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November 27, 2006

Ms. Genevieve Salmonson, Director  
Office of Environmental Quality Control  
Department of Health  
State of Hawaii  
235 South Beretania Street, Suite 702  
Honolulu, Hawai'i 96813

RECEIVED  
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OFFICE OF ENVIRONMENTAL  
QUALITY CONTROL

Dear Ms. Salmonson:

**SUBJECT:** Acquisition of Existing Drainageway Lands Project  
Final Environmental Assessment and Negative Declaration Determination  
Kukuau, South Hilo, Hawai'i

The County of Hawai'i, Department of Public Works has reviewed the comments received during the 30-day public comment period which ended on November 8, 2006 and the Final Environmental Assessment (Final EA) completed for the subject project. The agency has determined that this project will not have significant environmental effects, and has issued a Negative Declaration, also referred to as a Finding of No Significant Impact (FONSI).

Please publish the notice of availability of this Final EA for this project in the December 8, 2006 issue of the Office of Environmental Quality Control's *The Environmental Notice*. We have enclosed a completed OEQC Publication Form, two (2) hardcopies of the Final EA, and a CD which has pdf files of the Final EA and the project summary.

If you have any questions on this matter, please contact Mr. Galen Kuba at 961-8422.

Sincerely,

  
Bruce C. McClure, P.E.  
Director of Public Works

Enclosures

cc: Ronald Sato, SSFM International, Inc.



# **FINAL** **ENVIRONMENTAL ASSESSMENT**

## **ACQUISITION OF EXISTING DRAINAGEWAY LANDS PROJECT**

NOVEMBER 2006

PREPARED FOR:  
COUNTY OF HAWAII  
DEPARTMENT OF PUBLIC WORKS



PREPARED BY:  
SSFM INTERNATIONAL INC.



**FINAL  
ENVIRONMENTAL ASSESSMENT  
FOR  
ACQUISITION OF EXISTING DRAINAGEWAY  
LANDS PROJECT**

**HILO, HAWAII**

**NOVEMBER 2006**

*PROPOSING AGENCY:*



Department of Public Works  
County of Hawai'i  
101 Pauahi Street, Suite 7  
Hilo, Hawai'i 96720-4224

*PREPARED BY:*



SSFM International, Inc.  
501 Sumner Street, Suite 620  
Honolulu, Hawaii 96817

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## CHAPTER 1 INTRODUCTION

### 1.1 PURPOSE FOR ENVIRONMENTAL ASSESSMENT

The County of Hawai‘i, Department of Public Works (DPW), Engineering Division, is proposing to acquire certain parcels of private property and easements which presently serve as an existing unlined drainageway and detention basin. This drainageway and basin serve the existing Mohouli Subdivision located in the town of Hilo on the Island of Hawai‘i. This project is referred to as the “Acquisition of Existing Drainageway Lands Project.”

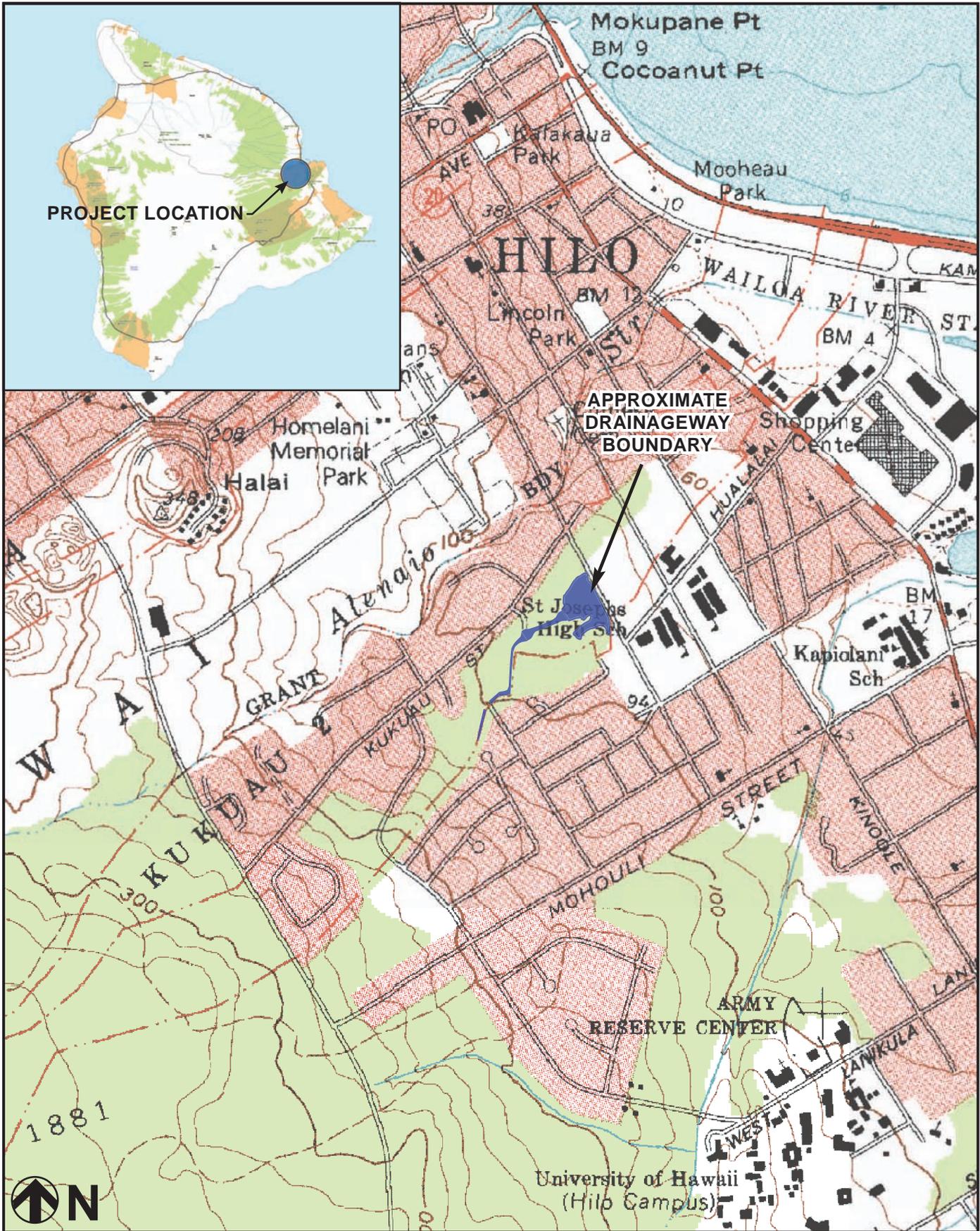
The Mohouli Subdivision housing project initially installed a 54-inch culvert within a drainageway as part of its development. This culvert discharges runoff from Ho‘opuni Way across Popolo Street and into a depression area situated inland (mauka or west) of Kapi‘olani Street. This drainage system was established as a temporary solution since drywells could not be utilized for the subdivision development. The County DPW is now planning to acquire certain privately-owned properties and easements for drainage purposes to formally establish this existing drainage system.

This land acquisition project for drainage purposes presently involves a total of 16 privately-owned parcels with various ownerships. These parcels and affected areas are discussed in greater detail in Chapter 2. Figure 1.1 shows the project’s location and general vicinity on the island. A summary of pertinent project related information is provided in Table 1.1. The parcels potentially affected by the acquisition of either entire lots or easements are identified below:

- (3) 2-04-025: 048 – 050, 052, 053, 059, 067, 078, 080, 093, 106 – 110, and 115.

The Project will thus involve the use of County funds for the acquisition of parcels or portions of parcels for easements associated with the existing drainageway. This project is therefore subject to State environmental documentation requirements.

A Draft Environmental Assessment (Draft EA) prepared in conformance with State regulatory requirements was published in the October 8, 2006 issue of the State Office of Environmental Quality Control’s *The Environmental Notice*. The 30-day public comment period for the review of that Draft EA ended on November 8, 2006. This Final Environmental Assessment (Final EA) was prepared based upon the comments received on the Draft EA, and a Negative Declaration, also referred to as a Finding of No Significant Impact (FONSI), is consequently being issued for this project.



**PROJECT LOCATION  
AND GENERAL VICINITY MAP**

**Figure 1.1**

Acquisition of Existing Drainageway Lands Project  
Department of Public Works, County of Hawaii

Source:  
Delorme 3-D Topo Quads



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**Table 1.1 Summary Information**

<b>Project Name:</b>	Acquisition of Existing Drainageway Lands Project
<b>Proposing Agency:</b>	Department of Public Works County of Hawaii 101 Pauahi Street, Suite 7 Hilo, Hawai'i 96720-4224 Contact: Mr. Bruce McClure, P.E., Director
<b>Agency's Consultant:</b>	SSFM International, Inc. 501 Sumner Street, Suite 620 Honolulu, Hawaii 96817 Contact: Mr. Ronald A. Sato, AICP
<b>Approving Agency:</b>	Department of Public Works, County of Hawaii
<b>Project Description:</b>	Acquisition of easements and parcels of an existing unlined drainageway and detention basin established as part of the development of the Mohouli Housing subdivision. Acquisition of these properties and easements would formally establish the County drainageway to serve such purpose since these are presently privately-owned properties by various individuals.
<b>Project Location:</b>	This drainageway is situated in the Hilo district of the Island of Hawai'i. The drainageway generally runs from Ho'opuni Way across Popolo Street and into a depression area situated inland (mauka or west) of Kapi'olani Street near the existing County Police Station.
<b>Existing Use:</b>	This existing drainageway and detention area consist of privately-owned property generally used for residential use or are undeveloped.
<b>Land Ownership:</b>	A total of 16 privately-owned parcels by various owners.
<b>Tax Map Key:</b>	(3) 2-4-025: 048 – 050, 052, 053, 059, 067, 078, 080, 093, 106 – 110, 115.
<b>Land Area:</b>	Total acreage for all the lots combined is 12.78 acres.
<b>State Land Use:</b>	Urban
<b>Zoning District:</b>	RS-7.5, RM-1
<b>SMA District:</b>	The properties and easements to be acquired are not located within the SMA area.

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The County DPW will serve as the Proposing Agency for this project. This project subsequently involves an "Agency Action" being undertaken by this department under the State's HEISL environmental regulations. As a result, the County DPW will serve as the "Approving Agency" for this Environmental Assessment which is issuing a Negative Declaration for the project.

## **1.2 LAND USE CLASSIFICATIONS AND DESIGNATIONS**

### **1.2.1 State Land Use Districts**

Under Chapter 205, HRS, all lands in the State of Hawaii are classified into four major land use districts (State Land Use Districts) which are the Urban, Rural, Agricultural, and Conservation districts (State of Hawaii, 2000). For each land use district classification, there are defined uses or activities permitted which are described under §205-2, HRS, and regulated by the State Land Use Commission.

The boundaries of these districts are shown on maps referred to as State Land Use District Boundary Maps. As the urban center for East Hawai‘i, the majority of lands in the Hilo community are predominantly designated as Urban District with outlying areas designated as Agricultural Districts.

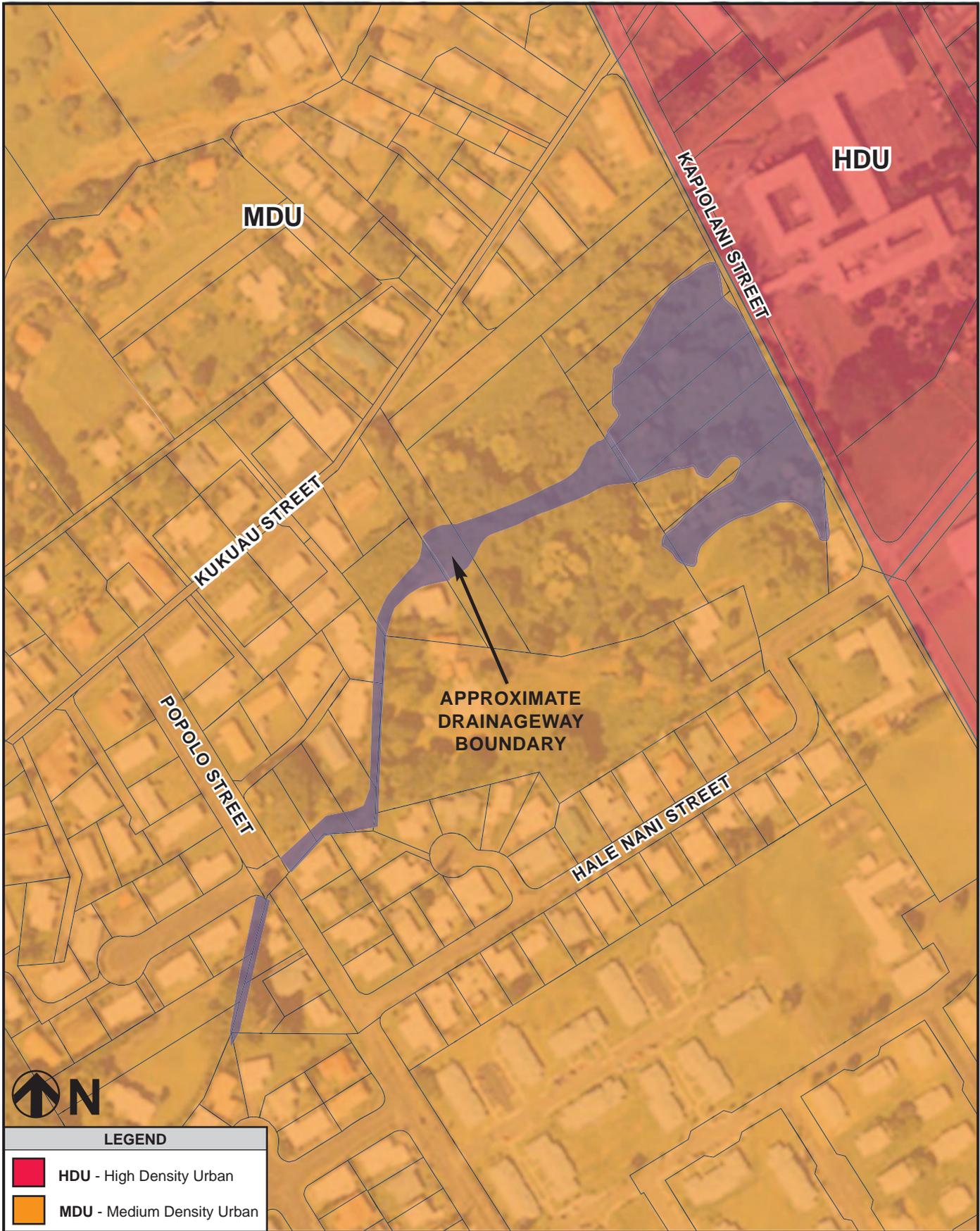
The properties designated for land acquisition (parcels and easements) and surrounding areas are all classified as “Urban District” on the State’s Land Use District Boundary Map for Hilo (Map H-66). Activities or uses permitted within this Urban District are provided by ordinances or regulations of the County within which the Urban District is situated. Thus, the subject properties and surrounding area are regulated by the ordinances and regulations of the County of Hawai‘i.

### **1.2.2 County of Hawai‘i General Plan**

The *County of Hawai‘i General Plan* adopted under Ordinance 05-25 serves as a policy document for the long-range comprehensive development of the island of Hawai‘i (County 2005). The County recently updated their *General Plan* from their 1989 version after undergoing public review.

Under the current *General Plan*’s Land Use Pattern Allocation Guide Map (LUPAG Map), the project area associated with this existing drainageway is designated as “Medium Density Urban”. Figure 1.2 shows the properties affected by the drainage area in relation to the County’s LUPAG Map boundaries. This Medium Density Urban designated area includes the entire block between Kapi‘olani Street, Mohouli Street, Komohana Street, and Ponahawai Street, which includes the project’s drainage area. The area makai, or seaward (east), of Kapi‘olani Street and the drainage area are designated as “High Density Urban”.

Medium Density Urban designated areas are established for village and neighborhood commercial uses, and single-family and multi-family residential uses and related functions. These urban centers and clusters provide physical, social, governmental and economic concentrations so that the total activities of the community can be more readily and easily conducted. In the County, several of these centers have political and social antecedents, while other areas have been influenced by economic activities (County 2005).



LEGEND	
	HDU - High Density Urban
	MDU - Medium Density Urban

**LAND USE PATTERN ALLOCATION  
GUIDE MAP**

**Figure 1.2**

*Acquisition of Existing Drainageway Lands Project  
Department of Public Works, County of Hawaii*

Source:  
(Aerial) NOAA 2000  
(GIS Data) County of Hawaii 2005



### **1.2.3 County of Hawai‘i Zoning District**

The properties to be acquired for establishing this drainageway are located in the South Hilo District of the Island of Hawai‘i. As a result, the County’s Zoning Districts for the Hilo area were reviewed to identify current zoning district classifications for affected properties and surrounding areas. Figure 1.3 shows the project area in relation to the County’s zoning districts.

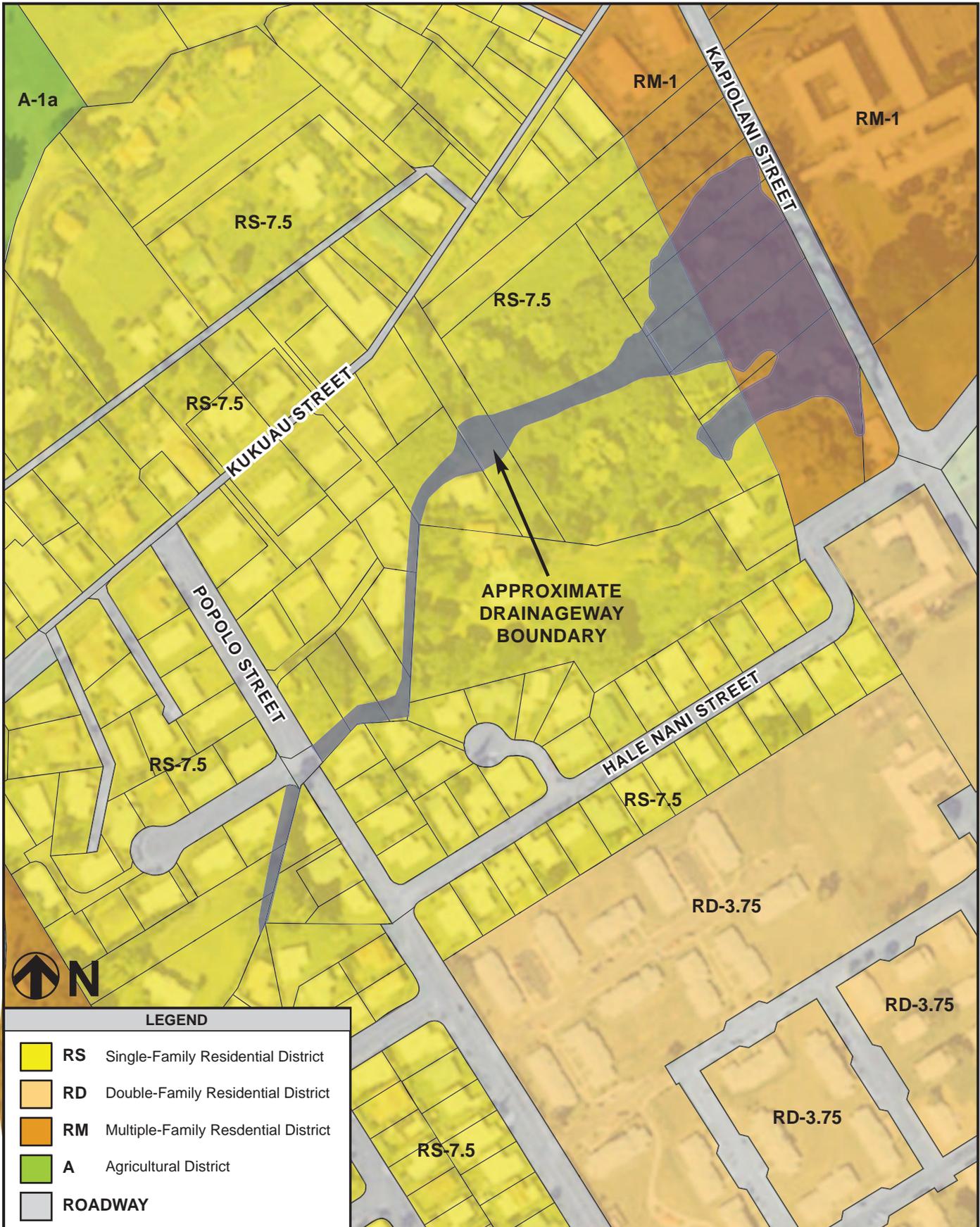
Based upon the zoning map information, the affected parcels are zoned as Single-Family Residential Districts, 7,500 square feet minimum lot size (RS-7.5), and Multi-Family Residential Districts, 1,000 square feet minimum dwelling unit size (RM-1). As shown on Figure 1.3, the majority of parcels are zoned RS-7.5 while portions of a few parcels along Kapi‘olani Street have multiple zoning with RM-1 as well.

The Single-Family Residential District provides for lower or low and medium density residential use, for urban and suburban family life. The Multi-Family Residential District provides for medium and high density residential use, and covers areas with full community facilities and services. It may occupy transition areas between commercial or industrial areas and other districts of less intense land use.

The formal establishment of the drainage easement and detention basin are permitted uses within these zoning districts. These zoning designations and its confirmation as a permitted use were also confirmed by the County Planning Department in their letter dated February 6, 2006 included in Appendix B.

### **1.2.4 Special Management Area**

Under Chapter 205A (Coastal Zone Management) of the Hawaii Revised Statutes, the County is given authorization to regulate land uses located within the established Special Management Area (SMA) for the Island of Hawai‘i. Review of the County of Hawai‘i’s Special Management Area Map for the South Hilo District determined that the properties and easements to be acquired are located outside of the SMA boundary in this area. This determination was also confirmed by the County Planning Department in their February 6, 2006 letter (Appendix B).



**COUNTY OF HAWAII ZONING MAP**

**Figure 1.3**

*Acquisition of Existing Drainageway Lands Project  
 Department of Public Works, County of Hawaii*

*Source:  
 (Aerial) NOAA 2000,  
 (GIS Data) County Office of Planning*



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## CHAPTER 2 PROJECT DESCRIPTION

### 2.1 PROJECT LOCATION AND VICINITY

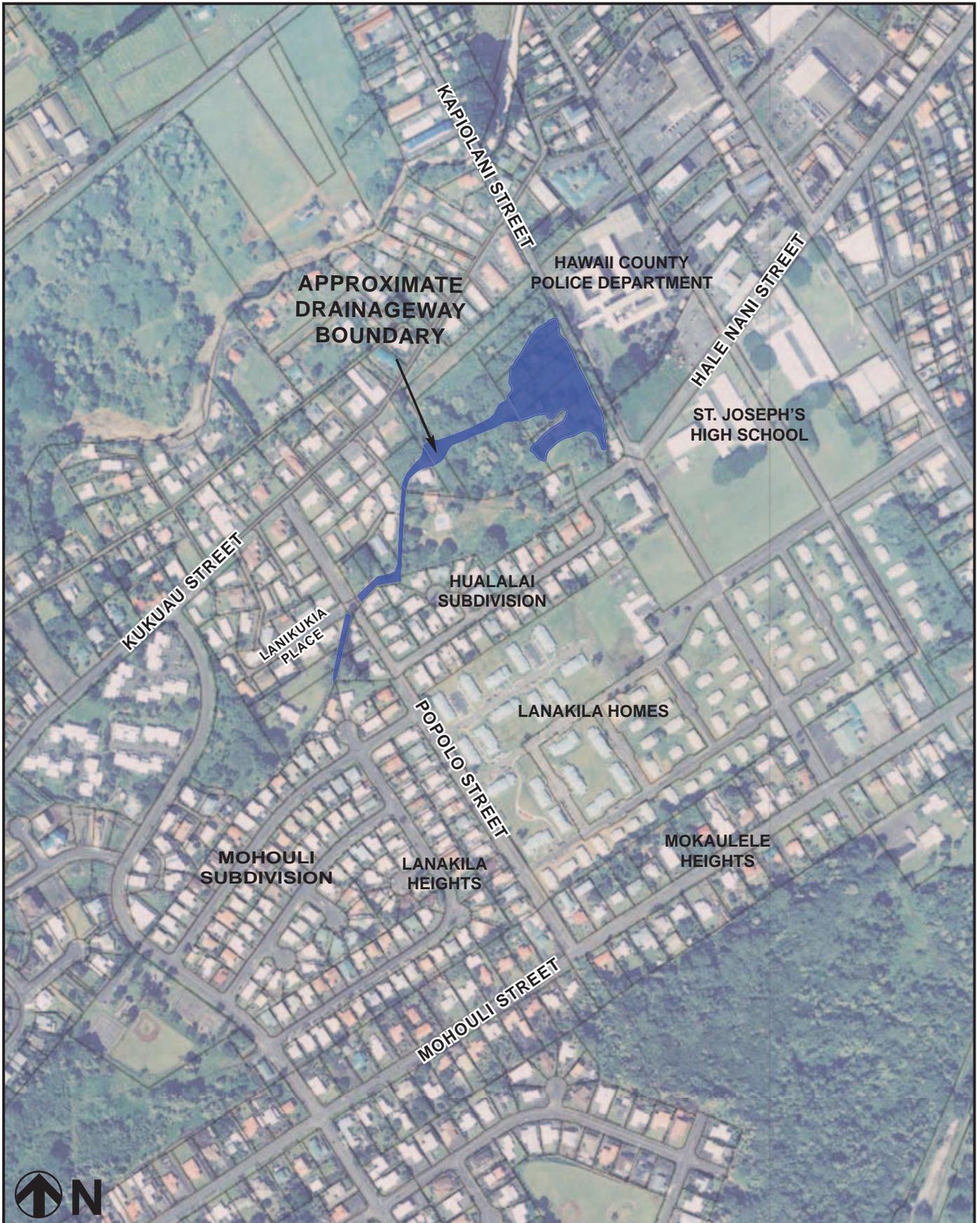
The affected properties are located on the eastern end of the Island of Hawai‘i in the Hilo District. Under the County’s *General Plan*, this district is divided into the North and South Hilo Districts. The project is located within the South Hilo District which generally includes the communities extending along the coastline from Hakalau on the north to Pana‘ewa on the south, and inland (mauka) up to the Hilo and Waiākea Forest Reserves. The project area is generally situated near the urban center of the town of Hilo which serves as the governmental headquarters for the County of Hawai‘i and business center for east Hawai‘i.

#### **Existing Surrounding Land Uses**

The surrounding area associated with the affected properties can be characterized as urban. This urbanized area consists of several residential subdivisions, the University of Hawai‘i-Hilo campus and its expansion area, and the commercial and business district of downtown Hilo, all of which are located within a 2-mile radius. The Waiākea Fishpond and Hilo Bay are located further north and east of the project site.

The areas immediately west, south, and north of the project’s drainage area are developed as residential subdivisions. The subdivisions in the area include Hualālai Subdivision, Mohouli Subdivision, Lanakila Homes, Lanakila Heights, Mokaulele Heights, and Wailoa Heights. Adjacent southeast of the project area along Kapi‘olani Street is St. Joseph Schools. The area immediately east (seaward or makai) of the drainage detention area includes the County’s police station headquarters.

The project site for the acquired parcels and easements being proposed is primarily on the block bordered by Kūkūau Street, Kapi‘olani Street, Hale Nani Street, and Pōpolo Street. Also included are properties along Lanikukia Place and across Pōpolo Street. There are multiple addresses and streets associated with this project. Figure 2.1 shows the project’s general drainage area route and existing surrounding uses in the immediate vicinity.



**EXISTING SURROUNDING USES MAP**

**Figure 2.1**

## 2.2 PROJECT SITE DESCRIPTION

The existing drainageway serving the Mohouli Subdivision, also referred to as the Mohouli Drainageway in this document, consists of an unlined drainageway running along several properties before settling in a detention area encompassing a few parcels along Kapi'olani Street. This drainageway begins from a drainage pipe at Ho'opuni Way which is situated at the end of a cul de sac for the Mohouli subdivision.

This culvert discharges runoff from this subdivision area into the Mohouli Drainageway which generally travels about 1,400 feet in a southwest to northeast (mauka to makai) direction to the detention area. A 24-inch drainage culvert is located within Kapi'olani Street near the southern end of this area to receive discharges. Figure 2.1 previously showed the general path of this drainageway.

### **Property Ownership Information**

The existing drainageway and detention area affect a total of 16 privately-owned properties. These properties consist of both undeveloped parcels and existing residential lots. Figure 2.2 shows the relation of the approximate drainageway boundary affecting these parcels which are identified based upon the Tax Map Key maps. As shown on this Figure, there are some parcels for which just a drainage easement will be acquired, and others for which larger areas of property will be acquired. The properties are identified as:

- (3) 2-04-025: 048 – 050, 052, 053, 059, 067, 078, 080, 093, 106 – 110, and 115.

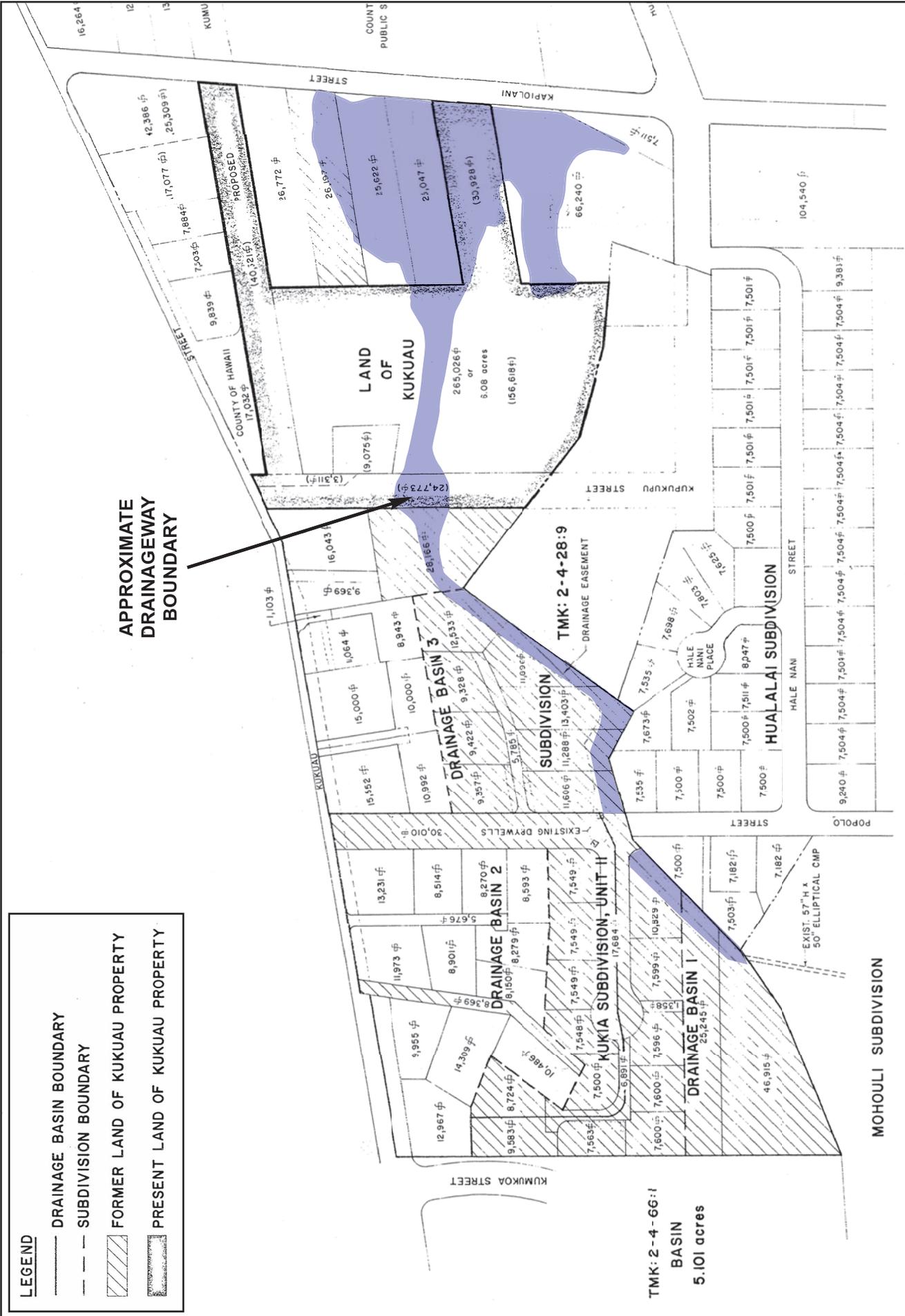
### **Hydrological Conditions Associated With Drainageway**

The existing drainageway is within the larger drainage basin area which generally flows into Alenaio Stream before eventually discharging into Hilo Bay. A drainage study titled *Revision to a Hydrological Study Involving the Land of Kukuau* conducted in 1988 analyzed the drainage basins contributing to the Mohouli Drainageway (JHK Tanaka, Inc., 1988).

Based upon this study, six drainage basins were identified of which five contributed runoff to the Mohouli Drainageway which eventually ended up in the Land of Kukuau drainage basin. This Land of Kukuau drainage basin consists of the properties serving as the detention area which are the subject of this lands acquisition project by the County DPW. Figure 2.3 shows the three drainage basin areas in the immediate vicinity of the Mohouli Drainageway which flow into the Land of Kukuau detention area.

Three of the drainage basins, which are not shown on Figure 2.3, are located mauka (west) of the Mohouli Drainageway project area. These basins identified consisted of the: 1) Mokaulele Heights Houselots Basin; 2) Mohouli Subdivision Basin; and 3) TMK: 2-04-066: 001 Basin. A brief summary of these basins is provided below.





**Figure 2.3**

**DRAINAGE BASINS SERVING PROJECT DRAINAGEWAY**



Source:  
JHK Tanaka Inc. (1988)

Acquisition of Existing Drainage Way Lands Project  
Department of Public Works, County of Hawaii

1. Mokaulele Heights Houselots Basin. This 8.1-acre basin serves residential homes associated with this subdivision, and storm water continues to flow towards the Mohouli Subdivision drainage system via Kumukoa Street.
2. Mohouli Subdivision Basin. This basin consists of 25.9 acres associated with the Mohouli Subdivision. Storm water from this subdivision is directed to the Mohouli Drainageway from a drainage pipe at Ho'opuni Way.
3. TMK: 2-04-066: 001 Basin. This basin consists of 5.0 acres serving a 14-lot residential subdivision (2.8 acres) and an undeveloped remnant parcel (2.2 acres). Surface runoff from only 1.1 acres of the subdivision flows toward the Mohouli Drainageway and thus to the Land of Kukuau basin. Runoff from the other area is directed toward Kumukoa Street which has a drainage system within that roadway. Within the 2.2 acres remnant parcel, runoff from 1.7 acres is directed toward the Mohouli Drainageway.

A summary of the three drainage basins shown on Figure 2.3 is provided. These basins were identified as: 1) Drainage Basin 1; 2) Drainage Basin 2; and 3) Drainage Basin 3.

1. Drainage Basin 1. This basin includes 13 residential lots associated with the Kukia Subdivision, Unit II and two lots situated south them. A basin area of about 3.4 acres from these parcels contributes surface runoff to the Mohouli Drainageway.
2. Drainage Basin 2. This basin consists of the remainder of Kukia Subdivision, Unit 11 which are residential lots bounded by Kumukoa Street, Kukuau Street, and Popolo Streets. The total area of this basin is 5.2 acres, and surface runoff is directed toward Popolo Street which has two drywells. Consequently, this basin will not contribute surface runoff to the Mohouli Drainageway.
3. Drainage Basin 3. This basin extends from the mauka right-of-way of the formerly planned Kupukupu Street extension to the makai right-of-way of Popolo Street, and from Kukuau Street southeast to the Hualalai Subdivision and parcel identified as TMK: 2-04-028: 009. The total area of the basin is about 5.1 acres, and surface runoff is directed to the Mohouli Drainageway.

Finally, the Land of Kukuau area shown on the figure essentially serves as another drainage basin for receiving and detaining the runoff water from the Mohouli Drainageway. The 1988 drainage study determined that five of the six basins would contribute surface runoff to the Mohouli Drainageway which eventually discharges into the Land of Kukuau Basin area. The total contributory area was estimated to be about 45.3 acres and the total flow quantities estimated was 375 cubic feet per second (cfs) based upon a 100-year storm. Of this total, the majority of runoff is due to the Mohouli Subdivision development. A summary of these surface runoff flow quantities is provided below.

**Summary of Runoff Flows from Drainage Basins**

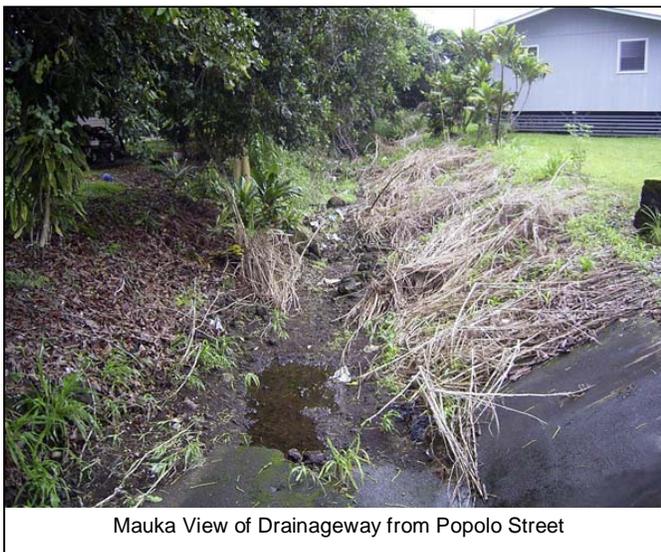
Drainage Basin Description	Basin Area (Acres)	Flow Quantity (cfs)
1. Mokaulele Heights Houselots Basin	8.1	64
2. Mohouli Subdivision Basin	25.9	233
3. TMK: 2-04-066: 001 Basin	2.8	16
4. Drainage Basin 1	3.4	26
5. Drainage Basin 3	5.1	36
Totals	45.3 acres	375 cfs

**Existing Drainageway Conditions**

The Mohouli Drainageway’s condition is described as three separate segments. The first segment involves the discharge point from the Mohouli Subdivision downstream to Popolo Street. The second segment is the drainageway’s path downstream along several existing residential lots up to a road serving as a driveway for a lot. The last segment consists of the drainageway’s path from this road to the detention area along Kapi’olani Street.

*Part 1. Mohouli Subdivision*

The upstream portion of the drainageway begins from the discharge point from the drainage pipe serving Ho’opuni Way of the Mohouli Subdivision. Storm water from Hoopuni Way is directed through a 57-inch high by 50-inch wide elliptical corrugated metal pipe to an existing excavated trapezoidal unlined drainage channel. This drainage channel is routed in a northeast direction about 290 feet to Popolo Street. It was designed to be about 10 feet wide at the base and 26 feet wide to the top of both embankments<sup>1</sup>. Near Popolo Street, this channel appears to be about 3 to 4 feet deep as shown on the exhibit (see photo ►).



Mauka View of Drainageway from Popolo Street

A concrete box culvert about 60 feet long was privately constructed to direct storm water under Popolo Street. The inlet headwall for this box culvert is 3 feet high by 10 feet wide on the mauka end and the outlet headwall is 25 feet wide.

Photos of these headwalls are included in the exhibit below. There are also two existing drywells located within Popolu Street in this area to collect storm water along this road.

<sup>1</sup> Information based upon partial construction plans for Popolo Street box culvert provided by County DPW.



Part 2. Drainageway Path Along Residences

From this box culvert, the man-made excavated trapezoid drainageway continues in the northeast (makai) direction along several existing residential properties as previously shown on Figures 2.1 and 2.2. Areas for drainage easements have already been established as shown on the Tax Map (Figure 2.2). This drainageway is about 5 feet deep, and 4 to 5 feet wide at the base. Between the top of each embankments, the drainageway width varies between about 8 and 12 feet due to heavy growth of vegetation. Some parcels where the drainageway runs thru are extensively overgrown with vegetation.

A couple properties along this drainageway, identified as TMK 2-04-025: 106 and 107, have constructed rock walls to protect their residence from flooding which occurs during heavy rains (see photo exhibit ►). Discussion with the owners indicated storm water in this drainageway has risen up to their home causing concerns for flooding of their residence. Concerns were expressed over a lot of rubbish being transported down this drainageway coming from inland areas which they've had to clean up. They've also indicated that there have been occasions where the flood water takes days to recede causing health concerns and insect (mosquitoes) problems. They suspect this problem is due to excessive vegetation growth downstream. Owners below (makai) this area have periodically cleared vegetation on their property to help address this problem, but routine maintenance has been difficult to achieve.



Further makai, this drainageway is generally routed through the center of a large parcel identified as TMK 2-04-025: 059. The path of this drainageway appears to follow a former man-made trapezoid earth channel based upon an available topographic map of the area. A walk through of this drainageway did identify this path with embankments which was covered with heavy vegetation. Figure 2.4 identifies this drainage channel's route through the lower properties up to Kapi'olani Street.

The drainageway then passes under a privately-owned paved access road serving as a driveway extending from Kukuau Road, and is identified as TMK 2-04-025: 080. Three 36-inch corrugated metal pipes were constructed as part of this access road to transport storm water under it. The top of this roadway is about seven feet tall, and a photo exhibit showing these pipes is provided.

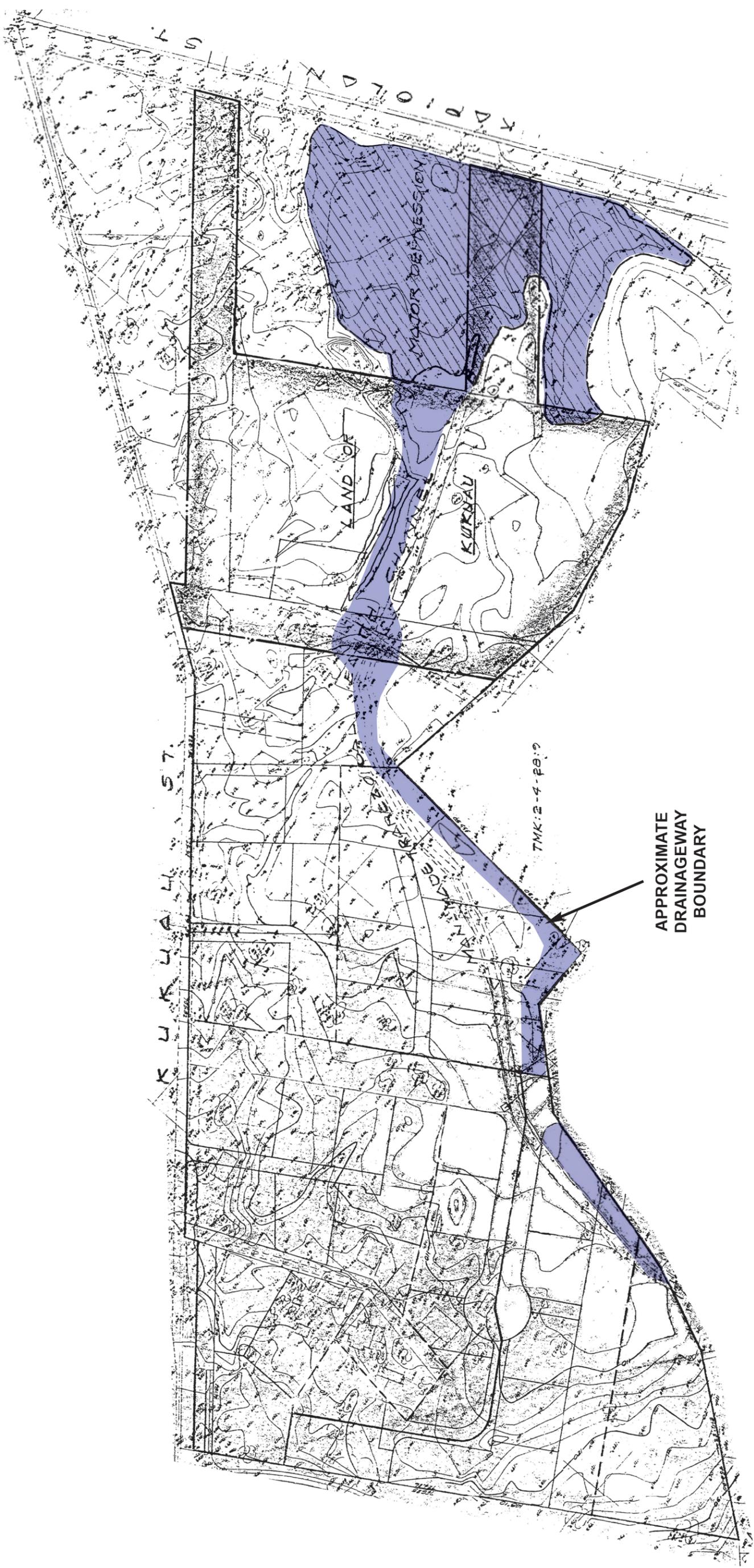


Part 3. Drainageway Path to Detention Area

Downstream of this driveway, the excavated drainageway enters the Land of Kukuau Basin and is generally routed through the center of a large parcel before settling in a low lying area covering several parcels as previously shown on Figure 2.4. These parcels are heavily overgrown with vegetation and trees. A *Land of Kukuau Drainage Study* identified a proposed inundation area through Parcels 080 and 048 (P. Yoshimura, Inc., October 1988). Figure 2.5 shows the proposed flood area thru these parcels.

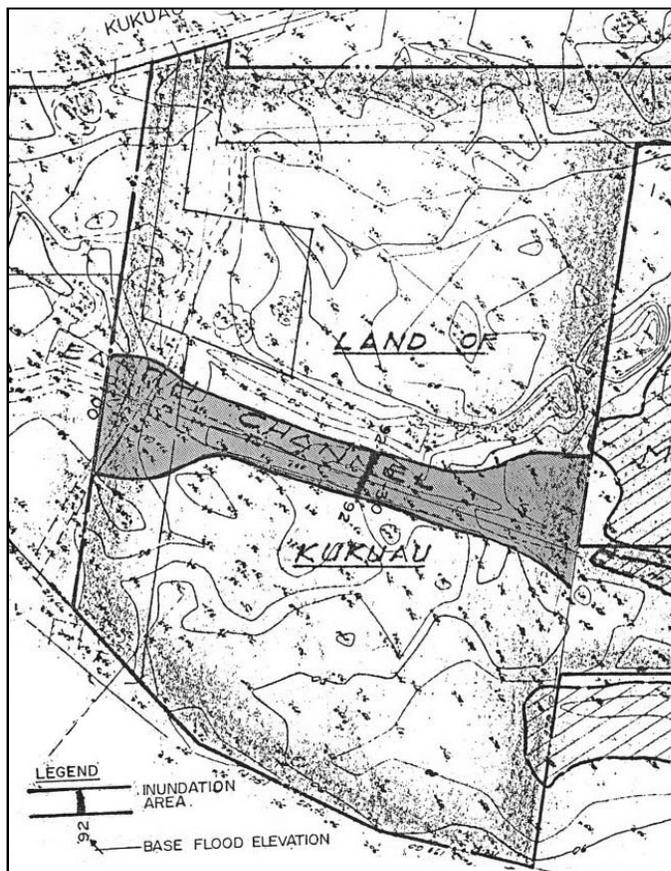
Based upon this study, the three existing drainage pipes within the driveway (Parcel 080) would not be sufficient to accommodate the projected 375 cfs storm water during a 100-year storm. Storm water would overflow over this privately owned road, and then travel in a more confined path within the drainageway before dispersing within the other downstream parcels.

The final area of this drainageway consists of a large property and several smaller rectangular shaped properties along Kapi'olani Street which presently serve as a detention basin for storm water due to their relatively flat topography and lower elevations as shown on Figure 2.4. These parcels are heavily vegetated with various non-native alien species of trees, shrubs, herbs, vines and ferns. A natural pāhoehoe bedrock formation also runs in a northeast (makai) direction just downstream of the driveway towards Kapi'olani Street. This bedrock "wall" formation creates a natural barrier directing storm water into lower lying areas to the south.



**TOPOGRAPHIC MAP SHOWING DRAINAGEWAY**

**Figure 2.4**



**Figure 2.5. Estimated Drainageway Through  
Parcels 048 & 080**

Source: P. Yoshimura, Inc., October 1988

With construction of Kapi‘olani Street, this roadway was elevated and currently functions as a “dam” effectively detaining storm water within these undeveloped parcels where it infiltrates into the lava ground. Kapi‘olani Street is situated at an elevation of about 88 feet mean sea level (msl), and some of the low points within these parcels are about 80 feet msl. Thus, the road is elevated between approximately 5 to 8 feet above these parcels. A 24-inch culvert is located at Parcel 049 to collect storm water and discharge it across Kapi‘olani Street where it connects to the County’s existing system.

### 2.3 PROJECT NEED AND OBJECTIVES

#### Project Background

The need for this Mohouli Drainageway is due to the construction of the Mohouli subdivision in the early 1970s by the former State Hawai‘i Housing Authority (now the Housing and Community Development Corporation of Hawai‘i). Drainage improvements to serve this subdivision was initially planned to consist of a culvert system connecting to the then planned realignment of Kukuau Street. The Kukuau Street improvements would have included a new drainage system that would redirect flows from the Mohouli subdivision, through the proposed Popolo Street extension, and then along Kukuau Street and Kapi‘olani Street for eventual discharge. However, this roadway project was cancelled by the County.

The State Hawai‘i Housing Authority (HHA) initially wanted to construct a culvert system and utilize dry wells as a temporary drainage improvement until the planned Kukuau Street drainage improvements were built. However, further testing by the State determined that dry wells were not feasible to construct. Therefore, an open drainage channel with ponding area was developed as a solution.

The State HHA constructed a 54-inch culvert within a 10-foot-wide drainageway through a residential lot at the end of Ho‘opuni Way (TMK: 2-04-059: 128). This culvert discharged storm water runoff into an open channel constructed within the adjoining private property that eventually flowed westerly (makai) into a drainageway which emptied into a depression area serving as a natural detention area (TMK 2-04-025: 050, 052, and 093).

For some unknown reason, the County became directly involved in the construction of the drainage system serving the Mohouli subdivision. Their participation included conducting a topographic study of various parcels affected by the drainageway, and designing a box culvert to direct flows across Popolo Street. This box culvert was privately constructed by SEI Lands, Inc. as part of their Kukia Subdivision, Unit II. At that time the County believed these improvements would be temporary since a new drainage system would be installed with the completion of the Kukuau Street improvement project planned. This drainageway then continued in use due to the cancellation of the roadway project.

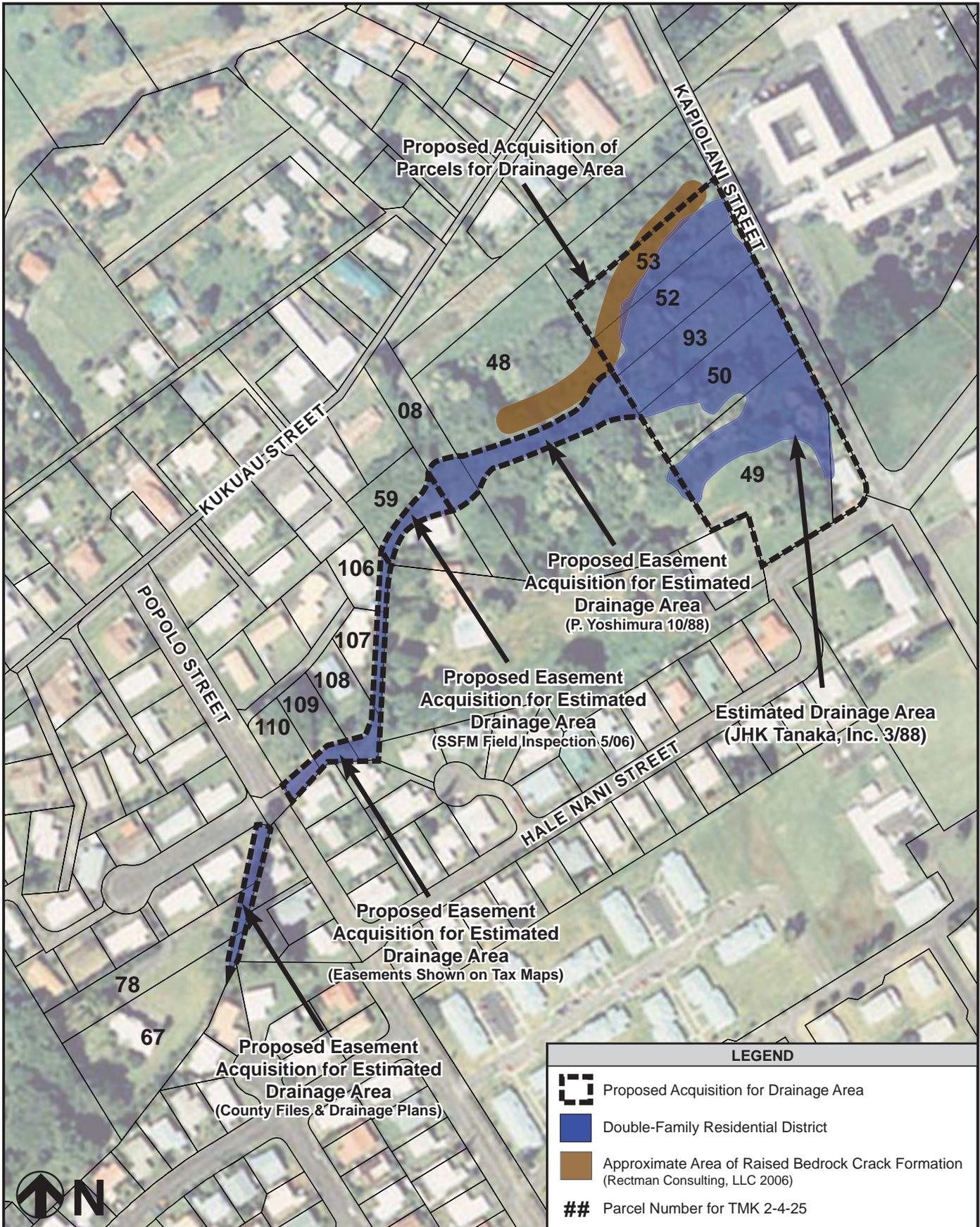
### **Project Need And Objective**

The acquisition of the drainage easements and certain properties is needed for the County of Hawai‘i to formally take ownership and jurisdiction over this existing drainageway. The drainage easements and properties are privately-owned, thus, the owners are presently responsible for their respective portions of the drainageway and for its maintenance. Acquisition of the drainage easements would allow owners to be properly compensated, and relieve them of from its maintenance.

Existing drainage conditions have also prevented certain property owners in the Lands of Kukuau drainage basin to develop their properties. The feasibility to develop those lots due to these drainage conditions along with the potential effects resulting from their development have made it difficult for owners to utilize these parcels. Consequently, acquisition of these parcels by the County would relieve these owners from this situation, and allow them to use the proceeds from the acquisition in another manner.

## **2.4 PROJECT DESCRIPTION**

The project consists of the acquisition of the existing drainageway (referred to as the Mohouli Drainageway) created several years ago to serve the Mohouli subdivision. Thus, the County of Hawai‘i will be acquiring privately-owned property consisting of easements and certain properties associated with the detention area serving this drainageway. Figure 2.6 shows the estimated area associated with this Mohouli Drainageway.



**ESTIMATED DRAINAGEWAY BOUNDARY**

**Figure 2.6**

Acquisition of Existing Drainageway Lands Project  
 Department of Public Works, County of Hawaii

Source:  
 (Aerial) NOAA 2000  
 (GIS Data) County of Hawaii 2005



As shown on Figure 2.6, the estimated area associated with the Mohouli Drainageway encompasses several properties. This drainageway area was estimated based upon existing drainage studies, a field inspection of the area, and available maps. A total of approximately 4.75 acres (about 206,760 square feet) involving 16 parcels are proposed for some type of acquisition by the County for this drainageway. Table 2.1 summarizing the planned acquisition of property is provided below.

<b>Table 2.1 Summary of Property Planned for Drainageway Acquisition</b>					
	<b>Tax Map Key</b>	<b>Listed Property Owner (per County Proper Tax Records)</b>	<b>Lot Size (sf)</b>	<b>Estimated Area of Acquisition (sf)</b>	<b>Comments</b>
1.	2-4-025: 048	Boschetti, Giampaolo	165,702	5,500	Estimated drainage easement
2.	2-4-025: 049	Peroff, Valentine Jr. et al	66,240	*66,240	Possible acquisition of entire parcel or portion
3.	2-4-025: 050	Boschetti, Giampaolo	30,928	*30,928	Possible acquisition of entire parcel or portion
4.	2-4-025: 052	Oda/McCarty Architects, Ltd.	25,622	25,622	Acquisition of entire parcel
5.	2-4-025: 053	O'Sullivan, Joseph & Monica Ann	25,622	*25,622	Possible acquisition of entire parcel or portion
6.	2-4-025: 059	Paiva, George & Richard	28,166	2,175	Estimated drainage easement
7.	2-4-025: 067	Realpe, Helen Queja & Jaun Manuel	46,915	11,100	Estimated drainage easement
8.	2-4-025: 078	Realpe, Helen Queja & Jaun Manuel	25,245	2,175	Estimated drainage easement
0.	2-4-025: 080	Boschetti, Giampaolo	24,773	16,800	Estimated drainage easement
10.	2-4-025: 093	Oda/McCarty Architects, Ltd.	25,047	25,047	Acquisition of entire parcel
11.	2-4-025: 106	De Costa, Reynold I. TR et al	12,533	3,150	Existing drainage easement on TMK Map
12.	2-4-025: 107	De Costa, Reynold I. TR et al	11,896	4,915	Existing drainage easement on TMK Map
13.	2-4-025: 108	Yago, Clarito G. & Perlita P.	13,403	3,611	Existing drainage easement on TMK Map
14.	2-4-025: 109	Hatada, Wesley K. & Gayle M.	11,388	3,007	Existing drainage easement on TMK Map
15.	2-4-025: 110	Hatada, Wesley K. & Gayle M.	11,606	3,278	Existing drainage easement on TMK Map
16.	2-4-025: 115	Yamamoto, Bruce Y. & Lau, Gwen TR	10,829	3,212	Existing drainage easement on TMK Map
* Areas are conservatively reflecting entire parcel at this time, but could only involve a portion to be determined based upon future discussions between the County and owner.					

A survey of this drainageway within properties would be conducted to formally identify and locate the boundaries of the drainage easements to be acquired. This survey would be conducted at a later time by the County when they start for process for property acquisition. Some parcels may be acquired in their entirety or just consist of portions of them. Negotiations with the property owners would be conducted by the County to resolve these details.

Most of the properties acquired would consist of drainage easements of which some have already been established for certain parcels based upon existing Tax Maps. The width of these existing drainage easements shown on the Tax Maps are about 25 feet wide. Based upon field observations, the present unlined drainage channel routed along these properties appears to be generally confined within a between 8 to 12 feet wide. Thick vegetation was present along the southern boundary of this drainageway. As a result, the actual easement could be less than that presently shown on the Tax Maps.

The lower half (western or makai) of the drainageway is not as confined as it disperses thru larger parcels before eventually spreading out over several parcels along Kapi'olani Street serving as a detention area. Existing drainage studies and a survey map for these areas generally show that the flow is somewhat confined within a path via a man-made trapezoidal earth channel. Earth berms associated with this channel were overgrown with vegetation, but were generally visible based upon a walk thru of the area. Thus, a drainage easement acquired would generally be routed through the center of a few parcels.

A raised bedrock crack formation present within several of the western (makai) properties appears to create a natural berm directing the storm water runoff to other lower lying properties to the south. The existing topography of these parcels creates a natural detention area for the runoff. Kapi'olani Street was constructed at a higher elevation also forming a dam along these parcels. Storm water thus appears to settle over several parcels in this area. Parcels 52 and 93 are planned to be acquired in their entirety. Other parcels (50, 53, and 49) may also be acquired in its entirety, or may only consist of a portion of the property. Actual areas would be determined based upon future discussions between the County and owners after further surveying work for the drainageway is completed.

### **Development Schedule and Estimated Costs**

The County of Hawai'i, Department of Public Works plans to initiate the process to begin acquisition negotiations with property owners after completion of the Environmental Assessment review process. This would involve conducting further surveying work to more formally delineate the drainageway boundary so specific areas can be better identified. As a result, this process will likely begin in January 2007. Completion of the acquisition of all subject properties and easements may take up to two (2) years, so a completion date of January 2009 is planned.

The estimated land acquisition costs for this project is \$1.5 million in 2006 dollars. The County of Hawai'i is the expending agency for this project.

### **Listing of Required Permits**

There are no entitlements or other forms of discretionary land use approvals required for this project. This project only involves the acquisition of existing parcels or easements to serve an existing drainageway. As a result, there would be no construction activities conducted under this project. Consequently, other types of ministerial permits would also not be required.

## **2.5 ALTERNATIVES CONSIDERED**

Alternatives considered to the proposed land acquisition for the existing Mohouli Drainageway project consisted of: 1) not implementing the project (No Action Alternative), and 2) constructing an alternative drainage system along Kūkūau Street.

In summary, the No Action alternative was eliminated from further consideration, because it would not adequately address the project need and objectives compared to proceeding with the proposed land acquisitions. The Kūkūau Street drainage system alternative was eliminated from further consideration because it is less economically feasible and practicable for the County compared with proceeding with the proposed land acquisitions.

### **No Action Alternative**

The No Action Alternative would involve not proceeding with the acquisition of parcels and easements associated with the existing drainageway. This alternative would subsequently require existing property owners to continue being responsible for the drainageway and its maintenance. This would negatively impact property owners because they would continue to be responsible for a drainageway created to serve the State HHA's Mohouli Subdivision development. This drainageway should more appropriately be under the jurisdiction of the County due to prior efforts in the 1970s supporting its establishment for the State HHA.

The present drainageway conditions have also prevented some property owners along Kapi'olani Street from developing their lots due to drainage issues. This situation has made it difficult for some owners to utilize their parcels. Acquisition of these parcels by the County would relieve these owners from this situation, and allow them to use the proceeds from the acquisition in another manner.

Consequently, this alternative was eliminated from further consideration because it would not properly address the project's need and objectives. Property owners would be negatively affected.

### **Kūkūau Street Drainage System Alternative**

This alternative considered constructing drainage facilities within Kūkūau Street to collect storm water runoff from the Mohouli Subdivision. This alternative essentially involved implementing portions of the Kūkūau Street drainage improvements planned back in 1973. However, necessary design changes to those plans were considered under this alternative due to existing site and roadway conditions along the route that were not present in 1973.

The drainage system improvements would have redirected flows from the Mohouli Housing Project along the existing Kūkūau Street, onto Kapi‘olani Street, and eventually discharging at the Alenaio Stream Bridge. Based upon these drainage improvements for Kūkūau Street, it was estimated that the construction costs for these drainage improvements would be about \$3.4 million (in 2006 dollars).

Consequently, this alternative was eliminated from further consideration because the costs to implement these improvements in Kūkūau Street would not be economically feasible or practicable for the County. The costs would be more than double the costs to acquire the planned properties and easements.

## CHAPTER 3 PHYSICAL AND BIOLOGICAL ENVIRONMENT

This chapter describes the existing surrounding environment in the vicinity of the drainageway project area. The probable environmental impacts associated with the acquisition of property associated with this drainageway are discussed, and mitigative measures are identified if necessary.

### 3.1 CLIMATE, TOPOGRAPHY, AND SOILS

#### Climate

Climate on the Island of Hawai‘i, as well as within the State of Hawai‘i, can be characterized as having low day-to-day and month-to-month variability. Differences in the climates of various areas are generally attributable to the island’s geologic formation and topography creating miniature ecosystems ranging from tropical rain forests to dryer plains along with corresponding differences in temperature, humidity, wind, and rainfall over short distances (Dept. of Geography 1998).

Temperatures in the Hilo area are very moderate with average daily minimum and maximum temperatures ranging from 66 degrees Fahrenheit (F) to 82 degrees. Average monthly temperatures recorded at Hilo International Airport in 2003, located about 1 mile east of the project area, averaged about 76 degrees and varied between an average of 68 and 84 degrees (NOAA 2003). Rainfall in the Hilo district is substantial with an average annual rainfall recorded at Hilo International Airport of about 128 inches per year.

The entire state of Hawai‘i lies well within the belt of northeasterly trade winds generated by the semi-permanent Pacific high pressure cell to the north and east of the islands. Areas along the eastern coasts of the islands are particularly affected by the trade winds and are usually well-ventilated nearly year round.

Although Hilo is situated along the eastern coast of the island, the tall mountains of Mauna Loa and Mauna Kea significantly modify the influence of trade winds. Northeast trade winds typically occur during the day, while winds from the southwest typically occur during the night due to cold air drainage from the mountains. The mean annual wind speed at the airport is about 8 miles per hour (mph), and usually varies between about 4 and 12 mph during the day.

#### Topography

The topography associated with the project’s Mohouli Drainageway (previously shown on Figure 2.4) can be characterized as generally consisting of a gradual slope from the outlet at Ho‘opuni Way of the Mohouli Subdivision traveling in an eastbound (makai) direction to parcels located along Kapi‘olani Street. The elevation at the Ho‘opuni Way outlet is about 110 feet

mean sea level (msl) and the low point along the parcels fronting Kapi‘olani Street is about 80 feet msl. The approximate length of this drainageway is 1,600 feet. Thus, the slope associated with this drainageway is less than 2 percent (1.88).

### **Soils**

Properties associated with the Mohouli Drainageway are situated on land consisting of the Keaukaha Series, extremely rocky muck with 6 to 20 percent slopes (rKFD) as indicated in the *Soil Survey of Island of Hawai‘i* (SCS, 1973). Figure 3.1 graphically shows the soil classification associated with this area. The Keaukaha Series consists of well-drained, thin organic soils overlying pāhoehoe lava bedrock, which occupy the low areas of Mauna Loa. As is consistent with the classification for the subject properties, this type of soil is found in areas ranging from sea level to about 1,000 feet and receives from 90 inches to 150 inches of rainfall annually.

The following descriptions of the land and soils types are from the *Soil Survey of Island of Hawai‘i* (SCS, 1973):

- **Keaukaha Series (rKFD)** This soil is near the city of Hilo. It is undulating to rolling and follows the topography of the underlying pāhoehoe lava. Rock outcrops occupy about 25 percent of the area. The surface layer is very dark brown muck about 8 inches thick. It is underlain by pāhoehoe lava bedrock. This soil is strongly acid. The natural vegetation consists of ‘ōhi‘a, tree fern, uluhe fern, and guava. These soils and Kīloa, ‘Ōla‘a, Pana‘ewa, and Pāpa‘i soils are in the same general area. Keaukaha soils are used for woodland, pasture, and homesites.

### **Impacts on Soils and Topography**

The acquisition of parcels and easements associated with the drainageway is not expected to have short-term or long-term impacts on the present topography associated with this drainageway nor the existing soil conditions. No improvements or construction activity is planned to alter this drainageway at this time. The only action to be undertaken by this project consists of the acquisition of property. Therefore, the existing conditions associated with this drainageway will remain.

## **3.2 NATURAL HAZARDS**

This section addresses only those natural and urban-related hazards applicable to the project site. Of the potential natural hazards, only earthquakes and lava flows, hurricane, and tsunami and flooding hazards are applicable. These natural hazards are addressed below.



**LEGEND**

- HoC - Hilo silty loam, 0 to 10% slopes
- rKFD - Keaukaha extremely rocky muck, 6 to 20% slopes

**SOIL SURVEY MAP**

**Figure 3.1**

Acquisition of Existing Drainageway Lands Project  
 Department of Public Works, County of Hawaii

Source:  
 (Aerial) NOAA 2000  
 (Soil Data) NRCS



### **Earthquake Hazards**

Earthquakes in the Hawaiian Islands are primarily associated with volcanic eruptions resulting from the inflation or shrinkage of magma reservoirs beneath which shift segments of the volcano (Macdonald, Abbott, and Peterson 1983). Although difficult to predict, an earthquake of sufficient magnitude causing structural or other property damage may occur in the future. Most of the earthquakes that have occurred in the past have been volcanic earthquakes causing little or no damage. The seismic risk classification of the Island of Hawai‘i is a rating of Zone 4 (USGS 1997).

The Island of Hawai‘i experiences many earthquakes each year; however, most are so small that they can only be detected by instruments. There are some strong enough to be felt, and a few cause minor to moderate damage. Most of this island’s earthquakes are directly related to volcanic activity, and are caused by magma moving beneath the earth’s surface. Earthquakes may occur before or during an eruption, or may result from the underground movement of magma that comes close to the surface. A few of the island’s earthquakes are less directly related to volcanism. These originate in the zones of structural weakness at the base of the volcanoes or deep within the earth beneath the island (USGS 1997).

The locations of larger damaging earthquakes of magnitude 6 or greater since 1868 on the Island of Hawai‘i have generally occurred on the southern half of the island primarily on the eastern end. The most recent large earthquake on this south flank occurred in June 1989 with a magnitude of 6.1. The largest earthquake near the Hilo area occurred in Honomū in 1973 and had a magnitude of 6.2.

With the acquisition of the property by the County, there would be no change to the potential for damages occurring to this drainageway as compared to existing conditions. No improvements or structures are planned for this drainageway at this time that may cause a potential for increased damage from an earthquake of sufficient magnitude.

### **Lava Flow Hazards**

Volcanic hazard zone maps developed for the Island of Hawai‘i were revised by the U.S. Geological Survey in 1987. The current map divides this island into zones ranked from 1 through 9 based on the probability of coverage by lava flows. Hazard zones from lava flows are based mainly on the location and frequency of both historic and prehistoric eruptions. Hazard zones also take into account larger topographic features of the volcanoes that will affect the distribution of lava flows.

Based upon this map, the drainageway related properties in the Hilo District were given a hazard zone rating of 3 which includes the entire Hilo town area. This hazard rating is for areas having a greater distance from active vents and topography making it less likely that flows will cover that area. This is a hazard area that had 1 to 5 percent covered by lava since 1800, and 15

to 75 percent of area covered by lava in the last 750 years. Only a few percentage of this area has been covered by lava over the past 10,000 years (USGS 1997).

With acquisition of the properties, this drainageway would continue to be subject to the same possibility of damage by lava flow (hazard zone rating 3) from an eruption. Consequently, lava flow impacts to these properties would likely involve mainly damages to existing vegetation and the topography since no physical changes to this drainageway would be implemented.

### **Hurricane Hazards, Tsunami Inundation And Flooding**

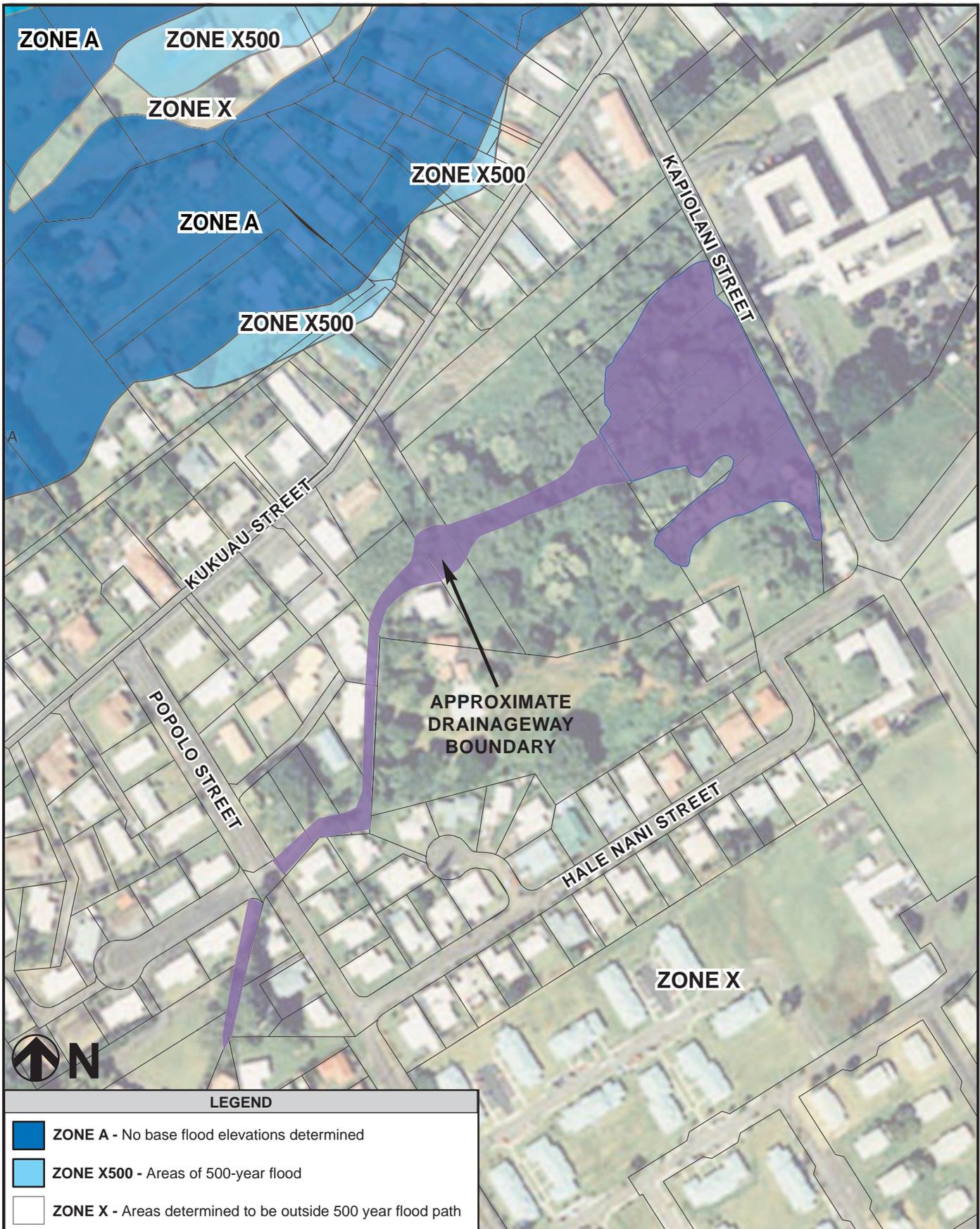
The three major elements that make a hurricane hazardous are: 1) strong winds and gusts, 2) large waves and storm surge, and 3) heavy rainfall (FEMA 1993). Of these three, only heavy rainfall would be most pertinent to this drainageway property acquisition project. There are no major structures associated with this drainageway that would be affected by strong winds and gusts.

A tsunami is a series of huge waves most commonly caused by violent movement of the sea floor. It is characterized by high speed, long wave length, long period between successive crests, and low height in the open ocean. Along a coastline, a tsunami can flood inland 100's of feet or more and cause considerable damage and loss of life. Along the Hilo coast, two tsunamis with the greatest run-up since 1812 occurred in 1946 (26 feet) and 1960 (35 feet) (USGS 2002).

The Flood Insurance Rate Map (FIRM), Community Panel Number 1551660880C (revised September 16, 1988), for the project area was reviewed to determine existing floodways. Based upon this FIRM, the Mohouli Drainageway proposed for acquisition is not located within any designated floodway. The properties associated with the drainageway are designated Zone X which is an area determined to be outside the 500-year flood plain. Figure 3.2 shows the drainageway site in relation to this FIRM.

The drainageway is located about 3,300 feet away from the Hilo Bay shoreline, and is situated at an elevation varying between 80 and 110 feet msl making it less susceptible to large waves and storm surge. As a result, this location makes impacts from large waves and storm surge highly improbable.

Although unpredictable, the Island of Hawai'i has historically received less threat and damage from hurricanes as compared to the Island of Kaua'i. Heavy rainfall in this region will result in discharges of storm water runoff occurring within the project drainageway. Runoff information previously discussed on this drainageway was calculated based upon a 100-year flood. The acquisition of drainageway property would not affect this existing drainageway because it will continue to serve that purpose and remain in its current physical condition. Thus, the flow path and quantities of heavy rains discharging storm water into this drainageway would remain the same.



**FLOOD INSURANCE RATE MAP**

**Figure 3.2**

*Acquisition of Existing Drainageway Lands Project  
 Department of Public Works, County of Hawaii*

*Source:  
 (Aerial) NOAA 2000  
 (Flood Data) FEMA*



### 3.3 AIR QUALITY

Air quality in Hawai'i is generally characterized as relatively clean and low in pollution. Northeast tradewinds that are predominant throughout the year typically carry emissions and other air pollutants from inland areas out toward the ocean. Air quality in the Hilo area is believed to be relatively good, except for occasional impacts from localized traffic congestion.

Perhaps the dominant air quality factor in the Hilo area for the past several years has been the volcanic emissions from Kilauea Volcano, although the prevailing winds carry emissions away from the Hilo area much of the time. Most of these emissions occur as sulfur dioxide and then subsequently convert into particulate sulfate, which causes a volcanic haze (vog) to blanket the area during "Kona wind" conditions.

Acquisition of the Mohouli Drainageway by the County will not have an affect on the air quality in the Hilo region or Island of Hawai'i. This project only involves the acquisition of property associated with an existing drainageway. There are no improvements planned to this drainageway that would involve construction activities causing short-term emissions.

### 3.4 NOISE

The existing dominant noise sources along the Mohouli Drainageway should generally consists of those generated by vehicular traffic, wind, occasional distant aircraft flybys, and activities occurring at residences such as voices, television noise, or pets such as dogs. Noise occurring along this drainageway, based upon the field observations, was representative of the type of sources expected which were mainly associated with existing residences. In general, existing noise levels in the area appeared fairly low and shouldn't exceed the State Department of Health's permissible sound levels during daytime hours.

Acquisition of properties associated with the drainageway would not have an affect on existing noise sources in the area. Properties being acquired would consist of easements and a few currently undeveloped parcels along Kapi'olani Street. Consequently, there would be no change to existing noise generating sources or to the type of noise occurring on these properties or in the immediate vicinity.

### 3.5 VISUAL RESOURCES

The *General Plan* of the County of Hawaii (County, February 2005) identified a number of sites as important scenic resources contributing to the natural beauty of the South Hilo District. The South Hilo District landscape gently slopes from Hilo Bay inland and upwards towards Mauna Kea and Mauna Loa. Hilo Bay also provides a picturesque foreground for the town of Hilo. Thus, visual resources in this district are generally dominated by views associated with the coastline and of Mauna Kea and Mauna Loa.

None of these visual resources would be affected by the acquisition of property associated with the Mohouli Drainageway. Based upon the field observation and other field studies conducted for this area, there are no other structures or resources present within the drainageway that could be considered as significant visual resources. No physical changes are also planned to this drainageway at this time which would alter existing views of this area.

### **3.6 HISTORIC, ARCHAEOLOGICAL, AND CULTURAL RESOURCES**

A joint archaeological inventory survey and limited cultural assessment was conducted by Rechtman Consulting, LLC for this project. This study investigated and assessed lands that encumber the existing drainageway area proposed for acquisition by the County. A copy of the inventory survey report is included in Appendix C of this document.

The purpose of this study was to document the presence of any historic properties (including traditional cultural properties) that might exist within the project area, assess the significance of any such resources, and provide a statement of impact to any such resources as a result of the proposed Mohouli Drainageway acquisition. This report was prepared in consultation with the State Historic Preservation Division (SHPD) to support the proposed project historic preservation review under HRS Chapter 6E-42, HAR Chapter 13-13-284, and State requirements for archaeological field survey (HAR Chapter 13-376-4).

#### **3.6.1 Archaeological Inventory Survey**

The archaeological inventory survey portion of this report included the following typical fieldwork procedures:

1. A complete ground survey of the entire project area for the purpose of site inventory. Documentation included photographs and scale drawings of identified sites;
2. Research on historical, cultural, and archaeological background, including prior studies relevant to the project. This research focuses on the specific project area, with background on the traditional district, the ahupua‘a, and with special emphasis on settlement patterns.
3. Consultation with community members about their cultural and historical concerns with the project area as required under the Hawai‘i Administrative Rules for SHPD.

#### **Historical Background of Area**

In precontact Hawai‘i, all land, ocean and natural resources were held in trust by the high chiefs (ali‘i ‘ai ahupua‘a or ali‘i ‘ai moku). The use of land, fisheries and other resources were given to the hoā‘āina (native tenants) at the prerogatives of the ali‘i and their representatives or land agents (konohiki), who were considered lesser chiefs.

The wealth of resources and population in Hilo were reflected in the chiefly controls held over the District, especially the ahupua‘a of Waiākea. Kamehameha I lived for a time in the Hilo

area and built many of his large war canoes at Hilo. The availability of large koa trees in the forests of the Hilo area made it an ideal place to fashion canoes. At his death Kamehameha I gave his Waiākea land holdings to his son Liholiho. Kūkūau 1st and 2nd were given to his trusted foreign advisors John Young and Isaac Davis.

The period of development between 1870s and 1890s involved dramatic changes to Hilo town and rapid growth of the sugar production industry, which was labor-intensive, and took advantage of an immigrant labor force. Hilo quickly grew to become the second largest city in the Hawaiian Islands with vast lands under sugarcane cultivation. The fertility was good, but many sugarcane fields were rocky. Sugar processing plants in the vicinity of Kūkūau 1st Ahupua‘a included the Waiākea Mill Company to the east, and Hawai‘i Mill Company in Pi‘ihonua Ahupua‘a, to the west.

The Waiākea Mill Company, whose land holdings included portions of Kūkūau, operated from 1897 through 1946, and was one of the largest sugar companies to operate in Hilo. When the company’s 30-year lease of Waiākea lands expired in 1918, the government, under homestead laws, subdivided the large tract of land into hundreds of lots granted to homesteaders in 1919. Commercial sugar production lasted in Kūkūau until the mid twentieth century, at which time many of the fields were converted to pasturage associated with cattle ranching.

### **Previous Archaeological Research**

Prior archaeological research for the proposed drainageway area has been minimal. Many of the previous archaeological studies conducted within the Hilo District have studied surrounding areas. One early archaeological study conducted for the Bernice Pauahi Bishop Museum noted that no archaeological remains were to be found within the town of Hilo, except for a few stones which are said to have been taken from heiaus. No traditional burials have been documented within the current project area.

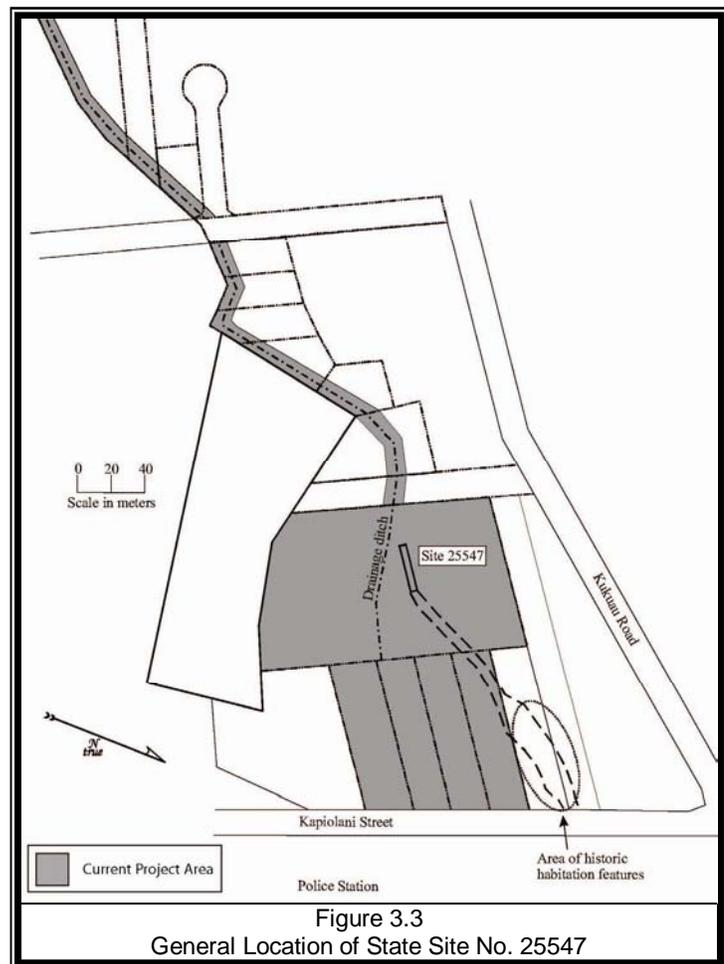
Near the turn of the century, others have documented the locations of heiau sites for the Island of Hawai‘i. Their research results lists 16 heiau for the Hilo District, none of which are located in the Kūkūau 1<sup>st</sup> Ahupua‘a. More recent archaeological studies conducted within the ahupua‘a of Kūkūau have focused on the Pū‘āinakō Street extension and Waiākea Sugar Plantation. All of the recorded sites and features for these were determined to be historic in origin and associated with the Waiākea Sugar Plantation.

### **Results of Fieldwork**

The survey identified a single archaeological site (Site 25547) located north of the existing man-made excavated drainage channel in the central portion of property identified as TMK: 2-04-025: 048. The general location of this site is shown below on Figure 3.3, and a detailed plan view is shown on Figure 3.4.

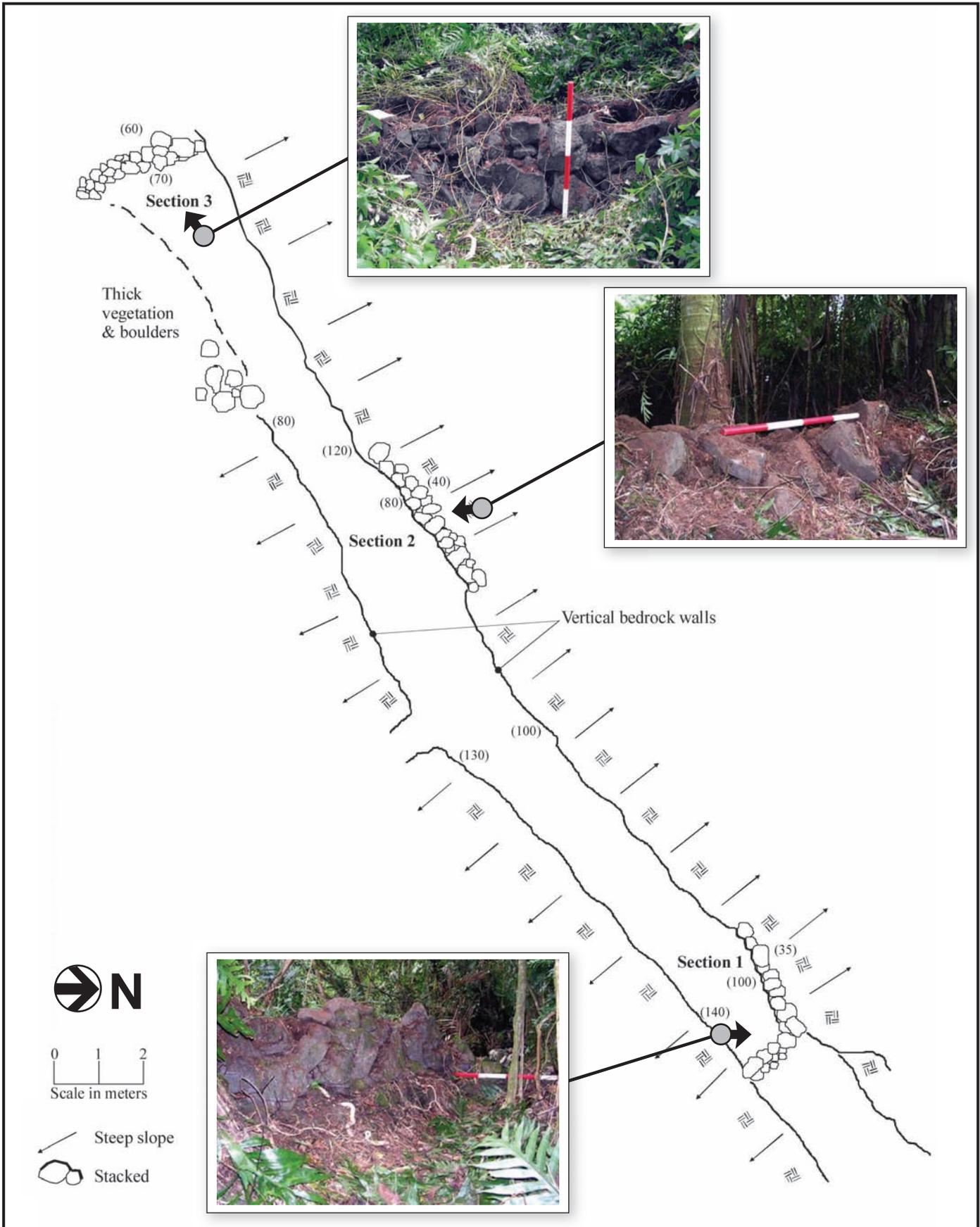
*Feature Description: Site 25547*

- *This is an elongated enclosure located within a raised bedrock ridge formation.*
- *Consists of a 24-meter long by 2-meter wide section of a natural pāhoehoe bedrock ridge that has been modified in three sections with stacked cobbles.*
- *Modifications to the bedrock ridge consist of two stacked cobble wall sections that cross the bedrock at the eastern and western edges of the feature (identified as Sections 1 and 3), and a third section that lines the bedrock ridge's northern edge near the center of the feature (Section 2).*
- *The site mostly consists of unmodified vertical bedrock standing one to two meters tall.*
- *Ground surface within the modified area consists of level soil covered by a thick mat of organic debris.*



It appears that the bedrock ridge modifications were designed to restrict access into or out of the intended area. Site 25547 may have functioned as an enclosure designed to keep small animals (i.e. pigs, dogs, etc.) within or out of the enclosed space. The bedrock ridge formation continues both east and west of the site area. No cultural debris was observed within or around Site 25547, but its proximity is near an area of known twentieth century habitation. Each modified section of Site 25547 (Sections 1, 2, and 3) is described in detail below, and Appendix C includes photographs of these sections.

Section 1. *Consists of an L-shaped stacked wall located at the eastern end of the site. Beginning at its western end, the wall runs northeast along the northern edge of the ridge for 2.8 meters, then turns southeast and extends 1.4 meters across the ridge to a 1.4 meter tall vertical bedrock face along the southern edge of Site 25547. Section 1 stands up to 1.2 meters tall by 0.7 meters wide, but the segment that crosses the crack is mostly collapsed, standing only 0.4 meters tall along its interior by 0.8 meters tall along its exterior.*



**ARCHEOLOGICAL SITE 25547**

**Figure 3.4**

Section 2. *Consists of a linear stacked wall located along the northern edge of the ridge, approximately half-way between Sections 1 and 3. Section 2 measures 4 meters long, stands 3 to 4 courses tall, with an interior height of 0.9 meters, an exterior height of 0.4 meters, and a width of 0.7 meters. It appears to have been constructed as a barrier to compensate for a low section of bedrock along the northern edge of the ridge. Vertical bedrock is present to the east and west of this section.*

Section 3. *Consists of a stacked wall that crosses the width of the bedrock ridge at the western end of Site 25547. This section is linear, running northwest/southeast, and measuring 3.1 meters long by 0.6 meter wide, by 0.8 meter tall (2 courses). This section is in poor condition due to collapse caused by dense vegetation, but it was likely designed to restrict access at the western end of the site.*

### **Site Assessment Results**

The archaeological Site was assessed for its significance based on criteria established by SHPD and specified in the Hawai'i Administrative Rules (§13-284-6). For resources to be considered significant they must possess integrity of location, design, setting, materials, workmanship, feeling, and association and meet one or more of the following criteria:

- A Be associated with events that have made an important contribution to the broad patterns of our history;
- B Be associated with the lives of persons important in our past;
- C Embody the distinctive characteristics of a type, period, or method of construction; represent the work of a master; or possess high artistic value;
- D Have yielded, or is likely to yield, information important for research on prehistory or history;
- E Have an important traditional cultural value to the native Hawaiian people or to another ethnic group of the state due to associations with traditional cultural practices once carried out, or still carried out, at the property or due to associations with traditional beliefs, events or oral accounts—these associations being important to the group's history and cultural identity.

While it is the practice of the DLNR-SHPD to consider most historic properties significant under Criterion D at a minimum, it is clear that traditional cultural properties by definition would also be significant under Criterion E. A three-part analytical framework process stemming from a previous court ruling was also applied to evaluate such potential impacts for Criterion E. This evaluation consisted of

- First, identify whether any valued cultural, historical, or natural resources are present; and identify the extent to which any traditional and customary native Hawaiian rights are exercised;

- Second, identify the extent to which those resources and rights will be affected or impaired; and
- Third, specify any mitigative actions to be taken to reasonably protect native Hawaiian rights if they are found to exist.

Based upon the evaluation, Site 25547 was considered significant under Criteria D for the information it has yielded regarding early twentieth century use of the study area. However, Site 25547 was recorded in detail and there is virtually no excavation potential. Therefore, no further work was recommended. This site is also not considered a traditional cultural property, and there were no specific natural or cultural resources, or cultural beliefs and practices identified relative to the land within the current study area (Rectman 2006).

Review of the archaeological inventory survey report by the State Historic Preservation Division resulted in their acceptance of it and approval of the recommendation that Site 25547 was significant for its information content and no further work is required. A copy of this September 28, 2006 letter from the State Historic Preservation Division is included in Appendix B of this document.

The property associated with Site 25547 is not planned to be acquired for the drainageway because it is part of the raised bedrock ridge formation within the larger parcel 048. This raised bedrock ridge appears to form a natural berm along the northern portion of the drainageway. An easement for this drainageway is proposed within this property which is not planned to include this Site at this time. However, the actual boundaries for the drainageway will be determined from a land survey during the acquisition process. Therefore, the acquisition of the drainageway is not expected to have a significant impact on historic or archaeological resources.

In the event subsurface human remains or other indications of human activity older than 50 years are encountered during land surveying activities, all work would stop immediately and the SHPD notified. The treatment of any human remains encountered would be determined, and conducted in accordance with the applicable requirements of Chapter 6E, HRS, and Chapter 13-300, HAR.

### **3.6.2 Cultural Resources**

A limited cultural impact assessment was performed for the project and is included in the archaeological inventory survey report in Appendix C. The function of this limited cultural impact assessment was to document and evaluate the effects the project may have on native Hawaiians or any other concerned ethnic group in terms of their culture and their rights to practice traditional customs. The scope of this study included:

1. Developing a cultural landscape background through the examination of historical documents for the purpose of identifying traditional Hawaiian activities including gathering of plants, animal and other resources or agricultural pursuits.

2. Review existing archaeological information pertaining to sites present on the property to reconstruct traditional land use activities, and identify and describe the cultural resources, practices and beliefs associated with the parcel.
3. Conduct limited consultations with kūpuna knowledgeable regarding the project area vicinity (Rechtman, 2006).

### **Historical Cultural Background**

The ahupua‘a of Kūkūau 1st and 2nd likely provided a wide variety of valuable subsistence resources to the pre-contact Hawaiians residing there and ali‘i who claimed the land. Settlements in this land were focused on the coast with the exception of some residences being established among the inland agricultural fields.

The ahupua‘a residents utilized the uplands in accordance to specific elevation zones. These land use zones reflected different environments where specific natural resources were readily acquired, and where varying degrees of modification of the terrain produced a surplus of dryland and wetland agricultural goods. Thus, the project area lands being part of the Upland Agricultural Zone (above 50 feet elevation) were probably subjected to extensive cultivation during prehistoric times.

### **Community Consultation**

An effort was made by Rectman Consulting, LLC to contact and consult with Hawaiian cultural organizations, government agencies, and individuals who might have knowledge of and/or concerns about traditional cultural practices specifically related to the project area. This effort was conducted by sending letters, emails, making telephone calls, and in-person contacts.

The Office of Hawaiian Affairs (East Hawai‘i) and the Hilo Hawaiian Civic Club were contacted but had no information relative to the existence of traditional cultural properties in the immediate vicinity of the current project area. They also did they provide any information indicating current use of the project area for traditional and customary practices.

Mr. Kenneth Bell was also consulted with respect to past land use in and around the current project area. He has participated in many oral historical projects concerning the development of the Hilo area. Mr. Bell explained that there was a scattering of a few “wooden shacks” that served as residences (not associated with the Waiākea Mill Company) in the portion of the project area fronting Kapi‘olani Street. This is the same location where clusters of historic refuse were observed immediately to the north of the project area.

### **Cultural Assessment Results**

Based upon the archaeological inventory survey, only Site 25547 was identified within the project area and was considered significant for the information it has yielded regarding early twentieth century use of the study area. This Site was recorded in detail and the study concluded

that no further work was recommended. This site was also not considered a traditional cultural property, and there were no specific natural or cultural resources, or cultural beliefs and practices identified relative to the land within the current study area (Rectman 2006). Therefore, the acquisition of the drainageway should not affect cultural resources, or cultural beliefs and practices.

### **3.7 BIOLOGICAL ENVIRONMENT**

#### **3.7.1 Botanical Resources**

A botanical survey was conducted by Geometrician Associates, LLC for this project. This study investigated and assessed lands that encumber the existing drainageway area proposed for acquisition by the County. A copy of the botanical survey report is included in Appendix D of this document.

The objectives of the botanical survey were to: 1) describe the vegetation; 2) list all species encountered; and 3) identify threatened or endangered plant species. Species were identified in the field and, as necessary, collected and keyed out in the laboratory. Special attention was given to the possible presence of any federally listed endangered plant species.

#### **Vegetational Influence**

The original vegetation of the general area was lowland rainforest consisting of a closed canopy forest of 'ohi'a (*Metrosideros polymorpha*), lama (*Diospyros sandwicensis*) and hala (*Pandanus tectorius*), along with a diverse array of canopy and understory trees, shrubs, herbs, vines and ferns, including hapu'u (*Cibotium sp.*), uki sedge (*Machaerina mariscoides*) and uluhe (*Dicranopteris linearis*). Hilo has a long history of farming during both traditional Hawaiian times and the past two centuries. A forest line was noted by early Westerners that appeared uniformly about four or five miles inland from the coast. The areas makai of the forest line were converted by slash-and-burn early in prehistory into cropland and grassland.

For many centuries, much of the inland portion of Hilo was covered in gardens of taro (*Colocasia esculenta*) that were associated with residences. The gardens were often outlined by windbreaks of sugar cane, banana (*Musa spp.*), and wauke (barkcloth) (*Brousonettia papyrifera*). Interspersed with settlements were mixed groves of trees with economic uses such as kukui (*Aleurites molluccana*), hala (*Pandanus tectorius*), coconut (*Cocos nucifera*), ulu (*Artocarpus altilis*), 'ohi'a 'ai (*Syzygium malaccense*), milo (*Thespesia populnea*) and hau (*Hibiscus tiliaceus*). Platforms or mounds of rock were constructed to promote the growth of gourds, ti (*Cordyline fruticosa*) and noni (*Morinda citrifolia*) plants.

### **Current Vegetation and Impacts**

The landscape associated with the drainageway area appears to have been heavily modified by human use, including traditional Hawaiian cultivation, historic-era agriculture, pasture, dumping, drainageway excavation, and grading. Except for the narrow, confined drainage channel, which was lined with overhanging trees and shrubs, a dense forest completely dominated by large alien trees covers this area.

The principal elements are mango (*Mangifera indica*), African tulip tree (*Spathodea campanulata*), gunpowder tree (*Trema orientalis*), *Melochia umbellata*, Alexandra Palm (*Archontophoenix alexandrae*), bingabing (*Macaranga mappia*), rose apple (*Syzygium jambos*) and java plum (*Syzygium cumini*). Groundcover is dominated by *Wedelia trilobata* and California grass (*Brachiaria mutica*). A number of alien vines including the thorny wait-a-bit (*Caesalpinia decapetala*) and *Philodendron* sp. festoon the trees.

A full list of plant species found on the site is contained in Table 1 of Appendix D. The vast majority of species are alien, with only a few common plants, principally ferns, vines and sedges, among the natives. All native plants found were indigenous (found in Hawai‘i as well as elsewhere) rather than endemic (found in Hawai‘i and nowhere else). In all, only 7 percent of the species found within the project area are indigenous, and their cumulative biomass probably accounts for far less than 1 percent of the vegetation.

No listed or proposed endangered plant species were found. Given the context, it would be very unusual to find one in this lowland environment with a history of intense disturbance.

Based upon the results of the botanical survey, the proposed acquisition of parcels and easements for drainageway purposes by the County is not expected to have an adverse impact on the existing botanical resources or vegetation. This property is overwhelmingly dominated by alien species. All of the very common native plants that are found on the site can also be found in similar wet lowland environments in East Hawai‘i and on most of the main Hawaiian Islands.

#### **3.7.2 Avian and Mammalian Resources**

An avian and mammalian survey was conducted by Rana Productions, Ltd. for this project. This study investigated lands that encumber the existing drainageway area proposed for acquisition by the County. The primary purpose of the survey was to determine if there were any avian or mammalian species currently listed as endangered, threatened, or proposed for listing under either the federal or the State of Hawai‘i’s endangered species programs on, or within in the immediate vicinity of the drainageway project area. A copy of the survey report is included in Appendix E of this document.

### **Mammalian Survey Results**

The survey of mammals was limited to visual and auditory detection, coupled with visual observation of scat, tracks, and other animal sign. A running tally was kept of all vertebrate species observed and heard within the project area. Visual and electronic scans were made for bats during crepuscular periods on the evening of May 9th, and on the morning of May 10, 2006.

With the exception of the endangered Hawaiian hoary bat (*Lasiurus cinereus semotus*), or 'ōpe'ape'a as it is known locally, all terrestrial mammals currently found on the Island of Hawai'i are alien species. Most are ubiquitous. The only mammalian species encountered during this survey were numerous dogs (*Canis f. familiaris*), which were seen tied up at various houses or within dog runs behind houses along the drainageway. Dogs were also heard barking from many other houses surrounding the general project site (Rana 2006).

Hawai'i's sole endemic terrestrial mammalian species, the endangered Hawaiian hoary bat, was not detected during the course of this survey. These findings were consistent with numerous other surveys conducted in similar habitat in the South Hilo District over the past five years. Although Hawaiian hoary bats were not recorded during this survey, they have been recorded on at least seven recent surveys within the general Hilo area. The Hawaiian hoary bat is a typical lasurine bat, and as such, they primarily lead a solitary existence described as "over-dispersed". They generally roost cryptically in foliage, which makes them difficult to study (Rana 2006).

Although, not detected, it is likely that Hawaii's four naturalized rodents, roof rat (*Rattus r. rattus*), Norway rat (*Rattus norvegicus*), Polynesian rat (*Rattus exulans hawaiiensis*), and European house mouse (*Mus domesticus*), as well as small Indian mongoose (*Herpestes a. auropunctatus*), and cats (*Felis catus*) use resources within the general project area at least occasionally. All of these alien mammalian species are deleterious to native ecosystems and their components.

### **Avian Survey Results**

Five avian count stations were sited approximately 150-meters apart within the project area. Eight-minute point counts were conducted at each station. Each station was counted once. Counts were conducted between the peak of daily bird activity. Additionally, two hours was spent within the project area on the evenings of May 9, and on the morning of May 10, 2006, in an attempt to detect nocturnally flying seabirds over-flying the project area. Time not spent counting was used to search the study site for species and habitats that were not detected during count sessions.

A total of 73 individual birds of 8 different species, representing 7 separate families were recorded during station counts. Table 1 of Appendix E includes a listing of these species. All avian species recorded were considered alien to the Hawaiian Islands. Avian diversity and densities were also typical of the habitat present within the project area, and with the results of

numerous other surveys conducted in similar habitat in the South Hilo District over the past five years. Three species: 1) Japanese White-eye (*Zosterops japonicus*), 2) Zebra Dove (*Geopilia striata*), and 3) House Finch (*Carpodacus mexicanus*) accounted for 52 percent of the total number of all birds recorded during station counts.

Although not detected during this survey, it is possible that small numbers of the endangered endemic Hawaiian Petrel (*Pterodroma sandwichensis*), or *ua'u*, and the threatened Newell's Shearwater (*Puffinus auricularis newelli*), or *'a'o*, over-fly the project area between the months of May and November. However, there is no suitable nesting habitat within or close to the project area for either of these pelagic seabird species.

### **Impacts on Resources from Project**

There is nothing unique about the project area associated with the drainageway or its existing vegetation. There is abundant like habitat in, and around Hilo. As a result, the acquisition of parcels and easements associated with the existing drainageway will not have significant impacts on native avian or mammalian resources present within the general project area.

Hawaiian hoary bats were not detected during this survey, but they have been recorded within the general project area on numerous occasions. With the current scientific information available, it is not known if bats ever roost within the project area. It is thus difficult to ascertain if clearing activities or modifications to portions of the remaining vegetated areas within this drainageway will result in deleterious impacts to this species. The principal potential impact that clearing and grubbing of the vegetated portions of the drainageway poses to Hawaiian hoary bats is disturbance to roosting female bats during the pupping season. This is when the females are tending to their young, and are less likely to be able to rapidly vacate a roost tree or bush as it is being felled, or cleared.

The principal potential impact to Hawaiian Petrels and Newell's Shearwaters from possible clearing activities associated with the drainageway is the increased threat that birds will be downed after becoming disoriented by exterior lighting that may be required in conjunction with such activities. To reduce the potential for interactions between nocturnally flying Hawaiian Petrels and Newell's Shearwaters with external lights and man-made structures, it is recommended that if it becomes necessary to use any external lighting during activities, that the lights be shielded following suggestions by Reed et al. (1985) and Telfer et al. (1987). This mitigation would serve the dual purpose of minimizing the threat of disorientation and downing of Hawaiian Petrels and Newell's Shearwaters, while also complying with the Hawaii County Code that requires the shielding of exterior lights so as to lower the ambient glare caused by unshielded lighting to the astronomical observatories located on Mauna Kea.

### 3.7.3 Hydrogeological Resources

Under the State's Water Resource Protection Plan, aquifers of the Island of Hawaii have been classified under an aquifer coding system to identify and describe these aquifers. This system is comprised of Aquifer Sectors, and then Aquifer Systems located within these sectors. An Aquifer Sector reflects an area with broad hydrogeological (subsurface) similarities while maintaining traditional hydrographic (surface), topographic and historical boundaries. The Aquifer System is an area within a sector that is more specifically defined by hydrogeologic continuity, particularly hydraulic connections among aquifer types and units.

The properties associated with the project drainageway are situated within the Northeast Mauna Loa Aquifer Sector. This sector includes the hydrologic units of Hilo and Keaau as separate systems. The parcels and easements proposed to be acquired are situated within the Hilo Aquifer System (80401).

The geology of this Hilo Aquifer System is dominated by the Ka'ū volcanic series of Mauna Loa volcano, and extends from the coast to the inland boundary at the crest of Mauna Loa. Groundwater within this aquifer sector exists primarily as basal groundwater followed by high level dike and perched water. Caprock, although thick and extensive, does not play an important role in the coastal regions of the aquifer. The Hilo Aquifer System has an estimated sustainable yield of 347 million gallons per day (CWRM, June 1990).

#### **Probable Impacts and Mitigative Measures**

Acquiring the subject properties and easements should have no impact on the underlying groundwater system because this project simply involves the expenditure of funds for their acquisition. There will be no increase in developed impervious surface from this project and would, therefore, not decrease the amount of localized groundwater recharge occurring in the project area. As a result, the project should not adversely impact the underlying aquifer system nor contaminate potable water sources.

## CHAPTER 4 ECONOMIC AND SOCIAL FACTORS

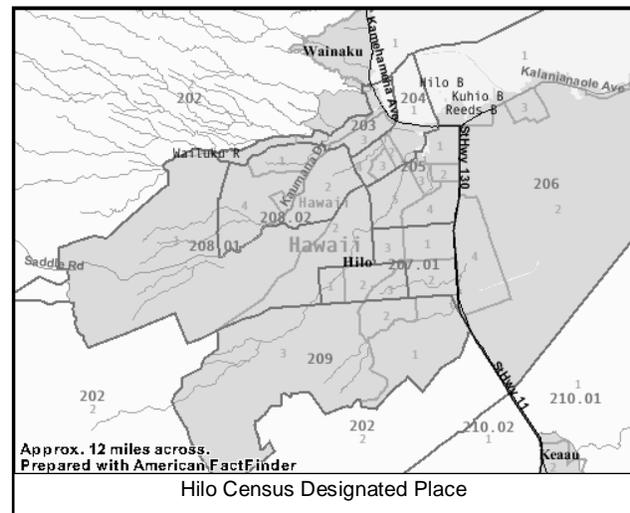
The section discusses the project's probable impact on economic and fiscal factors associated with the State and County, as well as social factors such as changes in resident population, housing, and character of the community.

### 4.1 ECONOMIC AND FISCAL FACTORS

#### Existing Economic Context

Hilo is the capital of the County of Hawai'i and the center of much of its agricultural activity. It has been the government center for the island since County government was instituted in 1905. It is also home to the University of Hawai'i, Hilo and a campus of the University of Hawai'i Community College system. The University Park development is also being developed by the University as a research and technology park representing the expansion of the existing campus. Hawai'i County has weathered an economic transformation and emerged with a mixed economy and relatively high levels of employment, but modest incomes on the whole.

The Hilo district is large, having a variety of areas supporting tropical agriculture on the island. The island's diverse ecosystems ranging from high alpine zones to low elevation systems varying from rain forest to desert support the diversity of agriculture activities occurring. The total farm acreage in Hawai'i County was approximately 870,000 acres in 1999 or 60.4 percent of the State's total. This County is the largest producer of fruit, flowers, macadamia nuts, coffee and cattle in the State and also has larger areas in government forest reserve and private forestland than the other counties. There is extensive variation in climate on the island, with agricultural specialization well developed for different ecologies (e.g. papaya production in Puna, ginger cultivation along the Hāmākua coast, and coffee plantings in South Kona).



#### Economic and Fiscal Effects

The proposed acquisition of the parcels and easements for the drainageway will involve the expenditure of County funds to acquire the privately-owned property. The preliminary estimated acquisition cost for the drainageway project is projected to be approximately \$1.5 million.

No construction activities or improvements to the drainageway are planned. Therefore, this project would have no effect on the number of construction jobs on the island or generate personal income for construction workers. There would also be no change to the existing number of operational jobs associated with the County of Hawai'i from this acquisition.

In terms of fiscal effects on State and County governments, the drainageway acquisition would not have an effect on State revenues or expenditures, but will slightly decrease County property tax revenue. Tax revenue sources for State government are composed primarily of general excise taxes (GET) on goods and services, along with corporate income tax, and personal income tax. Thus, the project would not affect these State revenue sources since the undeveloped properties and existing easements presently don't generate such income sources. The drainageway acquisition would also not affect State operational expenditures.

County revenues are primarily limited to property tax revenues, with a small amount from taxes associated with visitor spending. Currently, there is a small amount of revenue being generated from the privately-owned parcels associated with the Mohouli Drainageway. Although several of the affected properties are undeveloped, they are zoned for single-family and multi-family residential use. As a result, property tax revenues from these parcels were being generated to the County.

With the acquisition of the drainageway, the County would acquire some parcels and several easements which will reduce the amount of tax revenue presently being generated from property owners. However, the amount of revenue reduced would be minimal in comparison to revenue generated on a region or island-wide level. Thus, this revenue reduction should not have a significant impact on the County or their fiscal operations.

## **4.2 SOCIAL IMPACT FACTORS**

### **Population And Demography**

The County has a total population of 148,677 persons based upon the recent 2000 Census data. Hilo is the County's most populous town, and the Hilo Census Designated Place (CDP) had a total population of 40,759 persons. The Hilo CDP has 14,577 households and the median age of residents is the same as the County as a whole which is 38.6 years slightly older than the State.

Table 4.1 provides more data on the demography of the Hilo CDP in relation to both the County and State. Ethnically, Hawaii County's population is mixed, like the rest of the State. However, persons with Hawaiian and Caucasian ancestry are especially numerous representing 30.2 percent and 24.3 percent of the population, respectively.

Description	Hilo CDP		Hawaii County		State of Hawaii	
	No.	%	No.	%	No.	%
Total Population	40,759		148,677		1,211,537	
Age:						
0 - 5 years	2,301	5.6%	9,130	6.1%	78,163	6.5%
5 - 19 years	9,143	22.4%	22,601	15.2%	249,088	20.6%
20 - 64 years	22,492	55.2%	96,827	65.1%	723,685	59.7%
65 + years	6,823	16.7%	20,119	13.5%	160,601	13.3%
Median Age	38.6 years		38.6 years		36.2 years	
Persons in Households	39,368		145,873		1,175,755	
Persons in General Quarters	1,391		2,804		35,782	
No. of Households	14,577		52,985		403,240	
No. of Persons Living Alone	3,510		12,240		88,153	
Average Family Size	3.19		3.24		3.42	
Average Household Size	2.70		2.75		2.92	

The proposed acquisition of this existing drainageway is not expected to change the existing resident population or character of the community or Hilo district. There are no changes to the existing land use associated with this drainageway that would significantly change the area's population or demography. No new residential units or visitor units are associated with this project, and no in-migration of individuals to reside within the County would result. Consequently, this project would not change existing uses in the surrounding area or have a significant impact on surrounding land uses.

### **4.3 SECONDARY AND CUMULATIVE IMPACTS**

#### **Secondary Impacts**

Secondary impacts, or indirect effects, are effects which are caused by an action and are later in time or farther removed in distance, but are still reasonably foreseeable. Such effects may include growth inducing impacts and other effects related to changes in land use patterns, population density or growth rate, and related effects on air, water, and other natural systems.

The proposed acquisition of the existing drainageway is not expected to result in any secondary impacts on the surrounding environment. There are no expected changes to the existing resident population and land use patterns in the immediate vicinity of the drainageway. Parcels acquired would continue to remain undeveloped serving as the drainageway and retention basin.

### **Cumulative Impacts**

Cumulative impacts are effects on the environment which result from the incremental impact of a project when added to past, present, and reasonably foreseeable future actions. The cumulative impacts associated with this project includes assessing the implementation of the drainageway acquisition to evaluate it, and incorporate other known planned improvements within the study area that would effect or be affected by this project.

There are no other future planned developments or infrastructure changes known to occur in the immediate vicinity of this drainageway which would affect it. Therefore, the discussion of impacts presented within this document has included the cumulative effects associated with the project with consideration of other reasonably foreseeable future actions being implemented. The assessment results in this document show that there are no major cumulative impacts associated with this project.

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## CHAPTER 5 INFRASTRUCTURE FACILITIES

This chapter discusses the project's probable impact on infrastructure facilities serving the project site and surrounding area.

### 5.1 WATER FACILITIES

The water supply serving the South Hilo district includes one large and four small municipal systems provided by the County Department of Water Supply (DWS). The Hilo System is the largest on the island, consuming water from five surface sources and five deep well sources. The potable water system currently servicing the South Hilo District consists of groundwater sources: Panaewa Well Nos. 1, 2, and 3, Piihonua Well Nos. A, B, and C, and Saddle Road Well "A".

Since this project involves the acquisition of parcels and easements associated with an existing drainageway, it is expected that this project will not have any significant impact on the existing water facilities. There are no known potable water facilities situated within or crossing the drainageway.

### 5.2 WASTEWATER FACILITIES

The Hilo area is designated as an urban sewage planning area and the County Department of Environmental Management (DEM) operates a major treatment facility, the municipal Hilo Wastewater Treatment Plant (HWTP), serving this area which includes the project area. The HWTP is located near the airport front Puhi Bay. Currently, the system consists of 5.0 million gallons per day (mgd) secondary sewage treatment plant with an ocean outfall effluent disposal and a collection system of sewage pump stations, force mains, and gravity lines.

This project involves the acquisition of parcels and easements associated with the existing drainageway. Consequently, it is expected that this project will not have any significant impact on the existing wastewater facilities.

### 5.3 DRAINAGE FACILITIES

There are two perennial streams in the vicinity of the Mohouli Drainageway project area. The closest one is Alenaio Stream located north of the project site. This stream travels in a west to east direction and crosses Kapi'olani Street before emptying into Waiākea Fishpond. Waiākea Stream is located southeast of the project site and travels in a south to north direction. It crosses Mohouli Street and also empties into the Waiākea Fishpond.

The Mohouli Drainageway is within the larger drainage basin area which generally flows into Alenaio Stream before eventually discharging into Hilo Bay. Details associated with this drainageway were previously discussed in Section 2.2 of this document.

A total of six drainage basins were identified of which five contributed runoff to the Mohouli Drainageway which eventually ended up in the Land of Kukuau drainage basin. This Land of Kukuau drainage basin consisted of the properties serving as the detention area which are the subject of this lands acquisition project by the County DPW.

The drainageway's condition was described as three separate segments. The first segment involves the discharge point from the Mohouli Subdivision downstream to Popolo Street. The second segment is the drainageway's path downstream along several existing residential lots up to a road serving as a driveway for a lot. The last segment consists of the drainageway's path from this road to the detention area along Kapi'olani Street.

Acquisition of this drainageway by the County is not expected to have a significant impact on the existing conditions associated with this drainageway or affected privately-owned properties. This project involves acquiring parcels and easements from property owners so the County can formally take jurisdiction of the drainageway. No improvements or modifications are planned for this drainageway under this project that may alter current conditions. Finally, acquisition of the property will also allow the County to maintain this entire drainageway which isn't occurring now since portions of it are owned by several different property owners.

## **5.4 SOLID WASTE**

Solid waste collection and disposal operations serving the South Hilo District are provided by the County's Department of Environmental Management. Solid waste from Hilo and from other Hawai'i districts is disposed of at one of two landfills on the island – Hilo Landfill and Puuanahulu Landfill. Waste is disposed at County landfills by commercial haulers, County transfer trailers, individual haulers, industrial haulers, and government haulers (BCGI 1993).

This project involves the acquisition of parcels and easements associated with the existing drainageway. Consequently, it is expected that this project will not have any significant impact on the existing solid waste facilities.

## **5.5 TRANSPORTATION FACILITIES**

The Hawaii Belt Road (Hwy 19) is the only major public roadway facility providing vehicular access to and from the various communities throughout the island. This State highway connects the Hilo urban center to the rest of the island. This highway runs through Hilo Town, but does not travel near the drainageway project area.

Within the project area are several smaller County-owned streets that primarily service surrounding residential subdivisions. The streets within the area include Popolo Street, Hale Nani Street, Kapi'olani Street, and Kūkūau Street. Traffic along these streets is light since it is generally limited to use by residents living in the area.

This project involves the acquisition of parcels and easements associated with the existing drainageway. Consequently, it is expected that this project will not have any significant impact on the existing roadway facilities.

## CHAPTER 6 PUBLIC FACILITIES AND UTILITIES

This chapter discusses the project's probable impact on public facilities and utilities serving the project area and surrounding area.

### 6.1 ELECTRICAL AND COMMUNICATION FACILITIES

Electrical services are provided to the County of Hawai'i via Hawaiian Electric Light Company, Inc.'s (HELCO) distribution lines. HELCO is a privately owned utility company regulated by the State Public Utilities Commission. HELCO provides power from different sources – their own power generation system, power purchased from privately-owned companies, and HELCO-owned steam units, diesel units, and gas turbines. Power is provided to the various project properties from HELCO's Komohana substation via overhead lines.

Telecommunication services are provided to the project site area by Verizon Hawaii via overhead lines.

It is anticipated that the project will have no effect on the current demand for electrical and communication facilities or the ability of these utility companies to continue providing service or maintenance of facilities.

### 6.2 EDUCATIONAL FACILITIES

The South Hilo District currently contains 13 public schools operated under the State Department of Education (DOE). There are eight (8) elementary schools, three (3) intermediate, one (1) of which is a combined intermediate and elementary, and two (2) high schools. School enrollment of South Hilo is about 10,339 students. The Chiefess Kapi'olani Elementary School is located about a half-mile away from the drainageway near the Kīlauea Avenue with Mohouli Street intersection.

There are four (4) private schools within an approximate half-mile radius of the project site. They include St. Joseph Elementary and Junior/Senior High School, Mauna Loa Elementary School, Haili Christian School, and Kamehameha School. The St. Joseph Elementary and Junior/Senior High School is located nearest the drainageway site along Kapi'olani Street.

It is expected that the project will not have any impacts on these educational facilities since it involves the acquisition of parcels and easements associated with an existing drainageway. No improvements to the drainageway are planned at this time. Therefore, the project would not affect staffing requirements, student enrollments, or existing operations or activities conducted at nearby schools such as St. Joseph's School and Kapi'olani Elementary School. Similarly, these school properties would not be affected by the acquisition of easements and parcels.

### **6.3 POLICE AND FIRE PROTECTION**

The Hilo Police Department provides services to the South Hilo District from their South Hilo Police Station which serves as a base of operations for police personnel patrolling this district. This substation is located across Kapi‘olani Street from the project site. Additional police protection is available from the North Hilo Station located in Lāupahoe and Puna Station located in Keaau.

The County of Hawai‘i Fire Department has four fire stations in the South Hilo District – Central, Kaumana, Kawaiiani, and Waiakea.

It is expected that the project will not have any impacts on existing police for fire facilities in the surrounding area because it only involves the acquisition of parcels and easements associated with an existing drainageway. This acquisition project would not affect the Fire Department or Police Department’s ability to provide fire and police protection services for the community.

### **6.4 RECREATIONAL FACILITIES**

The town of Hilo is a major urban center in East Hawai‘i and has a diversity of recreational facilities. Within this town area, there are eight neighborhood parks having between 3.0 and 7.7 acres in size and have playfields. Additional playfields are provided by nine schools in the area. Hoolulu Complex is the major regional recreational center in Hilo town and consists of 56 acres of land generally located a couple of miles northeast of the project site between Waiakea Pond and the Hilo International Airport. There is an auditorium with a seating capacity of 2,800 that is used for various events. Other facilities include Wong stadium for sporting events, a swimming pool, outdoor tennis courts, a covered tennis stadium, and baseball fields.

Within the immediate vicinity of the drainageway project area, there are a few County parks associated with existing residential subdivisions. Mohouli Park is located northeast of the site and University Heights Park is located to the east.

The project will not have any impacts on these existing recreational facilities in the surrounding area or Hilo community because it only involves the acquisition of parcels and easements associated with an existing drainageway. These facilities are currently not affected by this Mohouli Drainageway.

### **6.5 MEDICAL FACILITIES**

Current medical facilities in the Hilo area include the Hilo Medical Center, Life Care Center of Hawai‘i, and the Hale Anuenue Care Center. This medical center is the largest on the island with a total of 164 beds for acute care services which includes 113 beds for medical/surgical and critical care. The Hale Anuenue Care Center provides long-term care services for the elderly. It has 120 beds for both skilled nursing and intermediate care. The Life

Care Center of Hawai'i facility is also a long-term care facility with 252 beds for skilled nursing and intermediate care.

The project will not have any impacts on these existing medical facilities because it only involves the acquisition of parcels and easements associated with an existing drainageway. These facilities are currently not affected by this Mohouli Drainageway.

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## CHAPTER 7 CONFORMANCE WITH PLANS AND POLICIES

This chapter discusses the project's conformance with the State Land Use District regulations and County's *General Plan* goals and policies, Hilo Community Development Plan recommendations, and Zoning District standards.

### 7.1 STATE LAND USE DISTRICT

The State Land Use Commission's Land Use District Boundary Map for the Island of Hawai'i indicates that the project site and immediate surround areas are designated as "Urban District".

Permitted uses within the State Land Use District are prescribed under Title 13, Chapter 205 (Land Use Commission), HRS, and the State Land Use Commission's Administrative Rules prescribed under Title 15, Subtitle 3, Chapter 15, Hawai'i Administrative Rules. Land uses within Urban Districts are thus governed by the ordinances or regulations of the county within which the Urban District is situated. Therefore, the acquisition of parcels and easements for the existing drainageway by the County would fall under the zoning ordinances and regulations under the jurisdiction of the County.

### 7.2 CHAPTER 344, STATE ENVIRONMENTAL POLICY

This section discusses the project's conformance and consistency with the pertinent goals, policies, and guidelines described under Chapter 344, HRS, State Environmental Policy.

#### **Environmental Policy**

- 1. Conserve the natural resources, so that land, water, mineral, visual, air and other natural resources are protected by controlling pollution, by preserving or augmenting natural resources, and by safeguarding the State's unique natural environmental characteristics in a manner which will foster and promote the general welfare, create and maintain conditions under which man and nature can exist in productive harmony, and fulfill the social, economic, and other requirements of the people of Hawaii.*

The project would be consistent with this environmental policy because the proposed drainageway acquisition would involve existing privately-owned land that is already serving this purpose. This project would not have an adverse impact on natural resources or the environment as discussed in the various sections of this document.

The State's unique natural environment will be safeguarded as the execution of this project will conserve natural resources by maintaining the existing drainageway to serve as storm water runoff and detention. Therefore, this project is not anticipated to impact any natural resources.

**2. Enhance the quality of life by:**

*A. Setting population limits so that the interaction between the natural and manmade environments and the population is mutually beneficial.*

This project would be consistent with these environmental polices regarding the quality of life. The property acquisition would not affect the existing or future resident population in Hilo or the establishment of new communities. The proposed project does not involve any new homes or visitor units, and not result in any in-migration.

**Guidelines**

**1. Population**

*A. Recognize population impact as a major factor in environmental degradation and adopt guidelines to alleviate this impact and minimize future degradation.*

*B. Recognize optimum population levels for counties and districts within the State, keeping in mind that these will change with technology and circumstance, and adopt guidelines to limit population to the levels determined.*

The project would not affect the existing or future resident population in Hilo or cause the establishment of new communities. The proposed improvements do not involve any new homes or visitor units, and the project would not result in any in-migration.

**2. Land, water, mineral, visual, air, and other natural resources**

*A. Encourage management practices which conserve and fully utilize all natural resources.*

*B. Promote irrigation and waste water management practices which conserve and fully utilize vital water resources.*

*C. Encourage management practices which conserve and protect watersheds and water sources, forest, and open space areas.*

*D. Establish and maintain natural area preserves, wildlife preserves, forest preserves, marine preserves, and unique ecological preserves.*

This project would be consistent with these guidelines because the improvements would not impact those natural resources identified such as watersheds, forest preserves, wildlife preserves, or unique ecological preserves. The purpose of this project is to acquire the privately-owned property to formally establish this

drainageway under the County's jurisdiction. Thus, existing natural resources associated with this drainageway will be preserved.

**3. *Flora and fauna***

- A. *Protect endangered species of indigenous plants and animals and introduce new plants or animals only upon assurance of negligible ecological hazard.*
- B. *Foster the planting of native as well as other trees, shrubs, and flowering plants compatible to the enhancement of our environment.*

As discussed in this document, no endangered species or indigenous plants or animals were identified or are known to existing within the drainageway project area and surrounding areas. Therefore, the acquisition of the parcels is not anticipated to significantly impact habitats of endangered species, or indigenous plants and animals. This project would also not introduce new plants or animals to the area which may contribute to an ecological hazard on flora or fauna in the region.

**4. *Parks, recreation, and open space***

- A. *Establish, preserve and maintain scenic, historic, cultural, park and recreation areas including the shorelines, for public recreational, educational, and scientific uses.*
- B. *Protect the shorelines of the State from encroachment of artificial improvements, structures, and activities.*

The project will be consistent with these guidelines because the acquisition of the drainageway will not adversely affect such historic, cultural, recreation, or open space resources. The drainageway is also not located along the shoreline. The acquisition of the parcels and easements would support the continued use of this drainageway, and maintain the undeveloped areas.

**5. *Community life and housing***

- A. *Recognize community appearances as major economic and aesthetic assets of the counties and the State; encourage green belts, plantings, and landscape plans and designs in urban areas; and preserve and promote mountain-to-ocean vistas.*

Acquisition of the parcels and easements will support this guideline by maintaining the existing undeveloped natural conditions associated with the drainageway.

**6. *Citizen participation***

- A. *Provide for expanding citizen participation in the decision making process so it continually embraces more citizens and more issues.*

The environmental review process allows for public and government agency input to express concerns and comments associated with the project. Such opportunities include pre-assessment consultation efforts and the availability of the Draft EA for public review. Thus, the public consultation process incorporated within this environmental review process provides the general public and decision-makers with a diverse array of information to consider in evaluating this project.

### 7.3 COUNTY OF HAWAI‘I GENERAL PLAN

This section discusses the project’s conformance with pertinent goals, objectives and policies from the County of Hawai‘i *General Plan* (2005).

#### A. *Flooding and Other Natural Hazards*

1. *Goals:*
  - a. *Protect human life.*
  - b. *Prevent damage to man-made improvements.*
  - c. *Prevent damage from inundation.*
  - d. *Reduce surface water and sediment runoff.*
  - e. *Maximize soil and water conservation.*
2. *Policies:*
  - a. *Development-generated runoff shall be disposed of in a manner acceptable to the Department of Public Works and in compliance with all State and Federal laws.*
  - b. *The county and the private sector shall be responsible for maintaining and improving existing drainage systems and constructing new drainage facilities.*
  - c. *Where applicable, natural drainage channels shall be improved to increase their capacity with special consideration for the practices of proper soil conservation, and grassland and forestry management.*

This drainageway acquisition project will be consistent with these policies supporting the identified goals because the existing drainageway was established in cooperation with the Department of Public Works to serve the Mohouli Subdivision. The manner in which this runoff is being disposed of via the drainageway has been occurring for many years. Acquisition of the parcels and easements would bring the drainageway under the jurisdiction of the County, and allow them to properly maintain it. This drainageway is not planned for any improvements at this time. However, the parcels to be acquired should be adequate to serve projected flows based upon prior studies.

**B. Public Utilities**

1. *Goals:*
  - a. *Ensure that properly regulated, adequate, efficient and dependable public and private utility services are available to users.*
  - b. *Maximize efficiency and economy in the provision of public utility services.*
  - c. *Design public utility facilities to fit into their surroundings or concealed from public view.*
2. *Policies:*
  - a. *Public utility facilities shall be designed to complement adjacent land uses and shall be operated to minimize pollution or disturbance.*
  - b. *Provide utilities and service facilities that minimize total cost to the public and effectively service the needs of the community.*
  - c. *Utility facilities shall be designed to minimize conflict with the natural environment and natural resources.*

This project will be in compliance with these policies supporting the identified goals because the drainageway is essentially comprised of a natural pathway and detention area encompassing lower elevation parcels. The County evaluated other options such as constructing a new drainage system within roadways, but determined the proposed project is more cost effective and practicable. The project is thus consistent by minimizing total public costs while effectively providing needed service. Since this drainageway is already established, it complements adjacent land uses and would no alter existing runoff or the quality of such discharges.

**C. Environmental Quality**

1. *Goals:*
  - a. *Define the most desirable use of land within the County that achieves an ecological balance providing residents and visitors the quality of life and an environment in which the natural resources of the island are viable and sustainable.*
  - b. *Maintain and, if feasible, improve the existing environmental quality of the island.*
  - c. *Control pollution.*
2. *Policies:*
  - a. *Take positive action to further maintain the quality of the environment.*
  - b. *Participate in watershed management projects to improve stream and coastal water quality and encourage local communities to develop such projects.*

- c. Work with the appropriate agencies to adopt appropriate measures and provide incentives to control point and non-point sources of pollution.*

This project will be consistent with these policies supporting the identified goals because acquisition of the parcels and easements would allow the County to maintain the existing drainageway. The drainageway would be under their jurisdiction allowing them to ensure the acquired undeveloped areas remain that way and supporting the natural environment.

#### **7.4 COUNTY OF HAWAII ZONING DISTRICT**

The properties and easements proposed to be acquired for the Mohouli Drainageway are zoned RM-1 (Multiple Family Residential District) and RS-7.5 (Single Family Residential District). Under the Hawaii County Code, Chapter 25, Zoning (Zoning Code), “public uses and structures” are permitted uses within these zoning districts.

The drainageway already exists, and would fall under this definition of public uses. It is thus a permitted use, and acquisition of the parcels and easements would not change this drainageway or classification under the Zoning Code.

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## CHAPTER 8 AGENCY AND PUBLIC CONSULTATION

Consultation with various government agencies and the community have been conducted for this project as part of the process implemented in preparing this document. Such efforts consisted of distributing pre-assessment solicitation letters to several agencies to obtain their input and comments on the project identifying issues which should be addressed along with the publication of the Draft EA.

Publication of the Draft EA also provided an opportunity for government agencies, the community, and affected property owners to review the document and provide comments. These consultation efforts are discussed in this Chapter, and copies of comments received are included in Appendix B of this document.

### 8.1 PRE-ASSESSMENT CONSULTATION (DRAFT EA)

Consultation with various Federal, State and County government agencies was conducted to obtain their comments and concerns associated with the project as part of the environmental assessment process. Letters providing project information along with a location map were sent to these parties in January 2006 for their review.

A listing of agencies and organizations for which consultation letters were sent is provided below. Those providing written response are identified with a “»” symbol. Copies of their written comments received with responses are included in Appendix B.

#### Federal Agencies

- Department of Agriculture, Natural Resources Conservation Service
- Department of the Army, U.S. Army Engineer District, Honolulu
- Department of Interior, National Park Service, Pacific West Region
- Department of the Interior, Water Resources Division, U.S. Geological Survey
- Department of Transportation, Federal Highway Administration, Hawaii Division

#### State of Hawaii Agencies

- » Department of Accounting and General Services
- Department of Agriculture
- Department of Business, Economic Development and Tourism (DBED&T)
- »<sup>2</sup> DBED&T, Hawai'i Community Development Authority
- DBED&T, Land Use Commission

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<sup>2</sup> Email received January 31, 2006 indicating HCDA does not have any interests in the area.

- »<sup>3</sup> DBED&T, Office of Planning
- » Department of Education
- Department of Hawaiian Home Lands
- Department of Health, Environmental Planning Office
- Department of Land and Natural Resources
- Department of Land and Natural Resources, State Historic Preservation Division
- » Department of Transportation
- » Department of Transportation, Hawai‘i District Office
- » Office of Hawaiian Affairs

#### **County of Hawaii Agencies**

- Civil Defense Agency
- » Department of Environmental Management
- Department of Parks and Recreation
- » Planning Department
- Department of Research and Development
- » Department of Water Supply
- Office of the Mayor
- » Fire Department
- » Police Department

#### **Non-Governmental Agencies**

- »<sup>4</sup> The Honorable Lorraine R. Inouye, Senator, 21st District
- The Honorable Clift Tsuji, Representative, 3rd District
- The Honorable Stacy Higa, Chairperson, Hawaii County Council
- Hawai‘i Electric Light Company
- Hawaiian Telcom Inc.

## **8.2 DRAFT ENVIRONMENTAL ASSESSMENT COMMENTS**

The Draft EA for this Acquisition of Existing Drainageway Lands Project was published in the October 8, 2006 issue of the State Office of Environmental Quality Control’s *The Environmental Notice* initiating a 30-day public comment period that ended on November 8, 2006. Copies of the Draft EA were distributed to the following parties for review and comments.

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<sup>3</sup> A telephone response was received from the Coastal Zone Management Division of the Office of Planning indicating their department has no comments and they don’t respond to these types of inquiries anymore because they rely on the existing functional agencies to respond. The exception would be Federal projects or projects having State-wide significance.

<sup>4</sup> Email response received on March 22, 2006 acknowledging receipt of pre-assessment consultation package and offering assistance as needed for the project.

Those parties that submitted comments are indicated with a “»” next to them. Comment letters received from these parties along with corresponding response letters from the County DPW are included in Appendix B. This Final EA has incorporated additional information in response to comments received on the Draft EA.

### **Federal Agencies**

- Department of Agriculture, Natural Resources Conservation Service
- » Department of the Army, U.S. Army Engineer District, Honolulu
- Department of Interior, National Park Service, Pacific West Region
- Department of the Interior, Water Resources Division, U.S. Geological Survey
- Department of Transportation, Federal Highway Administration, Hawaii Division

### **State of Hawaii Agencies**

- » Department of Accounting and General Services
- Department of Agriculture
- Department of Business, Economic Development and Tourism (DBED&T)
- DBED&T, Hawai‘i Community Development Authority
- » DBED&T, Land Use Commission
- BED&T, Office of Planning
- » Department of Education
- » Department of Hawaiian Home Lands
- Department of Health, Environmental Planning Office
- Department of Land and Natural Resources
- Department of Land and Natural Resources, State Historic Preservation Division
- Department of Transportation
- Department of Transportation, Hawai‘i District Office
- » Office of Hawaiian Affairs

### **County of Hawaii Agencies**

- Civil Defense Agency
- » Department of Environmental Management
- Department of Parks and Recreation
- Planning Department
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- The Honorable Stacy Higa, Chairperson, Hawaii County Council
- Hawai'i Electric Light Company, Inc.
- Hawaiian Telcom Inc.
- Oda/McCarty Architects, Ltd
- Mr. George Paiva
- Mr. Juan Manuel Realpe
- Mr. Clarito G. Yago
- Mr. Wesley K. Hatada
- » Mr. Joseph O'Sullivan
- Mr. Valentine Peroff, Jr.
- Mr. Reynold I. De Costa
- Mr. Bruce Yamamoto
- » Mr. Giampaolo Boschetti, c/o Carlsmith Ball, LLP

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## CHAPTER 9

### FINDINGS AND ANTICIPATED DETERMINATION

To determine whether a proposed action may have a significant effect on the environment, the Approving Agency needs to consider every phase of the action, the expected primary and secondary consequences, cumulative effect, and the short- and long-term effects. The Approving Agency's review and evaluation of the proposed action's effect on the environment would result in a determination whether: 1) the action would have a significant effect on the environment, and an Environmental Impact Statement Preparation Notice should be issued, or 2) the action would not have a significant effect warranting a Negative Declaration also referred to as a Finding of No Significant Impact (FONSI).

This chapter discusses the results of the environmental assessment conducted for the proposed acquisition of property associated with the Mohouli Drainageway in relation to the 13 Significance Criteria prescribed under the State Department of Health's Administrative Rules Title 11, Chapter 200. The purpose of this assessment was to consider the "significance" of potential environmental effects which includes the sum of effects on the quality of the environment along with the overall and cumulative effects. The resulting findings are discussed below for each criteria.

#### 9.1 PRELIMINARY FINDINGS

*1. Involves an irrevocable commitment to loss or destruction of any natural or cultural resource.*

The project would not result in the irrevocable commitment to loss or destruction of any natural or cultural resource. As discussed in the various chapters, the parcels and easements acquisitions are needed to allow the County to formally take jurisdiction over this drainageway. This existing drainageway is currently planned to remain under its existing condition. Acquisition of property along Kapi'olani Street will also ensure that those parcels remain undeveloped to continue serving as the drainageway's detention basin area. This project only involves the acquisition of the drainageway property, thus, there would be no destruction or loss of any significant geological or other natural resources, botanical resources, or habitat for endangered or threatened avian or mammalian species.

In terms of archaeological and historic resources, there are no known historic or culturally significant sites that are planned to be acquired as part of the drainageway. The bedrock ridge modifications (Site 25547) apparently designed to restrict access into or out of the intended area is believed to have functioned as an enclosure designed to keep small animals (i.e. pigs, dogs, etc.) within or out of the enclosed space. This Site was recorded in detail and no further work was recommended. Thus, this site is not considered a traditional

cultural property, and there were no specific natural or cultural resources, or cultural beliefs and practices identified relative to the land within the current study area. Therefore, the acquisition of the drainageway property will not involve the irrevocable commitment to loss or destruction of any historic of cultural resources.

**2. *Curtails the range of beneficial uses of the environment.***

The project would not curtail the range of beneficial uses associated with this existing drainageway or the surrounding environment. The drainageway area presently occurs within privately-owned lands in an urbanized residential area. Therefore, the current use of those properties is limited to the property owners. Acquisition of parcels will restrict use of the easements established along with entire parcels acquired. However, property owners would be compensated for their properties under the County's process which will allow them to utilize the proceeds. Several of the parcels are already restricted in use due to the drainageway and detention area encompassing properties. With the acquisition, the drainageway environment would be preserved and continue serving its present use.

**3. *Conflicts with the State's long-term environmental policies or goals and guidelines as expressed in Chapter 344, HRS, and any revisions thereof and amendments thereto, court decisions, or executive orders.***

The land acquisitions proposed under this project would not conflict with the State's long-term environmental policies or goals and guidelines as expressed in Chapter 344, HRS. This document addressed the probable environmental impacts associated with the project which would be minimal, and discussed the project's consistency with Chapter 344, HRS in Chapter 7.

**4. *Substantially affects the economic, social welfare, or cultural practices of the community or State.*<sup>5</sup>**

As discussed under Chapter 4 and other chapters in this document, the project would not have any significant negative impacts on the economic structure of the Hilo district, or the social welfare of the Hilo community. The acquisition of parcels and easements would not affect any known cultural resources or practices occurring within the project area as already discussed. As a result, there should be no negative impact or change to the overall character of the community.

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<sup>5</sup> This significance criteria was modified to reflect the recent change to Chapter 343, HRS approved by the Governor as Act 50 on April 26, 2000. This Act added "cultural practices" as part of the factors considered in determining the significance of an effect.

**5. *Substantially affects public health.***

The project is not expected to substantially affect public health since it would only involve the land acquisition of private properties for an existing drainageway. Acquisition of the parcels and easements by the County would ensure that these affected areas remain undeveloped to continue serving as a drainageway and detention area and not alter conditions from development which may affect future flood conditions in the area.

**6. *Involves substantial secondary impacts, such as population changes or effects on public facilities.***

The project should not have any secondary impacts on the social environment or infrastructure and public facilities. The project strictly involves only the acquisition of private land for the purposes of a drainageway, and does not include residential housing or visitor accommodations.

**7. *Involves a substantial degradation of environmental quality.***

The proposed project would not involve a substantial degradation to the quality of the surrounding environment. This document discussed the probable impacts of several environmental factors associated with the acquisition of the drainageway which determined that there should not be an adverse impact on the quality of the existing environment.

**8. *Is individually limited, but cumulatively has considerable effect upon the environment or involves a commitment for larger actions.***

This project only involves the acquisition of private properties and easements for the purposes of establishing a drainageway under the County's jurisdiction. This acquisition will not have a cumulative effect on the environment or involve a commitment for larger actions as discussed in this document.

**9. *Substantially affects a rare, threatened, or endangered species, or its habitat.***

There are no known endangered, threatened, or rare botanical resources, avian species, or mammalian species within the drainageway project area that would be substantially affected based upon the studies conducted and discussed in this document. This project only involves the acquisition of parcels and easements associated with the existing drainageway and detention area.

**10. *Detrimentially affects air or water quality or ambient noise levels.***

The project should not have a detrimentally significant impact on air, water quality, or ambient noise levels. This project only involves the acquisition of parcels and easements associated with the existing drainageway and detention area.

- 11. Affects or is likely to suffer damage by being located in an environmentally sensitive area such as a flood plain, tsunami zone, beach, erosion-prone area, geologically hazardous land, estuary, fresh water, or coastal waters.***

The existing drainageway is not identified as a flood plain based upon the existing flood insurance rate maps. However, it does currently serve the discharge of storm water runoff from the Mohouli Subdivision. The drainageway area is not situated within an environmentally sensitive area such as those identified. The acquisition of the property for this drainageway would not significantly affect those environmentally sensitive areas identified as discussed in the various sections of this document.

- 12. Substantially affects scenic vistas and viewplanes identified in county or state plans or studies.***

The project would not affect scenic vistas or view planes since there are no significant views or landform in the immediate vicinity which would be adversely affected by the project as discussed in this document.

- 13. Requires substantial energy consumption.***

The project would not require substantial energy consumption or increased electrical facilities. This project only involves the acquisition of parcels and easements associated with the existing drainageway and detention area.

## **9.2 DETERMINATION**

A Negative Declaration, also referred to as a Finding of No Significant Impact (FONSI), determination is warranted for the Acquisition of Existing Drainageway Lands Project based upon the information provided in this Final EA document. The results of the assessments conducted have determined that the acquisition of parcels and easements for the existing drainageway should not have significant impact on the surrounding environment.

These assessment results are also based upon the agency and public review comments received on the Draft EA published and distributed for public review. The findings supporting this determination are based upon the previous discussion of the project's affect on the environment in relation to the 13 Significance Criteria.

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## CHAPTER 10 BIBLIOGRAPHY

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# APPENDICES

# APPENDIX A

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*PHOTOGRAPHS OF PROJECT SITE  
AND SURROUNDING AREAS*



Photo 1 - Mauka View of Drainageway from Popolo Street



Photo 2 - View of Drainageway Along Popolo Street



Photo 3 - Drainageway Facing Downstream Along Popolo Street



Photo 4 - Culvert Facing Upstream Along Popolo Street



Photo 5 - View of Drainageway Facing Upstream



Photo 6 - View of Rock Wall Along Drainageway



**Photo 7 - View of Driveway from Kukuau Street**



**Photo 8 - View of Existing Drainage Pipes Within Access Road**



**Photo 9 - View of Floodway Area Facing Mauka of Kapiolani Street**



**Photo 10 - Floodway Area Mauka of Kapiolani Street**



**Photo 11 - Heavy Vegetation of Floodway Area Mauka of Kapiolani Street**



**Photo 12 - Area Mauka of Kapiolani Street**

# APPENDIX B

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## *CONSULTATION EFORTS*

# **APPENDIX B1**

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## ***PRE-ASSESSMENT CONSULTATION COMMENT LETTERS AND RESPONSES***

LINDA LINGLE  
GOVERNOR



RUSS K. SAITO  
COMPTROLLER

KATHERINE H. THOMASON  
DEPUTY COMPTROLLER

STATE OF HAWAII  
DEPARTMENT OF ACCOUNTING AND GENERAL SERVICES  
P.O. BOX 119, HONOLULU, HAWAII 96810

SSFM INTERNATIONAL, INC.  
RECEIVED  
~~FEB 24 2006~~

(P)1055.6

FEB 23 2006

FILE COPY

Mr. Ronald A. Sato, AICP  
SSFM International, Inc.  
501 Sumner Street, Suite 620  
Honolulu, HI 96817

Dear Mr. Sato:

Subject: Acquisition of Land for Existing Drainageway Project  
Pre-Assessment Consultation for Draft Environmental Assessment  
Kukuau, South Hilo, Hawaii, TMK: 2-4-25, 2-4-59, 2-4-55

Thank you for the opportunity to review the information regarding the Kukuau, South Hilo land acquisition. The project does not impact any of the Department of Accounting and General Services' projects or existing facilities and we have no comments to offer.

If you have any questions, please call me at 586-0400 or have your staff call Mr. David DePonte of the Public Works Division at 586-0492.

Sincerely,

RUSS K. SAITO  
State Comptroller

c: Ms. Genevieve Salmonson, OEQC



**SSFM INTERNATIONAL, INC.**

501 Sumner Street, Suite 620

Honolulu, Hawaii 96817

Phone: (808) 531-1308

Fax: (808) 521-7348

Project Managers, Planners, & Engineers  
American Council of Engineering Companies, Member

September 20, 2006

2005\_082.000

Mr. Russ K. Saito, Comptroller & Director  
Department of Accounting and General Services  
State of Hawai'i  
1151 Punchbowl Street  
Honolulu, Hawai'i 96813

Dear Mr. Saito:

Subject: Acquisition of Land for Existing Drainageway Project  
Pre-Assessment Comments, Draft Environmental Assessment  
Kūkūau, South Hilo, Hawaii

Thank you for the letter dated February 23, 2006 regarding the pre-assessment consultation efforts for preparation of the Draft Environmental Assessment for the subject project.

We confirm your determination that this project will not impact any of your projects or existing facilities, and you have no further comments to offer.

If you have any questions on this matter, please contact me at 531-1308. Thank you.

Sincerely,

SSFM INTERNATIONAL, INC.

A handwritten signature in black ink, appearing to read 'Ronald A. Sato', is written over the typed name.

Ronald A. Sato, AICP  
Senior Project Planner



STATE OF HAWAII  
DEPARTMENT OF EDUCATION  
P.O. BOX 2360  
HONOLULU, HAWAII 96804

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OFFICE OF THE SUPERINTENDENT

March 3, 2006

FILE COPY

Mr. Ronald A. Sato  
SSFM International, Inc.  
501 Sumner Street, Suite 620  
Honolulu, Hawaii 96817

Dear Mr. Sato:

Subject: Early Consultation on Hilo Drainageway Project, South Hilo, Hawaii

The Department of Education has no major concern with the proposed plans to acquire land to formally establish an existing drainage way and detention area. We note that the project has some proximity to Kapiolani Elementary School. We anticipate a brief discussion in the Draft Environmental Assessment of any potential impacts of the project on the elementary school campus.

Thank you for the opportunity to offer our early comments. If you have any questions, please call Heidi Meeker of the Facilities Development Branch at 733-4862.

Very truly yours,

Patricia Hamamoto  
Superintendent

PH:jmb

cc: Randolph Moore, Acting Assistant Superintendent, OBS  
Duane Kashiwai, Facilities Development Branch  
Valerie Takata, CAS, Hilo/Laupahoehoe/Waiakea Complex Areas



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American Council of Engineering Companies, Member

September 20, 2006

2005\_082.000

Ms. Patricia Hamamoto, Superintendent  
Department of Education  
State of Hawai'i  
P.O. Box 2360  
Honolulu, Hawai'i 96804

Dear Ms. Hamamoto:

Subject: Acquisition of Land for Existing Drainageway Project  
Pre-Assessment Comments, Draft Environmental Assessment  
Kūkūau, South Hilo, Hawaii

Thank you for the letter dated March 3, 2006 regarding the pre-assessment consultation efforts for preparation of the Draft Environmental Assessment for the subject project.

We confirm that your department has no major concerns with the proposed project. The Draft Environmental Assessment will include discussion as to the projects effects on Kapi'olani Elementary School which is in the general vicinity of this drainageway.

If you have any questions on this matter, please contact me at 531-1308. Thank you.

Sincerely,

SSFM INTERNATIONAL, INC.

A handwritten signature in black ink, appearing to read 'Ronald A. Sato'.

Ronald A. Sato, AICP  
Senior Project Planner





**SSFM INTERNATIONAL, INC.**

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September 20, 2006

2005\_082.000

Mr. Stanley M. Tamura, Hawai'i District Engineer  
Hawai'i District  
Highways Division  
Department of Transportation  
State of Hawai'i  
50 Makaala Street  
Hilo, Hawai'i 96720

Dear Ms. Tamura:

Subject: Acquisition of Land for Existing Drainageway Project  
Pre-Assessment Comments, Draft Environmental Assessment  
Kūkūau, South Hilo, Hawaii

Thank you for the letter dated February 2, 2006 regarding the pre-assessment consultation efforts for preparation of the Draft Environmental Assessment for the subject project.

We confirm your determination that this project will not directly affect your highway facilities. We also appreciate your interest and support in efforts to mitigate flood impacts to your highway facilities.

If you have any questions on this matter, please contact me at 531-1308. Thank you.

Sincerely,

SSFM INTERNATIONAL, INC.

A handwritten signature in cursive script, appearing to read 'Ronald A. Sato'.

Ronald A. Sato, AICP  
Senior Project Planner

JINDA LINGLE  
GOVERNOR



STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
869 PUNCHBOWL STREET  
HONOLULU, HAWAII 96813-5097

February 9, 2006

SSFM INTERNATIONAL, INC.

RECEIVED

FEB 17 2006

*ras*

RODNEY K. HARAGA  
DIRECTOR

Deputy Directors  
BRUCE Y. MATSUI  
BARRY FUKUNAGA  
BRENNON T. MORIOKA  
BRIAN H. SEKIGUCHI

IN REPLY REFER TO:

STP 8.2032

FILE

**FILE COPY**

Mr. Ronald A. Saito, AICP  
Senior Project Planner  
SSFM International, Inc.  
501 Sumner Street, Suite 620  
Honolulu, Hawaii 96817

Dear Mr. Saito:

Subject: Pre-Assessment Consultation for Draft Environmental Assessment  
Acquisition of Land for Existing Drainageway Project  
Kukuau, South Hilo

Thank you for the advance notice on the subject project. Based on the project map and summary, it appears that the project will not have an impact on our transportation facilities.

We understand that the draft environmental assessment will contain more detailed information on the project's scope, parameters, work limit area and other areas that may be affected or influenced by the project. Although we anticipate no or minimal impact to our facilities based on the preliminary and summary information you provided in your notice, we would like to receive a copy of the draft assessment to verify this.

We appreciate the courtesy of your advance notification and for the opportunity to provide our comments.

Very truly yours,

RODNEY K. HARAGA  
Director of Transportation

c: Mr. Galen Kuba, Hawaii County Department of Public Works



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American Council of Engineering Companies, Member

September 20, 2006

2005\_082.000

Mr. Rodney K. Haraga, Director  
Department of Transportation  
State of Hawai'i  
869 Punchbowl Street  
Honolulu, Hawai'i 96813

Dear Mr. Haraga:

Subject: Acquisition of Land for Existing Drainageway Project  
Pre-Assessment Comments, Draft Environmental Assessment  
Kūkūau, South Hilo, Hawaii

Thank you for your letter dated February 9, 2006 regarding the pre-assessment consultation efforts for preparation of the Draft Environmental Assessment for the subject project.

We confirm your determination that this project will not have an impact on your transportation facilities. The Draft Environmental Assessment will include more detailed information on the project's scope, estimated drainageway area, and affected properties. A copy of this document will be provided to your department for review as part of the public review process.

If you have any questions on this matter, please contact me at 531-1308. Thank you.

Sincerely,

SSFM INTERNATIONAL, INC.

A handwritten signature in black ink, appearing to read 'Ronald A. Sato'.

Ronald A. Sato, AICP  
Senior Project Planner

PHONE (808) 594-1888



STATE OF HAWAII  
OFFICE OF HAWAIIAN AFFAIRS  
711 KAPI'OLANI BOULEVARD, SUITE 500  
HONOLULU, HAWAII 96813

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FEB 17 2006

FAX (808) 594-1865

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February 10, 2006

**FILE COPY** HRD05/2230

Ronald A. Sato  
SSFM International, Inc.  
501 Summer Street, Suite 620  
Honolulu, HI 96817

**RE: Pre-Environmental Assessment Consultation for the Proposed Acquisition of Land for Existing Drainageway Project, South Hilo, Hawai'i Island.**

Dear Mr. Sato,

The Office of Hawaiian Affairs (OHA) is in receipt of your January 30, 2006 request for comment on the above listed proposed project. OHA offers the following comments:

Please contact Lukela Ruddle of OHA's Hilo office as part of your consultation effort. She will likely be able to assist you in locating groups and individuals to consult prior to drafting an Environmental Assessment.

OHA also asks that, In accordance with Section 6E-46.6, Hawaii Revised Statutes and Chapter 13-300, Hawaii Administrative Rules, if any significant cultural deposits or human skeletal remains are encountered, work shall stop in the immediate vicinity and the State Historic Preservation Division (SHPD/DLNR) shall be contacted.

Thank you for the opportunity to comment. If you have further questions or concerns, please contact Jesse Yorck, Native Rights Policy Advocate, at (808) 594-0239 or [jessey@oha.org](mailto:jessey@oha.org).

'O wau iho nō,

*Clyde W. Nāmu'o*  
Clyde W. Nāmu'o  
Administrator

CC: Lukela Ruddle  
OHA Community Affairs Coordinator (Hilo)  
162 A Baker Avenue  
Hilo, HI 96720-4869



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Project Managers, Planners, & Engineers  
American Council of Engineering Companies, Member

September 20, 2006

2005\_082.000

Mr. Clyde Namu'o, Administrator  
Office of Hawaiian Affairs  
State of Hawai'i  
711 Kapi'olani Boulevard, Suite 500  
Honolulu, Hawai'i 96813

Dear Mr. Namu'o:

Subject: Acquisition of Land for Existing Drainageway Project  
Pre-Assessment Comments, Draft Environmental Assessment  
Kūkūau, South Hilo, Hawaii

Thank you for your letter dated February 10, 2006 regarding the pre-assessment consultation efforts for preparation of the Draft Environmental Assessment for the subject project.

An archaeological inventory survey will be conducted for this drainageway project. As part of their efforts, consultation with individuals knowledgeable of the area will be performed. Your Hilo office will be contacted as requested.

No improvements are planned to this existing drainageway at this time. This project only involves the acquisition of parcels and easements associated with this drainageway so that the County can take jurisdiction of it. However, in the event any significant cultural deposits or human skeletal remains are encountered, all work will stop and the procedures specified under Section 6E-46.6, HRS and Chapter 13-300, HAR will be followed.

If you have any questions on this matter, please contact me at 531-1308. Thank you.

Sincerely,

SSFM INTERNATIONAL, INC.

A handwritten signature in black ink, appearing to read 'Ronald A. Sato'.

Ronald A. Sato, AICP  
Senior Project Planner

Harry Kim  
Mayor



Barbara Bell  
Director

Nelson Ho  
Deputy Director

**County of Hawaii**  
**DEPARTMENT OF ENVIRONMENTAL MANAGEMENT**  
25 Aupuni Street, Room 210 • Hilo, Hawai'i 96720-4252  
(808) 961-8083 • Fax (808) 961-8086

SSFM INTERNATIONAL, INC.  
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February 6, 2006

Mr. Ronald A. Sato, AICP  
SSFM International, Inc.  
501 Sumner Street, Suite 620  
Honolulu, HI 96817

Re: Acquisition of Land for Existing Drainageway Project  
Pre-Assessment Consultation for Draft Environmental Assessment  
Kukuau, South Hilo, Hawai'i

**FILE COPY**

Dear Mr. Sato,

Our department offers the following comments:

- County sewer exists where proposed easement crosses Popolo Street.
- Consideration of relocating or upgrading existing sewer should be included.

Thank you for allowing us the opportunity to offer input on this project and if we can be of further assistance, please don't hesitate to contact us.

Barbara Bell  
DIRECTOR

cc: TSS  
WWD

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**SSFM INTERNATIONAL, INC.**

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Honolulu, Hawaii 96817

Phone: (808) 531-1308

Fax: (808) 521-7348

Project Managers, Planners, & Engineers  
American Council of Engineering Companies, Member

September 20, 2006

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Ms. Barbara Bell, Director  
Department of Environmental Management  
County of Hawai'i  
25 Aupuni Street, Room 210  
Hilo, Hawai'i 96720

Dear Ms. Bell:

Subject: Acquisition of Land for Existing Drainageway Project  
Pre-Assessment Comments, Draft Environmental Assessment  
Kūkūau, South Hilo, Hawaii

Thank you for your letter dated February 6, 2006 regarding the pre-assessment consultation efforts for preparation of the Draft Environmental Assessment for the subject project.

We appreciate the information that a County sewer line is present along Popolo Street where the existing drainageway crosses this roadway. However, no improvements are planned to Popolo Street or the drainageway since this project only involves the acquisition of parcels and easements associated with this drainageway. Thus, relocating or upgrading the existing sewer system is not applicable and cannot be accommodated under this project.

If you have any questions on this matter, please contact me at 531-1308. Thank you.

Sincerely,

SSFM INTERNATIONAL, INC.

A handwritten signature in black ink, appearing to read 'Ronald A. Sato'.

Ronald A. Sato, AICP  
Senior Project Planner

Harry Kim  
Mayor



Christopher J. Yuen  
Director

Brad Kurokawa, ASLA  
LEED™ AP  
Deputy Director

County of Hawaii  
PLANNING DEPARTMENT

101 Aupuni Street, Suite 3 • Hilo, Hawaii 96720-3043  
(808) 961-8288 • FAX (808) 961-8742

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FILE COPY

February 6, 2006

Mr. Ronald A. Sato, AICP  
SSFM International, Inc.  
501 Sumner Street, Suite 620  
Honolulu, Hawaii 96817

Dear Mr. Sato:

**Subject: Acquisition of Land for Existing Drainageway Project  
Pre-Assessment Consultation for Draft Environmental Assessment  
Kūkūau, South Hilo, Hawai'i**

This is in response to your letter dated January 30, 2006 requesting our comments regarding the proposed project in connection with your preparation of a Draft Environmental Assessment as required by Chapter 343, Hawaii Revised Statutes and Title 11, Chapter 200, Department of Health, Hawaii Administrative rules.

We understand the proposed project provides for the acquisition of land and easements to formally establish the existing drainageway and detention area created by the Mohouli subdivision area.

The affected properties, as shown on the provided project location map, are zoned Single-Family Residential (RS-7.5) and Multi-Family Residential (RM-1) by the County of Hawaii. All of the affected properties are in the State Land Use Urban district and are not in the Special Management Area. The LUPAG Map of the Hawaii County General Plan designates the project area for medium density urban uses.

The proposed acquisition of private lands through purchase and easements to formally establish the existing drainageway and retention area is consistent with the Zoning Code and General Plan. Therefore, the Planning Department has no further comments on the proposed project.

Mr. Ronald A. Sato, AICP  
SSFM International, Inc.

Page 2

February 7, 2006

Should you have questions, please feel welcome to contact Larry Brown or Esther Imamura of my staff at 961-8288.

Sincerely,



CHRISTOPHER J. YUEN  
Planning Director

LMB:cd

P:\WPWIN60\Larry\EA-EIS Comments\SSFM-DPW-KukuauDrainageWay precon.doc

xc: DPW, Engineering Division



**SSFM INTERNATIONAL, INC.**

501 Sumner Street, Suite 620

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Project Managers, Planners, & Engineers  
American Council of Engineering Companies, Member

September 20, 2006

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Mr. Christopher Yuen, Director  
Planning Department  
County of Hawai'i  
101 Aupuni Street, Suite 3  
Hilo, Hawai'i 96720-3043

Dear Mr. Yuen:

Subject: Acquisition of Land for Existing Drainageway Project  
Pre-Assessment Comments, Draft Environmental Assessment  
Kūkūau, South Hilo, Hawaii

Thank you for your letter dated February 6, 2006 regarding the pre-assessment consultation efforts for preparation of the Draft Environmental Assessment for the subject project.

We appreciate the information on the existing land use designations associated with the project area which is consistent with the information we have. We note your department has no further comments on the project at this time.

If you have any questions on this matter, please contact me at 531-1308. Thank you.

Sincerely,

SSFM INTERNATIONAL, INC.

A handwritten signature in black ink that reads 'Ronald A. Sato'.

Ronald A. Sato, AICP  
Senior Project Planner

Harry Kim  
Mayor



Lawrence K. Mahuna  
Police Chief

Harry S. Kubojiri  
Deputy Police Chief

# County of Hawaii

## POLICE DEPARTMENT

349 Kapiolani Street • Hilo, Hawaii 96720-3998  
(808) 935-3311 • Fax (808) 961-8869

SSFM INTERNATIONAL, INC.  
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February 7, 2006

Mr. Ronald A. Sato, AICP  
Senior Project Planner  
SSFM International, Inc.  
501 Sumner Street, Suite 620  
Honolulu, Hawaii 96817

# FILE COPY

Dear Mr. Sato:

**Subject: Acquisition of Land for Existing Drainageway Project  
Pre-Assessment Consultation for Draft Environmental  
Assessment, Kukuau, South Hilo, Hawaii**

Staff, upon review of the above-mentioned project, has neither concerns nor comments to offer in regard to this request at this time. There will be no significant impact on traffic or public safety in the area.

Thank you for the opportunity to comment.

Sincerely,

*James M. Day*  
JAMES M. DAY  
ASSISTANT POLICE CHIEF  
AREA I OPERATIONS

LW/lli



**SSFM INTERNATIONAL, INC.**

501 Sumner Street, Suite 620

Honolulu, Hawaii 96817

Phone: (808) 531-1308

Fax: (808) 521-7348

Project Managers, Planners, & Engineers  
American Council of Engineering Companies, Member

September 20, 2006

2005\_082.000

Mr. James M. Day, Assistant Police Chief  
Area I Operations  
Police Department  
County of Hawai'i  
349 Kapi'olani Street  
Hilo, Hawai'i 96720-3998

Dear Mr. Day:

Subject: Acquisition of Land for Existing Drainageway Project  
Pre-Assessment Comments, Draft Environmental Assessment  
Kūkūau, South Hilo, Hawaii

Thank you for your letter dated February 7, 2006 regarding the pre-assessment consultation efforts for preparation of the Draft Environmental Assessment for the subject project.

We confirm your department has no concerns or comments associated with this proposed project at this time since there will be no significant impact on traffic or public safety in the area.

If you have any questions on this matter, please contact me at 531-1308. Thank you.

Sincerely,

SSFM INTERNATIONAL, INC.

A handwritten signature in black ink, appearing to read 'Ronald A. Sato', is written over the typed name.

Ronald A. Sato, AICP  
Senior Project Planner





**SSFM INTERNATIONAL, INC.**

501 Sumner Street, Suite 620

Honolulu, Hawaii 96817

Phone: (808) 531-1308

Fax: (808) 521-7348

Project Managers, Planners, & Engineers  
American Council of Engineering Companies, Member

September 20, 2006

2005\_082.000

Mr. Darryl Oliveira, Fire Chief  
Fire Department  
County of Hawai'i  
25 Aupuni Street, Suite 103  
Hilo, Hawai'i 96720

Dear Mr. Oliveira:

Subject: Acquisition of Land for Existing Drainageway Project  
Pre-Assessment Comments, Draft Environmental Assessment  
Kūkūau, South Hilo, Hawaii

Thank you for your letter dated February 10, 2006 regarding the pre-assessment consultation efforts for preparation of the Draft Environmental Assessment for the subject project.

We confirm your department has no comments on this project at this time.

If you have any questions on this matter, please contact me at 531-1308. Thank you.

Sincerely,

SSFM INTERNATIONAL, INC.

A handwritten signature in black ink that reads 'Ronald A. Sato'.

Ronald A. Sato, AICP  
Senior Project Planner





**SSFM INTERNATIONAL, INC.**

501 Sumner Street, Suite 620

Honolulu, Hawaii 96817

Phone: (808) 531-1308

Fax: (808) 521-7348

Project Managers, Planners, & Engineers  
American Council of Engineering Companies, Member

September 20, 2006

2005\_082.000

Mr. Milton Pavao, P.E., Manager  
Department of Water Supply  
County of Hawai'i  
345 Kekuanaoa Street, Suite 20  
Hilo, Hawai'i 96720

Dear Mr. Pavao:

Subject: Acquisition of Land for Existing Drainageway Project  
Pre-Assessment Comments, Draft Environmental Assessment  
Kūkūau, South Hilo, Hawaii

Thank you for your letter dated March 9, 2006 regarding the pre-assessment consultation efforts for preparation of the Draft Environmental Assessment for the subject project.

We confirm your department has no comments on this project at this time.

If you have any questions on this matter, please contact me at 531-1308. Thank you.

Sincerely,

SSFM INTERNATIONAL, INC.

A handwritten signature in black ink that reads 'Ronald A. Sato'.

Ronald A. Sato, AICP  
Senior Project Planner

# APPENDIX B2

---

*DRAFT EA COMMENT  
LETTERS AND RESPONSES*



REPLY TO  
ATTENTION OF

DEPARTMENT OF THE ARMY  
U. S. ARMY ENGINEER DISTRICT, HONOLULU  
FT. SHAFTER, HAWAII 96858-5440

October 26, 2006

Regulatory Branch

File No. POH-2006-433

Ronald A. Sato  
SSFM International, Inc.  
501 Sumner Street, Suite 620  
Honolulu, Hawaii 96817

SSFM INTERNATIONAL, INC.  
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Dear Mr. Sato:

This letter is in responds to your request letter dated October 6, 2006 for review and comments on a Draft Environmental Assessment (DEA) for acquisition of easement and parcels for proposed drainageway and detention basin in the vicinity of the Mohouli Housing subdivision, Hilo, Hawaii (TMKs: (3<sup>rd</sup>) 2-4-025: 048-050, 052, 053, 059, 067, 078, 080, 093, 106 – 110, 115). We have reviewed the information you provided with regards to the Corps' authority to issue Department of the Army (DA) permits pursuant to Section 10 of the Rivers and Harbors Act (RHA) of 1899 (33 USC 403) and Section 404 of the Clean Water Act (CWA) (33 USC 1344).

Based on the information provided in the DEA, it appears the proposed action, to acquire the necessary easements and parcels for the drainageway and detention basin, will not involve work in and/or placement of dredge and/or fill material into waters of the U.S. under our regulatory jurisdiction; therefore, **a DA permit is not required.**

Should future development of the proposed drainageway and detention basin require work that involves the aforementioned regulated activities, then a County of Hawaii Department of Public Works representative or designated project agent contact our office for a determination on whether a permit DA permit will be required.

Thank you for your consideration of potential impacts to the aquatic environment. For inquires regarding this project, please contact Ms. Joy Anamizu of my staff at 808-438-7023, by facsimile at 808-438-4060, or by e-mail at [joy.n.anamizu@usace.army.mil](mailto:joy.n.anamizu@usace.army.mil), and refer to the file number above.

Sincerely,

George P. Young, P.E.  
Chief, Regulatory Branch

Copy Furnished:

Mr. Bruce McClure, Department of Public Works, County of Hawaii, 101 Pauahi Street, Suite 7  
Hilo, Hawaii 96720-4224

Harry Kim  
Mayor



Bruce C. McClure  
Director

Jiro A. Sumada  
Deputy Director

**County of Hawai'i**  
**DEPARTMENT OF PUBLIC WORKS**  
Aupuni Center  
101 Pauahi Street, Suite 7 • Hilo, Hawai'i 96720-4224  
(808) 961-8321 • Fax (808) 961-8630

November 20, 2006

Mr. George P. Young, P.E., Chief  
Regulatory Branch  
Department of the Army  
U.S. Army Engineer District, Honolulu  
Fort Shafter, Hawai'i 96858-5440

Dear Mr. Young:

**SUBJECT: Acquisition of Existing Drainageway Lands Project  
Draft Environmental Assessment Comments  
Kukuau, South Hilo, Hawai'i**

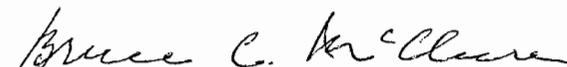
Thank you for your letter dated October 26, 2006 providing comments on the Draft Environmental Assessment for the subject project.

We confirm your determination that the acquisition of necessary easements and parcels for the drainageway and detention basin should not involve the discharge of dredged or fill material into the waters of the United States that are under your regulatory jurisdiction. Therefore a Department of Army permit will not be required for this project.

Should the County decide to construct improvements to this drainageway in the future, a representative will contact your office for a determination whether a Department of Army permit is required.

If you have any questions on this matter, please contact Mr. Galen Kuba at 961-8422.

Sincerely,

  
Bruce C. McClure, P.E.  
Director of Public Works

cc: Ronald Sato, SSFM International, Inc.

LINDA LINGLE  
GOVERNOR



RUSS K. SAITO  
COMPTROLLER

KATHERINE H. THOMASON  
DEPUTY COMPTROLLER

**STATE OF HAWAII**

(P)1259.6

DEPARTMENT OF ACCOUNTING AND GENERAL SERVICES  
P.O. BOX 119, HONOLULU, HAWAII 96810

SSFM INTERNATIONAL, INC.  
RECEIVED

OCT 30 2006

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**FILE COPY**

Mr. Ronald A. Sato, AIC  
SSFM International, Inc.  
501 Sumner Street, Suite 620  
Honolulu, HI 96817

FILE

Dear Mr. Sato:

Subject: Acquisition of Existing Drainageway Lands Project  
Draft Environmental Assessment  
Kukuau, South Hilo, Hawaii, TMK: (3) 2-4-025: Var

Thank you for the opportunity to review the information regarding the subject project. The project does not impact any of the Department of Accounting and General Services' projects or existing facilities and we have no comments to offer.

If you have any questions regarding the above, please have your staff call Mr. David DePonte of the Planning Branch at 586-0492.

Sincerely,

*Ernest Y.W. Lau*  
ERNEST Y.W. LAU  
Public Works Administrator

DD:vca

c: Ms. Genevieve Salmonson, OEQC  
Mr. Bruce McClure, DPW - Hawaii

Harry Kim  
Mayor



Bruce C. McClure  
Director

Jiro A. Sumada  
Deputy Director

**County of Hawai'i**  
**DEPARTMENT OF PUBLIC WORKS**  
Aupuni Center  
101 Pauahi Street, Suite 7 • Hilo, Hawai'i 96720-4224  
(808) 961-8321 • Fax (808) 961-8630

November 20, 2006

Mr. Ernest Y.W. Lau, Public Works Administrator  
Department of Accounting and General Services  
State of Hawai'i  
P.O. Box 119  
Honolulu, Hawai'i 96810

Dear Mr. Lau:

**SUBJECT: Acquisition of Existing Drainageway Lands Project  
Draft Environmental Assessment Comments  
Kukuau, South Hilo, Hawai'i**

Thank you for your letter dated October 26, 2006 providing comments on the Draft Environmental Assessment for the subject project.

We confirm your determination that this project will not impact any of your projects or existing facilities, and you have no further comments to offer.

If you have any questions on this matter, please contact Mr. Galen Kuba at 961-8422.

Sincerely,

  
Bruce C. McClure, P.E.  
Director of Public Works

cc: Ronald Sato, SSFM International, Inc.



STATE OF HAWAII  
DEPARTMENT OF BUSINESS, ECONOMIC DEVELOPMENT & TOURISM  
LAND USE COMMISSION  
P.O. Box 2359  
Honolulu, Hawaii 96804-2359  
Telephone: 808-587-3822  
Fax: 808-587-3827

SSFM INTERNATIONAL INC  
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October 31, 2006

FILE COPY

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Ronald Sato, AICP  
SSFM International, Inc.  
Honolulu, Hawaii 96817

96817/96836

Dear Mr. Sato:

Subject: Draft Environmental Assessment (Draft EA)  
Acquisition of Existing Drainageway Lands Project  
(3) 2-4-25: 48-50, 52, 53, 59, 67, 78, 80, 93, 106-110, 115  
Hilo, Hawaii

We have reviewed the above Draft EA forwarded by your transmittal dated October 6, 2006, and confirm that the subject parcels are located within the State Land Use Urban District.

Given the location, scope, and nature of the proposed activity, we have no further comments to offer at this time.

Thank you for the opportunity to comment on the subject application. Please do not hesitate to contact me at 587-3822 should you require clarification or any further assistance.

Sincerely,

ANTHONY J. H. CHING  
Executive Officer

Harry Kim  
Mayor



Bruce C. McClure  
Director

Jiro A. Sumada  
Deputy Director

**County of Hawai'i**  
**DEPARTMENT OF PUBLIC WORKS**  
Aupuni Center  
101 Pauahi Street, Suite 7 • Hilo, Hawai'i 96720-4224  
(808) 961-8321 • Fax (808) 961-8630

November 20, 2006

Mr. Anthony J.H. Ching, Executive Officer  
Land Use Commission  
Department of Business, Economic Development & Tourism  
State of Hawai'i  
P.O. Box 2359  
Honolulu, Hawai'i 96804-2359

Dear Mr. Ching:

**SUBJECT: Acquisition of Existing Drainageway Lands Project  
Draft Environmental Assessment Comments  
Kukuau, South Hilo, Hawai'i**

Thank you for your letter dated October 31, 2006 providing comments on the Draft Environmental Assessment for the subject project.

We confirm your determination that the project is located within the State Land Use Urban District and you have no further comments to offer at this time.

If you have any questions on this matter, please contact Mr. Galen Kuba at 961-8422.

Sincerely,

Bruce C. McClure, P.E.  
Director of Public Works

cc: Ronald Sato, SSFM International, Inc.



STATE OF HAWAII  
DEPARTMENT OF EDUCATION  
P.O. BOX 2360  
HONOLULU, HAWAII 96804

SSFM INTERNATIONAL, INC.  
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OFFICE OF THE SUPERINTENDENT

November 8, 2006

FILE COPY

Mr. Ronald A. Sato  
SSFM International, Inc.  
501 Sumner Street, Suite 620  
Honolulu, Hawaii 96817

Dear Mr. Sato:

Subject: Draft Environmental Assessment Hilo Drainageway Project

The Department of Education has reviewed the Draft Environmental Assessment (DEA) for the acquisition of lands for a proposed drainageway in Hilo.

We had been assured in a September 20, 2006, letter from you that the DEA would include a discussion of the project's effects on Kapi'olani Elementary School. We were unable to locate that discussion in the document.

We note again that the project has some proximity to Kapi'olani Elementary School and would like to know about any potential impacts (positive or negative) of the project on the elementary school campus.

Thank you for the opportunity to offer our comments. If you have any questions, please call Heidi Meeker of the Facilities Development Branch at 733-4862.

Very truly yours,

Patricia Hamamoto  
Superintendent

PH:jmb

cc: Randolph Moore, Acting Assistant Superintendent, OBS  
Duane Kashiwai, Public Works Manager, FDB  
Valerie Takata, CAS, Hilo/Laupahoehoe/Waiakea Complex Areas

Harry Kim  
Mayor



Bruce C. McClure  
Director

Jiro A. Sumada  
Deputy Director

**County of Hawai'i**  
**DEPARTMENT OF PUBLIC WORKS**  
Aupuni Center  
101 Pauahi Street, Suite 7 • Hilo, Hawai'i 96720-4224  
(808) 961-8321 • Fax (808) 961-8630

November 20, 2006

Ms. Patricia Hamamoto, Superintendent  
Department of Education  
State of Hawai'i  
P.O. Box 2360  
Hilo, Hawai'i 96804

Dear Ms. Hamamoto:

**SUBJECT: Acquisition of Existing Drainageway Lands Project  
Draft Environmental Assessment Comments  
Kukuau, South Hilo, Hawai'i**

Thank you for your letter dated November 8, 2006 providing comments on the Draft Environmental Assessment for the subject project.

The Draft Environmental Assessment did include discussion of the project's effects on existing school facilities for which no impacts are expected since the project only involves the acquisition of parcels and easements for the drainageway. Thus, Kapi'olani Elementary School will not be affected by this project. However, we will incorporate more specific language for this school to better address your comments within the Final Environmental Assessment.

If you have any questions on this matter, please contact Mr. Galen Kuba at 961-8422.

Sincerely,

  
Bruce C. McClure, P.E.  
Director of Public Works

cc: Ronald Sato, SSFM International, Inc.

LINDA LINGLE  
GOVERNOR  
STATE OF HAWAII



MICAH A. KANE  
CHAIRMAN  
HAWAIIAN HOMES COMMISSION

BEN HENDERSON  
DEPUTY TO THE CHAIRMAN

KAULANA H. PARK  
EXECUTIVE ASSISTANT

STATE OF HAWAII  
DEPARTMENT OF HAWAIIAN HOME LANDS

P.O. BOX 1879  
HONOLULU, HAWAII 96805

SSFM INTERNATIONAL, INC  
RECEIVED

OCT 31 2006

October 30, 2006

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Mr. Ronald Sato, AICP  
SSFM International, Inc.  
501 Sumner Street, Suite 620  
Honolulu, Hawaii 96817

FILE COPY

Dear Mr. Sato:

Thank you for the opportunity provide comments on the Draft Environmental Assessment report for the County of Hawaii's "Acquisition of Existing Drainageway Lands" project. The Department of Hawaiian Home Lands has no comments.

Should you have any questions, please call the Planning Office at (808) 586-3836.

Aloha and mahalo,

*for*   
Micah A. Kane, Chairman  
Hawaiian Homes Commission

c: County of Hawaii, Department of Public Works

Harry Kim  
Mayor



Bruce C. McClure  
Director

Jiro A. Sumada  
Deputy Director

**County of Hawai'i**  
**DEPARTMENT OF PUBLIC WORKS**  
Aupuni Center  
101 Pauahi Street, Suite 7 • Hilo, Hawai'i 96720-4224  
(808) 961-8321 • Fax (808) 961-8630

November 20, 2006

Mr. Micah A. Kane, Chairman  
Hawaiian Homes Commission  
Department of Hawai'ian Homelands  
State of Hawai'i  
P.O. Box 1879  
Honolulu, Hawai'i 96805

Dear Mr. Kane:

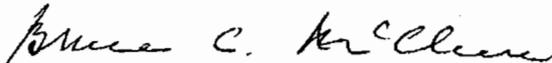
**SUBJECT: Acquisition of Existing Drainageway Lands Project  
Draft Environmental Assessment Comments  
Kukuau, South Hilo, Hawai'i**

Thank you for your letter dated October 30, 2006 providing comments on the Draft Environmental Assessment for the subject project.

We note your department had no comments on the Draft Environmental Assessment.

If you have any questions on this matter, please contact Mr. Galen Kuba at 961-8422.

Sincerely,

  
Bruce C. McClure, P.E.  
Director of Public Works

cc: Ronald Sato, SSFM International, Inc.



STATE OF HAWAII  
OFFICE OF HAWAIIAN AFFAIRS  
711 KAPI'OLANI BOULEVARD, SUITE 500  
HONOLULU, HAWAII 96813

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November 6, 2006

HRD06/2753

Ronald Sato, AICP  
SSFM International, Inc.  
501 Sumner Street, Suite 620  
Honolulu, Hawaii 96817

**FILE COPY**

**RE: Draft Environmental Assessment (DEA) for the Acquisition of Existing Drainageway Lands, County of Hawai'i Department of Public Works, Hilo, Hawai'i; TMK 2-4-025:048-050, 052, 053, 059, 067, 078, 093, 106-110, 115**

Dear Mr. Sato,

The Office of Hawaiian Affairs (OHA) is in receipt of your request for comments on the above referenced DEA, received by our office on October 9, 2006. The County of Hawai'i Department of Public Works proposes to acquire property and easements over privately-owned property in Hilo to accommodate the existing Mohouli drainageway. We understand that these acquisitions will allow the County to properly maintain the existing system, and we have no substantive comments at this time.

We appreciate that an effort was made to assess the impact on cultural resources, as required under Hawaii Revised Statutes, chapter 343, and that the County will stop work and contact the State Historic Preservation Division should iwi or cultural artifacts be uncovered. Thank you for the opportunity to comment. If you have any further questions or concerns please contact Koa Kaulukukui at (808) 594-0244 or [koalanik@oha.org](mailto:koalanik@oha.org).

Sincerely,

Clyde W. Nāmu'o  
Administrator

c: Lukela Ruddle  
OHA Hilo Office  
162 A Baker Avenue  
Hilo, Hawai'i 96720

Ronald Sato, SSFM International, Inc.  
November 6, 2006  
Page 2

Office of Environmental Quality Control  
235 South Beretania Street, Suite 702  
Honolulu, Hawai'i 96813

Bruce McClure  
County of Hawai'i  
Department of Public Works  
101 Pauahi Street, Suite 7  
Hilo, Hawai'i 96720-4224

Harry Kim  
Mayor



Bruce C. McClure  
Director

Jiro A. Sumada  
Deputy Director

**County of Hawai'i**  
**DEPARTMENT OF PUBLIC WORKS**  
Aupuni Center  
101 Pauahi Street, Suite 7 • Hilo, Hawai'i 96720-4224  
(808) 961-8321 • Fax (808) 961-8630

November 20, 2006

Mr. Clyde W. Nāmu'o, Administrator  
Office of Hawai'ian Affairs  
State of Hawai'i  
711 Kapi'olani Boulevard, Suite 500  
Honolulu, Hawai'i 96813

Dear Mr. Nāmu'o:

**SUBJECT: Acquisition of Existing Drainageway Lands Project  
Draft Environmental Assessment Comments  
Kukuau, South Hilo, Hawai'i**

Thank you for your letter dated November 6, 2006 regarding the Draft Environmental Assessment for the subject project.

We note your department has no substantive comments to offer at this time. Thank you for your comment on our efforts made in addressing the project's impact on cultural resources.

If you have any questions on this matter, please contact Mr. Galen Kuba at 961-8422.

Sincerely,

  
Bruce C. McClure, P.E.  
Director of Public Works

cc: Ronald Sato, SSFM International, Inc.



Harry Kim  
Mayor



Bruce C. McClure  
Director

Jiro A. Sumada  
Deputy Director

**County of Hawai'i**  
**DEPARTMENT OF PUBLIC WORKS**  
Aupuni Center  
101 Pauahi Street, Suite 7 • Hilo, Hawai'i 96720-4224  
(808) 961-8321 • Fax (808) 961-8630

November 20, 2006

Ms. Barbara Bell, Director  
Department of Environmental Management  
County of Hawai'i  
25 Aupuni Street, Room 210  
Hilo, Hawai'i 96720

Dear Ms. Bell:

SUBJECT: Acquisition of Existing Drainageway Lands Project  
Draft Environmental Assessment Comments  
Kukuau, South Hilo, Hawai'i

Thank you for your letter dated October 23, 2006 regarding the Draft Environmental Assessment for the subject project.

We note your department had no additional comments on the Draft Environmental Assessment.

If you have any questions on this matter, please contact Mr. Galen Kuba at 961-8422.

Sincerely,

A handwritten signature in cursive script that reads "Bruce C. McClure".

Bruce C. McClure, P.E.  
Director of Public Works

cc: Ronald Sato, SSFM International, Inc.

Harry Kim  
Mayor



Darryl J. Oliveira  
Fire Chief

Desmond K. Wery  
Deputy Fire Chief

# County of Hawai'i

## FIRE DEPARTMENT

25 Aupuni Street • Suite 103 • Hilo, Hawai'i 96720  
(808) 961-8297 • Fax (808) 961-8296

SSFM INTERNATIONAL, INC.  
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October 16, 2006

Mr. Ronald Sato  
SSFM International, Inc.  
501 Sumner Street  
Suite 620  
Honolulu, Hawaii 96817

SUBJECT: DRAFT ENVIRONMENTAL ASSESSMENT  
Acquisition of Existing Drainageway Lands Project  
County of Hawaii, Department of Public Works  
TAX MAP KEYS: (3) 2-4-025:048-050, 052, 053, 059, 067, 078, 080, 093, 106-  
110, 115 South Hilo, Hawaii

We have no comments to offer at this time in reference to the above-mentioned Draft Environmental Assessment.

  
DARRYL OLIVEIRA  
Fire Chief

PBE:lpc

CC: Bruce McClure, Department of Public Works



Harry Kim  
Mayor



Bruce C. McClure  
Director

Jiro A. Sumada  
Deputy Director

**County of Hawai'i**  
**DEPARTMENT OF PUBLIC WORKS**  
Aupuni Center  
101 Pauahi Street, Suite 7 • Hilo, Hawai'i 96720-4224  
(808) 961-8321 • Fax (808) 961-8630

November 20, 2006

Mr. Darryl Oliveira, Fire Chief  
Fire Department  
County of Hawai'i  
25 Aupuni Street, Suite 103  
Hilo, Hawai'i 96720

Dear Mr. Oliveira:

**SUBJECT: Acquisition of Existing Drainageway Lands Project  
Draft Environmental Assessment Comments  
Kukuau, South Hilo, Hawai'i**

Thank you for your letter dated October 16, 2006 regarding the Draft Environmental Assessment for the subject project.

We note your department had no comments on the Draft Environmental Assessment.

If you have any questions on this matter, please contact Mr. Galen Kuba at 961-8422.

Sincerely,

A handwritten signature in cursive script that reads "Bruce C. McClure".

Bruce C. McClure, P.E.  
Director of Public Works

cc: Ronald Sato, SSFM International, Inc.

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Monday, October 30, 2006

HCR 2 BOX 6262  
KEAAU, HI 96749  
TEL: 966-6600

MR. RONALD SATO, AICP  
SSFM INTERNATIONAL, INC  
501 SUMNER STREET, SUITE 620  
HONOLULU, HI. 96817

**FILE COPY**

DEAR MR. SATO,

RE: TMK: 2-4-025-053

THANK YOU FOR THE COPY OF YOUR REPORT. IT IS INTERESTING AND INFORMATIVE. HAVING READ YOUR COMMENTS ON OUR PROPERTY, WE WILL ASK THE COUNTY TO PURCHASE IT.

WE BOUGHT THE PROPERTY ALMOST 2 YEARS AGO. AT THE TIME IT SEEMED PERFECT FOR OUR NEEDS. WE ARE SELF-EMPLOYED AND WANTED TO PUT UP SOMETHING TO BRING US INCOME FOR OUR RETIREMENT.

OUR REALTOR TOOK US TO THE PLANNING DEPT. AND THE CLERK THERE, SAID THAT WE SHOULD HAVE NO TROUBLE CHANGING THE TWO ZONES (RS-7.5 AND RM-1) TO RM-1 BECAUSE THE RM-1 DESIGNATION WAS THE MAJORITY OF THE PARCEL AND THE COUNTY DIDN'T LIKE TO HAVE 2 ZONES ON ONE PARCEL.

THIS MET OUR NEEDS AND WE FIGURED THAT WE COULD PUT AN 8 UNIT, MULTI-FAMILY BUILDING ON THIS PARCEL.

NOW, THIS DRAINAGEWAY PROBLEM HAS SURFACED AND IT SEEMS THAT ALMOST HALF OF OUR PROPERTY GETS FLOODED. WE DO NOT THINK THAT WE WOULD WANT TO SPEND THE MONEY TO DEVELOP A PROPERTY THAT WOULD BE BORDERED BY A LARGE DRAINAGEWAY. THE VEGETATION IS DENSE AND WILL CREATE DAMPNES, MOLD, MOSQUITOS AND WHO KNOWS WHAT OTHER HEALTH HAZARDS. IT DOES NOT MAKE AN ATTRACTIVE SETTING. FUTURE DEVELOPMENTS MAUKA COULD CREATE MORE RUNOFF. INSURANCE COULD BE A BIG PROBLEM TOO.

IF WE HAD HAD ANY IDEA OF THIS TYPE OF PROBLEM, WE NEVER WOULD HAVE INVESTED IN THIS PROPERTY.

WE ARE HOPING THE COUNTY WILL FOLLOW YOUR SUGGESTION AND BUY OUR PROPERTY AT FAIR MARKET VALUE.

ONE FINAL COMMENT. WHEN WE INITIALLY MET WITH YOU AT THE PARK PAVILLION

BACK IN MARCH, YOU AND GALEN, THE COUNTY REPRESENTATIVE, LED US TO BELIEVE THAT THE TIME TABLE FOR ACQUISITION OF LANDS WOULD BE BY THE END OF 2006, NOW IN YOUR REPORT THE COMPLETION DATE FOR THE PROJECT IS JANUARY 2009! TWO YEARS! THAT'S A LONG TIME.

AGAIN, THANK YOU FOR YOUR REPORT. YOU HAVE MADE AN ISSUE, WE WERE NOT AWARE OF, EASY TO UNDERSTAND.

SINCERELY,

*Joseph O'Sullivan*  
*Monica O'Sullivan*

JOSEPH & MONICA O'SULLIVAN

CC: BRUCE MCCLURE, P.E., DIRECTOR

Harry Kim  
Mayor



Bruce C. McClure  
Director

Jiro A. Sumada  
Deputy Director

**County of Hawai'i**  
**DEPARTMENT OF PUBLIC WORKS**  
Aupuni Center  
101 Pauahi Street, Suite 7 • Hilo, Hawai'i 96720-4224  
(808) 961-8321 • Fax (808) 961-8630

November 20, 2006

Mr. Joseph & Mrs. Monica O'Sullivan  
HCR 2, Box 6262  
Kea'au, Hawai'i 96749

Dear Mr. & Mrs. O'Sullivan:

**SUBJECT:** Acquisition of Existing Drainageway Lands Project  
Draft Environmental Assessment Comments  
Kukuau, South Hilo, Hawai'i

Thank you for your letter dated October 30, 2006 providing comments on the Draft Environmental Assessment (Draft EA) for the subject project.

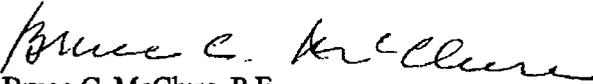
We acknowledge that you plan to ask the County to acquire your entire property, identified as TMK 2-04-025: 053, based upon the information provided in the Draft EA. We also note your comments associated with your purchase of the property. The acquisition of your property would involve the County's established process that includes determining the fair market value for it.

We also provide some clarification regarding the estimated timeframe for the acquisition of properties and easements identified. The County has been looking into the need to acquire certain parcels and easements for this drainageway. As a result, discussions with certain owners have already been occurring and funding pursued to acquire those parcels. The intent was to complete the acquisition of those parcels in 2006 since that process has already been started.

However, those plans did not anticipate having to include your parcel. Thus, funding appropriations and negotiations with all the remaining property owners such as yourselves would need to occur that will take some time to complete. Therefore, a 2009 timeframe in the Draft EA is estimated to complete the process and acquisitions with all these owners. We will try to complete this process in a timely manner, and greatly appreciate your cooperation.

If you have any questions on this matter, please contact Mr. Galen Kuba at 961-8422.

Sincerely,

  
Bruce C. McClure, P.E.  
Director of Public Works

cc: Ronald Sato, SSFM International, Inc.

NOV 14 2006

ras

FILE

# CARLSMITH BALL LLP

A LIMITED LIABILITY LAW PARTNERSHIP

121 WAIANUENUE AVENUE

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TELEPHONE 808.935.6644 FAX 808.935.7975

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November 7, 2006

## FILE COPY

SSFM International, Inc.  
Attn: Ronald Sato, AICP  
501 Summer Street, Suite 620  
Honolulu, Hawaii 96817

Re: Draft Environmental Assessment for Proposed Acquisition of Existing Drainageway Lands Project; Properties located at TMK: (3) 2-4-025:048-050, 052, 053, 059, 067, 078, 080, 093, 106-110, 115 (12.78 ± acres)

Dear Mr. Sato

We are in receipt of the SSFM International Inc., Draft Environmental Assessment for the Acquisition of Existing Drainageway Lands Project, dated September 2006, for the above referenced properties. Our comments are on behalf of our client Giampaolo Boschetti, owner of Parcels 048, 050 and 080. The proposed acquisition concerns drainage easements on Parcels 048 and 080, and a possible acquisition of the entire Parcel 050. Our client's properties make-up a total of 221,403 square feet.

In reviewing the approximate drainageway boundaries (Figure 1.2) projected for the acquisition, it appears that there are efforts to narrow and channelize the drainage easement boundaries on many of the concerned lots, except for Parcel 080 (as an aside, please correct TMK information of parcel "08" to 80 in Figure 2.6 of the Draft EA). The map depicts the easement boundary as much wider on that particular Parcel. We are requesting that the County minimize the width of the easement boundary on Parcels 080 and 048 to minimize the negative effects on our client's development potential for those two parcels.

Also, Parcel 050 consists of both Single Family Residential RS 7.5 and Multiple-family Residential (RM-1) zoning designations. We believe this parcel has the most developmental potential due to its zoning potential, therefore we are requesting that the County minimize the size of the drainage detention on this property to allow for the possibility of development by our client.

SSFM International, Inc.  
November 7, 2006  
Page 2

Please do not hesitate to contact me for any additional information or questions. We look forward to a follow-up from your agency.

Sincerely,



Jennifer L. Zelko

JLZ/1lh

cc: Department of Public Works, Mr. Bruce McClure, P.E., Director  
Paul Boschetti

4831-9852-0577.1

Harry Kim  
Mayor



Bruce C. McClure  
Director

Jiro A. Sumada  
Deputy Director

**County of Hawai'i**  
**DEPARTMENT OF PUBLIC WORKS**  
Aupuni Center  
101 Pauahi Street, Suite 7 • Hilo, Hawai'i 96720-4224  
(808) 961-8321 • Fax (808) 961-8630

November 20, 2006

Ms. Jennifer L. Zelko  
Carlsmith Ball, LLP  
P.O. Box 686  
Hilo, Hawai'i 96721-0686

Dear Ms. Zelko:

**SUBJECT: Acquisition of Existing Drainageway Lands Project  
Draft Environmental Assessment Comments  
Kukuau, South Hilo, Hawai'i**

Thank you for your letter dated November 7, 2006 providing comments on the Draft Environmental Assessment (Draft EA) for the subject project.

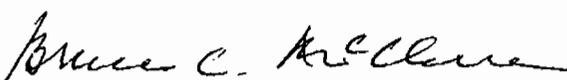
We will correct Figure 2.6 as noted. We would like to clarify that there are no improvements planned at this time to channelize or improve the existing drainageway. The estimated boundaries of this drainageway shown in the Draft EA were based upon prior studies and available information.

The presence of a trapezoidal earth channel through parcel 048 should help reduce the necessary drainageway width. However, a survey would still need to be conducted to better define the easement boundaries for this drainageway. Efforts will be taken to minimize the boundary width needed affecting your client's parcels to the extent feasible and practicable. This should help minimize effects on those parcels.

The County plans to coordinate with you and your client to address the potential area needed for a detention area associated with parcel 050.

If you have any questions on this matter, please contact Mr. Galen Kuba at 961-8422.

Sincerely,

  
Bruce C. McClure, P.E.  
Director of Public Works

cc: Ronald Sato, SSFM International, Inc.

# APPENDIX B3

---

## *CHAPTER 6E-42 HISTORIC PRESERVATION REVIEW*

LINDA LINGLE  
GOVERNOR OF HAWAII



PETER T. YOUNG  
CHAIRPERSON  
BOARD OF LAND AND NATURAL RESOURCES  
COMMISSION ON WATER RESOURCE MANAGEMENT

ROBERT K. MASUDA  
DEPUTY DIRECTOR - LAND

DEAN NAKANO  
ACTING DEPUTY DIRECTOR - WATER

AQUATIC RESOURCES  
BOATING AND OCEAN RECREATION  
BUREAU OF CONVEYANCES  
COMMISSION ON WATER RESOURCE MANAGEMENT  
CONSERVATION AND COASTAL LANDS  
CONSERVATION AND RESOURCES ENFORCEMENT  
ENGINEERING  
FORESTRY AND WILDLIFE  
HISTORIC PRESERVATION  
KAHOOLAWE ISLAND RESERVE COMMISSION  
LAND  
STATE PARKS

STATE OF HAWAII  
DEPARTMENT OF LAND AND NATURAL RESOURCES

STATE HISTORIC PRESERVATION DIVISION  
601 KAMOKILA BOULEVARD, ROOM 555  
KAPOLEI, HAWAII 96707

September 28, 2006

Dr. Robert Rechtman  
Rechtman Consulting, LLC  
HC 1 Box 4149  
Keaau, HI 96749

LOG NO: 2006.3257  
DOC NO: 0609JT83  
Archaeology

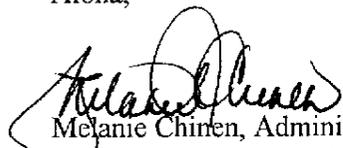
Dear Dr. Rechtman:

**SUBJECT: Chapter 6E-42 Historic Preservation Review –  
An Archaeological Inventory Survey and Limited Cultural Assessment for the  
Proposed Acquisition of Drainageway Lands Project  
Kūkūau 1<sup>st</sup> Ahupua‘a, South Hilo District, Island of Hawai‘i  
TMK: (3) 2-4-025: Var.**

Thank you for submitting the above referenced report by Nelson, Clark & Rechtman (2006) for our review and comment. The report presents the results of an archaeological inventory survey of TMKs 3-2-4-025: 048, 050, 052, por. 053, por. 067, por. 078, por. 080, 093, por. 106, por. 107, por. 108, por. 109, por. 110, por. 115, and por. 126 for the County of Hawai‘i. One historic property was identified. Rechtman Consulting, LLC, assessed site 25547 as significant under criterion D, and recommended no further work on the site.

The report is of good quality and meets the requirements of the historic preservation review process. We accept the recommendation for site 25547 and determine that it is significant under criterion D, for its information content. We also agree that the site has been thoroughly documented and that no further work is required. The report is therefore accepted, and the historic preservation review process for these parcels completed. Please contact Dr. Julie Taomia at 808-327-3691 if you have questions or concerns.

Aloha,

  
Melanie Chinen, Administrator  
State Historic Preservation Division

JT:gvf

# APPENDIX C

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## *ARCHAEOLOGICAL INVENTORY SURVEY AND LIMITED CULTURAL ASSESSMENT*

**Archaeological Inventory Survey and Limited Cultural Assessment for the Proposed Acquisition of Drainageway Lands Project**

(TMKs:3-2-4-25:48, 50, 52, 53, 59 por., 67 por., 78 por., 80 por., 93, 106 por., 107 por., 108 por., 109 por., 110 por., 115 por., and 126 por.)



Kūkūāu 1<sup>st</sup> Ahupua'a  
South Hilo District  
Island of Hawai'i

**Archaeological Inventory Survey and Limited Cultural Assessment for the Proposed Acquisition of Drainageway Lands Project**

(TMKs:3-2-4-25:48, 50, 52, 53, 59 por., 67 por., 78 por., 80 por., 93, 106 por., 107 por., 108 por., 109 por., 110 por., 115 por., and 126 por.)

**PREPARED BY:**

J. David Nelson, B.A.,  
Matthew R. Clark, B.A.,  
and  
Robert B. Rechtman, Ph.D.

Kūkūāu 1<sup>st</sup> Ahupua'a  
South Hilo District  
Island of Hawai'i

**PREPARED FOR:**

SSFMI International, Inc.  
Honolulu, HI 96817

August 2006

**RECHTMAN CONSULTING, LLC**

11C 1 Box 4149 Keolu, Hawaii 96749-9710  
phone: (808) 960-7636 fax: (808) 443-0065  
e-mail: bob@rechtmanconsulting.com

ARCHAEOLOGICAL, CULTURAL, AND HISTORICAL STUDIES

**RECHTMAN CONSULTING**

## EXECUTIVE SUMMARY

At the request of SSiM International, Inc., on behalf of their client, the County of Hawai'i, Rechtman Consulting, LLC conducted an archaeological inventory survey and limited cultural assessment of lands that encumber the existing drainage system created by the State of Hawai'i for the Mohouli Housing Project (TMK:3-2-4-25:48, 50, 52, 53, 59 por., 67 por., 78 por., 80 por., 93, 106 por., 107 por., 108 por., 109 por., 110 por., 115 por., and 126 por.) located in Kukūāua, South Hilo District, Island of Hawai'i. The County of Hawai'i is planning to acquire the lands and easement for the existing drainage way. The purpose of this study is to document the presence of any historic properties (including traditional cultural properties) that might exist within the project area, assess the significance of any such resources and provide a statement of impact to any such resources as a result of the proposed land acquisition project.

On May 23, and June 6 and 7, 2006, Matthew R. Clark, B.A., J. David Nelson, B.A., Mark J. Winburn, B.A., Olivier M. Bautista, B.A., and Ii'i Hanani'o performed an intensive pedestrian survey of the project area, under the direction of Robert B. Rechtman, Ph.D. As a result of the current inventory survey a single archaeological site (SIHP Site 25547) was recorded on TMK:3-2-4-25:48. Site 25547 is an elongated enclosure located within a raised bedrock crack formation to the north of an excavated drainage channel. Site 25547 contains three modified sections consisting of stacked cobbles. This site is probably Historic in origin, and its use likely coincided with the use of several Historic features noted on TMK:3-2-4-25:54 and 132, outside of the current project area, along the same raised bedrock formation as Site 25547. A long time Hilo resident, Kenneth Bell, indicated that the location of these features corresponded to the location of several wooden shacks that served as residences until the 1940s.

SIHP Site 25547 is considered significant under Criteria D for the information it has yielded regarding early twentieth century use of the study area. However, as SIHP Site 25547 was recorded in detail and there is virtually no excavation potential, no further work is recommended. This site is not considered a traditional cultural property and there were no specific natural or cultural resources or cultural beliefs and practices identified relative to the land within the current study area.

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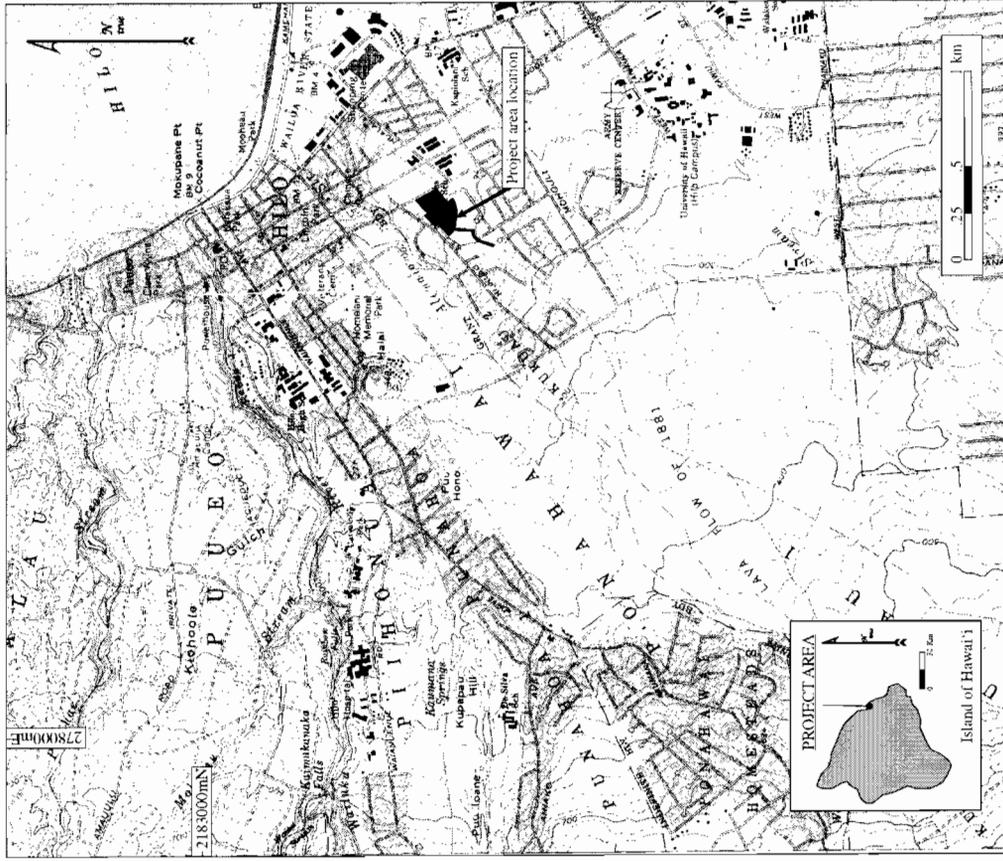


Figure 1. Project area location.

## INTRODUCTION

At the request of SSFM International, Inc., on behalf of their client, the County of Hawaii, Rochman Consulting, LLC conducted an archaeological inventory survey and limited cultural assessment of lands that encumber the existing drainage system created by the State of Hawaii for the Mohouli Housing Project (TMK:3-2-4-25-48, 50, 52, 53, 59 por., 67 por., 78 por., 80 por., 93, 106 por., 107 por., 108 por., 109 por., 110 por., 115 por., and 126 por.) located in Kakaia 1<sup>st</sup> Ahupua'a, South Hilo District, Island of Hawaii. The County of Hawaii is planning to acquire the lands and easement for the existing drainage. The purpose of this study is to document the presence of any historic properties (including traditional cultural properties) that might exist within the project area, assess the significance of any such resources and provide a statement of impact to any such resources as a result of the proposed land acquisition project.

This report is intended to accompany an Environmental Assessment (EA) being prepared in compliance with Chapter 343 Hawaii Revised Statutes, as well as fulfilling the requirements of the County of Hawaii Planning Department and the Department of Land and Natural Resources-State Historic Preservation Division (DLNR-SHPD) with respect to permit approvals for land-altering and development activities.

In the Hawaii Administrative Rules (HAR 13813-275-2) that govern the regulatory activities of the State Historic Preservation Division, a definition of historic property is provided.

"Historic property" means any building, structure, object, district, area, or site, including *berims* and underwater site, which is over 50 years old.

This definition should not be confused with the definition of Historic Property contained in the Federal legislation and its implementing regulation (Section 106 of the National Historic Preservation Act and 36 CFR 800, respectively), where Historic Property is defined as a resource "listed or eligible for listing in the National Register of Historic Places." The difference being that in the state-used definition ALL buildings, structures, objects, districts, areas, or sites older than fifty years are historic properties and need to be assessed as such. In the Federally used definition, ONLY those buildings, structures, objects, districts, areas, or sites that are determined to be significant are considered Historic Properties.

The criteria for the evaluation of significance contained in the Hawaii Administrative Rules generally follows that which was promulgated by the Federal government, with the addition of Significance Criterion E, which is not contained in the Federal evaluation criteria. To be significant the resource must possess integrity of location, design, setting, materials, workmanship, feeling, and association and meet one or more of the following criteria:

- A Be associated with events that have made an important contribution to the broad patterns of our history;
- B Be associated with the lives of persons important in our past;
- C Embody the distinctive characteristics of a type, period, or method of construction; represent the work of a master; or possess high artistic value;
- D Have yielded, or is likely to yield, information important for research on prehistory or history;
- E Have an important value to the native Hawaiian people or to another ethnic group of the state due to associations with cultural practices once carried out, or still carried out, at the property or due to associations with traditional beliefs, events or oral accounts—these associations being important to the group's history and cultural identity.

A working definition of Traditional Cultural Property is as follows:

"Traditional cultural property" means any historic property associated with the traditional practices and beliefs of an ethnic community or members of that community for more than fifty years. These traditions shall be founded in an ethnic community's history and contribute to maintaining the ethnic community's cultural identity. Traditional associations are those demonstrating a continuity of practice or belief until present or those documented in historical source materials, or both.

The origin of the concept of Traditional Cultural Property is found in National Register Bulletin 38 published by the U.S. Department of Interior-National Park Service. "Traditional" as it is used, implies a time depth of at least 50 years, and a generalized mode of transmission from one generation to the next, either orally or by act. "Cultural" refers to the beliefs, practices, life-values, and social institutions of a given community. The use of the term "Property" defines this category of resource as an identifiable place. Traditional Cultural Properties are not intangible, they must have some kind of boundary, and are subject to the same kind of evaluation as any other historic resource, with one very important exception. By definition, the significance of Traditional Cultural Properties should be determined by the community that values them.

### PROJECT AREA DESCRIPTION

The current project area consists of approximately ten acres (TMKs:3-2-4-25-48, 50, 52, 53, 59 por., 67 por., 78 por., 80 por., 93, 106 por., 107 por., 108 por., 109 por., 110 por., 115 por., and 126 por.) located in Kakaia 1<sup>st</sup> Ahupua'a, South Hilo District, Island of Hawaii (see Figures 1 and 2). Elevation within the project area ranges from approximately 90 to 120 feet above sea level. The area is a combination of open grassland, disturbed forestland, and developed residential land. The main portion of the project area follows a narrow drainage created by the State of Hawaii for the Mohouli Housing Project. The drainage crosses several developed residential parcels and outlets onto five undeveloped parcels (TMKs:3-2-4-25-48, 50, 52, 53, and 93) that are subject to periodic flooding. These parcels have been altered by bulldozing in most areas, save for strip in the central portion of TMK:3-2-4-25-48 and the northeastern corner of TMK:3-2-4-25-53 where a raised bedrock ridge formation was left intact. The area where the drainage channel lets out is bordered to the east by Kapiolani Street; to the south by an undeveloped residential parcel and two developed residential parcels, to the north by a proposed road right-of-way and an undeveloped residential parcel, and to the west by a driveway (proposed Kapakapu Street) and two developed residential parcels (see Figure 2). The project area is located directly across the street from the Hilo Police Station.

Soils in the study area are classified as Keaukaha extremely rocky muck (rkFD), a dark brown and strongly acidic soil that is approximately eight inches thick, and that possesses rapid permeability, moderate runoff, and a slight erosion hazard (Sato et al. 1973). This soil has developed over *pahoehoe* lava flows that originated from Mauna Loa Volcano approximately 750 to 1,500 years ago (Wolfe and Morris 1996).

Vegetation within the project area ranges from thick to fairly open (Figures 3 and 4), and is dominated by secondary growth forest containing a variety of exotic trees including mango (*Mangifera indica*), African tulip tree (*Spathodea campanulata*), Alexandra palm (*Archontophoenix alexandriae*), banyan (*Ficus microcarpa*), avocado (*Persea americana*), ti (*Cordyline fruticosa*), hala (*Pandanus tectorius*), rose apple (*Syzygium jambos*), and Java plum (*Syzygium cumini*). Ground cover consists primarily of ferns, grasses, and vines such as wedelia (*Wedelia trilobata*), maile piliu (*Paederia foetida*), and California grass (*Brachiaria mitrata*), thorny wait-a-bit (*Ceanothus derapetala*), and philodendron (*Philodendron* sp.) (Terry and Yoshida 2006). The existing vegetation pattern indicates that the study area has undergone substantial alteration in the past including but not limited to mechanized clearing and earth moving in the low-lying areas.

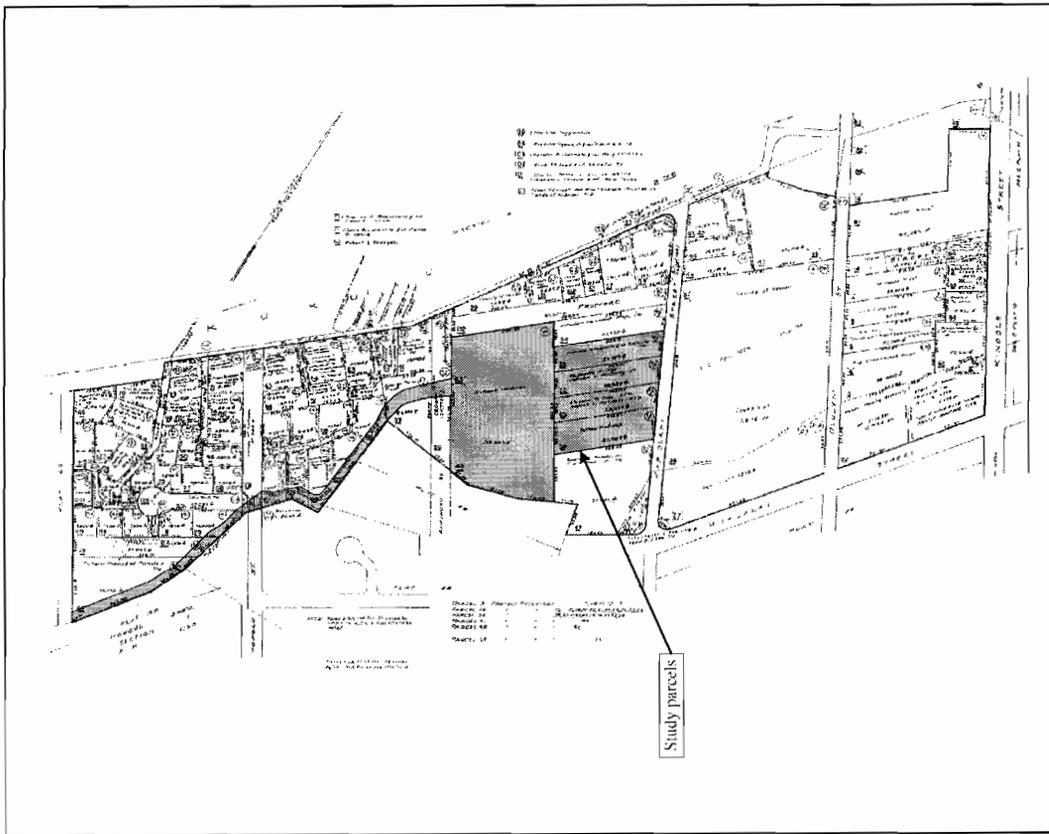


Figure 2. TMK:3-2-4-25 showing current study parcels (48, 50, 52, 53, 59 por., 67 por., 78 por., 80 por., 93, 106 por., 107 por., 108 por., 109 por., 110 por., 115 por., and 126 por.).



Figure 3. View to east of vegetation along Kapiolani Street.



Figure 4. View to east of vegetation on TMK:3-2-4-25-48 along the drainage channel.

## BACKGROUND STUDIES

This section of the report describes and synthesizes prior archaeological, cultural, and historical studies that are relevant to the current project area; and provides a brief culture-historical background of Kūkūāua I<sup>st</sup> Ahupua'a and the general South Hilo District.

### Previous Archaeology

At the turn of the century, Thrum (1907a, 1907b) and Stokes (Stokes and Dye 1991) documented *heiau* sites for the island of Hawai'i. Thrum (1907a) lists 16 *heiau* for Hilo District, none of which were located in Kūkūāua I<sup>st</sup> Ahupua'a. Thrum notes:

Of the *heiaus* of the district of Hilo little evidence of their existence now remains, so complete has been their destruction, but though their stones are scattered, much of their history is yet preserved. (Thrum 1907a: 40)

One early archaeological study of East Hawai'i was conducted by Hudson (1932) for the B. P. Bishop Museum. He noted that, "there was an important village and trading center around Hilo Bay" (1932:20), but related that, "no archaeological remains are to be found within the town of Hilo itself except a few stones which are said to have been taken from *heiaus*..." (1932:226).

More recent archaeological studies conducted to the south of the current project area in Waiākea Ahupua'a (Borthwick et al. 1993; Escott 2004; Hunt and McDermott 1993; Maly et al. 1994; Rechinan and Henry 1998; and Spear 1995) have identified, almost exclusively, historic archaeological remains associated with the Waiākea Sugar Plantation, which operated in Waiākea Ahupua'a between 1879 and 1947 (Rechinan and Henry 1998:5). Common features recorded during these studies included stacked rock mounds, enclosures, core-filled walls, and parallel wall alignments used for irrigation and for lining the plantation's railroad tracks.

To the north of the current project area, the B. P. Bishop Museum conducted research and an archaeological inventory survey at two locations along the Alenui Stream for a flood damage reduction study (Kelly and Athens 1982). Investigations along the proposed routes of their study area did not identify any archaeological sites. However, two locations were noted as having the potential to contain subsurface cultural deposits, one near a small plantation house, and another adjacent to the Old Hilo Jail.

Within the *ahupua'a* of Kūkūāua, Hunt and McDermott (1993) conducted an archaeological inventory survey of the Pū'ānānā Street extension. Their study area also crossed Waiākea and Pōnahawai *ahupua'a* south and west of the current project area. As a result of that survey eleven sites containing ninety-seven features were recorded within the proposed road alignment. All of the recorded sites and features were determined to be historic in origin and associated with the Waiākea Sugar Plantation. Three volcanic glass flakes recovered from an excavation beneath one of the historic features also suggested possible Precontact use of the area.

Additionally, Scientific Consultant Services (Spear et al. 1996) conducted an archaeological inventory survey of the then proposed Mohouli Connector Road that crossed the *ahupua'a* of Kūkūāua I<sup>st</sup> and 2<sup>nd</sup> Pōnahawai, and Pūnahoa. The 100-foot wide corridor extended for approximately 6,600 feet southwest (*mānaka*) of the current project area. The investigation found the land to be as much as three-quarters previously cleared by bulldozer, and no archaeological sites were recorded.

### Culture-Historical Background

This section summarizes the general cultural history of Hilo and more specifically the history of Kūkūāua I<sup>st</sup> Ahupua'a. For a more in-depth historical background of Hilo the reader is referred to Kelly et al. (1981), Maly (1996), and McEldowney (1979).

The earliest historical knowledge of Hilo comes from legends written by Kamakau (1961) of a 16<sup>th</sup> century chief 'Umi-a-Liloa (son of Liloa) who at that time ruled the entire island of Hawai'i. Descendants of Umi and his sister-wife were referred to as "Kona" chiefs, controlling Ka'u, Kona, and Kohala, while descendants of Umi and his Maui wife were "Hilo" chiefs, controlling Hāmānua, Hilo, and Puna (Kelly et al. 1981:1). According to Kamakau (1961) both sides fought over control of the island, desiring access to resources such as feathers, *mānāki* tapa, and canoes on the Hilo side; and *waiāke* tapa, and warm lands and waters on the Kona side (c.f. Kelly et al. 1981:3).

Sometime near the end of the 16<sup>th</sup> century or early in the 17<sup>th</sup> century, the lands of Hilo were divided into *ahupua'a* that today retain their original names (Kelly et al. 1981:3). These include the *ahupua'a* of Pu'u'ou, Pi'ihonua, Pōhōhōhō, Kūkūāu and Waiākea (Figure 5). The design of these land divisions was such that residents could have access to all that they needed to live, with ocean resources at the coast, and agricultural and forest resources in the interior. However, only Pi'ihonua and Waiākea provided access to the full range of resources stretching from the sea up to 6,000 feet along the slopes of Mauna Kea (Kelly et al. 1981:5).

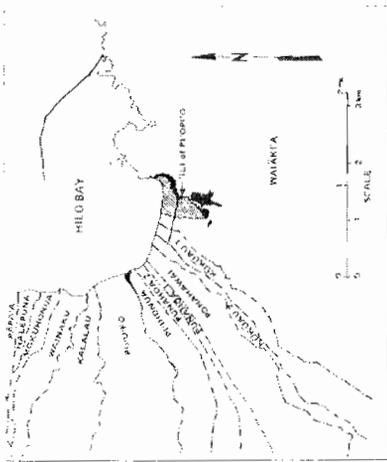


Figure 5. Hilo Bay showing *ahupua'a* (from Kelly et al. 1981:2).

Historical accounts (McEldowney 1979) place the current study area in a zone of agricultural productivity. As Isabella Bird recorded upon arriving in Hilo in 1873:

Above Hilo, broad lands sweeping up cloudwards, with their sugar cane, *kalo*, melons, pine-apples, and banana groves suggest the boundless liberality of Nature. (Bird 1964:38)

Handy and Handy (1972) also describe the general region as an agricultural area:

On the lava strewn plain of Waiākea and on the slopes between Waiākea and Waiāluu River, dry taro was formerly planted wherever there was enough soil. There were forest plantations in Panaeoa and in all the lower fern-forest zone above Hilo town along the course of the Waiāluu River. (Handy and Handy 1972:539)

Maly (1996) refers to a 1922 article from the Hawaiian Language newspaper, *Ka Nūpepa Kī'ōkī'a*, where planting on *pāhoehoe* lava flats is described.

There are *pāhoehoe* lava beds walled in by the ancestors in which sweet potatoes and sugar cane were planted and they are still growing today. Not only one or two but several times forty (*man ka'āu*) of them. The house sites are still there, not one or two but several times four hundred in the woods of the Panaeoa. Our indigenous bananas are growing wild, these were planted by the hands of our ancestors. (Maly 1996:A-2)

As part of an archaeological assessment study, Maly (1996) conducted historical research for the lands of Waiāluu, Pōhōhōhō, Waiākea, and Pi'ihonua (to the north and south of the *ahupua'a* of Kūkūāu). Maly discussed the significance of the use of the Hawaiian word *wai* in the place names: Pōhōhōhō, Waiākea, Waiāluu, and Waiāluu (River). According to Maly, the word *wai* (water) can be likened to the Hawaiian concept of wealth "*waiwai*," stressing its cultural importance (Maly 1996:A-2). In this context, the importance of Hilo can be better understood, with its copious streams that fed taro pondfields and its numerous fishponds (Maly 1996)

The *ahupua'a* of Kūkūāu 1<sup>st</sup> and 2<sup>nd</sup> likely provided a wide variety of valuable subsistence resources to the Precontact Hawaiians residing there and *ali'i* who claimed the land. Settlements in this land were focused on the coast with the exception of some residences being established among the inland agricultural fields. The *ahupua'a* residents utilized the uplands in accordance to specific elevation zones (McEldowney 1979). These land use zones reflected different environments where specific natural resources were readily acquired and with varying degrees of modification of the terrain produced a surplus of dryland and wetland agricultural goods. Thus, the project area lands being part of the Upland Agricultural Zone (above 50 feet elevation) were probably subjected to extensive cultivation during prehistoric times. McEldowney states:

The extent of this zone varies in early journals, but most confirm that an expanse of unwooded grasslands or a "plain" behind Hilo town extended up to approximately the 1,500 ft elevation (i.e., the edge of the forest). Scattered huts, emphasized by adjacent garden plots and small groves of economically beneficial tree species, dotted this expanse.

The cumulative effects of shifting agricultural practices (i.e., slash-and-burn or swidden), prevalent among Polynesian and Pacific peoples, probably created and maintained this open grassland mixed with pioneering species and species that tolerate light and regenerate after a fire... With remarkable consistency, early visitors to Hilo Bay describe an open parkland gently sloping to the base of the woods. This open but verdant expanse, broken by widely spaced "cottages" or huts, neatly tended gardens, and small clusters of trees... Estimates as to the extent of this unwooded expanse ranged from between five and six miles (Goodrich 1826:4) to between three and four miles (Coan 1882:29) above the coast or village, with most falling between four or five miles.

The constituents of gardens and tree crops in the village basically continued in the upland except that dry-land taro was planted more extensively and bananas were more numerous... This same pattern occurred between Waiākea Pond and the Pana'eoa Forest in the four or five miles of open country dominated by tall grasses. Here stands of *ʻākaka* (Aleurites moucamba), pandanus, and mountain apple became more conspicuous, with large areas of dryland taro planned in rocky crevices on the younger Mauna Loa flows... (McEldowney 1979:18-20).

In Precontact Hawai'i, all land, ocean and natural resources were held in trust by the high chiefs (*ali'i 'ai ahupua'a* or *ali'i 'ai moke*). The use of land, fisheries and other resources were given to the *hoā'āina* (native tenants) at the prerogatives of the *ali'i* and their representatives or land agents (*konohiki*), who were considered lesser chiefs. The wealth of resources and population in Hilo, according to Hunt and McDermott (1993), are reflected in the chiefly controls held over the District, especially the *ahupua'a* of Waiākea. Kamehameha I lived for a time in the Hilo area and built many of his large war canoes at Hilo. The availability of large *koa* trees in the forests of the Hilo area made it an ideal place to fashion canoes. When Vancouver visited Hilo in 1794, he found Kamehameha I stocking food and making war canoes for his conquest of the Hawaiian Islands. Kamehameha I had substantial land holdings in the Hilo area. At his death Kamehameha I gave his Waiākea land holdings to his son Liholiho. Kukūāu 1<sup>st</sup> and 2<sup>nd</sup> were given to his trusted *hauile* advisors John Young and Isaac Davis (Kelly et al. 1981:11).

By 1845, the Hawaiian system of land tenure was being radically altered, and the foundation for implementing the *Māhele 'Āina* was set in place. As the *Māhele* evolved, it defined the land interests of Kamehameha III (King Kamehameha III), some 252 high-ranking *Ali'i* and *Konohiki*, and the Government. As a result of the *Māhele*, all land in the Kingdom of Hawai'i came to be placed in one of three categories: (1) Crown Lands (for the occupant of the throne); (2) Government Lands; and (3) *Konohiki* Lands (cf. Indices of Awards 1929). The "Enabling" or "Kūlewa Act" of the *Māhele* (December 21, 1849) further defined the framework by which *hoā'āina* (native tenants) could apply for, and be granted fee-simple interest in "*Kūlewa*" lands (cf. Kamakau in *Ke Au Okoa* July 8 and 15, 1869; 1961). The *Kūlewa* Act also confirmed the rights of *hoā'āina* to access, subsistence, and collection of resources necessary to their life upon the land in their given *ahupua'a* ("Enabling Act", August 6, 1850-HAS DLNR 2-4).

According to Maly (1996), before receiving their awards from the Land Commission, the native tenants were required to prove that they lived on the land, or that they cultivated the land for a living. They were not permitted to acquire wastelands or lands that they cultivated "with the seeming intention of enlarging their lots."

Once a claim was confirmed, a survey was required before the Land Commission was authorized to issue any award. While the commoners were required to provide proof of land use and habitation, the land claims of royalty rarely included any land use documentation. For the commoners, this "requirement of proof" produced a series of volumes of registry and testimony-the "*Hike Māhela*".

During the *Māhela* of 1848, the sons of John Young and Isaac Davis received large portions of Kūkūāia *āhupuaʻa*. smaller parcels were awarded to both native Hawaiians, and foreign recipients (see following discussion). One of Davis' sons (G.D. Innet) received a large portion of Kūkūāia 2<sup>nd</sup> Ahupuaʻa (3,450 Acres, L.C.Aw. 8521-B) and Young's son (Keoni Ana) received 9,360 acres of Kūkūāia 1<sup>st</sup> Ahupuaʻa (L.C.Aw. 8515, see discussion below) (Kelly et al. 1981:40).

The current study area is a portion of L.C.Aw. 8515 to Keoni Ana, and is located just north of the northern border of L.C.Aw. 2663 to Kahue and L.C.Aw. 2402 to Keamihō (Figure 6). The *Māhela* records for Kahue and Keamihō provide the following documentation of land use in the vicinity of the current project area during the middle part of the nineteenth century:

Kūkūāia, December 16, 1847

**LCA 2663 Kahue** [Native Register Volume 8:675]

The land measures 50 fathoms by 30 fathoms

November 7, 1848

**LCA 2446** [corrected to 2663] **Kahue** [Foreign testimony Volume 5:3]

Haeleoupuui sworn, said he knew the house lot to be situated on the Ahupuaʻa of Kūkūāia 1<sup>st</sup> and bounded on the west by Kanakoholani's ground, on the North by the Ahupuaʻa of Kūkūāia, on the East by Aiko's enclosure, on the south by a piece of waste land. There are three houses on it, all belonging to Kahue. He received the plot from Puna in the year 1840, since which time he has held it without dispute

**LCA 2663, Kahue** [Foreign Testimony Volume 5:80]

Kamakani sworn says, I am an old resident on Kūkūāia, Hilo and know the kuleana of Kahue. It is bounded on the Hilo Paikū side by the kuleana of Keamihō, on all the other sides by the Kouohiki. He received it from Kaiaana in 1844, and Kaiaana from Kaunūohua before Nāhānua's death (1836).

December 18, 1847

**LCA 2402 Keamihō** [Native Register Volume 3:483]

Greetings to you John H., and all the Land Commissioners: We have heard we should petition by the end of the year, therefore we hereby petition for our house lot, I Keamihō, of Pōnahawai, and Kahue, of Kūkūāia. Here is the diagram of our house lot. This is finished. Also, there is a hala grove at Waaka, a portion is *paheleho* lava and a portion is *āʻa* lava. The boundaries are unequal: 60 by 160 by 110. This is finished. This diagram will be kept until the time when we meet. (Maly 1996:20)

November 7, 1848

**LCA 2402 Keamihō** [Foreign Testimony Volume 5:4]

2402 and 2663 Keamihō and Kahue (Wednesday November 8, 1848)

Kaapa sworn, deposed that the land of Keamihō and Kahue was on the *Ahupuaʻa* of Pōnahawai on the H. of Kanewahinekei, consists of a building lot and planting lot. Is bounded on the west by *kalo* fields, on the North by the ground of Hawahewa and Kaapa, on the East by strip of waste land, and on the south by a piece of waste land. It is not enclosed and has 3 fields for cultivation. I dwelling house belongs to Keamihō. The land was given to him by Hoolulu and Kahohowāia in the year 1835. Since which time he has always resided thereon. Kahue not decided, sent for.

Lahaina sworn, deposed that the evidence of Kaapa was true.

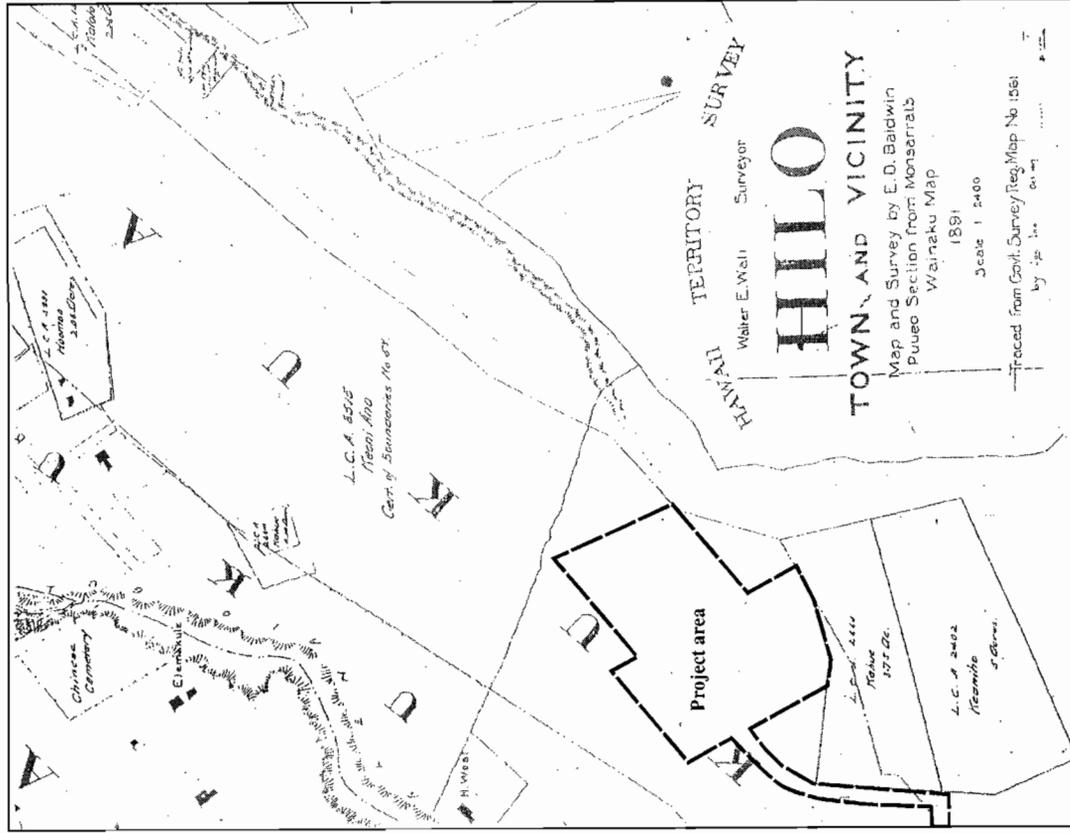


Figure 6. Portion of Register Map 1561 showing current study area (from Maly 1996:21).

November 8, 1848

#### LCA 2402 Keamihō [Native Testimony Volume 4-4071]

Kaapa sworn and deposed: I know, there in the Ahupua'a of Ponahawai in the land parcel of Kanewahineiki.... Moving to the parcel in Waiakea and testimony received-

Kaahu sworn and deposed: I know that there in the Ahupua'a of Waiakea are 2 cultivated fields (*kūhāpua*) that I gave to Keamihō, 3 cultivated fields remain mine. I gave them two fields to him in 1840. No one has disputed our claim. (Maly 1996:20, 22)

These testimonies indicate the use of lands adjacent to the *kūhāpua* parcel's boundaries. Through the testimony of Keamihō it is apparent that *kalo* (taro) was being cultivated to the west of LCAw, 2402, that wasteland was present to the south and east, and that the grounds of Hawāhewa and Kaapa were present to the north (which should be the location of LCAw, 2663). According to Kahue's testimony, wasteland was present to the south of LCAw, 2663 (which should be the location of LCAw, 2402). Kamakahōkai's ground was present to the west, Kūkūānu Ahupua'a to the north, and Aiko's enclosure was present to the east.

Most of the *kūhāpua* claims were awarded to native Hawaiians, but a Chinese individual, Y. Aiko (1799-1895), received a 1.01-acre parcel in Kūkūānu (LCAw, 3205) (Hunt and McDermott 1993). In Kahue's testimony he mentions that his parcel is bounded on the east by Aiko's enclosure. However, no information pertaining to the location of LCAw, 3205 was evident on any of the cartographic resources reviewed for the current study. It is uncertain if Aiko's LCAw, parcel was also the location of the Aiko's enclosure located to the east of LCAw, 2663.

Interestingly, Aiko is remembered as an early Chinese immigrant to Hawai'i who was involved in the first sugar production in the islands (Dorrance and Morgan 2000). Aiko arrived in the islands in mid-1830s from China. Two men were responsible for Aiko's arrival from China: Aiai, a Chinese businessman/retail store co-owner in Honolulu, and William French (1765-1861), a prominent local businessman with experience in the sugar industry. The two started a sugar mill in Waimea, Kaua'i in 1835. The goal of their operation was to "make sugar on shares" (splitting the proceeds between the grower and the miller). This was successful, using harvests of native grown cane. French and Aiai were emboldened to import four sugar masters, and a second mill from Canton, China (Dorrance and Morgan 2000:15, 16).

One of the four Chinese sugar masters brought to Hawai'i by French and Aiai was Aiko. When the mill in Waimea, Kaua'i shut down, Aiko went to the Island of Hawai'i. In 1837, Aiko settled in South Kohala on land that Governor Kuakini (1791-1844) planted in cane. He erected and operated a mill on shares with Kuakini until 1843, when he moved to North Kohala to run Kuakini's plantation located there (Dorrance and Morgan 2000:17).

Aiko had supervised both these operations since 1839. During this time, Governor Kuakini, with Chinese help, started another mill in Hilo on Ponahawai Hill. A year later in 1844, Aiko moved there with his family. Then after the *Māhela* of 1848, he acquired considerable property of his own. In 1849, Aiko went back to the North Kohala plantation, closed it down in 1850, and returned to Hilo. For the next two decades, until 1869, he lived there and devoted his time to helping several other Chinese run the mill and plantation at 'Amauluhi (Dorrance and Morgan 2000:17).

In 1867 a Hilo merchant and investor, Capt. Thomas Spencer (1812-1884) purchased 'Amauluhi Plantation from Aiko. The business consisted of a mill and 4,000 acres, 1 mile north of Hilo. Production was reported to be 500 tons of sugar in 1872 and in 1880; this amount was doubled under Aiko's management. But in 1884, this small plantation's lands were added to those of Hilo Sugar Company, and 'Amauluhi Plantation no longer existed" (Dorrance and Morgan 2000:102-103).

According to Maly (1996:26), the period of development between 1870s and 1890s saw the rapid change in Hilo town and growth of the sugar industry. Hilo soon grew to become the second largest city in the Hawaiian Islands (McEldowney 1979:39). Vast tracts of land were under sugarcane cultivation, which was remarkably labor-intensive, and took advantage of an immigrant labor force. Prior to 1930, breaking of ground to plant sugarcane was done by mules. By 1935 most areas (where possible) were plowed by tractors to a depth of six inches. The fields were not irrigated but rather relied on Hilo's high rainfall. Cane yields varied with rainfall. The fertility was good, but many fields were rocky (Kelly et al. 1981:121). Sugar processing plants in the vicinity of Kūkūānu 1<sup>st</sup> Ahupua'a included the Waiakea Mill Company to the east, and Hawaii Mill Company in

Pi'ihonua Ahupua'a, to the west. The Waiakea Mill Company, whose land holdings included portions of Kūkūānu, operated from 1897 through 1946, and was one of the largest sugar companies to operate in Hilo. When the company's 30-year lease of Waiakea lands expired in 1918, the government under homestead laws, subdivided a large tract of land into hundreds of lots granted to homesteaders in 1919 (Kelly et al. 1981:121). Commercial sugar production lasted in Kūkūānu until the mid twentieth century, at which time many of the fields were converted to pasture associated with cattle ranching.

## CURRENT PROJECT EXPECTATIONS

Based on soil substrate and elevation, the current project area falls within the Upland Agricultural Zone (Zone II) as defined by McEldowney (1979). The archaeological expectations for the zone include Precontact agricultural features and habitation sites. However, based on results of the previous archaeological studies in the vicinity (Hunt and McDermott 1993, and Spear et al. 1996) it appears that nineteenth and twentieth century mechanized cultivation may have impacted any earlier features and resulted in an overlay of more recent agriculture-related sites or ancillary habitation sites. Despite the high frequency of land clearing in the Hilo Bay area, the historical trend in prior studies in the area indicates that some features may be extant.

## FIELDWORK METHODS AND RESULTS

On May 23, and June 6 and 7, 2006, Mathew R. Clark, B.A., J. David Nelson, B.A., Mark J. Winburn, B.A., Olivier M. Bautista, B.A., and Liz Hauant'o performed an intensive pedestrian survey of the project area, under the direction of Robert B. Reichman, Ph.D. The limits of the area were marked on a map provided by SSIEM International, Inc. The field investigators walked east-west transects spaced at 10-meter intervals across the entire main body of the project area. The drainage ditch was then explored from its eastern to western end. With the exception of localized dense patches of *lappi'u* and California grass, ground visibility was adequate for locating all archaeological resources. When archaeological resources were encountered they were plotted on a map of the study parcel using a tape and compass, then cleared of vegetation, mapped in detail using a tape and compass, photographed, and described using standardized site record forms. The recorded archaeological features were grouped into sites based on their perceived proximity, functionality, and temporality.

## Findings

As a result of the current inventory survey a single archaeological site (Site 25547) was recorded on TMK:3-2-4-25-48 (Figure 7). Site 25547 is an elongated enclosure located within a raised bedrock crack formation to the north of the excavated drainage channel. Site 25547 that contains three modified sections consisting of stacked cobbles. This site is probably Historic in origin, and its use likely coincided with the use of several Historic features noted on TMKs:3-2-4-25-54 and 132, outside of the current project area, along the same raised bedrock formation as Site 25547. These features included a core-filled wall segment, several modified outcrops, an enclosure, modified lava bisters, and an early 20<sup>th</sup> century trash dump. A long time Hilo resident, Kenneth Bell (see Consultation section below), indicated that the location of these features corresponded to the location of several wooden shafts that were lived in until the 1940s. Site 25547 is described in detail below and its location, relative to the project area boundaries and the nearby habitation features, is shown in Figure 7.

### SHIP Site 25547

Site 25547 consists of a twenty-four-meter long by two-meter wide section of a natural *pāhāhāhā* bedrock crack that has been modified in three sections with stacked cobbles (Figure 8). The site is located north of the excavated drainage channel, in the central portion of TMK:3-2-4-25-48 (see Figure 7). The modifications to the bedrock crack consist of two sections of stacked cobble wall that cross the crack at the eastern and western ends of the feature (Sections 1 and 3), and a third section that lines the bedrock crack's northern edge in the central portion of the feature (Section 2). These modifications appear designed to restrict access into or out of the bedrock crack. The bedrock ridge/crack formation continues both east and west of the site area. Most of Site 25547 consists of unmodified vertical bedrock that stands one to two meters tall. Ground surface within the area enclosed by the modifications consists of level soil covered by a thick mat of organic debris. No cultural debris was observed within or around Site 25547, but based on its proximity to an area of known twentieth century habitation, it is likely that the site is of similar antiquity. Site 25547 may have functioned as enclosure designed to keep small animals (i.e. pigs, dogs, etc.) within or out of the enclosed space. Each modified section of Site 25547 (Sections 1, 2, and 3) is described in detail below.

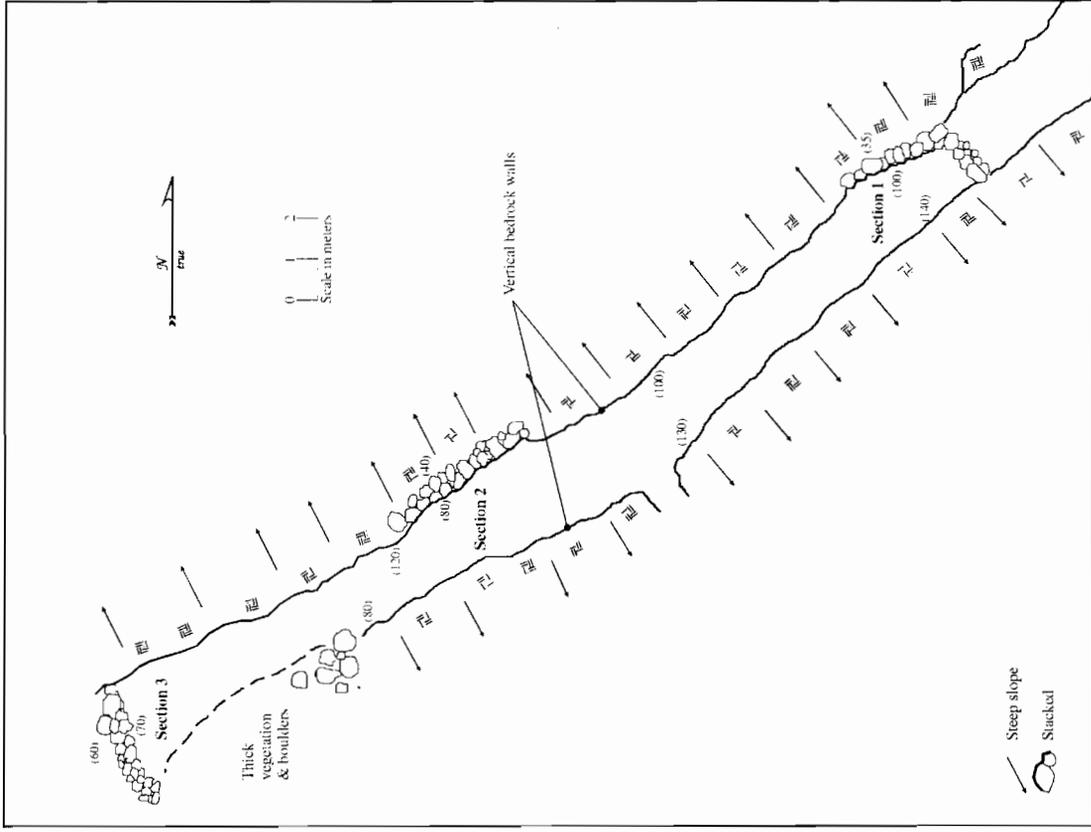


Figure 8. SIHP Site 25547 plan view.

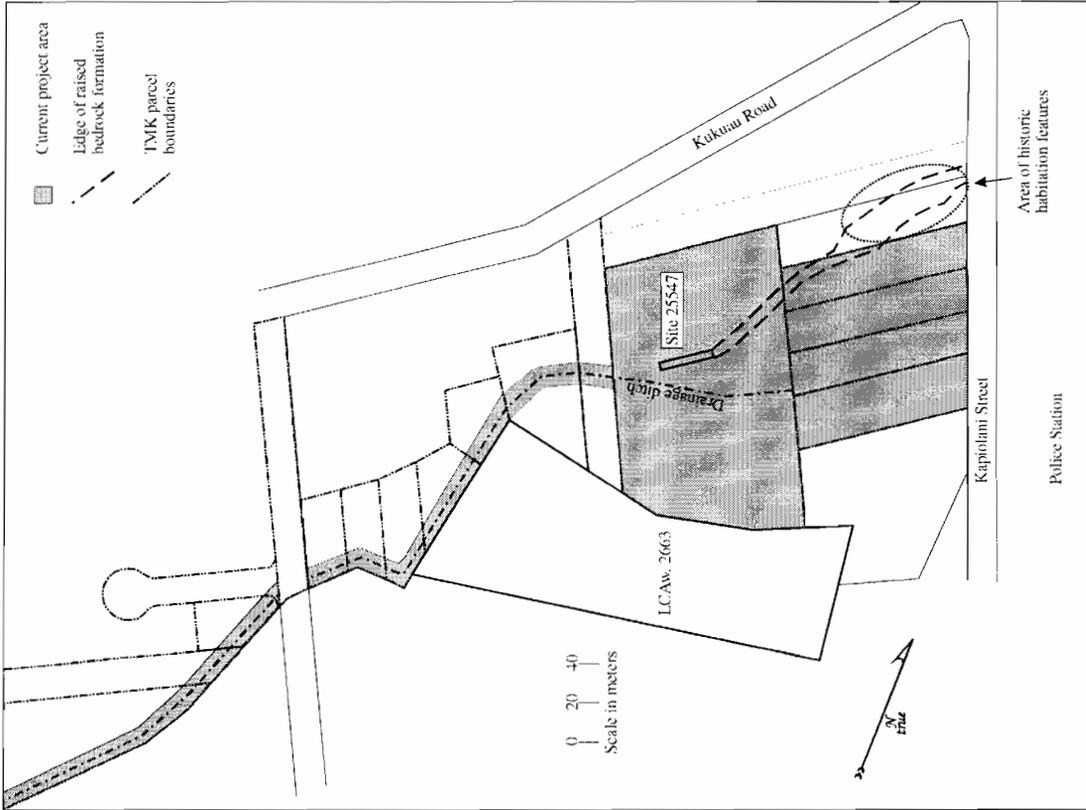


Figure 7. Project area plan view.

*Section 1*

Section 1 consists of an L-shaped stacked wall located at the eastern end of the site (see Figure 8). Beginning at its western end, the wall runs northeast along the northern edge of the crack for 2.8 meters, then turns southeast and extends 1.4 meters across the crack to a 1.4 meter tall vertical bedrock face along the southern edge of Site 25547. Section 1 stands up to 1.2 meters tall by 0.7 meters wide (Figure 9), but the segment that crosses the crack is mostly collapsed, standing only 0.4 meters tall along its interior by 0.8 meters tall along its exterior (Figure 10).

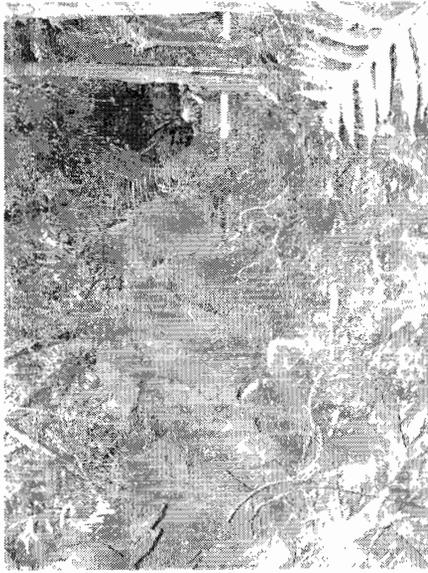


Figure 9. SHIP Site 25547 Section 1, stacked rock along bedrock edge, view to the north.



Figure 10. SHIP Site 25547 Section 1, collapsed rock stack across bedrock formation, view to west.

*Section 2*

Section 2 consists of a linear stacked wall located along the northern edge of the crack, approximately half way between Sections 1 and 3 (see Figure 8). Section 2 measures four meters long, stands three to four courses tall, with an interior height of 0.9 meters (Figure 11), an exterior height of 0.4 meters (Figure 12), and a width of 0.7 meters. Section 2 appears to have been constructed as a barrier to compensate for a low section of bedrock along the northern edge of the crack. Vertical bedrock is present to the east and west of Section 2.



Figure 11. SHIP Site 25547 Section 2, interior face of rock stack, view to north.

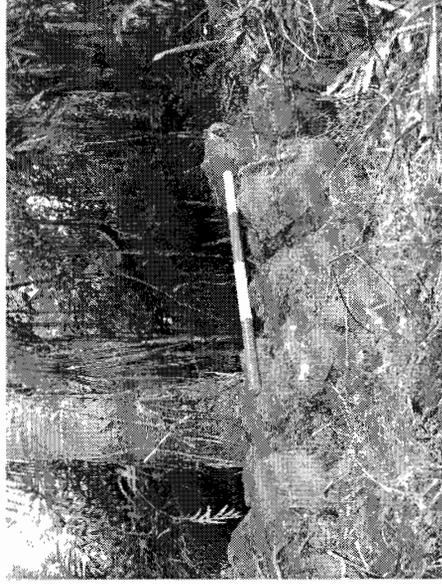


Figure 12. SHIP Site 25547 Section 2, exterior face of rock stack view to southwest.

Section 3

Section 3 consists of a stacked wall that crosses the width of the bedrock crack at the western end of Site 25547 (see Figure 8). Section 3 is linear, running northwest/southeast, and measuring 3.1 meters long by 0.6 meter wide, by 0.8 meter tall (2 courses) (Figure 13). This section is in poor condition due to collapse caused by dense vegetation, but it was likely designed to restrict access at the western end of the site.



Figure 13. SHHP Site 25547, Section 3, view to south.

CONSULTATION

As part of the current study an effort was made to obtain information about any potential traditional cultural properties and associated practices that might be present, or have taken place within the project area. The Office of Hawaiian Affairs (East Hawai'i) and the Hilo Hawaiian Civic Club were contacted but had no information relative to the existence of traditional cultural properties in the immediate vicinity of the current project area; nor did they provide any information indicating current use of the project area for traditional and customary practices.

Mr. Kenneth Bell was also consulted with respect to past land use in and around the current project area. Mr. Bell has participated in many oral historical projects concerning the development of the Hilo area. He was born in 1915 and is of mixed Hawaiian/Caucasian ancestry. Mr. Bell's father, William John Bell, was superintendent of the Railroad, and Carpentry and Blacksmith Shops for the Waiakea Mill Company. The Bell family lived on Kilauea Avenue during the years employed by the Mill. The senior Bell retired in 1940. Kenneth was well acquainted with the former Waiakea Mill and Plantation operation, having spent time with his father riding rails throughout the system of fields. Kenneth Bell eventually went to work for IIT&T (a division of C. Brewer) and retired as Superintendent of the Bulk Sugar Plant in 1980. Presently Mr. Bell lives in Hilo on Makani Circle. When asked in a telephone interview what he knew of the current project area, he explained that there was a scattering of a few "wooden shacks" that served as residences (not associated with the Waiakea Mill Company) in the portion of the project area fronting Kapiolani Street. This is the same location where clusters of historic refuse were observed immediately to the north of the project area.

SIGNIFICANCE EVALUATION, TREATMENT RECOMMENDATIONS, AND ASSESSMENT CONCLUSION

The above-described archaeological site is assessed for its significance based on criteria established and promoted by DLNR-SHPD and contained in the Hawai'i Administrative Rules 13813-284-6. This significance evaluation should be considered as preliminary until DLNR-SHPD provides concurrence. For resources to be considered significant they must possess integrity of location, design, setting, materials, workmanship, feeling, and association and meet one or more of the following criteria:

- A Be associated with events that have made an important contribution to the broad patterns of our history;
- B Be associated with the lives of persons important in our past;
- C Embody the distinctive characteristics of a type, period, or method of construction; represent the work of a master; or possess high artistic value;
- D Have yielded, or is likely to yield, information important for research on prehistory or history;
- E Have an important traditional cultural value to the native Hawaiian people or to another ethnic group of the state due to associations with traditional cultural practices once carried out, or still carried out, at the property or due to associations with traditional beliefs, events or oral accounts—these associations being important to the group's history and cultural identity.

While it is the practice of the DLNR-SHPD to consider most historic properties significant under Criterion D at a minimum, it is clear that traditional cultural properties by definition would also be significant under Criterion E. A further analytical framework for addressing the preservation and protection of customary and traditional native practices specific to Hawaiian communities resulted from the *Ka Ipa'akai O Ka'āina v Land Use Commission* court case. The court decision established a three-part process relative to evaluating such potential impacts: first, to identify whether any valued cultural, historical, or natural resources are present; and identify the extent to which any traditional and customary native Hawaiian rights are exercised; second, to identify the extent to which those resources and rights will be affected or impaired; and third, specify any mitigative actions to be taken to reasonably protect native Hawaiian rights if they are found to exist.

SHHP Site 25547 is considered significant under Criteria D for the information it has yielded regarding early twentieth century use of the study area. However, as SHHP Site 25547 was recorded in detail and there is virtually no excavation potential, no further work is recommended. This site is not considered a traditional cultural property and there were no specific natural or cultural resources or cultural beliefs and practices identified relative to the land within the current study area.

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# APPENDIX D

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*BOTANICAL SURVEY*

**Botanical Survey**  
**Mohouli Drainage Area**  
**TMKs 2-4-25-48, 49, 50, 52, 53, 59, and 80 (pars.)**  
**Hilo, Island of Hawai'i**

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Prepared for SSFM International Inc.  
September 2006

*Introduction*

This report describes the results of a botanical survey of an approximately 5-acre + portion of various private properties in Hilo, Hawai'i. These properties are currently subject to flooding and are being considered for purchase by the County of Hawai'i for drainage purposes. The properties examined directly included portions of TMKs 3-2-4-25, 48, 50, 52, 53, 67, 93, 105, 107, 108, 109, 110, 115, 126, 127, and 131. As right-of-entry was not available for TMK 3-2-4-25-49, it was examined from adjacent properties. The location of the properties, floodway and survey areas, which lie mauka of Kapiolani Street across from Hawai'i County Police Department headquarters, is illustrated in Figure 1. The area in blue shows the floodway, and the area enclosed by pink lines indicates the area surveyed by botanists on the ground. The survey area included a confined, manmade flood channel that collects drainage from subdivisions above Popolo Street, crosses Popolo Street and then extends as a confined channel for several hundred feet, and then opens up into the properties above Kapiolani Street.

*Purpose and Methodology*

The objectives of the botanical survey were to 1) describe the vegetation; 2) list all species encountered; and 3) identify threatened or endangered plant species. The area was first surveyed by Ron Terry in May 2006, and then again by botanist Layne Yoshida, with assistance from Graham Knopp, later that month. Species were identified in the field and, as necessary, collected and keyed out in the laboratory. Special attention was given to the possible presence of any federally (USFWS 2000) listed endangered plant species.

*Vegetational Influences*

The geologic substrate in this area is a Mauna Loa lava flow that dates from 3,000 to 10,000 years BP (Wolfe and Morris 1996). The original vegetation of the general area was lowland rainforest, per Gagne and Cuddihy (1990), consisting of a closed canopy forest of 'ohi'a (*Metrosideros polymorpha*), lama (*Diospyros sandwicensis*) and hala (*Pandanus tectorius*), along with a diverse array of canopy and understory trees, shrubs,

herbs, vines and ferns, including hapu'u (*Cibotium* sp.), uki sedge (*Machaerina mariscoides*) and uluhe (*Dicranopteris linearis*).

Hilo has a long history of farming during both traditional Hawaiian times and the past two centuries. A summary of Hilo land use history reported that early Western visitors remarked on the forest line that appeared uniformly about four or five miles inland from the coast (McEldowney 1979:22). The areas makai of the forest line were converted by slash-and-burn early in prehistory into cropland and grassland. For many centuries, much of the inland portion of Hilo was covered in gardens of taro (*Colocasia esculenta*) that were associated with residences. The gardens were often outlined by windbreaks of sugar cane, banana (*Musa* spp.), and wauke (barkcloth) (*Broussonetia papyrifera*). Interspersed with settlements were mixed groves of trees with economic uses such as kukui (*Aleurites moluccana*), hala (*Pandanus tectorius*), coconut (*Cocos nucifera*), ulu (*Artocarpus altilis*), 'ohi'a 'ai (*Syzygium malaccense*), milo (*Thespesia populinea*) and hau (*Hibiscus tiliaceus*). Platforms or mounds of rock were constructed to promote the growth of gourds, ti (*Cordyline frutescens*) and noni (*Morinda citrifolia*) plants.

*Current Vegetation*

The landscape here appears to have been heavily modified by human use, including traditional Hawaiian cultivation, historic-era agriculture, pasture, dumping, drainageway excavation, and grading. Except for the narrow, confined drainage channel, which was lined with overhanging trees and shrubs, a dense forest completely dominated by large alien trees covers the area. The principal elements are mango (*Mangifera indica*), African tulip tree (*Spathodea campanulata*), gunpowder tree (*Trema orientalis*), *Melochia umbellata*, Alexandra Palm (*Archontophoenix alexandriae*), bingabing (*Macaranga mappae*), rose apple (*Syzygium jambos*) and java plum (*Syzygium cumini*). Groundcover is dominated by *Wedelia trilobata* and California grass (*Bracharia mutica*). A number of alien vines including the thorny wait-a-bit (*Caesalpinia decapetala*) and *Philodendron* sp. festoon the trees.

*Flora*

A full list of plant species found on the site is contained in Table 1, below. As described above, the vast majority of species are alien, with only a few common plants, principally ferns, vines and sedges, among the natives. All native plants found were indigenous (found in Hawai'i as well as elsewhere) rather than endemic (found in Hawai'i and nowhere else). In all, only 7 percent of the species found here are indigenous, and their cumulative biomass probably accounts for far less than 1 percent of the vegetation.

*Threatened and Endangered Species*

No listed or proposed endangered plant species were found. Given the context, it would be very unusual to find one in this lowland environment with a history of intense disturbance.



Table 1

Scientific Name	Family	Common Name	Life Form	Status*
Ageratum conyzoides	Asteraceae	Ageratum	Herb	A
Alliandra sp.	Poaceae	Alliandra	Vine	A
Ananas comosus	Bromeliaceae	Pineapple	Herb	A
Archontophoenix alexandriae	Areaceae	Alexandra Palm	Tree	A
Asplenium nidus	Aspleniaceae	Bird's Nest Fern	Fern	I
Begonia sp.	Begoniaceae	Begonia	Herb	A
Bidens pilosa	Asteraceae	Beggar's Tick	Herb	A
Braeharia nutica	Poaceae	California Grass	Herb	A
Brownea sp.	Fabaceae	Brownea	Tree	A
Buddleia asiatica	Buddleiaceae	Dog Tail	Shrub	A
Caesalpinia decapetala	Fabaceae	Wait-a-bit	Vine	A
Caladium sp.	Araceae	Caladium	Herb	A
Canavalia bahiartica	Fabaceae	Maunaloa	Vine	A
Cecropia obtusifolia	Cecropiaceae	Trumpet Tree	Tree	A
Chamaecrista nictitans	Fabaceae	Partridge Pea	Herb	A
Chamaesyce hirta	Euphorbiaceae	Hairy Spurge	Herb	A
Chamaesyce prostrata	Euphorbiaceae	Graceful Spurge	Herb	A
Christella af. dentata	Thelypteridaceae	Cyclosorus	Fern	A
Christella dentata	Thelypteridaceae	Pai' iha	Fern	A
Citrus sp.	Rutaceae	Orange/ Lime	Tree	A
Clusia rosea	Clusiaceae	Autograph Tree	Tree	A
Codiaeum sp.	Euphorbiaceae	Croton	Shrub	A
Coix laetyma-jobi	Poaceae	Job's Tears	Herb	A
Colocasia esculenta	Araceae	Kalo	Herb	A
Commelina diffusa	Commelinaceae	Honohono	Herb	A
Cordyline fruticosa	Agavaceae	Ki	Shrub	A
Crotalaria sp.	Fabaceae	Crotalaria	Herb	A
Davallia sp.	Davalliaceae	Hare's Foot Fern	Fern	A
Desmodium sandwicense	Fabaceae	Spanish Clover	Herb	A
Dieffenbachia sp.	Araceae	Dumb Cane	Herb	A
Diosotis rotundifolia	Melastomataceae	Diosotis	Vine	A
Dracaena sp.	Agavaceae	Money Tree	Shrub	A
Drymaria cordata	Carvophyllaceae	Pipili	Herb	A
Erechtites hieracifolia	Asteraceae	Erechtites	Herb	A
Eugenia sp.	Myrtaceae	Cherry	Tree	A
Euphorbia heterophylla	Euphorbiaceae	Kaliko	Herb	A
Ficus microcarpa	Moraceae	Banyan	Tree	A
Filicium decipiens	Sapindaceae	Fern Tree	Tree	A
Hedyotium sp.	Zingiberaceae	Ginger	Herb	A
Hedyotis corymbosa	Rubiaceae	Hedyotis	Herb	A
Heliconia sp.	Heliconiaceae	Heliconia	Herb	A

Table 1, continued

Scientific Name	Family	Common Name	Life Form	Status*
Impatiens sp.	Balsaminaceae	Touch-me-not	Herb	A
Ipomoea alba	Convolvulaceae	Morning Glory	Vine	A
Ipomoea indica	Convolvulaceae	Morning Glory	Vine	I
Kylilinga brevifolia	Cyperaceae	Kylilinga	Herb	A
Lantana camara	Verbenaceae	Lantana	Shrub	A
Lepisorus thumbergianus	Polypodiaceae	Pleopeltis	Fern	I
Lindernia sp.	Scrophulariaceae	Lindernia	Herb	A
Litchi chinensis	Sapindaceae	Litchi	Tree	A
Ludwigia palustris	Onagraceae	Marsh Purslane	Herb	A
Macadamia sp.	Proteaceae	Macadamia	Tree	A
Macaranga mappia	Euphorbiaceae	Bingabing	Tree	A
Mangifera indica	Anacardiaceae	Mango	Tree	A
Mamihot esculenta	Euphorbiaceae	Mamihot	Shrub	A
Melastoma sp.	Melastomataceae	Melastoma	Shrub	A
Merronia tuberosa	Convolvulaceae	Wood Rose	Vine	A
Mimosa pudica	Fabaceae	Sleeping Grass	Herb	A
Monstera deliciosa	Araceae	Monstera	Shrub	A
Mucuna gigantea	Fabaceae	Sea Bean	Vine	I
Musa sp.	Musaceae	Banana	Shrub	A
Nephrolepis exaltata	Nephrolepidaceae	Sword Fern	Fern	I
Nephrolepis multiflora	Nephrolepidaceae	Sword Fern	Fern	A
Optismenus hirtellus	Poaceae	Basketgrass	Herb	A
Pacderia foetida	Rubiaceae	Maile Pilau	Vine	A
Pandanus toctorius	Pandanaeaceae	Hala	Tree	I
Panicum maximum	Poaceae	Guinea Grass	Herb	A
Paspalum dilatatum	Poaceae	Dallis Grass	Herb	A
Passiflora edulis	Passifloraceae	Lilikoi	Vine	A
Persea americana	Lauraceae	Avocado	Tree	A
Philodendron sp.	Araceae	Philodendron	Vine	A
Phlebodium aureum	Polypodiaceae	Phlebodium	Fern	A
Phoenix roebelenii	Araceae	Pygmy Palm	Shrub	A
Phyllanthus debilis	Euphorbiaceae	Niruri	Herb	A
Phymatosorus grossus	Polypodiaceae	Maile Scented Fern	Fern	A
Piper sp.	Piperaceae	Piper	Vine	A
Pluchea symphitifolia	Asteraceae	Sourbush	Shrub	A
Psidium cattianum	Myrtaceae	Waawa	Tree	A
Psidium guajava	Myrtaceae	Guava	Tree	A
Pterolepis glomerata	Melastomataceae	Pterolepis	Vine	A
Pycreus polystachyos	Cyperaceae	Sedge	Herb	I
Rubus rosifolius	Rosaceae	Thimbleberry	Herb	A
Salvia sp.	Lamiaceae	Salvia	Herb	A
Sansevieria trifasciata	Agavaceae	Snake Plant	Herb	A

Table 1, continued

Scientific Name	Family	Common Name	Life Form	Status*
Sechium edule	Cucurbitaceae	Chayote	Vine	A
Senna sp.	Fabaceae	Kalamona	Shrub	A
Sciraria palmifolia	Poaceae	Palm Grass	Herb	A
Schefflera actinophylla	Araliaceae	Octopus Tree	Tree	A
Spathodea campanulata	Bignoniaceae	African Tulip	Tree	A
Stachytarpheta jamaicensis	Verbenaceae	Stachytarpheta	Herb	A
Syngonium sp.	Araceae	Syngonium	Vine	A
Syzygium cumini	Myrtaceae	Java Plum	Tree	A
Syzygium jambos	Myrtaceae	Rose Apple	Tree	A
Syzygium malaccense	Myrtaceae	Mountain Apple	Tree	A
Tabebuia heterophylla	Bignoniaceae	Pink Tecoma	Tree	A
Thunbergia fragrans	Acanthaceae	White Thunbergia	Vine	A
Torenia asiatica	Scrophulariaceae	Olaa Beauty	Herb	A
Trema orientalis	Ulmaceae	Gunpowder Tree	Tree	A
Wedelia trilobata	Asteraceae	Wedelia	Vine	A
Zingiber zerumbet	Zingiberaceae	Awapuhi	Herb	A

A = alien, E = endemic, I = indigenous

# APPENDIX E

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*A SURVEY OF AVIAN AND  
TERRESTRIAL MAMMALIAN SPECIES,  
KUKUAU STREET TO KAPI'OLANI  
ROAD*

---

**A Survey of Avian and Terrestrial Mammalian  
Species, Kūkūau Street to Kapi‘olani Road Mohouli  
Drainage Improvement Project, South Hilo District,  
Island of Hawai‘i.**

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## Introduction

The County of Hawai'i, Department of Public Works is proposing to acquire lands in fee, or by easement, to encumber the existing drainage system created by the County and State of Hawai'i for the Mohouli Housing Project, which is located in the Kūkaʻau Iki *ahupua'a*, South Hilo, Hawai'i. Lands are identified as TMK: (3) 2-4-25-48-50, 52, 53, 59, 67, 78, 80, 93, 106-1110, 115, and 126 (Figure 1). This report summarizes the findings of an ornithological and mammalian survey conducted within the proposed project site. Fieldwork was conducted on May 9, and 10, 2006.

The primary purpose of the survey was to determine if there were any avian or mammalian species currently listed as endangered, threatened, or proposed for listing under either the federal or the State of Hawai'i's endangered species programs on, or within in the immediate vicinity of the site. Federal and State of Hawai'i listed species status follows species identified in the following referenced documents (DLNR 1998, Federal Register 2005, USFWS 2005, 2006).

Avian phylogenetic order and nomenclature follows *The American Ornithologists' Union Check-list of North American Birds 7<sup>th</sup> Edition* (American Ornithologists' Union 1998), and the 42<sup>nd</sup> through the 46<sup>th</sup> supplements to *Check-list of North American Birds* (American Ornithologists' Union 2000; Banks et al. 2002, 2003, 2004, 2005). Mammal scientific names follow *Mammals in Hawaii* (Tomich 1986). Plant names follow *Manual of the Flowering Plants of Hawai'i* (Wagner et al. 1990, 1999). Place names follow *Place Names of Hawaii* (Pukui et al. 1976).

Hawaiian and scientific names are italicized in the text. A glossary of technical terms and acronyms used in the document, which may be unfamiliar to the reader, are included at the end of the narrative text on page 10.

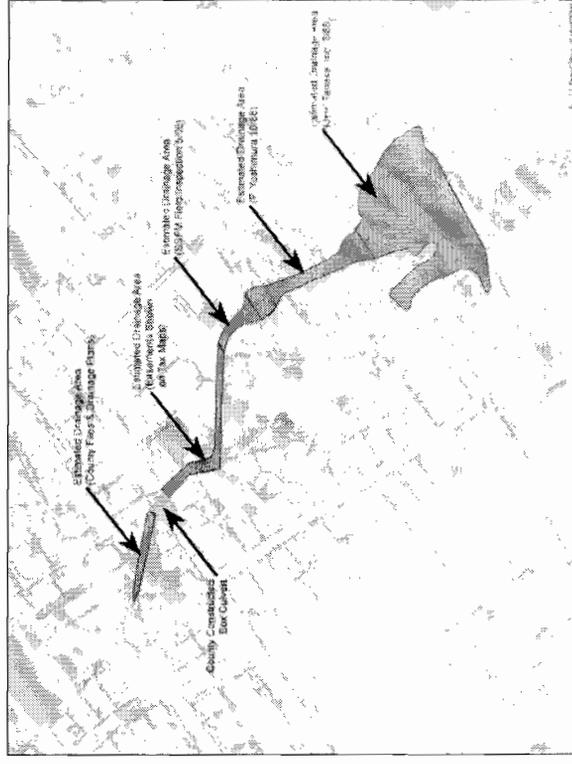
## General Site Description

The project area is bound to the northeast by Kapi'olani Street, and on the other three sides by residential subdivisions (Figure 1). There is a partially lined drainage way, which starts above Popolo Street, and enters the more undeveloped areas of the site from the southwest. There is ample evidence that storm waters have entered the site, with all sort of debris scattered along the drainage way and in the detention area located adjacent to Kapi'olani Street (Figure 1).

The vegetation on the site is extremely dense and is dominated by alien species almost to the exclusion of native plants. There are thick stands of bamboo (*Bambusa vulgaris*) on the southwestern end of the site along the drainage way which segues into a very dense wedelia (*Sphagnetocola trilobata*) and California grass (*Brachiaria mitica*), and numerous weedy species understorey. Trees include several extremely large mango (*Mangifera indica*) trees, gunpowder tree (*Trema orientalis*), bingabing (*Macaranga*

*nappa*), and lots of almost impenetrable stands of wait-a-bit (*Caesalpinia decapetala*), and lantana (*Lantana camara*).

Figure 1. Mohouli Housing Project Flood Channel and Basin



## Mammalian Survey Methods

With the exception of the endangered Hawaiian hoary bat (*Lasiurus cinereus semotis*), or 'ōpe'ōpe'a as it is known locally, all terrestrial mammals currently found on the Island of Hawai'i are alien species. Most are ubiquitous. The survey of mammals was limited to visual and auditory detection, coupled with visual observation of scat, tracks, and other animal sign. A running tally was kept of all vertebrate species observed and heard within the project area. Visual and electronic scans, using a Broadband AnaBat II<sup>®</sup> ultrasonic bat detector, were made for bats during crepuscular periods on the evening of May 9, and on the morning of May 10, 2006.

## Mammalian Survey Results

The only mammalian species encountered during this survey were numerous dogs (*Canis f. familiaris*), which were seen tied up at various houses or within dog runs behind houses along the drainageway. Dogs were also heard barking from many other houses surrounding the general project site. Hawaii's sole endemic terrestrial mammalian species, the endangered Hawaiian hoary bat, was not detected during the course of this survey.

## Avian Survey Methods

Five avian count stations were sited approximately 150-meters apart within the project area. Eight-minute point counts were conducted at each station. Each station was counted once. Field observations were made with the aid of Leitz 10 X 42 binoculars and by listening for vocalizations. Counts were conducted between 06:45 a.m. and 10:00 a.m., the peak of daily bird activity. Additionally, two hours was spent within the project area on the evenings of May 9, and on the morning of May 10, 2006, in an attempt to detect nocturnally flying seabirds over-flying the project area. Time not spent counting was used to search the study site for species and habitats that were not detected during count sessions.

## Avian Survey Results

Seventy-three individual birds of eight different species, representing seven separate families were recorded during station counts (Table 1). All avian species recorded are considered alien to the Hawaiian Islands.

Avian diversity and densities were in keeping with the habitat present within the project area. Three species, Japanese White-eye (*Zosterops japonicus*), Zebra Dove (*Geopelia striata*), and House Finch (*Carpodacus mexicanus*), accounted for 52% of the total number of all birds recorded during station counts. The most common avian species recorded was Japanese White-eye, which accounted for slightly less than 22% of the total number of individual birds recorded. An average of eight individual birds were recorded per station count.

Table 1

Avian Species Detected, Mohouli Drainage Site			
Common Name	Scientific Name	ST	RA
COLUMBIFORMES			
COLUMBIDAE – Pigeons & Doves			
Spotted Dove	<i>Streptopelia chinensis</i>	A	1.00
Zebra Dove	<i>Geopelia striata</i>	A	2.40
PASSERIFORMES			
TIMALIIDAE - Babblers			
Hwamei	<i>Garrulax canorus</i>	A	1.80
ZOSTEROPIDAE - White-Eyes			
Japanese White-eye	<i>Zosterops japonicus</i>	A	3.20
STURNIDAE - Starlings			
Common Myna	<i>Acridotheres tristis</i>	A	1.20
CARDINALIDAE - Cardinals Saltators & Allies			
Northern Cardinal	<i>Cardinalis cardinalis</i>	A	1.20
FRINGILLIDAE			
Fringilline And Cardueline Finches & Allies			
House Finch	<i>Carduelinae - Carduline Finches</i>	A	2.00
House Sparrow	<i>Passeridae - Old World Sparrows</i>	A	1.80

### KEY TO TABLE 1

ST Status

A Alien Species

RA Relative Abundance: Number of birds detected divided by the number of count stations (5)

## Discussion

### Mammalian Resources

The findings of the mammalian survey are consistent with numerous other surveys conducted in similar habitat in the South Hilo District over the past five years (David 2001, 2002a, 2002b, 2002c, 2003a, 2003b, 2005, 2006, David et al. 2004). Although, Hawaiian hoary bats were not recorded during this survey, bats have been recorded on at

least seven recent surveys within the general Hilo area (David 2001, 2002a, 2002b, 2002c, 2003a, 2003b, 2005, 2006).

The Hawaiian hoary bat is a typical lasurine bat, and as such, they primarily lead a solitary existence, described as "over-dispersed". They generally roost cryptically in foliage, which makes them difficult to study (Findley and Tomich 1983, Jacobs 1994, Carter *et al.* 2000). Very little research into the life cycle, distribution, or population estimates of this species, has been conducted, and much of what has been studied, were small, disconnected, or anecdotal studies as opposed to coherent controlled experiments. Fundamental research into this species distribution and life cycle has just begun (Bonaccorso *et al.* 2005).

Unlike nocturnally flying seabirds, which often collide with man-made structures, bats are uniquely adapted to avoid collision with most obstacles, man-made or natural. They navigate and locate their prey primarily by using ultrasonic echolocation, which is sensitive enough to allow them to locate and capture small volant insects at night.

The only mammalian species detected during the course of this survey, domestic dogs are alien to the Hawaiian Islands. Although, not detected, it is likely that Hawaii's four naturalized rodents, roof rat (*Rattus r. rattus*), Norway rat (*Rattus norvegicus*), Polynesian rat (*Rattus exulans hawaiiensis*), and European house mouse (*Mus domesticus*), as well as small Indian mongoose (*Herpestes a. aurophinctatus*), and cats (*Felis catus*) use resources within the general project area at least occasionally. All of these alien mammalian species are deleterious to native ecosystems and their components.

#### Avian Resources

Avian diversity and densities were in keeping with the habitat present within the project area, and with the results of numerous other surveys conducted in similar habitat in the South Hilo District over the past five years (David 2001, 2002a, 2002b, 2002c, 2003a, 2003b, 2005, 2006, David *et al.* 2004). All eight species of birds recorded during the survey, are commonly occurring alien species.

Although not detected during this survey, it is possible that small numbers of the endangered endemic Hawaiian Petrel (*Pterodroma sandwichensis*), or *ua'u*, and the threatened Newell's Shearwater (*Puffinus auricularis newelli*), or *'a'o*, over-fly the project area between the months of May and November (Banko 1980a, 1980b, Day *et al.* 2003a, Harrison 1990).

Hawaiian Petrels were formerly common on the Island of Hawai'i (Wilson and Evans 1890-1899). This pelagic seabird reportedly nested in large numbers on the slopes of Mauna Loa and in the saddle area between Mauna Loa and Mauna Kea (Henshaw 1902), as well as at the mid-to-high elevations of Mount Hualālai. Within recent historic times, Hawaiian petrels have been reduced to relict breeding colonies located at high elevations

on Mauna Loa, and possibly, Mount Hualālai (Banko 1980a, Banko *et al.* 2001, Cooper and David 1995, Cooper *et al.* 1995, Day *et al.* 2003a, Harrison 1990, Hue *et al.* 2001, Simons and Hodges 1998).

Newell's Shearwaters were formerly common on the Island of Hawai'i (Wilson and Evans 1890-1899). This species breeds on Kaua'i, Hawai'i, and Moloka'i in extremely small numbers. Newell's Shearwater populations have dropped precipitously since the 1880s (Banko 1980b, Day *et al.* 2003b). This pelagic species nests high in the mountains in burrows excavated under thick vegetation, especially *Ilitike (Dicranopteris linearis)* fern.

The primary cause of mortality in both Hawaiian Petrels and Newell's Shearwaters is thought to be predation by alien mammalian species at the nesting colonies (USFWS 1983, Simons and Hodges 1998, Ainley *et al.* 2001). Collision with man-made structures is considered to be the second most significant cause of mortality of these seabird species in Hawai'i. Nocturnally flying seabirds, especially fledglings on their way to sea in the summer and fall, can become disoriented by exterior lighting. When disoriented, seabirds often collide with manmade structures, and if they are not killed outright, the dazed or injured birds are easy targets of opportunity for feral mammals (Hadley 1961, Telfer 1979, Sincock 1981, Reed *et al.* 1985, Telfer *et al.* 1987, Cooper and Day 1998, Podolsky *et al.* 1998, Ainley *et al.* 2001). There is no suitable nesting habitat within or close to the project area for either of these pelagic seabird species.

#### Potential Impacts to Protected Vertebrate Species

##### Hawaiian Hoary Bat

Hawaiian hoary bats were not detected during this survey, but they have been recorded within the general project area on numerous occasions. With the current scientific information available, it is not known if bats ever roost within the project site. Whether the clearing and the modification of portions of the remaining vegetated areas within this site will result in deleterious impacts to this species is difficult to ascertain. The principal potential impact that clearing and grubbing of the vegetated portions of the site poses to Hawaiian hoary bats is disturbance to roosting female bats during the pupping season, when the females are tending to their young, and are less likely to be able to rapidly vacate a roost tree or bush as it is being felled, or cleared.

##### Hawaiian Petrel and Newell's Shearwater

The principal potential impact that improving the drainage features on this site poses to Hawaiian Petrels and Newell's Shearwaters is the increased threat that birds will be downed after becoming disoriented by exterior lighting that may be required in conjunction with the construction activities. It is assumed that no post construction outdoor lighting will be required in conjunction with the planned drainage improvements.

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## **Conclusions**

There is nothing unique about the project site or its vegetation. There is abundant like habitat in, and around Hilo. It is not expected that the acquisition of the site, and development of drainage features on the property will have significant impacts on native avian or mammalian resources present within the general project area.

## **Recommendation**

To reduce the potential for interactions between nocturnally flying Hawaiian Petrels and Newell's Shearwaters with external lights and man-made structures, it is recommended that if it becomes necessary to use any external lighting during construction, that the lights be shielded following suggestions by Reed et al. (1985) and Telfer et al. (1987). This mitigation would serve the dual purpose of minimizing the threat of disorientation and downing of Hawaiian Petrels and Newell's Shearwaters, while at the same time complying with the Hawaii County Code § 14-50 *et seq.* that requires the shielding of exterior lights so as to lower the ambient glare caused by unshielded lighting to the astronomical observatories located on Mauna Kea.

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## **Glossary:**

*Ahihiua* - Traditional Hawaiian land division, usually extending from the uplands to the sea  
Alien - Introduced to Hawaii by humans  
Crepuscular - Twilight hours  
Endangered - Listed and protected under the Endangered Species Act of 1973, as amended as an endangered species.  
Endemic - Native and unique to the Hawaiian Islands  
Indigenous - Native to the Hawaiian Islands, but also found elsewhere naturally  
Naturalized - A non-native species that has become established in the wild, i.e., rats in Hawaii  
Nocturnal - Night-time, after dark  
Pelagic - An animal that spends its life at sea - in this case seabirds that only return to land to nest and rear their young  
Threatened - Listed and protected under the ESA as a threatened species  
Volant - Flying, capable of flight, as in flying insect

DLNR - Hawaii State Department of Land & Natural Resources  
ESA - Endangered Species Act of 1973, as amended  
TMK - Tax Map Key  
USFWS - U.S. Fish & Wildlife Service

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