patterns of coastal use? Section 8 (Archaeological Findings) of the archaeological survey notes that Kaunohua Point is known for surfing. The cliff areas, such as those that make up much of the Kohala coast, are also known for the collection of limpets (opih). A summation of local uses of the coastal area adjacent to the trail needs to be constructed and discussed.

### 3. Summary Description of the Affected Environment

#### 3.7 Public Services

This section states that police, hospital, and fire facilities will not be burdened by the proposed trail. This seems to imply that the trail will not have potential adverse sociological affects. Experience has shown that parking lots for trail activities can also become gathering areas for persons including in unwanted activities (i.e. drinking, breaking into cars, etc). How will this type of activity be dealt with? Who will pay for monitoring if these activities become a problem?

Thank you for the opportunity to comment on this document.

Sincerely,  
  
John T. Harrison  
Environmental Coordinator

cc: OEQC  
Chalton International of Hawaii, Inc. ✓  
Roger Fujioka  
Chris Welch

CHALON INTERNATIONAL of Hawaii, Inc.  
P.O. BOX 249 HAWAII, HAWAII 96719 • TELEPHONE: (808) 889-6257 • FAX: (808) 889-5252  
August 25, 1994

Mr. John T. Harrison, Environmental Coordinator  
University of Hawaii at Manoa  
Environmental Center  
Crawford 317, 2550 Campus Road  
Honolulu, Hawaii 96822

SUBJECT: DRAFT ENVIRONMENTAL ASSESSMENT FOR THE KOHALA  
COASTAL TRAIL, NORTH KOHALA, HAWAII

Dear Mr. Harrison:

Thank you for your letter dated July 22, 1994 regarding the proposed 8.6 mile long multi-purpose trail on lands owned by Chalon International of Hawaii, Inc. We offer the following responses to your comments:

1. 2. General Description of the Action's Technical, Economic, Social, and Environmental Characteristics, Section 2.2 Technical Aspects of the Proposed Action

a) **Parking:** The proposed parking areas are discussed on page five of the Draft Environmental Assessment (D.E.A.). This section will be expanded to include a more detailed discussion regarding your concerns. Each of the six parking areas will accommodate up to 15 parking stalls. This means that up to 90 stalls may be provided when all the parking lots have been constructed at total build-out. Based on the County of Hawaii Zoning Code (Chapter 25) parking stall dimensions are 9' x 18', with a 12' back-up maneuvering aisle, requiring about 4,000 square feet for each parking area. Each parking area will contain: 1) a trash receptacle; 2) a gate, to open the parking lot in the day time and close the parking lot at night; 3) trailhead sign informing the user of their location and responsibilities; and 4) a perimeter fence around each parking area.

b) **Facilities:** This will be a new subsection within section 2.2. It will read as follows:

"Aside from the access roads and parking areas, the only facilities provided will be two portable rest rooms (discussed in Section 3.6). The rest rooms will be located at the western and eastern most trail terminus points."

**Trail Type:** To further clarify the type of trail being proposed (which has minimal facilities) we will include the following statement:

"The trail will be a "wildland" trail, as defined in Na Ala Hele Hawaii Trail & Access System Program Plan, by Department of Land and Natural Resources, Division of Forestry and Wildlife, dated May 1991, pg. IV-5:

"Trails or accesses in "primitive areas" which are without permanent improvements or human habitation and are protected and managed so as to preserve their natural condition. These areas should be scenic and wild, not highly sensitive to human presence, and will generally be managed for multiple uses."

Mr. John T. Harrison  
DRAFT ENVIRONMENTAL ASSESSMENT  
KOHALA COASTAL TRAIL  
August 25, 1994  
Page 2

2. Section 2.3, Social Economic Aspects of the Proposed Project

a) **Expected Use:** The DEA mentions user participation rates (pages 5 and 6) derived from surveys conducted for the State Recreation Functional Plan, Technical Reference Document, by Department of Land and Natural Resources, in 1990. Kohala residents participate in "walking/running" 11 percent on the weekends and 6 percent on the weekdays. Residents on the entire island would participate 7 to 8 percent of the time once a week in "walking/jogging/running." Participation of visitors on any given day in the Kohala area (North and South) for "hiking" is 21 percent.

The DEA will contain an additional section that applies the above mentioned participation rates to population figures for the present and the future year 2010 (Refer to the attached Tables 4 and 5). Based on trail studies and discussions with State Parks planners and staff at Na Ala Hele, user projections are used for trail management purposes. User estimates contained in this document should be considered rough guidelines only, because no entity on the Big Island has proposed and operated an 8.6 mile long coastal trail, with six access points. Moreover, extrapolation of trail use from other trails in the State will produce inaccurate and misleading information because there is no similar trail in operation.

b) The DEA does state that the trail will provide social and economic aspects that are largely positive (page five). It is true that the DEA states the trail will "promote economic diversity for the North Kohala District" (page five). We believe this statement is substantiated by the following excerpts that will be included in the Final E.A.:

"Based upon a literary search, no economic study on trail benefits has been conducted in Hawaii. A mainland source identifies the results of three trails, which in concept could be applied to the Kohala Coastal Trail. The Impacts of Rail-Trails, by the U.S. Department of the Interior National Park Service, Rivers and Trails Conservation Program, dated 1992 reaches the following conclusions about the economic impacts of three trails ranging in length from 7.6 miles to 26 miles located in Iowa, Florida and California:

• "The use of the sample trails generated significant levels of economic activity. These economic benefits were from two major sources: total trip-related expenditures and additional expenditures made by users on durable goods related to their trail activities."

• "Users spent an average of \$9.21, \$11.02, and \$9.97 per person per day as a result of their trail visits to the Heritage, St. Marks, and Lafayette/Moraga Trails, respectively. This resulted in a total annual economic impact of over \$1.2 million in each case. Expenditures on durable goods generated an additional \$130 to \$250 per user annually

Mr. John T. Harrison  
DRAFT ENVIRONMENTAL ASSESSMENT  
KOHALA COASTAL TRAIL  
August 25, 1994  
Page 3

- depending upon the trail."
- "The amount of "new money" brought into the local trail county(s) by trail visitors from the outside the county(s) was \$630,000, \$400,000 and \$294,000 annually for the Heritage, St. Marks, and Lalayette/Moraga Trails, respectively."
- "Restaurant and auto-related expenditures were the largest categories of trip-related expenses and visitors that spent at least one night in the local area were the biggest spenders. Equipment (such as bicycles) was the largest category of durable expenditure."

This concept can be applied to the proposed North Kohala Trail. The North Kohala District provides day time activities for the tourists visiting South Kohala and North and South Kona. These activities range from viewing historic sites at Lapakahi State Park, or visiting any one of the state our county beach parks, to viewing the Kamehameha Statue in Kapaau or hiking into Pololu Valley. Visitor's business in any one of the 79 registered merchants within Hawai and Kapaau creates a multiplier effect from the direct, indirect, and induced expenditures. The proposed Kohala Coastal trail will create an additional activity to those already existing in the District. This provides visitors another mechanism in which to spend their time. The longer time period people reside within the district, the higher the propensity will be to spend money, thereby benefiting existing businesses."

c) This trail is part of Chalton's overall development plan for their entire 19,000 acreage in the North Kohala District. The proposed trail is the result of over 88 community meetings with residents of North Kohala who requested more access to the shore. Chalton owns 12.8 miles of shoreline which is largely inaccessible to the residents or visitors.

d) The trail may eventually be marketed as a tourist attraction. This marketing will not come from Chalton, however, others may market it such as is done for other trails in Hawaii, i.e. the Na Pali Coast Trail on Kauai or the Hawaii Volcano National Park or Haleakala National Park on Maui.

e) Traditional and Cultural Uses: This will be a new subsection within the Social/Economic Environment Section 3.5.

"Chalton's investigations along the coastline where the Kohala Coastal Trail is proposed has been surveyed for traditional and cultural uses. It is for this reason that the trail is proposed along the coast to help restore ancient practices that have been curtailed throughout the Plantation era. Shoreline fishing and collection of shellfish occur along the entire coast, however this is limited because the users must seek permission from the lessees of the property. We find the heaviest use occurs at Pahoa Beach and near Honokohau Point. This is why Chalton has proposed parking areas in these locations to facilitate access.

Mr. John T. Harrison  
DRAFT ENVIRONMENTAL ASSESSMENT  
KOHALA COASTAL TRAIL  
August 25, 1994  
Page 4

Diving, spearfishing, and netting of fish takes place in limited locations due to the strong currents and rough conditions. Surfing, boogie boarding and fishing take place at Keawai Bay (Kauhola Lighthouse). For this reason Chalton will maintain the existing access point and two parking areas for this purpose." (Refer to Table 6 regarding a summary of traditional and cultural uses).

3. Summary Description of the Affected Environment, Section 3.0, Subsection 3.7 Public Services

This section will be clarified to include wording about the potential adverse sociological affects that may take place within the proposed parking lots:

"The proposed parking lots are a candidate site for undesirable activity such as drinking, vandalism and other illegal actions. Chalton will conduct random patrolling of the parking lots throughout each day. The patroller(s) will be charged with subduing offenders' actions and contacting the police department to report such activities. Chalton will pay for this ongoing monitoring as part of the overall trail operation. It is anticipated that such unwanted and illegal activities will take place primarily at night. The parking areas will be closed during evening hours. If monitoring indicates persistent problems, Chalton may reassess use of the parking area and possibly eliminate it."

We believe we have sufficiently addressed your concerns and we thank you for taking the time to participate in the environmental review process. Your letter and this response will be included in the final Environmental Assessment.

Sincerely,

*Matthew Grady*  
Matthew Grady, AICP  
Planner

CHALON INTERNATIONAL OF HAWAII, INC.

Attachments

cc: County of Hawaii Planning Department  
OEQC

TABLE 4  
COASTAL TRAIL USER ESTIMATES  
FOR RESIDENTS OF NORTH AND SOUTH KOHALA, 1990

| 1990 Resident Population | Participation Rates |          | No. of People Participating Daily in Walking and Running (c) |          | Estimated No. of People Using Proposed Coastal Trail (Daily) |          |
|--------------------------|---------------------|----------|--------------------------------------------------------------|----------|--------------------------------------------------------------|----------|
|                          | Week-day            | Week-end | Week-day                                                     | Week-end | Week-day                                                     | Week-end |
| 13,431 (a)               | 6% (b)              | 11% (b)  | 805                                                          | 1,477    | 8                                                            | 15       |

Notes:  
(a) The Population of Hawaii, 1990, Statistical Report 219, DBED, Research and Economic Analysis Division, July 1991, Table 10, pg. 19.  
(b) Sun Recreational Functional Plan, Technical Reference Document, Department of Land and Natural Resources, December 1990, Table 3-5, pg. 26. Note: percentages are for "walking/running". Survey results had only five responses for "hiking" category out of 222 respondents, therefore no participation percentage was assigned to the "hiking" category and "walking/running" was used as a substitute.  
(c) No. of people participating is derived by multiplying the participation rate percentages with the 1990 population.  
(d) Estimated people using the proposed coastal trail is derived by taking one percent of those people participating on the week-days and week-ends. The primary assumption is: 1) walking and running is considered on a regular basis, whereas hiking is less regular and more event related; 2) The use of every trail will require transportation to one of the trailheads ranging in time from 10 minutes for those in North Kohala to 40 minutes for those in South Kohala. - this distance/time factor will tend to reduce the number of users compared to a trail within an urbanized center that is close to populations and leads from one town to another.

TABLE 5  
COASTAL TRAIL USER ESTIMATES  
FOR RESIDENTS AND VISITORS FOR ISLAND OF HAWAII, 1990 TO YEAR 2010

| Year     | Population (a)                    | Participation Rates | No. of People Participating in Hiking Island-wide (Daily) (c) | Estimated No. of Hikers Using Proposed Coastal Trail (Daily) (d) |
|----------|-----------------------------------|---------------------|---------------------------------------------------------------|------------------------------------------------------------------|
| 1990 (b) | Resident 124,600<br>Visitor 9,800 | (c) 1%<br>(d) 16%   | 1,246<br>1,568                                                | 12<br>15                                                         |
| 2000 (b) | Resident 160,400                  | (c) 1%              | 1,604                                                         | 16                                                               |
| 2010 (b) | Resident 206,100                  | (c) 16%             | 3,616                                                         | 36                                                               |
| 2010 (b) | Visitor 36,900                    | (c) 1%<br>(d) 16%   | 2,061<br>5,904                                                | 20<br>59                                                         |

Notes:  
(a) Data Book 1973, County of Hawaii, Department of Research and Development, Table 6, pg. 5.  
(b) Visitor populations are calculated by subtracting resident population from the total population. Note, this is a 1990 estimate only for the visitor population for an average 12-month period.  
(c) Sun Recreational Functional Plan, Technical Reference Document, Department of Land and Natural Resources, December 1990, Table 3-5, pg. 27. Table lists 1% as the residential participation rate for "hiking" on an island-wide basis for week-days. The participation percentage for week-days is less than 0.5%.  
(d) Sun Recreational Functional Plan, Technical Reference Document, Department of Land and Natural Resources, December 1990, Table 3-10, pg. 34. Table lists "hiking" as a 16% participation rate for visitors.  
(e) Figures computed by multiplying the population times the participation rate.  
(f) Estimate is derived by taking 1 percent of all those hiking on the island of Hawaii at any one time. Assumptions include: 1) not everyone will be hiking on Kohala's proposed trail, as there are other locations on the island to support hiking, particularly the Volcano National Park; 2) Trailheads are not quickly accessible from urban cores, therefore require vehicle transportation. This factor leads to fewer trail users having to make a special trip and allocate time devoted to this trail use.

TABLE 6  
 TRADITIONAL AND CULTURAL USES OF THE  
 SHORELINE AREA FROM LIPOA GULCH TO  
 HAPUU BAY, NORTH KOHALA, ISLAND OF HAWAII

| USE/ACTIVITY                       | LOCATIONS                                                                                |
|------------------------------------|------------------------------------------------------------------------------------------|
| <u>Land Based Activities</u>       |                                                                                          |
| Pole Fishing(1)                    | Paho Beach, Honoheheka Point, Kauhola Point, Keawaei Bay                                 |
| Netting(1)                         | All along the coast                                                                      |
| Collection of Plant and Animals(1) | All along the coast                                                                      |
| Camping(1)                         | Associated with Pole Fishing at Paho Beach, Honoheheka Point, Kauhola Point, Keawaei Bay |
| Picnicking(1)                      | Kauhola Point and Keawaei Bay                                                            |
| Hiking(1)                          | All along with coast                                                                     |
| Hunting                            | None                                                                                     |
|                                    |                                                                                          |
| <u>Water Based Activities</u>      |                                                                                          |
| Spear Fishing(1)                   | All along the coast                                                                      |
| Swimming/Snorkeling(2)             | Keawaei Bay                                                                              |
| Kayaking/Canoeing                  | All along the coast (only when seas are calm)                                            |
| Boogie Boarding(2)                 | Keawaei Bay                                                                              |
| Surfing(2)                         | Keawaei Bay                                                                              |
| Wind Surfing                       | None                                                                                     |
| Boat Launching                     | None                                                                                     |
| Boat Moorages                      | None                                                                                     |

Notes:

- (1) These activities take place on a limited basis and only when the users obtain permission from Chalou's Lessee.
- (2) Keawaei Bay is and has been a regularly used location for surfers, boogie boarders, fisherman and occasional swimmers. This area is frequently called "Kauhola Point" or "Light House Point." Chalou has permitted virtually unrestricted access to this area since their purchase of the property in 1988.

## 8. REFERENCES

- Department of Land and Natural Resources, State Recreational Functional Plan, Technical Reference Document, December 1990.
- Department of Land and Natural Resources, Division of Forestry and Wildlife, Na Ala Hele, Hawaii Trail & Access System, Program Plan, May 1991.
- Department of Land and Natural Resources, Division of Forestry and Wildlife, Trail Guidelines, undated.
- Federal Emergency Management Agency, FIRM, Flood Insurance Rate Map, Hawaii County, September 16, 1988.
- Hawaii, Department of Business, Economic Development and Tourism, State of Hawaii Data Book 1991.
- Hawaii County, The General Plan Hawaii County, Ordinance No. 89 142, November 1989.
- Kohala Corporation, Unpublished Meteorological Records, 1888 to 1970.
- National Park Service, Economic Impacts of Protecting Rivers, Trails and Greenway Corridors, 1992.
- Phillips, Brandt, Reddick & Assoc. (Hawaii), Inc., North Kohala Community Development Plan, prepared for the County of Hawaii, November 30, 1984.
- PBR HAWAII in association with Chapman Consulting Services and GK & Associates, Mahukona Final Environmental Impact Report, April 1991.
- State of Hawaii, Hawaii Revised Statutes, Sections 205, 205a and 343, as amended in 1991 Supplements.
- Stipulated Agreement (Civil No. 5464), Between the State of Hawaii, Hui Mamalahoa Public Access Association and Kohala Corporation, North Kohala, Hawaii Portions of Tax Map Keys: 5-2-04:3, 5-2-06:3 and 5-2-07:12, March 1, 1982.
- Townscape Inc., Northwest Hawaii Regional Plan, prepared for the County of Hawaii, Revised October 1993.



U  
N  
I  
V  
E  
R  
S  
I  
T  
Y  
O  
F  
T  
E  
X  
A  
S  
A  
S  
I  
N  
S  
T  
I  
T  
U  
T  
E  
O  
F  
S  
C  
I  
E  
N  
C  
E  
S  
A  
N  
D  
E  
N  
V  
I  
R  
O  
N  
M  
E  
N  
T  
A  
L  
S  
T  
U  
D  
I  
E  
S

APPENDIX A  
BOTANICAL SURVEY



TABLE OF CONTENTS

BOTANICAL SURVEY  
KOHALA COASTAL TRAIL  
NORTH KOHALA DISTRICT, ISLAND OF HAWAII

|                                      | <u>page</u> |
|--------------------------------------|-------------|
| INTRODUCTION .....                   | 1           |
| SURVEY METHODS .....                 | 2           |
| DESCRIPTION OF THE VEGETATION .....  | 3           |
| Pastureland .....                    | 3           |
| Gulch Vegetation .....               | 4           |
| Coastal Vegetation .....             | 5           |
| DISCUSSION AND RECOMMENDATIONS ..... | 12          |
| PLANT SPECIES LIST .....             | 14          |
| LITERATURE CITED .....               | 23          |

by

Winona P. Char  
CHAR & ASSOCIATES  
Botanical Consultants  
Honolulu, Hawaii

Prepared for: CHALON INTERNATIONAL of Hawaii, Inc.  
Hawaii, Hawaii

October 1992

BOTANICAL SURVEY  
KOHALA COASTAL TRAIL  
NORTH KOHALA DISTRICT, ISLAND OF HAWAII

INTRODUCTION

The Kohala coastal trail project consists of a 20 to 30-foot wide corridor approximately 6.5 miles long following along the coast, makai (seaward) of Hawi and Kapa'au towns. The trail crosses the following tax map keys (TKs): 5-3-07:01 and 10, 5-4-08:01, 5-7-09:01, and 5-5-08:13. In a few gulch areas, the trail will separate into two corridors, one more mauka (inland) and the other closer to the coastline. Except for a few locations, the trail, for the most part, follows along former cane field roads, now overgrown in places. In addition to the trail, possible camp-site areas, a rest room/shower facility, and a future park expansion site have been identified for the area around Keava'eili Bay.

Field studies to assess the botanical resources along the coastal trail as well as on the areas proposed for the accompanying facilities (camp sites, parking areas, rest room facility, etc.) were conducted on 19 and 20 May 1992. The primary objectives of the botanical study were to: 1) provide a general description of the major vegetation types, 2) inventory the flora, and 3) search for threatened and endangered species protected by Federal and State laws.

The botanical survey report will be incorporated into a technical report which can be used for permit submittal to the State Department of Land and Natural Resources for a Conservation District Use Application (CDUA) permit and to the County of Hawaii's Planning Department for a Special Management Area (SMA) permit.

SURVEY METHODS

Prior to undertaking the field studies, a search was made of the pertinent literature to familiarize the principal investigator with other botanical studies conducted in the general area. Topographic maps and very recent, colored aerial photographs (1" = 400') were examined to determine vegetation cover patterns, terrain characteristics, access, boundaries, and reference points.

The less disturbed areas which support gulch and coastal vegetation were surveyed more intensively as these two vegetation types are more likely to support native plant communities or rare and vulnerable plants. A walk-through (pedestrian) survey method was used. The proposed trail alignment had been flagged and mapped prior to our field studies. A corridor 100 to 150 feet wide was surveyed; a corridor this wide also assesses the indirect impacts of the trail on the vegetation immediately adjacent to it. A team of four botanists, working in teams of two each, was used in gathering the technical data contained in this report.

Notes were made on plant associations and distribution, substrate types, topography, exposure, drainage, grazing damage, etc. Plant identifications were made in the field; plants which could not be positively determined were collected for later determination in the laboratory and herbarium, and, for comparison with the most recent taxonomic treatment of the flora.

The species recorded are indicative of the season ("rainy" vs. "dry") and the environmental conditions at the time of the survey. A survey taken at a different time of the year and under varying environmental conditions would no doubt yield slight variations in the species list, especially of the weedy, annual plants.

## DESCRIPTION OF THE VEGETATION

The area makai of the Akoni Pule Highway consists of broad, gently sloping lands, dissected in places by deep, narrow gulches. Where the land approaches the sea, it drops off into steep, coastal cliffs. Soils on the gently sloping areas belong to the Kohala series (Sato *et al.* 1972). These are well-drained, silty clay soils. The gently sloping lands were used for growing sugar cane, but with the closing of the Kohala plantation in 1975, most of the cane fields have been converted to pastureland.

Two botanical surveys have recently been conducted for the areas makai of Akoni Pule Highway but above the Special Management Area (SMA) along the coastline. The first of these surveys (Char 1992a) described the vegetation found on about 700 acres around Hala'uia (TKs 5-3-06:21, 5-3-07:01, 5-4-09:01); the northern limit of this project site was defined by the SMA boundary. The second survey (Char 1992b) covered about 230 acres of land located immediately makai of Hawi town. Vegetation on these two project sites consisted of pastureland on the broad, gently rolling, former sugar cane fields and gulch/scrub vegetation, dominated primarily by ironwood trees and Christmas berry shrubs, within the deep gulches and on other somewhat steeply sloping areas.

Within the coastal trail corridor, pastureland and gulch vegetation as well as a coastal vegetation type are recognized and described in more detail below. A checklist of all the vascular plants inventoried along the proposed trail corridor and on the accompanying facilities is presented at the end of the report.

### Pastureland

The proposed trail corridor passes through pastureland on the broad, gentle slopes and in some of the larger gulches where they widen out nearer to the coast. The pastureland is characterized

by low, clumpy mats of Guinea grass (*Panicum maximum*), 6 inches to 1 foot tall, with scattered lantana shrubs (*Lantana camara*), 1 to 3 feet tall. In some areas California grass (*Brachiaria mutica*) is codominant with Guinea grass, that is, the pasture grasses are about an equal mix of California grass and Guinea grass; there are fewer lantana shrubs in these areas. Rows of ironwood trees (*Casuarina equisetifolia*) line most of the old cane field roads along which the trail corridor is planned.

On well managed pastures, the thick grass cover tends to smother out weedy species. Weedy plants such as spiny amaranth (*Amaranthus spinosus*), crabgrass (*Digitaria* spp.), wiregrass (*Eleusine indica*), hairy horseweed (*Conyza bonariensis*), etc., tend to be found on areas with poorer, rockier soils, and on the more disturbed areas such as on the old cane field roads, along cattle paths, and under the ironwood trees where the cattle gather to rest. On poorly managed, overgrazed pastures, lantana shrubs increase dramatically to 70 to 80% cover; other weedy species such as sourbush (*Pluchea synphyllifolia*), indigo (*Indigofera suffruticosa*), and hairy horseweed increase in numbers.

### Gulch Vegetation

The trail crosses nine major gulch systems. They are Lipoa Gulch, Waipiele Gulch, Kapua Gulch, Hana'uia Gulch, Kapa'au Gulch, Akamoa Gulch, Wainai'a Gulch, Halelua Gulch, and Halawa Gulch. The proposed trail will separate into two corridors (maka and makai) at Kapua, Kapa'au, Akamoa, Wainai'a, and Halelua gulches. Gulch areas are mapped as "RB", rough broken land, on the soil maps (Sato *et al.* 1973).

In general, gulch vegetation is characterized by large, dense stands of ironwood trees, from 25 to 45 ft. tall, along the rims and upper slopes of the gulches. The mid-slopes support dense thickets of Christmas berry (*Schinus terebinthifolius*) or a mix of Christ-

was berry and koa-haoie or ekoa (Leucaena leucocephala) shrubs.

Along the gulch bottoms, the vegetation composition is more variable. For example, in the bottom of Lipoa Gulch, the vegetation consists of kiawe and a few kukui (Aleurites moluccana) and Java plum (Syzygium cumini) trees, 20 to 30 ft. tall. Koa-haoie is locally common, forming small-sized thickets up to 18 ft. tall. Christmas berry and lantana shrubs are occasional. Guinea grass and a few smaller shrubs such as abutilon (Abutilon grandifolium) and acute-leaved sida (Sida acuta) are the common components of the ground cover layer. Vines of liliko'i (Passiflora edulis) and bat-wing passiflora (Passiflora pulchella) are also frequently observed. Where the trail crosses portions of Kapua Gulch, there are dense thickets of Christmas berry on the bottom. Some gulches with running water, as in Hana'ula Gulch, support an open, grassy bottom dominated by California grass. Halava Gulch, which is heavily vegetated and has a stream along its bottom, is of interest as it contains a number of remnant cultivated species and there are some old stone terraces in the area. Some of the plants found here include taro (Colocasia esculenta), 'ape (Alocasia macrorrhiza), noni (Morinda citrifolia), either white or yellow ginger (Hedychium sp.) -- no flowers at the time of our survey, coffee (Coffea arabica), chili pepper (Capsicum frutescens), mango (Mangifera indica), Surinam cherry (Eugenia uniflora), papaya (Carica papaya), and canna (Canna indica).

#### Coastal Vegetation

The coastal vegetation occurs as a narrow band along the rugged and scenic coastline. Along the top of the coastal cliffs, where it interfaces the pastureland, the coastal vegetation is usually low and windswept, and, often exposed to salt-spray. Along the bluffs overlooking the ocean, the coastal vegetation has been degraded by overgrazing in many places. In these areas, plant

cover is sparse and patchy with the exposed reddish-colored soil eroded in places. Plants found in these areas include Bermuda grass (Cynodon dactylon), Henry's crabgrass (Digitaria adscendens), 'akulikuli (Sesuvium portulacastrum), kipukai (Heliotropium curassavicum), Fimbristylis cymosa, Australian saltbush (Atriplex semibaccata), and southistle (Sonchus oleraceus).

Low, windswept clumps of beach naupaka or naupaka kahakai shrubs (Scaevola sericea), 6 inches to 3 ft. tall, can be found in some areas such as the scenic point above Pahoa Beach (Figure 1) and around the lighthouse at Kauhola Point. Besides beach naupaka, other native species found at the scenic point include kipukai, 'akulikuli, hinahina (Heliotropium anomalum), pa'u-o-Hi'i'aka (Jacquemontia ovalifolia), and low, spreading mats of 'ulei (Osteoales anthyllidifolia) (Figure 2). Along the coastline to the north of the lighthouse, scattered between the beach naupaka, are patches of the native, yellow-flowered portulaca or 'ihi (Portulaca oleraceus). In other places along the coastal bluffs, groves of ironwood trees, an introduced species, are common.

The sheer cliff faces are barren except for a few, scattered clumps of plants on ledges; these include beach naupaka, kipukai, 'aweveo (Chenopodium oahuense), ironwood, and 'akulikuli.

At the mouths of some gulches, such as Akamoa Gulch, where they meet the sea, there are boulder-strewn beaches. Here fairly good examples of coastal vegetation which has not been too heavily grazed by cattle can be observed. These sites support dense clumps of low, wind-swept beach naupaka shrubs, yellow-green carpets of 'akulikuli, and bluish-green mats of 'aweveo (Figures 3, 4, 5).



FIGURE 1. Low, windswept beach naupaka shrubs along scenic coastal bluff near Pahoehoe Bay. Note also overgrazed areas with sparse vegetation just inland of naupaka shrubs.



FIGURE 2. 'Ulei or u'ulei, a native member of the rose family, is a low, rambling shrub with attractive, glossy green foliage. Flowers are about 1/4 inch across, white, and grouped into clusters of 3 to 6. The round, apple-like fruit is white when mature and edible, although somewhat insipid. The Hawaiians used the seeds and young shoots as a baby medicine. The hard wood had a number of uses. For example, it was used to construct a musical instrument, the 'ukeke, and the long, slender branches, which are strong and pliable, were bent into hoops for fish nets (Wagner *et al.* 1990).



FIGURE 3. Dense, low, tangled clumps of beach naupaka on lower slopes of Akamao Gulch adjacent to the shoreline. Note stand of ironwood trees on the slopes above the beach naupaka plants.

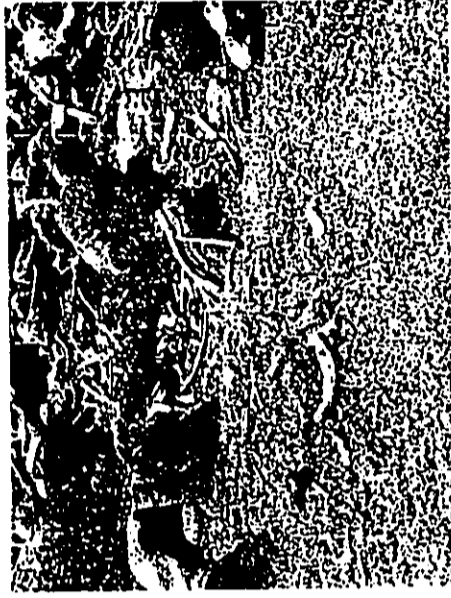


FIGURE 4. A yellow-green carpet of 'akulikuli in the foreground. In the background are large, waterworn boulders which line the beach. A few beach naupaka shrubs can be seen among the boulders.

## DISCUSSION AND RECOMMENDATIONS

On the gently sloping lands, the vegetation consists primarily of pastureland made up largely of Guinea grass and scattered lantana shrubs. On a few areas with poorly managed pastureland, lantana along with several other weedy shrub species forms scrubby thickets. In many places along the pastureland, rows of ironwood trees provide a shady respite from the noonday sun. The nine major gulch systems over which the trail crosses supports large stands of ironwood trees along the rims and upper slopes. Mid-slope areas are generally covered by thickets of Christmas berry and koa-haole or ekoo. Vegetation along the gulch bottoms is much more variable, ranging from small stands of trees such as kiawe, kukui, and Java plum with thickets of koa-haole, lantana, and Christmas berry to open grassy areas dominated by California grass. The coastal vegetation occurs as a narrow strip along the coastal bluffs and at the mouths of gulches, where they meet the sea. The vegetation is low and windswept in most places and exposed to salt-spray. Most of the native species occur in this vegetation type.

Along the trail corridor and areas proposed for other uses (camp sites, rest room facility, scenic overlooks, etc.), a total of 122 species were inventoried. Of these, the majority, 100 (82%), are introduced or alien species; 7 (6%) are originally of Polynesian introduction; and 15 (12%) are native. Of the natives, 13 are indigenous, that is, native to the Hawaiian Islands and elsewhere, and 2 are endemic, that is, they are found only in the Hawaiian Islands. None of the plants found during the field studies are officially listed threatened and endangered species (U.S. Fish and Wildlife Service 1989); nor are any proposed or candidate for such status (U.S. Fish and Wildlife Service 1990). All of them occur in similar environmental habitats throughout the islands.



FIGURE 5. The 'avevevo, a member of the goose-foot family, forms low, spreading mats in exposed coastal situations. The flowers, seen on the left side of the photograph, are very small and occur in dense glomerules.



The proposed coastal trail and other accompanying facilities (rest rooms/shower, parking sites, etc.) are not expected to have a significant negative impact on the botanical resources given the limited nature of the project and because it follows along existing cane field roads, for the most part.

A few recommendations for the management of the site are offered. Plans for the coastal trail include a mauka fence to keep cattle from grazing along the coastal bluffs. It is recommended that once the fencing is completed, certain areas should be landscaped to prevent further soil erosion. Native plants already on the site and adapted to the coastal conditions are recommended for planting; these include 'ulei, naupaka, 'ilima (*Sida fallax*), 'aveveo, 'ihi, and 'akuikuli.

In Kapua Gulch, there is a small patch of the introduced pencil plant (*Euphorbia tirucalli*). Pencil plant, a member of the spurge family (Euphorbiaceae), has many light-green, leafless, slender, cylindrical stems and branches. When cut or broken, these stems and branches exude a milky sap which is highly irritating to skin, mucous membranes, and eyes. It is recommended that these plants be removed and periodic inspections made to check for any new seedlings and young plants.

## PLANT SPECIES LIST -- KOHALA COASTAL TRAIL

A checklist of all those terrestrial, vascular plant species inventoried along the proposed trail corridor during the field studies is presented below. The species are arranged alphabetically by families within each of four groups: Ferns, Gymnosperms, Monocots, and Dicots. The taxonomy and nomenclature follow Lamoureux (1984) for the Ferns; the flowering plants, Monocots and Dicots, are in accordance with Wagner et al. (1990), for the most part. The Gymnosperms follow Little and Skolmen (1989).

For each species, the following information is provided:

1. Scientific name with author citation.
2. Common English and/or Hawaiian name, when known.
3. Biogeographic status. The following symbols are used:
  - E = endemic = native only (restricted) to the Hawaiian Islands
  - I = indigenous = native to the Hawaiian Islands and also elsewhere throughout the Pacific
  - P = Polynesian = plants originally of Polynesian introduction prior to Western contact (1778); not native
  - X = introduced or alien = all those plants introduced by humans to the islands, intentionally or accidentally, after Western contact; not native.
4. Presence (+) or absence (-) of a particular species within each of three vegetation types recognized along the proposed trail corridor (see text for discussion):

p = Pastureland  
g = Gulch Vegetation  
c = Coastal Vegetation

| <u>Scientific name</u>                                                                                                             | <u>Common name</u>                 | <u>Status</u> | <u>Vegetation type</u> |          |             |
|------------------------------------------------------------------------------------------------------------------------------------|------------------------------------|---------------|------------------------|----------|-------------|
|                                                                                                                                    |                                    |               | <u>P</u>               | <u>R</u> | <u>C</u>    |
| <b>FERNS</b>                                                                                                                       |                                    |               |                        |          |             |
| ADIANTACEAE (Maiden-hair Fern Family)<br>Adiantum hispidulum Sw.                                                                   | maiden-hair fern                   | X             | -                      | +        | -           |
| NEPHROLEPIDACEAE (Sword Fern Family)<br>Nephrolepis multiflora (Roxb.)<br>Jarrett ex Morton                                        | hairy sword fern,<br>kupukupu      | X             | -                      | +        | -           |
| POLYPODIACEAE (Common Fern Family)<br>Phymatosorus scolopendria (Burm.)<br>Pic.-Ser.                                               | leua'e, lauwa'e                    | X             | +                      | +        | -           |
| THELYPTERIDACEAE (Downy Woodfern Family)<br>Christella parasitica (L.) Levl.                                                       | woodfern, oakfern                  | X             | +                      | +        | -           |
| <b>GYMNOSPERMS</b>                                                                                                                 |                                    |               |                        |          |             |
| ARAUCARIACEAE (Araucaria Family)<br>Araucaria columnaris (G. Forst.) Hook.                                                         | Cook pine                          | X             | +                      | -        | -           |
| <b>FLOWERING PLANTS</b>                                                                                                            |                                    |               |                        |          |             |
| <b>MONOCOTS</b>                                                                                                                    |                                    |               |                        |          |             |
| AGAVACEAE (Sisal Family)<br>Furcraea foetida (L.) Haw.                                                                             | Mauritius hemp                     | X             | -                      | +        | -           |
| ARACEAE (Aroid Family)<br>Alocasia cucullata (Lour.) G. Don<br>Alocasia macrorrhiza (L.) Schott<br>Colocasia esculenta (L.) Schott | Chinese taro<br>'ape<br>taro, kalo | X<br>P<br>P   | -<br>-<br>-            | +        | -<br>-<br>- |

| <u>Scientific name</u>                                                                                                                                                        | <u>Common name</u>                                                                                               | <u>Status</u>         | <u>Vegetation type</u> |          |             |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------|-----------------------|------------------------|----------|-------------|
|                                                                                                                                                                               |                                                                                                                  |                       | <u>P</u>               | <u>R</u> | <u>C</u>    |
| ARECACEAE (Palm Family)<br>Cocos nucifera L.<br>Phoenix dactylifera L.                                                                                                        | coconut, niu<br>date palm                                                                                        | P<br>X                | +                      | -        | +           |
| CANNACEAE (Canna Family)<br>Canna indica L.                                                                                                                                   | canna, Indian shot,<br>polohe                                                                                    | X                     | -                      | +        | -           |
| COMMELINACEAE (Dayflower Family)<br>Commelina diffusa N.L. Burm.<br>Murdannia nudiflora (L.) Brennan                                                                          | honohono                                                                                                         | X<br>X                | -                      | +        | -           |
| CYPERACEAE (Sedge Family)<br>Cyperus rotundus L.<br>Fimbristylis cymosa R. Br.<br>Pycneis polystachyos (Rottb.) P. Beauv.                                                     | nutgrass, nut sedge                                                                                              | X<br>I<br>I           | +                      | -        | -<br>+<br>- |
| LILIACEAE (Lily Family)<br>Crinum asiaticum L.                                                                                                                                | spider lily                                                                                                      | X                     | -                      | -        | +           |
| PANDANACEAE (Hala Family)<br>Pandanus tectorius S. Parkinson ex Z.                                                                                                            | hala, pandanus                                                                                                   | I?                    | +                      | -        | +           |
| POACEAE (Grass Family)<br>Brachiaria mutica (Forssk.) Stapf<br>Chloris barbata (L.) Sw.<br>Chrysopogon aciculatus (Retz.) Trin.                                               | California grass<br>swollen fingergrass,<br>mau'ulei<br>golden beardgrass,<br>manienie 'ula                      | X<br>X<br>I?          | +                      | +        | -<br>-<br>+ |
| Cox lachryma-jobi L.<br>Cynodon dactylon (L.) Pers.<br>Digitaria adscendens (HBK.) Henr.<br>Digitaria sp.<br>Eleusine indica (L.) Gaertn.<br>Oplismenus hirtellus (L.) Beauv. | Job's tears<br>Bermuda grass, manienie<br>Henry's crabgrass<br>crabgrass<br>wiregrass, goosegrass<br>basketgrass | X<br>X<br>X<br>X<br>X | +                      | +        | +           |

| Scientific name                              | Common name                           | Status | Vegetation type |   |   |
|----------------------------------------------|---------------------------------------|--------|-----------------|---|---|
|                                              |                                       |        | P               | R | C |
| <i>Panicum maximum</i> Jacq.                 | Guinea grass                          | X      | +               | + | - |
| <i>Paspalum conjugatum</i> Bergius           | Hilo grass, mau'u<br>Hilo             | X      | +               | + | - |
| <i>Setaria gracilis</i> Kunth                | yellow foxtail, mau'u<br>Kaleponi     | X      | -               | + | - |
| <i>Setaria palmifolia</i> (J. König) Stapf   | palmgrass                             | X      | +               | + | - |
| <i>Sporobolus diander</i> (Retz.) P. Beauv.  | Indian dropseed                       | X      | +               | - | - |
| <i>Sporobolus indicus</i> (L.) R. Br.        | West Indian dropseed                  | X      | +               | - | - |
| <i>Stenotaphrum secundatum</i> (Walt.) Ktze. | buffalo grass, St.<br>Augustine grass | X      | +               | - | - |
| ZINGIBERACEAE (Ginger Family)                |                                       |        |                 |   |   |
| <i>Hedychium</i> sp.                         | ginger                                | X      | -               | + | - |
| <i>Zingiber zerumbet</i> (L.) Sm.            | 'awapuhi-kuahiwi                      | P      | -               | + | - |

17 DICOTS

|                                                 |                               |   |   |   |   |
|-------------------------------------------------|-------------------------------|---|---|---|---|
| ACANTHACEAE (Acanthus Family)                   |                               |   |   |   |   |
| <i>Ruellia graecizans</i> Backer                | ruellia                       | X | - | + | - |
| <i>Thunbergia fragrans</i> Roxb.                | white thunbergia              | X | - | + | - |
| AIZOACEAE (Firn-marigold Family)                |                               |   |   |   |   |
| <i>Sesuvium portulacastrum</i> (L.) L.          | 'akulikuki                    | I | - | - | + |
| <i>Tetragonia tetragonioides</i> (Pallas) Ktze. | New Zealand spinach           | X | - | - | + |
| AMARANTHACEAE (Amaranthus Family)               |                               |   |   |   |   |
| <i>Amaranthus spinosus</i> L.                   | spiny amaranth, pakai<br>kuku | X | + | + | - |
| ANACARDIACEAE (Mango Family)                    |                               |   |   |   |   |
| <i>Mangifera indica</i> L.                      | mango, manako                 | X | - | + | - |
| <i>Schinus terebinthifolius</i> Raddi           | Christmas berry               | X | + | + | + |

18

| Scientific name                                                             | Common name                    | Status | Vegetation type |   |   |
|-----------------------------------------------------------------------------|--------------------------------|--------|-----------------|---|---|
|                                                                             |                                |        | P               | R | C |
| APIACEAE (Parsley Family)                                                   |                                |        |                 |   |   |
| <i>Centella asiatica</i> (L.) Urb.                                          | Asiatic pennywort,<br>pohekula | X      | -               | + | - |
| ASTERACEAE (Sunflower Family)                                               |                                |        |                 |   |   |
| <i>Conyza bonariensis</i> (L.) Cronq.                                       | hairy horseweed, ilioha        | X      | +               | + | - |
| <i>Emilia fosbergii</i> Nicolson                                            | pualele                        | X      | -               | - | + |
| <i>Pluchea indica</i> (L.) Less.                                            | Indian pluchea                 | X      | +               | - | - |
| <i>Pluchea symphytifolia</i> (Mill.) Gillis                                 | pluchea, sourbush              | X      | +               | - | - |
| <i>Reichardia tingitana</i> (L.) Roth                                       | reichardia                     | X      | -               | + | + |
| <i>Sigesbeckia orientalis</i> L.                                            | small yellow crown-beard       | X      | -               | + | + |
| <i>Sonchus oleraceus</i> L.                                                 | sow thistle, pualele           | X      | -               | + | - |
| <i>Synedrella nodiflora</i> (L.) Gaertn.                                    | nodeweed                       | X      | -               | + | - |
| <i>Verbesina encelioides</i> (Cav.) Benth.<br>& Hook.                       | golden crownbeard              | X      | +               | - | - |
| <i>Wedelia trilobata</i> (L.) Hitchc.                                       | wedelia                        | X      | -               | + | + |
| <i>Xanthium strumarium</i> var. <i>canadense</i><br>(Mill.) Torr. & A. Gray | cocklebur, kikania             | X      | +               | - | - |
| BIGNONIACEAE (Bignonia Family)                                              |                                |        |                 |   |   |
| <i>Macfadyena unguis-cati</i> (L.) A. Gentry                                | cat's-claw climber             | X      | -               | + | - |
| BORAGINACEAE (Heliotrope Family)                                            |                                |        |                 |   |   |
| <i>Heliotropium amplexicaule</i> Vahl.                                      | heliotrope                     | X      | +               | - | - |
| <i>Heliotropium anomalum</i> var. <i>argenteum</i><br>A. Gray               | hinahina                       | E      | -               | - | + |
| <i>Heliotropium curassavicum</i> L.                                         | kipukai, nena                  | I      | -               | - | + |
| <i>Tournefortia argentea</i> L.f.                                           | tree heliotrope                | X      | -               | - | + |
| BRASSICACEAE (Mustard Family)                                               |                                |        |                 |   |   |
| <i>Coronopus didymus</i> (L.) Sm.                                           | swine cress                    | X      | -               | - | + |
| CACTACEAE (Cactus Family)                                                   |                                |        |                 |   |   |
| <i>Opuntia ficus-indica</i> (L.) Mill.                                      | panini, papipi                 | X      | -               | + | - |
| CARICACEAE (Papaya Family)                                                  |                                |        |                 |   |   |
| <i>Carica papaya</i> L.                                                     | papaya, mikana                 | X      | -               | + | - |

| Scientific name                                                    | Common name                              | Status | Vegetation type |   |   |
|--------------------------------------------------------------------|------------------------------------------|--------|-----------------|---|---|
|                                                                    |                                          |        | P               | R | C |
| <b>CASUARINACEAE (Ironwood Family)</b>                             |                                          |        |                 |   |   |
| Casuarina equisetifolia L.                                         | common ironwood,<br>psina                | X      | +               | + | + |
| Casuarina glauca Siebold ex Spreng.                                | saltmarsh ironwood,<br>longleaf ironwood | X      | +               | - | - |
| <b>CHENOPODIACEAE (Goosefoot Family)</b>                           |                                          |        |                 |   |   |
| Atriplex semibaccata R. Br.                                        | Australian saltbush                      | X      | -               | - | + |
| Chenopodium murale L.                                              | 'aheahea                                 | X      | +               | - | + |
| Chenopodium oahuense (Meyen) Aellen                                | 'aheahea, 'aweoweo                       | E      | -               | - | + |
| <b>COMBRETACEAE (Combretum Family)</b>                             |                                          |        |                 |   |   |
| Terminalia catappa L.                                              | tropical almond,<br>false kamani         | X      | -               | - | + |
| <b>CONVOLVULACEAE (Morning-glory Family)</b>                       |                                          |        |                 |   |   |
| Ipomoea alba L.                                                    | moon flower, koali pehu                  | X      | -               | + | - |
| Jacquemontia ovalifolia (Choisy)<br>H. Hallier                     | pa'u-o-Hi'i'aka                          | I      | -               | - | + |
| <b>EUPHORBIACEAE (Spurge Family)</b>                               |                                          |        |                 |   |   |
| Aleurites moluccana (L.) Willd.                                    | kukui, tutui                             | P      | -               | + | - |
| Chamaesyce hirta (L.) Millsp.                                      | hairy spurge, garden<br>spurge           | X      | +               | - | - |
| Chamaesyce hypericifolia (L.) Millsp.                              | graceful spurge                          | X      | -               | - | + |
| Chamaesyce prostrata (Aiton) Small                                 | prostrate spurge                         | X      | -               | + | + |
| Euphorbia tirucalli L.                                             | pencil plant, milk hedge                 | X      | -               | - | + |
| Phyllanthus debilis Klein ex Willd.                                | niruri                                   | X      | -               | + | - |
| Ricinus communis L.                                                | castor bean, koli                        | X      | -               | + | - |
| <b>FABACEAE (Pea Family)</b>                                       |                                          |        |                 |   |   |
| Canavalia cathartica Thouars                                       | mauna-loa                                | X      | +               | - | - |
| Chamaecrista nictitans var. glabrata<br>(Vogel) H. Irwin & Barneby | partridge pea, lauki                     | X      | +               | - | - |
| Desmanthus virgatus (L.) Willd.                                    | slender mimosa                           | X      | +               | + | + |
| Desmodium incanum DC.                                              | Spanish clover, ka'imi                   | X      | +               | + | + |

| Scientific name                                          | Common name                                      | Status | Vegetation type |   |   |
|----------------------------------------------------------|--------------------------------------------------|--------|-----------------|---|---|
|                                                          |                                                  |        | P               | R | C |
| <b>Desmodium triflorum (L.) DC.</b>                      |                                                  |        |                 |   |   |
|                                                          | three-flowered<br>beggarweed                     | X      | +               | - | - |
| Glycine wightii (Wight & Arnott) Verdc.                  |                                                  | X      | -               | + | - |
| Indigofera suffruticosa Mill.                            | indigo, 'iniko                                   | X      | +               | + | - |
| Leucaena leucocephala (Lam.) de Wit                      | koa-haole, ekoa                                  | X      | +               | + | - |
| Mimosa pudica var. unijuga (Duchass.<br>& Walp.) Griseb. | sensitive plant, sleeping<br>grass, pua hilahila | X      | +               | - | - |
| Prosopis pallida (Humb. & Bonpl. ex<br>Willd.) Kunth     | kiawe                                            | X      | -               | + | - |
| Senna surattensis (N.L. Burm.)<br>H. Irwin & Barneby     | kolomona                                         | X      | -               | + | - |
| <b>GOODENIACEAE (Goodenia Family)</b>                    |                                                  |        |                 |   |   |
| Scaevola sericea Vahl                                    | beach naupaka, naupaka<br>kahakai                | I      | -               | - | + |
| <b>LAMIACEAE (Mint Family)</b>                           |                                                  |        |                 |   |   |
| Hyptis pectinata (L.) Poit.                              | comb hyptis                                      | X      | -               | + | - |
| <b>MALVACEAE (Mallow Family)</b>                         |                                                  |        |                 |   |   |
| Abutilon grandifolium (Willd.)<br>Sweet                  | abutilon, mao                                    | X      | -               | + | - |
| Malvastrum coromandelianum (L.)<br>Garcke                | false mallow                                     | X      | +               | - | - |
| Sida acuta N.L. Burm.                                    | acute-leaved sida                                | X      | -               | + | + |
| Sida fallax Walp.                                        | 'ilima                                           | I      | -               | + | + |
| Sida rhombifolia L.                                      | Cuba jute                                        | X      | -               | + | - |
| <b>MELIACEAE (Mahogany Family)</b>                       |                                                  |        |                 |   |   |
| Melia azedarach L.                                       | China berry, pride of<br>India                   | X      | +               | - | - |
| <b>MENISPERMACEAE (Moonseed Family)</b>                  |                                                  |        |                 |   |   |
| Cocculus trilobus (Thunb.) DC.                           | huehue, hue                                      | I      | -               | + | - |

| <u>Scientific name</u>                                                                                                                                                        | <u>Common name</u>                                                      | <u>Status</u>    | <u>Vegetation type</u> |             |             |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------|------------------|------------------------|-------------|-------------|
|                                                                                                                                                                               |                                                                         |                  | P                      | R           | E           |
| MORACEAE (Mulberry Family)<br><i>Ficus microcarpa</i> L.f.                                                                                                                    | Chinese banyan                                                          | X                | -                      | +           | -           |
| MYRTACEAE (Myrtle Family)<br><i>Eucalyptus citriodora</i> Hook.<br><i>Eugenia uniflora</i> L.<br><i>Psidium guajava</i> L.<br><i>Syzygium cumini</i> (L.) Skeels              | lemon-scented gum<br>Surinam cherry<br>guava, kuawa<br>Java plum        | X<br>X<br>X<br>X | -<br>-<br>+            | +<br>+<br>+ | -<br>-<br>- |
| NYCTAGINACEAE (Four-o'clock Family)<br><i>Boerhavia repens</i> L.                                                                                                             | alena                                                                   | I                | -                      | -           | +           |
| OXALIDACEAE (Wood Sorrel Family)<br><i>Oxalis corniculata</i> L.                                                                                                              | yellow wood sorrel,<br>'ihi 'ai                                         | P?               | -                      | +           | +           |
| 21 PASSIFLORACEAE (Passion Flower Family)<br><i>Passiflora edulis</i> forma <i>flavicarpa</i><br>Degener<br><i>Passiflora foetida</i> L.<br><i>Passiflora pulchella</i> Kunth | passion fruit, liliko'i<br>running pop, pohapoha<br>bat-wing passiflora | X<br>X<br>X      | -<br>-<br>-            | +<br>-<br>+ | -<br>+<br>- |
| PHYTOLACCACEAE (Pokeweed Family)<br><i>Rivina humilis</i> L.                                                                                                                  | rouge plant, coralberry                                                 | X                | +                      | +           | -           |
| PLANTAGINACEAE (Plantain Family)<br><i>Plantago lanceolata</i> L.                                                                                                             | narrow-leaved plantain                                                  | X                | -                      | -           | +           |
| PORTULACACEAE (Purslane Family)<br><i>Portulaca lutea</i> Sol. ex G. Forster<br><i>Portulaca oleracea</i> L.                                                                  | 'ihi<br>pigweed, 'akulikuli<br>kula, 'ihi                               | I<br>X<br>X      | -<br>+                 | -<br>-      | +<br>+      |
| PRIMULACEAE (Primrose Family)<br><i>Anagallis arvensis</i> L.                                                                                                                 | scarlet pimpernel                                                       | X                | +                      | -           | -           |

| <u>Scientific name</u>                                                                                                  | <u>Common name</u>                                   | <u>Status</u> | <u>Vegetation type</u> |        |        |
|-------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------|---------------|------------------------|--------|--------|
|                                                                                                                         |                                                      |               | P                      | R      | E      |
| PROTEACEAE (Protea Family)<br><i>Macadamia ternifolia</i> var. <i>integrifolia</i><br>(Maiden & Betche) Maiden & Betche | macadamia                                            | X             | -                      | +      | -      |
| ROSACEAE (Rose Family)<br><i>Osteomeles anthyllidifolia</i> (Sm.)<br>Lindl.                                             | 'ulei, u'ulei                                        | I             | -                      | +      | +      |
| RUBIACEAE (Coffee Family)<br><i>Coffea arabica</i> L.<br><i>Morinda citrifolia</i> L.                                   | Arabian coffee<br>noni                               | X<br>P        | -<br>+                 | +<br>+ | -<br>- |
| SOLANACEAE (Nightshade Family)<br><i>Capsicum frutescens</i> L.                                                         | chili pepper, nioi                                   | X             | -                      | +      | -      |
| 22 FILIACEAE (Linden Family)<br><i>Triumfetta semitriloba</i> Jacq.                                                     | bur bush                                             | X             | -                      | +      | -      |
| VERBENACEAE (Verbena Family)<br><i>Lantana camara</i> L.<br><i>Stachytarpheta urticifolia</i> (Salisb.)<br>Sims         | lantana, lakana<br>nettle-leaved vervain,<br>owi, oi | X<br>X        | +                      | +      | -<br>- |

LITERATURE CITED

- Char, W.P. 1992a. Botanical survey, Kohala Plantation Village, North Kohala, Island of Hawai'i. Prepared for Chalon International of Hawaii, Inc. April 1992.
- \_\_\_\_\_. 1992b. Botanical survey, Hawi Makai project, North Kohala District, Island of Hawai'i. Prepared for Chalon International of Hawaii, Inc. May 1992.
- Lemourez, C.H. 1984. Checklist of Hawaiian pteridophytes. Unpublished manuscript, Univ. of Hawai'i, Manoa.
- Little, E.L., Jr. and R.C. Skolmen. 1989. Common forest trees of Hawaii (native and introduced). U.S.D.A. Agricultural Handbook 679: 1-321.
- Sato, H.H., V. Ikeda, R. Paeth, R. Smythe, and M. Takehiro, Jr. 1973. Soil survey of the island of Hawaii, State of Hawaii. U.S.D.A., Soil Conservation Service, Washington, D.C.
- U.S. Fish and Wildlife Service. 1989. Endangered and threatened wildlife and plants. 50 CFR 17.11 & 17.12.
- \_\_\_\_\_. 1990. Endangered and threatened wildlife and plants; Review of plant taxa for listing as Endangered or Threatened Species; Notice of review. Federal Register 55(35): 6184-6229.
- Wagner, W.L., D.R. Herbst, and S.H. Sohmer. 1990. Manual of the flowering plants of Hawai'i. 2 vols. University of Hawai'i Press and Bishop Museum Press, Honolulu. Bishop Museum Special Publication 83.

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  
36  
37  
38  
39  
40  
41  
42  
43  
44  
45  
46  
47  
48  
49  
50  
51  
52  
53  
54  
55  
56  
57  
58  
59  
60  
61  
62  
63  
64  
65  
66  
67  
68  
69  
70  
71  
72  
73  
74  
75  
76  
77  
78  
79  
80  
81  
82  
83  
84  
85  
86  
87  
88  
89  
90  
91  
92  
93  
94  
95  
96  
97  
98  
99  
100

APPENDIX B  
AVIFAUNA & FERAL MAMMAL SURVEY

SURVEY OF THE AVIFAUNA AND FERAL MAMMALS ALONG THE  
KOHALA COAST LINE, NORTH KOHALA, HAWAII

Prepared for  
Chalon International of Hawaii, Inc.  
by

Phillip L. Bruner  
Assistant Professor of Biology  
Director, Museum of Natural History  
Environmental Consultant - Faunal (Bird & mammal) Surveys

23 January 1992

INTRODUCTION

The purpose of this report is to summarize the findings of a two day (18-19 January 1992) bird and mammal field survey conducted along approximately 6.5 miles of coastline at North Kohala, Hawaii (Fig.1) Also included are references to pertinent literature as well as unpublished faunal reports.

The objectives of the field survey were to:

- 1- Document what bird and mammal species occur on the property or may likely occur given the type of habitats available.
- 2- Provide some baseline data on the relative (estimated) abundance of each species.
- 3- Determine the presence or likely occurrence of any native fauna particularly any that are listed as "Endangered" or "Threatened".
- 4- If any special or unique wildlife habitat occurs on the property locate such sites and note their possible value for birds and mammals in this region of the island.

GENERAL SITE DESCRIPTION

Figure One indicates the limits of the area surveyed for birds and mammals. This coastal habitat contains sheer cliffs and rocky shoreline on one side and pasture on the other. Inroadwood (Casuarina



spp.) is the most abundant tree. In several areas stream drainages have created deep gullies filled with dense brush. No running water was present during the two day study.

Weather during the field survey was variable with clear skies on day one and passing showers on day two.

#### STUDY METHODS

Field observations were made with binoculars and by listening for vocalizations. These observations were concentrated during the peak bird activity periods of early morning and late afternoon/early evening. Attention was also paid to the presence of tracks and scats as indicators of bird and mammal activity. At various locations eight minute counts were made of all birds seen or heard (Fig.1). Between these count (census) stations any unusual observations of birds were also noted. These data provide the basis for the relative (estimated) abundance figures given in this report (Table 1). Published and unpublished reports of birds known from nearby lands were also consulted in order to acquire a more complete picture of the possible species that might occur in the area (Bruner 1991a, 1991b, 1992; Pratt et al. 1987; Hawaii Audubon Society 1989; David 1989, 1990). Observations of feral mammals were limited to visual sightings and evidence in the form of scats and tracks. No attempts were made to

trap mammals in order to obtain data on their abundance and distribution. Two evenings were devoted to searching for the presence of owls and the Hawaiian Hoary Bat (Lasiorus cinereus semotus).

Scientific names used herein follow those given in Hawaii's Birds (Hawaii Audubon Society 1989); Field Guide to the Birds of Hawaii and the Tropical Pacific (Pratt et al. 1987); Mammal Species of the World (Honacki et al. 1982) and Trees of Hawaii (Kepler 1990).

#### RESULTS AND DISCUSSION

##### Resident Endemic (Native) Birds:

No endemic birds were recorded on the property. Short-eared Owl or Pueo (Asio flammeus sandwichensis) and Hawaiian Hawk or 'Io (Buteo solitarius) are known to occur in the area (Bruner 1991a). There are no permanent wetlands along this section of coastline thus no waterbirds would be expected. The stream drainages were dry and appeared to be active only during periods of heavy rain.

##### Migratory Indigenous (Native) Birds:

Migratory shorebirds winter in Hawaii between the months of August through May. Some juveniles will stay through the summer as well (Johnson and Johnson 1982). The most abundant shorebird which winters in Hawaii is the Pacific Golden Plover (Pluvialis

fulva). This species prefers open areas such as exposed reefs, rocky shorelines, mud flats, lawns, plowed fields and pastures. They arrive in Hawaii in early August and depart to their arctic breeding grounds during the last week of April (Johnson et al. 1981). Johnson et al. (1989) have shown plover are extremely site-faithful on their wintering grounds and many establish foraging territories which they defend vigorously. Such behavior makes it possible to acquire a reasonable estimate of the abundance of plover in any one area. These populations likewise remain relatively stable over many years. Forty five plover were recorded during the survey. These birds were observed in pastures and flying overhead.

Ruddy Turnstone (Arenaria interpres), another common migrant that utilizes pastures and other open habitats, was also noted. A total of 31 turnstone were tallied.

Eight Wandering Tattler (Heteroscelus incanus) were found foraging along the rocky shoreline. Tattler are usually solitary on the wintering grounds.

Resident Indigenous (Native) Birds:

No indigenous resident species were recorded on the property.

The only likely bird in this category is the Black-crowned Night Heron (Nycticorax nycticorax). This species may roost in the forested gullies.

Resident Indigenous (Native) Seabirds:

No seabirds were observed on the property, however, shearwaters,

probably Wedge-tailed Shearwater (Puffinus pacificus), were observed off-shore. The sea cliffs may be suitable for roosting or nesting seabirds due to their steep topography and relative inaccessibility to predators. However, no seabirds were noted near these cliffs.

Exotic (Introduced) Birds:

Only nine species of exotic birds were recorded during the field survey (Table 1). This compares to 13, 12 and 15 exotic species tallied on earlier surveys of nearby lands (Bruner 1991a, 1991b, 1992).

Based on the location of the property and the type of habitats available the following exotic species may also occur on or near the property: Ring-necked Pheasant (Phasianus colchicus), Barn Owl (Tyto alba, Northern Hockingbird (Mimus polyglottus), Eurasian Skylark (Alauda arvensis), Saffron Finch (Sicalis flaveola), Yellow-fronted Canary (Serinus mozambicus) and Yellow-billed Cardinal (Paroaria capitata) (Pratt et al. 1987; Hawaii Audubon Society 1989; David 1989, 1990; Bruner 1991a, 1991b, 1992).

Feral Mammals:

Small Indian Mongoose (Herpestes auropunctatus) and feral cats were observed. The area is used extensively for ranching. No trapping was conducted in order to assess the relative abundance of mammals.

Records of the endemic and endangered Hawaiian Hoary Bat are sketchy but the species has been reported regularly from the island of Hawaii (Tomich 1986; Kepler and Scott 1990). No bats were found

stretch of property were less than in the more diversified habitats further inland. The monotypic Ironwood/grass habitat and the exposure to wind make this area less desirable for birds.

2- No endemic birds were recorded. However, Hawaiian Hawk and Pueo do occur in this region (Bruner 1991a). Migratory plover, turnstone and tattler are common inhabitants of this area.

3- House Finch (Carpodacus mexicanus) and Common Myna (Acridotheres tristis) were the most abundant exotic species recorded on the survey. House Finch prefer Ironwoods for foraging, hence their abundance. Common Myna on the other hand, are attracted to the area because of the cattle.

4- In order to obtain more definitive data on mammals a trapping program would be required. The Hawaiian Hoary bat was not recorded at this site.

5- No unique wildlife habitat was found on this property. Except for a few native coastal plants the area is largely a disturbed pasture with an introduced coastal forest of Ironwood.

on the survey despite two nights of searching. Much remains to be known about the natural history of this bat and its ecological requirements here in Hawaii.

CONCLUSION

A brief field survey such as this one can provide only a limited perspective of the wildlife which utilize the area. Not all species will be observed and information on occurrence and use of the site must be sketched together from brief observations and the available literature. The number of species and the relative abundance of each species may vary throughout the year due to available resources and reproductive success. Species which are migratory will quite obviously be found only at certain times during the year. Exotic species sometimes prosper for a time only to later disappear or become a less significant part of the ecosystem (Williams 1987; Moulton et al. 1990). Thus only long term studies can provide a comprehensive view of the bird and mammal populations in a particular area. Nevertheless some general conclusions related to bird and mammal activity on this site can be made.

1- The entire length of the property was traversed and census stations were distributed along the route so as to provide a reasonable sample from which relative estimates of bird populations could be derived. The numbers of birds recorded in this coastal



Fig. 1. Location of trail area surveyed with faunal census stations marked by arrows.

-8-

TABLE 1

Exotic (introduced) birds recorded along a coastal stretch of property in North Kohala, Hawaii.

| COMMON NAME        | SCIENTIFIC NAME                | RELATIVE ABUNDANCE* |
|--------------------|--------------------------------|---------------------|
| Black Francolin    | <u>Francolinus francolinus</u> | C= 6                |
| Spotted dove       | <u>Streptopelia chinensis</u>  | U= 3                |
| Zebra Dove         | <u>Geopelia striata</u>        | C= 9                |
| Common Myna        | <u>Acridotheres tristis</u>    | A= 12               |
| Hwamei             | <u>Garrulax canorus</u>        | U= 2                |
| Northern Cardinal  | <u>Cardinalis cardinalis</u>   | C= 5                |
| Japanese White-eye | <u>Zosterops japonicus</u>     | C= 8                |
| Nutmeg Mannikin    | <u>Lonchura punctulata</u>     | C= 6                |
| House Finch        | <u>Carpodacus mexicanus</u>    | A= 14               |

\*(see page 10 for key to symbols)

-9-

KEY TO TABLE 1

Relative (estimate) abundance = Number of times observed during survey or average number on eight minute counts in appropriate habitat.

A= abundant (ave. 10+) number which follows is average of data from all survey days

C= common (ave. 5-10) number which follows is average of data from all survey days

U= uncommon (ave. less than 5) number which follows is average of data from all survey days

R= recorded (seen or heard at times other than on 8 min. counts or on one count only) number which follows is the total number seen or heard over the duration of the survey

SOURCES CITED

Bruner P.L. 1991a. Survey of the avifauna and feral mammals at Hawi, North Kohala, Hawaii. Unpubl. ms.

——— 1991b. Survey of the avifauna and feral mammals at Halaula, North Kohala, Hawaii. Unpubl. ms.

——— 1992. Survey of the avifauna and feral mammals at Maliu Ridge, North Kohala, Hawaii. Unpubl. ms.

David, R.E. 1989. North Kona Christmas Bird Count 1989. 'Elepaio 49(9):55-56.

——— 1990. North Kona Christmas Count 1989. 'Elepaio 50(5):41-42.

Hawaii Audubon Society. 1989. Hawaii's Birds. Fourth Edition. Hawaii Audubon Society, Honolulu.

Honacki, J.H., K.E. Kinman and J.W. Koeppl ed. 1982. Mammal species of the world: A taxonomic and geographic reference. Allen Press, Inc. and the Association of Systematic Collections, Lawrence, Kansas.

Johnson, O.W., P.H. Johnson, and P.L. Bruner. 1981. Wintering behavior and site-faithfulness of Golden Plovers on Oahu. 'Elepaio 41(12):123-130.

Johnson, O.W., and P.H. Johnson. 1983. Plumage-molt-age relationships in "over-summering" and migratory Lesser Golden-Plovers. Condor 85:406-419.

Johnson, O.W., M.L. Morton, P.L. Bruner and P.H. Johnson. 1989. Winter range fat cyclicity in Pacific Golden-Plovers (*Pluvialis fulva*) and predicted migratory flight ranges Condor 91:156-177.

Kepler, A.K. 1990. \_\_\_\_\_ of Hawaii. Univ. of Hawaii Press.

Kepler, C.B. and J.M. Scott. 1990. Notes on distribution and behavior of the endangered Hawaiian Hoary Bat (*Lasiurus cinereus semotus*) 1974-1983. 'Elepaio 50(7):59-64.

Houlton, M.P., S.L. Pimm and M.W. Krissinger. 1990. Nutmeg Mannikin (*Lonchura punctulata*): a comparison of abundance in Oahu Vs. Maui sugarcane fields: evidence for competitive exclusion? 'Elepaio 50(10):83-85.

Pratt, H.D., P.L. Bruner and D.G. Berrett. 1987. A Field Guide to the Birds of Hawaii and the Tropical Pacific. Princeton Univ. Press.

Tomic, P.Q. 1986. Mammals In Hawaii. Bishop Museum Press. Honolulu.

Williams, R.N. 1987. Alien Birds on Oahu 1944-1985. 'Elepaio 47(9):87-92.

APPENDIX C

ARCHAEOLOGICAL INVENTORY SURVEY AND  
LETTERS FROM THE STATE HISTORIC  
PRESERVATION DIVISION

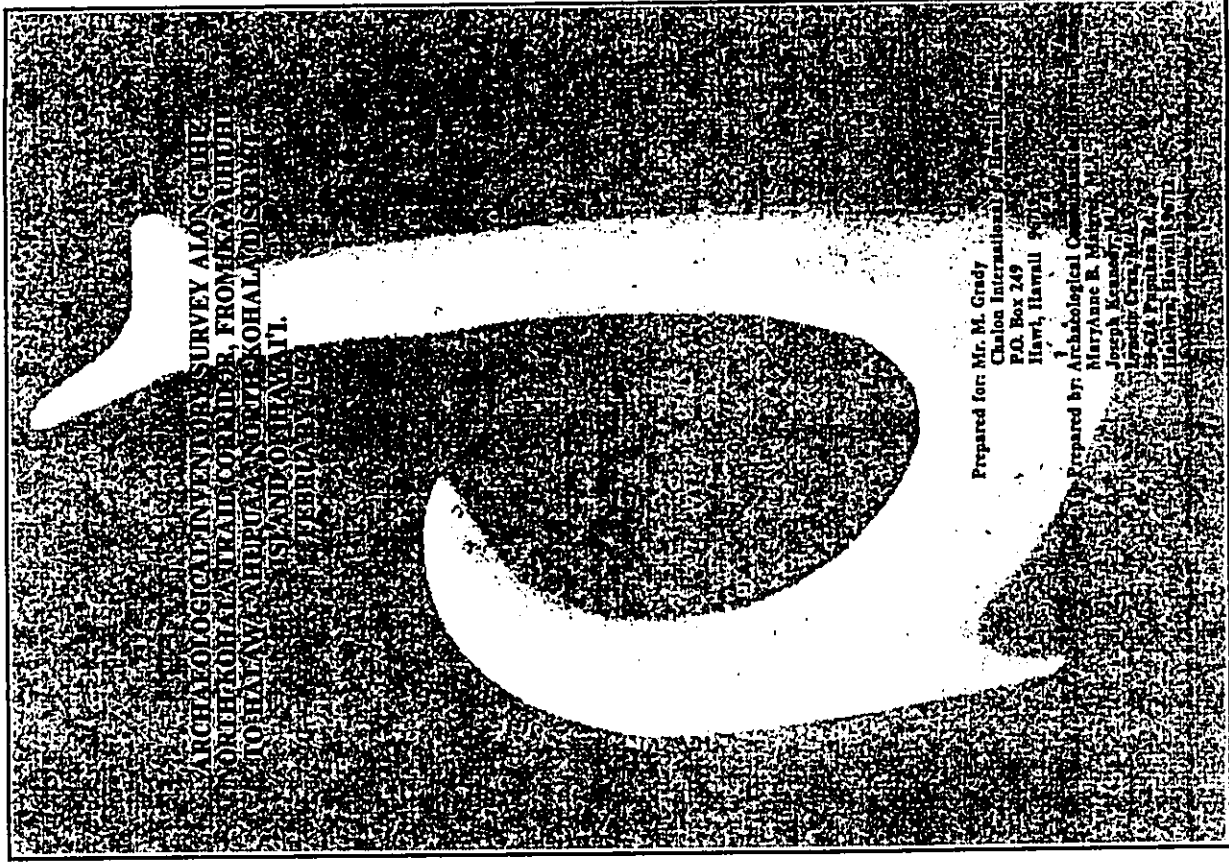


Table of contents

Abstract ..... 1

Section 1: Introduction ..... 2

Section 2: Physical Setting ..... 2

    Section 2.1: Location ..... 2

    Section 2.2: Topography ..... 5

    Section 2.3: Vegetation ..... 6

    Section 2.4: Soils ..... 7

Section 3: Historic Background ..... 7

    Section 3.1: Associations with Kamehameha I ..... 7

    Section 3.2: Historic Accounts ..... 10

    Section 3.3: Ethnographic Perspectives ..... 15

Section 4: Previous Archaeological Work ..... 20

Section 5: Summary of Land Use Patterns ..... 26

Section 6: Expected Archaeological Finds ..... 28

Section 7: Methodology ..... 29

Section 8: Archaeological Finds ..... 31

Section 9: Discussion of Archaeological Finds ..... 38

    Section 9.1: Along Sections of the Trail Path ... 38

    Section 9.2: Archaeological Findings in Context . 43

Section 10: Recommendations for Preservation ..... 44

Section 11: Conclusions ..... 44

Bibliography ..... 46



Inventory Survey of a 100ft Wide Corridor along the North Kohala Trail Through the Ahupua'a of Ka'auhuhu, Havi, Pahoa, Honomaka'u, Kapa'u, Puhuehu, La'aumama, Hanaula, Honopueo, Kapa'u, Aihakea, 'Iole, Hala'ula, Pu'aka, Apunaka'ohau, Halelua, Kapapa'a, and Halawa, Island of Hawaii.

Abstract

An inventory survey was conducted along a corridor for a coastal trail which extends for 6.3 miles through North Kohala. These archaeological investigations were conducted at the request of Chalton International of Hawaii, Inc. who owns the land over which the trail passes. The surveyed corridor was 100ft wide, which included the 15ft (4.5m) wide trail itself, and a 42.5ft (12.75m) buffer on either side.

The majority of the trail passes over land which has been heavily disturbed by activities associated with sugar cane cultivation. Boulder scatters, low earthen mounds, and alignments litter the side of the trail. The morphology, location and nature of these features led to the conclusion that they were historic, plantation deposits. However, the trail does pass close to three non-significant historic sites; two dumps (Sites T-1 and T-2) and a blast hole (Site T-3) beneath a railway track.

At its eastern end, the trail does pass through Halawa Gulch in which two significant historic sites are located. Site #50-80-02-18421 is an agricultural taro complex, which since it is currently being investigated by Dr. R. Cordy, State Historic Preservation Division, was not investigated by ACH. Site #18429 consists of two terraces, one possibly natural (Feature 18429-A) and one probably agricultural (Feature 18429-B). Neither of these sites are going to be crossed by the trail, although they both lie within the 100ft wide corridor.

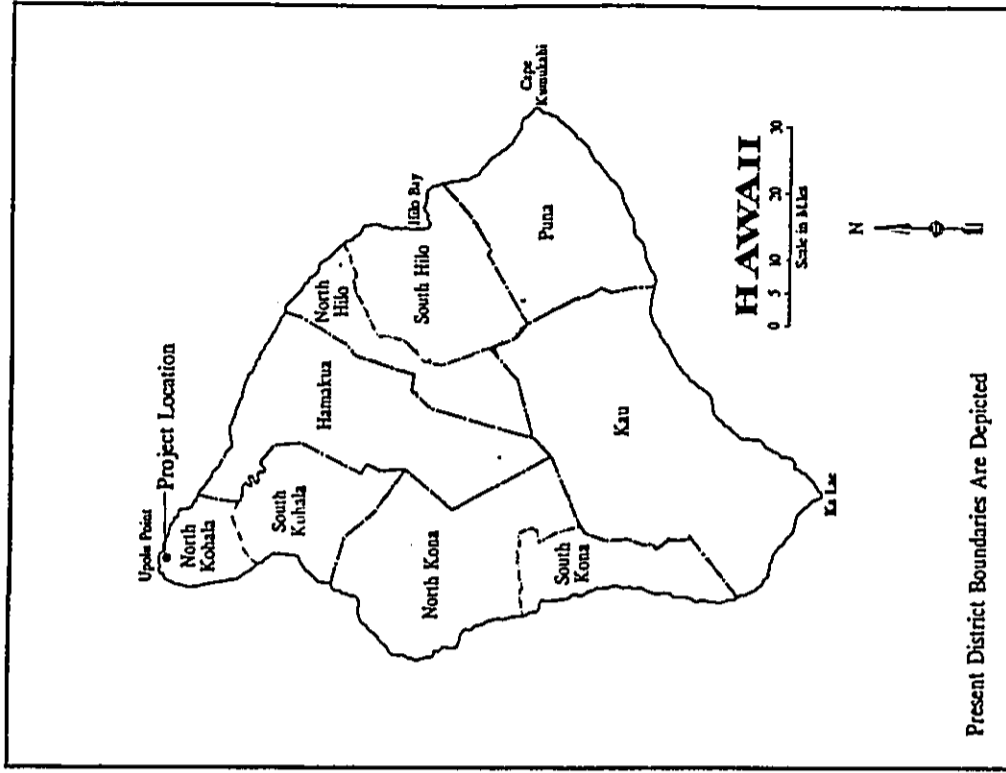
After consultations between Mr. M. Grady, Chalton International of Hawaii, Inc., Dr. R. Cordy, State Historic Preservation Division, and Archaeological Consultants of Hawaii, Inc., it has been decided that the sites in Halawa Gulch should be preserved with interpretive signs. The details of preservation will be outlined in a separate document.

Once interpretive signs have been placed along the trail in Halawa Gulch, the construction and use of the trail will have a "beneficial effect" upon significant historic resources.

Table of Contents (continued)

|                                                                                             |                             |
|---------------------------------------------------------------------------------------------|-----------------------------|
| Appendix A: Land Commission Awards In the Vicinity of the Subject Property .....            | A1                          |
| Appendix B: Place Names in the Vicinity of the Subject Property .....                       | B1                          |
| Appendix C: Site #50-80-02-18424 .....                                                      | C1                          |
| Appendix D: Dr. Cordy's Letter Concerning Agricultural Terraces in Halawa Gulch .....       | D1                          |
| Maps and Diagrams                                                                           |                             |
| Map 1: Project Location on a Map of Hawaii .....                                            | 3                           |
| Map 2: Subject Property on U.S.G.S. Map .....                                               | 4                           |
| Map 3: Detailed Topographic Maps of the Property with Archaeological Sites .....            | envelopes at back of report |
| Map 3(a): Western Terminus to Hanaula Gulch                                                 |                             |
| Map 3(b): Kapa'au Gulch to Eastern Terminus                                                 |                             |
| Map 4: Land Commission Awards Located Along this Section of the North Kohala District ..... | 12                          |
| Map 5: Archaeological Sites in the Ahupua'a Along the Trail Path .....                      | 21                          |
| Map 6: Kohala Sugar Company Field Map .....                                                 | 32                          |
| Map 7: Union Mill and Plantation, Ltd., Field Map .....                                     | 33                          |
| Map 8: Kohala Sugar Company Field Map .....                                                 | 36                          |
| Figure 1: Plan of Site 50-80-04-18429 .....                                                 | 39                          |
| Tables                                                                                      |                             |
| Table 1: Archaeological Sites Located in the Ahupua'a Through Which the Trail Passes .....  | 23                          |
| Table 2: Significance Table For Sites Located Along the North Kohala Trail Path .....       | 41                          |

Map 1: Project Location on a Map of Hawaii



Present District Boundaries Are Depicted

after: Spriggs and Tanaka 1988: xiii

Section 1: Introduction

At the request of Chalon International of Hawaii, Inc., an inventory survey was undertaken by Archaeological Consultants of Hawaii, Inc. (ACH). The area to be surveyed was a 100ft (30m) wide trail which extended for 6.3 miles (c. 10km) along the North Kohala coast on the island of Hawaii. The purpose of this inventory survey report is to assess the significance of any cultural structures or features which would be adversely affected by the construction and use of the trail.

The surveyed area traverses eighteen ahupua'a. Beginning from the west, at Ka'auhuhu Ahupua'a, the trail follows an easterly direction through the ahupua'a of Hawi, Pahoa, Honomakau'u, Kapu'a, Puehuehu, La'auama, Hanaula, Honopu, Kapa'au, 'Ainakea, 'Iole, Halaua, Pu'eke, Apuaka'ohau, Haleluu, Napapa'a, and Halawa (see Maps 1 and 2). The trail terminates after exiting the eastern side of Halawa Gulch (see Maps 3a and 3b). The entire trail lies within North Kohala District.

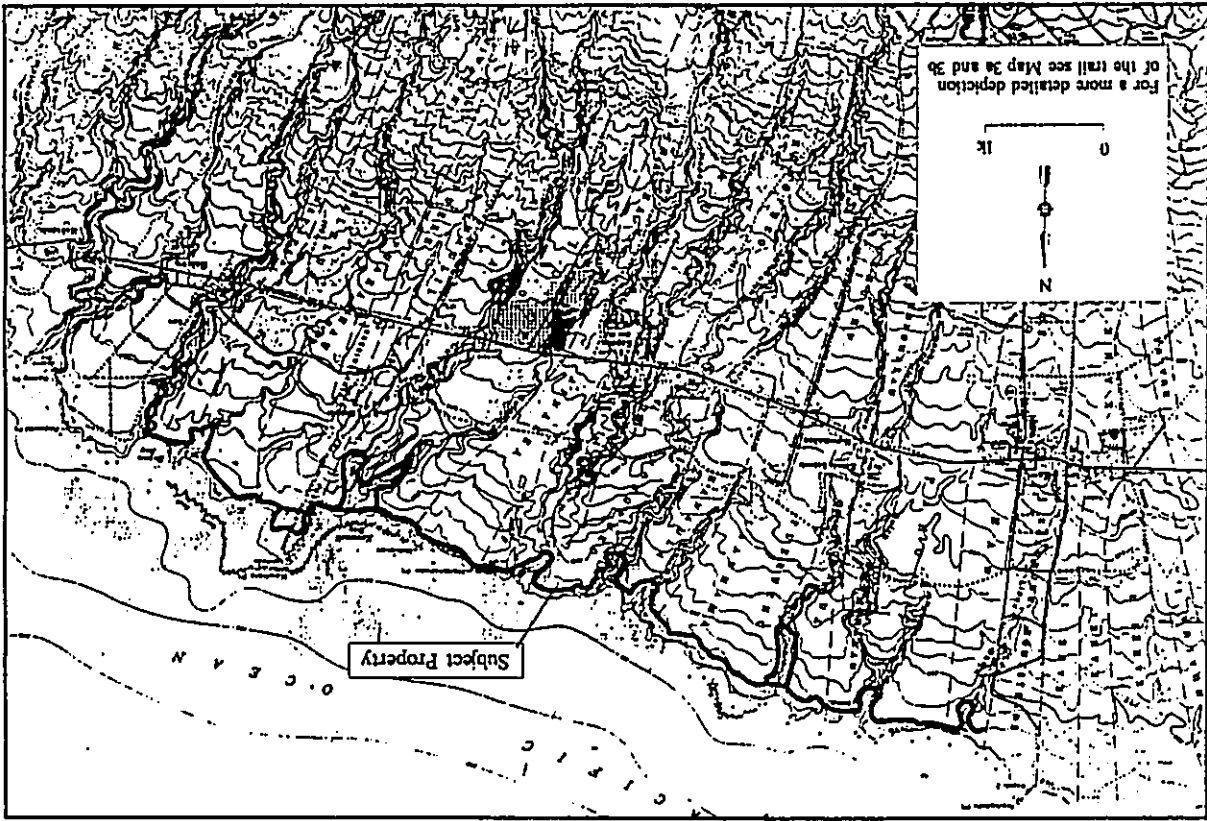
For the most part, the trail follows a single, combined path. At some points where the trail crosses the gulches, the combined trail splits into two paths: a multi-use (hikers, bicyclists, and horse riders) trail, and a pedestrian trail. The pedestrian path often traverses the steep gulch sides, whereas the multi-use path winds further back into the gulches following a more gentle gradient. The trail is to be used for recreational purposes.

At the time of her writing, Tomonari-Tuggle had noted that the area west of Halawa Gulch had not been comprehensively surveyed for archaeological purposes (1988: Section II:30). Recently, two archaeological studies have been conducted in areas directly inland from the trail route. Portions of Hawi, Pahoa, and Honomakau Ahupua'a have been surveyed by ACH in 1991 and 1992 (Denham et al. 1993, refer to Section 4). A much larger survey has been conducted by International Archaeological Research Institute, Inc., on a property between Hanaula and Halawa Gulches. Only the preliminary results of this survey have been made available to ACH at this time (Erkelens 1992, refer to Section 4). Both these archaeological surveys have been conducted on lands owned by Chalon International of Hawaii, Inc..

Section 2: Physical Setting

Section 2.1: Location

The eastern end of the trail is located at geographic grid coordinates 20 14'30"N, 155 45'30"W, and at UTM co-ordinates 2241000mN, 211000mE. The western end of the trail



Map 2: Subject Property on a USGS Map

is located at geographic grid coordinates 20 15'40"N, 155 50'00"W, and at UTM coordinates 2242000M, 2040000E. The area surveyed includes the 15ft (4.5m) width of the trail itself, and a 42.5ft (12.75m) buffer along each side of the corridor. The trail begins about two miles seaward, or Makai, of the center of Havi Town, just west of Lipoa Gulch. The trail runs approximately parallel to the coastline along the top of the cliffs, although at the gulches it extends short distances inland. Topographic, climatic, and cultural factors have shaped the landscape which the trail traverses.

Section 2.2: Topography

The topography consists of broad, gently sloping kula lands which are dissected by ten moderately deep gulches. These gulches are from west to east: Lipoa, Wainiele, Kapua, Ohanaula, Hanaula, an unnamed gulch at the confluence of Kapa'au and Hapahapai gulches, Pali Akamoa, Wainala, Halelua, and Halawa.

Land on the bluffs in between the gulches consists mainly of rolling hills gently sloping downward to cliff edges. The cliffs themselves, towering anywhere from 30ft to 100ft (feet) above the sea, end abruptly all along the coast. Often a carpeting of grass runs to the very edge of the cliff and overhangs it, suggesting that the sea is currently undercutting the cliff edge.

Denham et al. (1992) and Erkelens (1992) both indicate that agricultural clearing was concentrated along the gentle slopes. Some of the material which was cleared was then pushed into the gulches. Erkelens (1992) notes how the practice of harvesting sugar cane using bulldozers (though informant testimony indicates that the proper term for the equipment used in harvesting cane is "push rakes" as opposed to "bulldozers": per. comm., Michael Gomes 1993) further contributed to the dumping of boulders in the gulches. Sugar cane cultivation has not only extensively modified the slopes which were cultivated, but has extensively altered the slopes onto which cleared material was dumped. Since the sugar cane cultivation was concentrated on the slopes, it was expected that any archaeological sites would be found in the gulches. This has been borne out in the studies by: Archaeological Consultants of Hawaii, Inc., (Denham et al. 1993) who documented prehistoric and historic type sites in Kumakua Gulch; IARI (Erkelens 1992) who documented numerous historic and some possibly prehistoric type sites primarily in Hanaula, Kapa'au, Hapahapai, and Wainala Gulches; and Tomonari-Tuggle (1988:44) who noted agricultural terraces in Halawa Gulch.

### Section 2.3: Vegetation

The gulches at the western end of the trail, namely Lipoa, Waipiele, and Kapua, were extremely dry at the time of the survey, and there was little evidence of even intermittent stream flow. These gulches characteristically contained grasses, ironwood trees (*Casuarina equisetifolia*), lantana (*Lantana camara*), christmas berry (*Schinus molle*), *tetralix* (*Tetralix*), and *koa haole* (*Lycopersicon*). As one moves eastward the gulches become progressively wetter and they contain more extensive tree canopies. Ohanaula Gulch was green with grass, a few papaya trees (*Carica papaya*), and christmas berry. The small amount of water in Ohanaula Gulch apparently originates from a leak in the irrigation ditch system further inland, or mauka. Moving further eastward, Hanaula Gulch contained large trees; a partial canopy of java plum (*Eugenia cumini*), scattered mango (*Mangifera indica*), and a few large kukui (*Aleurites moluccana*). Many of the gulches had incised stream beds, i.e., Haelua Gulch, suggesting that, although they were dry at the time of the survey, they were subject to periodic stream flow and erosion. In Halava Gulch, the stream bed contained some water and approximately 1000 feet (300m) up from the coast there was an orchard of macadamia nut trees (*Macadamia integrifolia*).

The broad kula land between the gulches is relatively dry, and dominated by introduced grasses with lines of ironwood trees and scattered lantana. Cattle, after their introduction, were allowed to roam the un-used cane areas in between fields and along cliff edges to feed, controlling unwanted vegetation as a result. Today, cattle roam much of the land, maintaining a predominantly grass cover. Along sections of the trail, ironwood trees sometimes line its path, and in other places they dot the landscape. In some places, ironwood trees grow two to three feet from the cliff edge, and they even grow on the cliff face itself. Sugar planters imported and planted these trees in the late 1800's and early 1900's as 'breaks' to protect sugar cane crops from the wind and the harsh salt sprays.

As one walks east along the trail, there is a transition from open grassland to sparse scrubland to a greater tree cover. The changes in vegetation can be partially attributed to a climatic transition zone between the drier leeward side of North Kohala and the wetter windward valleys. The rainfall increases from approximately 50 inches a year at Hawi, to approximately 70 inches a year at Halava Gulch (Armstrong 1973:57). However, more importantly than the climatic gradient from east to west, the gradation in vegetation communities is a result of the differential impact of agricultural clearing, sugar cane cultivation, and cattle grazing. The gulches which have not been extensively cleared and have not been subject to continuous cattle grazing are

more likely to have a more continuous canopy of trees and shrubs. The areas which were subject to sugar cane cultivation and then cattle grazing are more likely to be grasslands.

The impact of human activities upon the vegetation must have been tremendous both before and after European arrival. However, the development of sugar cane cultivation must have had a catastrophic effect upon the pre-existing vegetation communities. For example, the area at the confluence of Wainala and Pali Akamoā Gulches overlooking Keaweeli Bay, was once buried under a glacier of bagasse and rafts of bagasse floated in the bay" (according to a local informant, M. Gomes 1992). The massive amounts of debris indicated that extensive clearing occurred, and activities associated with this clearing must have had a devastating impact upon any archaeological sites along this coast.

### Section 2.4: Soils

The gulches and the slopes they dissect have different soils, reflecting their different geomorphological and pedogenic environments. Most of the gulches contain intermittent streams which are subject to episodic flooding, although they were dry at the time of the survey. The sides of most of the gulches are extremely steep. Given these environments, it is unlikely that deep, stable soil deposits will form either in the base, or on the steep sides, of the gulches. Sato et al. (1973: Sheet 1) have classified the soils in the gulches as "Rough Broken Land", and they basically consist of an agglomeration of deposits eroded within their drainage basin. The slopes in between the gulches have deposits of Kohala silty clay (Sato et al. 1973:31-32) on varying degrees of slope. These silty clays are the product of in situ weathering of basaltic, igneous rocks.

### Section 3: Historic Background

#### Section 3.1: Associations with Kamehameha I

North Kohala District is of note because it was the birthplace of Kamehameha I; he was born just west of Mo'okini Heiau. Prior to the political consolidation of the Hawaiian Islands, wars between different political units, controlled by Hawaiian royalty or ali'i, were frequent. North Kohala was the place where Kamehameha's armies gathered in preparation for war, and was a training ground for young warriors (I'i 1959:15). There are references to Kamehameha I having his own lands at Halawa, Kohala at the time of Kalahepu'u's death (I'i 1959:13).

In one genealogy, Kamehameha is descended from Pili. Genealogies also link Kamehameha to Pa'ao, the high priest who came with Pili from Tahiti about twenty-five generations prior to Kamehameha's birth (Fornander 1969:86-87). Fornander notes that there were three main genealogies, two of which included the Pa'ao genealogy obtain(ed) principally among the priests and chiefs on Hawai'i" (1969:86-87). Pa'ao, arriving first at Puna, later traveled to the district of Kohala where he permanently settled.

Westervelt (1926:65-73) relates a story about the Kamehameha line. This story illustrates the transformational nature of genealogies, and suggests that politics had a major role in determining those genealogies which became the most distinguished. According to Westervelt:

When Kamehameha became king of 'the Rainbow Islands', his royal chant took the supreme place. Other genealogies lost their importance except as they blended in (with) that of the great king. He traced his royal blood to Pili, 'from a foreign land', and through Pili back to Wakea, a Polynesian chief of perhaps the second century; and thence back through a series of hero-gods to Kumu-Honua, 'the first created'.

According to oral histories, Pili landed in Hawai'i during the early part of the eleventh century, bringing Pa'ao with him. Pa'ao was a high priest, and Pili was a high chief. When Pili and Pa'ao moved to Kohala, Pa'ao built the Mo'okini Temple and gave to that land the name "Upolu". Here in Kohala, from the eleventh century to 1819, the high chief and priest (and their descendants, among whom was Kamehameha I) made their home. They represented two great forces of Hawaiian society, the religious and the civil. Pa'ao invested Pili with civil authority, but retained absolute independent control over the minds of the chiefs and the people in religious matters (Westervelt 1926:78; Fornander 1969:36-37).

An interesting variation of the Pa'ao story is found in the Journal of William Ellis (1963:283). This story is found in a description of Ellis' journey from Kapa'au to 'Upolu:

...we passed through the district of Paupeu (Pu'uepa), in which formerly stood a temple called Mokini, celebrated in the historical accounts of the Hawaiians, as built by Paao...A tradition preserved among them states, that in the reign of Kahoukapu, a kahuna (priest) arrived at Hawai'i from a foreign country; that he was a white man, and brought with him two idols or gods, one large, and the other small; that they were adopted by the people, and placed among the Hawaiian gods; that the above-mentioned temple of Mokini was

erected for them, where they were worshipped according to the direction of Paao, who became a powerful man in the nation (Ellis 1963:283).

Fornander (1969) offers an account of what the two idols may have been when, ten years prior, he had visited the Mo'okini Heiau:

The then Circuit Judge of that part of the islands, Mr. Maiapaakai, who was well conversant with the ancient lore of the district, and who accompanied me to the ruins, showed me a secret well or crypt in the south side of the walls, east of the main entrance, several feet deep, but now filled up with stones and boulders of similar nature to those that compose the wall. Having climbed on the top of the wall and removed the stones out of the well, we found at the bottom two maika stones of extraordinary size, which were said to be the particular ulu which Paao brought with him from foreign lands, and with which he amused himself when playing the favorite game of maika. These stones were as large as the crown of a common-sized hat, two inches thick at the edges and a little thicker in the middle. They were of a white, fine-grained hard stone, that may or may not be of Hawaiian quarrying...I have seen many maika stones of from two to three inches diameter, of a whitish straw colour, but never seen or heard of any approaching these of Paao in size or whiteness...their enormous size would apparently forbid their employment for that purpose...there could be no conceivable necessity for hiding them in the bottom of this crypt or well in the wall of the heiau...the legend...says that Paao brought two idols with him from Upolu...yet no tradition that I have heard mentions the names of these two idols or where they were deposited. May not these so-called maika stones of Paao, so carefully hidden in the walls of the heiau be those idols that Paao brought with him? Their presence there is a riddle; and the superstitious fear with which they are treated or spoken of by the elder inhabitants of the district evinces in a measure the consideration in which they were anciently held, that certainly would never have been bestowed on a chief's playthings like actual maika stones (Fornander 1969:36-37).

Kamehameha, according to Westervelt (1926:65), was the most noted person in Hawaiian history to be descended in a straight genealogical line from Pili. Hehahaeva, the Christian, was the last high priest of the Pa'ao line. Both lines were established in Kohala. Their story, jointly, is the story of the founding of the "Kamehameha dynasty", and also resulted in:

...the establishment of an Aha-ali'i--council of chiefs-- or herald's college, which demanded the genealogy and proof of high birth, before admission was granted to the privileges of rank. In meeting this demand genealogies became of great importance and the separation between chiefs and common people became a gulf fixed by custom (Westervelt 1926:77).

Hale-o-Kaili Heiau, which is located on the headland east of Hapu'u Bay, is noted by Thrum to have been the family heiau of Kamehameha I (1907). Indeed, it is in the vicinity of the former village of Halava, which was located on the sea between the bays of Hapu'u and Kapanai'a (Clark 1985:144). Clark (1985:144) goes on to note:

It was at this village that Kamehameha had lived as a child and to which, as a young man, he returned for a time at the advice of his uncle Kalanipou'u.

At a later date (Clark 1985:145):

Kamehameha retreated to Kohala, to the village of Halava, taking with him his wife Kalola, his half-brother, Kaleimamahū, and the war god Kūka'ilimoku, a carved image with a menacing, toothed, open mouth. During this period, Kamehameha busied himself with a variety of projects and leisure activities. One of his most famous projects was the construction of a road at Kapanai'a from the top of the sea cliffs to the pebble beach below. The road's gradual incline much facilitated the transportation of the village's canoes to and from the safety of the storage sheds on the cliff tops. Kamehameha and his companions also chipped out *Konane Papanūi*, checker board like depressions, on flat shore-line boulders, providing places to play the game *konane* near the water's edge.

#### Section 3.2: Historic Accounts

In ancient times North Kohala was a "wet-taro area, but intensively cultivated in dry and forest taro, sweet potatoes, bananas and cane as well" (Handy and Handy 1972:528). Ellis (1963), during his tour around the islands of Hawai'i in the early 1820's, remarked that:

the soil was fertile and vegetation abundant. The coast ... is frequently broken by snug little bays or inlets which are invaluable to the inhabitants, on account of the facilities they afford for fishing.

Ellis further described the "industry of the Hawaiians" who did not depend on fishing in these parts due to the lack of reefs off shore to attract fish. Instead, they "made up the deficiency" by "hav[ing] numerous small lakes and ponds,

frequently artificial, wherein they breed fish of various kinds and in tolerable abundance" (Ellis 1963:286).

The windward kula slopes between Upolu Point and Kapa'au (see Maps 1 and 2), had agricultural areas despite the lack of permanent streams for irrigation. Tomonari-Tuggle (1988:20) mentions that the slopes north of 'Iole were developed into dry fields which continued around to the leeward side. Menzies, moreover, noted that:

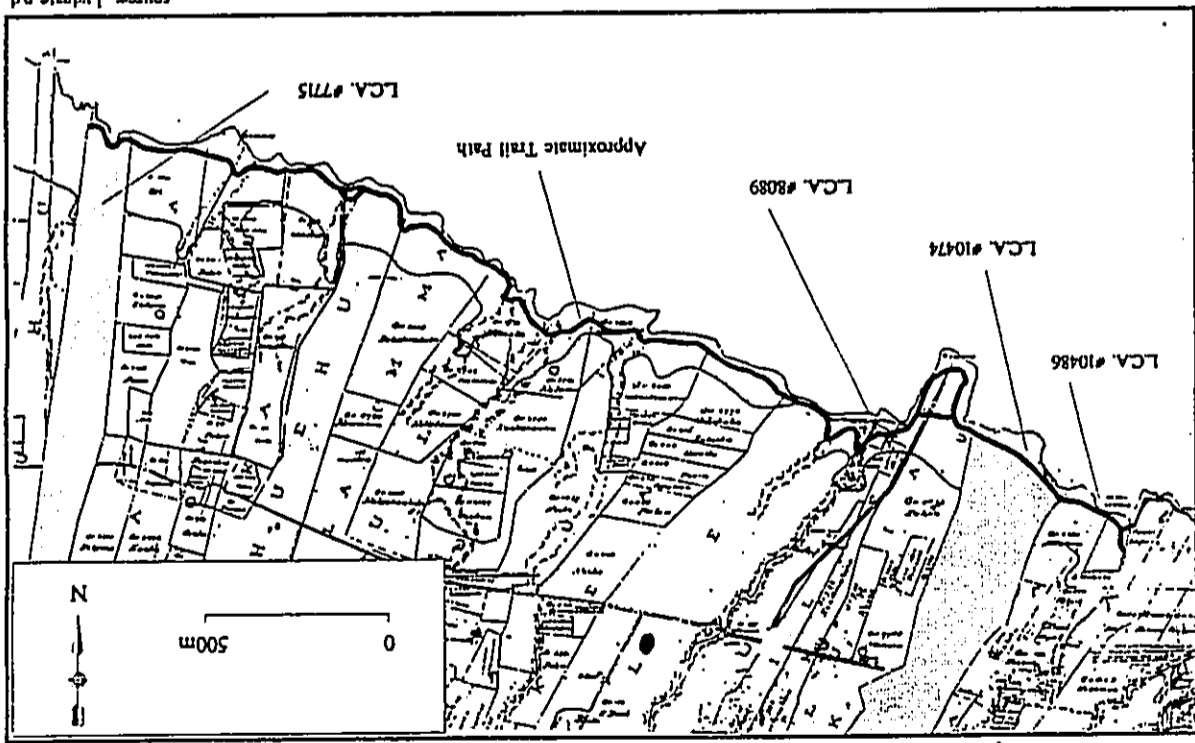
...from the north-west point of the island, the country stretched back for a considerable distance with a very gradual ascent, and is destitute of tree or bushes of any kind. But it bears every appearance of industrious cultivation by the number of small fields into which it is laid out (Menzies 1920:52).

Dryland taro was planted in grasslands, and the ground was prepared for planting by a swidden method (Handy and Handy 1972:531). Initially the grass was burnt and the stubble was allowed to rot in the ground before the cuttings were planted. Terraced areas were located "a mile or more inland, wherever water could be brought from streams or springs" such as "the group of terraces, now under cane below the old Bond homestead, which was formerly cultivated by Kamehameha I" (Handy, and Handy 1972:529).

The windward kula gulches, extending eastward from 'Iole to 'Ako'ako'a Point, are young, narrow, shallow basins, the product of perennial streams. Broad, moderately sloped kula areas separate them. In the small gulches between Niuli'i and Pololu, and to the east of Pololu at Honokane-nui, small terraces were planted in taro wherever sufficient water was available. Wet taro was also grown "in small pockets of land wherever streams, even intermittent ones, flowed down from the mountains in the wet seasons" (Handy and Handy 1972:531).

During the post-contact period, the population of North Kohala declined dramatically. Between 1832 and 1835, according to State Statistician Schmitt (1977:27), the population of North Kohala declined 23%, the biggest reason for the lowered count was the decimation of the Hawaiian people after the introduction of diseases by early visitors. With the population decline came a shift in settlement patterns away from the leeward coast and subsistence fishing, and toward the windward side and the leeward uplands. By the mid-1800's the Great Mahele had re-distributed much of Hawai'i's land, including the coastal areas of North Kohala.

The trail passes through four L.C.A.'s in four different ahupua'a: L.C.A. #7715 in Hāwī Ahupua'a (to Kamehameha); L.C.A. #8089 in Hāwī'ula Ahupua'a (to Holoape); L.C.A. #10474 in Haleiua Ahupua'a (to Mamau); and L.C.A. #10486 in Halawa Ahupua'a (to Naukana) (see Map 4; refer to Appendix A). No



Map 4: Land Commission Awards Located Along this Section of the North Kohala District

source: Lydgate nd.

Information is given in the testimonies in the Native and Foreign Testimonies for Land Commission Awards regarding the uses of L.C.A.'s #7715 and #10474. However, L.C.A. #7715, or Kamehameha's land was claimed by Lot Kapuāiwa, or Kamehameha V, who was a son of Kekuaōa; and L.C.A. #10474 was claimed by Namauu, who was the brother of H. Kekuaōa, a former governor of Oahu. L.C.A. #8089 constituted unfenced, cultivated dryland and a house (refer to Appendix A). L.C.A. #10486 consisted of two apana, or sections, one makai and one mauka. The makai section consisted of 13 wet kalo patches, or 10.1, 3 potato gardens and 5 houses (refer to Appendix A). The mauka section consisted of 8 wetland taro patches and 4 potato patches.

A survey was conducted of all the L.C.A.'s in the ahupua'a through which the trail passes. Halawa Gulch contained a number of awards in which wetland taro cultivation was specified. This is consistent with the field crews' observations that the stream in Halawa Gulch had small volumes of flowing water in it. An evaluation of the former capacity of Halawa Stream to support wetland taro cannot be made on present stream discharges, for disturbances associated with sugar cane cultivation have undoubtedly affected the water levels in this stream and the overlaid flow of water within the drainage basin. Taro was specified for a few patches in other ahupua'a (e.g. L.C.A. #8815 in Honopuē). Handy and Handy (1972:53) note that in the ahupua'a along this coast, wetland taro was cultivated wherever sufficient water was available, although this is not fully reflected in the L.C.A. documentation.

The majority of the claims in other ahupua'a, except Halawa, were for dryland cultivation. Dryland, or kula, plots characteristically consisted of sweet potato, paper mulberry (or mauke), sugar cane, bananas, and often dryland taro. A number of claims from Ka'auhuhu to Kapapa'a Ahupua'a specified potato patches, which refers to the "English" or "Irish" potato which was grown as a cash crop during the 1850's in this area (see below). One claim, L.C.A. #9782 in Kapa'au Ahupua'a (to Lehuanui), was for a pond.

From Ka'auhuhu to Halawa Ahupua'a, house sites were inter-dispersed among the garden plots. The claims were primarily located adjacent to the gulches, often including portions of the gulch base and portions of the slopes which overlook them. These were no doubt placed to take advantage of the intermittent stream flow in the base of the gulches.

After 1850, Tomonari-Tuggle (1988:31) notes that potatoes were being cultivated in Kohala for commercial purposes in the "kula slopes north of nuclear Kohala". Here, as in the coastal areas,

...the predominant form of cultivation was non-irrigated due to the limitations of insufficient surface water. However, with the shifting emphasis toward commercial agriculture, it is possible that the cultivation of Irish potatoes may have been a significant part of the landscape (Tomonari-Tuggle 1988:38).

At about this time large-scale sugar cultivation began to gain importance. In 1863 the Kohala Sugar Co. began operations, with Havi Mill and Plantation Co. following suit within the next two decades. Havi Mill's two subsidiaries, Puakea and Homestead Plantations, along with the Hawaiian Railroad Co., contributed to the growth of the sugar industry. Havi Mill, however, refrained from using the railroad line running from Mahukona to Niuli'i until around 1912, preferring instead to use the landing at Honoipu to transport its product. Remains of both the mills and the railroad, as well as the landing area at Honoipu, are still present today along the North Kohala coastline.

Following the initiation of operations at the Kohala Mill, additional mills opened in quick succession including the Halawa Mill in 1873, the Union Mill in 1874, the Niuli Mill in 1877, and the Havi Mill in 1881 (per. comm. Michael Gomes 1993). Kohala, like the rest of Hawai'i, was gearing up for the increased production of sugar which would result from passage of the Reciprocity Treaty of 1876. Four years after its modest beginnings, Havi Mill became the center of a commercial complex. By 1885, it operated retail stores in both Honomaka'u and Havi. By the turn of the century, when government lands at Ka'auhuhu and Kahei were opened for homesteading, new residential communities were created to the north of Havi, giving the Havi Mill and its subsidiaries the opportunity to serve a new community (Tomonari-Tuggle 1988:53).

Within five years of the passage of the Reciprocity Treaty there was a need for a railroad which would transport sugar to a seaport for shipment to the mainland where it would be refined. King Kalakaua took an interest in this project, and by March 1881 work was started by Chinese brought in specifically for this purpose. Each was paid \$17.00 per month, about two dollars more than was paid to plantation workers under contract. A year later, in March 1882, the Hawaiian Railroad was completed, stretching from Niuli'i, near Poiolu Valley to Mahukona on the leeward side (Lum 1989:41).

After forty years of growth, the Kohala Sugar Co., envisioning consolidation and self-sufficiency in its operations, acquired Havi Mill in 1931 and Halawa Mill in 1937. These moves gave them access to 20,000 acres of land in windward Kohala. They centered their administrative offices in Havi, continued milling at the Hala'ula Mill, and

provided goods and services in the commercial areas of Kapa'au and Havi. Havi, a plantation town, was organized into thirty-five camps of sugarcane workers, most of whom were immigrants. The company supplied them with houses, a swimming pool, tennis courts, a theater, a boarding house, a gymnasium, a volleyball court, and a dispensary, all in an effort to insure that workers would remain in the area (Tomonari-Tuggle 1988:54; pers. comm., M. Moniz 1992).

The decline in the sugar industry following World War II was primarily due to increased mechanization in sugar production. The resultant loss of jobs led to the out-migration of many former mill employees and a corresponding decline in the population. By 1975, Kohala Sugar Co. ceased sugar production. In the last fifteen years, North Kohala has been the site of limited investments in residential development. Havi, still a small commercial center, remains more or less intact, but at present access to beaches is restricted because of fenced areas built to keep cattle from straying.

### Section 3.3: Ethnographic Perspectives

A recent meeting between longtime residents from the Kohala area and Ms. L. Cruz, M.A., revealed numerous stories, both historic and legendary. Few of the stories relate specifically to areas adjacent to the path of the trail, but they do relate to the ahupua'a through which the trail passes. Local residents narrated stories concerning legendary events and plantation life.

The willingness of long-time residents in the area to share their thoughts about cultural and spiritual traditions with an outsider illustrates their concern for keeping their remembrances alive. Their memories of North Kohala, coupled with a few material artifacts and photographs, were shared in order to perpetuate thoughts and experiences that might otherwise be lost. The informants desired that their memories should be passed on in written form, as the concrete preservation of the experience of history.

#### Section 3.3.1: Legendary Stories

Marie, and her husband, Sonny Solomon, related some stories handed down to her from her parents and grandparents:

##### The Kapa'au Blood Stones

A story handed down from Marie Solomon's great-grandmother, who was born in 1818, concerns the "Kapa'au stones". These are the stones on which Kamehameha and other rulers before him are said to have played *konane* (Hawaiian game similar to checkers).



In early times the chiefs are said to have been extremely cruel. It is said that the early chiefs would send their *kauiwa* (slaves) to dig up human bones from which fishhooks would be made. Sometimes the chiefs would have their slaves dig up freshly buried corpses and, using the flesh of the bodies, would instruct them to make *paly* (a kind of fish bait) to be used in the hunting of sharks. Chiefs would challenge each other in the game of *konane*, often times staking their lives on the outcome. The loser died immediately. Because so much blood was shed on these stones (which were actually boulders), they came to be called "blood stones".

By the time of Kamehameha I, the stakes in *konane* games had lessened considerably; chiefs played for fish, or sometimes the entire catch of a fishing fleet for the day. Other times they played for someone's wife. During the plantation period the stones were removed from Kapanai, near Kapa'au, to other areas. Some of them were taken to where Kamehameha I's statue now stands at Kapa'au. Marie Solomon's mother, when notified of the stones removal, warned of dire consequences. It is possible that her warnings were well-founded. The person responsible for moving the stones mysteriously died a short time later while on a hunting trip. The Kohala Sugar Co., which authorized the removal of the stones, went out of business soon afterwards.

#### Heleka'i Stream

Near to Kauhola Lighthouse is Kauhola Stream. A story was told of the "heleka'i", the running water, or more literally "the moving stream". At certain times the ocean at Keawaeli (a famous surfing spot where tournaments were held even in Kamehameha's day) would come upstream, even when the level of the ocean water appeared to be normal. The water would travel upstream, all the way inland, without any noticeable change in the shore line water level. At such times Puhī (an *'aumakua* or family/personal god) was said to be moving along the stream.

One day Puhī came up this stream where a child was playing, and took the child. The family tried to get the child back, but to no avail. Finally they brought a man from Hāuli to help them. The man made a rope of *olona* (*Touchardia latifolia*) to catch Puhī. The man waited by the stream, and when Puhī came upstream again, the man tossed his rope and caught Puhī. Puhī struggled until the man yelled at him to stop. An agreement was made between the man and Puhī, Puhī would return the child and the man would set him free. The exchange was made.

#### Kamehameha, "The Killer of Chiefs"

When Kamehameha's mother was pregnant with him, she had a craving for human eyeballs. She was given, instead, shark eyeballs, and after she had eaten them, was approached by a

*kaula* (prophet). The prophet told her that, because she had eaten shark eyeballs, she would have a son who would be a rebel and a "killer of chiefs".

As time passed, a son was born and he was called Paiea. Later he was given the name Kamehameha because he lived in loneliness. Kamehameha had a desire to become the ruling chief, but because he was not the first born of the oldest brother, he lacked the *mana* (spiritual power or strength) needed to become successful. Kamehameha decided then that in order to succeed he would have to overcome his competitors. So he eliminated them, one by one, including Kalanipū'u's son, Keoua, who was the rightful heir. Finally all of his competitors were dead. He went to meet in council with Kalola (apparently not Kalola, the wife of Kamehameha) and other ruling chiefs. She was the highest in the land (*alii nui*) and had the most *mana*. His place was outside of the meeting house with others of his status, for he had no birthright. However, since he had overcome his competitors and was the only ruler in his area, he had to be allowed in. His entrance into the meeting house defiled the place, and he "watered" the *mana* of those inside, making it weak and dilute. He placed himself opposite Kalola and requested that she give him her daughter for a wife. Kalola agreed, knowing she had little choice, and gave him both her daughter and her granddaughter. Kamehameha took them as his wives and from these two women are descended the Kamehameha line, all of whom were infused with *mana* through the daughters of Kalola.

#### Section 3.3.2: Plantation Times

Nobu Sugiyama, eldest of the group (84 years), described Hāuli Town in the 1930's, complete with names and locations of former businesses. He recalled no less than 34 individual stores and their owners. Among these were: Fukuda Store, Takano Garage (now a washerette), Tradewind Bar (owned by Domingo), Kihara Barbers at the corner of the garage, stores owned by Yamamoto, Castillo, Fujitani, Miura, Achong, Yabuta, Morikawa, Pasquale, Dilag, Luke, Hashimoto, and numerous others, mostly of Japanese ethnicity.

Sixty years ago Mr. Sugiyama (Nobu) and his brother owned and operated several movie theaters in the North Kohala area. He recalled that in the early days silent movies were shown and young men and women of all ages would come and be entertained, not only by the films, but also by the people coming with their instruments to sing and play music as accompaniment to the film which was being shown on the screen. Youngsters would stay until the early hours of the morning, an accepted practice in a town as small and close-knit as Hāuli.

Millie Moniz offered some perspectives on plantation to camp life. In the 1930's camps were segregated according to

ethnicity. There were Japanese, Chinese, Portuguese, Puerto Rican, Filipino, and haole camps. There was also one black person there, a plantation laborer, who lived in a Filipino camp with other single Filipino men. There were "family" camps and "singles" camps. A thriving service industry grew up around the singles camp, with young women providing services such as doing laundry, sewing tailor made clothes out of "Indian head blue or green", and preparing okazu (lunches) for single men to take into the fields. According to Nobu, "we look for the best okazu, otherwise we no like go work."

At this point, Marie Solomon asked "who made okolehao? People used to say the Okinawans made the best okolehao, and delivered it on horseback". Everyone agreed. Okolehao was a liquor distilled from ti root. Later the term was applied to gin made from rice or pineapple juice (Pukui and Elbert 1964:259). Nobu commented on the ti root as the basic ingredient. Millie, digressing slightly, related a more traditional note on the alcoholic qualities of ti root:

...ti roots were used in the imu and placed on the pig. After the pig was cooked and placed on platters, the ti root was split into smaller pieces and served with the meal. It was sweet and alcoholic, and an acceptable thing to serve.

According to Nobu, "the man who made okolehao (would) hide it in the cane field and tie a ribbon around a stalk of cane to mark where the bottle was". The going rate in those days was \$1.25 per gallon, but the containers were all five-gallon sized. A prospective buyer would look for the marker, pick up a bottle and later drop off the correct amount of money at a designated place.

One of the attractions for singles and young people in this area was the "Salvation Hall", actually a socializing arm of the Salvation Army. The halls were where young people could get better acquainted, and they served as centers of social activity. Down Camp was also equipped with theaters, stores, tennis courts, and other recreational facilities. Millie noted the difference in the haole camp, where the plantation bosses and higher-ups lived, and in the other camps where plantation workers lived. Haole camp was much more well-appointed and well-equipped.

Millie described how "in our camp the Teshima family operated the furu, or Japanese hot bath. There was a separate building for the bath house, wash house, [and] out house. The whole building had four stalls with toilet and wash tub. The Teshima family operated the furu for the single guys. They would draw the water, light the fire, heat it up. And all the Filipino guys would come and wash up. They paid a quarter to have them heat the water, a quarter

for the whole week. The singles had no families so they had to have someone help them".

In a discussion of nearby Kapa'au, where the only post office was located, Nobu recalled the names of several merchants operating businesses on the main street: Yokoyama the tailor, store owners Lee Chang, Zane, Quinn, Harada, Nambu, and Sakamoto. Sakamoto Store sold "groceries, clothes and coffins, and was the biggest dealer in rice, 300 bags each order, as compared to 20 bags for Kohala Store and three bags for Higa Store". Back then, just prior to World War II, the population was quite extensive, "in the thousands" according to Nobu. There were numerous single men and, in Kapa'au, aside from the social halls there were "taxi dance" halls and the "Mamei-ya" house. At the "taxi-dance" men paid ten cents per dance to dance with women who were brought to the dance hall from other areas. It was a way for women to earn extra money and at the same time it obviously provided single men an opportunity to meet and fraternize with young women. The "Mamei-ya" house, the designation of which required a prolonged explanation from Nobu as to its significance, was a house of prostitution located in the Palace Hotel. Men, mostly plantation workers, paid two dollars to patronize the establishment where business was brisk.

At the time war was declared, in 1941, Millie was 13 years old. She remembered the Marines stationed nearby who lived in Malibu Camp, and the Jodo Mission where the Signal Corps was barracksed up until the end of the war. Rationing became a part of everyday life, affecting gasoline, liquor and rice. Residents grew victory gardens. For the years of the war a service industry, similar to that catering to single plantation workers in earlier times, formed around military men. Women were hired to do laundry, washing the uniforms of Marines in nearby rivers and streams, and ironing them with old-fashioned coal-heated irons.

A question arose as to how the war affected Kohala: "Did the Japanese immigrants suffer adverse affects because of the declaration of war between Japan and the U.S.?" At the outbreak of World War II, there was a large Japanese population in the Kohala area which had been imported as laborers for the sugar industry. Nobu recalled that there were only three families, out of the many who lived in Kohala, who were singled out: the Makahara's, the Takara's and the Kirita's. These families operated stores selling imported Japanese goods such as Japanese medicines, dyes, and so on. These families were sent to a detention camp in Missouri. Nobu believed that few, if any, of the Japanese families had any great interest in the war because they were too busy just trying to make a living. An interesting thing that did occur, however, was that the Japanese men who had married Hawaiian women changed their names after the war

started, preferring to use their wives' surnames instead, for example, Tamanaha became Solomon.

#### Section 4: Previous Archaeological Work

The North Kohala coastal area around Hāwī may be a possible area of archaeological remains" (Tomonari-Tuggle 1988:8). According to Tomonari-Tuggle (1988:8), "sugar cultivation and commercial development have made identification of possible agricultural field systems a difficult task". These activities have probably destroyed the majority of sites. Tomonari-Tuggle describes eight sites in North Kohala archaeologically, all of them are historic. Among those described are:

**Site 7100:** The Bond Complex was the center of missionary activities in the 1800's. It lies in the ahupua'a of 'Iole, between Kapa'au and the Kohala Sugar Mill. The complex consists of a church, a seminary for women, a cemetery, and the home of Elias Bond (Tomonari-Tuggle 1988:53).

**Site 7105:** Kohala Sugar District, including seven sugar mill sites, plantation houses, and offices of the companies. The Hāwī Mill's stack stands behind the present Kohala Corporation offices in Hāwī Town (Tomonari-Tuggle 1988:53).

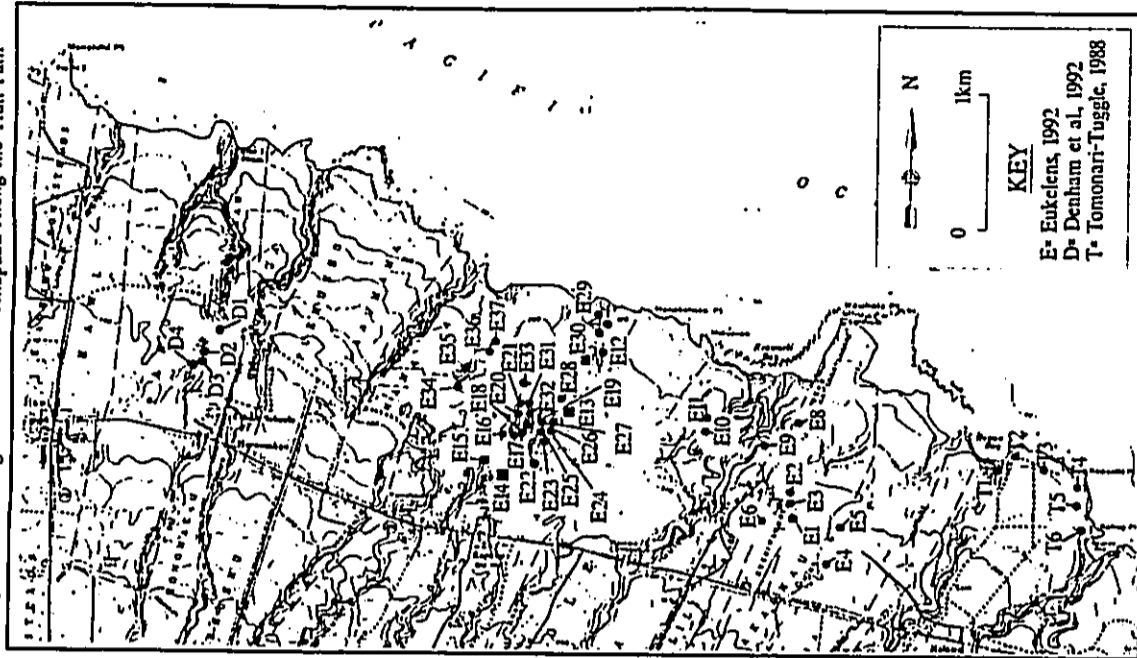
**Site 7139:** Hāwī Commercial District, includes the commercial center with its rows of wooden, frontier style buildings with false fronts (Tomonari-Tuggle 1988:54).

There were also a number of camps, which are considered historically significant because they had served as a source of identity to the sugar workers. In the early period the camps were ethnically segregated, providing a sense of cultural identity among their residents (Tomonari-Tuggle 1988:54).

Only a limited number of archaeological surveys have been conducted in the ahupua'a through which the trail passes. The researches that have been undertaken are briefly discussed, from west to east. ACH undertook a surface survey of portions of Hāwī, Pahoa, and Honomakau Ahupua'a (Denham et al. 1993). Four sites were identified: a rock with petroglyphs and a possible birthing stone with petroglyphs (Site #17781); a possible historic cemetery (Site #17782); two probable historic burial platforms (Site #17783); and a mound, depressions, and low rock alignment (Site #17784) (see Map 5 and Table 1). The area which was surveyed during these investigations, was approximately 1000m MAUKA of the present trail.

IARII has recently conducted an archaeological survey between Hanaula and Hāwī Gulches (Erkelens 1992) (see Map 5

Map 5: Archaeological Sites in the Ahupua'a Along the Trail Path



and Table 1). They identified a number of sites, primarily in the gulches. The exact age of these sites has not been determined for only the results of the surface survey have been made available to ACH. A number of features associated with the historic uses of this area were found, as were some seemingly prehistoric sites. Of note were possible burials, a historic cemetery, terraces, and three platforms. Continued investigations may enable the age and function of these features to be determined.

Moving eastwards, an archaeological reconnaissance survey was conducted over a 72 acre site at Kapa'au, North Kohala, Hawaii, at TMK 5-3-06:18, 19 and 20 (Barrera 1984). The subject property was close to, or on, Kalaniopu'u's gaming area. A gaming field was selected at Hinakahua at Kapa'au, by Kalaniopu'u soon after Cook's departure. Barrera's 3 hour survey of the subject property found no evidence of prehistoric or historic utilization. Barrera did not identify any significant historic sites. It is possible that Site 7, a possible heiau identified during Erkelens survey, was located on the property purportedly surveyed by Barrera (pers. comm. Erkelens 1992).

Further east along this coast, a number of heiau have been documented, two of which would have been located close to the path of the coastal trail.

First, there was a heiau named Muleiula which Thrum describes thus:

On the adjoining land, Halelua, eastward of the lighthouse, is said to have been a small heiau whose walls were removed early in the sixties when the Kohala plantation was started. This was Muleiula, traditionally credited to Hua, the infamous king of Hana, Maui, when he raided Hawaii. [Fornander mentions that in Kauni-a-kama's time this heiau of Muleiula belonged to a chief named Kamakohua, and it appears again in a list of several as consecrated by Lonoikamakahiki in his tour of the island.-Ed.] (Thrum 1907:64).

Thrum notes that this heiau was destroyed in the early 1860's (1907:42). Stokes also describes this heiau:

Heiau of Mulei'ula, land of 'Apua'kohau, Kohala. This heiau was on the list given me by Mr. Thrum. No information was gathered in Kohala, but Mr. Thrum's published account states that it is eastwards of the lighthouse (1907a:42). This would place it a few feet northeast of Kauhola benchmark (Stokes 1992:173).

The historian Kamakau mentions the existence of this heiau, and also provides some information which sheds some light on

Fornander's comments regarding the chief Kamakauhua: "On Hawaii are Ho'okini, Mulei'ula, Hapu'u, and Kanua in Kohala" (Kamakau 1976:145). There is some disagreement between Thrum and Kamakau regarding whether Kamakauhua was a Hawaii or Maui chief. Contrary to Thrum, Kamakau states:

The chiefs of Hawai'i lived in a state of warfare, and several chiefs were killed by the maka'ainana because of the burdens they laid upon them and the plundering of their possessions. Those of Ka'u killed their ali'i ai moku Ko'ihala, Kohaikalani, and Hala'ea. Those of Kona killed Ke-li'i-o-kaloa, the son of 'Umi; those of Kohala killed the chiefs Kama'i'ole and Ka-maka-o-hua (Kamakau 1991:75-76).

Beckwith's recounting of the legend of Haumea, patroness of childbirth, may offer another explanation for the function of Muleiula heiau:

Muleiula, daughter of Olopana, is about to give birth. Preparations are made for a Caesarian operation. Haumea appears and hears the lamentations. She says, "In our land babies are born naturally without cutting open the mother. The name of the remedy is Ka-lau-o-ke-kahuli and its blessing is Kani-ka-wi. It is a tree to be fondled and its blossom is beautiful." The girl ate of it according to instructions. When the child was coming Muleiula felt it being forced out by the plant. Haumea pressed herself against the thigh. After the baby was born, through Haumea's power the tree rose and flew and landed at Pu'ukumu, Waihee, on Maui, and there it grew (Beckwith 1976:283-284).

Thus it is possible that the heiau named Muleiula was associated with childbirth.

Second, Thrum notes a heiau called Ohau in the ahupua'a of Halelua:

Moving again to the westward, about one third of a mile into the next bay [Halelua Gulch] was located the site of the heiau of Ohau, reported as having been about 40 or 40 x 50 feet, its walls 12 to 14 feet in height, some 14 feet thick at the base and about six feet at the top. Until within five years this heiau was in a good state of preservation, and the removal of so manifest a heiau, by E. E. Olding, for the sake of using the bit of ground it covered, for cane, may be considered a bit of greedy vandalism. This heiau stood on a low swell of ground near the mouth of a ravine, about 350 feet from the shore. The stones which comprised this structure may now be observed in a massive wall ten feet thick, about 140 feet long, and 12 to 14 feet high, built across the bottom of the ravine. It is said that during their

Table 1: Archaeological Sites Located in the Ahupua'a Through Which the Trail Passes.

The sites listed in this table are depicted on Map 5: after Denham et al. 1992,

- D1 State Site #50-80-02-17781:  
17781:A boulder with petroglyphs  
17781:B possible birthing stone with petroglyphs
- D2 State Site #50-80-02-17782: Possible Cemetery  
17782:A low rock alignment - boundary marker  
17782:B low rock mound - possible burial  
17782:C low rock mound - possible burial  
17782:D low rock mound - possible burial  
17782:E low rock mound - possible burial  
17782:F low rock mound - possible burial  
17782:G low rock mound - possible burial  
17782:H low rock alignment - boundary marker
- D3 State Site #50-80-02-17783: Probable Human Burials  
17783:A low platform - probable burial  
17783:B low platform - probable burial
- D4 State Site #50-80-02-17784:  
17784:A low stacked mound  
17784:B shallow depressions  
17784:C low rock alignment

after Erkelens 1992,

- E1 Boulder pile - possible burial  
E2 Historical cemetery  
E3 Terrace and boulder alignments  
E4 Cement foundation and boulder alignment  
E5 Terraces and mounds  
E6 Tin roof structure  
E7\* Possible heiau (\* not depicted on Map 5)  
E8 Plantation camp foundation  
E9 Brick and concrete foundation with trash  
E10 Possible boulder alignments  
E11 Possible burials  
E12 Possible platform and mound  
E13 Rock scatter - possible burial  
E14 Boulder pile  
E15 Historical cemetery  
E16 Possible terrace alignments  
E17 Mounds and alignment

Table 1 (cont.)

- E18 Boulder pile  
E19 Platform  
E20 Possible terrace  
E21 Mounds  
E22 Wall and platform  
E23 Possible boulder alignment and pile  
E24 Boulder pile  
E25 Possible terrace  
E26 Mound  
E27 Platform and walls  
E28 Rock pile  
E29 Wall  
E30 Historic artifact scatter  
E31 Modified stream crossing  
E32 Rock pile  
E33 Possible burial  
E34 Terrace wall  
E35 Boulder alignment and rock pile  
E36 Rock pile  
E37 Rock pile
- after Tomonari-Tuggle 1988,  
T1 Terrace complex in Halawa Gulch  
T2 Hale o Kaili Heiau  
T3 Boulder alignment  
T4 Cultural deposit in cliff face  
T5 Stone foundation  
T6 Boulder area

removal numbers of human bones were unearthed, some of which were sacked and cast in the sea, and others reentered" (Thrum 1907:64).

Interestingly, Stokes describes a heiau for this location which he calls "O'ahu":

Heiau of O'ahu, land of Halelua, Kohala. Kauhola benchmark bears 144 degrees, 41', 4285.5 feet. The heiau has been entirely destroyed, and the site is now planted in cane. With the stones of the heiau, a wall 7 feet high and 4 feet thick was built across the valley" (Stokes 1907:172-173).

Thrum also notes that Ohau was meant to have been of Luakini class (Thrum 1907:42). Human sacrifice was practiced at this type of heiau. It is probable that this heiau was actually named Ohau, instead of Oahu, for the neighboring ahupua'a to the west is called Apuaka'ohau, and the upper reaches of Halelua Gulch, in which the heiau is located, runs through Apuaka'ohau Ahupua'a.

Inland from the trail corridor, in Wainaiia Gulch, Palapalaho'omau Heiau was located (Thrum 1907). At the time of Thrum's inventory, this heiau was in ruins and overgrown with lantana. This heiau has been destroyed. Further east, from Halelua Gulch to Neue Bay, is the area reconnaissance surveyed by Tomonari-Tuggle (1988:37-46) during her evaluation of the cultural resources of this area. Tomonari-Tuggle re-identified a number of heiau noted by Thrum (Kapalama Heiau and Hale-o-Kaili Heiau, in particular). In Halelua Gulch, Tomonari-Tuggle refers to a terrace complex which is inferred to have been used for the irrigated cultivation of taro. At present, Dr. R. Cordy of the State Historic Preservation Division is conducting archaeological investigations at these terraces. Stokes makes reference to Hale-o-Kaili Heiau and Kapalama Heiau (Stokes 1907:179-180). Hale-o-Kaili Heiau is noted by Thrum to have been the family heiau of Kamehameha I (refer to Section 3.1). There are also a number of references to these archaeological sites in John I'i's "Fragments of Hawaiian History". The names of many places in the vicinity of the trail have a number of interesting literal translations (refer to Appendix B).

#### Section 5: Summary of Land Use Patterns

According to Griffin, et al., (1971) "the earliest chronometric date for Kohala is AD 1300 from a rich midden deposit at Lapakahi" (Griffin, Riley, Rosendahl and Tuggle 1971). They hypothesize that population size increased as agricultural productivity became more intensive between AD 1300-1500. On the leeward coast, farming development "in the upland areas resulted in extensive dry field systems,

indicating a relatively large population" (Emory 1951; Schilt and Sinoto 1980). The shift from a subsistence reliance upon marine resources toward agricultural production, may have resulted in a concomitant shift in socio-political structures. A focus on interactions that were coastal, resulted in political alignments along a Mauka-Makai axis, perhaps heralding the beginning of the ahupua'a system.

By AD 1500, the Great Wall Complex, at Koaie south of Mahukona was constructed, perhaps suggesting the existence of a stratified socio-political hierarchy. This hierarchy may have been instrumental in the conscription of labor for the building of the wall. Griffin et al. have suggested that:

...the complex symbolized growing class differentiation between chiefs and commoners, while at the same time insuring the consolidation of the ahupua'a as a socio-political unit (Griffin et al. 1971:108).

Tuggle and Tomonari-Tuggle (1980) suggest that intensive cultivation occurred in the windward valleys in the late 16th century. Agricultural development is hypothesized to have been rapid, although limited. They propose a progression from swidden cultivation to dryland field agriculture, to irrigated methods of cultivation.

In the four centuries prior to Cook's arrival, small dispersed settlements enlarged in size and population as agricultural activity increased. At this time, agriculture and settlements expanded into drier, and more environmentally marginal areas such as the eastern ahupua'a traversed by the trail.

In the first few years of European contact, great social, demographic and economic changes occurred throughout the Hawaiian Islands. The changes were partly due to the interactions with an alien way of life, and partly due to the introduction of diseases to which Hawaiians had no immunity. The indigenous Hawaiian population was decimated by introduced diseases, which contributed to severe dislocations in every aspect of Hawaiian life. Thus it is probable, and almost certain, that prior to European contact, the population was much greater, and socio-economic activities were much more extensive and intensive than historical accounts would suggest.

At the time of the Great Mahele, houses were inter-dispersed among fields in the ahupua'a along this section of the coast. Most of the houses and agricultural plots were located either in, or adjacent to, the gulches. The broad slopes in between gulches were primarily given as grants, although two entire ahupua'a, Havi and Halelua were awarded as L.C.A.'s to prestigious individuals. Wetland taro

cultivation occurred in Halawa Gulch at the eastern end of the trail.

After 1863, sugar became the primary economic resource in North Kohala, with other commercial crops and ranching being ancillary activities. Subsistence farming was still practiced, with irrigated taro in the gulches and forest taro in the uplands. Other resources were still available in mountain areas, such as pigs, bananas, and ferns. The emphasis on commercial land use continued after the passage of the Mahele and the shift from land tenure rights to private ownership (Tomonari-Tuggle 1988:49).

At present, North Kohala is in yet another period of transition, from a

...frontier community characterized by diversity in population, settlements, and commercial ventures, to a 20th century established and thriving community (Tomonari-Tuggle 1988:51).

The area is a focus of old traditions and new economies, a place where new developments are rising on the horizon.

#### Section 6: Expected Archaeological Finds

After a consideration of the historic, archaeological, and land use pattern reconstructions for this area, an evaluation can be made of the expected archaeological finds. The most valuable information to guide the archaeological investigations are the historical accounts and L.C.A. records of the area. However, due to the decimation of the Hawaiian population and the Hawaiian way of life after European contact, it is likely that much more extensive activities occurred prior to European contact than is indicated in these historical records.

According to the L.C.A. information for this area, houses were dispersed among the agricultural plots along this coast, primarily being located in the gulches. It was thus probable that habitation and agricultural features would be located in these areas. It was also probable that similar features, relating to earlier occupations, could be located on the intervening slopes. Human burials were considered likely to be present, given that a considerable Hawaiian population probably used to live in this area. In the absence of easily excavatable sand deposits, it was thought probable that burials would be located at the habitation sites or would lie beneath low stacked mounds or platforms. Given that probable historic cemeteries have been located in North Kohala, it was possible that burials marked by mounds with headstones would also be encountered (Denham *et al.* 1993, Erkelens 1992).

The largest determinants for the presence or absence of archaeological sites in a given area, are the land uses since aboriginal abandonment. It is highly likely that Hawaiians re-used sites and the materials used in the construction of a particular site after its abandonment. These activities make the interpretation of any site problematic. However, along this section of the North Kohala coast, the most significant determinant for the location of existing archaeological sites is the sugar cane industry. The initial clearing, dumping, and plowing associated with the cultivation of sugar cane had an enormous impact upon the pre-existing landscape. Following the introduction of mechanized production methods, before the land is planted with cane, much of it was bulldozed. This bulldozing would have destroyed any existing structures or deposits in the cleared areas, and severely disturbed the areas onto which the cleared materials were dumped. In this area of North Kohala the effects of sugar cane were magnified, for bulldozers were eventually used for harvesting as well (Erkelens 1992).

After the findings of Denham *et al.* (1993) and Erkelens (1992), it was expected that any sites would most likely be located in the gulches rather than on the broad slopes in between the gulches. The gentler slopes in between the gulches were more likely to have been used for sugar cane cultivation. The plowing for sugar cane cultivation often disturbed the soil to a depth of at least 50cm, destroying any intact cultural deposits to this depth. The evidence from the previous two surveys in this area, suggested that some of the gulch slopes were cultivated and that those which were not cultivated were heavily disturbed by dumping or other activities associated with sugar cane.

In summary, it was thought that any sites or features associated with pre-European contact or historic occupation, would most likely be located in the gulches, either in their bases or along their sides. It was thought unlikely that any undisturbed, significant historic sites would be located on the gentler slopes, for these areas would have been planted with sugar cane. It was possible that sites could still be present on the steeper gulch slopes or along the gulch floors, although these areas may have been extensively disturbed by activities associated with sugar cane cultivation. The most likely sites thought to be encountered during this survey were those associated with habitation and agriculture, although it was possible that human burials could be encountered.

#### Section 7: Methodology

The surface survey was undertaken over three distinct periods by: Ms. MA. Maigret, B.A., and Mr. M. O'Shaughnessy,

B.A., between March 5th and 11th, 1992; Ms. MA. Margret and Mr. T. Denham, on June 24th and 26th, 1992; and Ms. MA. Margret on September 2nd, 1992. The Principal Investigator for this project was Mr. J. Kennedy, M.A.. The sequential periods of fieldwork became necessary as Chalon International of Hawaii, Inc., proposed alternative trail routes. Both ACH and Chalon have worked with the State Historic Preservation Division (SHPD) in order to ensure that there will be no adverse effect upon archaeological sites as a result of the trail route.

The area surveyed was 42.5ft on either side of the pathway, which itself was 15ft wide. The majority of the trail corridor was surveyed by a two member archaeological crew, who used a 1:2400 topographic map for orientation. Through the sections of the trail which traversed open, closely cropped, grassland, the survey crew walked 40ft apart, 20ft on either side of the trail's mid-point. Where dense stands of vegetation, boulder scatters or low earthen mounds were encountered, they were intensively examined by both members of the survey crew. A portion of the pedestrian trail through Halawa Gulch was surveyed by one field archaeologist with the assistance of Chalon International of Hawaii, Inc., personnel. In the event that any structures of possible historic significance were found, their dimensions were noted, they were described, and accurately located on a detailed topographic map of the trail using tape and compass.

Boulder scatters and low earthen mounds obviously associated with mechanical clearing were not considered significant. These mechanically moved deposits were not given temporary site numbers. The field roads constructed since sugar cane cultivation ceased, were not considered significant for they dated to the last 50 years. The railroad beds, which portions of the trail followed, were not considered significant for they had been cleared of all structural features relating to their former use, e.g., tracks, and were now used as road beds. Subsurface testing would only be considered necessary in order to determine the age and function of significant features which were to be adversely affected by the construction and use of the trail. Testing was not considered necessary in L.C.A.'s through which the trail passes, for the construction and use of the trail will not disturb any subsurface deposits. Much of the trail passes over areas disturbed during sugar cane cultivation. In some sections it follows a pre-existing road bed. These areas would be unsuitable for testing.

In the event that it was not possible to avoid all historic sites, it was hoped that any significant sites, if they were in excellent condition, could be incorporated into an interpretive trail.

#### Section 8: Archaeological Findings

The description of possible sites along the path of the trail begins from its western end, just west of Lipoa Gulch. The following presentation gives a brief description of each section of the trail, and details any possibly significant archaeological sites which were encountered, heading from west to east (see Maps 3a and 3b).

Walking along the combined trail, one descends into, and traverses the mouth of, Lipoa Gulch. The combined trail, on the western side of Lipoa Gulch follows a cutting which is an existing road bed. According to a 1932 Kohala Sugar Co., Hawi Section Map, the railroad associated with the sugar industry in this area followed a path further inland, or mauka, of the combined trail (see Map 6). Scattered boulders litter the area on either side of the road cutting. No running water is present in the base of Lipoa Gulch.

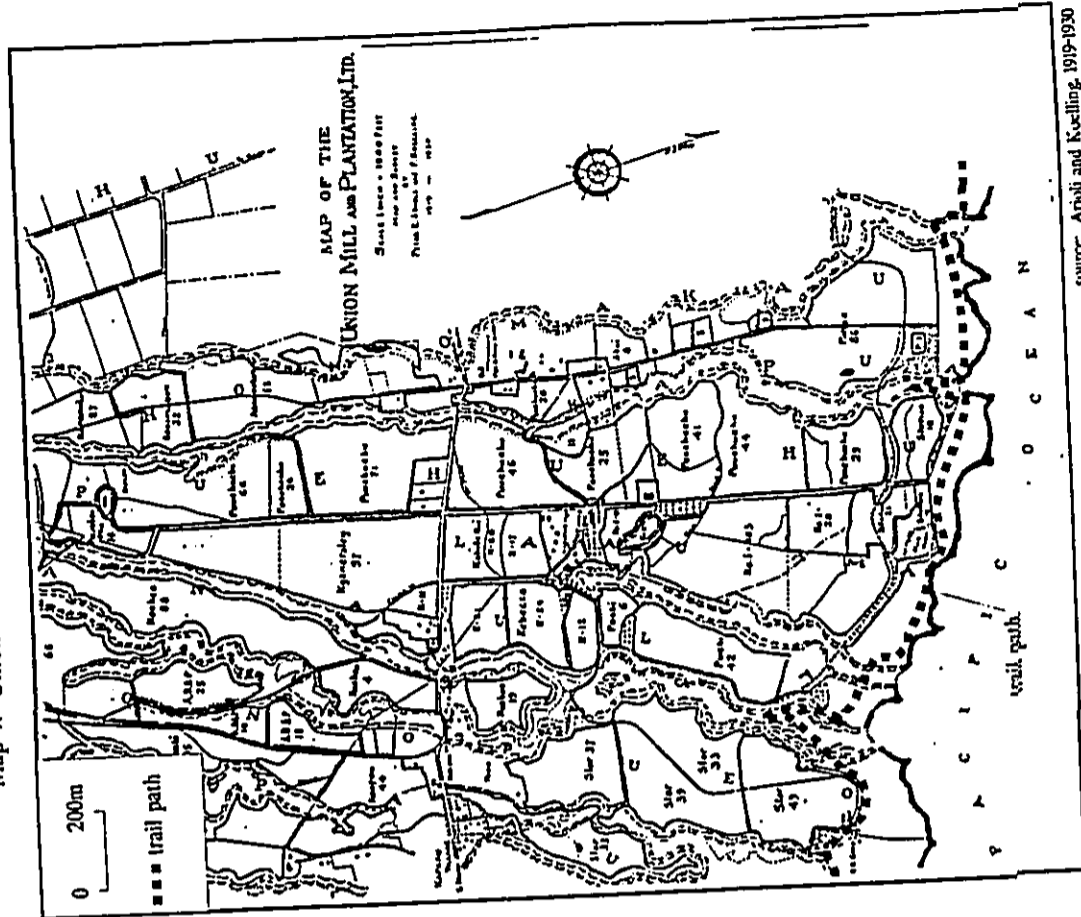
The higher ground in between Lipoa and Waipiele Gulches consists of gently sloping grasslands. Double and treble rows of ironwood trees run approximately 150ft (45m) back from, and parallel to, the cliff edge. The combined trail runs mauka of these trees across an open area of grassland. Beneath these trees, there are intermittent, unstructured aggregations of boulders. These boulders have been cleared from the surrounding grasslands, either when the area was planted with sugar cane, or since cattle grazing has occurred in the area. A 1932 Kohala Sugar Co. map shows that the trail runs mauka of the former sugar cane field (see Map 6).

The combined trail continues into the steeply sided Waipiele Gulch. The eastern side of Waipiele Gulch is covered in ironwood, whereas the western side is covered in low grass. After exiting Waipiele Gulch, the combined trail continues across open grassland lined with ironwood trees. The grassland is grazed by cattle. In Kapua Gulch the combined trail splits into multi-use and pedestrian paths. Both these paths were surveyed.

In between Kapua and Ohanaula Gulches the combined trail follows a pre-existing field road. On exiting Kapua Gulch, a historic dump site (Site T-1) is located mauka of the trail (see Map 3a). This dump site is located on the bluff overlooking the ocean and Kapua Gulch. The dump consists of a sparse scatter of historic trash, such as engine blocks, kitchenware, bottles, rusted machinery parts, parts of railroad equipment, plastics, and old shoes. The material is scattered over an area measuring approximately 200ft (60m) along the cliff edge and approximately 70ft (20m) wide. This site was a historic, Union Mill dump. A map of Union Mill and Plantation, Ltd. shows Station 18 located inland from the dump site (see Map 7). The nature of the dumped material and its proximity to plantation operations leads to the

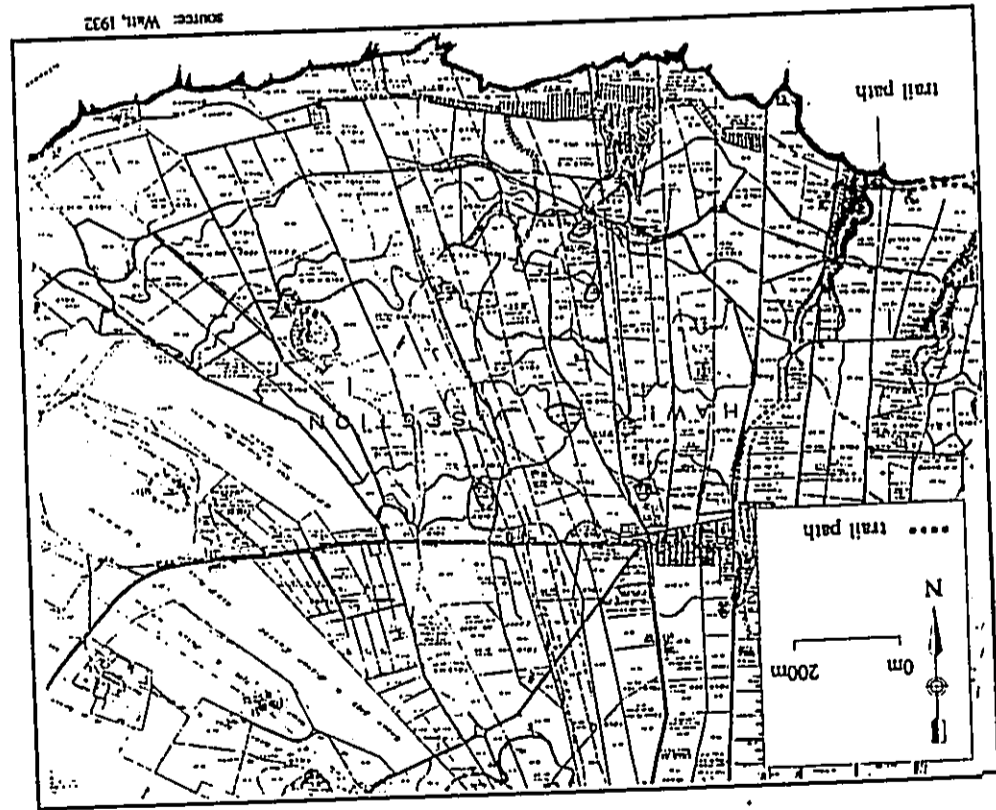


Map 7: Union Mill and Plantation, Ltd., Field Map



source: Arioli and Keating, 1919-1930

Map 6: Kohala Sugar Company Field Map



source: Wall, 1932

conclusion that it is an indirect product of the sugar cane industry. The combined trail passes approximately 100ft (30m) inland of this dump site. The surface topography in the vicinity of the trail just east of Kapa'au Gulch is dissected by furrows. These furrows are almost certainly the result of plowing which occurred during sugar cane cultivation.

T-1), a second historic dump (Site T-2) extends for approximately one hundred feet along the cliff edge. This dump only extends about 40ft (12m) inland (see Map 3a). Historic trash is visible protruding from the upper few feet of the cliff edge. This dump consists of scattered metal spikes, concrete blocks, and iron safes. A short, cemented wall is located at this dump site. Similar to the dump further west, this dump is also historic and probably derived from activities associated with the sugar cane industry. The combined trail passes through the MAUKA portion of this dump.

Continuing east along the existing road bed, a number of boulder scatters are distributed both MAUKA and MAKAI of the combined trail as it passes through an area of ironwood trees. The boulder scatters are unstructured, and appear to be the result of agricultural clearing further inland. These boulders are located MAKAI of a grass field which has few, if any, boulders located in it. Many of these boulders have scrape marks along their sides indicating that they had been mechanically moved. The grass field is grazed by cattle. Similar to the boulder scatters which are located MAKAI of the cleared fields, a number of poorly defined, low earthen mounds are located immediately MAKAI of this field and the existing road bed. These earthen mounds are mechanical, bulldozer shoves which were necessary to clear the field. Where these mounds occur at the cliff edge, historic debris is visible within them.

On the western side of Ohanaula Gulch, the combined trail follows an existing field road bed which runs high up Hanaula Gulch, it rises up onto a slope above the road bed it had previously been following, and follows a cleared area, MAKAI of an existing fence line. Descending the western slope of Hanaula Gulch, the combined trail passes through ironwood trees, crosses the stream bed, and rejoins the road bed on the eastern side of the gulch. Exiting Hanaula Gulch, the combined trail follows a field road along the edge of a field of lantana scrub.

Exiting the field of lantana, the combined trail passes through a wooded area, following the existing road bed. The combined trail descends into Kapa'au Gulch, where it crosses the Kapa'au Stream bed. At the point where the combined trail passes over the stream bed, a large hole has been

blasted MAUKA of the path. This blast hole (Site T-3) is approximately 8-10m (between 26ft to 33ft) wide at its upslope end, and passes underneath the road bed (see Map 3b). A local informant indicated to the field archaeologists that this hole had been blasted through the rock in order to facilitate drainage under the road bed; the present-day road bed being the pre-1937 railway bed. Just east of this blast hole is the intersection of the pre-1937 railroad bed and the post-1937 railroad bed. Neither of these railroad beds are historically significant, for they have been cleared of their former structural features and are now used as roadways. Exiting the shade of Kapa'au Gulch along the former railway bed, the combined trail's path leads toward the cliff edge.

From Kapa'au to Pali Akamoia Gulch, the trail runs parallel to, and MAUKA of, the cliff edge. It follows a line of ironwood trees just MAUKA of a field road. On the western slope of the confluence of Pali Akamoia Gulch and Wainaiia Gulch, directly overlooking Keawaeli Bay, there is a scatter of boulders. This boulder scatter is located approximately 20ft (6m) MAKAI of the hiking trail. The boulders cover an area of approximately 1000 square feet (100 sq. m.). Most boulders are on average 60-80cm in diameter. No structural organization nor arrangement of these boulders was evident. According to a 1931 map of the Kohala Sugar Co.'s cane fields, this boulder accumulation is located MAKAI of the Hawaii Rail Road Company's line and the sugar cane field "Ainakea I" (see Map 8). It is highly probable that this unstructured boulder accumulation was created during the clearing of lands for sugar cane cultivation.

As the combined trail enters Pali Akamoia Gulch it splits: the pedestrian trail goes MAKAI, and the multi-use trail goes MAUKA. The pedestrian trail runs across the mouths of both Pali Akamoia and Wainaiia Gulches. There are steep scrambles where the pedestrian trail crosses the gulch channels, which were both dry at the time of the survey. The multi-use trail follows a course which hugs the contours in the gulches and in sections it follows the former railway bed.

Exiting the eastern end of Wainaiia Gulch, the pedestrian trail follows an existing road bed, whereas the multi-use trail crosses a gentle slope covered in grass. The two trails converge in a parking area at the southeastern end of Kauhola Point. Two combined trails emerge from a parking area, one extends onto Kauhola Point, whereas the other runs directly east. Where the combined trail skirts the bay immediately east of Kauhola Point, it is possible to look down upon "Kohala Swimming Pool". This place is known for surfing:

The surf of Maluu in Haleluu, Kohala, rises on the east side of Kauhola Point ...Kekakau surfed there, and it is

said that he was most skilled in surfing. He was a kamaaina of the place, and it was he who led Kaahumanu to the surf of Maluu. Perhaps that was when the chiefs were farming in Kauhola. No one remembers the year, but it is said that Kauhola was cultivated before the two battles of Laupahoehoe (I'i 1959:134).

Another account refers to Nu'uuanu, who was a high chief during the reign of Kalanipou'u (SHPD 1993). He was attacked by a shark at this break and died. This surf break is a historic site which is significant for traditional cultural reasons; however, it lies outside the trail corridor and does not fall within the remit of this report. If interpretive signs are placed along the trail path, it may be useful to have one addressing this site.

The two combined trails merge at the eastern end of Kauhola Point. Continuing east, the combined trail follows an unpaved road for sections, and along others it cuts across open grasslands. Along this section of the coast there are numerous scattered boulders littering the landscape. The arrangement of these boulders does not seem to have any structure, except that in places they line the edge of the road.

As the combined trail continues east along the coast, it descends into Halelua Gulch at a shallow angle. The combined trail passes through the middle of a grass area in the base of the gulch. The trail lies approximately 100ft (30m) mauka of a rock stream area which contains a distinct rock alignment, and approximately 60ft (18m) makai of the densely vegetated stream bed (see Map 3b). The rock stream area and alignment are believed to be the remains of the wall which was constructed after the demolition of Ohau Heiau (State Site #50-80-02-18424; see Appendix C). Since the 15ft wide trail lies over 100ft away from the rock stream area, the construction and use of the trail will have no effect upon it. The bed of Halelua Stream is moist, although it is not flowing. This stream has cut an incised channel, which suggests intermittent stream flow and erosion.

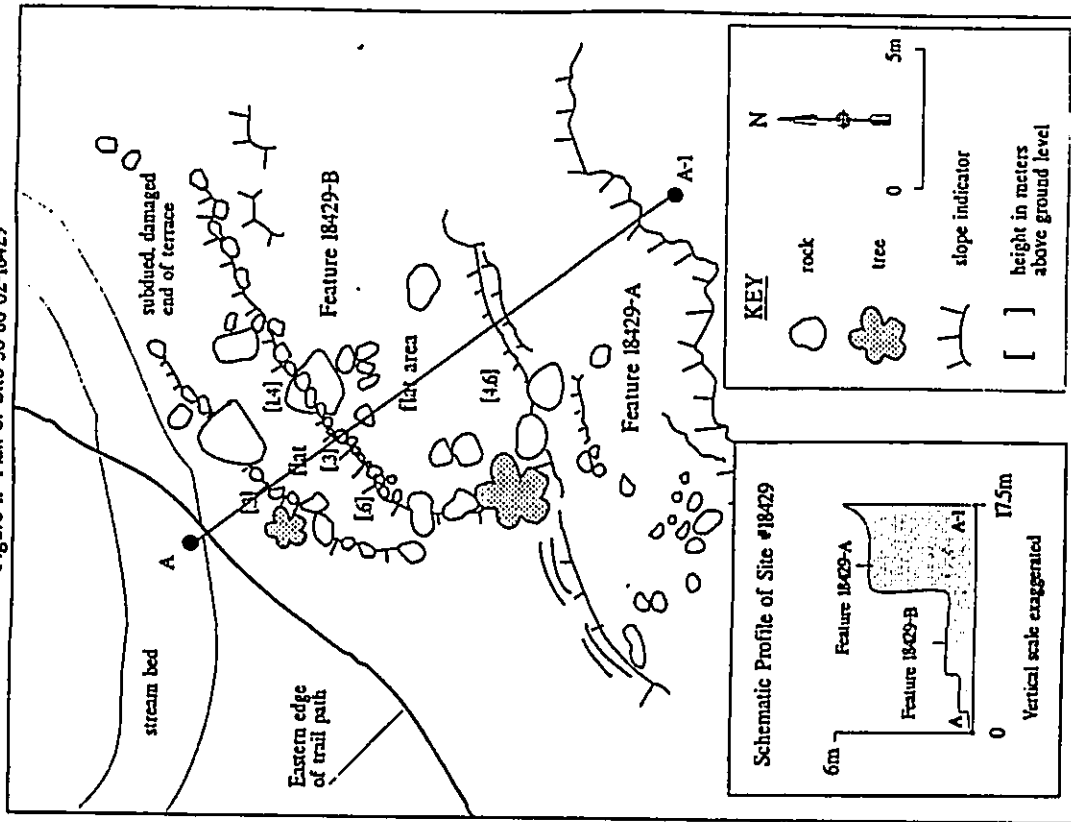
The combined trail rises out of Halelua Gulch and continues along the mauka edge of a clump of ironwood trees. The combined trail follows an existing road bed around to the top of Halawa Gulch. Before the combined path descends into Halawa Gulch, it splits into pedestrian and multi-use trails. The pedestrian trail follows a road bed into the base of Halawa Gulch down to the edge of the sea. As the trail descends into the base of Halawa Gulch, a number of terraces are visible in the base of the gulch. These terraces are State Site #50-80-02-18423 and are being investigated by Dr. R. Cordy, State Historic Preservation Division (SHPD). The pedestrian trail itself does not cross any terraces for it follows a pre-existing road bed on the western side of the

Map 8: Kohala Sugar Company Field Map



source: Watt, 1931

Figure 1: Plan of Site 50-80-02-18429



stream bed (see Map 3b; refer to Appendix D). This road used to serve as a means of carrying material to and from Hapu'u Landing, a small quay which used to exist at the mouth of Halawa Gulch. The pedestrian trail climbs steeply up the eastern side of the gulch and after exiting the gulch, arrives at an existing road (Kapanala and Hapu access road) which marks the trail's eastern terminus.

The multi-use trail does not follow the existing road bed into the base of Halawa Gulch, instead it follows a slope into the base of the gulch. After the multi-use trail crosses Halawa Stream, two terraces are located to the east of the path (see Map 3b and Figure 1). The upper terrace (Site 18429-A) is possibly natural, it is approximately 60ft (18m) long, with a 15ft (4.6m) high face. The terrace was approximately 20ft (6m) wide. The lower terrace (Site 18429-B) has a 22ft (6.5m) long face, with an average height of 2ft (60cm). The surface of this lower terrace is approximately 30ft (9m) square. The lower terrace is probably agricultural. The multi-use trail does not cut across these terraces, although it does pass approximately 15ft (4.5m) away from them. The portion of the multi-use trail which extends east from the stream to the top of the gulch slope, seems as though it has been used as a rough track. At the top of the gulch slope, the multi-use trail passes through an area of Christmas berry trees, Java plum, ferns, and some clumps of wild taro. The multi-use trail then traverses an area of open pasture before it joins the road which marks the easternmost portion of the trail. Water has been present in Halawa Stream during each of the trail surveys.

In addition to the sites located on the subject property, the field crew re-identified the remains of Kapalama Heiau, Hale-o-Kali Heiau, and a boulder alignment. Kapalama Heiau has been described by Thrum (1907:63), and Stokes (1992:179-180). Hale-o-Kali Heiau has been described by Thrum (1907:63-64) and Stokes (1992:181). The boulder alignment is between Hapu'u Bay and Kapanala Bay has been previously reported by Tomonari-Tuggle (1988: Section II:37-44). However, after consultation with the land owner, it was realized that these sites were not located along the coastal trail. These sites are situated within the existing coastal trail established under Civil Case No. 5464 as of March 1, 1982.

#### Section 9: Discussion of Archaeological Findings

##### Section 9.1: Along Sections of The Trail

As already stated, the former railroad beds, constructed during the plantation period, are not significant to the interests of historic preservation. They have been cleared

of all structures relating to their use as a railway and, in places, they are now used as field roads. Many of the field roads which do not follow former railroad beds are absent from sugar cane plantation maps, and were thus cleared after sugar cane cultivation ceased.

From the beginning of the trail to Kapua Gulch, no sites or features of possible significance are present. Boulder scatters and alignments are located along this section of the trail. From the fieldwork, it is evident that these boulder scatters are located Makai of fields which were cleared for agriculture. The sugar plantation maps support this interpretation, for many of these features are located Makai of former sugar cane fields. These boulder scatters are not significant because they are derived from clearing activities associated with sugar cane cultivation.

Between Kapua and Ohanaula Gulches, a number of features are present. However, none of these features are significant because they are all associated with sugar cane cultivation. The trail passes Makai of one historic dump (Site T-1), and through another (Site T-2). Both these dumps contain historic material and consequently they are not significant to the interests of historic preservation (see Table 2). In addition to these dumps, the trail passes through boulder scatters and poorly defined low earthen mounds. These features are located Makai of cleared fields, and many are distributed adjacent to the road bed which the trail follows. These features are a product of clearing for sugar cane, cattle ranching, or road construction. The boulders and low earthen mounds are located Makai of former sugar cane fields, and their orientation suggests that many were mechanically pushed into place. Where the low earthen mounds are being eroded at the cliff edge, historic materials are visible within them. These features are evidently the product of historic agricultural activities, and they are not significant to the interests of historic preservation. It should be noted that between Kapua and Ohanaula Gulches, the combined trail follows a pre-existing road bed.

Continuing east along the trail, the blast hole (Site T-3) in Kapa'au Gulch is the next site encountered. However, this site is not significant to the interests of historic preservation for it was evidently constructed in order to facilitate drainage underneath the railway bed (refer to Table 2). The boulder scatter which overlooks Keawaeli Bay is not significant to the interests of historic preservation, for it is derived from clearing associated with sugar cane cultivation.

The rock stream area with alignment (State Site #50-80-02-18424) in Halelua Gulch is significant to the interests of historic preservation (see Appendix C). The basis for its significance lies in it being the possible remnants of a wall

Table 2: Significance Table For Sites Located Along The North Kohala Trail Path

| Site # | Description                                                             | Significance |
|--------|-------------------------------------------------------------------------|--------------|
| T-1    | Historic Dump                                                           | NS           |
| T-2    | Historic Dump                                                           | NS           |
| T-3    | Blast Hole                                                              | NS           |
| 18423  | Terrace Complex                                                         | C, D         |
| 18429  | Terraces<br>18429-A: Possibly Natural<br>18429-B: Probably Agricultural | C, D         |

#### Significance Criteria

- C - Excellent example of site type.
- D - Has yielded, or is likely to yield, important scientific information.
- NS - Not significant to the interests of historic preservation.

Excavation is not believed to be necessary for the mitigation of the trail paths on the terraces in Halawa Gulch. The trail paths do not cross these terraces, and thus the paths will have no adverse effect upon their surface or subsurface components. The details of preservation can now be outlined for each of the significant sites.

Section 9.2: Archaeological Findings In Context

As was expected, activities associated with the cultivation of sugar cane have had an extensive impact upon the North Kohala landscape. The greatest effects can be seen along the pali, on the gentle slopes in between gulches. The majority of these slopes have been cleared of large boulders and any small topographic irregularities to form smooth, rock free slopes which are now largely under grassland. The cleared materials were mechanically pushed seaward to the edge of the fields and the cliffs, or they were pushed into the gulches. This material has formed the many boulder scatters and low earthen mounds along the trail. Some of the gulches show evidence of having been heavily disturbed, not only with respect to their vegetation but also with respect to their morphology. The predominant vegetation in the gulches was grasses and ironwood trees; it was unlikely that this would have been typical of the pre-European contact vegetation communities. Some of the gulches have gentle slopes which seem to have been bulldozed, i.e., the base of Halelua Gulch, which Historical accounts indicate was planted with sugar cane. The significant sites which were found were located in the base of Halawa Gulch. This gulch seems to have only been slightly disturbed in historic times by the construction of a road through it.

The agricultural terraces in Halawa Gulch were not unexpected finds. Tomonari-Tuggle had previously made reference to terraces in Halawa Gulch (1988). This gulch is the wettest along the trail, and thus would be the one most likely to contain terraces for the wetland cultivation of taro. In addition, the historic disturbances in this gulch seem to have been more limited than in other gulches further west.

The presence of sites in gulches has been noted during archaeological surveys across North Kohala (Denham et al. 1993; Erkelens 1992, and Tomonari-Tuggle 1988). The absence of significant sites outside the gulches has been attributed to the activities of sugar cane cultivation. Some of these activities must also have been extensive in the gulches, which would explain an absence of historic sites in most of them.

created with the stones derived from Ohau, or Ohau, Heiau. Thrum has detailed the destruction of Ohau Heiau by E. E. Olding for the purposes of cultivating sugar. The former location of the heiau would not be significant, for it would have been used for sugar cane cultivation. Similarly, the grassed area in the base of this gulch, through which the combined trail passes, was used for sugar cane cultivation before it was given over to grazing. In the portions of this gulch which have been used for sugar cane cultivation, it is unlikely that an intact subsurface cultural component is present. However, Thrum's description does note that some human bones were re-interred during the destruction of the heiau, and it is possible that human remains may still be present in the rock strewn area. The trail does not pass within 100ft (30m) of the rock strewn area, and it will have no effect upon it.

Both trail paths through Halawa Gulch pass close to agricultural terraces. The pedestrian trail follows an existing road bed into the base of Halawa Gulch, and on its eastern side it overlooks and passes close to a well-defined terrace complex (State Site #18423). This terrace complex has been sketched, mapped and excavated by Dr. R. Cordy, SHPD; the results of these investigations are yet to be published. These terraces are significant to the interests of historic preservation, under Historic Register Criteria C and D, namely they are significant as excellent examples of site type (Criterion C) and for the scientific information they contain (Criterion D) (refer to Table 2). Mr. M. Grady, after consultations with Dr. R. Cordy, SHPD, has informed ACH that it is not necessary for ACH to map the terraces which Dr. Cordy has previously investigated (refer to Appendix D). Since the pedestrian trail follows a roadway on the western side of the gulch, and it climbs steeply up the eastern side of the gulch, the trail will not have an adverse impact on these agricultural terraces (Site #18423) as long as measures are taken for their interpretive preservation.

However, Dr. Cordy has stated that he has not investigated all of the terraces in Halawa Gulch, only a portion of them (refer to Appendix D). The multi-use trail passes close to two terraces which have not been mapped by Dr. Cordy (State Site #50-80-02-18429). One of these terraces is believed to be possibly natural (Feature A), whereas the other is believed to be cultural, probably agricultural (feature B). The trail does not cross these terraces, but it does pass approximately 15ft away from them. These terraces are significant to the interests of historic preservation under National Register of Historic Places Criteria C and D (refer to Table 2). Since the trail passes 15ft away from these terraces, it will have no adverse effect upon them, as long as measures are taken for their long term preservation.

#### Section 10: Recommendations for Preservation

The significant sites located along the path of the coastal trail are both located in Halawa Gulch. These sites consist of terraces which are believed to be primarily agricultural. Since the terrace complex (Site #18423) has been investigated by Dr. Cordy, and since the trail does not cross these terraces, ACH has not conducted fieldwork on them. The second site in Halawa Gulch consists of two terraces (Site #18429); one probably agricultural; and the other possibly natural. These terraces have been described and plotted on a detailed topographic map of the area (see Map 3b). The multi-use trail does not cross these terraces, and as long as measures are taken to ensure their correct preservation, it is not necessary to conduct further archaeological investigations on them.

The terraces mapped by Dr. Cordy (Site #18423) are definitely, and Feature 18429-B is probably, agricultural. Both these sites are located on L.C.A. #10486, which was a claim for wetland taro patches, dryland agricultural patches and five houses, one of which was a canoe house. Continued investigations would undoubtedly facilitate a chronological reconstruction of the habitational-agricultural complex in this section of Halawa Valley, however these investigations are not necessary for the mitigation of the coastal trail.

Both terrace sites are to be preserved, and interpretive signs will be installed along the trail paths. The pedestrian and multi-use trail paths through Halawa Gulch should each have interpretive signs placed where they pass close to a significant site. The precise details of preservation, and the information which is to be placed on the interpretive signs, should be defined after consultations between Chalon International of Hawaii, Inc., the State Historic Preservation Division, and a qualified archaeologist.

#### Section 11: Conclusions

A surface inventory survey was conducted along a 100ft (30m) wide path for a coastal trail which traverses 18 ahupua'a in North Kohala District on the island of Hawaii. The trail extends for approximately 6.3 miles. The purpose of this inventory survey has been to mitigate the impact of the trail upon any significant historic resources.

A number of features associated with activities relating to sugar cane production were identified along the course of the trail. These features included boulder scatters, poorly defined low earthen mounds, historic dumps, former railroad beds, and a blast hole underneath a railway line. The structure, composition, and location of these features

suggested that they were associated with sugar cane cultivation and its related activities. The boulder scatters and low earthen mounds were located makai of cleared fields, bore evidence of mechanical disturbance, and were associated with historic materials. The location of these features relative to former sugar cane fields, roads, and railways, reinforced the above interpretation. These historic sites are not significant to the interests of historic preservation.

The notable absence of sites in most of the gulches can largely be attributed to activities associated with sugar cane cultivation. Agricultural clearing, harvesting with bulldozers, and other activities disturbed the gentler slopes. Activities associated with sugar cane cultivation also impacted the gulch sides and slopes, albeit differently.

Two sites of historic significance were encountered in Halawa Gulch: Site #18423 consisted of a terrace complex, and Site #18429 consisted of two terraces, only one of which was probably agricultural. Site #18423 is being investigated by Dr. R. Cordy of SHPD, and thus is not described fully in this report. Site #18429 is described and mapped in this report. The trail passes close to both sites, but it does not cross either of them. Both sites are to be preserved for interpretation. The details of preservation will be outlined in a separate preservation plan.

The information in this report contributes to the mitigation of the coastal trail on significant historic resources. The preservation plan once drafted and implemented will ensure that the trail has a "beneficial effect" upon significant historic resources located along its path.

- Bibliography
- Armstrong, R.W.  
1973 Atlas of Hawaii. University of Hawaii Press, Honolulu.
- Beckwith, M.  
1976 Hawaiian Mythology. University of Hawaii Press, Honolulu.
- Barrera, W.  
1984 Archaeological Reconnaissance at Kapauu, North Kohala, Hawaii. Letter dated May 6, 1984 to Mr. E. Kuniyoshi, Belt, Collins and Associates.
- Clark, J.R.K.  
1985 Reaches of the Big Island. University of Hawaii Press, Honolulu.
- Denham, T., Kennedy J., and Reitsema L.  
1993 Archaeological Inventory with Subsurface Testing Report for a Property at TMK: 5-5-08:03, 20, 43, 45, 48, 51, and 52, in the Ahupua'a of Hauli, Pahoa, and Honomakau, North Kohala District, on the Island of Hawaii. Revised.
- Ellis, W.  
1963 Polynesian Researches: Hawaii. Rutland, Vermont: Charles E. Tuttle Co.
- Emory, T.  
1951 Hawaiian Life in Kalalau, Kaula'i According to John Hanohano and His Mother, Wahine-i-Moouli Pa. Manuscript. Honolulu: B.P. Bishop Museum.
- Erkelens, C.  
1992 Phase I Archaeological Inventory Survey, Kohala Plantation Village Project Area (TMK 5-3-06:21, 5-3-07:01, 5-4-09:02), North Kohala, Hawaii. Preliminary report.
- Fornander, A.  
1969 An Account of the Polynesian Race: Its Origins and Migrations. Rutland, Vermont: Charles E. Tuttle Co.
- Griffin, P.B., T. Riley, P. Rosendahl, and H.D. Tuggle  
1971 "Archaeology of Halawa and Lapakahi: Windward Valley and Leeward Slope". New Zealand Archaeological Association Newsletter. Vol. 14, No. 3:101-12.
- Handy, E. and E. Handy  
1972 Native Planters in Old Hawaii. B.P. Bishop Museum Bulletin No. 233. Honolulu.
- I'i, J.  
1959 Fragments of Hawaiian History. Bishop Museum Press, Honolulu.
- Lum, L.A. and W.K. Luke  
1989 From Kwang Tung to Kohala: Lineage of the Luke Family of Kohala, Hawaii. Kohala: Luke Family.
- Menzies, A.  
1920 Hawai'i Nei 128 Years Ago: Journal of Archibald Menzies. Honolulu.
- Sato, H.H. et al.  
1973 Soil Survey of Island of Hawaii, State of Hawaii. United States Department of Agriculture.
- Schilt, R. and A. Sinoto  
1980 Limited Phase I Archaeological Survey of Mahukona Properties, North Kohala, Island of Hawaii. Dept. Anthropology. B.P. Bishop Museum. Honolulu.
- Schmitt, R.  
1977 Historical Statistics of Hawaii. Honolulu: University of Hawaii Press.
- Spriggs, M. and P.L. Tanaka  
1988 Ma Wea 'Imi I Ka Na Kahiko: An Annotated Bibliography of Hawaiian Archaeology. Asian and Pacific Archaeology Series, No. 11. University of Hawaii Press, Honolulu.
- Stokes, J.C.G.  
1991 Heiau of the Island of Hawaii: A Historic Survey of Native Hawaiian Temple Sites. (ed. and intro. by T. Dye) B.P. Bishop Museum Bulletin in Anthropology No. 2. Bishop Museum Press. Honolulu.
- Thrum, T.G.  
1907 Hawaiian Almanac. Honolulu.
- Tomonari-Tuggle, M.  
1988 Kohala: Perception of a Changing Community. Second Draft. Dept. of Land and Natural Resources, Division of State Parks, Outdoor Recreation and Historic Sites. Honolulu.
- Tuggle, H. and M. Tomonari-Tuggle  
1980 "Prehistoric Agriculture in Kohala, Hawaii". Journal of Field Archaeology. Vol. 7:297-312.
- Westervelt, W.  
1926 Hawaiian Historical Legends. New York: Revell.



MAPS 3(A) AND 3(B) ARE INCLUDED AS  
PART OF THE "CONCEPT PLAN" (FIGURES 4A, 4B) IN  
THE E.A. FOR THE KOHALA COASTAL TRAIL

Appendix A:  
Land Commission Awards  
In the Vicinity of the Subject Property

LCA 7712 to Lot Kapuwaiva

Native Register, Vol. 5:444

Lot Kapuwaiva's lands in the division by the Mo'i in the month of January 1848 - Hawi, Hikiapua, Kamao, Hihl One, Kauaparaoa, Kaupulehu, Kaloko, Keauhou (Place where the Mo'i was born), Puua.

Native Testimony, Vol. 10:244

Lot Kamehameha states that Lot Kapuwaiva has Kamehameha's land as registered in the Mahele Book (listing same as above)

APPENDIX A

Land Commission Awards

LCA 8082 to Holopse

Native Testimony, Vol. 4:81

Kekoa sworn and stated: "I have seen there is in the illi land of Puuolaau of Halaula ahupuaa in Kohala, Hawaii.

Mauka  
Kohalawaho  
Makai  
Hamakua

Ike  
Maulili 2  
Idle land  
Ahupuaa  
Idle land  
Ahupuaa

This is dry land which has been cultivated and there is one house for him. He had received his interest from his parents at the time of Kamehameha I; no one had objected."

Kuae sworn and stated: "I have known exactly as Kekoa has stated here."

Foreign Testimony, Vol. 4:25

Kekoa sworn: Testifies that claimant occupies one lot of land in illi of Puuolaau, ahupuaa of Halaula, which is thus bounded - South & North, Wasteland - West ahupuaa - East ahupuaa. Said lot is dryland, unfenced and cultivated. One house is on the premises owned by claimant. Claim came through his parents at the time of Kamehameha I. Uncontested.

Native Register, Vol. 8:74

Ahupua'a of Halaula. The interest acquired by me. M. Kekuanaoa gave it to Kinilau and Kinilau gave it to Holopse. I have occupied my illi of Puuolaau for 9 years, until today. Aloha to you and thanks.

LCA 9690 to Kane

Native Register, Vol. 8:75

Ahupuaa of Pueke. From Kauikeouli to Kapau, from Kapau to Napani, from Napani to Hua, and from Hua to me, Kane, living here at this time. I have occupied this 'ili of Puuolaaui for four years, and my interest was acquired from the foregoing persons.

Native Testimony, Vol. 14:80

September 28, 1848

Kekuae sworn and stated: "I have seen one section in the ili of Puuolaaui in Pueke ahupuaa, Kohala, Hawaii.

|            |           |
|------------|-----------|
| mauka      | Idle land |
| Kohalawaho | ahupuaa   |
| makai      | idle land |
| Hamakua    | Idle land |

There is a garden and it has been cultivated. There is no house and the interest had been from Makia (Konohiki) at the time of Kamehameha II. No one has objected."

Kekoa sworn and stated: "I have known in the same way as Kekuae has stated here."

Foreign Testimony, Vol. 4:34

Kekuae sworn: Testifies that claimant occupies said section of land in the ili of Puuolaaui, ahupuaa Pueke, which is thus bounded:

|                |   |                 |
|----------------|---|-----------------|
| South          | - | Waste Land      |
| North and East | - | Waste Land      |
| West           | - | ahupuaa Halaula |

Said land consists of upland - unfenced - cultivated - no house on the premises. Makia (Konohiki) gave this land to claimant in the time of Kamehameha II. Uncontested. Kekoa sworn confirms the above testimony of Kekuae.

LCA 10474 to Namauu

Native Testimony, Vol. 10:188

N. Namauu's land in the mahele book lists Halelua in Kohala and several others. Department of the Interior, December 23, 1852. A. G. Thurston, Secretary.

Native Register, Vol. 4:558

N. Namauu's claim. [Note in the margin] Forgot Halelua Ahupua'a in Kohala, Hawaii.

LCA 10486 to Naukana

Native Testimony, Vol. 4:68

September 27, 1848

Makiaha sworn and stated: "I have seen 2 sections in Hapuu ahupuaa, Kohala, Hawaii.

1. Mauka, my land; Kohalawaho, Pupaa I, an ili land; makai, a pali by the beach; Hamakua, a pali and Amakao. There are 13 patches, 3 potato gardens and 5 houses, 2 storage houses, 1 house for Kaihe, 1 for Pahupu and folks, also Kahuna and 2 houses for Naonea. Three other people have interests in this land of Naukana. He had received his interest from Kaihe in 1838; no one has objected."

2. Ili of Puunoni: Mauka, Makahinaoile ili land; Kohalawaho, idle land; makai, Kapuna ili land; Hamakua, for Kaihe (Konohiki). There are 8 patches and 4 potato fields and this section was acquired in exactly the same way; no one has objected."

Pipa sworn and stated: "I have known exactly as Makiaha has stated here."

Foreign Testimony, Vol. 4:24

Makiaha sworn, Testifies that claimant occupies one section of land in the ili of Hapuu, ahupuaa Halawa, which is thus bounded:

|       |   |                      |
|-------|---|----------------------|
| South | - | land held by Makiaha |
| West  | - | ahupuaa Napaapaa     |
| North | - | Precipices           |
| East  | - | stream of water      |

Said section consists of thirteen wet kalo patches - lot of dry land - unfenced - cultivated - five houses stand upon the above described premises. Two of these are owned by claimant. One unoccupied by the Konohiki. A canoe house by Pahupu and Kahuna and one by Naonea. Three other individuals hold claims to part of the said lot of land. Kaihe (Konohiki) gave the said land to claimant A.D. 1838.

Also, witness declares further that claimant occupies one section of land in ili of Puunoni ahupuaa aforesaid, which is bounded thus:

Native Testimony, Vol. 4:70

Maukana sworn and stated: "I have seen one section in the ili land at Kapuna of Halawa ahupuaa in Kohala, Hawaii. Mauka is Pupunohi, an ili land; Kohalawaho, Napaapa ahupuaa; maka, my land; Hamakua, Haleiki, a land. There are 11 patches, one potato patch and one house for him. Kaihe [Konohiki] gave him his interest in 1841; no one has objected to this day." Pipa sworn and stated: "My knowledge \_\_\_\_\_ as Maukana has stated here."

South - ili of Makahineole  
West and East - wasteland  
North - ili of Kapuna

Said lot consists of eight wet kalo patches and dry land unfenced - chiefly cultivated as houses thereon - title same as above. Uncontested.

NATIVE REGISTER, Vol. 8:18

To Kamehameha III, Greetings: Here is my little claim for land. Halawa is the ahupua'a. My two land areas are Hapuu and Pupunohi. Kamehameha III gave Kaihe the ahupua'a, and Kaihe gave me these 'ilis which I have occupied under him for twelve years, without moving. Maukana.

LCA 2782 to Lehuauui

NATIVE REGISTER, Vol. 8:22

I have a little claim for land. From the time of Kamehameha we lived here together, and when he died the land was bequeathed to Lumahelhei kane [Ulumehelhei], and we occupied the house during his lifetime. On his death, the land was bequeathed to Lumahelhei wahine [Ulumehelhei] and we still occupied the house. Therefore this is a very old interest.

NATIVE TESTIMONY, Vol. 4:84 September 28, 1848

Kaluehu [Konohiki] sworn and stated: "I have seen there is in the ili land of Waineneke of the Kapua ahupuaa in Kohala, Hawaii, 1 section where

|            |         |          |
|------------|---------|----------|
| Mauka      | Pahoa's | land     |
| Kohalawaho | Puupio  | ili land |
| Makai      | Wainona | " "      |
| Hamakua    | Papala  | " " and  |

a pond for the konohiki. Weioi had given him [konohiki] during the time of Kamehameha I. Six other claimants are this ili; no one has objected."

LCA 10548 to Makiaha

NATIVE REGISTER, Vol. 8:16

Halawa, Feb. 8, 1848

To the Mo'i, Greetings: I hereby explain my claim for land in the ahupua'a of Halawa, as directed by the Land Commissioners. Kamehameha III was the one who gave S. Kaihu the Ahupua'a of Halawa, and Kaihu was the one who gave me this 'ili of Kapuna. I have occupied this 'ili for six years. Here is the diagram of my 'ili.

Appendix B:  
Place Names In The Vicinity of The Subject Property

All literal translations are from Pukui, Elbert and Mookini (1974). The names of the ahupua'a and gulches are given from the west to the east as one proceeds along the trail.

Ahupua'a:

- Hononaka'u - Village and land section, Kohala;  
"harbor [of] fear" (p.50).
- Kapu'a - Land sections, Ho'opuloa and Kohala; gulch  
"the whistle" (p.89).
- Puehuehu - "spray scattered" (p.192) (with reference to  
place on Oahu).
- Honopueo - Land section, Kohala;  
"named for an owl, 'aumakua (personal god) who  
led a Kua'i hero, Ko'olau-a-Mano, to find his  
mother. Lit. owl bay" (p.51).
- Kapa'au - Land section, Kohala;  
"elevated portion of heiau" (p.86).
- 'Ainakea - Land section, Kohala;  
"Kamehameha I was trained here by Kaukoko in  
O'ahu fighting methods. A hero, Kukuipahu,  
and 3,200 men were killed here and their  
feather cloaks taken.... 'Ainakea is a kind  
of sugarcane" (p.7).
- 'Iole - Land division, Kohala;  
"named for a legendary rat, Mountain and  
stream, Lihu'e District, Kua'i. Lit. rat"  
(p.57).
- Hala'ula - Land section and village, Kohala;  
"red pandanus" (p.57).
- Kukuivaluhia - Land section, Kohala;  
"scraped candlenut" (p.123).
- Halelua - Land section, gulch, and surfing area of  
ancient Hawai'i, Kohala;  
"pit house" (p.38).
- Halawa - Land section, village, gulch, and mill,  
Kohala;  
"curve" (p.36).

APPENDIX B

Place Names in the Vicinity of the Subject Property



Lipoa                      Gulches:  
- name of a place on Mau'i originates from brown  
seaweeds.

APPENDIX C

Site #50-80-02-18424

Appendix C:  
Site #50-80-02-18424

This site consists of a rock strewn area approximately 40m (c.130ft) long and 10-15m (33-48ft) wide. The rubble scatter is composed of partially buried angular and waterworn basalt stones. This scatter extends from the east slope of the gulch across much of the gulch's mouth (see Map 3). There is an alignment at the eastern end of this scatter which is three rows thick. This alignment extends for only 15ft (4.5m). This rock alignment, and the rocks scattered around it, are believed to be the remnants of the wall created when Ohau, or "Oaha", Heiaua was destroyed at the beginning of the twentieth century (refer to Section 4).

The present rock scatter and alignment are located less than 100ft from the ocean, whereas Thrum noted that Ohau Heiaua was approximately 350ft from the ocean. The proximity of the rock scatter to the ocean is probably due to both:

- a) coastal erosion of the land in the base of Halelua Gulch as evidenced by a 4ft high ledge; and
- b) the wall, built when the heiau was destroyed, was probably constructed makai of the former heiau in order that the land upon which the heiau stood could be used for sugar cane cultivation.

This site is possibly significant, for Thrum noted that at the time of the heiau's destruction some human bones were re-interred, rather than being sacked, suggesting that they had been placed into the wall. This site is significant under National Register of Historic Places Criterion D, for its information content, and under Criterion E, for its significance to the Hawaiian people. These wall remnants have been given State Site #50-80-02-18424. The former site of the heiau would not be a significant site, for according to Thrum (1907:64) it was planted with sugar cane.

This site is located at least a hundred feet from the combined trail, and is not within the surveyed corridor. Thus the trail will have "no effect" upon this site.

APPENDIX D

Agricultural Terraces in Halawa Gulch

JOHN W. ABELL  
GOVERNOR OF HAWAII



STATE OF HAWAII  
DEPARTMENT OF LAND AND NATURAL RESOURCES  
STATE HISTORIC PRESERVATION DIVISION  
33 SOUTH KING STREET, 8TH FLOOR  
HONOLULU, HAWAII 96813

Sept. 14, 1992

Tim Denham  
Archaeological Consultants of Hawaii  
59-624 Pupukea Road  
Haleiwa, Hawaii 96712

Dear Tim:

SUBJECT: Agricultural Terraces in Halawa Gulch  
Halawa, North Kohala, Hawaii

My apologies for not getting the sketch map to you before now.

Kanalei Shun, Marc Smith and I mapped the irrigated terraces on the gulch's floor at the mouth of Halawa Stream on March 12-13, 1992. We also excavated two trenches in the site, to recover datable samples and evaluate construction sequences.

Anyway, attached is a section from our fieldbook which sketches the site. The left-hand side of the page is the north side of the gulch. Seven terraces are present along this stream flat, with an associated canal ('auwai). The south side of the gulch has one small terrace (VIII). The inland (top on sketch) portion of this site is delimited by a low stone bluff where the gulch slopes pinch together. The seaward area is marked by the end of the terraces and the stream swings to the north bluff edge of the gulch. I am not exactly sure how much farther the stream continues to the sea (less than 100 meters). We found no further terraces in this area. The road which descends to the shore is quite close to the south side of the site (right on the sketch), and it continues on out to the shore. Use of this road for a coastal trail again should have "no effect" on this site, assuming the site will have an interpretive sign.

I hope this helps. If you have any questions, please feel free to call.

By the way, our office has been very impressed in the marked improvement of Archaeological Consultants of Hawaii's reports over the last two years. Please be sure to let Joe know this too.

Sincerely,

*Ross Cordy*

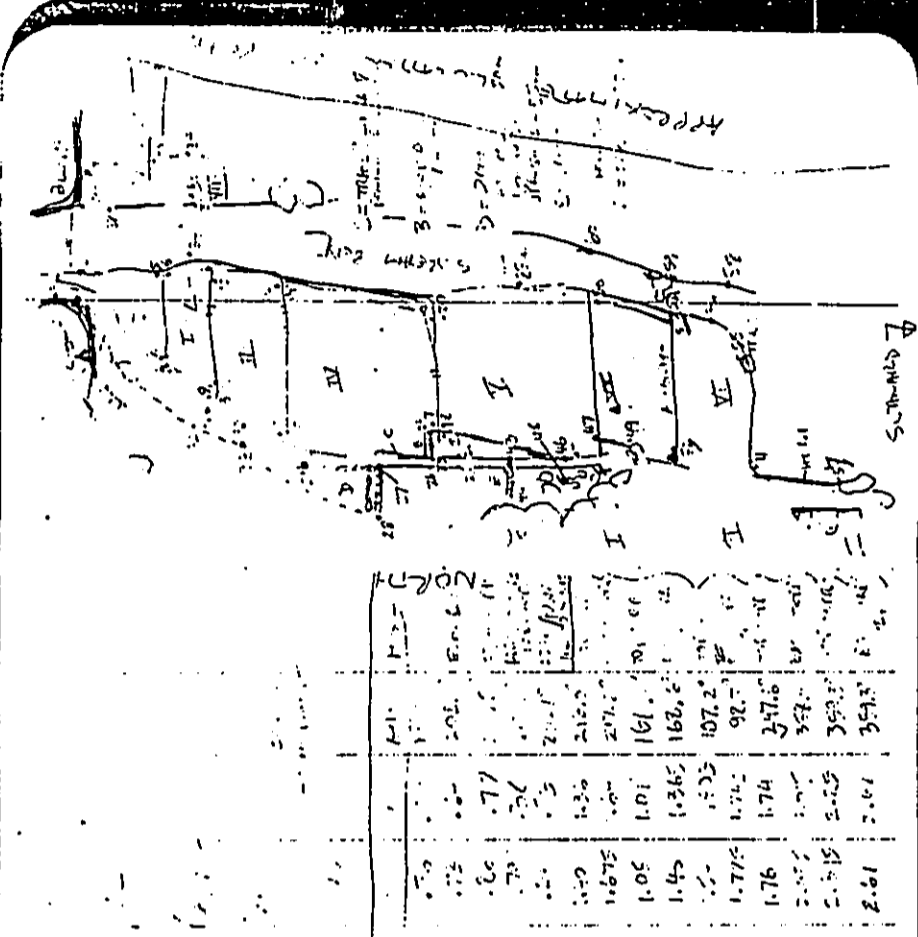
Ross Cordy  
Branch Chief, Archaeology

DI

WILLIAMS PATY, CHAIRPERSON  
BOARD OF LAND AND NATURAL RESOURCES

DIANNE  
JOHN P. LUPTON, JR.  
DONALD HANAUKE

AQUACULTURE DEVELOPMENT PROGRAM  
AGRICULTURAL RESOURCES  
CONSERVATION AND ENVIRONMENTAL AFFAIRS  
RESOURCES DEVELOPMENT  
CONSERVATION AND CONSERVATION  
FORESTRY AND WILDLIFE  
HISTORIC PRESERVATION DIVISION  
LAND MANAGEMENT  
STATE PARKS  
WATER AND LAND DEVELOPMENT







STATE OF HAWAII  
DEPARTMENT OF LAND AND NATURAL RESOURCES

**COPI**

LATE HISTORIC PRESERVATION DIVISION  
103 SOUTH KING STREET, 6TH FLOOR  
HONOLULU, HAWAII 96813

LEIHI JAMES COLLETTSON  
BOARD OF LAND AND NATURAL RESOURCES

DISPUTES

LAND ACQUISITION  
GENERAL HAWAII

AGRICULTURE DEVELOPMENT  
PROGRAM

ADULTIC RESOURCES

CONSERVATION AND

ENVIRONMENTAL AFFAIRS

RESOURCES DEVELOPMENT

CONTRACTS

FORESTRY AND WILDLIFE

HISTORIC PRESERVATION

LAND MANAGEMENT

STATE PARKS

WATER AND LAND DEVELOPMENT

LOG NO: 9027

DOC NO: 9307ks39

August 4, 1993

Mr. Tim Denham  
Archaeological Consultants of Hawaii, Inc.  
59-624 Pupukea Road  
Haleiwa, Hawaii 96712

Dear Mr. Denham:

**SUBJECT:** Review of Draft Report: "Archaeological Inventory Survey Along the North  
Kohala Trail Corridor, from Ka'auhuku to Haleiwa, Ahupua'a, North Kohala  
District, Island of Hawaii", November, 1992"  
(Denham, Cruz, Minkrel, Kennedy 1992)

Thank you for submitting the subject report to our office for review. We received the report in December, 1992 and we apologize for our very untimely response.

We find the report acceptable and needing but a few minor revisions to clarify points that were unclear in the report. These points are itemized in Attachment 1.

We believe that all the historic sites along the proposed trail corridor have been located, totaling but 2 sites, 50-80-02-18423 and -18429, were identified. (Note our question about the railroad beds in the attachment, however. If these are significant sites in the project area, we would need to modify this letter.) Please note that the function of site -18423 has been determined by our Division's investigation to be irrigated terraces, and hence definitely agricultural in purpose, and not just "probable agricultural terraces" as suggested (e.g. top of pages 42 and 44). We agree that both sites are significant for their information content (criterion D) and as excellent examples of a site type within northern Kohala (criterion C).

These two significant sites will be made more accessible with the presence of the trail. The proposal is to preserve and interpret these sites. Also, only the pedestrian, and not the multi-purpose, trail passes will pass these sites. We find this mitigation proposal to be acceptable, and it should result in a "no adverse effect" to these sites. Indeed, the effect can be perceived as a beneficial one, because public education of these sites will be increased.

Tim Denham  
Page 2

Should the proposed trail project be approved, the next step in the historic preservation review process -- to ensure the "no adverse effect" determination -- would be the preparation of a detailed preservation plan for the two sites. This plan would include signage text, signage appearance and location, a map of the relation of the trail to the sites, coverage of access concerns (including reduction of or controlling of walking access into the irrigated taro site complex to prevent damage), and the like. Along these lines the multi-purpose trail runs within 15 feet of site -18429 and this distance may be too close. This concern should be resolved in the preservation plan. Our office would have to approve this plan, and the County Planning Department if a County permit is involved, and we would have to verify its successful execution in writing.

We would like to point out that the surf, at least on one side of Kauihola Point, has oral histories associated with it. You have noted one account on page 37. Another seems to be the account of Nu'uuanu, a high chief during Kalamiohupū's reign, who was perceived as a rebel and was attacked by a shark at this break and died. This surf area would be a historic site that is significant for traditional cultural reasons. It would be useful to have signage addressing this site along the trail.

Last, one other archaeological site, number -18424, was identified in the report as the possible remnants of Oahu Heiau. It was located in Haleiwa Gulch, lying outside (30 m+) the trail corridor. We believe that this site is significant for its information content, and if it is the ruins of the heiau for its traditional cultural value (criterion E). Since this site is outside the corridor, the project will have "no effect" on this site.

If you should disagree with any of our comments or if you should have further questions, please contact Kanalei Shiun at 587-0007.

Sincerely,

*Don Hibbard*  
DON HIBBARD, Administrator  
for State Historic Preservation Division

KS:amk

c: Matt Grady, Chalton (Hawaii) International  
Na Maka Ala o Kohala

ATTACHMENT I  
NEEDED REVISIONS  
ON

ACBI Draft Report  
"Archaeological Inventory Survey Along the North Kohala Trail Corridor  
, from Ke'aukahu to Halawa Ahupua'a,  
North Kohala District, Island of Hawaii, November, 1992"  
(Denham, Cruz, Maigret, Kennedy 1992)

1. Background Section

- a). We need a clearer and more legible location map (Map 2 on page 4). We have difficulty reading the *ahupua'a* and place names on this map.
- b). Your reference from Clark (1985) on page 10, mentions Kamehameha's wife as Kalola. This is not correct (cf. Kamakau 1961; Formander 1969, II). Incidentally, Clark is not cited in the Bibliography at the end of the report as should be.
- c). 1st paragraph on page 29, you mention earlier (prehistoric?) occupations and human burials in "marked" mounds as a site type you would expect in the project area. We are uncertain about what you mean by "marked". You need to expand on this sentence a little more.

2. Methodology

- a). Methods on how the survey was conducted need to be specified, that is, was the corridor walked using transect, or some other method. If transect was used, then width of transect need to be specified.

3. Results

- a). On page 35, pre- and post-1937 railroad beds are mentioned in the report for the first time. Can the pre-1937 railroad bed be considered a significant historic site as it is over 50 years old? Perhaps, the bed is too disturbed to be considered significant. This concern should be clarified.

COPY



STATE OF HAWAII  
DEPARTMENT OF LAND AND NATURAL RESOURCES  
STATE HISTORIC PRESERVATION DIVISION  
33 SOUTH KING STREET, 6TH FLOOR  
HONOLULU, HAWAII 96813

ELITE LANDS, CULTUREWORK  
BOARD OF LAND AND NATURAL RESOURCES  
DEPT. OF LAND AND NATURAL RESOURCES  
JOHN P. KENNEDY  
DONALD L. HANAUER  
AQUACULTURE DEVELOPMENT  
PROGRAM  
AQUATIC RESOURCES  
CONSERVATION AND  
ENVIRONMENTAL AFFAIRS  
RESOURCES DIVISION  
CONSERVATION AND  
RECREATION DIVISION  
SOCIETY AND WELFARE  
DIVISION  
LAND MANAGEMENT  
DIVISION  
STATE PARKS  
WATER AND LAND DEVELOPMENT

February 15, 1994

Mr. Joseph Kennedy  
Archaeological Consultants of Hawaii, Inc.  
59-424 Pupukea Road  
Haleiwa, Hawaii 96712

Dear Mr. Kennedy:

SUBJECT: Review of Report: "Archaeological Inventory Survey Along the North Kohala Trail Corridor, from Ka'auhuku to Halawa, Ahupua'a, North Kohala District, Island of Hawaii, September, 1993" (Denham, Cruz, Malignet, Kennedy, 1992)

Thank you for submitting the subject report to our office for final review. Except for one minor point mentioned below, our office agrees that the report adequately meets our concerns. The report is now an acceptable inventory survey report.

We agree two significant historic sites, -18423 and -18429, are present along the trail corridor and in place preservation of these sites is an acceptable mitigation measure. As only the pedestrian, and not the multi-purpose, trail route will pass near these sites, "no adverse effect" to the sites is expected. We believe the pedestrian trail running along these sites is bound to have a beneficial effect on the sites as public awareness of and education on the sites intrinsic values will be increased.

The next stage in the review process of the trail project would be the submittal to our office of a detailed preservation plan for sites -18423 and -18429 for approval and concurrence. This plan need not be long, and can use illustrations to make most points. The plan should include signage text, signage appearance and location, a plan map of the relation of the trail to the sites, coverage of access concerns (including reduction of and controlling of walking access into site 18423, the irrigated taro site complex, to prevent damage), etc. The multi-purpose trail runs within 15 feet of site 18429, and this concern should be addressed in the preservation plan. The surf spot on one side of Kaunohia Point has historic traditional significance and signage should be placed in an appropriate location along the trail referring to this site. This plan typically is required as a condition to any approved County or State permit, if one is required. Alternatively, the detailed plan could be submitted and approved before submittal of any applications

J. Kennedy  
Page 2

The last step in the review process would be for our office to verify in writing that the preservation plan has been successfully executed. If you should have any further questions, please contact Kanalet Shun at 587-0007.

Sincerely,

DON HIBBARD, Administrator  
State Historic Preservation Division

KS:amk

c. Matt Grady, Chalco (Hawaii) International  
Na Maka Ala o Kohala  
Virginia Goldstein, County Planning Department

**OEQC BULLETIN PUBLICATION FORM**

**TITLE OF PROJECT:** Construction and operation of a private 8.5 mile long Multi-Purpose Trail for Recreational purposes including access roads, parking areas and restrooms. RECREATION

**LOCATION:** ISLAND HAWAII **DISTRICT** NORTH KOHALA

**TAX MAP KEY:** 5-3-06: por 21; 5-3-07: 1 & por 10; 5-4-08: por 1; 5-4-09: por 1; 5-5-08: por 13 91 JUN 13 P 2:43

**PLEASE CHECK THE FOLLOWING CATEGORIES:**

**Type of Action:** AGENCY **APPLICANT** X

**Applicable State or Federal Statute:**

X Chapter 343, HRS           Chapter 205A, HRS           NEPA (Federal Action Only)

**Type of Document:**

|                                                                            |                        |                            |
|----------------------------------------------------------------------------|------------------------|----------------------------|
| <u>X</u> Draft Environmental Assessment (Negative Declaration anticipated) | <u>    </u> Draft EIS  | <u>    </u> NEPA NOP       |
| <u>    </u> Final Environmental Assessment (Negative Declaration)          | <u>    </u> Final EIS  | <u>    </u> NEPA Draft EIS |
| <u>    </u> Final Environmental Assessment (EIS Preparation Notice)        | <u>    </u> NEPA FONSI | <u>    </u> NEPA Final EIS |

**Type of Revision (if applicable):**

     Revised           Supplemental           Addendum           Other (please explain)

*Prior to general distribution, please submit to OEQC: 4 copies of the Draft EA, Final EA (Negative Declaration or EIS Preparation Notice), 4 copies of the Draft EIS or Final EIS (For Draft and Final EISs an additional copy is mailed to OEQC.)*

**PROPOSING AGENCY OR APPLICANT SHOULD SUBMIT COPIES OF THE DOCUMENTS TO THE APPROVING AGENCY OR ACCEPTING AUTHORITY PRIOR TO SUBMITTING COPIES TO OEQC.**

**APPROVING AGENCY OR ACCEPTING AUTHORITY:** COUNTY OF HAWAII PLANNING DEPARTMENT

**ADDRESS:** 25 AUPUNI STREET  
HILO, HAWAII 96720

**CONTACT:** VIRGINIA GOLDSTEIN, PLANNING DIRECTOR **PHONE:** 961-8288

**PROPOSING AGENCY OR APPLICANT:** CHALON INTERNATIONAL OF HAWAII, INC.

**ADDRESS:** P.O. BOX 249  
HAWAII, HAWAII 96719

**CONTACT:** MATTHEW GRADY-PLANNER, / DUANE KANUHA-VICE PRESIDENT **PHONE:** 889-6257 / 934-7033

**CONSULTANT:** \_\_\_\_\_

**ADDRESS:** \_\_\_\_\_

**CONTACT:** \_\_\_\_\_ **PHONE:** \_\_\_\_\_

**COMMENT PERIOD END DATE:** JULY 23, 1994

**CONDITIONS WHICH TRIGGERED THE EIS LAW:**

**PLEASE CHECK ALL THAT APPLY TO THE PROPOSED ACTION.**

Use of State or County lands or funds  
HRS 343-5(a)(1)

Use of lands in the Waikiki Special District  
HRS 343-5(a)(5)

Use of Conservation District Lands  
HRS 343-5(a)(2)

Amendment to a County General Plan  
HRS 343-5(a)(6)

Use of Shoreline Setback Area  
HRS 343-5(a)(3)

Reclassification of Conservation Lands  
HRS 343-5(a)(7)

Use of Historic Site or District  
HRS 343-5(a)(4)

Construction or modification of helicopter facilities  
HRS 343-5(a)(8)

**OTHER CONDITIONS:**

Use of Special Management Area (City & County of Honolulu)

Other \* \_\_\_\_\_

\* If the project does not trigger HRS 343, please explain why document is being submitted to OEQC.

---

**SUMMARY** of the proposed action or project to be published in the OEQC Bulletin. Please submit it as a summary ready for publication. The description should be brief (300 words or less), yet provide sufficient detail to convey the full impact of the proposed action.

The applicant is proposing the establishment of an 8.6 mile long multi-purpose coastal trail within the district of North Kohala, Island of Hawaii. The proposed coastal trail will be located approximately 1 mile makai of the town of Hawi and extends from Lipoa Gulch near Hawi to Halawa Gulch near Halawa town. The proposal intends to provide a multi-purpose trail for mountain bicycles, horseback riding, hiking and jogging. The proposed coastal trail would consist of 6.9 miles of existing cane haul roads with the remaining 1.7 miles to be constructed to provide a continuous alignment by linking these cane haul roads together. Construction will utilize and maintain all existing soils as well as the existing topography. The coastal trail will have a maximum total width of 8 feet with a tread surface of natural and packed clinker (decomposed basaltic rock) and/or wood chips, depending on the intended use. Where the trail crosses gulches, a cement ford crossing at existing grade may be constructed to limit erosion. The trail alignment will be located a minimum of 50 feet mauka of the cliff edges.

Six parking areas at points along the coastal trail will be provided at total buildout of the project. The coastal trail will be open to the public daily from dawn to dusk. Arrangements with the applicant can be made to allow access for nighttime fishermen. Associated improvements, such as improved access roads and portable restroom facilities, will also be provided

**NOTE:** Since the deadline for EIS submittal is so close to the publication date for the OEQC Bulletin, please assist us by bringing the Document for Publication Form and a computer disk with the project description (size 3 1/2" or 5 1/4" disk are acceptable; preferably WordPerfect 5.1 or ASCII text format) to the Office of Environmental Quality Control as early as possible. Thank you.

Stephen K. Yamashiro  
Mayor



Virginia Goldstein  
Director

Norman Olesen  
Deputy Director

RECEIVED

County of Hawaii '94 JUN 13 P243

PLANNING DEPARTMENT

25 Aupuni Street, Room 109 • Hilo, Hawaii 96720-4252  
(808) 961-8288 • Fax (808) 961-9615

June 9, 1994

Mr. Brian J. J. Choy, Director  
Office of Environmental Quality Control  
220 South King Street, 4th Floor  
Honolulu, Hawaii 96813

**CERTIFIED MAIL**

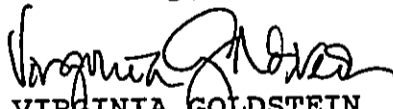
Dear Mr. Choy:

Subject: Draft Environmental Assessment (EA) for the  
Construction & Operation of a Private 8.5 mile long  
Multi-Purpose Trail for Recreational Purposes including  
access roads, parking areas and restrooms.  
Applicant: Chalon International of Hawaii, Inc.  
Tax Map Key: 5-3-06: Por. 21, 5-3-07: Pors. 1 & 10,  
5-4-08: Por. 1, 5-4-09: Por.1 and 5-5-08: Por. 13

The County of Hawaii Planning Department has reviewed the draft  
environmental assessment for the subject project, and anticipates  
a negative declaration determination. Please publish notice of  
availability for this project in the June 23, 1994, OEQC  
Bulletin.

We have enclosed a completed OEQC Bulletin Publication Form and  
four copies of the draft Environmental Assessment as required.  
Please contact Daryn Arai or Rodney Nakano of this office should  
you have any questions.

Sincerely,

  
VIRGINIA GOLDSTEIN  
Director

DSA:pak  
LChalo04.DSA

Enclosure - (4) copies/Environmental Assessment

cc: West Hawaii Office  
Chalon International of Hawaii, Inc.

Stephen K. Yamashiro  
Mayor



Virginia Goldstein  
Director

Norman Olesen  
Deputy Director

County of Hawaii

PLANNING DEPARTMENT  
25 Aupuni Street, Room 109 • Hilo, Hawaii 96720-4252  
(808) 961-8288 • Fax (808) 961-9615

'94 APR -4 A8:49

March 24, 1994

Mr. Takeshi Okumura  
Mr. Michael Gomes  
Chalon International of Hawaii, Inc.  
P. O. Box 249  
Hawi, HI 96719

Dear Mr. Okumura & Mr. Gomes:

Special Management Area Use Permit Application (Incomplete)

Applicant: Chalon International of Hawaii, Inc.

Request: Construction & Operation of a Private 8.5 mile long  
Multi-Purpose Trail for Recreational Purposes including  
access roads, parking areas and restrooms.

Tax Map Key: 5-3-06: Por. 21, 5-3-07: Pors. 1 & 10, 5-4-08: Por. 1,  
5-4-09: Portion 1 and 5-5-08: Portion 13

We have received of your Special Management Area (SMA) Use Permit application, accompanied by an environmental assessment (negative declaration) of the proposed construction and operation of a multipurpose recreational trail and related improvements as required by Chapter 343, Hawaii Revised Statutes, relating to Environmental Impact Statements. Prior to commencing with the processing of the referenced SMA Use Permit application, this office must comply with the requirements of Chapter 343, H.R.S, as amended.

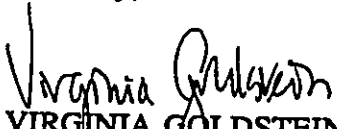
As the approving agency, our office must review the environmental assessment submitted with the application to determine its acceptability. Should the document be found acceptable, we will file the environmental assessment (negative declaration) with the Office of Environmental Quality Control for public review and comment for a period of thirty (30) days. There is also a 60-day period during which the public or other agencies may challenge the determination. Any concerns or issues raised during the review period need to be addressed by the applicant. These concerns/issues and the applicant's responses need to be incorporated within a Final Environmental Assessment-Notice of Determination to be once again filed with the OEQC for publication.

Mr. Takeshi Okumura  
Mr. Michael Gomes  
Page 2  
March 24, 1994

Upon compliance with the requirements of Chapter 343, H.R.S., we are able to commence with the processing of the SMA Use Permit Application. For your information, we received only two copies of the SMA Use Permit Application. Prior to commencing with the processing of the application, we will require that 16 copies of the SMA Use Permit Application be submitted to this office.

Please contact Daryn Arai or Susan Gagorik of this office should you have any questions.

Sincerely,

  
VIRGINIA GOLDSTEIN  
Planning Director

DSA:mjh  
LChalo03.DSA

xc: West Hawaii Office

~~CONFIDENTIAL~~