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April 12, 2011

Herman Tuiolosega, Acting Director Office of Environmental Quality Control 235 S. Beretania Street, Suite 702 Honolulu, HI 96813

SUBJECT: FINDING OF NO SIGNIFICANT IMPACT (FONSI) FOR KAPULENA AGRICULTURAL PARK - TMK: (3)4-7-005:001, 002 & 003; (3)4-7-006:001, 005, 006, 007, 010, 018 & 020 AHUPUA'A OF KAPULENA, HĀMĀKUA JUDICIAL DISTRICT, COUNTY OF HAWAI'I

Dear Mr. Tuiolosega:

The Hawai'i County, Department of Finance has reviewed the comments received during the 30-day public comment period for the above referenced Environmental Assessment, has determined that this project will not have a significant environmental effect and has made a Finding of No Significant Impact (FONSI) determination. Please publish notice of availability for this project in the next OEQC Environmental Notice.

We have enclosed one hard copy as well as one electronic copy of the Final EA. Also enclosed are electronic copies of the completed OEQC Publication Form and the project summary. Please call Kenneth Van Bergen of the Hawai'i County Department of Finance at (808) 961-8009 or Catie Cullison at PBR HAWAI'I at (808) 521-5631, if you have any questions.

Sincerely,

Nancy Crawford Director of Finance County of Hawai'i

Enclosures

KAPULENA AGRICULTURAL PARK

Final Environmental Assessment

Prepared for: County of Hawai'i Department of Finance

Prepared by:



April 2011

PROJECT PROFILE

Project Name:	Kapulena Agricultural Park		
Location:	Kapulena, Hāmākua District, Hawaiʻi TMK: (3) 4-7-005:001, 002 & 003 (3) 4-7-006:001, 005, 006, 007, 010, 018, 020		
Landowner:	County of Hawai'i		
Proposing Agency:	County of Hawai'i, Department of Finance		
Accepting Authority:	Mayor or designee, County of Hawai'i		
Existing Use:	Fallow former sugarcane land overgrown with Guinea grass, ironwood trees, and other invasive weeds		
Proposed Action:	Development and lease (or permit) of County lands as an agricultural park		
Land Use Designations: State Land Use District:	Agriculture		
Hawai'i County Zoning:	A-40a		
County General Plan:	Important Agricultural Lands		
Alternatives Considered	Howeis County has considered four alternatives, no action colling		

Alternatives Considered: Hawai'i County has considered four alternatives: no action, selling, exchanging, or leasing. Based on the lack of response to the Pa'auilo land sales, selling is not a viable alternative at this time. In lieu of selling or exchanging, the County has decided to forego generating revenues as a primary objective and instead to use this County asset to pursue community objectives in terms of promoting agriculture.

Summary of Major Impacts and Mitigation Measures:

The endangered Hawaiian hoary bat has been detected at this site. Measures to avoid impacts to the bat, as well as the Hawaiian hawk include limiting tree clearing to months outside these species' nesting season. One archaeological feature at this site is proposed to be avoided by any new activity. The feature may be the remnants of a heiau or the feature may also be a historic sugarcane structure used for the loading or processing cane. This feature is recommended to be avoided until additional archaeological testing can be accomplished to ascertain its origins. Based on soil characteristics, topography, and rainfall, the site is suitable for agriculture, but not as suitable in the upper portion of

the site where the topography is steeper (where the ALISH designation is Unclassified, i.e., not Prime or Other). The site is within the service area of the Hāmākua Ditch, and alternative surface or groundwater sources for irrigation may be developed to serve mauka portions of the site. Altering the land contours for agricultural use could affect the drainage onto the downstream owners, but this can be mitigated by developing conservation plans as required by the County's grading ordinance. Any educational facilities associated with the agricultural use would be allowed to install cesspools that meet the Department of Health's standards since the site is located in a non-critical wastewater disposal area where any cesspool leachate would not impact the groundwater or nearshore coastal waters. The site is not in any special natural hazard area.

Determination:	Finding of No Significant Impact (FONSI)
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Appendix D	Cultural Impact Assessment
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1.0 INTRODUCTION

1.1 PROPOSING AGENCY

In accordance with Section 343-5(b), *Hawai'i Revised Statutes* (HRS), whenever an agency proposes the use of County land or funds, that agency shall prepare an Environmental Assessment for the action at the earliest practicable time to determine whether an Environmental Impact Statement shall be required.

In order to comply with Chapter 343, HRS, the County Department of Finance (DOF) has contracted PBR HAWAII to prepare and process this environmental assessment. The County DOF is the proposing agency for this project; the mailing address and primary contact person is listed below:

Ms. Nancy Crawford, Director County of Hawai'i Department of Finance 25 Aupuni Street, Suite 2103 Hilo, Hawai'i 96720-4252

1.2 BACKGROUND

The County of Hawai'i is the landowner of the subject property and is the agency preparing this environmental assessment. The 10 parcels covered by this EA were acquired from Hāmākua Sugar in 1994 in a settlement of taxes owed to the County of Hawai'i. Prior to the County's acquisition, the property had been in active sugar cane production. In the intervening years, the County of Hawai'i has not developed or used the properties beyond performing basic maintenance. The County had considered selling these lands to generate revenue to help meet budget shortfalls. In response to community comments, the County has reconsidered and has worked with various partners to evolve the proposed agricultural park described in more detail in Section 2.0 of this assessment.

1.3 DESCRIPTION OF THE PROPERTY

The property, totaling approximately 1,739.807 acres, is located in the Hāmākua District on the northeast side of the Island of Hawai'i ("Kapulena Lands"). The Kapulena Lands lie mauka of Honoka'a-Waipi'o Road (Highway 240) roughly half way between Honoka'a and Waipi'o Valley (Figure 1). The Kapulena Lands consist of ten (10) parcels (tax map keys (TMK) 3rd/4-7-005:001, 002, 003; 4-7-006:001, 005, 006, 007, 010, 018, 020), and spans across several ahupua'a (see Figure 2).

Within those ten (10) parcels there are a number of grants, Land Court Awards and a Mahele Award. There are nine (9) underlying grants and two Land Court Awards on TMK 4-7-005:001. There are two (2) grants on 4-7-005:002. There is a portion of two grants on 4-7-006:006. 4-7-006:018 is comprised of a portion of three grants, a portion of one Land Court Award and one Mahele Award. 4-7-006:010 is comprised of two grants, the portions of three additional grants and one Land Court Award. Finally, there is an underlying grant on 4-7-005:003, 4-7-006:005

and 4-7-006:020. Pursuant to the criteria and procedures relating to pre-existing lots set forth in the Subdivision Code, Article 11 (Hawai'i County Code section 23-117 through 23-120), the County of Hawai'i Planning Department determined that there 32 pre-existing lots of record within these 10 parcels (see table below and Appendix A). This determination enables a consolidation and resubdivision of the Kapulena Lands into 32 lots without meeting the minimum lot size or infrastructure improvement requirements of the zoning and subdivision codes (Hawai'i County Code §§25-2-11 and 23-7).

ТМК	Lots of Record	Owner	Tax Acres
	<u>Grants:</u> 1883,		
	1768, 1770,		
	1764, (por) 1564,		
	(por) 1765, (por)		
	791, (por) 868,		
	(por) 670		
	<u>LCA:</u> (por)		
	9971:4, (por)		
347005001	9971:8	County of Hawai'i	777.940
	<u>Grants</u> : (por)		
347005002	1882, (por) 1776	County of Hawai'i	38.570
347005003	<u>Grant</u> : (por) 1882	County of Hawai'i	1.430
	<u>Grant</u> : (por) 2449		
347006001	<u>LCA</u> : (por) 9971:2	County of Hawai'i	214.000
347006005	<u>Grant</u> : (por) 2123	County of Hawai'i	81.400
	<u>Grant</u> : (por) 2124,		
347006006	(por) 670	County of Hawai'i	167.700
347006007	(por) 2124	County of Hawai'i	61.250
	(por) 4003, (por)		
	2123, (por) 2449,		
	<u>LCA</u> : (por) 9971:		
	2, <u>Mahele AW</u> 4-		
347006018	В	County of Hawai'i	227.284
	<u>Grants</u> : 1763,		
	1767, (por) 1564,		
	(por) 1765, (por)		
	791		
347006010	LCA: 9971:4	County of Hawai'i	164.850
347006020	<u>Grant</u> : (por) 4012	County of Hawai'i	5.383
		Total Acreage	1,739.807
		No. Tax Map Lots	10
		No. Pre-Existing	
		Lots of Record	32

Table 1. Kapulena TMKs and Lots of Record

The primary access to the Kapulena Lands from Highway 240 is by "Quarry Road", a paved former cane road maintained by the County. The portion of this road not on County-owned lands is privately owned by Kamehameha Schools (TMK 4-6-5:001 and 4-6-4:007). The County recently obtained an easement from Kamehameha Schools to establish legal rights to use this road through Kamehameha School's property. The portion of the easement that is not a subdivided roadway lot is defined by metes and bounds. This cane road connects to Mud Lane, an unimproved government road. The County obtained easements from Kamehameha Schools and another private owner, Mauka-Makai Corp., to enable access to Mud Lane. Two unpaved mauka-makai roads (former cane haul roads) connecting Honoka'a-Waipi'o Road to the quarry road also provide access through the site.

The lands are fallow, formerly cultivated in sugar cane, and are now vegetated primarily by common ironwood trees and Guinea grass. A County rock quarry is located on TMK 4-7-006:005.



Access road to County rock quarry from paved cane haul road



1.4 SURROUNDING LAND USES

Surrounding land owners and uses include (see Figure 3):

- North (makai). The Lower Hāmākua Ditch defines a portion of the Kapulena Lands northern boundary. Kamehameha Schools owns the land between the Ditch and Highway 240. The neighbors along the remaining portion of the northern boundary are several private owners whose lands are primarily in pasture or orchards. Along the highway is a cluster of homes called Kapulena.
- South (mauka). The State of Hawai'i (Hāmākua Forest Reserves), Department of Hawaiian Home Lands, Boy Scouts of America Aloha Council, and a private owner are the neighbors to the south between the Kapulena Lands and the Hawai'i Belt Road (Highway 19).
- East (towards Waimea). The neighbor to the east is a private owner (Mauka-Makai Corp.) whose land is currently used as pasture.
- West (towards Honoka'a). The neighbors to the west are several private owners including Kamehameha Schools.



Figure 1, Regional Location Map

1-5

November 2010



Source: Hawaiÿi County Tax Assessor Parcel Data (2008) Disclaimer: This graphic has been prepared for general planning purposes only.





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2.0 PROJECT DESCRIPTION

2.1 PROJECT GOALS AND OBJECTIVES

The Hawai'i County Department of Finance (DOF) proposes to permit or lease the subject property for agricultural use as an agricultural park. The agricultural park will allow these lands to be put back into productive agricultural use. The lease rents (or permit fees) will be nominal and therefore not expected to be a major general fund revenue source. However, the County views the promotion of agriculture rather than income will serve the greater public interest in furtherance of sustainability goals.

2.2 NEED FOR THE PROJECT

The County has owned the Kapulena Lands since 1994, when it was acquired from Hāmākua Sugar Company in lieu of real property taxes owed. Although the County had considered selling the Kapulena Lands to offset budget shortfalls, community interest in using the land for diversified agriculture prompted the County to consider other plans for the property. The County met with experts in agriculture from State and Federal Agencies and forged a partnership with the Hāmākua Farm Bureau, the Big Island Farm Bureau, Kamehameha Schools, the University of Hawai'i College of Agriculture and Forestry, the University of Hawai'i College of Tropical Agriculture and Human Resources, and The Kohala Center to develop the agricultural park concept addresses the following needs:

- To develop and demonstrate best practices for sustainable and efficient grazing operations to support the grass-fed beef industry;
- To test alternative orchard and other crops for larger scale production;
- To test and provide incubator opportunities for value-added products;
- To train farmers and processors in cultivation and business practices at different scales from family to larger-scale operations, with an emphasis to strengthen the family-farm based agricultural community in Hāmākua.

The County recognizes that agriculture in the Hāmākua District has diversified to include cattle ranching, production of macadamia nut, fruit trees, vegetables, flowers, aquaculture and forestry. The diversification of the industry has lead to a growth in the total number of agricultural operations, but an overall loss in acreage utilized for farming and ranching. Thus, improving best practices, providing an area to risk new product development, providing training opportunities, and providing low cost start-up land suitable for agricultural pursuits are ways the County can contribute to promote agriculture.

2.3 PROPOSED USE

The proposed agricultural park plan will proceed in the following steps:

- 1) The County will clear the existing cane roads through the Kapulena Lands and install fencing along the roads to create paddocks (see Figure 4 Agricultural Park);
- 2) Initial grazing activities under a cooperative pilot project with the Hāmākua Farm Bureau will take place on about 100 acres in the makai portion of the lands between the Lower Hāmākua Ditch and approximately the 1,300-foot elevation (portion of TMK 3-4-7-005:001) to clear the area of the overgrown non-native grasses. Selective removal of

ironwood trees may be required to clear land for grazing;

- 3) After an initial period of grazing activities, these makai lands generally below the 1,300-foot elevation will be made available for more intensive agricultural production activities, and will be divided up into one- to five-acre sites for use in public or private agricultural operations. Cattle will be moved off of these makai lands as the more intensive agricultural demand for these lands warrant.
- 4) For the balance of the lands in the mauka portion above the 1,300-foot elevation, initial grazing activities under the cooperative pilot project with the Hāmākua Farm Bureau will take place on approximately 300 acres between the County of Hawai'i's quarry operation and the 2,000-foot elevation (portion of TMK 3-4-7-006:018 and 3-4-7-006:001);
- 5) Grazing will be expanded into additional areas of the Kapulena Lands under a permit from the County to the Hāmākua Farm Bureau or through other permits or leases as the lands are prepared and infrastructure becomes available. Long term, the mauka lands generally above the 1,300-foot elevation will be used to establish and operate a cooperative project to demonstrate best practices for increasing the per-acre production of grass-fed beef. This project may also include silviculture activities to demonstrate business models that combine silviculture and pasture activities. Expanding the grazing operations will necessitate removal of the ironwood forest in phases under the supervision of the Natural Resources Conservation Service and the Hāmākua Soil and Water Conservation District.
- 6) The educational component of the project will include a partnership with the Center for Agricultural Success (CACS), a new entity being planned by the University of Hawai'i College of Agriculture and Forestry. The center will conduct training on both the Kapulena Lands and in classroom space elsewhere. The facilities required to be developed for CACS' educational purposes will be located on the makai portion of the site below the 1,300-foot elevation. Educational facilities will include sheds, a shop, an office; and a clearing-house facility for processing produce.
- 7) An industrial-scale facility for converting ironwood trees into bio-charcoal was considered for this site. However, concerns relating to noise and air quality will require additional investigation. Thus, pilot-scale bio-charcoal experimentation may occur at the site with the expectation that a new or supplemental Environmental Assessment will be required to commence an industrial-scale bio-charcoal facility.

The infrastructure improvements to support this plan include:

- Fencing;
- Clearing and surface treatment of existing roads to agricultural standards;
- Installation of pumping equipment to access water from the Lower Hāmākua Ditch for operations at the lower elevations;
- Water source development such as a well, reservoir or large-scale water catchment systems at higher elevations.

All of the above improvements are anticipated to occur onsite. This EA does not cover any offsite improvements. The County will not permit any farm dwellings.

2.4 PHASING AND TIMING OF ACTION

Fencing and clearing of existing roads will occur immediately. The initial pilot grazing project is planned to commence in early 2011. The installation of infrastructure, expanded agricultural use, and the construction of the training facility will phase in over a projected 10-year period.



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3.0 ASSESSMENT OF THE NATURAL ENVIRONMENT, POTENTAL IMPACTS AND MITIGATION MEASURES

This chapter describes the existing natural environment of the Kapulena Lands and potential impacts that may result from the proposed agricultural park. The chapter also describes mitigation measures to address potential impacts.

3.1 CLIMATE

Because the project site lies between the 1,000 and 2,000-foot ground elevation on the northeast side of Hawai'i Island, it is affected by the prevailing northeast trade winds, making the climate there cool and wet. Winds are generally northeast, with typical trade wind speeds of 10 to 15 miles per hour.

Average annual rainfall in the general vicinity of the project site is approximately 70 inches (see Figure 5). The average temperature ranges between 71 and 76 degrees Fahrenheit.

Potential Impacts and Mitigation Measures

The climate is suitable for the proposed agricultural uses.



3.2 TOPOGRAPHY AND GEOLOGY

Hawai'i Island consists of a group of shield volcanoes that make up a small part of an extensive chain of volcanoes reaching across the mid-Pacific. The Kapulena Lands are located on the northeast side of the island on the northwest flank of Mauna Kea. The land between the several gulches that traverse the site slope at an average of 6 to 12% in the lower elevations of the site, and 10 to 20% at the upper elevations. Soils within the project area derive from Mauna Kea Holocene and Pleistocene era volcanic rocks (Wolfe and Morris 1996).

Potential Impacts and Mitigation Measures

The grades are suitable for the planned cultivation uses in the lower elevations and the pasture uses in the upper elevations of the site.

3.3 DRAINAGE & SURFACE WATER RESOURCES

The Kapulena Lands are bound to the east by Honokaia Gulch. Proceeding west, the lands are traversed by Malanahae Gulch, Kawaikalia Gulch, Kapulena Gulch, Waikoloa Stream, Waialeale Gulch and Waipunahoe Gulch—all perennial streams (see Figure 6, Streams and Drainageways). All of these streams were assessed as having medium cultural values and unknown aquatic and riparian values according to the State's stream assessment study. Of these streams, Waikoloa Stream was deemed the most significant. The National Wetlands Inventory identifies two areas of wetland associated with Malanahae Gulch. These wetlands may be remnant reservoirs, constructed for agricultural irrigation purposes.

The Kapulena Lands are designated Zone X by the Flood Insurance Rate Map, indicating that the lands lie outside the 500-year floodplain (see Figure 7, Flood Insurance Rate Map). Stream crossings by the existing cane roads are over culverts. These culverts are eroded in places and may require improvements.

Potential Impacts and Mitigation Measures

Although there are no plans to divert water from the streams for irrigation, any future diversion considerations should be required to have an aquatic survey to assess the habitat values and impacts.

Figure 6, Streams and Drainageways



Nov ember 2010







Outside Floodplain / Minimal Flooding

Source: Federal Emergency Management Agency (2007) Disclaimer: This graphic has been prepared for general planning purposes only.



3.4 Soils

Three soil suitability studies have been prepared for lands in Hawai'i. These are the U.S. Department of Agriculture *Soil Conservation Service Soil Survey* (USDA 1972), the University of Hawai'i Land Study Bureau *Detailed Land Classification* (Baker 1965), and the State of Hawai'i Department of Agriculture's *Agricultural Lands of Importance to the State of Hawai'i* (ALISH) (State of Hawai'i 1977). The principal focus of these studies has been to describe the physical attributes of Hawai'i's lands and the relative productivity of different land types for agricultural production purposes.

3.4.1 Soil Conservation Service Soil Survey

The Soil Survey of the Island of Hawai'i, State of Hawai'i (USDA 1972) identifies the following eight soil types at the Kapulena Lands (Figure 8, Soils).

- Honokaa Silty Clay Loam, Low Elevation, HsD (10–20% slopes)
- Honokaa Silty Clay Loam, Low Elevation, HsE (20–35% slopes)
- Honokaa Silty Clay Loam, HTD (10-20% slopes)
- Kukaiau Silty Clay Loam, KuD (12-20% slopes)
- Kukaiau Silty Clay Loam, KuE (20-35% slopes)
- Paauhau Silty Clay Loam, PaD (12-20% slopes)
- Paauhau Silty Clay Loam, PaE (20-35% slopes)
- Rough Broken Land, RB

Honokaa Silty Clay Loam, 10–20% slopes (HTD) constitutes approximately 345 acres, or roughly 20 percent of the Kapulena Lands, and is located at the site's highest elevations. In a representative profile, the surface layer is dark brown silty clay loam, approximately 6 inches thick. The subsoil is also silty clay loam. It is dark brown, very dark brown, and very dark grayish brown and is approximately 59 inches thick. This soil is medium acid to slightly acid throughout the profile. It dehydrates irreversibly into fine gravel-size aggregates. Permeability is rapid, runoff is slow, and the erosion hazard is slight. Roots can penetrate to a depth of 5 feet or more. This soil is used mostly for pasture and woodland. At the time of the survey (1972), a small acreage at the lowest elevation was used for sugarcane. These soils are in capability Class IV.

Honokaa Silty Clay Loam, Low Elevation, 10–20% slopes (HsD) constitutes approximately 28 acres or roughly 1.6 percent of the Kapulena Lands. This soil is similar to Honokaa silty clay loam 10 to 20 percent slopes, except that it occurs at a lower elevation where the soil temperature is warmer. This soil was historically used mainly for sugarcane. Small areas are used for pasture and macadamia nuts. These soils are in Capability Class IV.

Honokaa Silty Clay Loam, slopes Low Elevation, 20–35% (HsE) constitutes approximately 255 acres or roughly 15 percent of the Kapulena Lands. A band of this soil type runs the length of the site between the 1600 foot and 1700 ground elevation level. This soil is similar to Honokaa silty clay loam 10 to 20 percent slopes, except that it is steep and occurs at a lower

elevation where the soil temperature is warmer. Runoff is medium, and the erosion hazard is moderate. This soil was used mostly for sugarcane. Small areas are used for pasture and macadamia nuts. These soils are in Capability Class VI.

Kukaiau Silty Clay Loam, KuD (12-20% slopes) constitutes approximately 752 acres, or roughly 43 percent of the Kapulena Lands. At the site, it is found between the 1000 foot and 1600 foot ground elevations.

The Kukaiau series consists of well-drained silty clay loams that formed in volcanic ash. These soils are gently sloping to steep. They are on uplands at an elevation ranging from 500 to 1,500 feet and receive from 70 to 100 inches of rainfall annually. Their mean annual soil temperature is between 67° and 69° F. The natural vegetation consists of hilograss, kaimi clover, guava, and 'ōhi'a. These soils and Honokaa, Ookala, and Paauhau soils are in the same general area.

Historically, Kukaiau soils were used mostly for sugarcane. Small areas are used for truck crops, macadamia nuts, and pasture.

This soil is low on the windward side of Mauna Kea. It is dissected by many, deep, narrow gulches. In a representative profile the surface layer is very dark grayish-brown silty clay loam about 10 inches thick. The subsoil is dark-brown silty clay loam about 40 inches thick. It is underlain by basalt. The surface layer is extremely acid, and the subsoil is medium to slightly acid. This soil dehydrates irreversibly into aggregates the size of fine sand. Runoff is medium and the erosion hazard is moderate.

This soil was used mainly for sugarcane. Small areas are used for macadamia nuts and pasture. (Capability subclass IVe, nonirrigated; sugarcane group 3; pasture group 7; woodland group 5)

Kukaiau Silty Clay Loam, KuE (20-35% slopes) constitutes approximately 127 or roughly 7 percent of the Kapulena Lands. This soil is similar to Kukaiau silty clay loam, 6 to 12 percent slopes, except for the steeper slopes. Runoff is rapid, and the erosion hazard is severe. Included in mapping are small areas in drainageways that have very steep slopes. This soil was historically used mostly for sugarcane. Small areas are used for pasture. (Capability subclass VIe, nonirrigated; sugarcane group 3; pasture group 7; woodland group 5)

Paauhau Silty Clay Loam, PaD (12-20% slopes) constitutes approximately 2 acres, less than one percent of the Kapulena Lands. The Paauhau series consists of well-drained silty clay loams that formed in volcanic ash. These soils are gently sloping to steep. They are in coastal areas on Mauna Kea at an elevation ranging from near sea level to 1,000 feet and receive from 60 to 80 inches of rainfall annually. Their mean annual soil temperature is between 72° and 74° F. The natural vegetation consists of bermudagrass, hilograss, kaimi clover, and carpetgrass. These soils and Kukaiau and Ookala soils are in the same general area. Paauhau soils are used mostly for sugarcane. Small acreages are used for truck crops and pasture. This soil is low on the windward side of Mauna Kea. The dominant slope is 15 percent. In a representative profile the surface layer is very dark grayish-brown silty clay loam about 10 inches thick. The subsoil is dark-brown silty clay loam about 34 inches thick. The substratum is weathering, basic igneous rock. This soil dehydrates irreversibly into fine sand-size aggregates. It is strongly acid in the surface layer and medium acid to slightly acid in the subsoil. Permeability is moderately rapid, runoff is medium, and the erosion hazard is moderate. Roots can penetrate to a depth of 3 feet or more. The available water capacity is 1.8 inches per foot of soil. This soil was historically used mostly for

sugarcane. Small acreages are used for pasture and truck crops. (Capability subclass IVe, irrigated, and IVe, nonirrigated; sugarcane group 1; pasture group 7; woodland group 5)

Paauhau Silty Clay Loam, PaE (20-35% slopes) also constitutes approximately less than one percent of the Kapulena Lands, occupying approximately 10 acres at the site's lowest elevations. This soil is similar to Paauhau silty clay loam, 12 to 20 percent slopes, except that it is steeper. Runoff is rapid, and the erosion hazard is severe. Historically, this soil was used for sugarcane. Small acreages are used for pasture. (Capability subclass VIe, irrigated, and VIe, nonirrigated; sugarcane group 1; pasture group 7; woodland group 5)

Rough broken land, (RB) constitutes approximately 248 acres, or roughly 14 percent of the Kapulena Lands and is found along most of the site's gulches. Rough broken land is a miscellaneous land type that consists of very steep, precipitous land broken by many intermittent drainage channels. It occurs primarily in gulches, and the slope is dominantly 35 to 70 percent. The soil material ranges from very shallow to deep. Stones and rock outcrops are common in some areas. Elevation ranges from near sea level to 3,000 feet, and the annual rainfall ranges from 50 inches to more than 150 inches. Vegetation varies with rainfall. Kukui trees are common in the gulches. There are a few, scattered waterfalls. Rough broken land is used for pasture, woodland, wildlife habitat, and recreation areas. Adapted pasture plants and yields are similar to those for soils associated with this land type. These soils are in Capability Class VII.

Soil capability grouping shows, in a general way, the suitability of soils for most kinds of field crops. Soils are classed from I to VIII, with Capability Class I being the best suited for agriculture and Class VIII being the least suited. As described above the Kapulena site is comprised of soils in Classes IV, VI, and VII.

- Class IV soils have very severe limitations that reduce the choice of plants, require very careful management, or both.
- Class VI soils have severe limitations that make them generally unsuited to cultivation and limit their use largely to pasture or range, woodland, or wildlife.
- Class VII soils have very severe limitations that make them generally unsuited to cultivation and restrict their use largely to pasture or range, woodland, or wildlife.

Capability subclasses, which are designated by adding a letter after the roman numeral, indicate the main limitation risk. For example, Paauhau Silty Clay Loam and Kukaiau Silty Clay Loam are classed as IVe, VIe, indicating that the main limitation risk is from erosion, unless close growing vegetative cover is maintained.

3.4.2 Land Study Bureau Soil Rating

The *Detailed Land Classification, Island of Hawai'i* (Baker et al. 1965) classifies non-urban areas based on a five-class rating system for agricultural productivity using the letters A, B, C, D, and E. Under this system, A represents the highest class of productivity and E the lowest. The Pa'auilo Lands comprise lands rated B, C, D and E (Figure 9, Detailed Land Classification).

The site contains lands rated C, D and E. "C" or "fair" lands are associated with the lower elevation portions of the site which are primarily comprised of Kukaiau Silty Clay Loam, 12-20% slopes. "D" or poor lands roughly correspond with areas of Honokaa Silty Clay Loam 20-

35% slopes and Honokaa Silty Clay Loam 10-20% slopes soils located at the site's higher elevations. The land rated E, or of the very lowest productivity are associated with the gulches that cross the site.

3.4.3 Agricultural Lands of Importance

The ALISH system classifies four types of land: Prime Lands, Unique Lands, Unclassified, and Other Lands (State of Hawai'i 1977). See Figure 10, Agricultural Lands of Importance.

Prime Agricultural Land is land best suited for the production of food, feed, forage, and fiber crops. When treated and managed, including water management, and according to modern farming methods, the land has the soil quality, growing season, and moisture supply needed to economically produce sustained high yields of crops (State of Hawai'i 1977).

Other Agriculture Land is land other than Prime or Unique Agricultural Land that is also of statewide or local importance for the production of food, feed, fiber, and forage crops. The lands in this classification are important to agriculture in Hawai'i yet exhibit properties, such as seasonal wetness, erosion, limited rooting zone, slope, flooding, or drought, which exclude the lands from the Prime or Unique Agricultural Land classifications. By applying greater inputs of fertilizer and other soil amendments, providing drainage improvements, implementing erosion control practices, and providing flood protection, these lands can be farmed satisfactorily and produce fair to good crop yields (State of Hawai'i 1977).

The Kapulena Lands includes areas of Prime Lands. These lands are associated with the lower elevations of the site that are comprised of Kukaiau Silty Clay Loam, 12-20% slopes and are rated "C" by the Detailed Land Classification (both previously discussed). The higher elevation lands on the site are unclassified by the ALISH system. These unclassified areas roughly correspond with the soil types Honokaa Silty Clay Loam 20-35% slopes and Honokaa Silty Clay Loam 10-20% slopes and are rated E by the Detailed Land Classification. Land within the gulches are also unclassified by the ALISH system. Areas of the site classified as "Other" by the ALISH system roughly correspond with the Kukaiau Silty Clay Loam 20-35% slopes soil type which are scattered throughout the site.

Potential Impacts and Mitigation Measures

To mitigate soil erosion from agricultural practices, the County is developing a conservation plan for review and approval by the Natural Resource Conservation Service (NRCS). All agricultural lessees or permittees using the site will be subject to this plan.



Kapule Roads Natural Resources Conservation Service Soil Classification



Source:Natural Resources Conservation Service Disclaimer: This graphic has been prepared for general planning purposes only.

Figure 9, Detailed Land Classification





Figure 10, Agricultural Lands of Importance

Prime ALISH Other ALISH Unclassified

Source: State of Hawai'i Dept of Agriculture (1977) Disclaimer: This graphic has been prepared for general planning purposes only.



3.5 GROUNDWATER RESOURCES AND HYDROLOGY

Kapulena sits atop the Honoka'a system, which is a component of the East Mauna Kea Aquifer. The Honoka'a system has a sustainable yield of approximately 31 million gallons per day (Hawai'i DLNR). The Kukuihaele County water system main is located makai of the site along Highway 240 but would require a connecting line over private property and pumping up to the site. There is a line from the Waimea Water system serving the Boy Scout Camp mauka of the site that could serve the site by gravity flow, but would require crossing over private property (see Figure 11, Aquifers and County Water Systems).

Potential Impacts and Mitigation Measures

No farm dwellings are contemplated or will be permitted. The likely irrigation sources include pumping from the Lower Hāmākua Ditch or water catchments. Deep well drilling to tap groundwater may not be cost-effective, and would be subject to Water Commission well permits when proposed. The proposed educational facilities will likely rely on water catchments. Any proposals requiring offsite improvements for the Lower Hāmākua Ditch or connection to the County water system would be assessed separately from this EA. If subdivision is required for leasing or other purposes, the pre-existing lots described in section 1.3 enable a consolidation and resubdivision into 32 lots without having to meet County road and water standards.



Figure 11, Aquifers and County Water Systems

3.6 NATURAL HAZARDS

Natural hazards that could impact the property include earthquakes, volcanic eruptions, hurricanes, and flooding. The island of Hawai'i is associated with volcanic eruption and earthquakes. The U.S. Geological Survey (USGS) has developed lava-flow hazard zones with a numerical rating of 1 to 9, with 1 having the greatest risk. The site is within Lava-Flow Hazard Zone 8, which indicates that only a few percent of this area has been covered by lava in the past 10,000 years (USGS, 1992).

The State of Hawai'i has been affected twice in the past two decades by devastating hurricanes – Hurricane 'Iwa, in 1982, and Hurricane 'Iniki in 1992. The most recent series of earthquakes, with magnitudes of 6.7 and 6.0, occurred at Kīholo Bay on October 15, 2006. While it is difficult to predict these natural occurrences, it is reasonable to assume that future events could occur.

The project area, as the rest of the island and state, is vulnerable to the destructive winds and torrential rains associated with hurricanes. Honoka'a High School, located approximately 5 miles east of the project site, is a designated Emergency Evacuation Center for the area (State Civil Defense, 2007).

According to the Flood Insurance Rate Map (FIRM), the project site is designated as Zone X, outside of the 500-year floodplain (see Figure 7). The site is located approximately a mile from the shoreline and is outside of the tsunami evacuation area.

Potential Impacts and Mitigation Measures

The proposed agricultural park is not expected to exacerbate any risks or exposure to hazardous conditions.

3.7 FLORA

A botanical survey of the site was conducted between September 28 and October 1, 2009 with the objectives to document plant species on the property; document the status and abundance of each species; determine the presence or likely occurrence of any native flora, particularly an that are Federally listed as Threatened or Endangered; and, determine if the project area contains any special habitats which if lost or altered might result in a significant negative impact on the flora in this part of the island. The Botanical Survey Report was incorporated into a Flora and Fauna Study Assessment and is attached as Appendix B.

Most of the site (approximately 90% of the land area) is dominated by two plant species, Guinea grass and common ironwood. These plants have rapidly colonized the former cane fields since they went out of agricultural production 15 years ago. The report describes the Guinea grass as "nearly impenetrable" and the ironwood trees as, "dense, 30 - 50 foot tall stands". However, other plant species were identified on the site, primarily surviving in the many gulches which dissect the property. During the survey, 21 native species were identified, including nine species that are endemic to Hawai'i. Those native and endemic plants that were identified are relatively common and none are listed as rare. Other non-native plant species found on site are of no

special conservation interest or concern. A complete list of recorded plants is included with the Flora and Fauna Assessment (Appendix B).

The Botanical Survey Report findings indicated that the entire site showed signs of pig rooting. The Report found that, "this was especially true in the gulches where every square foot appeared to be heavily rooted. This rooting had the twin effects of severely limiting the diversity of the more delicate native understory species, while at the same time aiding the spread of aggressive, shade-tolerant weeds such as the strawberry guava."

Potential Impacts and Mitigation Measures

No plant species listed or proposed as Threatened or Endangered by the U.S. Fish and Wildlife Service or the Hawai'i State Department of Land and Natural Resources were found. The property has been heavily altered by sugar cane cultivation, and in the last 15 years has been degraded by invasive plant species and feral pigs. The Botanical Survey Report recommends that any future uses in the area consider the protection and enhancement of the best examples of remnant strips of native forest in the property's gulches.

3.8 FAUNA

A Fauna Survey was conducted in conjunction with the Botanical Survey. The Fauna Survey is found in Appendix B, Flora and Fauna Survey and Assessment. Nine site visits were conducted, including four during the evening to detect occurrence of the Hawaiian hoary bat ('ōpe'ape'a, *Lasiurus cinereus semotus*).

A single 'ope'ape'a was sighted near the site's rock quarry (approximately 1,600 foot ground elevation). The report indicates that the 'ope'ape'a is a common and highly mobile species and that it is likely that more of this species would be detected at a different time on the property. Feral pig (*Sus Scrofa*) was found to be abundant and a few mongoose were sighted. The report indicates that while not sighted, feral cats (*felis catus*), rats (*Rattus spp.*) and mice (*Mus domesticus*), are also likely present on site.

In general, the report finds that due to the overwhelming colonization of Guinea grass and ironwood trees, bird life was relatively sparse in both diversity and number. Although native and endemic birds such as the Hawaiian Hawk ('io, *Buteo solitarius*) and Hawaiian owl (pueo, *Asio flammeus sandwichensis*) were specifically looked for, none were sighted. While not sighted, the 'io and pueo are known to be found in the Hāmākua district and could be expected to occasionally use this site. Additionally, no native seabirds such as the threatened Newell's shearwater (*Puffinus auricularis newellii*) or the Endangered petrel (*Pterodronma sandwichensis*) were found, nor were any shearwater burrows found. A complete list of the ten, non-native bird species that were sighted is included with the Flora and Fauna Survey (Appendix B).

The Fauna Survey also looked for insects which have been listed as Federally Endangered such as Blackburn's sphinx moth (*Manduca blackburni*) and three endemic picture-wing flies (*Drosophila heteroneura*), (*D. mulli*) and *D. ochrobasis*). None of these insects or their larvae were observed, nor were any of the host plant species normally associated with these insects found on site.
The Fauna Survey concludes that due to the low quality of habitat characterized by the dominance of Guinea grass and common ironwood, there is little to attract a diversity of mammal and bird species. The only species that is common throughout the property is the feral pig and the site's dense vegetation makes it difficult for hunters to be effective at controlling the population.

Comments to the Draft Environmental Assessment from the US Fish and Wildlife Service (FWS) advise that both the Hawaiian hoary bat and the Hawaiian hawk (Buteo solitaries) have been observed in the vicinity of the project. The FWS comments also indicate that Hawaiian geese have been known to be attracted to water catchments or reservoirs.

Potential Impacts and Mitigation Measures

Due to the degraded habitat, the Fauna Survey Report does not recommend any special measures be taken. However, at the suggestion of the US Fish and Wildlife Service letter dated February 9, 2011 (see Appendix F), the following mitigation measures will be implemented:

- 1. To avoid impacts to Hawaiian hoary bats during the bat-pupping and rearing season, woody plants greater than 15 feet tall will not be removed between May 15 and August 15.
- 2. To avoid impacts to Hawaiian hawks during the nesting season, brush or tree clearing and use of heavy equipment will be avoided during the months of March through September. If brush or tree clearing, or use of heavy equipment must occur during these months, the County will contact your office before commencing a survey for nests.
- 3. If water sources are developed that involve a reservoir or catchment system, agricultural park managers and lessees will be made aware of the potential for attracting Hawaiian geese. If geese are attracted to the water storage facilities, your office will be contacted for guidance related to goose management.

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4.0 ASSESSMENT OF THE HUMAN ENVIRONMENT, POTENTIAL IMPACTS AND MITIGATION MEASURES

This chapter provides background information on the existing human environment of the proposed project area. Subject areas addressed include archaeology, historic resources, culture, noise, air quality, visual environment, population and housing, community character, and economic environment. This chapter also addresses the potential impacts of the proposed agricultural park and identifies appropriate mitigation measures to minimize the identified short-term and long-term impacts.

4.1 ARCHAEOLOGICAL AND HISTORIC RESOURCES

An Archaeological Inventory Survey (AIS) of the site was conducted in 2009, to "identify and evaluate historical properties pursuant to state cultural resources management regulations" (SCS 2010). Seventeen sites comprised of 28 features were recorded during the AIS (Appendix C). Four of the sites were rock shelters used intermittently for temporary habitation during the pre-Contact Era. One site was a disturbed multi-tier platform that might be the remains of a heiau know to have existed in Kapulena Ahupua'a. The majority of features were rock mounds, terraces, rock walls and drainage ditches associated with Historic Era sugarcane cultivation.

Inventory field work included: a pedestrian survey of the entire site; plotting located sites on a project area map with Global Positioning System (GPS); individual site mapping and recording; and hand excavations. Some sites were selected for test excavation to determine site characteristics including site function, construction method, and temporal placement. Two types of hand excavation, Test Units (TU) and Stratigraphic Trenches (ST) were utilized depending on the size of features and desired percentage to be excavated, desired percentage of screening and overall goals of excavation. The archival component of the survey included database, library and report research into the history of the area as well as searches for archaeological studies of the site and immediately surrounding area.

There is limited prehistoric information pertaining to the area as the site is located in what was traditionally a sparsely populated area with poor access to marine resources and population centers of Waipi'o Valley, Hilo and Waimea. The project area is not at the nexus of a trail system, as much of the cross-inland travel was conducted on trails that crossed the saddle between Mauna Kea, Mauna Loa and Huālalai.

In published moʻolelo, Kapulena is named for the king shark of Hāmākua. Waikoloa, a gulch that runs through the ahupua'a is named for a wind and is literally translated as, "water pulling far". Another stream in the ahupua'a, Wai'ale'ale is literally translated as, "rippling or overflowing water".

Early historic accounts of the area include the travels of Reverends William Ellis and Asa Thurston on their way to Waipi'o in 1823. They met a small group of people at Malanahae and continued on to Kapulena where they preached to an assembly of about one hundred people. They observed that the path from Kapulena to Waipi'o was crooked and bordered on both sides by tall grass and well-cultivated "plantations".

Isabella Bird also traveled through the area in 1872. She noted the rough and steep trails on her journey from Hilo to Waipi'o. Bird also describes the sugar plantation at Kaiwiaki (Onomea Plantation). At the time of her journey, the Hamakua Mill Company and Pacific Sugar Mill Company had not yet been established.

Between 1869 and 1880, seven sugar companies were established along the Hāmākua coast. The Pacific Sugar Mill Company, established in 1878 in Kukuihaele maintained cultivated sugar cane fields in the project area. The AIS includes information from the University of Hawai'i's Hawaiian Sugar Planters' Association Plantation Archives about the Pacific Sugar Mill Company, documenting that the plantation extended along the coast for four miles and up the mountains from two to nine miles. The elevation ranged from 300 to 1,900 feet giving a variety of growing conditions. Pacific Sugar Mill has the distinction of introducing the mongoose into Hawai'i. The plantation had cattle and was unique for its many head of sheep. Free mutton was given to employees along with housing and healthcare. The plantation did not prosper due to mis-management and in 1913 it was decided to close the mill and merge with Honokaa Sugar Mill Company. In 1916 the mill equipment was sold. The Honokaa sugar mill grew to encompass more than 9,000 acres. It had an extensive flume system to carry the cane to railroad cars and eventually to the mill. Bagged sugar was transported by a tramway from the mill to a warehouse at the boat landing. Wire cable conveyed the bagged sugar from the warehouse to steamships. By this method Honokaa Sugar Company was able to ship raw sugar directly to the US mainland, bypassing Honolulu. The Honokaa Sugar Company eventually operated as the Hamakua Sugar Company which was in operation until October, 1994.

The AIS also documents previous archaeological investigations in the area, indicating that most studies focused on sites in Waipi'o Valley and that no studies have been conducted at the project site.

The Archaeological Inventory Survey Results recorded 17 sites comprised of 28 features (see Appendix C). Information recorded during the current study has adequately ascertained the timing and function of all features at all 16 sites. The majority of the sites are associated with Historic-era sugarcane field clearing. Four of the sites are associated with pre-Contact temporary habitation. Artifact recovered from the rock shelters were traditional basalt and volcanic-glass tool debitage and marine shell.

One site (SITE 28385 TS-5, Appendix C) is a possible heiau remnant from the pre-Contact era. The multi-tiered platform is located at the top of a mauka/makai oriented ridgeline at an elevation of 1,440 feet in Kapulena ahupua'a. The area surrounding the site is old sugarcane fields dominated by ironwood trees. There are several Christmas berry and guava trees growing on top of the platform. There is a sugarcane dirt road and ditch just west and north of the platform. The entire east and south sides of the platform have been truncated by bulldozer. The AIS speculates that it is possible that the remaining platform is only the west end or the northwest corner of a much larger structure. The northeast and southwest tiers have been altered by bulldozers pushing portions of the feature and loose rock from the surrounding fields into them. There is a length of one inch thick wire cable embedded in the soil and rock on the east side of the feature. The AIS speculates that the feature has been altered by sugarcane clearing activities and is in poor condition. However, based on the amount of labor that went into the multi-tier platform at this site and based on the construction style and are of the feature, it is possible that this is the remains of Pukioi'aka heiau. Evidence to support this hypothesis is the

lack of midden and habitation remains commonly recovered at habitation sites. The radiocarbon date recovered from test units (where burnt wood matter and charred materials were found) suggest a pre-Contact date for use of the platform.

Potential Impacts and Mitigation Measures

No further archaeology work is recommended for 16 of the 17 sites. Information recorded during the current study has adequately ascertained the timing and function of all features at all 16 sites. The sites are associated with Historic-era sugarcane field clearing and pre-Contact temporary habitation. Data recovery is recommended at the multi-tier platform at SITE 28385 to further refine the temporal association of the feature and to determine the platform's function. The platform has been badly impacted by sugarcane field clearing, only partially remains and is in poor condition. Only a small amount of charcoal was recovered from one test unit during subsurface testing. While a single radiocarbon sample returned a possible late pre-Contact Era to early post-Contact Era data range, additional radiocarbon samples are recommended to be obtained. It is possible based on a small amount of surface artifacts that the platform is a historic sugarcane structure built for loading or processing cane. However, the amount of labor expended to build the structure is uncommonly great compared to sugarcane features documented at other sugar plantation sites. Data recovery is recommended to answer these remaining research questions.

The agricultural park involves returning land to agricultural production. It is expected agricultural activities will resume on lands that were previously cleared and used for cultivation of sugar cane. However, care should be taken to avoid impacts to pre-Contact era temporary habitation sites (which are all located in close proximity to stream gulches, and unlikely to be cultivated). Additionally, special care should be taken to avoid any impacts to the pre-Contact era site that is possible remnants of a heiau. The site should not be cleared for land cultivation until additional archaeological testing is accomplished. Similarly, until additional archaeological testing is proposed for this area, the archaeological site should be protected by fencing. Proposed mitigation is avoidance of pre-Contact era temporary habitation sites and avoidance of the possible heiau site.

4.2 CULTURAL RESOURCES

A Cultural Impact Assessment (CIA) in conformance with Act 50 of the State of Hawai'i (2000) was conducted in order to identify and address effects of the proposed action on Hawai'i's culture as well as traditional and customary rights and is included as Appendix D to this report. Preparation of the CIA followed the guidelines provided by the Office of Environmental Quality in 1997. This included documenting methods for selection of informants and agencies interviewed: following ethnographic interview procedures; reviewing historical materials; and, an analysis of the potential effects of the proposal on cultural resources.

The CIA found that two Land Commission Awards were made within the project area. One half of Malanahae Ahupua'a was awarded to Simeona Luluhiwalani (LCA 4: B, R.P. 7825). Two 'apana (LCA 9971: A and B) in Waikoloa ahupua'a were awarded to William Pitt Leleihoku. There is no descriptive information given for Leleihoku's two 'apana in Waikoloa ahupua'a. Luluhiwalani states in his claim in Malanahae that his right to the land was acquired when:

Kamehameha II sailed to Kawaihae - this was Kaneuwaine [1819] - the land of the Ali`i was cut up there. Then the Ali`i gave Malanahae to Hikiau. Kaleimoku said "This land is for my kaikaina." Then the chiefs asked, "To whom?" To Keoua, he is a kaikaina of us all. Kaleimoku approved /saying/ "This is my very own kaikaina." Then the Ali`i gave this land to him absolutely. Keoua was with Keeumoku at this time. /The land was held/ from this time. At the time in which Kamehameha II sailed for England, in the night Keoua died, and the next day the Ali`i sailed for England. When he was alive, Keoua directly bequeathed all his lands to me. I am above, my makuahine is below /one the lands held/ from Hawaii to Oahu. These are the land which I hereby present /as claims/ at this time (Waihona 'Aina 2000).

The Pacific Sugar Mill Company was established in 1878 at Kukuihaele and cultivated sugar cane in fields within the current project area. The CIA includes information from the University of Hawai'i's Hawaiian Sugar Planters' Association Plantation Archives about the Pacific Sugar Mill Company, documenting that the plantation extended along the coast for four miles and up the mountains from two to nine miles. The elevation ranged from 300 to 1,900 feet giving a variety of growing conditions. Pacific Sugar Mill has the distinction of introducing the mongoose into Hawai'i. The plantation had cattle and was unique for the number of sheep. Free mutton was given to employees along with housing and healthcare. The plantation did not prosper due to mis-management and in 1913 it was decided to close the mill and merge with Honokaa Sugar Mill Company. In 1916 the mill equipment was sold. The Honokaa sugar mill grew to encompass more than 9,000 acres. It had an extensive flume system to care the cane to railroad cars and eventually to the mill. Bagged sugar was transported by a tramway from the mill to a warehouse at the boat landing. Wire cable conveyed the bagged sugar from the warehouse to steamships. By this method Honokaa Sugar Company was able to ship raw sugar directly to the US mainland, bypassing Honolulu. The Honokaa Sugar Company eventually operated as the Hamakua Sugar Company which was in operation until October, 1994.

Fourteen individuals who either worked for the Hamakua Sugar Company or live in the Hāmākua District and have knowledge of the lands of Kapulena were contacted for information for this report. Of the fourteen, twelve responded, and eight of those individuals had knowledge of the project area and provided information. None of the informants had knowledge of past or ongoing cultural practices on the project area.

One of the informants, Jim Thropp had detailed knowledge the project site. The CIA summarized the Jim Thropp interview:

Jim was born in Honolulu and grew up in Kāne'ohe. He was 75 years old at the time of this interview. He studied general agriculture at California Polytechnic State University where he was awarded a degree in general crops production. He worked at a sugar plantation on Kaua'i before being hired by the Hamakua Sugar Company. Jim was in charge of crop logging, tissue testing, and fertilizer application. He remembers that the soil on the study parcel are weak in calcium, nitrogen, and phosphorus. He also stated that the earthen ditches on the project area are contour ditches created to draw water off of the fields and into the gulches. These are part of a man-made drainage system to prevent sheet wash and flooding down-slope. Jim did not remember any traditional Hawaiian features on either of the parcels. He said that by the time he was there, the company was using machinery to work the fields and harvest the crops. That

meant that all rock was removed from the fields and pushed into the gulches to prevent the rock from fouling or damaging the machinery. He remembers that there were some large ulu trees in some of the gulches. Jim did not know of any cultural practices that might have been conducted during his time working for the plantation company.

Other persons with long-standing connections to Hāmākua were interviewed and summaries of their interviews follow:

Paul Nalani Kaholoa'a is from a family that was established in the Waipi'o and Honoka'ia since pre-Contact times. One of Paul's ancestors was awarded a Land commission award (LCA 7116) in Honoka'ia in 1848. The award included a house lot with two houses, and nine mala (garden) of vegetables, one mala of mamaki, and two mala of bananas. Paul grew up hunting with his father Jackie and his uncles. They hunted pig on property within the project area, as well as in Waipi'o Valley and Waimanu Valley. Paul is not aware of any ongoing cultural practices or plant collecting on lands within the project area.

Leon J. No'eau Peralto is from a family that has long-standing connections to the lands of Kūka'iau and Koholālele Ahupua'a, Hāmākua District. He has made an exhaustive study of the historical documentation pertaining to this region, and is familiar with the wahi pana and local mo'olelo of these lands. He is also active in ongoing cultural matters that impact the Hāmākua community. Mr. Peralto is not aware of any ongoing cultural practices or plant collecting on lands within the project area.

Gilbert Bailado is from a family that has long-standing connections to the Hāmākua region. He is active in ongoing cultural matters that impact the Hāmākua community. He has also made a study of historic property boundaries, ahupua'a boundaries, LCA boundaries, and historic trail locations. He has worked with Rick Gmerkin, the Ala Kahakai National Historic Trail Association Director. Both were interviewed for the current CIA and are not aware of any historic trails or cultural practices or plant collecting on lands within the project area.

As suggested in the "Guidelines for Assessing Cultural Impacts" (OEQC 1997), CIAs incorporating personal interviews should include ethnographic and oral history interview procedures, circumstances attending the interviews, as well as the results of this consultation. It is also permissible to include organizations with individuals familiar with cultural practices and features associated with the project area.

Consultation was sought from the Director of Native Rights, Land and Culture, Office of Hawaiian Affairs on O'ahu; the Hawai'i branch of the Office of Hawaiian Affairs; the Kuakini Civic Club; and the Kona Hawaiian Civic Club. Except for OHA acknowledging the receipt of our letter, none of the organizations responded with information concerning the potential for cultural resources to occur in the project area, or with additional suggestions for further contacts.

Based on organizational response as well as archival research, it is reasonable to conclude that, pursuant to Act 50, the exercise of native Hawaiian rights, or any ethnic group, related to gathering, access or other customary activities will not be affected by development activities on this parcel.

Potential Impacts and Mitigation Measures

Because there were no cultural activities identified within the project area, there are no adverse effects anticipated by the CIA. Further, the former mauka-makai cane haul roads have been heavily overgrown with Guinea grass indicating that the roads have been unused or infrequently used for any activity. However, subsistence hunting is known to be practiced throughout mauka areas of Hāmākua. The agricultural park plan includes fencing of the paved, former cane haul road to protect the public's safety from entering active cattle paddocks. In order to minimize access impacts, two former cane haul roads connecting the Waipi'o-Honoka'a Road and the quarry access road have been cleared of Guinea grass. It is expected that at least one of these roads will remain open, providing access for project use and cultural practitioners alike.

4.3 NOISE

Currently, the project site is vacant, wooded land. No significant noise is generated on site, and ambient noise in the area emanates from wind, wildlife, and the infrequent traffic along the various access roads in the project vicinity. There are no existing dwellings near the site.

Potential Impacts and Mitigation Measures

Since no farm dwellings will be permitted on the site, there will be no noise concerns to onsite. Noise from agricultural activities on the site should not impact any offsite dwellings due to the distance between residents in this sparsely populated area.

4.4 AIR QUALITY

Air quality in Hawai'i is among the best in the nation, and criteria pollutant levels remain well below state and federal ambient air quality standards. The State Department of Health, Clean Air Branch monitors the ambient air in Hawai'i and has established a statewide system of monitoring stations whose primary purpose is ensuring that air quality standards are met. Hawai'i Island is regularly affected by emissions from Mount Kilauea, or VOG. Due to the prevailing northeast winds, the site is less likely to be affected by VOG than sites on the south or Kona coasts. However, Kona winds can circulate VOG up the Hāmākua Coast in the site's vicinity.

Generally, air quality is affected by regional and local climate together with the amount and type of human activity in any given location. Federal and state ambient air quality standards have been established to regulate six parameters: particulate matter, sulfur dioxide, nitrogen dioxide, carbon monoxide, ozone, and lead. No state or county air-quality monitoring stations exist in the vicinity of the site.

Air quality in the vicinity of the site may be affected by pollutants from widely dispersed agricultural sources, such as concentrations of cattle and fugitive mists from infrequent spraying for agricultural pests. Other sources are emissions from occasional vehicular traffic on area roads and from farm machinery.

Potential Impacts and Mitigation Measures

There are no large, stationary sources of air pollutants and no major industries that would contribute to air pollution within, or in the vicinity of, the project area. The proposed agricultural activities will generate dust that is expected and acceptable for such activities.

4.5 VISUAL RESOURCES AND OPEN SPACE

The natural beauty of Hawai'i is universally recognized and considered to be a significant and valuable asset. Various portions of the site offer spectacular views of the ocean, the upper slopes and summit of Mauna Kea, and the richly vegetated, broad lower slopes descending to the coast. In some *mauka* areas, near boundaries with private land and the Hāmākua Forest Reserve, there are views of native forest containing koa and 'ōhi'a trees.

The Kapulena Lands themselves are not listed in the *General Plan* as examples of natural beauty. Current agricultural zoning would preserve the current open space character of the lands.

Potential Impacts and Mitigation Measures

Should agricultural structures be constructed, the heights are limited to 45-feet. The height limit ensures that visual resources will not be greatly affected should structures be constructed. Additionally, a return to agricultural use could mean removal of ironwood trees which have come to dominate the site's vegetation. Tree removal could serve to provide greater visual access to the coastline or mauka to Mauna Kea.

4.6 SOCIO-ECONOMIC CHARACTERISTICS

4.6.1 Community Profile

At the time of the 2000 U.S. census, Hawai'i County's population was 148,677, having grown from 120,317 in 1990. At same time, 2,233 people lived in the nearest Census Designated Place (CDP), Honoka'a down from 2,307 in 1990 (DBEDT 2006).

In general, the population of the Honoka'a CDP is slightly older than Hawai'i County as a whole, and has a racial mix that is significantly less Caucasian and significantly more Asian. Households in the CDP roughly correspond with household types with the exception of having a greater percentage of householders over 65 years old living alone. The CDP has a higher instance of occupied housing units than Hawai'i County as a whole. Median household income is also slightly higher than the County as a whole.

Subject	Honoka'a CDP		Hawai'i County	
Subject	Number	Percent	Number	Percent
Total Population	2,233	100	148,677	100.0
AGE				
Under 5 years	142	6.4	9,130	6.1
5 – 19 years	475	21.2	33,690	22.7
20 – 64 years	1,134	50.8	85,738	57.6
65 years and over	482	21.5	20,119	13.5
Median Age (years)	40.2	_	38.6	_
RACE (alone or in combination with one or more)				
White	990	44.3	77,477	52.1
Black or African American	7	.3	1,789	1.2
American Indian and Alaska Native	24	1.1	4,847	3.3
Asian	1,444	64.7	70,921	47.7
Native Hawaiian and other Pacific Islander	490	21.9	46,111	31.0
Other	90	4.0	7,271	4.9
HOUSEHOLD (by type)				
Total Households	761	100.0	52,985	100.0
Family Households (families)	564	74.1	36,903	69.6
With own children under 18 years	222	29.2	17,072	32.2
Married-couple family	412	54.1	26,828	50.6
With own children under 18 years	148	19.4	11,302	21.3
Female householder, no husband present	110	14.5	7,000	13.2
With own children under 18 years	52	6.8	4,095	7.7
Non-families	197	25.9	16,082	30.4
Living alone	176	23.1	12,240	23.1
65 years and over	107	14.1	4,214	8.0
Average persons per household	2.88		2.75	
HOUSING OCCUPANCY AND TENURE				
Total Housing Units	835	100.0	62,674	100.0
Occupied units	761	91.1	52,985	84.5
By owner	499	65.6	34,175	64.5
By renter	262	34.4	18,810	35.5
Vacant units	74	8.9	9,689	15.5
INCOME IN 1999				
Median household income	\$41,964	—	\$39,805	—

Table 2. Demographic Characteristics: 2000

Source: DBEDT 2006.

Potential Impacts and Mitigation Measures

The agricultural park is not expected to immediately affect the demographics of the area. The use is anticipated to help contribute to the long term viability of agriculture in the region, positively affecting Hāmākua's population and family incomes. No mitigation measures are planned.

4.6.2 Housing

There are currently no homes on the site. The homes that exist near the project site are dispersed on large agricultural lots. A more dense concentration of housing exists along Honoka'a-Waipi'o Road.

Potential Impacts and Mitigation Measures

Although an increase in agricultural activity would be beneficial, the lack of water and infrastructure will probably limit the intensity of such agricultural uses and it is assumed that any need for housing will be reasonably accommodated by existing housing in the area. Based on the foregoing, no adverse impacts to housing are expected, and no mitigation measures are planned.

4.6.3 The Economy and Employment

The Hawai'i County General Plan (County of Hawai'i 2005a) discusses the economy of the Hāmākua District, of which the Kapulena Lands are a part. Despite the closing of Hāmākua Sugar in 1994, the population of the Hāmākua region has grown moderately, primarily due to the development of major resorts in the neighboring district of Kohala. The economy has come to depend on cattle, macadamia nuts, and diversified agriculture. There are numerous cattle ranches in Hāmākua and several varieties of crops are grown in addition to macadamia nuts. Investments in the timber industry have also been made in Hāmākua, including a large eucalyptus plantation and a community-based forestry imitative at 'O'ōkala.

Crops grown in the Hāmākua area are taro, watermelon, tomatoes, ginger, kava, coffee, sweet potato and other vegetables. Manufacturing in the area is limited to processing agricultural crops, although there is a 60-megawatt co-generation power plant at Haina that still has the potential to encourage other manufacturing activities (County of Hawai'i 2005a).

The Hāmākua District also encompasses the astrological facilities at Mauna Kea. According to the Hawai'i General Plan, astronomy has contributed over \$619,000,000 to the State's economy and employs 270 permanent positions. These numbers are expected to increase should the Thirty-Meter Telescope (TMT) proposed by a consortium of universities, receive entitlements and be constructed (Hawaii Tribune Herald, 2009).

Subject	Honoka'a CDP		Hawai'i County	
Subject	Number	Percent	Number	Percent
Population 16 years and older	1,766	100	114,647	100.0
In labor force	1,001	56.7	70,791	61.7
Employed Civilian Population	942	100	64,797	100
Service Occupations	350	37.2	14,403	22.2
Management and Professional Occupations	193	20.5	19,607	30.2
Sales and Office Occupations	180	19.1	16,309	25.1
Farming, Fishing and Forestry Occupations	31	3.3	2,449	3.8
Construction, Extraction and Maintenance Occupations	94	10.0	6,454	9.9
Production, Transportation and Material Moving Occupations	94	10.0	5,757	8.9
Median household income	\$41,964	—	\$39,805	

Table 3. Employment Status

Of the residents aged 16 years or older recorded for Honoka'a CDP in the 2000 census, approximately 57 percent were in the labor force (DBEDT 2005). Of the employed civilian population over the age of 16, 37.2 percent worked in service occupations, 20.5 percent in management and professional occupations and 19.1 percent in sales and office occupations. Smaller numbers worked in production, transportation, and materials moving (10 percent); construction (10 percent); and in farming, fishing and forestry (3.3 percent).

Median household income was \$41,964 for the Honoka'a CDP. This compares with a median income of \$39,805 for Hawai'i County and \$49,820 for the state (DBEDT 2005).

For the year 2009, the Hawai'i County unemployment rate was reported to be 10.3 percent in August, with a statewide unemployment rate of 7.2 percent for the same month. Thus, the employment status of those in Kapulena and surrounding areas may have been affected by the recent economic downturn.

Potential Impacts and Mitigation Measures

The future potential agricultural use of the lands can only enhance the agricultural economic base of the Hāmākua area. The potential increase in agricultural activity would likely create long term agricultural related jobs.

In light of the economic impact of the closing of Hāmākua Sugar, returning the site to agricultural use consistent with its agricultural zoning would benefit the local economy.

5.0 ASSESSMENT OF THE EXISTING INFRASTRUCTURE AND PUBLIC SERVICES, AND POTENTIAL IMPACTS AND MITIGATION MEASURES

This chapter discusses the existing infrastructure of the project area and the proposed infrastructure improvements. Mitigation measures have also been identified to address potential impacts.

5.1 TRANSPORTATION FACILITIES

Existing Roadways. The site is accessed by private roads from the Honoka'a-Waipi'o Road (Highway 240). Honoka'a-Waipi'o Road is a two lane road with a paved shoulder of varying width. It serves as the primary access to Waipi'o Valley. Traffic includes local vehicles, 4-wheel drive tour operators and rented automobiles that are driven by visitors to the Waipi'o lookout, turn-around and return south through Honoka'a. The primary access to the Kapulena Lands from the Honoka'a-Waipi'o Road is by "Quarry Road", a paved former cane road maintained by the County. The portion of this road not on County-owned lands is privately owned by Kamehameha Schools (TMK 4-6-5:001 and 4-6-4:007). The County recently obtained an easement from Kamehameha Schools to establish legal rights to use this road through Kamehameha Schools' property. The portion of the easement that is not a subdivided roadway lot is defined by metes and bounds. This cane road connects to Mud Lane, an unimproved government road. The County obtained easements from Kamehameha Schools and another private owner, Mauka-Makai Corp., to enable access to Mud Lane. Other former cane haul roads on-site that once provided mauka-makai access are heavily overgrown with Guinea grass and appear to be unused or infrequently used for any activity.

Potential Impacts and Mitigation Measures

The proposed agricultural park may cause traffic to increase slightly on roads that access the properties to manage the land. Impacts are not, however, expected to be significant. The County will maintain the primary access road to the site, as it presently does. The County has obtained easement rights for the portions of the main access road over private property to resolve any legal access questions. The agricultural park plan includes fencing of this road to protect the public's safety from entering active cattle paddocks. In order to minimize potential impacts associated with this reduction in access for hunters or other cultural practitioners, two former cane haul roads connecting the Waipi'o-Honoka'a Road and the quarry access road have been cleared of Guinea grass and are now more functional. It is expected that at least one of these roads will remain open, providing access for project use and cultural practitioners alike.

5.2 WATER SUPPLY FACILITIES

The Lower Hāmākua Ditch passes through the makai (north) portion of this site. The nearest County of Hawai'i Department of Water Supply domestic water facility is the Kukuihaele water system located approximately 3,200 feet from the southeast corner of TMK 4-7-006:018. The DWS has stated that they will not allow additional services until extensive water system improvements are made. Comments from the DWS dated February 8, 2011 (Appendix F) confirm that the Kukuihaele Water System does not have adequate capacity to support the project at this time.

Potential Impacts and Mitigation Measures

Installation of pumping equipment will be necessary to access water from the Lower Hāmākua Ditch for operations at the lower elevations. Water source development such as a well, reservoir or large-scale water catchment systems will likely be pursued to provide agricultural water at higher elevations. The DWS is not allowing new hookups for domestic service until extensive water improvements are made. There are no plans for any water improvements; therefore, any increased demand for water would need to be met through the use of rainwater-catchment stored in tanks or reservoirs.

5.3 WASTEWATER FACILITIES

There are no wastewater treatment facilities in the vicinity of the project site.

The site is located in a "non-Critical Wastewater Disposal Area (CWDA)". In non-critical areas, such as the site, cesspools are permitted as long as there are no wells within 1000'. The siting of any future wells for drinking purposes would be subject to the 1000' buffer from future cesspools on the site. See Figure 12, Critical Wastewater Disposal Area.

Potential Impacts and Mitigation Measures

The deep soils in the area would filter, absorb, or adsorb the cesspool leachate before reaching the groundwater table. The depth to the groundwater and the soils overlying the groundwater aquifer were the bases for the Department of Health's non-critical designation for cesspools in the area.

Figure 12, Critical Wastewater Disposal Area



5.4 DRAINAGE FACILITIES

There are no stormwater drainage facilities at the site or within the vicinity. Precipitation is absorbed by vegetation, infiltrates into site soils and surface flows to the many gulches that cross the site. Hāmākua Ditch runs roughly parallel to the site's north (makai) boundary.

Potential Impacts and Mitigation Measures

The proposed lease of the site is not expected to affect area drainage.

Depending on future land use after the land is leased, drainage improvements in compliance with the Hawai'i County Code, Chapter 10, Sections 25, Drainage and 26, Sediment Control may be required.

5.5 SOLID WASTE DISPOSAL FACILITIES

According to the *Update to the Integrated Solid Waste Management Plan for the County of Hawaii*, in 2002, the total amount of solid waste managed by the county system was approximately 160,000 tons (Harding ESE, 2002). The two landfills on the island are the South Hilo Landfill and the Pu'uanahulu Landfill. The estimated lifespan of the Pu'uanahulu Landfill, with a 15 percent diversion rate and receiving only West Hawai'i waste, is until the year 2049. If the Pu'uanahulu Landfill receives all of the county's waste, and if planned recycling and resource recovery efforts progress (potentially increasing the diversion rate to 45 percent), then the Pu'uanahulu Landfill has capacity until the year 2045. Additionally, the proposed waste reduction technology in East Hawai'i could potentially expand the Pu'uanahulu Landfill beyond the year 2049 (County of Hawai'i, 2004).

The nearest transfer station is at Honoka'a. The station accommodates household waste and offers recycling facilities. From the transfer station, solid waste is hauled to the County landfill at Pu'uanahulu. Green waste facilities are located at the Hilo and Kealakehe/Kailua Transfer stations.

Potential Impacts and Mitigation Measures

Green waste generated from the onsite agricultural activities will be composted onsite or used for energy generation.

5.6 ELECTRICAL FACILITIES

Power supplied by Hawaii Electric Light Company (HELCO) is available in the cane haul road corridor adjacent to TMK 4-7-006:018. The lines terminate short of TMK 4-7-006:020. HELCO facilities are also located along Honoka'a-Waipi'o Road. *Potential Impacts and Mitigation Measures*

Agricultural land uses and educational facilities associated with the Agricultural Park may require electricity service. Should electrical power be desired for the TMKs that are not adjacent to HELCO facilities, one option would be the extension of HELCO facilities and provision of

easements across private property. Other options would be the use of off-the-grid alternatives such as generators and photovoltaic devices.

5.7 EDUCATIONAL FACILITIES

Public Schools. The site is located in the Honoka'a Complex. The nearest elementary school is Honoka'a Elementary. The site is served by Honoka'a Intermediate and High School. Official enrollment count for the 2008-2009 school year was 357 total students at Honoka'a Elementary and 790 total students at Honoka'a Intermediate and High School.

Potential Impacts and Mitigation Measures

No impacts are anticipated since farm dwellings will not be allowed.

5.8 POLICE PROTECTION

The Kapulena area is served by the Honoka'a District Police Station, which is located approximately five miles from the site at 45-3400 Māmane Street, in Honoka'a. The Honoka'a police station has a staff of 13 Patrol Officers, one Community Police Officer, two Sergeants, one Police Operations Clerk and the District Captain.

Potential Impacts and Mitigation Measures

The proposed agricultural park will not directly introduce new residents to the project area and is not anticipated to increase demand for police services.

5.9 FIRE PROTECTION

Fire protective service and rescue services for the Hawai'i County are provided by the Hawai'i County Fire Department, which operates 20 regular fire stations and 22 volunteer fire stations. One fire station (at Pōhakuloa) is federally operated. The 20 regular fire stations and three of the volunteer stations (Laupāhoehoe, Pāhala, and Nā'ālehu) provide 24-hour fire protection and emergency medical services. Emergency medical ambulance services are contracted by the State Department of Health. Fire Department personnel provide basic and advanced life support. Emergency medical services account for 75 percent of all Fire Department incidences. All fire personnel who provide advanced and basic life support possess appropriate certification and licenses (Hawai'i County 2005). The nearest station to the site is located at 45-3388 Māmane Street, in Honoka'a, approximately 6.5 miles from the project lands.

The majority of the site is within the County of Hawai'i response area. However, portions of TMK (3) 4-7-006: 010 is within a cooperative response area between the County and the State of Hawai'i, DLNR, Division of Forestry and Wildlife (DOFAW).

Potential Impacts and Mitigation Measures

The proposed lease of the site will not directly increase the need for fire and emergency services in the vicinity.

5.10 HOSPITALS AND HEALTH CARE FACILITIES

Hale Hoʻōla Hāmākua long-term care facility (formerly Honoka'a Hospital), at 45-547 Plumaria, Honoka'a is the primary healthcare facility serving the Hāmākua District. Located approximately 5 miles from the site, Hale Hoʻōla Hāmākua is an acute and long-term care hospital with 50 beds (4 acute and long-term care and 46 skilled nursing and intermediate care), and 24-hour emergency room services.

North Hawai'i Community Hospital also serves the area. Located in Waimea, at 67-1125 Māmalahoa Highway, approximately 21 miles from the project area, North Hawai'i Community Hospital has 39 acute-care beds and offers 24-hour emergency service (NHCW 2009).

Potential Impacts and Mitigation Measures

The proposed lease will not directly increase the need for healthcare in the vicinity.

5.11 RECREATIONAL FACILITIES

The following recreational facilities are located in the vicinity of the site:

- Kukuihaele Park
- Kukuihaele Landing
- Haina Park in Honoka'a
- Honoka'a Landing
- Honoka'a Park
- Honoka'a Rodeo Arena
- Pā'auhau Landing
- Kalōpā State Recreation Area
- Pa'auilo Gym/Park
- Koholālele Landing

The site is also adjacent to Hāmākua Forest Reserves land. Kohala Forest Reserves land and Pu'u o 'Umi Natural Area Reserve is north of the site (beyond Waipi'o Valley).

Potential Impacts and Mitigation Measures

The proposed lease of the site itself will not directly affect the population in the project vicinity, access to Hāmākua Forest Reserves land, nor will it dramatically increase the demand for community services or public facilities.

6.0 RELATIONSHIP TO POLICIES, PLANS AND CONTROLS

This section describes the State of Hawai'i and County of Hawai'i land use plans, policies, and ordinances relevant to the proposed agricultural park.

6.1 STATE OF HAWAII

6.1.1 State Environmental Impact Statement Law, Chapter 343, Hawai'i Revised Statutes

This Environmental Assessment is prepared pursuant to Chapter 343, HRS and Section 11-200-4, HAR, which states that, "the governor, or an authorized representative, whenever an action proposes the use of state/county lands or the use of state/county funds, or, whenever a state agency proposes an action within section 11-200-6(b) shall be the final authority to accept an environmental impact statement."

Since the proposed project requires the use of county lands and funds, it will comply with applicable provisions of Chapter 343, HRS and Section 11-200-4, HAR. Therefore, the Mayor or designated representative, the County of Hawai'i, Department of Finance, will act as the Accepting Authority for this Environmental Assessment.

6.1.2 Chapter 205, Hawai'i Revised Statutes – State Land Use Law

The State Land Use Law establishes the Land Use Commission (LUC) and gives this body the authority to designate all lands in the state into one of four districts: Urban, Rural, Agricultural, or Conservation. The site's district designation is Agriculture and is adjacent to lands designated Conservation (Figure 13). No change to the State Land Use Designation for the site is proposed. The proposed land uses for the agricultural park are permitted uses in the Agricultural District.

6.1.3 Section 205A, Hawai'i Revised Statutes – Coastal Zone Management Program

The Coastal Zone Management Area as defined in Chapter 205A, Hawai'i Revised Statutes (HRS), includes all the lands of the state. The objectives of the Hawai'i Coastal Zone Management (CZM) Program, as set forth in Chapter 205A, include the protection and maintenance of the State's coastal resources. As the Coastal Zone is defined in Chapter 205A, the site is within the Coastal Zone Management Area; however, the lands are located a mile from the shoreline, at a minimum elevation of approximately 1,000 feet above mean sea level. The following paragraphs discuss the project's relationship to the objectives and policies of the Coastal Zone Management Program.

The proposed project site is approximately 2.3 miles from the shore and is not expected to have any adverse impacts on Coastal Recreational Resources (205A-2(1)), Coastal Ecosystems (205A-2(4)), or Beach Protection (205A-2(9)). For the same reason, the site will not be subject to potential impacts from Coastal Hazards (205A-2(6)).

The proposed agricultural use of the lands will not adversely impact the area's Historic Resources (205A-2(2)). Scientific Consultant Services, Inc. (2009) conducted an Archaeological

Inventory Survey of the project area. Mitigation will be to avoid features that are thought to be temporary habitation sites and the possible remains of a heiau.

The proposed action will not significantly affect the Scenic and Open Space (205A-2(2)) quality of the project area. The site is currently uncultivated open space. The agricultural park is expected to return the lands to agricultural use and may open up views when cleared.

Agricultural use of the site is expected to have a beneficial effect on Economic Use (205A-2(5)). The site is located in an area has long been an agricultural community. This action will make it possible to put these non-coastal lands back into agricultural use after having been fallow for more than a decade. The agricultural park will provide opportunities for residents who wish to be in agriculture to use land for that purpose and enable the production of valuable agricultural commodities.

Regarding the CZM's goals to promote Public Participation in coastal management (205A-2(8)), this EA reports and publishes the potential short- and long-term impacts of the proposed use. Prior to, and throughout the development of this EA, various agencies (or agency documents) were consulted (see consultation list in Section 9.0). Additionally, several members of the community were interviewed for the Cultural Resources Impact Assessment.

Managing development is appropriately the role of those State and County agencies assigned the responsibility of implementing the provisions of Chapter 205A, HRS, and the Coastal Zone Management Program. A major component of the Hawai'i Coastal Zone Management Program is the designation of Special Management Areas (SMA). The Counties determine the extent of the Special Management Areas within their jurisdictions and must approve and issue a permit for any development within the SMA. The site is not located within Hawai'i County SMA and no permit will be required.

Figure 13, State Land Use Districts



Figure 14, Special Management Area



LEGEND



Special Management Area



Source: Hawai'i County Dept of Planning (2008) Disclaimer: This graphic has been prepared for general planning purposes only.

6.2 COUNTY OF HAWAII

County-specific land use plans and ordinances pertaining to the site include the *County of Hawaii General Plan* and the Hawai'i County Zoning Code. The following subsections present relevant elements of these land use plans and ordinances, accompanied with a description of how each will be addressed during the course of the proposed project.

6.2.1 General Plan

The *County of Hawaii General Plan* (General Plan) was adopted in February 2005 and is a policy document for the long-range comprehensive development of the Island of Hawai'i. The plan provides direction for the future growth of the County and offers policy statements that embody the expressed goals for present and future generations. The General Plan provides the legal basis for all subdivision, zoning, and related ordinances and for the initiation and authorization of all public improvements and projects.

Specific goals and policies applicable to the proposed lease are discussed below.

<u>Natural Beauty</u>

Goals:

- (a) Maximize opportunities for present and future generations to appreciate and enjoy natural and scenic beauty.
- (b) Protect scenic vistas and view planes from becoming obstructed.

Discussion: The site offers views of Mauna Kea, the coastline, and ocean, however, the General Plan does not recognize this site as a specific site of natural beauty. As previously discussed, the agricultural use of the lands is expected to preserve scenic places and vistas in the area.

Environmental Quality

Goals

(b) Maintain and, if feasible, improve the existing environmental quality of the island.

Policies

(a) Take positive action to further maintain the quality of the environment.

Discussion: The proposed agricultural use involves minimal construction or development activity. The lands are expected to retain their current Agriculture zoning, and no significant environmental impacts are expected.

Natural Resources

Goals

- (a) Protect and conserve the natural resources from undue exploitation, encroachment and damage.
- (c) Protect and promote the prudent use of Hawaii's unique, fragile, and significant environmental and natural resources.

Policies

(g) Promote sound management and development of Hawaii's land and marine resources for potential economic benefit.

Discussion: Among the natural resources of Hawai'i are its soil, water, and air. The site is in the state land use Agricultural District, is zoned by the County for Agriculture, and contain land rated as Prime Agricultural Lands. The proposed use as an agricultural park will utilize the soil resources that have been fallow these past years. Negative impacts to air and water quality and to soils are not expected.

<u>Economic</u>

Goals

- (a) Provide residents with opportunities to improve their quality of life through economic development that enhances the County's natural and social environments.
- (b) Economic development and improvement shall be in balance with the physical, social, and cultural environments of the island of Hawaii.
- (d) Provide an economic environment that allows new, expanded, or improved economic opportunities that are compatible with the County's cultural, natural and social environment.

Policies

(a) Assist in the expansion of the agricultural industry through the protection of important agricultural lands, development of marketing plans and programs, capital improvements and continued cooperation with appropriate State and Federal agencies.

Discussion: Agricultural activities ceased at this site with the default of Hamakua Sugar and subsequent ownership of the land by the County. The proposed agricultural park will make it possible to put the lands back into agricultural use, by making it available for residents who wish to be in agriculture to use land for that purpose. Putting the lands back into agriculture is consistent with the physical, social, and cultural environment of Hawai'i and the Hāmākua District.

Land Use – Agriculture

Goals

(a) Identify, protect and maintain important agriculture lands on the island of Hawai'i.

Policies

(j) Ensure that development of important agricultural land be primarily for agricultural use.

Discussion: The site is former sugar cane land that has lain fallow since 1994.

On the county's Land Use Pattern Allocation Guide (LUPAG) map, found in the Hawai'i County General Plan (Hawai'i County 2005), the site is designated Important Agricultural Lands (Figure 15, Land Use Pattern (General Plan)). Because the site is expected to return to agricultural use, the proposed lease is consistent with the Important Agricultural Lands designation.

6.2.2 Hawai'i County Zoning

Chapter 25 of the Hawai'i County Code is the County's Zoning Code. The Zoning Code specifies permitted uses as well as site development parameters, such as density and building setbacks. All of the TMKs that comprise the site are zoned A-40a by the County of Hawai'i (Figure 16, Zoning). Agricultural districts provide for agricultural and very low-density agriculturally-based residential use. Density in the A-40a District is limited to a minimum building site area of 40 acres.

Discussion: The lease of the site is consistent with the Agricultural district. It is anticipated that the site will continue to be designated Agriculture and that agricultural uses can once again resume at the site.

Honoka:a=_Waipi:o_Road_ "Māmalahoa:Highway=

Figure 15, Land Use Pattern (General Plan)



CE CEI	
t::-	Kapulena
	Roads
LUPA	G Land Classification
	Low Density Urban
] Important Agricultural Lands
	Open Area
	Conservation
Source: Ha Disclaimer:	awai'i County Dept. of Planning (2005) This graphic has been prepared for general planning purposes only.

Land Use Pattern Allocation Guide





6.3 MAJOR APPROVALS REQUIRED

Since the proposed agricultural park is a permitted use under existing land use designations, no major approvals are required. The conservation plan is a requirement to undertake grading for agricultural purposes under the County's erosion and sedimentation control code (Hawai'i County Code section 10-3).

Activity	Required Permit/Plan	Approving Authority	
On-site well	Well construction	CWRM	
	permit, pump		
	installation permit		
Grading, clearing for	Conservation Plan	NRCS/County of	
farm activities		Hawaiʻi	

7.0 ALTERNATIVES TO THE PROPOSED ACTION

Under Section 11-200-10(6), HAR, Environmental Impact Statement Rules, the alternatives to the proposed action considered are limited to those that would allow the objectives of the project to be met, while minimizing potential adverse environmental impacts. The feasible alternatives must also address the project's economic characteristics while responding to the surrounding land uses that will be impacted by the project. In conformance with applicable regulations, the following alternatives, including alternative sites and uses of the property, have been identified and investigated.

7.1 NO-ACTION ALTERNATIVE

Under the no-action alternative the County would retain ownership of the site TMKs. The County would continue to pay expenses associated with owning the lands and not realize the benefits of leasing or selling the lands. Under this alternative, the lands would continue to be property-tax exempt and the County will not realize any income from taxes. In addition, the lands would not pass to new land managers capable of agricultural operations and would not be put to their best use. Thus, the no-action alternative has been rejected from further consideration.

7.2 THE ALTERNATIVE OF EXECUTING A LAND EXCHANGE

Over the last few years, the County has explored land exchange options for its other surplus properties with large landowners in the vicinity. None of the parties involved could come to a mutually agreeable decision, therefore, this alternative is considered to be a viable option for this site at this time.

7.3 THE ALTERNATIVE OF SELLING THE LANDS

The County considered the option of selling the lands to achieve three purposes; making the land available for productive use; realize funding through land sale profits; and, generation of real property tax revenues once the lands were held privately. However, as this option was considered, the community objective to promote agriculture gained traction and it was determined that the land has value that merits the County continuing retaining it in public ownership. Thus, the alternative of selling the land was rejected in favor of maintaining public ownership and a higher level of control over the property. In lieu of selling or exchanging, the County has decided to forego generating revenues as a primary objective and instead to use this County asset to pursue community objectives in terms of promoting agriculture.

7.4 THE ALTERNATIVE OF LEASING THE LANDS

The County also considered leasing the lands directly to agricultural users. However, this alternative requires a greater level of effort on behalf of County staff to administer the day-today details of an agricultural lease. The County recognizes that there are other entities, such as the Farm Bureau, that are better equipped to manage an agricultural park and that partnerships with agricultural and educational entities facilitate agricultural experimentation and education. Thus, the proposed action involving partnerships is a more refined alternative than the County leasing land to individual farmers or non-agricultural users.

7.5 ACTIONS OF A SIGNIFICANTLY DIFFERENT NATURE WHICH WOULD PROVIDE SIMILAR BENEFITS WITH DIFFERENT ENVIRONMENTAL IMPACTS

There are no known actions significantly different than the proposed agricultural park that would free the County from paying the expenses associated with owning and administering the lands and achieve the community objective to promote agriculture, while retaining a level of management control in the public interest.

7.6 THE ALTERNATIVE OF POSTPONING ACTION PENDING FURTHER STUDY

The County has evaluated the site in the context of its short-term and long-term plans and goals and has determined that allowing the lands to lie fallow does not further those plans and goals. The County believes that it has evaluated all reasonable alternatives.

8.0 DETERMINATION, FINDINGS, AND REASONS FOR SUPPORTING DETERMINATION

This EA has evaluated the potential primary, secondary, and cumulative environmental impacts, both short-term and long-term, that could result from the lease of the site. Based on an assessment of existing research, a Finding of No Significant Impact (FONSI) has been made.

8.1 SIGNIFICANCE CRITERIA

According to the Significance Criteria contained in Section 11-200-12, HAR, an applicant or agency must determine whether an action may have a significant impact on the environment, including all phases of the project, its expected consequences both primary and secondary, its cumulative impact with other projects and its short-term and long-term effects. The HAR establish "significance criteria" to determine whether significant environmental impact will occur as a result of a proposed action. An action shall be determined to have a significant impact on the environment if it meets any one of the following criteria:

(1) Involves an irrevocable commitment to loss or destruction of any natural or cultural resources

The agricultural park and its anticipated subsequent use are not expected to negatively impact natural resources in the lands or in the vicinity. While the lands are expected to remain in agriculture, the exact use and any associated impacts are unknown at this time. Lessees would have to comply with County, State, and federal regulations with regard to the protection of natural resources.

An archaeological inventory survey has been conducted by Scientific Consultant Services, Inc., for the project area and has been coordinated with the SHPD. The survey documented 17 sites containing 28 features, the majority of which are associated with Historic-era sugar plantation field clearing activities. Four of the sites were rock shelters that were likely used intermittently for temporary habitation during the pre-Contact era. One site was a disturbed multi-tier platform that might be the remains of a heiau know to have existed in Kapulena Ahupua'a. Mitigation is avoidance of the temporary habitation sites and of the possible heiau site.

An inventory of flora and fauna was conducted in 2009. No plant species listed or proposed as threatened or endangered were identified within the project area. Faunal survey recorded the presence of the endangered Hawaiian hoary bat within the project area. The faunal survey report concluded that due to the migrant nature of the Hawaiian hoary bat and the abundant habitat in the Hāmākua District, the proposed agricultural use of the site is not expected to have any significant adverse impact on this species.

(2) Curtails the range of beneficial uses of the environment

The site is currently undeveloped and unused land designated by the State and County for agricultural uses. By developing an agricultural park and associated partnerships, the County will be able to facilitate the return to productive agricultural 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 proposed agricultural park is consistent with the environmental policies, goals, and guidelines established in Chapter 344, HRS, State Environmental Policy. This EA has addressed such issues as natural resources conservation, soils, drainage, visual environment, flora and fauna, open space, air and water quality, wastewater, and energy consumption.

(4) Substantially affects the economic welfare, social welfare, or cultural practices of the community or state

This EA has addressed questions of population, housing, educational facilities, economic development, quality of life, noise, and transportation. The proposed agricultural park will positively affect the economic and social welfare of the Hāmākua community by providing the opportunity To develop and demonstrate best practices for sustainable and efficient grazing operations to support the grass-fed beef industry; to test alternative orchard crops for larger scale production; to test and provide incubator opportunities for value-added products; and to train farmers and processors in cultivation and business practices at different scales from family to larger-scale operations, with an emphasis to strengthen the family-farm based agricultural community in Hāmākua.

(5) Substantially affects public health

The proposed agricultural park will not substantially affect public health in the immediate area or island wide. The lands are expected to retain their current zoning and any future agricultural uses will be required to comply with State adopted standards for sanitation and waste disposal.

(6) Involves substantial secondary impacts, such as population changes or effects on public facilities

The agricultural park will not create a demand for public facilities. Farm dwellings are not expected to be permitted with the agricultural park due to the lack of infrastructure available to the site.

(7) Involves a substantial degradation of environmental quality

The agricultural park will not degrade environmental quality. Construction of structures to support the agricultural park will be subject to applicable County building permits. Similarly, processing facilities, if developed, will be subject to Department of Health

regulations, as applicable. Site work during construction will include best management practices to control sedimentation and protect waterways from pollutants.

(8) Is individually limited but, cumulatively, has considerable effect on the environment, or involves a commitment for larger actions

The agricultural park is anticipated to stimulate a return to agricultural activity for this property. Agricultural use of the lands is not expected to result in cumulative effects on the environment or involve a commitment for larger actions.

(9) Substantially affects a rare, threatened, or endangered species or its habitat

The endangered Hawaiian hoary bat was recorded within the project area during the faunal survey. Because this species are common in the Hāmākua region, and habitat is abundant, the anticipated agricultural use is not expected to result in adverse impacts to this species.

(10) Detrimentally affects air or water quality or ambient noise levels

The agricultural park will not significantly affect noise and air quality levels. Once leased, traffic on area roads is expected to increase somewhat as the roads will be used by those using the property. However, substantial detrimental impacts to air quality are not expected, as any air pollutants would be rapidly dispersed by the prevailing winds. Periodic vehicular traffic associated with use of the lands may periodically contribute to ambient noise levels in the immediate vicinity of area roads. Any processing facilities that would be developed within the park would be subject to Department of Health air and water quality requirements.

(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, freshwater, or coastal waters

The site is not 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. As such, the agricultural park and subsequent use of the lands would have no adverse impacts upon such areas, and the lands and any improvements to them would not be likely to suffer damage from hazards associated with such areas.

(12) Substantially affects scenic vistas and view planes identified in county or state plans or studies

The property is not identified as exceptional in State or County plans. However, the project vicinity includes a diverse range of scenic vistas and open expanses that typify the upper Hāmākua coast. The site is located at higher elevations and offer views of the coastline. Existing views of the coastline from within the lands would be unaffected by the land lease and could potentially be improved should clearing of the ironwood trees occur.

In the Agricultural zoning districts, residential structures are limited to 35 feet in height and other agricultural structures are limited to 45 feet in height. Thus, any new structures built on the property are not expected to significantly affect views of the coast or to degrade views of the slopes of Mauna Kea from makai areas.

(13) Requires substantial energy consumption.

The proposed agricultural park will not substantially increase energy consumption. With the lease, the lands are expected to be put to agricultural use. Because no utility upgrades are planned, off-the-grid alternatives such as generators and photovoltaic devices will need to be considered should any construction or need for power be necessary.

9.0 CONSULTED PARTIES AND PARTICIPANTS

9.1 PRE-ASSESSMENT CONSULTATION PERIOD

Pre-consultation letters, along with a location map, were distributed to the agencies and organizations listed in the following table prior to development of this Environmental Assessment. Agency comment letters and responses are included in Appendix E.

	AGENCY	Letter Date	Provided Comments (yes/no)	
Cou	inty	· · · · · ·		
1	Department of Environmental Management	08/07/2009	yes	
2	Planning Department	08/07/2009		
3	Department of Public Works	08/07/2009		
4	Department of Research and Development	08/07/2009		
5	Department of Water Supply	08/07/2009		
6	Fire Department	08/07/2009	yes	
7	Police Department	08/07/2009	yes	
8	J. Yoshimoto, Chair, County Council	08/07/2009		
9	Dominic Yagong, Councilmember	08/07/2009		
10	Office of the Mayor	08/07/2009		
Stat	e e			
11	Department of Business, Economic Development and Tourism (DBEDT)	08/07/2009		
12	DBEDT Land Use Commission	08/07/2009		
13	DBEDT Office of Planning	08/07/2009	yes	
14	DBEDT Strategic Industries Division	08/07/2009	yes	
15	Department of Health – Environmental Planning Office	08/07/2009		
16	Department of Land and Natural Resources (DLNR)	08/07/2009	yes	
17	DLNR State Historic Preservation Division	08/07/2009	yes	
18	Office of Environmental Quality Control	08/07/2009	yes	
19	Office of Hawaiian Affairs	08/07/2009	yes	
20	Office of Hawaiian Affairs – Kona Office	08/07/2009		
21	U.H. Mānoa College of Tropical Agriculture and Human Resources	08/07/2009		
Federal				
22	US Army Corps of Engineers, Honolulu District – Regulatory Branch	08/07/2009		
23	US Fish and Wildlife Service – Pacific Islands Contact Office	08/07/2009		
Oth	Other Organizations			
24	Kamehameha Schools – Land Assets Division	08/07/2009		

Table 4, Pre-Assessment Comments

9.2 COMMENTS TO THE DRAFT ENVIRONMENTAL ASSESSMENT

The Draft Environmental Assessment was sent to agencies for review and comment. It was also made available to the general public at the Honoka'a Library and on line through the Office of Environmental Quality Control's Environmental Notice. Comments were received from Federal, State and County agencies as shown in Table 5. Comments and written responses are included as Appendix F.

	AGENCY	COMMENT DATE
Cou	nty	·
1	Department of Environmental Management	Jan. 19, 2011
2	Planning Department	Feb. 9, 2011
3	Department of Public Works	
4	Department of Research and Development	
5	Department of Water Supply	Feb. 8, 2011
6	Fire Department	
7	Police Department	
8	Dominic Yagong, Councilmember	
9	Office of the Mayor	
Stat	e	
10	Department of Business, Economic Development and Tourism (DBEDT)	
11	DBEDT Land Use Commission	
12	DBEDT Office of Planning	
13	DBEDT Strategic Industries Division	
14	Department of Health – Environmental Planning Office	Jan. 10, 2011
15	Department of Land and Natural Resources (DLNR)	Feb. 10, 2011
16	DLNR State Historic Preservation Division	
17	Office of Environmental Quality Control	
18	Office of Hawaiian Affairs	Feb. 9, 2011
19	Office of Hawaiian Affairs – Kona Office	
20	U.H. Mānoa College of Tropical Agriculture and Human Resources	
Fed	eral	
21	US Army Corps of Engineers, Honolulu District – Regulatory Branch	Jan. 10, 2011
22	US Fish and Wildlife Service – Pacific Islands Contact Office	Feb. 09, 2011
Oth	er	
23	Kamehameha Schools, Land Asset Manager	

Table 5.	Comments to the Draft Environmental Assessment
I unic Se	, Commence to the Di art Envir omnentar rissessment
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Appendix Pre-Existing Lots of Record Determination

William P. Kenoi Mayor



Bobby Jean Leithead Todd Planning Director

> Margaret K. Masunaga Deputy Planning Director

County of Hawaii

PLANNING DEPARTMENT Aupuni Center • 101 Pauahi Street, Suite 3 • Hilo, Hawaii 96720 Phone (808) 961-8288 • Fax (808) 961-8742

November 24, 2009

Finance Department Figerly Management Division

25 Aupuni Street, Suite 118 Hilo, HI 96720

County of Hawai'i Finance Department

Kenneth J. Van Bergen, Property Manager

Dear Mr. Van Bergen:

PRE-EXISTING LOTS OF RECORD DETERMINATION (PRE-X SUBDIVISION No. 14) Malanahae, Kapoaula, Hauko, Keahakea, Kaauhuhu, Kapulena, Waialeale 1st & 2nd, Waikoloa, Niupuka and Hanapai, Hāmākua, Hawai'i TMK: 4-7-005:001, 002, 003; 4-7-006:001, 005, 006, 007, 010, 018 and 020

This acknowledges receipt of your request of September 28, 2009, regarding the determination of pre-existing lots within the subject TMK parcels. Please pardon the delay but as you will see, there was some difficulty determining the actual properties that are present within the referenced parcel numbers.

First of all, be informed that the past practices of the State Bureau of Conveyances (BOC) with regard to the methods of recording land ownership documents has not always been in agreement with County subdivision law. Prior to the mid 1990's, it was a simple matter of presenting properly prepared deed documents and/or subdivision plats to the BOC and they would be recorded and subsequently indicated on the Tax Map Plats giving the appearance of legally subdivided land. These maps are for property tax assessment purposes only and do not necessarily reflect the proper creation of lots as specified in county law. For example, we do not say that the fact that many grants are contained within a single tax map parcel—as happened in TMK No. 4-7-005:001—had the effect of consolidating the grants. The contrary is also true: the fact that one grant was put in two tax map parcels did not necessarily, in itself, subdivide the grant into two lots.

Kenneth J. Van Bergen, Property Manager County of Hawai'i Finance Department Page 2 November 24, 2009

We have reviewed our department records and those of the Department of Finance – Real Property Tax Division (RPT) in accordance with Article 11 (Pre-existing Lots) of the Subdivision Code (Sections 23-117 through 23-120).

By way of Commissioner's Quitclaim Deed to the County of Hawai'i dated May 9, 1995, and filed as Document No. 95-061558, we have determined that the various Grants, Land Commission Awards, Mahele Awards, etc., within the subject parcels represent the following thirty-two (32) pre-existing lots of record:

TMK 4-7-005:001

- 1) The Whole of Grant 1883
- 2) The Whole of Grant 1768
- 3) The Whole of Grant 1764
- 4) The Whole of Grant 1770
- 5) A Portion of Grant 1564
- 6) A Portion of Grant 1765
- 7) A Portion of Grant 791
- 8) A Portion of Grant 868
- 9) A Portion of Grant 670
- 10) A Portion of Land Commission Award 9971 Apana 4
- 11) A Portion of Land Commission Award 9971 Apana 8

TMK 4-7-005:002

- 12) A Portion of Grant 1882
- 13) A Portion of Grant 1776

TMK 4-7-005:003

14) A Portion of Grant 1882

TMK 4-7-006:001

- 15) A Portion of Grant 2449
- 16) A Portion of Land Commission Award 9971 Apana 2

TMK 4-7-006:005

17) A Portion of Grant 2123

TMK 4-7-006:006

- 18) A Portion of Grant 2124
- ***(w/Parcel 006:007, illegal subdivision)***
- 19) A Portion of Grant 670

TMK 4-7-006:007

20) A Portion of Grant 2124

(w/Parcel 006:006, illegal subdivision)

Kenneth J. Van Bergen, Property Manager County of Hawai'i Finance Department Page 3 November 24, 2009

TMK 4-7-006:010

- 21) The Whole of Grant 1763
- 22) The Whole of Grant 1767
- 23) A Portion of Grant 1564
- 24) A Portion of Grant 1765
- 25) A Portion of Grant 791
- 26) A Portion of Land Commission Award 9971 Apana 4

TMK 4-7-006:018 (Lot 16)

- 27) A Portion of Grant 4003
- 28) A Portion of Grant 2123
- 29) A Portion of Grant 2449
- 30) A Portion of Land Commission Award 9971 Apana 2
- 31) A Portion of Mahele Award 4-B

TMK 4-7-006:020

32) A Portion of Grant 4012

This determination does not, however, verify the ownership of all of these lots. For instance, on August 20, 1991, the affidavit of Herbert Napuakalani Pratt, Jr. was recorded with the State of Hawai'i Bureau of Conveyances that claims ownership of the **whole** of Grant 2123 of which parcel 4-7-006:005 is a part.

Those that were noted in *****bold***** are for informational purposes since the parcel numbers may not have been legally created by subdivision but are counted because of having been specifically included in the Quitclaim Deed.

We understand that after receiving this pre-existing lot determination, you may submit an application to consolidate and resubdivide these properties. We will require proof of title for any lots being consolidated and resubdivided, such as a title report, to avoid the problems that will occur if lots with bad title are consolidated into other properties.

If consolidation and resubdivision is not the intent, you may want to have a modern metes and bounds survey conducted for a more accurate and current land area determination and that a map reflecting this information may be submitted to this department for certification.

Any request for additional Tax Map Parcel Numbers should be in writing to our Tax Maps and Records Section.

Kenneth J. Van Bergen, Property Manager County of Hawai'i Finance Department Page 4 November 24, 2009

Should you have any questions, please feel free to contact Jonathan Holmes of this department.

Sincerely,

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Fifthend Coll

BJ LEITHEAD TODD Planning Director

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- Encs.: Tax Map Plat w/Pre-existing Lots GIS Reference Map
- xc: Tax Maps and Records Supervisor w/maps Real Property Tax Division-Hilo w/maps Manager-DWS w/maps Director, DPW w/maps TMK File 4-7-5:1 w/maps











Figure 2 Dense grassland - 6 to 8 ft. deep Guinea grass Ironwood forest with Guinea grass understory 9 Figure 3 öhi'a and the strawberry guava were found primarily in the gulches and along the mauka fringe of property nor were any found that are candidates for such status. No special habitats were found on Because of the above existing conditions and because the proposed action does not involve any land use changes, there is little of botanical concern regarding this property. The proposed action is not expected to have a significant negative impact on the botanical resources in this part of the The whole property showed signs of pig rooting. This was especially true in the gulches where every square foot appeared to be heavily rooted. This rooting had the twin effects of severly limiting the diversity of the more delicate native understory species, while at the same time aiding A total of 161 plant species were recorded across the entire property during nine site visits. Of No federally listed Threatened or Endangered plant species (USFWS, 2009) were found on the species were all non-native in Hawaii and of no special conservation interest or concern. Two fig strawberry guava (Psidium cattleianum). The ferns were found under the common ironwood and aquilimum var. decompositum), hapu'u pulu (Cibotium glancum), ni'ani'au (Nephrolepis exaltata property has been heavily altered by historic land uses and continues to be degraded by invasive and well as elsewhere in the Pacific including: palapalai fern, uluhe, (Gonocornus minutes), no majority of the 21 remaining species of native plants, but most of these are older, mature plants. Reproduction of all but a few native species is almost non-existent. in the gulches. The molasses grass was found growing in the open with the Guinea grass. The manono and köpiko'ula (Psychotria hawaiiensis), and 12 species that are indigenous in Hawaii (Peperomia blanda var. floribunda) and popolo (Solanum americanum). None of these native common name, koali awahia (Ipomoea indica), huehue (Cocculus orbiculatus), 'ala'alawainui species, rough-leaved fig (Ficus nota) and rock fig (Ficus platypoda), had been planted by the The vegetation throughout the project area consists primarily of non-native species. The common name, molasses grass (Melinis minutiflora), 'öhi'a (Metrosideros polymorpha) and alien plant species and feral pigs. The many gulches dissecting the property harbor the great species are rare and none of them are federally listed or protected. The remaining 135 plant subsp. hawaiiensis), lepelepeamoa (Selaginella arbuscula), neneleau, kolea lau nui, 'öhi'a, päkahakaha (Lepisorus thunbergianus), moa (Psilotum nudum), (Cyperus polystachyos) no these 21 were native species including 9 that are endemic to Hawaii: kilau fern (Pteridium common name, pala'ä fern (Sphenomeris chinensis), wawae'iole (Lycopodiella cernua), plantation in some of the gulches, most notably in Kawaikalia and Honokäia Gulches. No recommendations are offered at this time regarding the botanical resources. DISCUSSION AND RECOMMENDATIONS the spread of aggressive, shade-tolerant weeds such as strawberry guava. 5 the property either. the property. Big Island

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chyperiod, the following information is provided: Depende precensi (Kauco) Kauo Depende precensi (Kauco) Kauo Depende precensi (Kauco) Kauo entitie entitie EUECHACCEE (Chai Firer Family) EuechaCCEE (Chai Firer Family) EuechaCCEE (Chai Firer Family) separation English or flavoring symbols are used: enorative EuechaCCEE (Chai Firer Family) EuechaCCEE (Chai Firer Family) EuechaCCEE (Chai Firer Family) separation all that is coloring symbols are used: EuechaCCEE (Chai Firer Family) EuechaCCEE (Chai Firer Family) EuechaCCEE (Chai Firer Family) second entitie entitie entitie entitie entitie second entitie firer Family) EuechaCCEE (Chai Firer Family) EuechaCCEE (Chai Firer Family) second entitie entitie entitie entitie second entitie firer EuechaCCEE (Chai Firer Family) EuechaCCEE (Chai Firer Family) second entitie Euechacce Euechacce Euechacce second entitie Euechacce Euechacce Euechacce<	c) rycle, the (b) relativity information is provided in the control if mutual is control if mutual if mutual if mutual is control if mutual if mutual i	nomy and nomenciature of the Ferns follow Palmer (2003), while the Monocots and Dicots v Wagner et al. (1999) and Staples and Herbst (2005).	ATHYRIACEAE (Lady Fem Family)				
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and contraction inclusion inclusion <td< td=""><td>and the number of the numbe</td><td></td><td>BLECHNACEAE (Chain Fem Family)</td><td></td><td></td><td></td><td></td></td<>	and the number of the numbe		BLECHNACEAE (Chain Fem Family)				
monon fingulation through and the formation manuments of the formation manuments of the formation manument of the formation state and formation state and formation and the formation and t	 and legitor thrain and the thrain and legitor thrain and	lentific name with author citation	Blechnum appendiculatum Willd.		non-native	common	
-geographical stans. The following symbols are used: Spherosyntosis coopering trayoles: Ametrial tree form non-antive Incomantive ensite in the word. BENNSTA.EDTIA.CEAE (Bracken Family) Matrials tree form non-antive Incomantive genous:= mirror on the Howainn Islands and alot on one or more other systems = mirror on the Howainn Islands and alot on one or more other pressum = fusco spatial transition (1). Denominal (1). Matrials tree form incomantive Incomantive or the instruction Islands and alot on one or more other systems = mirror other Howainn Islands and alot on one or more other pressum = fusco spatial transition (1). Denominal (1). Matrials tree form incomantive Incomantive or the restands interinounly or accidentally after weator normation. Denominal (10.06000 (10.0600	spengnikul atuar. To following yonds are uct: menantise contria anyole Menantise contrantise Menantise Menantise <td< td=""><td>mmon English or Hawaiian name.</td><td>CYATHEACEAE (Tree Fern Family)</td><td></td><td></td><td></td><td></td></td<>	mmon English or Hawaiian name.	CYATHEACEAE (Tree Fern Family)				
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spectra = airvo (b): Hawaiiii Ishafe and also to one or more other proting activity of the Hawaiii Ishafe and also to one or more other activity of the ishafe ishafe ishafe is the folynesium is the come of more proting browight to the islands intentionally or excitenally after westmentioning/ison. protopolity ishafe is the ishafe isha	green and on the dimension function of the stands with the projectance of the stands with the projectance in the conceaning of the stands with the projectance. project projectance projectance provided and the stands with the projectance of the stands with the projectance of the stands with the projectance. project projectance provided and the stands with the projectance of the stands with the projectance of the stands with the projectance. project projectance provided and the stands with the projectance of the stands with the projectance. provided and the stands with the projectance of the stands with the projectance of the stands with the projectance. provided and the stands with the projectance of the stands with the projectance of the stands with the projectance of the stands with the projectance. provided and the stands with the projectance of the stands with the projectance of the stands with the projectance of the stands with the projectance. provided and the stands with the projectance of the stands with the projectance of the stands with the projectance of the stands with the projectance. provided and the stands with the projectance of the stands with the projectance of the stands with the projectance. provided and the stands with the projectance of the stands with the projectance of the stands with the projectance. provided and the stands with the projectance of the stands with the projectance of the stands with the projectance. provided and the stands with the projectance of the stands with the projectance of the stands with the projectance. provided and the stands with the projectance of the stands with the projectance of the stands with the projectance. provided and the stands with the projectance of the stands with the projectance of the stands with the projectance of the stands with the stands with the projectance	demic = native only to the Hawaiian Islands, not naturally occurring anywhere	DENNSTAEDTIACEAE (Bracken Family)				
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after vestorin contact. citorium glance of each species within the project area: lequir pult endemic uncomm undome of each species within the project area: undome of each species within the project area: lequir pult endemic uncomm undome of each species within the project area: uncomm with vestoring in a few small DRY OPT TERIDACEAE (wood Fem Family) imprint imprint imprint imprint imprint a montom with with project area: citorian grant in citor a curring in a few small Distromoler (file scale (file) Fem Family) imprint imprint imprint imprint a control scalened spresely throughout the area or cocurring in a few small Distromoler (file) Fem Family) imprint imprint imprint a control scalened spresely throughout the area or cocurring in a few small Distromoler (file) Fem Family) imprint imprint a control scalened spresely throughout the area or cocurring in a few small Distromoler (file) Fem Family) imprint imprint a control scalened spresely throughout the area or cocurring in a few small Distromoler (file) Fem Family) imprint imprint a control file file file file file file a control file file file file	art or vestanto called and and art of the sector of the sector se	of their migrations. n-native = all those plants brought to the islands intentionally or accidentally	DICKSONIACEAE (Dicksonia Fem Family)				
and an efform the project area: DRYOFTERIDACEAE (Wood Fern Family) Tear af incise Cav. Important of the vegation within the project area: and an efform ghout the area or locally abuidant within a proton of the vegation within the project area: DRYOFTERIDACEAE (Fales Sughon Fern Family) and an efform ghout the area or locally abuidant within a proton of the vegation within the project area: Deranopers i linearis (Burn,f.) Underw. Indue Indue area of social swithin the project area. Immonole scattered spratecy throughout the area or occurring in a few small Dicromopers i linearis (Burn,f) Indue Indue Indue Immonole area of a social individuals within the project area. Immonole scattered spratecy throughout the area or occurring in a few stall Dicromopers i linearis (Burn) (Diew. Indue Indue Indue Immonole area of a social individuals within the project area. Immonole scattered spratecy (Direase Fern Family) Immonole scattered spratecy Immonole scattered spratecy Immonole scattered spratecy area or social individuals within the project area. Immonole scattered spratecy Immonole scattered spratecy Immonole scattered spratecy Immonole scattered spratecy area or social individuals within the project area. Immonole scattered spratecy Immonole scattered spratecy Immonole scattered spratecy Immonole scattered spratecy area or social individuals within the project area.	undimo of each spredies within the project area. undim = "fortic area" and/or part of the vegetation within the project area. and = "fortic area" and/or part of the vegetation within the project area. Determine the area or occurring in a few analy perform of "the vegetation within the project area. Determine the area or occurring in a few analy profition of "the vegetation and/or phone" of the vegetation of the veget	after western contact.	Cibotium glaucum (Sm.) Hook. & Arnott	ning n'ugah	endemic	uncommon	
and forming a major part of the vegetation within the project area. Tectaria Incica Cav. Incircant Carl State Stagbon Fern Family) Incircant Carl State	Technistic andire formition Technistic and the sector of	undance of each species within the project area:	DRYOPTERIDACEAE (Wood Fern Family)				
The second paraset of control of the second paraset of the second paras	The state of t	undant = forming a major part of the vegetation within the project area.	Tectaria incisa Cav.		non-native	rare	
The state of t	The state of t	portion of it.	GLEICHENIACEAE (False Staghorn Fern Family)				
1- only a few isolated individuals within the project area. HYMENOPHYLLACEAE (Filmy Fem Family) Gencornus minutus (Blume) Bosch LinkDSAEACEAE (Lindsaea Fem Family) Linkasea ensifolia Sw. Pada are Pada	i = only a few roolated individuals within the project area. HYMENOPHYLLACEAE (Filmy Fem Franity) Goncornus minute (Blune) Bosch LINDSAEACEAE (Lindsaea Fem Franity) <i>Goncornus minute</i> (Blune) Bosch LINDSAEACEAE (Lindsaea Fem Franity) <i>Lindsaea ersifolia</i> Sw. <i>Dintensis</i> (L.) Macon <i>Lindsaea ersifolia</i> Sw. <i>Dintensis</i> (L.) Macon <i>Lindsaea ersifolia</i> Sw. <i>Dintensis</i> (L.) Macon <i>Lindsaea ersifolia</i> Sw. <i>Dintensis</i> (L.) Macon <i>Lindsaea ersifolia</i> Sw. <i>Dintensis</i> (L.) Macon <i>Lindsaea</i> Eren Famity) <i>Lindsaea ersifolia</i> Sw. <i>Dintensis</i> (L.) Macon <i>Dintensis</i> (L.) Macon <i>Lindsaea</i> Eren Famity) <i>Lindsaea</i> Eren Famity <i>Lindsaea</i>	onnion – scauered sparsery unoughout ure area or occurring in a rew sman	Dicranopteris linearis (Burm.f.) Underw.	uluhe	indigenous	uncommon	
The set of the s	Goncomus minuta (Blume) Bosch indigenous ine LINDSAECEAE (Lindsae Fern Family) indigenous ine LINDSAECEAE (Lindsae Fern Family) indiana indigenous ine Lindsae ensiglia Sw. galaria indiano indigenous ine Splenomeris chinensis (L) Maxon palaria indigenous rate UYCOPDIACEAE (Club Moss Family) wowae fole indigenous rate Lycopodiella cerna (L) Pic. Sem. wowae fole indigenous rate NePHROLEPIDACEAE (Sword Fern Family) wowae fole indigenous rate	s = only a few isolated individuals within the project area.	HYMENOPHYLLACEAE (Filmy Fem Family)				
LINDSAEACEAE (Lindsaea Fem Family) Lindsaea ensifolia Sw. Lindsaea ensifolia Sw. Sphenomeris chinensis (L.) Maxon pala Ta LYCOPODIACEAE (Cub Moss Family) Lycopodiella cernua (L.) Pic. Sem. wawae 'lofe Nephrolepis brownii (Desv.) Hovenkamp & Miyam. Asian sword fern non-native	INDSAEACEAE (Lindsaea Fem Family) Lindsaea rensifolia Su. Lindsaea ensifolia Su. Sphenomeris (Lindsaea (Lindsaea Fem Family) VCOPOIACEAE (Club Mose Family) Lycopodialla cerma (L) Pic. Sem. Verbris Family) Lycopodialla cerma (L) Pic. Sem. Verbris Family) NePHROLEPIDACEAE (Sword Fem Family) Nephrolepis brownii (Des.) Hovenkamp & Miyam. Asian sword fem		Gonocornus minutus (Blume) Bosch		indigenous	rare	-
Indexace onsifolia Sw.	Lindsace ensifolia Sw. Image and the second secon		LINDSAEACEAE (Lindsaea Fem Family)				
7 Sphenomeris clinensis (L.) Maxon pala ä indigenous rare LYCOPODIACEAE (Club Moss Family) LYCOPODIACEAE (Club Moss Family) wawae 'tole indigenous rare NePHROLEPIDACEAE (Sword Fem Family) NePHROLEPIDACEAE (Sword Fem Family) Nen-native common	Sphenomeris chinensis (L.) Maxon pala ä indigenous rate LYCOPOIACEAE (Club Moss Family) LYCOPOIACEAE (Club Moss Family) mawae 'tole indigenous rate Lycopodiella cernua (L.) Pic. Serm. wawae 'tole indigenous rate NEPHROLEPIDACEAE (Sword Fern Family) wawae 'tole indigenous rate Nephrolepis brownii (Desv.) Hovenkamp & Miyam. Asian sword fern non-native common		Lindsaea ensifolia Sw.		non-native	rare	
LYCOPODIACEAE (Club Moss Family) Lycopodiella cernua (L.) Pic. Serm. wawae fole indigenous rare NEPHROLEPIDACEAE (Sword Fern Family) Nephrolepis brownii (Desv.) Hovenkamp & Miyam. Asian sword fern non-native common	Image: Difference of the model of the m		Sphenomeris chinensis (L.) Maxon	pala'ä	indigenous	rare	
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7 NEPHROLEPIDACEAE (Sword Fem Family) Nephrolepis brownii (Desv.) Hovenkamp & Miyam. Asian sword fem non-native common	7 NEPHROLEPIDACEAE (Sword Fern Family) Nephrolepis brownii (Desv.) Hovenkamp & Miyam. Asian sword fern non-native common		Lycopodiella cernua (L.) Pic. Serm.	wawae 'iole	indigenous	rare	
<i>Nephrolepis brownii</i> (Desv.) Hovenkamp & Miyam. Asian sword fern non-native common 7	<i>Nephrolepis brownii</i> (Desv.) Hovenkamp & Miyam. Asian sword fern non-native common 7		NEPHROLEPIDACEAE (Sword Fern Family)				
8	8		Nephrolepis brownii (Desv.) Hovenkamp & Miyam.	Asian sword fern	non-native	common	
8	8						
		7	8				

SCIENTIFIC NAME		SILLATI		SCIENTIFIC NAME	COMMON NAME	STATUS	ABUNDANCE
SUENTIFIC NAME	CUMMUN NAME	SIALUS	ABUNDANCE	Cordyline fruticosa (L.) A. Chev.	ki, ti leaf	Polynesian	uncommon
Neplirolepsis exaltata (L.) Schott subsp. hawaiiensis W.H. Wagner	ni'ani'au	endemic	uncommon	COMMELINACEAE (Spiderwort Family)			
POLYPODIACEAE (Polypody Fern Family)				Commelina diffusa N.L. Burm.	honohono	non-native	uncommon
Lepisorus thunbergianus (Kaulf.) Ching	päkahakaha	indigenous	rare	CYPERACEAE (Sedge Family)			
Phlebodium aureum (L.) J. Sm.	rabbit's-foot fern	non-native	uncommon	Cyperus polystachyos Rottb.		indigenous	uncommon
PSILOTACEAE (Whisk Fern Family)				Cyperus rotundus L.	nut sedge	non-native	rare
Psilotum mudum (L.) P. Beauv.	тоа	indigenous	rare	Kyllingia brevifolia Rottb.	kili'o'opu	non-native	rare
PTERIDACEAE (Brake Fern Family)				JUNCACEAE (Rush Family)			
4diantum hispidulum Sw.	rough maidenhair fern	non-native	common	Juncus bufonius L.	toad rush	non-native	rare
4diantum raddianum C. Presl	maidenhair fern	non-native	rare	LILIACEAE (Lily Family)			
^p ityrogramma austroamericana Domin	gold fern	non-native	rare	Hymenocallis pedalis Herbert	spider lily	non-native	rare
^p ityrogramma x mckenneyi W.H. Wagner	hybrid gold fern	non-native	rare	MUSACEAE (Banana Family)			
SELAGINELLACEAE (Spike Moss Family)				Musa acuminata x balbisiana Colla	banana	non-native	rare
Selaginella arbuscula Brack.	lepelepe a moa	endemic	rare	ORCHIDACEAE (Orchid Family)			
Selaginella kranssiana (Kunze) A. Braun	spreading selaginella	non-native	rare	Arundina graminifolia (D.Don) Hochreutiner	bamboo orchid	non-native	uncommon
THELYPTERIDACEAE (Marsh Fern Family)				POACEAE (Grass Family)			
Christella dentata (Forssk.) Brownsey & Jermy		non-native	rare	Andropogon virginicus L.	broomsedge	non-native	uncommon
Christella parasitica (L.) H. Lev.		non-native	common	Axonopus compressus (Sw.) P. Beauv.	carpetgrass	non-native	rare
Macrothelypteris torresiana (Gaud.) Ching		non-native	rare	Axonopus fissifolius (Raddi) Kuhlm.	narrow-reaved carpetgrass	non-native	uncommon
MONOCOTS				Briza sp.	quaking grass	non-native	rare
ARACEAE (Aroid Family)				Chloris radiata (L.) Sw.	plushgrass	non-native	rare
Philodendron scandens K. Kotch & Sello	heart-leaved philodendron	non-native	rare	Digitaria violascens Link	smooth crabgrass	non-native	rare
Xanthosoma robustum Schott	ape	non-native	rare	Eleusine indica (L.) Gaertn.	wiregrass	non-native	rare
ASPARAGACEAE (Asparagus Family)				Eragrostis pectinacea (Michx.) Nees	Carolina lovegrass	non-native	rare
				Melinis minutiflora P. Beauv.	molasses grass	non-native	common
6					10		

CIENTIFIC NAME	COMMON NAME	STATUS	ABUNDANCE	SCIENTIFIC NAME	COMMON NAME	STATUS	ABUNDANC
olinis ronons (Willd.) Zizka	Natal redton	non-native	rane	Schimus terebinthifolius Raddi	Christmas berry	non-native	uncommon
dismenus hirtellus (1.) P. Beaux.	hasketorass	non-native	Inncommon	APIACEAE (Parsley Family)			
	con Granon			Centella asiatica (L.) Urb.	Asiatic pennywort	non-native	rare
nicum maximum Jacq.	Guinea grass	non-native	abundant	ARALIACEAE (Ginseng Family)			
spalum conjugatum Bergius	Hilo grass	non-native	uncommon	Hydrocotyle sibthorpioides Lam.	marsh pennywort	non-native	rare
spalum urvillei Steud.	Vasey grass	non-native	rare	ASTERACEAE (Sunflower Family)			
misetum clandestimum Chiov.	Kikuyu grass	non-native	rare	Accenting riparia (Recel) R King & H Rohinson	Hämäkua namakani	non-native	rare
misetum purpureum Schumach.	Napier grass	non-native	uncommon				
charum officinarum L.	sugar cane	Polyneisan	rare	Ageratum conyzotaes L.	maile hohono	non-native	rare
ciolenis indica (L.) Chase	Glenwood prass	non-native	uncommon	Ageratum houstonianum Mill.	maile hohono	non-native	rare
irodumium condonuorum (V. mth) Naac	0	non notive	nominoon	Bidens pilosa L.	Spanish needle	non-native	rare
		1011-11011	nicominon	Conyza bonariensis (L.) Cronq.	hairy horseweed	non-native	rare
aria parvijiora (Poir.) Kerguelen	yellow foxtail	non-native	rare	Conyza canadensis (L.) Cronq.	horseweed	non-native	rare
orobolus africanus (Poir.) Robyns & Tournay	smutgrass	non-native	rare	Crassocephalum crepidioides (Benth.) S. Moore	redflower ragleaf	non-native	rare
vobolus diander (Retz.) P. Beauv.	Indian dropseed	non-native	rare	Erechtites valerianifolia (Wolf) D.C.	fireweed	non-native	-316
ochloa mutica (Forssk.) T.Q. Nguyen	California grass	non-native	rare	Hymochoeris vadicata L	oosmore	non-native	Lare
(GIBERACEAE (Ginger Family)							
ychium cornarium J. Konig	white ginger	non-native	rare	Montanoa Inbiscijolia Benth.	Christmas daisy	non-native	rare
brehium flavescens N. Carev ex Roscoe	vellow ginger	non-native	rare	Phichea carolinensis (Jacq.) G. Don	sourbush	non-native	rare
	0			Senecio madagascariensis Poir.	fireweed	non-native	uncommon
tychnum garanerianum Shephera ex Ker-Gawl.	kahili ginger	non-nauve	rare	Sphagneticola trilobata (L.) Pruski	wedelia	non-native	rare
giber zertmbet (L.) Sm.	'awapuhi	Polynesian	uncommon	Tithonia diversifolia (Hemsl.) A Grav	tree marigold	non-native	rare
COTS				BEGONIACEAE (Beconia Family)			
ANTHACEAE (Acanthus Family)							
stasia sp.		non-native	rare	Begonia hirtella Link BICNIONIA CEA E (Bimonia E-mila)		non-native	rare
ACARDIACEAE (Mango Family)							
s sandwicensis A. Gray	neneleau	endemic	uncommon	Spathodea campanulata P. Beauv BOMBACACEAE (Bombax Family)	African tulip tree	non-native	rare
II				1	12		

SCIENTIFIC NAME	COMMON NAME	STATUS	ABUNDANCE	SCIENTIFIC NAME	COMMON NAME	STATUS	ABUNDANCE
Pachira aquatica Aublet	Guiana chestnut	non-native	rare				
BRASSICACEAE (Mustard Family)				Desmodium intortum (Mill.) Urb.		non-native	rare
Rorippa sarmentosa (G. Forst.) J. F. Macbr.	pä'ihi	non-native	rare	Desmodium sandwicense E. Mey.	Spanish clover three-flowered	non-native	rare
CARYOPHYLLACEAE (Pink Family)				Desmodium triflorum (L.) DC	beggarweed	non-native	rare
Drymaria cordata (L.) Willd. ex Roem. & Schult.	pipili	non-native	rare	Indigofera suffruticosa Mill.	inikö	non-native	rare
CASUARINACEAE (She-oak Family)				Macroptilium lathyroides (L.) Urb.	wild bean	non-native	rare
Casuarina equisetifolia L.	common ironwood	non-native	abundant	Mimosa pudica L.	hilahila	non-native	rare
COMBRETACEAE (Indian Almond Family)				Trifolium repens L.	white clover	non-native	rare
Terminalia myriocarpa Van Heurk & Mull. Arg.	jhalna	non-native	rare	HYPERICACEAE (St. Johnswort Family)			
CONVOLVULACEAE (Moming Glory Family)				Hypericum mutilum L.		non-native	rare
Inomoea indica (J. Burn.) Merr.	koali awahia	indigenous	rare	LAMIACEAE (Mint Family)			
CRASSULACEAE (Stonecrop Family)		0		Hyptis pectinata (L.) Poit.	comb hyptis	non-native	rare
Bryophyllum pinnatum (Lam.) Oken	air plant	non-native	rare	LAURACEAE (Laurel Family)			
EUPHORBIACEAE (Source Family)	-			Persea americana Mill.	avocado	non-native	rare
Aleurites moluccana (L.) Willd.	kukui	Polvnesian	uncommon	LYTHRACEAE (Loosestrife Family)			
Chamaesyce hirta (L.) Millsp.	hairy spurge	non-native	rare	Cuphea carthagenensis (Jacq.) Macbr.	tarweed	non-native	rare
Chamasyce thymifolia (L.) Millsp.		non-native	rare	MALVACEAE (Mallow Family)			
Ricinus communis L.	Castor bean	non-native	rare	Sida acuta N.L. Burm.		non-native	rare
FABACEAE (Pea Family)				Sida rhombifolia L.	Cuban jute	non-native	rare
<i>Acacia</i> sp.		non-native	rare	MELASTOMATACEAE (Melastoma Family)			
Canavalia cathartica Thouars	maunaloa	non-native	rare	Clidemia hirta (L.) D. Don	Koster's curse	non-native	rare
Chamaecrista nictitans (L.) Moench	partridge pea	non-native	rare	Tibouchima herbacea (DC.) Cogn.	cane tibouchina	non-native	rare
Crotalaria brevidens Benth.	rattlepod	non-native	rare	MELIACEAE (Mahogany Family)			
Crotalaria micans Link	rattlepod	non-native	uncommon	Toona ciliata M. Roem.	Australian red cedar	non-native	rare
<i>Crotalaria pallida</i> Aiton	smooth rattlepod	non-native	rare	MENISPERMACEAE (Moonseed Family)			
Desmodium incanum DC	ka'imi clover	non-native	rare				
-	2						
-					-		

			÷				
SCIENTIFIC NAME	COMMON NAME	STATUS	ABUNDANCE	SCIENTIFIC NAME	COMMON NAME	STATUS	ABUNDANCE
Cocculus orbiculatus (L.) DC.	huehue	indigenous	rare	Passiflora edulis Sims	passion fruit	non-native	rare
MORACEAE (Mulberry Family)				PIPERACEAE (Pepper Family) Peneronia hlanda (Jaco) Kunth vor Aoribunda (Mio) H			
Ficus nota (Blanco) Merrill	rough-leaved fig	non-native	uncommon	Huber	'ala'alawainui	indigenous	rare
Ficus platypoda (Miguel) Miguel	rock fig	non-native	rare	PLANTAGINACEAE (Plantain Family)			
MYRSINACEAE (Myrsine Family)				Lidernia crustacea (L.) F.V. Mueller	false pimpernel	non-native	rare
Ardisia crenata Sims	Hilo holly	non-native	rare	Plantago lanceolata L.	narrow-leaved plantain	non-native	rare
Myrsine lessertiana A. DC.	kölea lan nui	endemic	rare	Plantago major L.	laukahi	non-native	rare
MYRTACEAE (Myrtle Family)				Torenia asiatica L.	Ola'a beauty	non-native	rare
Eucalyptus botryoides Sm.	bangalay	non-native	rare	Veronica serpyllifolia L.	thyme-leaved speedwell	non-native	rare
Eucalyptus robusta Sm.	swamp mahogany	non-native	rare	POLYGALACEAE (Milkwort Family)			
Metrosideros polymorpha Gaud.	öhi'a	endemic	common	Polygala paniculata L.	milkwort	non-native	rare
Psidium cattleianum Sabine	strawberry guava	non-native	common	POLYGONACEAE (Buckwheat Family)			
Psidium guajava L.	guava	non-native	uncommon	Persicaria glabra (Willd.) M. Gomez	kämole	non-native	rare
Syzygium jambos (L.) Alston	rose apple	non-native	rare	PROTEACEAE (Protea Family)			
OLEACEAE (Olive Family)				Grevillea robusta A. Cunn. ex R. Br.	silk oak	non-native	rare
Fraximus uhdei (Wenzig) Lingelsh.	tropical ash	non-native	rare	Macadamia integrifolia Maiden & Betche	macadamia nut	non-native	rare
ONAGRACEAE (Evening Primrose Family)				ROSACEAE (Rose Family)			
Ludwigia palustris (L.) Elliot	marsh purslane	non-native	rare	Erioboltya japonica (Thunb.) Lindl.	loquat	non-native	rare
OROBANCHACEAE (Broom-rape Family)				Rubus rosifolius Sm.	thimbleberry	non-native	rare
Castilleja arvensis Cham. & Schlectend.	Indian paintbrush	non-native	rare	RUBIACEAE (Coffee Family)			
OXALIDACEAE (Wood Sorrel Family)	'ihi'ai. vellow wood			Coffea arabica L.	Arabian coffee	non-native	rare
Oxalis corniculata L.	sorrel	Polynesian	rare	Kadua affinis DC.	manono	endemic	rare
Oxalis debilis Kunth	pink wood sorrel	non-native	rare	Oldenlandia corymbosa L.		non-native	rare
PASSIFLORACEAE (Passion Flower Family)				Psychotria hawaiiensis (A. Gray) Fosb.	köpiko 'ula	endemic	rare
				Spermacoce assurgens Ruiz & Pav.	buttonweed	non-native	rare
15				16			

	FAUNA SURVEY REPORT	SURVEY METHODS	A walk-through fauna survey method was conducted in conjunction with the bolanical survey	All parts of the project area including all habitat types were covered. Field observations were made with the aid thincoulars and hy listention to covalizations. Molece used are according	abudance, activities and location as well as observations of trails, tracks, scat and signs of feedi	In addition four evening visits were made to the area to record crepuscular activities and vocalizations and to see if there was any evidence of occurrence of the Hawaiian hoary bat	(Lasinnus cinereus semotus) in the area.	RESULTS	STEMMEN		Only sign of three mainting species were observed during nine site visits to the property. Taxonomy and nomenclature follow Tomich (1986).	Feral pig $(Sta Scrofa) - Pig$ sign was everywhere on the property. Pigs were seen and heard on	numerous occasions.	<u>Mongoose</u> (<i>Herpestes auropunctatus</i>) - A few mongoose were seen in the margins of the forest openings where they hunt for rodents and birds.	<u>Hawaiian hoary bat, '$\delta pe'ape'a}$ (<i>Lasiurus cinereus semotus</i>) - A single bat was sighted at about 1,600 feet elevation on one evening survey near the rock quarry.</u>	While not seen during the survey rats (<i>Rattus spp.</i>) and mice (<i>Mus domesticus</i>) would be common in this type of area where they would feed on seeds, fruits and herbaceous vegetation. Feral cats (Felis catus) would also be expected here. They would hunt for the rodents and birds.	A special effort was made to look for any occurrence of the native Hawaiian hoary bat by making four evening surveys on the property. When present in an area hese bats can be easily identified as they forage for insects, their distinctive flight patterns clearly visible in the glow of twilight. One bat was seen in this manner in one area around the rock quarry. In addition a bat detection device (Batbox IIID) was employed set to the frequency of $27,000$ to $28,000$ hertz which is typical for this bat species. The bat mentioned above was also detected at the same time using this device.	18
 ABUNDANCE	rare		rare		rare		rare	rare	rare		rare		rare					
STATUS	non-native		non-native		non-native		non-native	indigenous	non-native		non-native		non-native					
COMMON NAME			Mexican satinleaf		dog tail		pohā	pöpolo	kikania lei				öwī					17
CIENTIFIC NAME	permacoce sp.	APOTACEAE (Sapodilla Family)	Nrysophyllum mexicanum Brandegee	CROPHULARIACEAE (Figwort Family)	uddleia asiatica Lour.	OLANACEAE (Nightshade Family)	hysalis peruviana L.	olanum americanum Mill.	olanum capsicoides All.	TERCULIACEAE (Cacao Family)	1elochia unbellata (Houtt.) Stapf	'ERBENACEAE (Verbena Family)	tachytarpheta australis Moldenke					

BIRDS

Birdlife was fairly sparse in both diversity and numbers due to extensive Guinea grass and ironwood forest habitat. Only ten species of birds were seen during nine site visits. Taxonomy and nonnenclature follow American Ornithologists' Union (2005). Zebra dove (Geopelia striata) – These small doves were seen throughout the corridor feeding in small flocks in clearings and flying between trees.

<u>[apanese white-eye</u> (Zosterops japonicus) – Small groups of these small green birds were seen and heard twittering in trees throughout the property.

Chestnut mannikin (Lonchura Malacca) – Flocks of these small reddish-brown birds were seen feeding on grass seeds.

<u>Nutmeg mannikin</u> (Lonchura punctulata) – Small flocks of these mannikins were seen feeding on grass seeds, often in the company of chestnut mannikins.

<u>Spotted dove</u> (*Streptopelia chimensis*) – Several of these large doves were seen perched in trees and flying over the property.

<u>House finch</u> (*Carpodacus mexicanus*) – Small groups of these finches were found on this property where they associate with and feed on the seeds of common ironwood.

<u>Northern cardinal</u> (*Cardinalis cardinalis*) -A few cardinals were seen and heard calling from trees during both the day and evening surveys.

<u>Red-billed leiothrix</u> (*Leiothrix hutea*) – A few of these small colorful birds were seen and heard calling in forest trees mostly in the gulches.

<u>Hwannei</u> (*Garrulax canorus*) – A couple of these beautiful singers were heard warbling in gulch forests.

Kalii pheasant (Lophura lencomelanos) – These dark pheasants were heard calling in the forests and a few feathers were found.

Had the survey been extended, no doubt other non-native birds would have been seen but the habitat is not suitable for Hawaii's native forest birds which occupy forested uplands beyond the elevational range of mosquitoes and the avian diseases they carry. Two native birds, the endemic, Endangered 'io or Hawaiian hawk (*Buteo solitarius*) and the endemic pueo or Hawaiian owl (*Asio flammeus sauvicileusis*), are known to frequent wet windward forests where they prey on rodents and small birds. These two birds were looked for but were not seen during the survey.

No native seabirds, most particularly the Endangered petrel (*Pterodroma sanwichensis*) or the Threatened Newell's shearwater (*Puffinus auricularis newellii*) were found on the property nor were any burrows seen.

No Endangered nene or Hawaiian goose (*Branta sandvicensis*) were seen on the property. The habitat of dense forests and deep grasses is not suitable for these birds. They prefer lush green grass such as is found in irrigated lawns and golf courses or open lava shrublands.

INSECTS

While insects in general were not tallied, a good diversity of types were seen that no doubt helped fuel the diversity of birdlife seen. One native Sphingid moth, Blackburn's sphinx moth (*Manduca blackburn*) has been put on the Federal Endangered species list and this designation requires special focus (USFWS 2000). Blackburn's sphinx moth is known to occur in parts of West Hawaii and its feeding requirements are very specialized. It requires host plants in the nightshade family that are toxic, such as native species of 'aiea (*Nothocestrum spp.*) and such non-nigute alternative hosts as tobacco (*Nicotiana dancan)* and the elbaccon (*Nicotiana glanca*). None of these host species were found on the subject property and no Blackburn's sphinx moths or their larvae were seen.

Three Big Island endemic picture-wing flies have been listed as Endangered, (*Drosophila heteroneura*), (*D. multi*) and (*D. ochrobasis*). These are known from various locations on the island between elevations of 3,000 and 5,500 feet. None of their host plants occur within the project area and none of these species were observed.

DISCUSSION AND RECOMMENDATIONS

The fauna of the property were low in both numbers and diversity due to the condition of the hDiat. The dense Guinea grass and common fromwood vegetation offers little that would attract most mammal and bird species. With the exception of the Hawaiian hoary bat, all mammal and birds species were non-native, and only the feral pig appears to be common to abundant throughout. Feral pigs are able to burrow through the dense vegetation to access all part of the property. They spend most of their time in the gulches, however, where they intensively plow up the terrain in search of edible roots and earthworms. Hunters actively pursue these pigs and many are taken but the dense vegetation makes it difficult for the hunters to be effective at controlling the population at moderate levels. While only one bat was seen during four evening surveys, these bats are known to be widespread on the Big Island and not uncommon in some area. They are also highly mobile, moving up and down mountain slopes and from one district to another. These movements are no doubt linked to food source availability. It is likely that more bats would be detected at another time on this property. While consideration for these endangered bats and their habitat is required, the proposed action associated with this property involves no changes in land use and there will be no impacts on the habitat. No recommendations regarding the Hawaiian hoary bat are suggested.

	ABUNDANCE		abundant	uncommon	ed rare		common	uncommon	uncommon	uncommon	rare	rare	rare	rare	rare						
	STATUS		non-native	non-native	endemic, Endanger		non-native	non-native	non-native	non-native	non-native	non-native	non-native	non-native	non-native						
	SCIENTIFIC NAME		Sus scrofa	Herpestes auropunctatus	Lasirus cinereus semotus		Geopelia striata	Zosterops japonicus	Lonchura malacca	Lonchura punctulata	Streptopelia chinensis	Carpodacus mexicanus	Leiothrix lutea	Garrulax canorus	Lophura leucomelanos						22
	COMMON NAME	MAMMALS	Pig	Mongoose	'öpe'ape'a, Hawaiian bat	BIRDS	Zebra dove	Japanese white-eye	Chestnut mannikin	Nutmeg mannikin	Spotted dove	House finch	Red-billed leiothrix	Hwamei	Kalij pheasant						
Hawaiian hawk and the pueo were not detected during the survey but are known from this he Big Island. The hawk in particular is Endangered and carries this status and associated	protections with it wherever it goes. It would be expected to occasionally visit this y and should be watched for. No impacts on this species, however, are expected to result is project action.		conclusion there is little that is unique about the degraded habitat on this property that would it more special or important for native animal or bird species. Moreover, no immediate	es in land uses will result from this transaction. The proposed sale of the 1,738 acres of r suear cane lands in the Kanulena Allotment is not expected to have a significant negative	t on the fauna resources in this part of Hämäkua District.		ANIMAL SPECIES LIST	wing is a checklist of the animal species inventoried during the field work. Animal species	range in descending abundance within two groups. Mammals and Birds. For each species		Common name	Scientific name	Bio-geographical status. The following symbols are used: endemic = native only to Hawaii; not naturally occurring anywhere else	in the world. indicements – notices to the Hauvaitan Islands and also to one or more	nuigenous - natve to the analism status and also to one of inote other geographic area(s).	non-native = ait nose animals orought to rawait intentionary or accidentally after western contact. . migratory = spending a portion of the year in Hawaii and a portion elsewhere. In Hawaii the migratory birds are usually in the overwintering/non-breeding phase of their life cycle.	. Abundance of each species within the project area: abundant = many flocks or individuals seen throughout the area at all	times of day. common = a few flocks or well scattered individuals throughout the	uncommon = only. project area.	rare = only one or two seen within the project area.	21

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ABSTRACT At the request of PBR Hawaii and Associates, (SCS) conducted an archaeological inventory survey on a 1,738.377-acre parcel [TMK: (3) 47-05:01, 05, 06, 07, 10, 18, and 20 ¹¹ , Niupuka, and Hanabae, Kapoula, Kapulena, Wai'ale'ale 1 ⁴¹ and 2 ⁴¹ , Waiköloa 1 ⁴³ and 2 ²¹⁴ , Niupuka, and Hanapai, <i>mauka</i> of Kapulena, in Hämäkua District, Hawai'i Island. The parcel extends from 960ft (293m) to 2,160ft (659m) above mean sea level (ams). Scientific Consultant Services (SCS), Inc. conducted an archaeological inventory survey of the property to identify and evaluate historical properties pursuant to state cultural resource management regulations (HAR § 275 and 276). Seventeen sites comprised of 28 features were recorded during the archaeological inventory survey. Four of the site (2388, 2391), 25392, and 28394) were rockshelters used internitently for temporary habitation during the pre-Contact Era. One site (2383) was a disturbed multi-tier platform that might be the remains of a <i>heiru</i> known to have existed in Kapulena Alupua'a. The vast majority of features (n=20) were rock mounds, terraces, rock walls, and drainage ditches associated with Historic Era sugarcane cultivation.	Three stratigraphic trenches (3.0m square total) and eight test-units (6.25m square total) were excavated at eight sites. All of the sites were assessed as significant under criterion D as outlined in Hawai'i Administrative Rules §13-275-6. Site 28385 was also assessed as significant under criterion E. Data recovery is recommended at Site 28385 to determine if the platform is the remains of a <i>heiau</i> . If future data recovery determines it is a <i>heiau</i> , a preservation plan will be written to protect and interpret the site. Documentation obtained during the present study was sufficient to determine the temporal association and function of all of the other sixteen sites. No further work is recommended for any of the features at the remaining sixteen sites.		
AN ARCHAEOLOGY INVENTORY SURVEY REPORT AN ARCHAEOLOGY INVENTORY SURVEY REPORT ON 1,738.377 ACRES IN MALANAHAE, KAPOAULA, KAPULENA, WAI'ALE'ALE 1 ST AND 2 ND , WAIKÔLOA 1 ST AND 2 ND , NIUPUKA, AND HANAPAI AHUPUA'A, HÃMÃKUA DISTRICT, ISLAND OF HAWAI'I [TMK: (3) 4-7-05:01, 02, and 03, and (3) 4-7-06: 01, 05, 06, 07, 10, 18, and 20]	Prepared by: Glenn G. Escott. M.A. May 2010 Draft	Prepared for: PBR Hawaii & Associates 1001 Bishop Street, Suite 650 Honolulu, HI 96813	

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 Table 1: Inventory of Sites in Project Area.

 Table 2: Site Significance and Recommended Treatments.

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INTRODUCTION

At the request of PBR Hawaii and Associates, Scientific Consulting Services (SCS) conducted an archaeological inventory survey on a 1,738.377-acre parcel [TMK: (3) 4.7-05:01, 02, and 03, and (3) 4.7-06: 01, 05, 06, 07, 10, 18, and 20] in the *alupua* 'a of Malanahae, Kapoula, Kapulena, Wai'ale'ale 1st and 2^{ad}, Waiköloa 1st and 2^{ad}, Niupuka, and Hanapai, *mauka* of Kapulena in Hāmākua District, Hawai'i Island (Figure 1, 2, and 3). The parcel extends from 960ft (293m) to 2.160ft (659m) above mean sea level (ams1). The project area was used for over one hundred years to grow sugarcane. The parcel was last owned by the Hamakua Sugar Company and is presently owned by Hawai'i County.

Scientific Consultant Services (SCS), Inc. conducted an Archaeological Inventory Survey of the property to identify and evaluate historical properties pursuant to state cultural resource management regulations (HAR § 275 and 276). Seventeen sites comprised of 28 features were recorded during the archaeological inventory survey. Four of the sites (28388, 28391, 28392, and 28394) were rockshelters used intermittently for temporary habitation during the pre-Contact Era. One site (28385) was a disturbed multi-tier platform that might be the remains of a *lieiuu* known to have existed in Kapulena Ahupua'a. The vast majority of features (n=20) were rock mounds, terraces, rock walls, and drainage ditches associated with Historic Era sugarcane cultivation.

PHYSICAL SETTING

The project is approximately 960ft (293m) to 2,160ft (659m) above mean sea level (amsl). The substrate is Mauna Kea lava flows that are more than 10,000 years old (Wolfe and Morris 1996). The three soil types identified in the project area are Honokaa series silty clay loam (HsD, HsE, and HTD) with 0% to 30% slopes, Kukaiau series silty clay loam (KuD and KuE) with 12% to 20% slopes, and rough broken land (RB) along the steep narrow gulches (Sato *et al.* 1973). Annual rainfall is from 80 to 120 inches. The project area slopes primarily to the north and slightly to the east.

Vegetation on the project area consists primarily of introduced grasses and trees, including guinea grass (Urochloa maxima), ironwood (Castuarina equisetifolia), and guava trees (Psiditum sp.). The project area has been used as sugarcane fields since the early post-Contact times. Aerial photographs from 1990 show that the majority of the property was bulldozed and used for sugarcane agriculture (Figure 4). Non-native species of grass, brush, and trees are





METHODOLOGY

ARCHIVAL METHODS

In addition to referencing available resources at SCS, archival research was conducted in the State Historic Preservation Division (SHPD) report database and library facility (Hilo, HI), the Hawaii County land records office, the *Waihona 'Aina Mahele* database website, the Hawaiian collections holdings at the University of Hawai'i-Hilo Library, and the Hawaii State Library system. Archival work consisted of general research on the history and archaeology of the project area, as well as specific searches of previous archaeological studies in and around the subject parcel. Historic land use data, land ownership, maps, and narrative information were obtained from the Hawaii County land records office, the *Waihona 'Aina Mahele* database website, and the University of Hawaii', Hilo, Special Collections.

FIELD METHODS

Inventory Survey work was conducted in November and December, 2009 (200 manhours total) by Tomasi Patolo, B.A.; Guerin Tomei, B.A.; Jon Wilson, B.A.; and Glenn Escott, M.A. (Project Director). Robert Spear, PhD was the Principal Investigator for the project. There were four main field components to Inventory Survey process: pedestrian survey of the entire project area; plotting located sites on a project area map with Global Position System (GPS) Universal Transverse Mercator (UTM) units (Zone 5 North) using WSG84 datum for all four sites; individual site mapping and recording; and hand excavations. Survey was conducted along east/west traverse lines. Observed surface midden, features, or anomalies were assigned temporary feature numbers. The site UTM was recorded at the site datum, which is marked with a metal tag.

Some sites were selected for test excavation to determine several site characteristics including site function, construction method, and temporal placement. Two types of hand excavation were utilized depending on the size of features and desired percentage to be excavated, desired percentage of screening, and overall goals of excavation: Test Units (TU) and, Stratigraphic Trenches (ST). Test-units were excavated in natural and ten centimeter arbitrary levels. These were used on features that were thought to have a high potential for yielding occupational or temporal data, and used where vertical control would contribute to this data. This type of excavation was screened for cultural material through $1/8^{th}$ inch mesh, and all units were stratigraphically

profiled. A single 1.0×0.5 meter stratigraphic trench was excavated to examine soil stratigraphy and feature construction.

All excavated matrices were screened through both quarter inch and eighth-inch mesh. Cultural material was recorded by type on standard SCS excavation forms and collected. Soil colors were recorded using Munsell color charts, soil composition was recorded with the aid of the U.S. Department of Agriculture Soil Survey Manual on standard soil stratigraphy forms, and profiles were drawn. Overview photographs were taken of individual site features, sites, excavations, and the project area. Color photographs were taken with a 3.2 mega-pixel digital camera using a 20 cm long north arrow scale divided into 10 cm black and white increments.

LABORATORY METHODS

Inventory of midden and artifacts collected from the text excavations were analyzed and weighed. All field notes, maps, cultural material, and photographs pertaining to this project are currently being curated at the SCS facilities on the Island of Hawai'i.

CULTURAL AND HISTORICAL BACKGROUND

HAWAHAN LAND DIVISIONS AND SETTLEMENT Initial settlement of the high Hawaiian Islands is believed to have of

Initial settlement of the high Hawaiian Islands is believed to have occurred along the wetter and more fertile windward coasts where "conditions were optimal for marine and terrestrial exploitation along lines followed previously in Eastern Polynesia" (Green 1980:1). This exploitation involved inshore and pelagic fishing, gathering shellfish from the shore and strand, plant and animal husbandry, and the utilization of natural terrestrial flora and fauna (Kirch and Kelly 1975; Pearson *et al.* 1971; Kirch 1985). The pattern of this early settlement is thought to have consisted of widely spaced, permanent home bases that gradually expanded to form a nearly continuous zone of permanent settlement along the windward coasts as local populations grew.

There is a paucity of prehistoric information pertaining to the lands of the project area and surrounding lands (Cordy 2000:216-217). The project area is located in a traditionally sparsely populated area along the high cliffs of the Hāmākua coast. It has poor access to marine resources and is far from the sociopolitical population center of Hilo to the east, and just outside of the Waipi'o Valley and Waimea to the west. Though a coastal trail was used to travel along the Hāmākua, much of the travel between Hilo and Waipi'o was done by sailing canoe. The project areas is not at the nexus of a trail system, and much of the cross-island travel was

conducted on trails that crossed the saddle between Mauna Kea, Maun Loa, and Huālalai (Figure 5).



WAHI PANA (LEGENDARY PLACES)

The *ahupua* 'a of Malanahae, Kapoaula, Kapulena, Wai'ale'ale 1st and 2nd, Waiköloa 1st and 2nd, Niupuka, and Hanapai are traditional Hawaiian land divisions situated between the 200 foot high cliffs of the Hāmākua coast and the uplands. Kapoaula and Waiköloa are the longest *mauka/makai* and reach elevations of roughly 3,000ft amsl and 2,600ft amsl, respectively. The remaining ahupua'a reach an upper elevation of approximately 1,600ft amsl. Kapulena is named for the king shark of Hāmākua (Pukui *et al.* 1974:90). Waiköloa is the name of a wind, and is the name of the gulch that runs through the ahupua'a. Waiköloa is translated literally as "water pulling far" (Pukui *et al.* 1974:223). Wai'ale'ale is translated literally as "rippling or overflowing water (Pukui *et al.* 1974:220). No references to the names of the four remaining *ahupua* 'a are available.

PREHISTORIC AND HISTORIC ACCOUNTS OF THE KAPULENA AREA

No published prehistoric accounts of named places within the project area are recorded by Kamakau, I'i, Kalakaua, or Fournander. Cordy, using leaders of O'ahu and their exploits at Waipi'o, suggests that there was a ruling polity at Waipi'o that likely controlled lands of the Hāmākua (Cordy 2000: 141-142). Kamakau (1992) records that Kamehameha camped at Laupāhoehoe during his battles to conquer the Island of Hawai'i. The Reverends William Ellis and Asa Thurston traveled through lands of the project area on their way to Waipi'o in 1823. They met a small group of people at Malanahae, and continued on to Kapulena where they preached to an assembly of about one hundred people (Ellis 2004:357). The path from Kapulena to Waipi'o was crooked and bordered on both sides by tall grass and well-cultivated "plantations." Ellis described the bottom of the Waipi'o Valley as

one continued garden, cultivated with taro, bananas, sugar-cane, and other productions of the island, all growing luxuriantly. Several large ponds were also seen in different directions, well stocked with excellent fish. A number of small villages, containing from twenty to fifty houses each, stood along the foot of the mountains, at unequal distances on each side, and extended up the valley till projecting cliffs obscured the view (Ellis 2004:360). Ellis also visited several *heian* at Waipi'o. It was said that one of the *heian* was used by 'Umi a Liloa (ruled A.D 1600-1620) to make sacrifices after conquering the six *moku* of the Island of Hawai'i (Ellis 2004;366). Ellis also described Pakarana [Paka'alana *heian*], the place of refuge (Pu'uhonua) at Waipi'o. The compound was smaller than that at Honaunau and had a

Figure 5: Hawai'i Island Trail Systems.

small house containing the bones of Līloa. Both King Kamehameha and King Liholiho made offerings at the small house when they visited Waipi'o (Ellis 2004: 367).

Ellis and Thurston counted 256 houses in the valley and estimated the population to be about 1,325 people (Ellis 2004: 368). He also noted there were populous villages on the coast on either side of the valley. He pointed out that the Waipi'o Valley has been historically a place of socio-political power along the Hāmākua coast. In 1872, Isabella Bird traveled by horseback along the Hāmākua from Onomea to the Waipi'o Valley and described the landscape she travelled through. The journey was over very rough and steep trails, and took five days. Bird noted "this is the most severe road on horses on Hawaii, and it takes a really good animal to come to Waipi'o and go back to Hilo (Bird 2007:85). The description that follows underscores the sparsely populated Hāmākua area:

From Onomea to the place where we expected to find the guide, we kept going up and down the steep sides of ravines, and scrambling through torrents till we reached a deep and most picturesque gulch [Kawainui], with a primitive schoolhouse at the bottom, and some grass-houses clustering under palms and papayas, a valley scene of endless ease and perpetual afternoon. Here we found that D.'s uncle, who was to have been our guide, could not go, because his horse was not strong burgh, but here cousin volumetered his secont, and went away to catch his horse, while we tethered ours and went into the school-house.

This reminded me somewhat of the very poorest schools connected with the Edinburgh Ladies' Highland School Association, but the teacher had a remarkable paucity of clothing, and he scemed to have the charge of his baby, which, much clothed, and indeed much muffled, lay on the bench beside him. For there were benches, and a dexis, and even a blackboard and primers down in the deep wild gulch, where the music of living waters, and the thunderous roll of the Pacific, accompanied the children's tuneless voices as they sang an Hawaiian hymn. I shall remember nothing of the scholars but rows of gleaming white teeth, and splendid brown eyes. I though the pretry rigidly enforced law, which compels all were lamentably few, though the pretry rigidly enforced law, which compels all evildren between the ages of isx and fifteen to attend school for forty weeks of the year, had probably gathered together all the children of the district. They all wore coloured chemises and leis of flowers (Bird 2007:85). We had a perfect day until the middle of the afternoon. The dimpling Pacific was never more than a mile from us as we kept the narrow track in the long green grass; and on our left the blunt snow-patched peaks of Mauna Kea rose from the girdle of forest, looking so delusively near that I fancied a two-hours' climb would thate us to his lofty summit. The track for twenty-six miles is just in and out of gulches, from 100 to 800 feet in depth, all opening on the sea, which sweeps

into them in three booming rollers. The candle-nut or kukui (aleurites triloba) tree, which on the whole predominates, has leaves of a rich deep green when mature, which contrast beautifully with the flaky silvery look of the younger foliage. Some of the shallower gulches are filled exclusively with this tree, which in growing up to the light to within 100 feet of the top, presents a mass and density of leafage quite unique, giving the gulch the appearance as if billows of green had rolled in and solidified there. Each gulch has some specially of ferms and trees, and in such a distance as sixty miles they vary considerably with the variations of soil, climate, and temperature. But everywhere the rocks, trees, and soil are covered and crowded with the most exquisite ferms and mosses, from the great tree-fern, whose bright fronds light up the darker foliage, to the lovely maidenhair and graecful selaginelias which are mirrored in pools of sparkling water. Everywhere, too, the great blue morning glory opened to a heaven not bluer than itself.

heavy shadow, and each experience increases one's apprehensions concerning the leaves, and its grey, wintry, desolate-looking branches reminded me that there are smooth round green fruit upon them, and on reaching them finding that they were of the fruit, foliage, and vegetation is an intense delight to me. I should like to see treasures impartially, and out of cool depths of ferns rose the feathery coco-palm, of an endless spring. Imagine my surprise on seeing at the bottom of one gulch, a orange trees, their great size, far exceeding that of the largest at Valencia, having the islands, would look by contrast. We passed through a long thicket of sumach, whose aerial roots support it in otherwise impossible positions, and in others the crimson blossoms borne on the old wood, blazing among its shining many-tinted and innumerable other trees, shrubs, and lianas, in the beauty and bounteousness oval, shining, dark leaves, much crimped at the edges, bright green berries along how the rigid aspect of a coniferous tree, of which there is not one indigenous to less-favoured parts of the world, and that you are among mist, cold, murk, slush, The descent into the gulches is always solemn. You canter along a bright breezy the glorious breadfruit, with its green melon-like fruit, the large ohia, ideal in its beauty,---the most gorgeous flowering tree I have ever seen, with spikes of roseprevented me from recognizing them earlier! In another, some large shrubs with upland, and are suddenly arrested by a precipice, and from the depths of a forest blossoms on solitary axillary stalks, and yellow fruit was universal. The novelty leafage,---the tall papaya with its fantastic crown, the profuse gigantic plantain, the stalks, and masses of pure white flowers lying flat, like snow on evergreens, sombre ohia, yet there were some grand clefts in which nature has mingled her which must be crossed, and one reluctantly leaves the upper air to plunge into grove of good-sized, dark-leaved, very handsome trees, with an abundance of turned out to be coffee! The guava with its obtuse smooth leaves, sweet white an exotic from North America, which still retains its old habit of shedding its abyss a low plash or murmur rises, or a deep bass sound, significant of water next. Though in some gulches the kukui preponderates, in others the lauhala gales, leaflessness, and all the dismal concomitants of an English winter.

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surges, which came up as if bent on destruction. The path by which we descended looked a mere thread on the side of the precipice. I don't know what the word beetling means, but if it means anything bad, I will certainly apply it to that pali. A number of disastrous-looking native houses are clustered under some very tall	We moved on in single file at a jog-trot wherever the coard admitted of it, meeting mounted on the surf is a most weight of the guide, but it is a most wretched situation; the roar of the surf is deafening, the scanty supply of water is brackish, there are numours that leprosy is rife, and the people are said to be the poorest on Hawaii (Bird 2007:87-91). We moved on in single file at a jog-trot wherever the road admitted of it, meeting mounted natives now and then, which led to a delay for the exchange of nulou;	and twice we had to turn into the thicket to avoid what here seems to be considered a danger. There are many large herds of semi-wild bullocks on the mountains, branded cattle, as distinguished from the wild or unbranded, and when they are wanted for food, a number of experienced vaccheros on strong shod horses go up, and drive forty or fifty of them down. We met such a drove bound for Hilo, with one or two men in front and others at the sides and behind, uttering loud shouts. The bullocks are nearly mad with being hunted and driven, and at times rush like a living tornado, tearing up the earth with their horns. As soon as the galloping riders are seen and the crooked-horned beats, you retire behind a	screen. Increments the some tradition of some one naving been knocked down and hurt, for reckless as the natives are said to be, they are careful about this, and we were warmed several times by travellers whom we met, that there were "bullocks ahead." The law provides that the vaccheros shall station one of their number at the head of a gulch to give notice when cattle are to pass through. We jogged on again till we met a native who told us that we were quite close to our destination; but there were no signs of it, for we were still on the lofty uplands, and the only prominent objects were huge headlands confronting the sea. I got off to walk, as my mule seemed footsort, hurd had tot gome many yards when we came suddenly to the verge of a pall, abourt 1,000 feed deep [Waipio], with a narrow fertile valle below, with a yet nigher pali on the other side, both butting perpendicularly on the sea. I should think the valley is not more than three miles long, and it is walled in py high inaccessible mountains. It is in fact, a gulch on a	vastly entarged scale. Ine prospect below us way very charming, a retruit region perfectly level, protected from the sca by sandhills, watered by a winding stream, and bright with fishponds, meadow lands, kalo patches, orange and coffee groves, figs, breadfruit, and palms. There were a number of grass-houses, and a native church with a spire, and another up the valley testified to the energy and aggressiveness of Rome (Bird 2007:94-95). Bird's host in Waipi'o was Halemanu, a member of the legislature and the deputy sheriff. Halemanu expressed a sadness for the dwindling of the Hawaiian population. Forty years earlier (<i>circa</i> 1832) there were approximately 1,300 inhabitants in the Waipi'o Valley (Bird 2007:100).	13
derful that people should have thought of crossing these gulches on y with four legs. Formerly, that is, within the last thirty years, the es could only be ascended by climbing with the utmost care, and ed by being lowered with ropes from crag, and from tree to tree, nging on by the hands became impracticable to even the most	The function of the set of the theorem of Mr. Lyons were let reach the gospel to the people of the theor populous valleys. But within its, narrow tracks, allowing one horse to pass another, have been cut sides of these precipices, without any windings to make them easier, leviating enough from the perpendicular to allow of their descent by the d maive-born animals. Most of them are worn by water and animals' an, rugged, jagged, with steps of rock sometimes three feet high,	by breakage here and there. Up and down these the animals slip, jump, ble, some of them standing still until severely spurred, or driven by from behind. Then there are softer descents, slippery with damp, and n heavy rains, down which they slide dexterously, gathering all their legs m. On a few of these tracks a false step means death, but the vegetation thes the pail below, blinds one to the risk. I don't think anything would to go up a swinging zigzag—up a terrible pali opposite to me as I sides of which are quite undraped.	Inclusion for the first twenty-tour must scontain running water, the great gulch we crossed early yesterday, has a river with a smooth bed as wide mues at Eion. Some have only small quiet streams, which pass gently erry grottoes. Others have firere strong torrents dashing between abrupt ock, among immense boulders into deep abysses, and cast themselves pice after precipice into the ocean. Probably, many of these are the first forrents, whose jagged masses of a-a have since been wom smooth, elled into holes by the action of water. A few are crossed on narrow ut the majority are forded, if that quiet conventional term can be applied tent floruderings by which the horses bring one through. The cy deceives them, and however deep the water is, they always try to lift effect out of it, which gives them a diagreeable rolling motion. (Mr. in his valuable monograph on the Hawaiian volcanoes quoted below, s much impressed with these gulches as I am.)	ed in one glorious valley, and Kaluna made drinking cups which held it, out of the beautiful leaves of the Arum esculentum. Towards turbid-looking clouds lowered over the sea, and by the time we reached pali of all, the south side of Laupahochoc, they burst on us in torrents of manied by strong wind. This terrible precipice takes one entirely by alloma, who node first, disappeared as and besides that it hought he had it is merely a dangerous broken ledge, and besides that it looks as if couly foothold for a goat, one is dizzied by the sight of the foaming mediately below, and, when we actually reached the bottom, there was row strip of shingle between the stupendous cliff and the resounding	12

At the time of Bird's visit there were no more than 200. Bird also wrote about a few of the major, traditional Hawaiian institutions established at Waipi'o, including:

the Puhonua, or place of refuge for all this part of the island. This, and the very complete one of Honaunau, on the other side of Hawaii, were the Hawaiian "Cities of Refuge." Could any tradition of the Mosaic ordinance on this subject have travelled hither? These two sanctuaries were absolutely inviolable. The gates stood perpetually open, and though the fugitive was liable to be pursued to their very threshold, he had no sooner crossed it than he was safe from king, chief, or avenger. These gates were wide, and some faced the sea, and others the mountains. Hither the murderer, the manslayer, the tabu-breaker fled, repaired to the presence of the idol, and thanked it for aiding him to reach the place of security. After a certain time the fugitives were allowed to return to their families, and none dared to injure those to whom the high gods had granted their protection. In time of war, tall spears from which white flags were unfurled, were placed at each end of the enclosure, and until the proclamation of peace invited the vanquished to enter. These flags were fixed a short distance outside the walls, and no pursuing warnor, even in the hot flush of victory, could pursue his routed foe one foot beyond. Within was the sacred pale of palut tabu, and anyone attempting to strike his victim there would have been put to death by the priests and their adherents. In war time the children, ind party the priests and their adherents. In war time the children, ind party the priests and their neighbouring districts, were received within the enclosure, where they awaited the issue of the conflict in security, and were safe from violence in the even of defeat. These pulnoturas contain pieces of stone weighing from two to three tons, raised six feet from the ground, and the walls, narrowing gradually towards the nonuments of humanity in the midst of the barbarous institutions of heathenism, and it shows a considerable degree of enlightenment that even rebels in arms and fugitives from invading armies were safe, if they reached the sacred refuge, for the priests of Keawe knew no distinctions of party. In dreadful contrast to this place of mercy, there were some very large heiaus (or temples) here, on whose hideous altars eighty human ascrifices are said to have been offered at one time. One of the legends told me concerning this lovely valley, is, that King Umi, having vanquished the kings of the six divisions of Hawaii, was ascrificing captives in one of these heiaus, when the voice of his god, Kuahilo, was heard from the clouds, demanding more slaughter. Fresh human blood streamed from the altars, but the insatiable demon continued to call for more, till Umi had sacrificed all the captives and all his own men but one, whom he at first refused to give up, as he was a great favourite, but Kuahilo thundered from heaven, till the favourite warrior was slain, and only the king and the sacrificing priest remained.

This valley of the "vanquished waters" abounds in legends. Some of these are about a cruel monster, King Hooku, who lived here, and whose memory, so fait as he is remembered, is much execrated. It is told of him that if a man were said to have a handsome head he sent some of his warriors to behead him, and then hacked and otherwise disfigured the face for a diversion. On one occasion he ordered a man's arm to be cut off and brought to him, simply because it was said to be more beautifully tattooed than his own. It is fifty-four years since the last human sacrifice was exposed on the Waipio altars, but there are several old people here who must have been at least thirty when Hawaii threw off idolatry for ever (Bind 2007:100-101). Bird also described the sugar plantation at Kaiwiki, east of the project area. It was one of the first sugar mills established on the Island of Hawai'i. The Hamakua Mill Company and the Pacific Sugar Mill Company had not yet been established at the time of her journey. Those two companies were established in 1877 and 1878, respectively. The Pacific Sugar Mill Company was located at Kukuihaele, and the Kaiwiki Mill Company was located further east at '0'ōkala. Her description of the Kaiwiki Mill follows:

Then there is the sugar plantation of Kaiwiki, with its patches of bright green cane, its flumes crossing the track above our heads, bringing the cane down from the upland cane-fields to the crushing-mill, and the shifting, busy scenes of the sugar-boiling season.

in the mud to a deep broad stream. This is a most picturesque spot, the junction of hideous aspect, and leaped out on the other side to climb a track cut on the side of parties of natives, all flower-wreathed, talking and singing, coming gaily down on hibiscus, were it not for their exceeding beauty, would almost pall upon one from asking and receiving nuhou, or news, at the doors. Our accustomed horses leaped poor and pale as compared with that of tropical Hawaii. Palms, candlenuts, ohias, Then the track goes down with a great dip, along which we slip and slide vegetation merits the term "dazzling." We think England green, but its colour is grouped close by under some palms, with the customary loungers on horseback, their abundance, and each gulch has its glorious entanglement of breadfruit, the large-leaved ohia, or native apple, a species of Eugenia (Eugenia Malaccensis), their sure-footed horses, saluting us with the invariable "Aloha." Every now schoolhouse, or a group of scholars all ferns and flowers. The greenness of the a precipice, which would be steep to mount on one's own feet. There we met and the pandanus, with its aerial roots, all looped together by large sky-blue into a ferry-scow provided by Government, worked by a bearded female of two clear bright rivers, and a few native houses and a Chinaman's store are and then we passed native churches, with spires painted white, or a native convolvuli and the running fern, and is marvellous with parasitic growths.

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The unique beauty of this coast is what are called gulches— narrow deep ravines or gorges, from 100 to 2,000 feet in depth, each with a series of cascades from 10 to 1,800 feet in height. I dislike reducing their glories to the baldness of figures, but the depth of these clefts (originally, probably, the seams caused by fine torrents), cut and worn by the fierce streams feed by the snows of Mauna Kea, and the rains of the forest belt, cannot otherwise be expressed. The cascades are most truly beautiful, glearning white among the dark depths of foliage far away, and falling into deep limpid basins, festooned and overhung with the richest and greenest vegetation of this prolific climate, from the huge-leaved banana and shining breadfruit to the most feathery of ferms and lycopodiums. Each gulch opens on a velvet lawn close to the sea, and most of them have space for a few grass houses, with occoanut trees, bananas, and kalo patches. There are sixty-nine of these extraordinary chasms within a distance of thirty miles!

hope that I am not too old, as I feared I was, to learn a new mode of riding, for my occasional fears of an ignominious downfall. I even wish that you could see me in my Rob Roy riding dress, with leather belt and pouch, a lei of the orange seeds of your stirrups, at a right angle with the horse's head, and up, grasping his mane to prevent the saddle slipping. He goes down like a goat, with his bare feet, looking cautiously at each step, sometimes putting out a foot and withdrawing it again in which are nothing better than ledges cut on the sides of precipices, for one goes up and down not only in perfect security but without fatigue. I am beginning to the pandanus round my throat, jingling Mexican spurs, blue saddle blanket, and companions rode at full speed over places where I should have picked my way carefully at a foot's pace; and my horse followed them, galloping and stopping I think we came through eleven, fording the streams in all but two. The descent into some of them is quite alarming. You go down almost standing in favour of better footing, and sometimes gathering his four feet under him and sliding or jumping. The Mexican saddle has great advantages on these tracks, short at their pleasure, and I successfully kept my seat, though not without Rob Roy blanket strapped on behind the saddle! This place is grandly situated 600 feet above a deep cove, into which two beautiful gulches of great size run, with heavy cascades, finer than Foyers at its best, and a native village is picturesquely situated between the two. The great white rollers, white by contrast with the dark deep water, come into the gulch just where we forded the river, and from the ford a passable road made for hauling user ascends to the house. The air is something absolutely delicious; and the nummur of the rollers and the deep boom of the cascades are very soothing. There is little rise or soft, like that made by a train in a tunnel.

We were kindly welcomed, and were at once "made at home." Delicious phrase! the full meaning of which I am learning on Hawaii, where, though everything has the fascination of novelty. I have ceased to feel myself a stranger. This is a roomy, rambling frame-house, with a verandah, and the door, as is usual

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here, opens directly into the sitting-room. The stair by which I go to my room suggests possibilities, for it has been removed three inches from the wall by an estripuake, which also brought down the tall chinnery of the bolining-house. Close by there are small pretty frame-houses for the overseer, bookkeeper, sugar boiler, and machinist, a store, the factory, a pretty native church near the edge of the cliff, and quite a large native village below. It looks green and bright, and the atmosphere is perfect, with the cool air coming down from the mountains, and a soft breeze coming up from the blue dreamy ocean. Behind the house the uplands gloe away to the colossal Mauma Kea. The actual, dense, impenterable forest does not begin for a mile and a half from the coast, and its broad dark belt, extending to a height of 4,000 feet, and beautifully broken, throws out into greater brightness the upward glades of grass and the fields of gugar-came.

This is a very busy season, and as this is a large plantation there is an appearance of great animation. There are five or six saddled horses usually tethered below the house; and with overseers, white and coloured, and narives riding at full gallop, and people coming on all sorts of errands, the hum of the rushing-mult, the rush of water in the flumes, and the grind of the waggons carrying cane, there is no end of stir.

The plantations in the Hilo district enjoy special advantages, for by turning great part of their cane and all their wood for fuel down to the mills without other instance of injustice were perpetrated on a plantation the factory might stand still greater part of their work is ploughing and hauling the kegs of sugar down to the Honolulu. This plantation employs 185 hands, native and Chinese, and turns out like to work for a term unless obliged, and a pernicious system of "advances" is The wages are about eight dollars a month with food, or eleven dollars without imported as coolies, and usually contract to work for five years. As a matter of some of the innumerable mountain streams into flumes the owners can bring a expense than the original cost of the woodwork. Mr. A. has 100 mules, but the 600 tons of sugar a year. The natives are much liked as labourers, being docile and on the whole willing; but native labour is hard to get, as the natives do not food, and the planters supply houses and medical attendance. The Chinese are usually for a year, by a contract which has to be signed before a notary public. practised. The labourers hire themselves to the planters, in the case of natives cove, where in favourable weather they are put on board of a schooner for policy no less than of humanity the "hands" are well treated; for if a single the next year, for hardly a native would contract to serve again. The Chinese are quiet and industrious, but smoke opium, and are much addicted to gaming. Many of them save money, and, when their turn of service is over, set up stores, or grow vegetables for money. Each man employed has his horse, and on Saturday the hands form quite a cavalcade. Great tact, firmness, and knowledge of human nature are required in the manager of a plantation. The natives are at times disposed to shirk work without sufficient cause; the native lunas, or overseers, are not always reasonable, the Chinamen and natives do not

always agree, and quarrels and entanglements arise, and everything is referred to the decision of the manager, who, besides all things else, must know the exact amount of work which ought to be performed, both in the fields and factory, and see that it is done. Mr. A. is a keen, shrewd man of business, kind without being weak, and with an eye on every detail of his plantations. The requirements are endless. It reminds me very much of plantation life in Georgia in the old days of slavery. I never elsewhere heard of so many headaches, sore hands, and other triffling ailments. It is very amusing to see the attempts which the would-be invalids make to lengthen their brief smilling faces into lugbriousness, and the sudden relaxation into naturalness when they are allowed a holiday. Mr. A. comes into the house constantly to consult his wife regarding the treatment of different ailments.

mill, where it is subjected to a pressure of five or six tons. One hundred pounds of with a gradually decreasing result in the quality and quantity of the sugar. The last crystalline result makes one forget the initial stages of the manufacture. The cane, vat, where it is dosed with quicklime to neutralize its acid, and is then run off into on his finger; and, by certain minute changes in their condition, he judges when it pan and reboiled, and this reboiling of the drainings is repeated two or three times. fluid, with a thick scum upon it, is simply disgusting. After a preliminary heating proceeded far enough, the action of the heat is suspended, and the reddish-brown. and are then allowed to descend into an heater, where they are kept warm till they or molasses, which remains after the first crystallization is returned to the vacuum mass of sugar and treacle is put into what are called "centrifugal pans," which are skimmed, and ladled from one to the other till it reaches the last, which is nearest can be run into "forms" or tanks, where they are allowed to granulate. The liquid, This juice passes, as a pale green cataract, into a trough, which conducts it into a contents of the pan by withdrawing a few drops, and holding them up to the light concentration is completed by boiling the juice in vacuo at a temperature of 150 thickened into the consistency of thick gruel by the formation of minute crystals, whirl through, and retain the sugar crystals, which lie in a dry heap in the centre. cane under this process yield up from sixty-five to seventy-five pounds of juice. large heated metal vessels. At this stage the smell is abominable, and the turbid process, which is used for getting rid of the treacle, is a most beautiful one. The forced violently against their sides by centrifugal action, and they let the treacle I have made a second tour through the factory, and am rather disgusted oily-looking liquid is drawn into the vacuum-pan till it is about a third full; the drums about three feet in diameter and two feet high, which make about 1,000 stripped of its leaves, passes from the flumes under the rollers of the crushingrevolutions a minute. These have false interiors of wire gauze, and the mass is and skimming it is passed off into iron pans, several in a row, and boiled and to the fire, and there it boils with the greatest violence, seething and foaming, is time to add an additional quantity. When the pan is full, the contents have degrees, and even lower. As the boiling proceeds, the sugar boiler tests the bringing all the remaining scum to the surface. After the concentration has with sugar making. "All's well that ends well," however, and the delicate

The cane is being flumed in with great rapidity, and the factory is working till late at might. The came from which the juice has been expressed, called "trash," is dried and used as fuel for the furnace which supplies the steam power. The sugar is packed in kegs, and a cooper and carpenter, as well as other mechanics, are employed.

Sugar is now the great interest of the islands. Christian missions and whaling have had their day, and now people talk sugar. Hawaii thrills to the news of a cent up or a cent down in the American market. All the interests of the kingdom are threatened by this one, which, because it is grievously depressed and staggers under a heavy import duty in the American market, is now clamorous in some quatres for "amexation," and in others for a "reciprocity treaty," which last means the cession of the Pearl River lagoon on Oahu, with its adjacent shores, to America, for a Pacific naval station. There are 200,000 acres of productive soil on the islands, of which only a fifteenth is under culture. Herein is a prospective Utopia, and people are always dreaming of the sugar-growing capacities of the belt of rich disintegrated lava which slopes upwards from the sea to the bases of the mountains. Hitherto, sugar growing has been a very disastrous speculation, and few of the planters at present do more than keep their heads above water. Were labour plentiful and the duties removed, fortunes might be made; for the soil yields on an average about three times as much as that of the State of Louisiana. Two and a half tons to the acre is a common yield, five tons, a frequent one, and instances are known of the slowly matured came of a high altitude yielding as much as seven tons! The magnificator climate makes it a very easy crop to grow. There is no brief harvest time with its rush, hurry, and frantic demand for labour, nor frost to render necessary the hasty eutting of an immature crop. The same number of hands is kept on all the year round. The planters can plant pretty much when they please, or not plant at all, for two or three years, the outling of the former crop are smaller in bulk. They can plant, cut, and grind at one whether the cane be tasselled or not, and they can plant, cut, and grind at one time.

It is a beautiful crop in any stage of growth, especially in the tasselled stage. Every part of it is useful—the cane pre-eminently—the leaves as food for horses and mules, and the tassels for making hats. Here and elsewhere there is a plate of cut cane always within reach, and the children chew it incessantly. I fear you will be tired of sugar, but I find it more interesting than the wool and muton of Victoria and New Zealand, and it is a most important tiem of the wealth of this toy kingdom, which last year exported 16,995,402 lbs. of sugar and 192,105 gallons of molasses. Footnote: In 1875 the export of sugar reached a total of 25,600/182 lbs. JWth regard to molasses, the Government prohibits the manufacture of rum, so the planters are deprived of a fruitful source of profit. It is

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really difficult to tear myself from the subject of sugar, for I see the cane waving in the sun while I write, and hear the busy hum of the crushing-mill [Bird 2007:72-78]. Bird was staying at the Onomea Plantation as a guest at the time. The Onomea Plantation was owned by her host Judge S.L. Austin who started the plantation in 1863 (Campbell and Ogburn 1990). A description of the Onomea Plantation works by Campbell and Ogburn (1990) is quoted below.

During the early days, Onomea's crushing plant was water driven. A metal water wheel and boiler had been shipped from Glasgow, Scotland in 1862. Water from the flumes provided the power to turn the wheel, which in turn moved the sugar cance neuther. The water-driven crushing plant was much larger and heavier than those of other mills. The mill was situated just below Papaikou at the foot of a guch, which opened out to the ocean. It was the first nine-roller mill erected on the island. The mill was connected by rail to one of the best landings and loading devices on the coast. The sugar cars were hauled to the landing by a cable and sugar could be sent over the main cable to the hold of a ship without rehandling. By means of this device about 1,600 bags of sugar could be loaded in an hour.

A distinctive feature of Onomea was its system of flumes, which spanned gorges and carried care down the slopes to the mill. Filty-five miles of stationary and portable flumes were constructed. The trestle, which carried the main flume experts Hanawainui Gulch, was the largest wooden bridge in the territory and the one spanning Kawainui Gulch was the highest, 176 feet. Onomea's location in a heavy rainfall belt made it difficult to mechanize came harvesting and transportation easily. Onomea was one of the last plantations to stop hand cutting begun in 1908 was finally completed in 1956. The heavy rainfall also tended to wash topsoil away and leach it out. Onomea was the first Hawaiian sugar plantation to use commercial fertilizer on its fields. In 1879 (1897?), bone meal fertilizer was used to improve the soil. Later on Manager John T. Moir's protective efforts towards Onomea's topsoils resulted in the invention of a plow which was adapted to the peculiar topography of the county and the nature of the soil. The shallow, clay-like soils were subject to washing unless properly cultivated. It is to Moir's credit that no field was washed out to sea during his 20 years of management. He was also considered one of the leaders in the conservation of waste products and the use of them to build up the land. The descriptions of the Kaiwiki and Onomea plantations are good period descriptions of sugar plantations and operations in the area of the Hamakua Sugar Plantation that was soon to be operated within the project area.

NATIVE TESTIMONY BEFORE THE COMMISSION TO QUIET LAND TITLES With the Mahele of 1848 and the two Acts of 1850, authorizing the sale of land in fee

simple to resident aliens and the award of *kulecuna* lands to native tenants, land tenure in Hawaii arrived at a significant turning point (Chinen 1961:13). Two Land Commission Awards were made within the project area. One half of Malanahae Ahupua'a was awarded to Simeona Luluhiwalani (LCA 4: B, R. P. 7825). Two '*apana* (LCA 9971: A and B) in Waiköloa Ahupua'a were awarded to William Pitt Leleihoku. There is no descriptive information given for Leleihoku's two '*apana* in Waiköloa Ahupua'a. Leleihoku's two '*apana* in Waiköloa Ahupua'a. Leleihoku's two '*apana* in Waiköloa Ahupua'a. There is no descriptive information given for that his right to the land was acquired when

Kamehameha II sailed to Kawaihae - this was Kaneuwaine [1819] - the land of the Ali'i was cut up there. Then the Ali'i gave Malanahae to Hikiau. Kaleimoku said "This land is for my kaikaina." Then the chiefs asked, "To whom?" To Keoua, he is a kaikaina of us all. Kaleimoku approved 'saying' "This is my very own kaikaina." Then the Ali'i gave this land to him absolutely. Keoua was with Keeunoku at this time. *T*he land was held' from this time. At the time in which Kaenunoku at this time. The land was held' from this time. At the time in which Kamenheal II sailed for England, in the night Keoua died, and the next day the Ali'i sailed for England.

When he was alive, Keoua directly bequeathed all his lands to me. I am above, my makuahine is below /one the lands held/ from Hawaii to Oahu. These are the land which I hereby present /as claims/ at this time (Waihona 'Aina 2000).

THE HISTORY OF SUGAR IN HAWAI'I

Captain Cook found sugarcane (*Saccharum officinarum*) growing in Hawai'i at the time of his arrival in 1778 (Beaglehole 1967:479). He noted that the cane was of large size and good quality. According to Hawaiians, sugarcane (*ko*) grew wild and quite well in the valleys and lowlands. It was not refined but was eaten as a food crop and was used as an offering, especially to the shark god *Mano* (Rolph 1917:166). Captain James King also noted that upon his arrival at Maui in 1778, Hawaiians came along ship carrying sugarcane as well as fruits and vegetables (Beaglehole 1967:497). Several sugarcane varieties, either indigenous or brought by early Polynesians, were known to the Hawaiians, including *Uatalehu, Uatalehu maoli* (native), *Honnaula, Laukena (Laukond), Kea (Koken), Papa,* and *Ohna* (Wilfong 1883).

The earliest instances of sugar and molasses production in Hawai'i remain uncertain, but were likely small-scale sugar extraction operations. A number of important chiefs set aside land for several of these early endeavors (Kelly *et al.* 1981:81). Rolph (1917:166-167) documents the inception of organized sugar production as follows:

Additionally, production was low because indigenous sugarcanes were susceptible to introduced American south caused a price increase and a concomitant rise in Hawaiian sugar production and Lahaina sugarcane, a variety indigenous to the Marquesas, was introduced to Hawai'i in Hawaiian sugar production remained low despite the introduction of steam power in 1858-1859 the sugar industry created a labor shortage that necessitated hiring contract laborers from other 1854, and by 1870 had displaced all indigenous varieties for sugar production (Wilfong 1883). export, from 2,600 tons in 1863 to 8,869 tons in 1866 (Rolph 1917:171). The rapid growth of Hawaiian sugar production was still somewhat hindered by U.S. import duties, until a outbreak of the American Civil War (1861-1865). The disruption of sugar production in the reciprocity treaty negotiated between the Kingdom of Hawai'i and the U.S. in 1876 reduced import duties levied on Hawaiian sugar, increasing the profitability of sugar production and (Figure 7). Less than 50% of the sugar was extracted from the cane using these methods. to the milling process. The Island of Hawai'i had a single mill operating at Hilo until the disease and were soft and therefore unsuitable for milling (Mangelsdorf 1956). Figure 6: A Whaling Trypot Typical of Those Used For Making Raw Sugar 53 Polynesian islands. Hawai'i (Rolph 1917:169). Missionaries at Hilo in the early 1800s produced sugar and molasses irrigated nor fertilized and sugar yields were roughly one ton per acre. Planting, by 'o' \hat{o} (digging Ladd & Company established the first large-scale sugar production in Hawai'i on Kauai, stick), and harvesting was done by Hawaiian contract workers (Thrum 1874:36). Laborers were paid in kind, often in cloth. Once at the milling facilities, cane was fed one stalk at a time into Sugarcane growing and milling operations were still simple. Cane fields were neither directed the planting of one hundred acres of sugar cane in 1839 in Kohala, on the Island of while David Malo operated a mill on Maui between 1840 and 1850, and Governor Kuakini Governor Kuakini's land, and likely operated by Chinese, produced about 30 tons of sugar. extracted by the rollers was collected in trough and was boiled in whaling ship iron trypots Society in January, 1852, claims the earliest sugar factory was put up on the island of Lanai in 1802 by a Chinaman who came to the islands in one of the vessels trading for sandalwood. He brought with him a stone mill and boilers, and L. L. Torbert, one the early planters, in a paper read before the Royal Agricultural Waikapu, Maui. A pioneer cane grower, Antonio Silva by name, lived at the latter general in 1823-24. This undoubtedly had direct connection with the manufacture statement that 257 tons of sugar were exported from the islands in 1814, but cites boards) by native labor, collecting the juice and boiling it in a small copper kettle. beyond 1820, but the name of the pioneer planter is unknown. It is certain that at for their own use (Kelly et al. 1981:81). In 1841, a mill on the Wailuku River in Hilo on iron band reinforced wooden rollers powered by water, oxen, mule, and horse. The juice Accounts from various sources agree that the making of sugar and molasses was arrival of the first missionaries. Lavinia, an Italian, did the same thing in 1823. His method was to pound the cane with stone pestles on huge wooden trays (poi after grinding one small crop and making it into sugar, went away the next year place, and some Chinamen had a sugar mill near Hilo. In those days mills were According to Jarves [Jarves, James Jackson, History of the Sandwich Islands, Don Francisco de Paula made sugar in Honolulu in 1819, the year before the Anderson [Anderson, Rufus, The Hawaiian Islands, Boston, 1864] makes a In 1828 a considerable amount of cane was raised in the Nuuanu valley and Honolulu, 1872] the first instance of the manufacture of sugar goes back to first molasses was manufactured and then sugar some time before 1820. made of wood, very crudely put together and worked by oxen. of rum, which was extensively carried on at the time. no authority upon which to base his assertion. 22 taking his apparatus with him.

e and cultivated blished on the es states that the	awaii uur miles n 300 to arable; the	f el Parker tt-Smith, terprise. 1 878 and s.	into rat control gre roots ported the rich pt to	musual is a . As on Aavaiians.	age crop hiich miles long hiso had a	, which water 2as the head ,000,000 cific	
ACIFIC SUGAR MILL COMPANY (1878-1928) The Pacific Sugar Mill Company was established in 1878 at Kukuihael gar cane in fields within the current project area. A good synoptic history pr iversity of Hawai'i's Hawaiian Sugar Panters' Association Plantation Archiv	Pacific Sugar Mill was located on the northeast coast of the Island of E between Honokaa and Waipio Valley. It extended along the coast for fi and up the mountains from two to nine miles. The elevation ranged fro 1,900 feet giving a variety of growing conditions. Half of the land was remainder was pasture and forests.	The beginnings of Pacific Sugar Mill are not entirely clear. A Charter of Incorporation (HSC 48/13 Doc #142) dated August 19, 1879 lists Sam and F.A. Schaefer as the founders. Other published sources cite Dr. Mc Dr. Trousseau and Mr. Herbert Purvis as founders/ proprietors of the et Material in the collection does confirm that the plantation was started in the first crop harvested in 1880 with F.A. Schaefer and Co. as the agem	Pacific Sugar Mill had the distinction of introducing the first mongoos Hawaii. In 1883 W.H. Purvis imported them from India and Africa for on the plantation. Pacific, Sugar Mill also experimented growing canai. (tanners' dock) when Mr. J. Marsden, Commissioner of Agriculture, in seed of this plant in 1895. It was expected that the root would become source of tamin for use in the leather industry. This was an early attem diversify and utilize land unsuitable for cane.	Most plantations had a small herd of cattle but Pacific Sugar Mill was i because it also had over 600 head of sheep. Free mutton was provided i perquisite for employees along with free housing, fuel and medical can most plantations, the carly work force consisted of Chinese and native Later on Japanese, Portuguese, Spaniards, Puerto Ricans, Koreans and	performed both as day laborers and contract workers. By 1908 Pacific Sugar Mill had a nine-roller mill and produced an aver of three tons per acre. The cane was delivered by flumes to a railroad, v traversed the plantation from east to west. The railroad was about four and extended from the mill to Honokaa's boundary. Pacific Sugar Mill, wire rope landing to transport sugar bags to steamers for shipment.	The water for the flumes was obtained by diverting the Hiilawe Stream had its source in the Kohala Mountains. Pacific Sugar Mill also had the rights to Lalakea Stream and to Kukuihaele Valley Stream. The water v transported partly through a flume and partly by a ditch to a reservoir a of the plantation. Four more reservoirs with an estimated capacity of 50 gallons were also constructed. This supply of water not only enabled Pr	25
urring the growth of the sugar industry. From 1877 to 1888, sugar production almost 500% and doubled in the following ten years (Kelly <i>et al.</i> 1981:81). American s purchased nearly 99% of all Hawaiian export products, much of it sugar.	1880 Rose Bamboo sugar cane was introduced from Australia and was grown at higher s on Hawai'i. Rose Bamboo cane did especially well on the relatively high table lands Hāmākua coast. Lahaina and Rose Bamboo varieties were susceptible to insects and nd subsequently yields decreased annually until both varieties were completely replaced e turn of the century by Yellow Caledonia cane (also called White Tanna cane), a	med for New Caledonia and Tanna, an island of present day Vanuatu (Rolph . Yellow Caledonia had been imported to Hawai'i in 1881 and was first grown with ess in Ka'u (Tew 1987). The variety was resistant to disease and grew well in cooler vith moderately high rainfall, and consequently was cultivated with great success along kua until its replacement in 1925 with hybrid varieties of sugarcane (James 2004:5).	the Hawaiian sugar industry continued to grow and additional contract laborers were of as far away as China and Japan (after 1890), and later from Korea, the Philippines, co, and Portugal. Sugar plantations began offering free medical care and rent-free of attract laborers. The annexation of Hawai't by the U.S. in 1898 ensured the continued consumer demand for Hawaiian sugar. Additionally, incorporation provided new or needed public works to improve the transportation and shipping facilities that made	trade more profitable. The development of port facilities and the extensive railroad at ran from Kalapana in South Puna to Pa'auilo along the Hāmāku coast were a direct he sugar industry.	TORY OF SUGAR IN THE KAPULENA AREA ven sugar companies were established along the Hāmākua coast between 1869 and epting Onomea Plantation in the Hilo area (Bouvet 2001:9). Geographically, from the ohala sides of the Hāmākua, they were the Laupahoehoe Sugar Company (est. 1880), la Sugar Plantation Company (est. 1869), the Kukaiau Sugar Company (est. 1887), the Sugar Company (est. 1877), the Paauhau Sugar Company (est. 1878), the Honokaa	mpany (est. 1878), and the Pacific Sugar Mill Company (est. 1878).	24

Sugar Mill to transport all of its cane to the mill but was sufficient enough to enable Honokaa Sugar Company to flume 50% of its crop. In spite of an abundant water supply, the plantation did not prosper due to mismanagement. In 1907 a glanders epidemic broke out because of poor conditions in the stables and most of the livestock had to be destroyed. The mill and housing were in serious disrepair. As part of a retrenchment effort in 1913, it was decided that the mill would be closed down and all the cane would be sent to Honokaa for grinding. At this time the administration of both plantations was brought under the manager in order to eliminate excess labor, machinery and costs. In 1916, Pacific Sugar Mill sold its mill equipment to Mitsui Company of Japan. This partial merger with Honokaa proved to be such a success that a proposal was made for an amalgamation of all interests to ring about added savings and facilitate the economic management of the two planations. Pacific Sugar Mill was formally dissolved on August 24, 1928 and became the Kukuihaele Division of Honokaa Sugar Company (Campbell and Ogburn 1989b).

HONOKAA SUGAR MILL COMPANY (1878-1928)

The Honokaa Sugar Company grew to encompass more than 9,000 acres (Campbell and Ogburn 1989a). The Honokaa Sugar Company had an extensive flume system to carry cane to railroad cars that brought the cane to the mill. The mill had a tramway that transported the bagged sugar to the warehouse at the boat landing. The sugar was then loaded onto steamships by means of a wire cable. The Honokaa Sugar Company was able to ship raw sugar directly to the mainland by this method, instead of first shipping to Honolulu.

DAVIES HAMAKUA SUGAR COMPANY (1978-1984) AND HAMAKUA SUGAR COMPANY (1984-1994)

The Laupahoehoe Sugar Company merged with the Honokaa Sugar Company in 1978 to form the Davies Hamakua Sugar Company (1978-1984). In 1984 the Davies Hamakua Sugar Company was bought by Francis Morgan and renamed the Hamakua Sugar Company (1984-1994). The Hamakua Sugar Company operated until October of 1994, and its closing marked the end of the sugar industry on the Island of Hawai'i.

PREVIOUS ARCHAEOLOGICAL INVESTIGATIONS

While no archaeological studies have been conducted in the current project area, several studies were conducted to the west and south of the current project area. Most archaeological studies undertaken in Hämäkua District have focused on sites in the Waipi'o Valley.

The earliest archaeological study in this portion of Hamakua district is T.G. Thrum's *letiau* survey (Thrum 1908). Thrum's work notes that five *letiau* were known to have existed in the area (Thrum 1908;41). He visited the sites of two *letiau*, Kalelemauli and Pukiohuaka, both reported to be located in Kukinhaele Ahupua'a, but no longer in existence at the time of his visit. A third *letian*, Kaiponihua, was said two exist at Ke-a [likely Kea'a *ahupua* 'a] between Kukuihaele and Kapulena. Two additional *letiau*, Punanamoa and Hauola, were known to exist in Waiko'eko'e. John F.G. Stokes returned to Thrum's *heiau* sites and carried out more extensive mapping and recordation (Stokes 1919, Stokes and Dye 1991). Stokes work does not include Purnanamoa nor Kaiponihu *heiau*. In addition, he writes that Pukiohi'aka *heiau* was located 1400 feet above sea level in Kapulema Ahupua'a. He notes that the *heiau* was built by the *kahu* of Hi'aka for prayer, and not for sacrifice (Stokes and Dye 1991:162). The *heiau* was destroyed at some point prior to his visit. Stokes also writes that Kalelemauli *heiau* was located in Kc'ahakea Ahupua'a, though it was destroyed before his visit. The *heiau* was located in Kc'ahakea Ahupua'a, though it was destroyed before his visit. The *heiau* was used for human sacrifice and was dedicated to Kũ and Lono (Stokes and Dye 1991:162).

Stokes located a sixth *heiau* in the region, known as Hokuwelowelo *heiau* at Lalakea. He described the *heiau* as,

A small pen near the edge of the sea cliff overlooking the mouth of Waipio Valley. Its elevation is 900, and it is about 150 feet from the road, and the same distance from the edges of the sea-cliff and Waipio valley cliff. This heiau is said to have been "built by the gods," and was the place where the famous *Kihapu* was guarded until the latter was stolen by the thief-dog, Puapualenalena from Puako (Stokes 1919). Alfred E. Hudson published a description of the Hokuwelowelo *heiau* as part of archaeological work he conducted on the Island of Hawaii between 1930 and 1932. Hudson's description of the *heiau*, recorded as Site 4, is excerpted below.

The mound which is pointed [sic] as the site of this heiau is located on Waipio beach midway between the palis and about 30 feet beyond high ide level. The spot is generally known in the local tradition to have been occupied by a heiau and was specifically identified under this name by Mr. Kanekoa, age 76, and Mr. Haa, 70, who have always lived in the valley.

Hokuwelowelo as it stands at present consists of two elevated mounds connected by a somewhat lower one, the whole faced along the seaward side by a boulder wall in good condition, some portions of which also remain along the north and south sides. The tops of the mounds are level, covered with sand and grass, and extend inland about 50 feet to merge gradually with the sand dunes, making it impossible to judge the original width of the platform (Hudson 1932: 146). Hudson's study also describes additional archaeological sites and features located in Waipi'o Valley, including Hanuaula, Kaao Nui, and Moaula *heiau*; Pakaalana place of refuge; a fishing *koa*, walled enclosures, a burial ground, house platforms, and several trails. He also noted that at the time of his investigations, it appeared likely that many archaeological sites along the Hāmātua Coast had been removed by sugarcane farming.

V.H. Loo and W.J. Bonk returned to the Waipi'o Valley and evaluated several of the sites documented by Hudson. They recommended preservation for Pakalana [Pakaalana] and Hokuwelowelo *heian*, and the fishing *koa* documented by Hudson (Loo and Bonk 1971:2-3). During the period of their archaeological studies, the Kaao Nui *heiau* was damaged during grubbing and removal of vegetation nearby (*ibid*:26-27). A 1977 archaeological study of the Waipi'o valley and Hamakua coast found that there is a scarcity of visible prehistoric habitation sites along the Hamakua due to modern agricultural practices, though subsurface deposits might still exist (Tanaka, Inc. and EDAW, Inc. 1977:65).

PHRI conducted an archaeological inventory survey of 1,303 acres of upland forest in 1990 (Walker, Kai, and Rosendahl 1991). Six sites were documented, primarily agricultural sites (66%), as well as transportation sites and indeterminate sites. In 1991, PHRI conducted an archaeological inventory survey of portions of a 3,770-acre area of former Hamakua Sugar Company lands in the *ahupua* 'a of Lalakea, Kukuihaele, Kanahonua, Waiko'eko'e, Kea'e, and Kalakala'ula (Head and Goodfellow 1991). That project area is just west of the current project area. PHRI study covered an area from the ocean below Kukuihaele town to an elevation of approximately 2,400ft amsl. Forty-four sites with 124 component features were documented (Head and Goodfellow 1991:12). Twenty of the sites had multiple features and twenty-four contained a single feature. Fifty percent of all sites were either agricultural (25%, n=11) or agricultural and habitation (25%, n=22) (Head and Goodfellow 1991:17). Nine solely habitation sites and five burials in a cemetery were also documented. The remaining sites were associated with transportation and various historical sugarcane agriculture

activities. The most predominant features were terraces (37.9%, n=47) and modified outcrops (14.5%, n=18). The majority of sites and features were modifications associated with sugarcane cultivation. A point of interest to the current archaeological study is that all but two of the sites were located below 1,600ft amsl.

PHRI conducted an additional archaeological inventory survey in 1991 (Franklin *et al.* 1994) within the project area reported in Head and Goodfellow 1991. The project area is situated from the coastal cliffs to roughly 850ft amsl. This inventory survey documented additional work at three previously identified sites (Head and Goodfellow 1991)and four newly identified sites. New sites included a historic residence, a burial complex, a trail, and a terrace. Several of the sites were associated with recorded Land Commission awards.

EXPECTED ARCHAEOLOGICAL RESOURCES

Based on previous archaeological projects conducted at similar elevations just west of the current project area, it is expected that Historic era sugar plantation features will be identified within the current project area. Pre-contact, traditional Hawaiian features are expected to be present only in undisturbed areas, such as in gulches and along the borders of sugarcane fields. The long-term and constant land-use associated with the sugarcane cultivation has likely destroyed or obscured most pre-Contact era archaeological sites. Pre-Contact era features within the gulches are likely to be temporary habitation sites with associated rockshelters, rock alignments, and terraces. Historic era agricultural features are likely to be modified outcrops, rock mounds, and tock concentrations associated with rock clearing of fields. Additionally, there might be rock alignments, rock walls, and terraces along the borders of the know sugarcane fields. Finally, based on oral interview, there are likely drainage and irrigation ditches dug into the ground surface within the fields.

ARCHAEOLOGICAL INVENTORY SURVEY RESULTS

Seventeen sites comprised of 28 features were recorded during the archaeological inventory survey (Table 1; Figure 7 and 8). Three of the sites (28382, 28383, and 28387) were located in TMK: (3) 4-7-06:01. The remaining fourteen sites were located in TMK: (3) 4-7-05:01. Nine of the sites were located in Kapulena Ahupua'a, five sites were identified in Wai'ale'ale 2 Ahupua'a, and two sites were recorded in Waikoloa Ahupua'a. Sixteen of the sites were at an elevation of between 1,200 and 1,600ft amsl, and one site was located at 1,150ft amsl. The majority of sites were clustered within or near the major gulches.

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Table 1: Inventory of Sites in Project Area.

Site #	Site Type	Site Function	Features	Shape	Easting	Northing
28381	Rock Wall	Boundary/Ag Clearing	1	Linear N/S	234613	2223765
28382	Ditch	Field Drainage	1	Linear	235516	2223390
28383	Rock Wall	Boundary	1	Linear	235416	2223440
28384	Rock Mounds	Agricultural Clearing	3	Rectangular	234150	2224888
28385	Platform	Poss. Heiau	1	Rectangular	234621	2223927
28386	Rock Wall & Terrace	Boundary/Ag Clearing	2	Linear	234635	2223980
28387	Ditch	Field Drainage	2	Linear	235435	2223400
28388	Rockshelter	Temporary Habitation	3	Rectangular	234445	2223938
28389	Terrace	Soil Retention	1	Linear	233742	2223542
28390	Rock Mound/Terraces	Agricultural Clearing	3	Irregular	233678	2223596
28391	Rockshelter	Temporary Habitation	1	Rectangular	233743	2224276
28392	Rockshelter	Temporary Habitation	1	Rectangular	233809	2224034
28393	Rock Walls	Boundary	4	Rectangular	233780	2224004
28394	Rockshelter	Temporary Habitation	1	Rectangular	233864	2224004
28395	Rock Mounds & Alignments	Agricultural Clearing	1	Rectangular	234853	2224308
28396	Terrace	Boundary/Ag Clearing	1	Rectangular	234618	2224029
28397	Rock Mound	Agricultural Clearing	1	Irregular	234612	2223826







The wall is primarily one course high but is stacked up to three courses high in some places. The entire feature has the appearance of an unfinished Historic-era wall. It was likely constructed with rock cleared from nearby sugarcane fields and was placed along the edge of the gulch. The wall has been impacted by regular field clearing and cane harvesting and is collapsed in places. There are also piles of rock from bulldozing near the wall. The wall is in poor condition. The site has been documented and no further work is recommended.

SITE 28384 (TS-4)

(1-01) LOCOT TIL	
ORM	Rock Mounds & Terrace
UNCTION:	Agricultural Rock Clearing
AGE:	Historic-Era
DIMENSIONS:	Length: 12.0m (NW/SE); Width: 5.0m
:NOITION:	Good
SURFACE ARTIFACTS:	Historic-Era Trash
EXCAVATION:	None

SITE 28384

Site 28384 is located just south of a dirt road and a gulch at an elevation of 1,040ft (317m) amsl in Wai'ale'ale 2 Ahupua'a (see Figure 7). Vegetation in the area is a mix of *kukui*, ironwood, guava, *ti*, socado, java plum, and various ferns and grasses. The site consists of three features, a rough terrace (Fe. 1), and two linear rock mounds (Fe. 2 and Fe. 3) constructed along the south edge of a gulch (Figure 12). There are several pieces of modern bottle glass, metal, and bulldozer push piles at the site.

Feature 1

Feature 1 is a linear terrace on the southwest edge of the site (Figure 13). The terrace measures 3.0m long (N/S) by 2.5m wide, and 0.58m in maximum height. The terrace is constructed of loosely piled angular and subangular cobbles and small boulders. There is a short section on the east side (along the gulch) that is stacked two courses high and is roughly faced. There is a section of two-inch metal pipe and a piece of plate metal on top of the terrace. The terrace has been slightly altered by weather and ungulates, and is in good condition.



atture 2 Feature 2 is a linear rock mound ight. The rock mound id construction bibles and small boulders. The roc spulates, and is in good condition. The rock mound id construction. The rock mound measures 3.0ml sight. The rock mound id construction bibles and small boulders. The roc spulates, and is in good condition. The rock was likely bulldozed to thi ounds was slightly modified with favel bibles and small boulders. The seconneeded. te 23384 Summary cight. The rock mound id construction. bibles and small boulders. The roc spulates, and is in good condition. te 23384 Summary condition. bibles and small boulders. The roc spulates, and is in good condition. te 23384 Summary Size 23384 is the remains of the rock was likely bulldozed to thi ounds was slightly modified with favel di pipe found on its surface. The seconneeded. THE 28385 (TS-5) DRM
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Christmas berry and guava trees growing on top of the platform. There is a sugarcane dirt road and ditch just west and north of the platform. The entire east and south sides of the platform have been truncated by bulldozer. It is possible that the remaining platform is only the west end or the northwest corner of a much larger structure.

The multi-tiered platform is constructed of angular and subangular cobbles and small boulders (Figure 14). The perimeter of each tier is constructed of large cobbles and small boulders and is well-faced (Figure 15 and 16). The interior top surface of each tier is level paving of angular and subangular small to large basalt cobbles (Figure 17). The large tier along the center of the west edge of the feature is roughly 0.5m higher than the paved tier along its southwest side, and is approximately 0.45m higher than the paved tier along its northeast side. The western tier measures roughly 10.0m long (N/S) by 5.0m wide. The southwest tier is roughly 6.0m long (N/S) by 6.0m wide. The northeast tier is roughly 11.0m long (E/W) by 7.0m wide. The northeast portion of the west tier is paved, as are portions of the outside perimeters of the northeast and southwest tiers.

The northeast and southwest tiers have been altered by bulldozers pushing portions of the feature and loose rock from the surrounding fields onto them. There is a length of one inch thick wire cable embedded in the soil and rock on the east side of the feature. The cable might have been attached to a bulldozer during clearing of the fields. There are also several pieces of clear bottle and jar glass on the top surface of the feature. The feature has been altered by sugarcane clearing activities and is in poor condition. Three one by one meter test-units and one 50cm by one meter stratigraphic trench were excavated at Site 23385 to determine the timing of function of the platform.

Stratigraphic Trench 1 (ST-1)

A 0.5 by 1.0m stratigraphic trench (ST-1) was excavated along the north face of the platform at Site 28385. ST-1 was excavated as two natural stratigraphic layers, was excavated to a maximum of 45cmbs, and terminated on a culturally sterile sediment (Figure 18). Layer I (0-30cmbs) was loose very dark brown (10YR2/2) loam with a few medium size Christmas berry roots. No artifacts were recovered from Layer I. The base of the platform architecture is along the top surface of Layer I, possibly due to erosion along the slope away from the feature and toward the road/ditch to the north.



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Layer II (30-45cmbs) was compact dark yellowish brown (10YR4/6) very fine to coarse silty clay with peds and a few very small Christmas berry roots. No artifacts were recovered from Layer II. ST-1 was terminated at the top of a yellowish brown fine silt due to the lack of artifacts in both Layer I and Layer II.

Test-Unit 1 (TU-1)

Test-Unit 1 was a 1.0 by 1.0m unit excavated in the top of the highest paved tier of the platform at Site 28385 (see Figure 14). TU-1 was excavated as a single architectural layer. It was excavated to a maximum of 130cmbs, and terminated on soil and architectural rock. The unit was terminated because it was unstable and began to collapse. The architectural layer was piled angular and subangular cobbles to small boulders with small amounts of organic detritus and no roots. No internal structure or subsurface features were encountered. No artifacts were recovered from TU-1.

Test-Unit 2 (TU-2)

Test-Unit 2 was a 1.0 by 1.0m unit excavated in the paved area in the southwest corner of the platform at Site 28385 (see Figure 14). TU-2 was excavated as a single architectural layer. It was excavated to a maximum of 120cmbs, and terminated on soil and architectural rock. The unit was terminated because it was unstable and began to collapse. The architectural layer was piled angular and subangular cobbles to small boulders with small amounts of organic detritus and no roots. No internal structure or subsurface features were encountered. No artifacts were recovered from TU-2.

Test-Unit 3 (TU-3)

TU-3 was excavated in the top surface of the northern most paved area of the platform at Site 28385 (see Figure 14). TU-3 was excavated as an architectural layer and two natural stratigraphic layers (Figure 19). The unit was excavated to a maximum of 113cmbs, and terminated on a culturally sterile sediment.

The Architectural Layer (0-78cmbs) was piled angular and subangular cobbles to small boulders with small amounts of organic detritus and no roots. No internal structure or subsurface features were encountered. The base of the platform architecture is along the top surface of Layer I. No artifacts were recovered from the Architectural Layer.



an elevation of 1,418ft (432m) amsl in Kapulena Ahupua'a (see Figure 7). The level area boulders. The interior of the northwest end contains a level paving of cobbles and a few Site 28386 is located along the top of a manka/makai (N/S) oriented ridgeline at small boulders. The north and east sides of the paved area is stacked and faced (Figure Length: 28.0m (N/S); Width: 5.0m; Height: 1.30m (max) Feature 1 is a three sided terrace located at the north end of the site. The terrace consists of two features: a three sided terrace (Fe. 1) and a rock mound (Fe. 2) (Figure several Christmas berry and guava trees, and grass growing on the ridgeline. The site surrounding the ridgeline is old sugarcane fields dominated by ironwood. There are measures 16.0m long (northwest/southeast) by 5.0m wide, and is 1.3m in maximum height. Feature 1 is constructed of an outer perimeter of large cobbles and small artifacts, no other cultural material was identified at the site. The radiocarbon at habitation sites. In fact, other than a very few historic and metal and glass possible that this is the remains of Pukiohi'aka heiau located 1400 feet above hypothesis is the lack of midden and habitation remains commonly recovered Based on the amount of labor that went into the multi-tier platform at date recovered from TU-3 suggest a possible pre-Contact date for use of the platform has been severely impacted by sugarcane agricultural land-clearing Site 28385, and based on the construction style and area of the feature, it is platform as well. If Site 28385 is the remains of the Pukiohi'aka heiau, the sea level in Kapulena Ahupua'a (Stokes 1919). Evidence to support this Field Boundary/Rock Clearing **Terrace and Rock Mound** Stratigraphic Trench 1 51 Historic-Era Good None practices and is in poor condition. SURFACE ARTIFACTS: SITE 28386 (TS-6) EXCAVATION: DIMENSIONS: CONDITION: FUNCTION: SITE 28386 Feature 1 FORM AGE: 22). 21). 2000CalAI 1670AD (0.46) 1780AD 1800AD (0.39) 1890AD 1910AD (0.15) 1950AD 1660AD (1.00) 1960AD (39% likelihood). The 2-sigma date range was from 1660 to 1960AD. Though kukui nut (0.4g), and a deposit of ash and charred matter (1.7g) were recovered Layer I was sent for radiocarbon dating (Figure 20). The sample returned a 1-Layer II (108-113cmbs) was compact dark brown (7.5YR3/4) fine silty from Layer I. The 1.7g of charred matter and ash, recovered from 90cmbs in sigma date range of 1670 to 1780AD (46% likelihood) and 1800 to 1890AD clay with a few small cobbles and very few small Christmas berry roots. No Layer I (78-108cmbs) was loose very dark brown (10YR2/2) fine to coarse loam with peds, 5% small basalt cobbles, and a few small Christmas artifacts were recovered from Layer II. TU-3 was terminated at the top of a berry roots. A total of 10.8g of burnt wood fragments, a fragment of burnt the range is broad, the 1-sigma results suggests a late pre-Contact to early 1800CalAD 1 sigma 2 sigma Figure 20: Site 28385, TU-3, Layer I Radiocarbon Dating Results. SCSRC630:140±40BP Historic provenience for the ash deposit and use of the platform. OrCal #3.5 Broek Rensey (2000); cdb r 4 ed:12 letr up/drowl Calibrated date 1600CalAD 50 culturally sterile yellowish brown fine silt.

1400CalAD

200BP

300BP

Radiocarbon determination

100BP OBP

500BP 400BP



- LAYER II: DARK YELLOWISH BROWN (10YR'4/6) SILTY CLAY - LAYER I: VERY DARK BROWN (10YR 2/2) LOAM 80 cm - NEW ARCHITECTURE, BASALT ROCK UNEXCAVATED Figure 23: Site 28386, Feature 1, ST-1 South Profile. 40 KEY 55 - FEATURE ARCHITECTURE - CHRISTMAS BERRY ROOT = -0 0 coarse silty clay with peds and a few very small Christmas berry roots. No artifacts were stacked angular and subangular basalt cobbles and small boulders. The northeast edge of Layer II (33-43 cmbs) was compact dark yellowish brown (10YR4/6) very fine to bulldozer. Feature 2 has been altered by mechanical field clearing activities and is in fair wall portion of the feature retains the ridgeline soil. There are no artifacts on the feature excavated to a maximum of 43 cmbs, and terminated on a culturally sterile sediment and the top surface of Layer I, possibly due to erosion along the slope away from the feature A 0.5 by 1.0m stratigraphic trench (ST-1) was excavated along the north face of the platform at Site 28385. ST-1 was excavated as two natural stratigraphic layers, was The southeast end of the feature is constructed as a retaining wall along the east facing edge of the ridgeline. Portions of the wall are stacked and faced. The retaining fragments were recovered from Layer I. The base of the platform architecture is along recovered from Layer II. ST-1 was terminated at the top of a yellowish brown fine silt Feature 2 is an oval rock mound measuring 1.7m long (northwest/southeast) by condition. A 0.5m by 1.0m stratigraphic trench was excavated along the north end of or on the ground surface within the site. Feature 1 appears unaltered and is in good 0.6m wide, and is 0.9m in maximum height. The mound is constructed of piled and Layer I (0-33 cmbs) was loose very dark brown (10 YR2/2) loam with a few medium size Christmas berry roots. A small amount (0.4g) of small charred wood the rock mound is stacked and faced in places. There are no artifacts on or around Feature 2. The southeast end of the rock mound has been impacted, possibly by Feature 1 to determine its timing and function. 54 and toward the road/ditch to the northeast. decomposing bedrock (Figure 23). Stratigraphic Trench 1 (ST-1) and decaying bedrock. Feature 2 condition.



Site 28386 appears to be the results of sugarcane field clearing. Rock was removed from the surrounding level fields and placed on the rocky ridgeline. The rock was stacked in order to keep it from rolling down the slope of the ridge. Some of the rock was stacked along the slope of the ridge to prevent erosion. This type of clearing is common on Historic-era sugarcane and ranch lands (Escott 2004, Wolforth and Chalmer 2007 draft). It is possible that the terrace marks a sugarcane field boundary. Site 28386 has been fully documented and no further work is recommended.

SITE 28387 (TS-7)

(1-01) 10007 3110	
FORM	Earthen Ditch
FUNCTION:	Irrigation
AGE:	Historic-Era
DIMENSIONS:	Length: 200.0m (N/S); Width: 70.0m; Depth: 1.00m (max)
CONDITION:	Fair
SURFACE ARTIFACTS:	None
EXCAVATION:	None

SITE 28387

Site 23387 is located between a shallow gulch to the east and an old sugarcane field on the west, at an elevation of 1,560ft (476m) amsl in Kapulena Ahupua'a (see Figure 7). Vegetation in the area is guava, Christmas berry, various ferns, ginger, and grass—primarily disturbance vegetation. The site consists of two earthen ditches (Fe. 1 and Fe. 2) due into the hillside between a natural gulch and an old sugarcane field (Figure 24 and 25). The ditches are roughly 0.6m to 0.8m wide and are approximately 0.5m to 1.0m deep. Feature 1 is located at the north end of the site and measures 150.0m long. There is a 12.0m long section of Feature 2 that is rock-lined along its east bank. The downslope sides of the ditches are built up slightly with sediment removed from the ditch. The ditches have been impacted by weathering, are slited in, and are allow the natural topography of the area. The ditches have been impacted by weathering, are slited in, and are in fair condition. The site has been documented and no further work is recommended.





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Layer I (0-12cmbs) was loose and wet very dark brown (10YR2/2) sandy silt with 20% pebbles and small cobbles, and less than 1% very fine roots. A small amount (2.5g) of small charred wood fragments and a small fragment (0.1g) of burnt <i>kukui</i> nut were recovered from Layer I. The base of Layer I was clear and slightly wavy.
Remoter The bar and the stand of

Litraer Termes Soil Retention Historic Far Length 13.0m (NESW); Width: 1.0m; Height: 1.5m (max) Soin Retention Historic Far Length 13.0m (NESW); Width: 1.0m; Height: 1.5m (max) Good Now Now Now Now Now Now Now Now Now Now	EARTHEN SLOPE	
Linear Terrace Soil Retention Historic-Era Length: 13.0m (NE/SW); Width: 1.0m; Height: 1.5m (1 Good None None None None at an elevation of 1,570ft (479m) amsl in Wai'ale'ale 2 egtetation in the area is rose apple—primarily a disturband at netrace constructed on the sloping east edge of the gul onstructed of angular and subangular cobbles and small use to six courses high (Figure 30). The terrace is primar there is a section at its center that retains a concentration there is a section at its center that retains a concentration of faced along its southeast edge. The ground surface upsl and ulose rock from falling into the gulch. The terrace app dition. The site has been fully documented and no furthe dition. The site has been fully documented and no furthe dition. The site has been fully documented and no furthe dition. The site has been fully documented and no furthe dition. The site has been fully documented and no furthe dition. The site has been fully documented and no furthe dition. The site has been fully documented and no furthe dition. The site has been fully documented and no furthe dition. The site has been fully documented and no furthe dition. The site has been fully documented and no furthe dition. The site has been fully documented and no furthe dition. The site has been fully documented and no furthe dition in the area is tratigraphic Trench 1 stratigraphic Trench 1	Figure 29: Site 28389 Plan View. 65	
t_{ij} and t_{ij} is a second se	Linear Terrace Soil Retention Historic-Era Length: 13.0m (NE/SW); Width: 1.0m; Height: 1.5m (n Good None None None None None None None None	<i>ti</i> , and various invasive weeds. 64

Site 28390 consists of a linear terrace (Fe. 1) a rectangular rock mound/terrace (Fe. 2), and a rectangular rock mound (Fe. 3) (Figure 31). The features are in a muddy swale at the base of a steep hill to the south. There is a 3.0m diameter pool of water in just southeast of the site. The level area to the north and west is old sugarcane field.

Feature 1

Feature 1 is a linear terrace located at the south end of the site. The terrace measures 7.0m long (northwest/southeast) by 1.0m wide, and is 0.5m in maximum height. The terrace is constructed of angular and subangular cobbles and mall boulders. The rocks are primarily placed in a single alignment with some stacking and rough facing on the west end of the terrace. There is a concentration of rocks along the south side of the west end of the terrace. The terrace appears to be constructed to retain soil from the raised level area to the south. This level area might be a path to the waterhole to the southeast. The terrace has been badly disturbed by pigs and is in poor condition.

Feature 2

Feature 2 is located on a rock outcrop at the north end of the site and is a rockclearing mound constructed with the formal appearance of a three-sided terrace. The feature is 5.5m long (N/S) by 5.4m wide, and is 0.73m in maximum height. The feature is constructed of large cobbles and small boulders stacked as a perimeter around an interior fill of small cobbles to small boulders (Figure 32). The top surface of the mound is uneven due to settling, but might have once been a level paving. The north and west sides of the feature are stacked five to six courses high and are faced (Figure 33). Feature 2 is slightly altered by weathering and is in good condition. A 1.0 by 2.0m testunit was excavated at Feature 2 to determine timing and function.

Test-Unit 1 (TU-1)

A 1.0 by .20m test-unit was excavated though the west side of Feature 2 at Site 28390 (see Figure 31). TU-1 was excavated as an architectural layer and one natural stratigraphic layer (Figure 34). The unit was excavated to a maximum of 100cmbs, and terminated on a culturally sterile dark yellowish brown sediment.

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Figure 30: Photograph of Site 28389 Terrace Facing Northeast.





The Architectural Layer (0-60cmbs) was piled and stacked angular and subangular cobbles to small boulders with small amounts of organic detritus and no roots. No internal structure or subsurface features were encountered. The base of the platform architecture extended 15cm below the top of Layer I. No artifacts were recovered from the Architectural Layer.

Layer I (60-100cmbs) was loose very dark brown (10YR2/2) very fine to coarse loam with peds, 20% basalt pebbles to small boulders, and a few small Christmas berry roots. A small amount (1.1g) of burnt wood fragments, were recovered from the top surface of Layer I. No other cultural material was recovered from Layer I. TU-1 was terminated on the top of a dark yellowish brown silty sediment.

Feature 3

Feature 3 is a rectangular rock clearing mound located 2.5m north of Feature 2. The rock mound is 4.0m long (northeast/southwest) by 1.8m wide and is 0.5m in maximum height. It is constructed of piled and stacked angular and subangular cobbles and small boulders. The majority of the feature is piled with a small section of stacked and faced perimeter on the north side. Feature 3 appears to be unaltered and is in good condition.

Site 28390 Summary

Site 28390 is an area at the edge of sugarcane field where rock cleared from the field was placed. The linear terrace (Feature 1) likely marks the edge of a small pathway to a waterhole. The rock clearing mounds are a type commonly found on Historic-era sugarcane and ranch lands (Escott 2004, Wolforth and Chalmer 2007 draft). Site 28390 has been fully documented and no further work is recommended.

SITE 28391 (TS-11) Rockshelter FORM Rockshelter FUNCTION: Temporary Habitation AGE: Pre-Contact Era DIMENSIONS: Length: 5.5m (NW/SE); Width: 5.0m; Height: 2.68m CONDITION: Good SURFACE ARTIFACTS: None

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Test-Unit 1

EXCAVATION:

SITE 28391

Site 28391 is located along the east edge of the Waikōloa Gulch at an elevation of 1,415ft (431m) amsl in Wai'ale'ale 2 Ahupua'a (see Figure 7). Vegetation in the area is rose apple. The rockshelter opening is approximately 5.5m wide and faces to the southeast (Figure 35). There are two linear terraces (an exterior and interior) within the rockshelter. The exterior terrace is 3.6m long (northeast/southwest) by 0.3m to 0.5m wide, and is 0.2m in height. The interior terrace is 1.1m long (northeast/southwest) by 0.2m wide, and is 0.2m in maximum height. Both terraces are constructed of a single course of angular and subangular basalt cobbles. The interior terrace is roughly faced. The rockshelter appears to be unaltered and is in good condition. A 0.5m by 1.0m test-unit was excavated in the rockshelter to determine timing and function.

Test-Unit 1 (TU-1)

A 0.5 by 1.0m rest-unit (TU-1) was excavated near the entrance to the rockshelter (see Figure 35). TU-1 was excavated as two natural stratigraphic layers, was excavated to a maximum of 40cmbs, and terminated on a culturally sterile sediment and decomposing bedrock (Figure 36).

Layer I (0-21cmbs) was loose very dark brown (10YR2/2) very fine silt loam with 5% pebbles and small cobbles, and less than 1% very fine roots. A total of 34.5g of small charred wood fragments, a fragment (2.2g) of burnt *kukui* nut, a secondary basalt flake and an interior flake of volcanic-glass were recovered from Layer I. The base of Layer I was clear and slightly wary.

Layer II (21-40cmbs) was loose dark brown (10YR3/3) silt with 10% small to medium-size cobbles and less than 1% roots. A small amount of charred wood fragments (7.9g) and a small fragment (0.2g) of burnt *knkni* nut were recovered from Layer. TU-1 was terminated at the top of decaying bedrock and fine dark yellowish brown silt sediment.

A radio carbon sample (SCSRC631) from Layer I and a sample (SCSRC632) from Layer II returned date 2-sigma date ranges of 1800-1960AD (72% probability) and 1720-1820AD respectively (Figure 37 and 38). It seems likely that based on the dates and artifact assemblage that the rockshelter was used from the late pre-Contact era to the time of contact with Europeans.







Layer I (0-47cmbs) was loose dark brown (10YR3/3) very fine to fine sandy silt with 30% pebbles to medium-size cobbles and no roots. A possible basalt hammerstone and a possible sling stone were recovered from Layer I (Figure 41). A very small amount of tiny charred wood fragments (0.2g) was recovered from Layer. TU-1 was terminated at the top of decaying bedrock and fine dark yellowish brown silt sediment. It is possible that the rockshelter was used as a limited temporary habitation and/or rest/stop by travelers passing through the area during the pre-Contact era. The rockshelter appears have been altered by flooding and is in fair condition. Site 28392 has been fully documented and no further work is recommended.

ITE 28393 (TS-13)	
ORM	Rock Walls
UNCTION:	Boundary
NGE:	Historic-Era
DIMENSIONS:	Length: 56.0m (N/S); Width: 28.0m
CONDITION:	Fair
URFACE ARTIFACTS:	None
EXCAVATION:	None

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SITE 28393

Site 28393 is located approximately forty meters west of Site 28393 along the Waikoloa Gulch at an elevation of 1,390ft (424m) amsl in Waikoloa 1 Ahupua'a (see Figure 7). Vegetation in the area is *kukui*, rose apple, coffee, *ii*, guava, and various ferns. The site consists of three rock walls (Fe. 1, 3, and 4) and rock concentration (Fe. 2) (Figure 42). The features are located on both the north and south sides of the gulch. The north side of the gulch is a narrow and steep slope, and the south side is wider and level.

Feature 1

Feature 1 is a rock wall segment located on the south side of the site. The wall is situated from the base of a hill on the south to the edge of the Waiköloa Gulch on the north. The wall is roughly 19.0m long (NW/SE) by 0.8m wide, and is 1.55m in maximum height. The wall is constructed of stacked angular and subangular cobbles and small boulders. It is bi-faced and core-filled. The construction style is typical of Historic-era ranch and sugarcane plantation walls.

Figure 41: Top: Site 28392, TU-1, Layer I (0–47cmbs): Possible Basalt Slingstone. Bottom: Site 28392, Surface: Basalt Hammerstone Showing Battered Edges.





The wall might have extended across the gulch and connected to the Feature 3 wall, but it does not do so currently. The northern terminus is collapsed. The wall has been altered by weathering and pigs, and is in fair condition.

Feature 2

Feature 2 is a rock concentration located three meters west of Feature 1. The rock concentration is roughly 8.0m long (NW/SE) by 3.4m wide, and is 0.45m in maximum height. The rock concentration is constructed of angular and subangular cobbles and small boulders loosely piled on the ground surface. There is no stacking or facing evident in feature construction. The concentration is the result of rock clearing on the level soil bank of the Waiköloa Gulch. Feature 2 has been altered by pigs and is in poor condition.

Feature 3

Feature 3 is a rock wall segment located on the north side of the site. The wall is situated from the base of a bedrock ridge on the north to the edge of the Waiköloa Gulch on the south. The wall is roughly 4.0m long (NE/SW) by 0.8m wide, and is 1.0m in maximum height. The wall is constructed of stacked angular and subangular cobbles and small boulders. It is bi-faced and core-filled. The construction style is typical of Historic-era ranch and sugarane plantation walls. The wall might have extended across the gulch and connected to the Feature 1 wall, but it does not do so currently. The wall has been altered by weathering and pigs, and is in fair condition.

Feature 4

Feature 4 is a collapsed rock wall segment located on the north side of the site. The wall is situated from the base of a hill on the south to the edge of the Waiköloa Gulch on the north. The collapsed wall is roughly 13.0m long (NE/SW) by 5.8m wide, and is 0.9m in maximum height. The wall is constructed of stacked angular and subangular cobbles and small boulders. It is bi-faced and core-filled. The construction style is typical of Historic-era ranch and sugarcane plantation walls. Both ends of the wall are collapsed. There is a pile of rock where the wall collapsed on the east end. Feature 4 appears to be the edge of a footpath leading to the gulch bottom from the sugarcane field above the north side of the gulch. Feature 4 has been altered by weathering and pigs, and is in poor condition.











A 1.0 by 1.0m test-unit (TU-2) was excavated along the southeast edge of the terrace at Site 28396. TU-2 was excavated as an architectural layer and two natural stratigraphic layers, was excavated to a maximum of 130cmbs, and terminated on a culturally sterile sediment and decaying bedrock (see Figure 46).

The Architectural Layer (0-100cmbs) was piled angular and subangular cobbles to small boulders with small amounts of organic detritus and no roots. No internal structure or subsurface features were encountered. No artifacts were recovered from the Architectural Layer.

Layer I (100-120cmbs) was loose very dark brown (10YR2/2) loam with a 20% basalt cobbles and less than 1% small roots. A piece of highly corroded ferrous metal (6.7g) was recovered from Layer I. The base of the platform architecture is within the top 5cm of Layer I.

Layer II (120-130cmbs) was compact dark yellowish brown (10YR4/6) very fine to coarse silty clay with small peds and a few very small roots. No artifacts were recovered from Layer II. TU-2 was terminated at the top of a yellowish brown fine silt and decaying bedrock.

Site 28396 Summary

Site 28396 appears to be the results of sugarcane field clearing. Rock was removed from the surrounding level fields and placed on the rocky ridgeline. The rock was stacked in order to keep it from rolling down the slope of the ridge. Some of the rock was stacked along the slope of the ridge to prevent erosion. This type of clearing is common on Historic-era sugarcane and ranch lands (Escott 2004, Wolforth and Chalmer 2007 draft). It is possible that the terrace marks a sugarcane field boundary. Site 28396 has been fully documented and no further work is recommended.






Site #	Site Type	Age	Site Function	Significance Criteria	Recommended Treatment
28381	Rock Wall	Historic Era	Boundary/Ag Clearing	D	No Further Work
28382	Ditch	Historic Era	Field Drainage	D	No Further Work
28383	Rock Wall	Historic Era	Boundary	D	No Further Work
28384	Rock Mounds	Historic Era	Agricultural Clearing	D	No Further Work
28385	Platform	Pre-Contact	Poss. Heiau	D, E	Data Recovery
28386	Rock Wall & Terrace	Historic Era	Boundary/Ag Clearing	D .	No Further Work
28387	Ditch	Historic Era	Field Drainage	D	No Further Work
28388	Rockshelter	Pre-Contact	Temporary Habitation	D	No Further Work
28389	Terrace	Historic Era	Soil Retention	D	No Further Work
28390	Rock Mound/Terraces	Historic Era	Agricultural Clearing	D	No Further Work
28391	Rockshelter	Pre-Contact	Temporary Habitation	D	No Further Work
28392	Rockshelter	Pre-Contact	Temporary Habitation	D	No Further Work
28393	Rock Walls	Historic Era	Boundary	D	No Further Work
28394	Rockshelter	Pre-Contact	Temporary Habitation	D	No Further Work
28395	Rock Mounds & Alignments	Historic Era	Agricultural Clearing	D	No Further Work
28396	Теггасе	Historic Era	Boundary/Ag Clearing	D	No Further Work
28397	Rock Mound	Historic Era	Agricultural Clearing	D	No Further Work

Table 2. Site Significance and Pa

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It must have yielded or may be likely to yield, information important in prehistory or to associations with cultural practices and traditional beliefs that were, or still are, carried rock concentrations created by during field clearing activities; five terraces forming field Sites identified during this project were assessed for their significance as outlined in Hawai'i Administrative Rules §13-275-6. To be assessed as significant a site must be construction, or represent a significant and distinguishable entity whose components may (E) Have important value to native Hawaiian people or other ethnicities in the state, due boundaries and likely the result of field clearing activities; four rock walls forming field The remaining twelve sites identified on the project are the remains of Historic It must be associated with events that have made a significant contribution to the era sugarcane agriculture. Component features include seven rock mounds and three All of the sites documented in this report were evaluated for their significance It must embody distinctive characteristics of a type, period, or method of broad patterns of our history, or be considered a traditional cultural property. It must be associated with the lives of persons significant in the past. SIGNIFICANCE ASSESSMENTS characterized by one or more of the following five criteria: boundaries; and three earthen drainage ditches. regarding prehistory (Table 2). lack individual distinction. history. out.

0

(B)

0

(A)

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A CULTURAL IMPACT ASSESSMENT OF 1,738.377 ACRES IN MALANAHAE, KAPOAULA, KAPULENA, WAI'ALE'ALE 1ST AND 2ND, WAIKŌLOA 1ST AND 2ND, NIUPUKA, AND HANAPAI AHUPUA'A, HĀMĀKUA DISTRICT, ISLAND OF HAWAI'I [TMK: (3) 4-7-05:01, 02, and 03, and (3) 4-7-06: 01, 05, 06, 07, 10, 18, and 20]

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> Final Report March 2011

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INTRODUCTION

At the request of PBR Hawaii and Associates, Scientific Consultant Services, Inc. (SCS) conducted a Cultural Impact Assessment, of a 1,738.377-acre parcel [TMK: (3) 4-7-05:01, 02, and 03, and (3) 4-7-06: 01, 05, 06, 07, 10, 18, and 20] in the *ahupua`a* of Malanahae, Kapoaula, Kapulena, Wai'ale'ale 1st and 2nd, Waikōloa 1st and 2nd, Niupuka, and Hanapai, *mauka* of Kapulena in Hāmākua District, Hawai'i Island (Figure 1, 2, 3, and 4). The parcel extends from 960ft (293m) to 2,160ft (659m) above mean sea level (amsl). The parcel is being considered for agricultural park lease land by the County of Hawai'i.



Figure 1: Hawai'i Island Map Showing Project Area Location.



Figure 2: USGS TOPO Map Showing Project Area Location (Shaded Yellow).



Figure 3: Location of Project Area (Shaded Yellow) on TMK: (3) 4-7 Map.



Figure 4: Aerial Photograph of Project Area Showing Sugarcane Fields.

The Constitution of the State of Hawai'i clearly states the duty of the State and its agencies is to preserve, protect, and prevent interference with the traditional and customary rights of native Hawaiians. Article XII, Section 7 requires the State to "protect all rights, customarily and traditionally exercised for subsistence, cultural and religious purposes and possessed by *ahupua*'a tenants who are descendants of native Hawaiians who inhabited the Hawaiian Islands prior to 1778" (2000). In spite of the establishment of the foreign concept of private ownership and western-style government, Kamehameha III (Kauikeaouli) preserved the peoples traditional right to subsistence. As a result in 1850, the Hawaiian Government confirmed the traditional access rights to native Hawaiian *ahupua*'a tenants to gather specific natural resources for customary uses from undeveloped private property and waterways under the Hawaiian Revised Statutes (HRS) 7-1. In 1992, the State of Hawai'i Supreme Court, reaffirmed HRS 7-1 and expanded it to include, "native Hawaiian rights…may extend beyond the *ahupua*'a in which a native Hawaiian resides where such rights have been customarily and traditionally exercised in this manner" (Pele Defense Fund v. Paty, 73 Haw.578, 1992).

Act 50, enacted by the Legislature of the State of Hawaii (2000) with House Bill 2895, relating to Environmental Impact Statements, proposes that:

...there is a need to clarify that the preparation of environmental assessments or environmental impact statements should identify and address effects on Hawaii's culture, and traditional and customary rights... [H.B. NO. 2895].

Act 50 requires state agencies and other developers to assess the effects of proposed land use or shore line developments on the "cultural practices of the community and State" as part of the HRS Chapter 343 environmental review process (2001).

Its purpose has broadened, "to promote and protect cultural beliefs, practices and resources of native Hawaiians [and] other ethnic groups, and it also amends the definition of 'significant effect' to be re-defined as "the sum of effects on the quality of the environment including actions that are...contrary to the State's environmental policies...or adversely affect the economic welfare, social welfare, or cultural practices of the community and State" (H.B. 2895, Act 50, 2000).

Thus, Act 50 requires an assessment of cultural practices to be included in the Environmental Assessments and the Environmental Impact Statements, and to be taken into consideration during the planning process. The concept of geographical expansion is recognized by using, as an example, "the broad geographical area, e.g. district or *ahupua*`a" (OEQC 1997). It was decided that the process should identify 'anthropological' cultural practices, rather than 'social' cultural practices. For example, *limu* (edible seaweed) gathering would be considered an anthropological cultural practice, while a modern-day marathon would be considered a social cultural practice.

According to the Guidelines for Assessing Cultural Impacts established by the Hawaii State Office of Environmental Quality Control (OEQC 1997): The types of cultural practices and beliefs subject to assessment may include subsistence, commercial, residential, agricultural, access-related, recreational, and religions and spiritual customs. The types of cultural resources subject to assessment may include traditional cultural properties or other types of historic sites, both manmade and natural, which support such cultural beliefs.

This Cultural Impact Assessment involves evaluating the probability of impacts on identified cultural resources, including values, rights, beliefs, objects, records, properties, and stories occurring within the project area and its vicinity cultural values and rights within the project area and its vicinity (H.B. 2895, Act 50, 2000).

METHODOLOGY

This Cultural Impact Assessment was prepared in accordance with the methodology and content protocol provided in the Guidelines for Assessing Cultural Impacts (OEQC 1997). In outlining the "Cultural Impact Assessment Methodology", the OEQC state: ...information may be obtained through scoping, community meetings, ethnographic interviews and oral histories... (1997).

The report contains archival and documentary research, as well as communication with organizations having knowledge of the project area, its cultural resources, and its practices and beliefs. This Cultural Impact Assessment was prepared in accordance with the methodology and content protocol provided in the Guidelines for Assessing Cultural Impacts (OEQC 1997). The assessment concerning cultural impacts should address, but not be limited to, the following matters:

(1) a discussion of the methods applied and results of consultation with individuals and organizations identified by the preparer as being familiar with cultural practices and

features associated with the project area, including any constraints of limitations with might have affected the quality of the information obtained;

- (2) a description of methods adopted by the preparer to identify, locate, and select the persons interviewed, including a discussion of the level of effort undertaken;
- (3) ethnographic and oral history interview procedures, including the circumstances under which the interviews were conducted, and any constraints or limitations which might have affected the quality of the information obtained;
- (4) biographical information concerning the individuals and organizations consulted, their particular expertise, and their historical and genealogical relationship to the project area, as well as information concerning the persons submitting information or interviewed, their particular knowledge and cultural expertise, if any, and their historical and genealogical relationship to the project area;
- (5) a discussion concerning historical and cultural source materials consulted, the institutions and repositories searched, and the level of effort undertaken, as well as the particular perspective of the authors, if appropriate, any opposing views, and any other relevant constraints, limitations or biases;
- (6) a discussion concerning the cultural resources, practices and beliefs identified, and for the resources and practices, their location within the broad geographical area in which the proposed action is located, as well as their direct or indirect significance or connection to the project site;
- (7) a discussion concerning the nature of the cultural practices and beliefs, and the significance of the cultural resources within the project area, affected directly or indirectly by the proposed project;
- (8) an explanation of confidential information that has been withheld from public disclosure in the assessment;
- (9) a discussion concerning any conflicting information in regard to identified cultural resources, practices and beliefs;
- (10) an analysis of the potential effect of any proposed physical alteration on cultural resources, practices or beliefs; the potential of the proposed action to isolate cultural resources, practices or beliefs from their setting; and the potential of the proposed action to introduce elements which may alter the setting in which cultural practices take place, and;
- (11) the inclusion of bibliography of references, and attached records of interviews, which were allowed to be disclosed.

Based on the inclusion of the above information, assessments of the potential effects on

cultural resources in the project area and recommendations for mitigation of these effects can be proposed.

ARCHIVAL RESEARCH

Archival research focused on a historical documentary study involving both published and unpublished sources. These included legendary accounts of native and early foreign writers; early historical journals and narratives; historic maps and land records such as Land Commission Awards, Royal Patent Grants, and Boundary Commission records; historic accounts, and previous archaeological project reports.

INTERVIEW METHODOLOGY

Interviews are conducted in accordance with Federal and State laws and guidelines. Individuals and/or groups who have knowledge of traditional practices and beliefs associated with a project area or who know of historical properties within a project area are sought for consultation. Individuals who have particular knowledge of traditions passed down from preceding generations and a personal familiarity with the project area are invited to share their relevant information. Often people are recommended for their expertise, and indeed, organizations, such as Hawaiian Civic Clubs, the Island Branch of Office of Hawaiian Affairs, historical societies, Island Trail clubs, and Planning Commissions are depended upon for their recommendations of suitable informants. These groups are invited to contribute their input, and suggest further avenues of inquiry, as well as specific individuals to interview.

If knowledgeable individuals are identified, personal interviews are sometimes taped and then transcribed. These draft transcripts are returned to each of the participants for their review and comments. After corrections are made, each individual signs a release form, making the information available for this study. When telephone interviews occur, a summary of the information is often sent for correction and approval, or dictated by the informant and then incorporated into the document. Key topics discussed with the interviewees vary from project to project, but usually include: personal association to the *ahupua*`a, land use in the project's vicinity; knowledge of traditional trails, gathering areas, water sources, religious sites; place names and their meanings; stories that were handed down concerning special places or events in the vicinity of the project area; evidence of previous activities identified while in the project vicinity.

In this case, letters briefly outlining the development plans along with maps of the project area were sent to individuals and organizations whose jurisdiction includes knowledge of the area with an invitation for consultation. Consultation was sought from Kai Markell, the Director of Native Rights, Land and Culture, Office of Hawaiian Affairs on O'ahu; Ruby McDonald, Coordinator of the Hawai'i branch of the Office of Hawaiian Affairs; the Waimea Hawaiian Civic Club; Ku Kahakalau (Hawai'i Island Burial Council); Leningrad Elarianoff (Hawai'i Island Burial Council); Dr. Billy Bergin; Keawe Vredenburg; Clement Junior Kanuha; Leon J. No'eau Peralto; Keawe Verdenburg; Gilbert Bailado; Rick Gmerkin (Ala Kahakai National Historic Trail, NPS); and Reggie Lee. If cultural resources are identified based on the information received from these organizations and/or additional informants, an assessment of the potential effects on the identified cultural resources in the project area and recommendations for mitigation of these effects can be proposed. Public Notices were placed in the Ka Wai Ola OHA Newspaper, the Tribune Herald, and the Advertiser.

PROJECT AREA AND VICINITY

The project area is a 1,738.377-acre parcel [TMK: (3) 4-7-05:01, 02, and 03, and (3) 4-7-06: 01, 05, 06, 07, 10, 18, and 20] in the *ahupua*`a of Malanahai, Kapoaula, Kapulena, Wai'ale 'ale 1st and 2nd, Waikōloa 1st and 2nd, Niupuka, and Hanapai, *mauka* of Kapulena in Hāmākua District, Hawai'i Island (Figure 1, 2, and 3). The area was wooded during the pre-Contact era. More recently, the area was under sugarcane cultivation (see Figure 4). The majority of the parcel has been altered by sugarcane agriculture.

CULTURAL HISTORICAL CONTEXT

HAWAIIAN LAND DIVISIONS AND SETTLEMENT

Initial settlement of the high Hawaiian Islands is believed to have occurred along the wetter and more fertile windward coasts where conditions were optimal for marine and terrestrial exploitation along lines followed previously in Eastern Polynesia. This exploitation involved inshore and pelagic fishing, gathering shellfish from the shore and strand, plant and animal husbandry, and the utilization of natural terrestrial flora and fauna (Kirch and Kelly 1975; Pearson *et al.* 1971; Kirch 1985). The pattern of this early settlement is thought to have consisted of widely spaced, permanent home bases that gradually expanded to form a nearly continuous zone of permanent settlement along the windward coasts as local populations grew.

There is a paucity of prehistoric information pertaining to the lands of the project area and surrounding lands (Cordy 2000:216-217). The project area is located in a traditionally

sparsely populated area along the high cliffs of the Hāmākua coast. It has poor access to marine resources and is far from the sociopolitical population center of Hilo to the east, and just outside of the Waipi'o Valley and Waimea to the west. Though a coastal trail was used to travel along the Hāmākua, much of the travel between Hilo and Waipi'o was done by sailing canoe. The project area is not at the nexus of a trail system, and much of the cross-island travel was conducted on trails that crossed the saddle between Mauna Kea, Maun Loa, and Huālalai (Figure 5).

WAHI PANA (LEGENDARY PLACES)

The *ahupua* '*a* of Malanahae, Kapoaula, Kapulena, Wai 'ale 'ale 1st and 2nd, Waikōloa 1st and 2nd, Niupuka, and Hanapai are traditional Hawaiian land divisions situated between the 200 foot high cliffs of the Hāmākua coast and the uplands. Kapoaula and Waikōloa are the longest *mauka/makai* and reach elevations of roughly 3,000ft amsl and 2,600ft amsl, respectively. The remaining ahupua 'a reach an upper elevation of approximately 1,600ft amsl. Kapulena is named for the king shark of Hāmākua (Pukui *et al.*1974:90). Malanahae is translated as "a body of furious men" (Parker Dictionary: 658, cited on http://ulukau.org). Kapulena is the name of the yellow trumpet shell (Parker Dictionary: 646, cited on http://ulukau.org). Wai 'ale 'ale is translated literally as "rippling or overflowing water (Pukui *et al.*1974:220). Waikōloa is the name of a wind, and is the name of the gulch that runs through the ahupua 'a. Waikōloa is translated literally as "coconut tree with a hole through it" (Parker Dictionary: 661, cited on http://ulukau.org). Hanapai is the act of tying up food bundles (Parker Dictionary: 631, cited on http://ulukau.org). No references to the name of Kapoaula Ahupua 'a are available.

PREHISTORIC AND HISTORIC ACCOUNTS OF KOHOLĀLELE

No published prehistoric accounts of named places within the project area are recorded by Kamakau (1992), I'i (1993), Kalakaua (1990), or Fournander (1996). Cordy, using leaders of O'ahu and their exploits at Waipi'o, suggests that there was a ruling polity at Waipi'o that likely controlled lands of the Hāmākua (Cordy 2000: 141-142). Kamakau (1992) records that Kamehameha camped at Laupāhoehoe during his battles to conquer the Island of Hawai'i.

The Reverends William Ellis and Asa Thurston traveled through lands of the project area on their way to Waipi'o in 1823. They met a small group of people at Malanahae, and continued on to Kapulena where they preached to an assembly of about one hundred people (Ellis 2004:357). The path from Kapulena to Waipi'o was crooked and bordered on both sides by tall grass and well-cultivated "plantations."



Figure 5: Hawai'i Island Trail Systems.

Ellis described the bottom of the Waipi'o Valley as

one continued garden, cultivated with taro, bananas, sugar-cane, and other productions of the island, all growing luxuriantly. Several large ponds were also seen in different directions, well stocked with excellent fish. A number of small villages, containing from twenty to fifty houses each, stood along the foot of the mountains, at unequal distances on each side, and extended up the valley till projecting cliffs obscured the view (Ellis 2004:360).

Ellis also visited several *heiau* at Waipi'o. It was said that one of the *hieau* was used by 'Umi a Līloa (ruled A.D 1600-1620) to make sacrifices after conquering the six *moku* of the Island of Hawai'i (Ellis 2004:366). Ellis also described Pakarana, the place of refuge (Pu'uhonua) at Waipi'o. The compound was smaller than that at Honaunau and had a small house containing the bones of Līloa. Both King Kamehameha and King Liholiho made offerings at the small house when they visited Waipi'o (Ellis 2004: 367).

Ellis and Thurston counted 256 houses in the valley and estimated the population to be about 1,325 people (Ellis 2004: 368). He also noted there were populous villages on the coast on either side of the valley. He pointed out that the Waipi'o Valley has been historically a place of socio-political power along the Hāmākua coast.

In 1872, Isabella Bird traveled by horseback along the Hāmākua from Onomea to the Waipi'o Valley and described the landscape she travelled through. The journey was over very rough and steep trails, and took five days. Bird noted "this is the most severe road on horses on Hawaii, and it takes a really good animal to come to Waipio and go back to Hilo (Bird 2007:85). The description that follows underscores the sparsely populated Hāmākua area:

From Onomea to the place where we expected to find the guide, we kept going up and down the steep sides of ravines, and scrambling through torrents till we reached a deep and most picturesque gulch [Kawainui], with a primitive schoolhouse at the bottom, and some grass-houses clustering under palms and papayas, a valley scene of endless ease and perpetual afternoon. Here we found that D.'s uncle, who was to have been our guide, could not go, because his horse was not strong enough, but her cousin volunteered his escort, and went away to catch his horse, while we tethered ours and went into the school-house.

This reminded me somewhat of the very poorest schools connected with the Edinburgh Ladies' Highland School Association, but the teacher had a remarkable paucity of clothing, and he seemed to have the charge of his baby, which, much clothed, and indeed much muffled, lay on the bench beside him. For there were

benches, and a desk, and even a blackboard and primers down in the deep wild gulch, where the music of living waters, and the thunderous roll of the Pacific, accompanied the children's tuneless voices as they sang an Hawaiian hymn. I shall remember nothing of the scholars but rows of gleaming white teeth, and splendid brown eyes. I thought both teacher and children very apathetic. There were lamentably few, though the pretty rigidly enforced law, which compels all children between the ages of six and fifteen to attend school for forty weeks of the year, had probably gathered together all the children of the district. They all wore coloured chemises and leis of flowers (Bird 2007:85).

We had a perfect day until the middle of the afternoon. The dimpling Pacific was never more than a mile from us as we kept the narrow track in the long green grass; and on our left the blunt snow-patched peaks of Mauna Kea rose from the girdle of forest, looking so delusively near that I fancied a two-hours' climb would take us to his lofty summit. The track for twenty-six miles is just in and out of gulches, from 100 to 800 feet in depth, all opening on the sea, which sweeps into them in three booming rollers. The candle-nut or kukui (aleurites triloba) tree, which on the whole predominates, has leaves of a rich deep green when mature, which contrast beautifully with the flaky silvery look of the younger foliage. Some of the shallower gulches are filled exclusively with this tree, which in growing up to the light to within 100 feet of the top, presents a mass and density of leafage quite unique, giving the gulch the appearance as if billows of green had rolled in and solidified there. Each gulch has some specialty of ferns and trees, and in such a distance as sixty miles they vary considerably with the variations of soil, climate, and temperature. But everywhere the rocks, trees, and soil are covered and crowded with the most exquisite ferns and mosses, from the great tree-fern, whose bright fronds light up the darker foliage, to the lovely maidenhair and graceful selaginellas which are mirrored in pools of sparkling water. Everywhere, too, the great blue morning glory opened to a heaven not bluer than itself.

The descent into the gulches is always solemn. You canter along a bright breezy upland, and are suddenly arrested by a precipice, and from the depths of a forest abyss a low plash or murmur rises, or a deep bass sound, significant of water which must be crossed, and one reluctantly leaves the upper air to plunge into heavy shadow, and each experience increases one's apprehensions concerning the next. Though in some gulches the kukui preponderates, in others the lauhala whose aerial roots support it in otherwise impossible positions, and in others the sombre ohia, yet there were some grand clefts in which nature has mingled her treasures impartially, and out of cool depths of ferns rose the feathery coco-palm, the glorious breadfruit, with its green melon-like fruit, the large ohia, ideal in its beauty,—the most gorgeous flowering tree I have ever seen, with spikes of rosecrimson blossoms borne on the old wood, blazing among its shining many-tinted leafage,—the tall papaya with its fantastic crown, the profuse gigantic plantain, and innumerable other trees, shrubs, and lianas, in the beauty and bounteousness of an endless spring. Imagine my surprise on seeing at the bottom of one gulch, a grove of good-sized, dark-leaved, very handsome trees, with an abundance of smooth round green fruit upon them, and on reaching them finding that they were orange trees, their great size, far exceeding that of the largest at Valencia, having prevented me from recognizing them earlier! In another, some large shrubs with oval, shining, dark leaves, much crimped at the edges, bright green berries along the stalks, and masses of pure white flowers lying flat, like snow on evergreens, turned out to be coffee! The guava with its obtuse smooth leaves, sweet white blossoms on solitary axillary stalks, and yellow fruit was universal. The novelty of the fruit, foliage, and vegetation is an intense delight to me. I should like to see how the rigid aspect of a coniferous tree, of which there is not one indigenous to the islands, would look by contrast. We passed through a long thicket of sumach, an exotic from North America, which still retains its old habit of shedding its leaves, and its grey, wintry, desolate-looking branches reminded me that there are less-favoured parts of the world, and that you are among mist, cold, murk, slush, gales, leaflessness, and all the dismal concomitants of an English winter.

It is wonderful that people should have thought of crossing these gulches on anything with four legs. Formerly, that is, within the last thirty years, the precipices could only be ascended by climbing with the utmost care, and descended by being lowered with ropes from crag to crag, and from tree to tree, when hanging on by the hands became impracticable to even the most experienced mountaineer. In this last fashion Mr. Coan and Mr. Lyons were let down to preach the gospel to the people of the then populous valleys. But within recent years, narrow tracks, allowing one horse to pass another, have been cut along the sides of these precipices, without any windings to make them easier, and only deviating enough from the perpendicular to allow of their descent by the sure-footed native-born animals. Most of them are worn by water and animals' feet, broken, rugged, jagged, with steps of rock sometimes three feet high, produced by breakage here and there. Up and down these the animals slip, jump, and scramble, some of them standing still until severely spurred, or driven by some one from behind. Then there are softer descents, slippery with damp, and perilous in heavy rains, down which they slide dexterously, gathering all their legs under them. On a few of these tracks a false step means death, but the vegetation which clothes the pali below, blinds one to the risk. I don't think anything would induce me to go up a swinging zigzag—up a terrible pali opposite to me as I write, the sides of which are quite undraped.

All the gulches for the first twenty-four miles contain running water. The great Hakalau gulch we crossed early yesterday, has a river with a smooth bed as wide as the Thames at Eton. Some have only small quiet streams, which pass gently through ferny grottoes. Others have fierce strong torrents dashing between abrupt walls of rock, among immense boulders into deep abysses, and cast themselves over precipice after precipice into the ocean. Probably, many of these are the courses of fire torrents, whose jagged masses of a-a have since been worn smooth, and channelled into holes by the action of water. A few are crossed on narrow bridges, but the majority are forded, if that quiet conventional term can be applied to the violent flounderings by which the horses bring one through. The transparency deceives them, and however deep the water is, they always try to lift their fore feet out of it, which gives them a disagreeable rolling motion. (Mr. Brigham in his valuable monograph on the Hawaiian volcanoes quoted below, appears as much impressed with these gulches as I am.)

We lunched in one glorious valley, and Kaluna made drinking cups which held fully a pint, out of the beautiful leaves of the Arum esculentum. Towards afternoon turbid-looking clouds lowered over the sea, and by the time we reached the worst pali of all, the south side of Laupahoehoe, they burst on us in torrents of rain accompanied by strong wind. This terrible precipice takes one entirely by surprise. Kaluna, who rode first, disappeared so suddenly that I thought he had gone over. It is merely a dangerous broken ledge, and besides that it looks as if there were only foothold for a goat, one is dizzied by the sight of the foaming ocean immediately below, and, when we actually reached the bottom, there was only a narrow strip of shingle between the stupendous cliff and the resounding surges, which came up as if bent on destruction. The path by which we descended looked a mere thread on the side of the precipice. I don't know what the word beetling means, but if it means anything bad, I will certainly apply it to that pali.

A number of disastrous-looking native houses are clustered under some very tall palms in the open part of the gulch, but it is a most wretched situation; the roar of the surf is deafening, the scanty supply of water is brackish, there are rumours that leprosy is rife, and the people are said to be the poorest on Hawaii (Bird 2007:87-91).

We moved on in single file at a jog-trot wherever the road admitted of it, meeting mounted natives now and then, which led to a delay for the exchange of nuhou; and twice we had to turn into the thicket to avoid what here seems to be considered a danger. There are many large herds of semi-wild bullocks on the mountains, branded cattle, as distinguished from the wild or unbranded, and when they are wanted for food, a number of experienced vaccheros on strong shod horses go up, and drive forty or fifty of them down. We met such a drove bound for Hilo, with one or two men in front and others at the sides and behind, uttering loud shouts. The bullocks are nearly mad with being hunted and driven, and at times rush like a living tornado, tearing up the earth with their horns. As soon as the galloping riders are seen and the crooked-horned beasts, you retire behind a screen. There must be some tradition of some one having been knocked down and hurt, for reckless as the natives are said to be, they are careful about this, and we were warned several times by travellers whom we met, that there were "bullocks ahead." The law provides that the vaccheros shall station one of their number at the head of a gulch to give notice when cattle are to pass through.

We jogged on again till we met a native who told us that we were quite close to our destination; but there were no signs of it, for we were still on the lofty uplands, and the only prominent objects were huge headlands confronting the sea. I got off to walk, as my mule seemed footsore, but had not gone many yards when we came suddenly to the verge of a pali, about 1,000 feet deep [Waipio], with a narrow fertile valley below, with a yet higher pali on the other side, both abutting perpendicularly on the sea. I should think the valley is not more than three miles long, and it is walled in by high inaccessible mountains. It is in fact, a gulch on a vastly enlarged scale. The prospect below us was very charming, a fertile region perfectly level, protected from the sea by sandhills, watered by a winding stream, and bright with fishponds, meadow lands, kalo patches, orange and coffee groves, figs, breadfruit, and palms. There were a number of grass-houses, and a native church with a spire, and another up the valley testified to the energy and aggressiveness of Rome (Bird 2007:94-95).

Bird's host in Waipi'o was Halemanu, a member of the legislature and the deputy sheriff. Halemanu expressed a sadness for the dwindling of the Hawaiian population. Almost fifty years earlier (*circa* 1823) there were approximately 1,300 inhabitants in the Waipi'o Valley (Bird 2007:100). At the time of Bird's visit there were no more than 200. Bird also wrote about a few of the major, traditional Hawaiian institutions established at Waipi'o, including:

the Puhonua, or place of refuge for all this part of the island. This, and the very complete one of Honaunau, on the other side of Hawaii, were the Hawaiian "Cities of Refuge." Could any tradition of the Mosaic ordinance on this subject have travelled hither? These two sanctuaries were absolutely inviolable. The gates stood perpetually open, and though the fugitive was liable to be pursued to their very threshold, he had no sooner crossed it than he was safe from king, chief, or avenger. These gates were wide, and some faced the sea, and others the mountains. Hither the murderer, the manslayer, the tabu-breaker fled, repaired to the presence of the idol, and thanked it for aiding him to reach the place of security. After a certain time the fugitives were allowed to return to their families, and none dared to injure those to whom the high gods had granted their protection.

In time of war, tall spears from which white flags were unfurled, were placed at each end of the enclosure, and until the proclamation of peace invited the vanquished to enter. These flags were fixed a short distance outside the walls, and no pursuing warrior, even in the hot flush of victory, could pursue his routed foe one foot beyond. Within was the sacred pale of pahu tabu, and anyone attempting to strike his victim there would have been put to death by the priests and their adherents. In war time the children, old people, and many of the women of the neighbouring districts, were received within the enclosure, where they awaited the issue of the conflict in security, and were safe from violence in the event of defeat. These puhonuas contain pieces of stone weighing from two to three tons, raised six feet from the ground, and the walls, narrowing gradually towards the top, are fifteen feet wide at the base and twelve feet high. They are truly grand monuments of humanity in the midst of the barbarous institutions of heathenism, and it shows a considerable degree of enlightenment that even rebels in arms and fugitives from invading armies were safe, if they reached the sacred refuge, for the priests of Keawe knew no distinctions of party.

In dreadful contrast to this place of mercy, there were some very large heiaus (or temples) here, on whose hideous altars eighty human sacrifices are said to have been offered at one time. One of the legends told me concerning this lovely valley is, that King Umi, having vanquished the kings of the six divisions of Hawaii, was sacrificing captives in one of these heiaus, when the voice of his god, Kuahilo, was heard from the clouds, demanding more slaughter. Fresh human blood streamed from the altars, but the insatiable demon continued to call for more, till Umi had sacrificed all the captives and all his own men but one, whom he at first refused to give up, as he was a great favourite, but Kuahilo thundered from heaven, till the favourite warrior was slain, and only the king and the sacrificing priest remained.

This valley of the "vanquished waters" abounds in legends. Some of these are about a cruel monster, King Hooku, who lived here, and whose memory, so far as he is remembered, is much execrated. It is told of him that if a man were said to have a handsome head he sent some of his warriors to behead him, and then hacked and otherwise disfigured the face for a diversion. On one occasion he ordered a man's arm to be cut off and brought to him, simply because it was said to be more beautifully tattooed than his own. It is fifty-four years since the last human sacrifice was exposed on the Waipio altars, but there are several old people here who must have been at least thirty when Hawaii threw off idolatry for ever (Bird 2007:100-101).

Bird also described the sugar plantation at Kaiwiki, east of the project area. It was one of the first sugar mills established on the Island of Hawai'i. The Hamakua Mill Company and the Pacific Sugar Mill Company had not yet been established at the time of her journey. Those two companies were established in 1877 and 1878, respectively. The Pacific Sugar Mill Company was located at Kukuihaele, and the Kaiwiki Mill Company was located further east at 'O'ōkala. Her description of the Kaiwiki Mill follows:

Then there is the sugar plantation of Kaiwiki, with its patches of bright green cane, its flumes crossing the track above our heads, bringing the cane down from the upland cane-fields to the crushing-mill, and the shifting, busy scenes of the sugar-boiling season.

Then the track goes down with a great dip, along which we slip and slide in the mud to a deep broad stream. This is a most picturesque spot, the junction of two clear bright rivers, and a few native houses and a Chinaman's store are grouped close by under some palms, with the customary loungers on horseback, asking and receiving nuhou, or news, at the doors. Our accustomed horses leaped into a ferry-scow provided by Government, worked by a bearded female of hideous aspect, and leaped out on the other side to climb a track cut on the side of a precipice, which would be steep to mount on one's own feet. There we met parties of natives, all flower-wreathed, talking and singing, coming gaily down on their sure— footed horses, saluting us with the invariable "Aloha." Every now and then we passed native churches, with spires painted white, or a native schoolhouse, or a group of scholars all ferns and flowers. The greenness of the vegetation merits the term "dazzling." We think England green, but its colour is poor and pale as compared with that of tropical Hawaii. Palms, candlenuts, ohias, hibiscus, were it not for their exceeding beauty, would almost pall upon one from their abundance, and each gulch has its glorious entanglement of breadfruit, the large-leaved ohia, or native apple, a species of Eugenia (Eugenia Malaccensis), and the pandanus, with its aerial roots, all looped together by large sky-blue convolvuli and the running fern, and is marvellous with parasitic growths.

The unique beauty of this coast is what are called gulches— narrow deep ravines or gorges, from 100 to 2,000 feet in depth, each with a series of cascades from 10 to 1,800 feet in height. I dislike reducing their glories to the baldness of figures, but the depth of these clefts (originally, probably, the seams caused by fire torrents), cut and worn by the fierce streams fed by the snows of Mauna Kea, and the rains of the forest belt, cannot otherwise be expressed. The cascades are most truly beautiful, gleaming white among the dark depths of foliage far away, and falling into deep limpid basins, festooned and overhung with the richest and greenest vegetation of this prolific climate, from the huge-leaved banana and shining breadfruit to the most feathery of ferns and lycopodiums. Each gulch opens on a velvet lawn close to the sea, and most of them have space for a few grass houses, with cocoanut trees, bananas, and kalo patches. There are sixty-nine of these extraordinary chasms within a distance of thirty miles!

I think we came through eleven, fording the streams in all but two. The descent into some of them is quite alarming. You go down almost standing in your stirrups, at a right angle with the horse's head, and up, grasping his mane to prevent the saddle slipping. He goes down like a goat, with his bare feet, looking cautiously at each step, sometimes putting out a foot and withdrawing it again in favour of better footing, and sometimes gathering his four feet under him and sliding or jumping. The Mexican saddle has great advantages on these tracks, which are nothing better than ledges cut on the sides of precipices, for one goes up and down not only in perfect security but without fatigue. I am beginning to hope that I am not too old, as I feared I was, to learn a new mode of riding, for my companions rode at full speed over places where I should have picked my way carefully at a foot's pace; and my horse followed them, galloping and stopping short at their pleasure, and I successfully kept my seat, though not without occasional fears of an ignominious downfall. I even wish that you could see me in my Rob Roy riding dress, with leather belt and pouch, a lei of the orange seeds of

the pandanus round my throat, jingling Mexican spurs, blue saddle blanket, and Rob Roy blanket strapped on behind the saddle!

This place is grandly situated 600 feet above a deep cove, into which two beautiful gulches of great size run, with heavy cascades, finer than Foyers at its best, and a native village is picturesquely situated between the two. The great white rollers, whiter by contrast with the dark deep water, come into the gulch just where we forded the river, and from the ford a passable road made for hauling sugar ascends to the house. The air is something absolutely delicious; and the murmur of the rollers and the deep boom of the cascades are very soothing. There is little rise or fall in the cadence of the surf anywhere on the windward coast, but one even sound, loud or soft, like that made by a train in a tunnel.

We were kindly welcomed, and were at once "made at home." Delicious phrase! the full meaning of which I am learning on Hawaii, where, though everything has the fascination of novelty, I have ceased to feel myself a stranger. This is a roomy, rambling frame-house, with a verandah, and the door, as is usual here, opens directly into the sitting-room. The stair by which I go to my room suggests possibilities, for it has been removed three inches from the wall by an earthquake, which also brought down the tall chimney of the boiling-house. Close by there are small pretty frame-houses for the overseer, bookkeeper, sugar boiler, and machinist; a store, the factory, a pretty native church near the edge of the cliff, and quite a large native village below. It looks green and bright, and the atmosphere is perfect, with the cool air coming down from the mountains, and a soft breeze coming up from the blue dreamy ocean. Behind the house the uplands slope away to the colossal Mauna Kea. The actual, dense, impenetrable forest does not begin for a mile and a half from the coast, and its broad dark belt, extending to a height of 4,000 feet, and beautifully broken, throws out into greater brightness the upward glades of grass and the fields of sugar-cane.

This is a very busy season, and as this is a large plantation there is an appearance of great animation. There are five or six saddled horses usually tethered below the house; and with overseers, white and coloured, and natives riding at full gallop, and people coming on all sorts of errands, the hum of the crushing-mill, the rush of water in the flumes, and the grind of the waggons carrying cane, there is no end of stir.

The plantations in the Hilo district enjoy special advantages, for by turning some of the innumerable mountain streams into flumes the owners can bring a great part of their cane and all their wood for fuel down to the mills without other expense than the original cost of the woodwork. Mr. A. has 100 mules, but the greater part of their work is ploughing and hauling the kegs of sugar down to the cove, where in favourable weather they are put on board of a schooner for Honolulu. This plantation employs 185 hands, native and Chinese, and turns out 600 tons of sugar a year. The natives are much liked as labourers, being docile and on the whole willing; but native labour is hard to get, as the natives do not

like to work for a term unless obliged, and a pernicious system of "advances" is practised. The labourers hire themselves to the planters, in the case of natives usually for a year, by a contract which has to be signed before a notary public. The wages are about eight dollars a month with food, or eleven dollars without food, and the planters supply houses and medical attendance. The Chinese are imported as coolies, and usually contract to work for five years. As a matter of policy no less than of humanity the "hands" are well treated; for if a single instance of injustice were perpetrated on a plantation the factory might stand still the next year, for hardly a native would contract to serve again.

The Chinese are quiet and industrious, but smoke opium, and are much addicted to gaming. Many of them save money, and, when their turn of service is over, set up stores, or grow vegetables for money. Each man employed has his horse, and on Saturday the hands form quite a cavalcade. Great tact, firmness, and knowledge of human nature are required in the manager of a plantation. The natives are at times disposed to shirk work without sufficient cause; the native lunas, or overseers, are not always reasonable, the Chinamen and natives do not always agree, and quarrels and entanglements arise, and everything is referred to the decision of the manager, who, besides all things else, must know the exact amount of work which ought to be performed, both in the fields and factory, and see that it is done. Mr. A. is a keen, shrewd man of business, kind without being weak, and with an eye on every detail of his plantations. The requirements are endless. It reminds me very much of plantation life in Georgia in the old days of slavery. I never elsewhere heard of so many headaches, sore hands, and other trifling ailments. It is very amusing to see the attempts which the would-be invalids make to lengthen their brief smiling faces into lugubriousness, and the sudden relaxation into naturalness when they are allowed a holiday. Mr. A. comes into the house constantly to consult his wife regarding the treatment of different ailments.

I have made a second tour through the factory, and am rather disgusted with sugar making. "All's well that ends well," however, and the delicate crystalline result makes one forget the initial stages of the manufacture. The cane, stripped of its leaves, passes from the flumes under the rollers of the crushingmill, where it is subjected to a pressure of five or six tons. One hundred pounds of cane under this process yield up from sixty-five to seventy-five pounds of juice. This juice passes, as a pale green cataract, into a trough, which conducts it into a vat, where it is dosed with quicklime to neutralize its acid, and is then run off into large heated metal vessels. At this stage the smell is abominable, and the turbid fluid, with a thick scum upon it, is simply disgusting. After a preliminary heating and skimming it is passed off into iron pans, several in a row, and boiled and skimmed, and ladled from one to the other till it reaches the last, which is nearest to the fire, and there it boils with the greatest violence, seething and foaming, bringing all the remaining scum to the surface. After the concentration has proceeded far enough, the action of the heat is suspended, and the reddish-brown, oily-looking liquid is drawn into the vacuum-pan till it is about a third full; the

concentration is completed by boiling the juice in vacuo at a temperature of 150 degrees, and even lower. As the boiling proceeds, the sugar boiler tests the contents of the pan by withdrawing a few drops, and holding them up to the light on his finger; and, by certain minute changes in their condition, he judges when it is time to add an additional quantity. When the pan is full, the contents have thickened into the consistency of thick gruel by the formation of minute crystals, and are then allowed to descend into an heater, where they are kept warm till they can be run into "forms" or tanks, where they are allowed to granulate. The liquid, or molasses, which remains after the first crystallization is returned to the vacuum pan and reboiled, and this reboiling of the drainings is repeated two or three times, with a gradually decreasing result in the quality and quantity of the sugar. The last process, which is used for getting rid of the treacle, is a most beautiful one. The mass of sugar and treacle is put into what are called "centrifugal pans," which are drums about three feet in diameter and two feet high, which make about 1,000 revolutions a minute. These have false interiors of wire gauze, and the mass is forced violently against their sides by centrifugal action, and they let the treacle whirl through, and retain the sugar crystals, which lie in a dry heap in the centre.

The cane is being flumed in with great rapidity, and the factory is working till late at night. The cane from which the juice has been expressed, called "trash," is dried and used as fuel for the furnace which supplies the steam power. The sugar is packed in kegs, and a cooper and carpenter, as well as other mechanics, are employed.

Sugar is now the great interest of the islands. Christian missions and whaling have had their day, and now people talk sugar. Hawaii thrills to the news of a cent up or a cent down in the American market. All the interests of the kingdom are threatened by this one, which, because it is grievously depressed and staggers under a heavy import duty in the American market, is now clamorous in some quarters for "annexation," and in others for a "reciprocity treaty," which last means the cession of the Pearl River lagoon on Oahu, with its adjacent shores, to America, for a Pacific naval station. There are 200,000 acres of productive soil on the islands, of which only a fifteenth is under cultivation, and of this large area 150,000 is said to be specially adapted for sugar culture. Herein is a prospective Utopia, and people are always dreaming of the sugar-growing capacities of the belt of rich disintegrated lava which slopes upwards from the sea to the bases of the mountains. Hitherto, sugar growing has been a very disastrous speculation, and few of the planters at present do more than keep their heads above water.

Were labour plentiful and the duties removed, fortunes might be made; for the soil yields on an average about three times as much as that of the State of Louisiana. Two and a half tons to the acre is a common yield, five tons, a frequent one, and instances are known of the slowly matured cane of a high altitude yielding as much as seven tons! The magnificent climate makes it a very easy crop to grow. There is no brief harvest time with its rush, hurry, and frantic demand for labour, nor frost to render necessary the hasty cutting of an immature crop. The same number of hands is kept on all the year round. The planters can plant pretty much when they please, or not plant at all, for two or three years, the only difference in the latter case being that the rattoons which spring up after the cutting of the former crop are smaller in bulk. They can cut when they please, whether the cane be tasselled or not, and they can plant, cut, and grind at one time!

It is a beautiful crop in any stage of growth, especially in the tasselled stage. Every part of it is useful—the cane pre-eminently—the leaves as food for horses and mules, and the tassels for making hats. Here and elsewhere there is a plate of cut cane always within reach, and the children chew it incessantly. I fear you will be tired of sugar, but I find it more interesting than the wool and mutton of Victoria and New Zealand, and it is a most important item of the wealth of this toy kingdom, which last year exported 16,995,402 lbs. of sugar and 192,105 gallons of molasses.[Footnote: In 1875 the export of sugar reached a total of 25,080,182 lbs.] With regard to molasses, the Government prohibits the manufacture of rum, so the planters are deprived of a fruitful source of profit. It is really difficult to tear myself from the subject of sugar, for I see the cane waving in the sun while I write, and hear the busy hum of the crushing-mill [Bird 2007:72-78].

Bird was staying at the Onomea Plantation as a guest at the time. The Onomea Plantation was owned by her host Judge S.L. Austin who started the plantation in 1863 (Campbell and Ogburn 1990). A description of the Onomea Plantation works by Campbell and Ogburn (1990) is quoted below.

During the early days, Onomea's crushing plant was water driven. A metal water wheel and boiler had been shipped from Glasgow, Scotland in 1862. Water from the flumes provided the power to turn the wheel, which in turn moved the sugar cane crusher. The water-driven crushing plant was much larger and heavier than those of other mills. The mill was situated just below Papaikou at the foot of a gulch, which opened out to the ocean. It was the first nine-roller mill erected on the island. The mill was connected by rail to one of the best landings and loading devices on the coast. The sugar cars were hauled to the landing by a cable and sugar could be sent over the main cable to the hold of a ship without rehandling. By means of this device about 1,600 bags of sugar could be loaded in an hour.

A distinctive feature of Onomea was its system of flumes, which spanned gorges and carried cane down the slopes to the mill. Fifty-five miles of stationary and portable flumes were constructed. The trestle, which carried the main flume across Hanawainui Gulch, was the largest wooden bridge in the territory and the one spanning Kawainui Gulch was the highest, 176 feet. Onomea's location in a heavy rainfall belt made it difficult to mechanize cane harvesting and transportation easily. Onomea was one of the last plantations to stop hand cutting cane. However, progress was made and the extensive road building program begun in 1903 was finally completed in 1956.

The heavy rainfall also tended to wash topsoil away and leach it out. Onomea was the first Hawaiian sugar plantation to use commercial fertilizer on its fields. In 1879 (1897?), bone meal fertilizer was used to improve the soil. Later on Manager John T. Moir's protective efforts towards Onomea's topsoils resulted in the invention of a plow which was adapted to the peculiar topography of the county and the nature of the soil. The shallow, clay-like soils were subject to washing unless properly cultivated. It is to Moir's credit that no field was washed out to sea during his 20 years of management. He was also considered one of the leaders in the conservation of waste products and the use of them to build up the land.

The descriptions of the Kaiwiki and Onomea plantations are good period descriptions of sugar plantations and operations in the area of the Hamakua Sugar Plantation that was soon to be operated within the project area.

NATIVE TESTIMONY BEFORE THE COMMISSION TO QUIET LAND TITLES

With the Mahele of 1848 and the two Acts of 1850, authorizing the sale of land in fee simple to resident aliens and the award of *kuleana* lands to native tenants, land tenure in Hawaii arrived at a significant turning point (Chinen 1961:13). Two Land Commission Awards were made within the project area. One half of Malanahae Ahupua'a was awarded to Simeona Luluhiwalani (LCA 4: B, R.P. 7825). Two '*apana* (LCA 9971: A and B) in Waikōloa Ahupua'a were awarded to William Pitt Leleihoku. There is no descriptive information given for Leleihoku's two '*apana* in Waikōloa Ahupua'a. Luluhiwalani states in his claim in Malanahae that his right to the land was acquired when

Kamehameha II sailed to Kawaihae - this was Kaneuwaine [1819] - the land of the Ali`i was cut up there. Then the Ali`i gave Malanahae to Hikiau. Kaleimoku said "This land is for my kaikaina." Then the chiefs asked, "To whom?" To Keoua, he is a kaikaina of us all. Kaleimoku approved /saying/ "This is my very own kaikaina." Then the Ali`i gave this land to him absolutely. Keoua was with Keeumoku at this time. /The land was held/ from this time. At the time in which

Kamehameha II sailed for England, in the night Keoua died, and the next day the Ali`i sailed for England.

When he was alive, Keoua directly bequeathed all his lands to me. I am above, my makuahine is below /one the lands held/ from Hawaii to Oahu. These are the land which I hereby present /as claims/ at this time (Waihona 'Aina 2000).

THE HISTORY OF SUGAR IN HAWAI'I

Captain Cook found sugarcane (*Saccharum officinarum*) growing in Hawai'i at the time of his arrival in 1778 (Beaglehole 1967:479). He noted that the cane was of large size and good quality. According to Hawaiians, sugarcane ($k\bar{o}$) grew wild and quite well in the valleys and lowlands. It was not refined but was eaten as a food crop and was used as an offering, especially to the shark god *Mano* (Rolph 1917:166). Captain James King also noted that upon his arrival at Maui in 1778, Hawaiians came along ship carrying sugarcane as well as fruits and vegetables (Beaglehole 1967:497). Several sugarcane varieties, either indigenous or brought by early Polynesians, were known to the Hawaiians, including *Ualalehu*, *Ualalehu maoli* (native), *Honuaula*, *Laukena* (*Laukona*), *Kea* (*Kokea*), *Papa*, and *Ohua* (Wilfong 1883).

The earliest instances of sugar and molasses production in Hawai'i remain uncertain, but were likely small-scale sugar extraction operations. A number of important chiefs set aside land for several of these early endeavors (Kelly *et al.* 1981:81). Rolph (1917:166-167) documents the inception of organized sugar production as follows:

L. L. Torbert, one the early planters, in a paper read before the Royal Agricultural Society in January, 1852, claims the earliest sugar factory was put up on the island of Lanai in 1802 by a Chinaman who came to the islands in one of the vessels trading for sandalwood. He brought with him a stone mill and boilers, and after grinding one small crop and making it into sugar, went away the next year taking his apparatus with him.

Anderson [Anderson, Rufus, *The Hawaiian Islands*, Boston, 1864] makes a statement that 257 tons of sugar were exported from the islands in 1814, but cites no authority upon which to base his assertion.

According to Jarves [Jarves, James Jackson, *History of the Sandwich Islands*, Honolulu, 1872] the first instance of the manufacture of sugar goes back to beyond 1820, but the name of the pioneer planter is unknown. It is certain that at first molasses was manufactured and then sugar some time before 1820.

Don Francisco de Paula made sugar in Honolulu in 1819, the year before the arrival of the first missionaries. Lavinia, an Italian, did the same thing in 1823.

His method was to pound the cane with stone pestles on huge wooden trays (poi boards) by native labor, collecting the juice and boiling it in a small copper kettle.

Accounts from various sources agree that the making of sugar and molasses was general in 1823-24. This undoubtedly had direct connection with the manufacture of rum, which was extensively carried on at the time.

In 1828 a considerable amount of cane was raised in the Nuuanu valley and Waikapu, Maui. A pioneer cane grower, Antonio Silva by name, lived at the latter place, and some Chinamen had a sugar mill near Hilo. In those days mills were made of wood, very crudely put together and worked by oxen.

Ladd & Company established the first large-scale sugar production in Hawai'i on Kauai, while David Malo operated a mill on Maui between 1840 and 1850, and Governor Kuakini directed the planting of one hundred acres of sugar cane in 1839 in Kohala, on the Island of Hawai'i (Rolph 1917:169). Missionaries at Hilo in the early 1800s produced sugar and molasses for their own use (Kelly *et al.* 1981:81). In 1841, a mill on the Wailuku River in Hilo on Governor Kuakini's land, and likely operated by Chinese, produced about 30 tons of sugar.

Sugarcane growing and milling operations were still simple. Cane fields were neither irrigated nor fertilized and sugar yields were roughly one ton per acre. Planting, by 'o' \bar{o} (digging stick), and harvesting was done by Hawaiian contract workers (Thrum 1874:36). Laborers were paid in kind, often in cloth. Once at the milling facilities, cane was fed one stalk at a time into iron band reinforced wooden rollers powered by water, oxen, mule, and horse. The juice extracted by the rollers was collected in a trough and was boiled in whaling ship iron trypots (Figure 6). Less than 50% of the sugar was extracted from the cane using these methods. Additionally, production was low because indigenous sugarcanes were susceptible to introduced disease and were soft and therefore unsuitable for milling (Mangelsdorf 1956).

Lahaina sugarcane, a variety indigenous to the Marquesas, was introduced to Hawai'i in 1854, and by 1870 had displaced all indigenous varieties for sugar production (Wilfong 1883). Hawaiian sugar production remained low despite the introduction of steam power in 1858-1859 to the milling process. The Island of Hawai'i had a single mill operating at Hilo until the outbreak of the American Civil War (1861-1865). The disruption of sugar production in the American south caused a price increase and a concomitant rise in Hawaiian sugar production and export, from 2,600 tons in 1863 to 8,869 tons in 1866 (Rolph 1917:171). The rapid growth of the sugar industry created a labor shortage that necessitated hiring contract laborers from other Polynesian islands.

Hawaiian sugar production was still somewhat hindered by U.S. import duties, until a reciprocity treaty negotiated between the Kingdom of Hawai'i and the U.S. in 1876 reduced import duties levied on Hawaiian sugar, increasing the profitability of sugar production and further spurring the growth of the sugar industry. From 1877 to 1888, sugar production increased almost 500% and doubled in the following ten years (Kelly *et al.* 1981:81). American consumers purchased nearly 99% of all Hawaiian export products, much of it sugar.



Figure 6: A Whaling Trypot Typical of Those Used For Making Raw Sugar.

In 1880 Rose Bamboo sugar cane was introduced from Australia and was grown at higher elevations on Hawai'i. Rose Bamboo cane did especially well on the relatively high table lands along the Hāmākua coast. Lahaina and Rose Bamboo varieties were susceptible to insects and

disease and subsequently yields decreased annually until both varieties were completely replaced around the turn of the century by Yellow Caledonia cane (also called White Tanna cane), a variety named for New Caledonia and Tanna, an island of present day Vanuatu (Rolph 1917:170). Yellow Caledonia had been imported to Hawai'i in 1881 and was first grown with great success in Ka'u (Tew 1987). The variety was resistant to disease and grew well in cooler climates with moderately high rainfall, and consequently was cultivated with great success along the Hāmākua until its replacement in 1925 with hybrid varieties of sugarcane (James 2004:5).

The Hawaiian sugar industry continued to grow and additional contract laborers were hired from as far away as China and Japan (after 1890), and later from Korea, the Philippines, Puerto Rico, and Portugal. Sugar plantations began offering free medical care and rent-free housing to attract laborers. The annexation of Hawai'i by the U.S. in 1898 ensured the continued American consumer demand for Hawaiian sugar. Additionally, incorporation provided new funding for needed public works to improve the transportation and shipping facilities that made the sugar trade more profitable. The development of port facilities and the extensive railroad system that ran from Kalapana in South Puna to Pa'auilo along the Hāmāku coast were a direct result of the sugar industry.

THE HISTORY OF SUGAR IN THE KAPULENA AREA

Seven sugar companies were established along the Hāmākua coast between 1869 and 1880, excepting Onomea Plantation in the Hilo area (Bouvet 2001:9). Geographically, from the Hilo to Kohala sides of the Hāmākua, they were the Laupahoehoe Sugar Company (est. 1880), the O'okala Sugar Plantation Company (est. 1869), the Kukaiau Sugar Company (est. 1887), the Hamakua Sugar Company (est. 1877), the Paauhau Sugar Company (est. 1878), the Honokaa Sugar Company (est. 1878), and the Pacific Sugar Mill Company (est. 1878).

PACIFIC SUGAR MILL COMPANY (1878-1928)

The Pacific Sugar Mill Company was established in 1878 at Kukuihaele and cultivated sugar cane in fields within the current project area. A good synoptic history published on the University of Hawai'i's Hawaiian Sugar Panters' Association Plantation Archives states that the

Pacific Sugar Mill was located on the northeast coast of the Island of Hawaii between Honokaa and Waipio Valley. It extended along the coast for four miles and up the mountains from two to nine miles. The elevation ranged from 300 to 1,900 feet giving a variety of growing conditions. Half of the land was arable; the remainder was pasture and forests.
The beginnings of Pacific Sugar Mill are not entirely clear. A Charter of Incorporation (HSC 48/13 Doc #142) dated August 19, 1879 lists Samuel Parker and F.A. Schaefer as the founders. Other published sources cite Dr. Mott-Smith, Dr. Trousseau and Mr. Herbert Purvis as founders/ proprietors of the enterprise. Material in the collection does confirm that the plantation was started in 1878 and the first crop harvested in 1880 with F.A. Schaefer and Co. as the agents.

Pacific Sugar Mill had the distinction of introducing the first mongoose into Hawaii. In 1883 W.H. Purvis imported them from India and Africa for rat control on the plantation. Pacific, Sugar Mill also experimented growing canaigre roots (tanners' dock) when Mr. J. Marsden, Commissioner of Agriculture, imported the seed of this plant in 1895. It was expected that the root would become a rich source of tannin for use in the leather industry. This was an early attempt to diversify and utilize land unsuitable for cane.

Most plantations had a small herd of cattle but Pacific Sugar Mill was unusual because it also had over 600 head of sheep. Free mutton was provided as a perquisite for employees along with free housing, fuel and medical care. As on most plantations, the early work force consisted of Chinese and native Hawaiians. Later on Japanese, Portuguese, Spaniards, Puerto Ricans, Koreans and Filipinos performed both as day laborers and contract workers.

By 1908 Pacific Sugar Mill had a nine-roller mill and produced an average crop of three tons per acre. The cane was delivered by flumes to a railroad, which traversed the plantation from east to west. The railroad was about four miles long and extended from the mill to Honokaa's boundary. Pacific Sugar Mill also had a wire rope landing to transport sugar bags to steamers for shipment.

The water for the flumes was obtained by diverting the Hiilawe Stream, which had its source in the Kohala Mountains. Pacific Sugar Mill also had the water rights to Lalakea Stream and to Kukuihaele Valley Stream. The water was transported partly through a flume and partly by a ditch to a reservoir at the head of the plantation. Four more reservoirs with an estimated capacity of 50,000,000 gallons were also constructed. This supply of water not only enabled Pacific Sugar Mill to transport all of its cane to the mill but was sufficient enough to enable Honokaa Sugar Company to flume 50% of its crop.

In spite of an abundant water supply, the plantation did not prosper due to mismanagement. In 1907 a glanders epidemic broke out because of poor conditions in the stables and most of the livestock had to be destroyed. The mill and housing were in serious disrepair. As part of a retrenchment effort in 1913, it was decided that the mill would be closed down and all the cane would be sent to Honokaa for grinding. At this time the administration of both plantations was brought under the manager in order to eliminate excess labor, machinery and costs. In 1916, Pacific Sugar Mill sold its mill equipment to Mitsui Company of Japan.

This partial merger with Honokaa proved to be such a success that a proposal was made for an amalgamation of all interests to ring about added savings and facilitate the economic management of the two plantations. Pacific Sugar Mill was formally dissolved on August 24, 1928 and became the Kukuihaele Division of Honokaa Sugar Company (Campbell and Ogburn 1989b).

HONOKAA SUGAR MILL COMPANY (1878-1928)

The Honokaa Sugar Company grew to encompass more than 9,000 acres (Campbell and Ogburn 1989a). The Honokaa Sugar Company had an extensive flume system to carry cane to railroad cars that brought the cane to the mill. The mill had a tramway that transported the bagged sugar to the warehouse at the boat landing. The sugar was then loaded onto steamships by means of a wire cable. The Honokaa Sugar Company was able to ship raw sugar directly to the mainland by this method, instead of first shipping to Honolulu.

DAVIES HAMAKUA SUGAR COMPANY (1978-1984) AND HAMAKUA SUGAR COMPANY (1984-1994)

The Laupahoehoe Sugar Company merged with the Honokaa Sugar Company in 1978 to form the Davies Hamakua Sugar Company (1978-1984). In 1984 the Davies Hamakua Sugar Company was bought by Francis Morgan and renamed the Hamakua Sugar Company (1984-1994). The Hamakua Sugar Company operated until October of 1994, and its closing marked the end of the sugar industry on the Island of Hawai'i.

CULTURAL INFORMANT INTERVIEWS

SCS, Inc contacted fourteen individuals who either worked for the Hamakua Sugar Company, or have a long-standing *'ohana* connection to Hāmākua District, or are familiar with the project area lands through cultural and historical work they conduct on the Island of Hawai'i (Table 1). All but two of the individuals responded. Eight of the twelve individuals that responded had knowledge of the project area and provided information. None of the informants had knowledge of past or ongoing cultural practices on the project area property.

Name	Affiliation	Responded	Has Knowledge	Cultural Practices
Terry Knabusch	Hamakua Sugar Office	Yes	No	Does not know
Faye Honma	Hamakua Sugar Office	Yes	No	Does not know
Jim Thropp	Hamakua Sugar Agriculturalist	Yes	Yes	No
Gary Aganus	Hamakua Sugar	Yes	No	Does not know

Table 1: Individuals Responding to CIA.

Name	Affiliation	Responded	Has Knowledge	Cultural
				Practices
	Field			
	Superintendent			
Rick Toledo	Hamakua Sugar	No	Unknown	Unknown
	Field			
	Superintendent			
Ku Kahakalau	Hawai'i Island	Yes	Yes	No
	Burial Council,			
	Hāmākua District			
Denny Mathews	Hāmākua Resident	No	Unknown	Unknown
Keawe	Waimea Resident	Yes	Yes	No
Vredenburg				
Dr. Billy Bergin	Pani 'olo	Yes	Yes	No
	Preservation			
	Society, President			
Leon J. No'eau	Hāmākua 'Ohana	Yes	Yes	No
Peralto				
Gilbert Bailado	Hāmākua 'Ohana	Yes	Yes	No
Jim Medeiros Sr.	Cultural	No	Unknown	Unknown
Rick Gmerkin	Ala Kahakai	Yes	Yes	No
	National Historic			
	Trail, NPS			
Paul Nalani	Hāmākua 'Ohana	Yes	Yes	No
Kaholoa'a				

JIM THROPP INTERVIEW (PA'AUILO, HAWAI'I)

Jim was born in Honolulu and grew up in Kāne'ohe. He was 75 years old at the time of this interview. He studied general agriculture at California Polytechnic State University where he was awarded a degree in general crops production. He worked at a sugar plantation on Kauai before being hired by the Hamakua Sugar Company. Jim was in charge of crop logging, tissue testing, and fertilizer application. He remembers that the soil on the study parcel are weak in calcium, nitrogen, and phosphorus. He also stated that the earthen ditches on the project area are contour ditches created to draw water off of the fields and into the gulches. These are part of a man-made drainage system to prevent sheet wash and flooding down-slope. Jim did not remember any traditional Hawaiian features on either of the parcels. He said that by the time he was there, the company was using machinery to work the fields and harvest the crops. That meant that all rock was removed from the fields and pushed into the gulches to prevent the rock from fouling or damaging the machinery. He remembers that there were some large *ulu* trees in some of the gulches. Jim did not know of any cultural practices that might have been conducted during his time working for the plantation company.

HĀMĀKUA 'OHANA INTERVIEWS

Paul Nalani Kaholoa'a is from a family that was established in the Waipi'o and Honoka'ia since pre-Contact times. One of Paul's ancestors was awarded a Land commission award (LCA 7116) in Honoka'ia in 1848. The award included a house lot with two houses, and nine *mala* (garden) of vegetables, one *mala* of *mamaki*, and two *mala* of bananas. Paul grew up hunting with his father Jackie and his uncles. They hunted pig on property within the project area, as well as in Waipi'o Valley and Waimanu Valley. Paul is not aware of any ongoing cultural practices or plant collecting on lands within the project area.

Leon J. No'eau Peralto is from a family that has long-standing connections to the lands of Kūka'iau and Koholālele Ahupua'a, Hāmākua District. He has made an exhaustive study of the historical documentation pertaining to this region, and is familiar with the *wahi pana* and local *mo'olelo* of these lands. He is also active in ongoing cultural matters that impact the Hāmākua community. Mr. Peralto is not aware of any ongoing cultural practices or plant collecting on lands within the project area.

Gilbert Bailado is from a family that has long-standing connections to the Hāmākua region. He is active in ongoing cultural matters that impact the Hāmākua community. He has also made a study of historic property boundaries, *ahupua* '*a* boundaries, LCA boundaries, and historic trail locations. He has worked with Rick Gmerkin, the Ala Kahakai National Historic Trail Association Director. Both were interviewed for the current CIA and are not aware of any historic trails or cultural practices or plant collecting on lands within the project area.

SUMMARY

The "level of effort undertaken" to identify potential effect by a project to cultural resources, places or beliefs (OEQC 1997) has not been officially defined and is left up to the investigator. A good faith effort can mean contacting agencies by letter, interviewing people who may be affected by the project or who know its history, research identifying sensitive areas and previous land use, holding meetings in which the public is invited to testify, notifying the community through the media, and other appropriate strategies based on the type of project being proposed and its impact potential. Sending inquiring letters to organizations concerning development of a piece of property that has already been totally impacted by previous activity and is located in an already developed industrial area may be a "good faith effort". However, when many factors need to be considered, such as in coastal or mountain development, a good faith effort might mean an entirely different level of research activity.

In the case of the present parcel, letters of inquiry were sent to organizations whose expertise would include the project area. Consultation was sought from Kai Markell, the Director of Native Rights, Land and Culture, Office of Hawaiian Affairs on O'ahu; Ruby McDonald, Coordinator of the Hawai'i branch of the Office of Hawaiian Affairs; the Waimea Hawaiian Civic Club; Ku Kahakalau; Keawe Vredenburg; Dr. Billy Bergin; Clement Junior Kanuha; Leon J. No'eau Peralto; Keawe Verdenburg; Gilbert Bailado; Rick Gmerkin (Ala Kahakai National Historic Trail, NPS); and Reggie Lee. Public notices were publishes in Ka Wai Ola, The Advertiser, and the Tribune Herald.

Historical and cultural source materials were extensively used and can be found listed in the References Cited portion of the report. Such scholars as I`i, Kamakau, Chinen, Kame`eleihiwa, Fornander, Kuykendall, Kelly, Handy and Handy, Puku`i and Elbert, Thrum, and Cordy have contributed, and continue to contribute to our knowledge and understanding of Hawai`i, past and present. The works of these and other authors were consulted and incorporated in the report where appropriate. Land use document research was supplied by the Waihona `Aina 2007 Data Base.

CIA INQUIRY RESPONSE

As suggested in the "Guidelines for Accessing Cultural Impacts" (OEQC 1997), CIAs incorporating personal interviews should include ethnographic and oral history interview procedures, circumstances attending the interviews, as well as the results of this consultation. It is also permissible to include organizations with individuals familiar with cultural practices and features associated with the project area.

As stated above, consultation was sought from the Director of Native Rights, Land and Culture, Office of Hawaiian Affairs on O'ahu; the Hawai'i branch of the Office of Hawaiian Affairs; the Kuakini Civic Club; and the Kona Hawaiian Civic Club. Except for OHA acknowledging the receipt of our letter, none of the organizations responded with information concerning the potential for cultural resources or practices to occur in the project area. Those individuals who had knowledge of the project area lands responded that they were not aware of any cultural resources or ongoing cultural practices or beliefs associated with those lands.

Analysis of the potential effect of the project on cultural resources, practices or beliefs, its potential to isolate cultural resources, practices or beliefs from their setting, and the potential of the project to introduce elements which may alter the setting in which cultural practices take

place is a requirement of the OEQC (No. 10, 1997). To our knowledge, the project area has not been used for traditional cultural purposes within recent times. Based on historical research and the responses from the above listed contacts, it is reasonable to conclude that Hawaiian rights related to gathering, access or other customary activities within the project area will not be affected and there will be no direct adverse effect upon cultural practices or beliefs. The visual impact of the project from surrounding vantage points, e.g. the highway, mountains, and coast would appear to be minimal.

CULTURAL ASSESSMEMNT

Based on organizational response, individual cultural informant responses, as well as archival research, it is reasonable to conclude that, pursuant to Act 50, the exercise of native Hawaiian rights, or any ethnic group, related to gathering, access or other customary activities will not be affected by development activities on this parcel. Because there were no cultural activities identified within the project area, there are no adverse effects.

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August 27, 2009

AUG 2 3 2009

PBR HAWAII

Ms. Catie Fernandez Planner PBR Hawaii and Associates, Inc. 1001 Bishop St ASB Tower, Suite 650 Honolulu, Hawaii 96813-3484

Re: Pre-Assessment Consultation to Prepare Environmental Assessments for the sale of Hawaii County Hamakua Lands (Koholalele & Kapulena)-Preconsultation

In response to your August 7, 2009, notice, thank you for the opportunity to provide comments in the consultation phase of the Environmental Assessments for the sale of Hawaii County Hamakua Lands (Koholalele & Kapulena).

Our website provides detailed information on guidelines, directives and statutes, as well as studies and reports on aspects of energy and resource efficiency at: (<u>http://www.hawaii.gov/dbedt/info/energy/efficiency/state</u>). Please also do not hesitate to contact Carilyn Shon, Energy Efficiency Branch Manager, at telephone number 808-587-3810, for additional information on energy efficiency and renewable energy resources.

We look forward to reviewing the Draft Environmental Assessment.

Sincerely,

Theodore A. Peck Administrator

c: OEQC

County of Hawaii, Department of Finance



December 23, 2010

PRINCIPALS

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R. STAN DUNCAN, ASLA Executive Vice-President

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KAPOLEI OFFICE 1001 Kamokila Boulevard Kapolei Building, Suite 313 Kapolei, Hawai'i 96707-2005 Tel: (808) 521-5631 Fax: (808) 535-3163 Theodore A. Peck, Administrator State of Hawai'i, DBEDT PO Box 2359 Honolulu, HI 96804

SUBJECT: ENVIRONMENTAL ASSESSMENT FOR AN AGRICULTURAL PARK AT APPROXIMATELY 1,700 ACRES OF HAWAII COUNTY LAND KAPULENA, HĀMĀKUA

Dear Mr. Peck,

Thank you for your letter dated August 27, 2009 regarding the above referenced Draft Environmental Assessment. Through the pre-consultation process the project has evolved from the sale of the Kapulena lands to a partnership between the County, Hāmākua Farm Bureau, the Big Island Farm Bureau, Kamehameha Schools, the University of Hawai'i College of Agriculture and Forestry; the University of Hawai'i College of Tropical Agriculture and Human Resources; and The Kohala Center to develop an agricultural park. The new agricultural park will serve as the site for a pilot project to demonstrate best practices for sustainable and efficient grazing operations to benefit the grass-fed beef industry; as a test area for trials of orchard and other crops with potential for larger scale production; as an incubator and product handling area for trials of value-added agricultural products; and as a technical training site to help students learn cultivation, production, planning, marketing and business strategies for agricultural enterprises. The training component of the project is designed to establish and strengthen a family-farm based agricultural community in Hāmākua.

As the planning consultant for the applicant, County of Hawai'i, Department of Finance, we acknowledge your website offering detailed information on guidelines, directives and statues as well as studies and reports on aspects of energy and resource efficiency.

Thank you for contributing to the development of this document. Your comments will be included in the Draft Environmental Assessment.

Sincerely,

PBR(HAWAII Catie Fernandez

Planner

CC:

Comments\Kapulena\DBEDT.doc

Kenneth Van Bergen, County of Hawai'i O:\Job25\2506.19 Hawaii County-Hamakua Lands EA\EA\Pre-Consultation\Responses to Pre-Consultation

William P. Kenoi Mayor



Lono A. Tyson Director

Ivan M. Torigoe Deputy Director

County of Hawai'i

DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

25 Aupuni Street • Hilo, Hawai`i 96720 (808) 961-8083 · Fax (808) 961-8086 http://co.hawaii.hi.us/directory/dir_envmng.htm

RECEIVED

August 24, 2009

AUG 1 3 2009 PBR HAWAII

PBR HAWAII & ASSOCIATES, INC. 1001 Bishop Street ASB Tower, Suite 650 Honolulu, HI 96813-3484

Attention: Catie Fernandez Planner

RE: Environmental Assessments for the sale of Hawai'i County Hāmākua Lands (Koholalele & Kapulena) - Preconsultation

Dear Ms. Fernandez,

We have no comments to offer on the subject sale.

Thank you for allowing us to review and comment on this project.

With Regards and Aloha,

MATM/ Lono A. Tyson

DIRECTOR





December 23, 2010

PRINCIPALS

THOMAS S. WITTEN, ASLA President

R. STAN DUNCAN, ASLA Executive Vice-President

RUSSELL Y. J. CHUNG, FASLA, LEED[®] AP *Executive Vice-President*

VINCENT SHIGEKUNI Vice-President

GRANT T. MURAKAMI, AICP, LEED[®] AP *Principal*

W. FRANK BRANDT, FASLA Chairman Emeritus

ASSOCIATES

TOM SCHNELL, AICP Senior Associate

RAYMOND T. HIGA, ASLA Senior Associate

KEVIN K. NISHIKAWA, ASLA Associate

KIMI MIKAMI YUEN, LEED[®]AP Associate

SCOTT ALIKA ABRIGO, LEED[®]AP Associate

SCOTT MURAKAMI, ASLA, LEED[®]AP Associate

DACHENG DONG, LEED^{*}AP Associate

HONOLULU OFFICE 1001 Bishop Street, Suite 650 Honolulu, Hawai'i 96813-3484 Tel: (808) 521-5631 Fax: (808) 523-1402 E-mail: sysadmin@pbrhawaii.com

KAPOLEI OFFICE 1001 Kamokila Boulevard Kapolei Building, Suite 313 Kapolei, Hawal'i 96707-2005 Tel: (808) 521-5631 Fax: (808) 535-3163 Lono A. Tyson County of Hawai'i Department of Environmental Management 15 Aupuni Street Hilo, HI 96720

SUBJECT: ENVIRONMENTAL ASSESSMENT FOR AN AGRICULTURAL PARK AT APPROXIMATELY 1,700 ACRES OF HAWAII COUNTY LAND KAPULENA, HĀMĀKUA

Dear Mr. Tyson,

Thank you for your letter dated April 13, 2009 regarding the above referenced Draft Environmental Assessment. Through the pre-consultation process the project has evolved from the sale of the Kapulena lands to a partnership between the County, Hāmākua Farm Bureau, the Big Island Farm Bureau, Kamehameha Schools, the University of Hawai'i College of Agriculture and Forestry; the University of Hawai'i College of Tropical Agriculture and Human Resources; and The Kohala Center to develop an agricultural park. The new agricultural park will serve as the site for a pilot project to demonstrate best practices for sustainable and efficient grazing operations to benefit the grass-fed beef industry; as a test area for trials of orchard and other crops with potential for larger scale production; as an incubator and product handling area for trials of value-added agricultural products; and as a technical training site to help students learn cultivation, production, planning, marketing and business strategies for agricultural enterprises. The training component of the project is designed to establish and strengthen a family-farm based agricultural community in Hāmākua.

As the planning consultant for the applicant, County of Hawai'i, Department of Finance, we acknowledge that the Department of Environmental Management has no comments at this time.

Thank you for contributing to the development of this document. Your comments will be included in the Draft Environmental Assessment.

Sincerely,

PBR-HAWAII Catie Fernandez Planner

cc:

Kenneth Van Bergen, County of Hawai'i O:\Job25\2506.19 Hawaii County-Hamakua Lands EA\EA\Pre-Consultation\Responses to Pre-Consultation Comments\Kapulena\DEM.doc LINDA LINGLE



LAURA H. THIELEN CHARPERSON BOARD OF LAND AND NATURAL RESOURCES OMMISSION ON WATER RESOURCE MANAGEMENT



STATE OF HAWAII DEPARTMENT OF LAND AND NATURAL RESOURCES LAND DIVISION

POST OFFICE BOX 621 HONOLULU, HAWAII 96809

September 1, 2009

RECEIVED

SEP 0 2 2009 الاصلام HAWAII

PBR Hawaii & Associates, Inc. 1001 Bishop Street ASB Tower Suite 650 Honolulu, Hawaii 96813-3484

Attention: Ms. Catie Fernandez, Planner

Ladies and Gentlemen:

Subject: Pre-Consultation for Environmental Assessments for the Sale of Hawaii County Hamakua Lands

Thank you for the opportunity to review and comment on the subject matter. The Department of Land and Natural Resources' (DLNR), Land Division distributed or made available a copy of your report pertaining to the subject matter to DLNR Divisions for their review and comment.

Other than the comments from Commission on Water Resource Management, Land Division-Hawaii District, Division of Aquatic Resources, Division of Boating & Ocean Recreation, Engineering Division, Division of State Parks, the Department of Land and Natural Resources has no other comments to offer on the subject matter. Should you have any questions, please feel free to call our office at 587-0433. Thank you.

Sincerely,

Marlens E. Unotei

Morris M. Atta Administrator LINDA LINGLE GOVERNOR OF HAWAII



LAURA H. THIELEN CHAIRPERSON BOARD OF LAND AND NATURAL RESOURCES COMMISSION ON WATER RESOURCE MANAGEMENT

2009 AUG 131 A 11: 351

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LAND DIVISION PULC, HAWAH

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SEP 0 2 2009

PBR HAWAII



TO:

2009 AUG SPATE OF HAWAII DEPARTMENT OF LAND AND NATURAL RESOURCES DEPT. OF LAND DIVISION NATURAL (POSTOFFICEBOX 621 STATHONOLULU, HAWAII 96809

August 12, 2009

MEMORANDUM

DLNR Agencies:

- <u>x</u> Div. of Aquatic Resources
- <u>x</u> Div. of Boating & Ocean Recreation
- <u>x</u> Engineering Division
- x_Div. of Forestry & Wildlife
- <u>x</u> Div. of State Parks
- <u>x</u> Commission on Water Resource Management
- x_Office of Conservation & Coastal Lands
- <u>x</u> Land Division Hawaii District

x Historic Preservation Walkene

FROM: Morris M. Attantic Morris M. Attantic SUBJECT: Pre-consultation on environmental assessments for the sale of Hawaii County Hamakua lands

LOCATION: Island of Hawaii

APPLICANT: PBR Hawaii & Associates, Inc. on behalf of County of Hawaii

Transmitted for your review and comment on the above referenced document. We would appreciate your comments on this document. Please submit any comments by September 1, 2009.

If no response is received by this date, we will assume your agency has no comments. If you have any questions about this request, please contact my office at 587-0433. Thank you.

Attachments

We have no objections. We have no comments. Comments are attached. Signed: Date:

LINDA LINGLE GOVERNOR OF HAWAII



LAURA H. THIELEN CHAIRPERSON BOARD OF L'AND AND NATURAL RESOURCES COMMISSION ON WATER RESOURCE MANAGEMENT



STATE OF HAWAII DEPARTMENT OF LAND AND NATURAL RESOURCES LAND DIVISION ATURAL RESOURCES POST OFFICE BOX 621STATE OF HAWAII HONOLULU, HAWAII 96809

August 12, 2009

RECEIVED SEP 0 2 2009

PBR HAWAII

MEMORANDUM

TO:

FROM:

- **DLNR Agencies:**
 - x Div. of Aquatic Resources
- x_Div. of Boating & Ocean Recreation

x_Engineering Division

x Div. of Forestry & Wildlife

x Div. of State Parks

x Commission on Water Resource Management

x Office of Conservation & Coastal Lands

x Land Division – Hawaii District

x Historic Preservation

Morris M. Atta

Pre-consultation on environmental assessments for the sale of Hawaii County SUBJECT: Hamakua lands

LOCATION: Island of Hawaii

APPLICANT: PBR Hawaii & Associates, Inc. on behalf of County of Hawaii

Transmitted for your review and comment on the above referenced document. We would appreciate your comments on this document. Please submit any comments by September 1, 2009.

If no response is received by this date, we will assume your agency has no comments. If you have any questions about this request, please contact my office at 587-0433. Thank you.

Attachments

We have no objections. We have no comments. Comments are attached. Signe Date:

LUNDA LINGLE GOVERNOR OF HAWAII	STATE OF HAWAII DEPARTMENT OF LAND AND NATURAL RESOUR LAND DIVISION POST OFFICE BOX 621 HONOLULU, HAWAII 96809 August 12, 2009	LAND DIVISI	URA H. THIELEN CHAIPPERSON WATER RESOURCES WATER RESOURCE MANAGEMENT AQUATIC RESOURCES: 2527 DIRECTOR	
MEMORANDUM			TECH ASST	ĺ
TO: RECEIVED AUG 1 2 2009 FROM: SUBJECT: LOCATION APPLICAN	DENR Agencies: x Div. of Aquatic Resources x Div. of Boating & Ocean Recreation x Engineering Division x Div. of Forestry & Wildlife x Div. of State Parks x Commission on Water Resource Management x Office of Conservation & Coastal Lands x Land Division -Hawaii District x Historic Preservation Morris M. Atta Mathematical Assessments for Hamakua lands N: Island of Hawaii M: Island of Hawaii & Associates, Inc. on behalf of County	REC SEP PBR 1 the sale of Hav of Hawaii	Return to: No. Copies Copies to: Due Date: RN CEIVED 0 2 2009 HAWAII waii County	

Transmitted for your review and comment on the above referenced document. We would appreciate your comments on this document. Please submit any comments by September 1, 2009.

If no response is received by this date, we will assume your agency has no comments. If you have any questions about this request, please contact my office at 587-0433. Thank you.

Attachments

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BIN OF ADUATIC RESOURCES

We have no objections. We have no comments. Comments are attached. Signed: 2009 Date: 17

AURA IL THIELEN BOAD OF LAND ADDATING SECONDES LINDA LINGLE GOVERNOR OF HAWAII RESOURCE MANAGEMENT 2009 AUG 12 PM 1:45 d and STATE OF HAWAII DEPARTMENT OF LAND AND NATURAL RESOURCES LAND DIVISION PECEIVED POST OFFICE BOX 621 HONOLULU, HAWAII 96809 SEP 0 2 2009 August 12, 2009 BOR HAWAII **MEMORANDUM DLNR Agencies:** x Div. of Aquatic Resources 90k x_Div. of Boating & Ocean Recreation x Engineering Division x Div. of Forestry & Wildlife U x Div. of State Parks Ņ x Commission on Water Resource Management x Office of Conservation & Coastal Lands x_Land Division –Hawaii District x Historic Preservation Morris M. Attal Wellere -FROM: Pre-consultation on environmental assessments for the sale of Hawaii County SUBJECT: Hamakua lands LOCATION: Island of Hawaii APPLICANT: PBR Hawaii & Associates, Inc. on behalf of County of Hawaii

Transmitted for your review and comment on the above referenced document. We would appreciate your comments on this document. Please submit any comments by September 1, 2009.

If no response is received by this date, we will assume your agency has no comments. If you have any questions about this request, please contact my office at 587-0433. Thank you.

Attachments

We have no objections. We have no comments. Comments are attached.

Signed: Date: 8, 8



RECEIVED LAND DIVISION Z009 AUG 25 A 8: 43 LAURA H. THIELEN CHAIRFERSON BOARD OF LAND AND NATURAL RESOURCES COMMISSION ON WATER RESOURCE MANAGEMENT

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109 AUG 12 AM09:45 ENGINEERING

PBR HAWAII



DEPT OF LAND & STATE OF HAWAII NATUR, DEPARTMENT OF LAND AND NATURAL RESOURCES STATE OF HAWAII POST OFFICE BOX 621 HONOLULU, HAWAII 96809

August 12, 2009

MEMORANDUM

TO:

FROM:

DLNR Agencies:

<u>x</u> Div. of Aquatic Resources

x Div. of Boating & Ocean Recreation

 $\langle \underline{\mathbf{x}}_{\mathrm{Engineering Division}} \rangle$

x Div. of Forestry & Wildlife

<u>x</u> Div. of State Parks

x_Commission on Water Resource Management

<u>x</u>Office of Conservation & Coastal Lands

x Land Division – Hawaii District

x_Historic Preservation

Walkne Morris M. Atta

SUBJECT: \mathcal{O} Pre-consultation on environmental assessments for the sale of Hawaii County Hamakua lands

LOCATION: Island of Hawaii

APPLICANT: PBR Hawaii & Associates, Inc. on behalf of County of Hawaii

Transmitted for your review and comment on the above referenced document. We would appreciate your comments on this document. Please submit any comments by September 1, 2009.

If no response is received by this date, we will assume your agency has no comments. If you have any questions about this request, please contact my office at 587-0433. Thank you.

Attachments

We have no objections. We have no comments. Comments are attached. Signed: Date:

DEPARTMENT OF LAND AND NATURAL RESOURCES ENGINEERING DIVISION

1994 and 200 polar

LD/MorrisAtta

Ref.: PreConEASaleHamakuaLands Hawaii.441

COMMENTS

- () We confirm that the project site, according to the Flood Insurance Rate Map (FIRM), is located in Flood Zone .
- (X) Please take note that according to the maps that you provided, it appears that the project sites, according to the Flood Insurance Rate Map (FIRM), are located in Minimal Tsunami Inundation areas and Zone X. The National Flood Insurance Program does not have any regulations for developments within the Minimal Tsunami Inundation areas and Zone X.
- () Please note that the correct Flood Zone Designation for the project site according to the Flood Insurance Rate Map (FIRM) is ____.
- Please note that the project must comply with the rules and regulations of the National Flood Insurance Program (NFIP) presented in Title 44 of the Code of Federal Regulations (44CFR), whenever development within a Special Flood Hazard Area is undertaken. If there are any questions, please contact the State NFIP Coordinator, Ms. Carol Tyau-Beam, of the Department of Land and Natural Resources, Engineering Division at (808) 587-0267.

Please be advised that 44CFR indicates the minimum standards set forth by the NFIP. Your Community's local flood ordinance may prove to be more restrictive and thus take precedence over the minimum NFIP standards. If there are questions regarding the local flood ordinances, please contact the applicable County NFIP Coordinators below:

- () Mr. Robert Sumitomo at (808) 768-8097 or Mr. Mario Siu Li at (808) 768-8098 of the City and County of Honolulu, Department of Planning and Permitting.
- () Mr. Kelly Gomes at (808) 961-8327 (Hilo) or Mr. Kiran Emler at (808) 327-3530 (Kona) of the County of Hawaii, Department of Public Works.
- () Mr. Francis Cerizo at (808) 270-7771 of the County of Maui, Department of Planning.
- () Mr. Mario Antonio at (808) 241-6620 of the County of Kauai, Department of Public Works.
- () The applicant should include water demands and infrastructure required to meet project needs. Please note that projects within State lands requiring water service from the Honolulu Board of Water Supply system will be required to pay a resource development charge, in addition to Water Facilities Charges for transmission and daily storage.
- () The applicant should provide the water demands and calculations to the Engineering Division so it can be included in the State Water Projects Plan Update.
- (X) Additional Comments: We do not have any objections for the proposed sale of County of Hawaii lands in Koholalele and Kapulena, Hamakua District, Hawaii.
- () Other:_

Should you have any questions, please call Ms, Suzie S. Agraan of the Planning Branch at 587-0258.

u Signed: ERIC T. HIRANO, CHIEF ENGINEER Date:

3370

LAURA H. THIELEN CHAIRPERSON

BOARD OF LAND AND NATURAL RESOURCES COMMISSION ON WATER RESOURCE MANAGEMENT

LINDA LINGLE





STATE OF HAWAII DEPARTMENT OF LAND AND NATURAL RESOURCES LAND DIVISION DURCES POST OFFICE BOX 621 AWAII HONOLULU, HAWAII 96809

'09 AUG 12 A10 :24

RECEIVED

STATE PARKS DIV

August 12, 2009

DEPT OF LAND 3 NATURAL RESOURCE

MEMORANDUM

TO: DLNR Agencies:

<u>x</u> Div. of Aquatic Resources

<u>x</u> Div. of Boating & Ocean Recreation

<u>x</u> Engineering Division

x_Div. of Forestry & Wildlife

<u>x</u> Div. of State Parks

x Commission on Water Resource Management

<u>x</u> Office of Conservation & Coastal Lands

<u>x</u>Land Division – Hawaii District

<u>x</u> Historic Preservation

Walene Morris M. Atta^t

SUBJECT: Pre-consultation on environmental assessments for the sale of Hawaii County Hamakua lands

LOCATION: Island of Hawaii

APPLICANT: PBR Hawaii & Associates, Inc. on behalf of County of Hawaii

Transmitted for your review and comment on the above referenced document. We would appreciate your comments on this document. Please submit any comments by September 1, 2009.

If no response is received by this date, we will assume your agency has no comments. If you have any questions about this request, please contact my office at 587-0433. Thank you.

Attachments

FROM:

We have no objections. We have no comments. Comments are attached. Signed:

Date: 8/12

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SEP 0 2 2009

PBR HAWAII

LIND & LINGLE





STATE OF HAWAII DEPARTMENT OF LAND AND NATURAL RESOURCES LAND DIVISION

POST OFFICE BOX 621 HONOLULU, HAWAII 96809

September 5, 2009

RECEIVEL SEP 0.8 2009

PBR HAWAN

PBR Hawaii & Associates, Inc. 1001 Bishop Street ASB Tower Suite 650 Honolulu, Hawaii 96813-3484

Attention: Ms. Catie Fernandez, Planner

Ladies and Gentlemen:

Subject:

Pre-Consultation for Environmental Assessments for the Sale of Hawaii County Hamakua Lands

Thank you for the opportunity to review and comment on the subject matter. The Department of Land and Natural Resources' (DLNR), Land Division distributed or made available a copy of your report pertaining to the subject matter to Division of Forestry & Wildlife for their review and comment.

The Department of Land and Natural Resources has no other comments to offer on the subject matter. Should you have any questions, please feel free to call our office at 587-0433. Thank you.

Sincerely,

handene Ellnolei

Morris M. Atta Administrator LINDA LINGLE VERNOR OF HAWAII



LAURA H. THIELEN CHAIRPERSON BOARD OF LAND AND NATURAL RESOURCES IMISSION ON WATER RESOURCE MANAGEMI RECEIVED LAND DIVISION

2009 SEP -3 P 2:41



STATE OF HAWAII DEPARTMENT OF LAND AND NATURAL RESOURCES OF LAND & LAND DIVISION NATURAL RESOURCES STATE OF HAWAII

POST OFFICE BOX 621 HONOLULU, HAWAII 96809

August 12, 2009

FECEIVED

SEP 0 9 2009

EaR HAWAII

MEMORANDUM

TO:

FROM:

DLNR Agencies:

x Div. of Aquatic Resources

x Div. of Boating & Ocean Recreation

x Engineering Division

x Div. of Forestry & Wildlife

x Div. of State Parks

x Commission on Water Resource Management

<u>x</u> Office of Conservation & Coastal Lands

x Land Division - Hawaii District

x Historic Preservation

Pro Contraction M. Atta

SUBJECT Pre-consultation on environmental assessments for the sale of Hawaii County Hamakua lands

LOCATION: Island of Hawaii

APPLICANT: PBR Hawaii & Associates, Inc. on behalf of County of Hawaii

Transmitted for your review and comment on the above referenced document. We would appreciate your comments on this document. Please submit any comments by September 1, 2009.

If no response is received by this date, we will assume your agency has no comments. If you have any questions about this request, please contact my office at 587-0433. Thank you.

Attachments

PAUL J. CONRY, ADMINISTRATOR **DIVISION OF ORESTRY AND WILDLIFE**



PRINCIPALS

THOMAS S. WITTEN, ASLA President

R. STAN DUNCAN, ASLA Executive Vice-President

RUSSELL Y. J. CHUNG, FASLA, LEED[®] AP Executive Vice-President

VINCENT SHIGEKUNI Vice-President

GRANT T. MURAKAMI, AICP, LEED^{*}AP Principal

W. FRANK BRANDT, FASLA Chairman Emeritus

ASSOCIATES

TOM SCHNELL, AICP Senior Associate

RAYMOND T. HIGA, ASLA Senior Associate

KEVIN K. NISHIKAWA, ASLA Associate

KIMI MIKAMI YUEN, LEED^{*}AP Associate

SCOTT ALIKA ABRIGO, LEED[®]AP Associate

SCOTT MURAKAMI, ASLA, LEED[®]AP Associate

DACHENG DONG, LEED[®]AP Associate

HONOLULU OFFICE 1001 Bishop Street, Suite 650 Honolulu, Hawai'i 96813-3484 Tel: (808) 521-5631 Fax: (808) 523-1402 E-mail: sysadmin@pbrhawaii.com

KAPOLEI OFFICE

1001 Kamokila Boulevard Kapolei Building, Suite 313 Kapolei, Hawai'i 96707-2005 Tel: (808) 521-5631 Fax: (808) 535-3163 December 23, 2010

Morris M. Atta DLNR Land Division PO Box 621 Honolulu, HI 96809

SUBJECT: ENVIRONMENTAL ASSESSMENT FOR AN AGRICULTURAL PARK AT APPROXIMATELY 1,700 ACRES OF HAWAII COUNTY LAND KAPULENA, HĀMĀKUA

Dear Mr. Atta,

Thank you for your letter dated August 12, 2009 regarding the above referenced Draft Environmental Assessment. Through the preconsultation process the project has evolved from the sale of the Kapulena lands to a partnership between the County, Hāmākua Farm Bureau, the Big Island Farm Bureau, Kamehameha Schools, the University of Hawai'i College of Agriculture and Forestry; the University of Hawai'i College of Tropical Agriculture and Human Resources; and The Kohala Center to develop an agricultural park. The new agricultural park will serve as the site for a pilot project to demonstrate best practices for sustainable and efficient grazing operations to benefit the grass-fed beef industry; as a test area for trials of orchard and other crops with potential for larger scale production; as an incubator and product handling area for trials of valueadded agricultural products; and as a technical training site to help students learn cultivation, production, planning, marketing and business strategies for agricultural enterprises. The training component of the project is designed to establish and strengthen a family-farm based agricultural community in Hāmākua.

As the planning consultant for the applicant, County of Hawai'i, Department of Finance, we acknowledge the DLNR Land Division, Division of Boating and Ocean Recreation, Division of Forestry and Wildlife, Division of State Parks, Division of Aquatic Resources and the Commission on Water Resource Management have no comments at this time. We also acknowledge that the Engineering Division finds that the site is mapped on the Flood Insurance Rate Map (FIRM) as being in the Minimal Tsunami Inundation areas and Zone X and that the National Flood Insurance Program does not have any regulations for development within these zones.

Mr. Morris Atta ENVIRONMENTAL ASSESSMENT FOR AN AGRICULTURAL PARK AT APPROXIMATELY 1,700 ACRES OF HAWAII COUNTY LAND KAPULENA, HĀMĀKUA 2 of 2

Thank you for contributing to the development of this document. Your comments will be included in the Draft Environmental Assessment.

Sincerely,

PBR HAWAII 6z vna

Catie Fernandez Planner

cc: Kenneth Van Bergen, County of Hawai'i

O:\Job25\2506.19 Hawaii County-Hamakua Lands EA\Pre-Consultation\Responses to Pre-Consultation Comments\Kapulena\DLNR_CWRM-DOBOR-Parks-DAR-Eng.doc

LAURA H. THIELEN CIARPERSON BOARD OF LAND AND NATURAL RESOURCES COMMISSION ON WATER RESOURCE MANAGEMENT



LINDA LINGLE GOVERNOR OF HAWAII

STATE OF HAWAII DEPARTMENT OF LAND AND NATURAL RESOURCES LAND DIVISION

POST OFFICE BOX 621 HONOLULU, HAWAII 96809

September 16, 2009

PBR Hawaii & Associates, Inc. 1001 Bishop Street ASB Tower Suite 650 Honolulu, Hawaii 96813-3484 RECEIVE

SEP 1 7 2009

PBR HAWAII

Attention: Ms. Catie Fernandez, Planner

Ladies and Gentlemen:

Subject: Pre-Consultation for Environmental Assessments for the Sale of Hawaii County Hamakua Lands

Thank you for the opportunity to review and comment on the subject matter. The Department of Land and Natural Resources' (DLNR), Land Division distributed or made available a copy of your report pertaining to the subject matter to State Historic Preservation Division for their review and comment.

The Department of Land and Natural Resources has no other comments to offer on the subject matter. Should you have any questions, please feel free to call our office at 587-0433. Thank you.

Sincerely,

Quarlene Ellou

Morris M. Atta Administrator GOVERNOR OF HAWAII



September 10, 2009



LAURA H, THTELEN CHAIRPERSON BOARD OF LAND AND NATURAL RESOURCES DMMISSION ON WATER RESOURCE MANAGEMENT

> RUSSELL Y. TSUJI FIRST DEPUTY

KEN C. KAWAHARA DEPUTY DIRECTOR - WATER

AQUATIC RESOURCES BOATING AND OCEAN RECREATION BURCAU OF CONVEYANCES COMMISSION ON WATER RESOURCE MAINAGEMENT CONSERVATION AND RESOURCES ENFORCEMENT ENGINEERING FORSERVATION VALOLIFE INSTORIC 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

RECEIVED

SEP 1 7 2009

Arc

PBRHAWAII

DOC NO: 0909MD09 Archaeology

LOG NO: 2009.3286

TO: Morris M. Atta DLNR Land Division

FROM: Nancy McMahon, Deputy SHPO/State Archaeologist and Historic Preservation Manager

State Historic Preservation Division

Cancy U. M. Mahon

SUBJECT:Chapter 6E-8 Historic Preservation Review –
Request for Pre-Consultation on Environmental Assessments for the Sale of Hawaii
County Hamakua Lands (Total Acreage 2,779.807)
Koholalele & Kapulena Ahupua'a, Hamakua District, Island of Hawai'i
TMKs: (3) 4-2-005:001; 4-7-005:001-003; 4-7-006:001, 005-007, 010, 018 & 020

Thank you for the opportunity to comment on the aforementioned project, which we received on August 13, 2009. We regret that we were unable to meet your requested response date of September 1, 2009.

Much of these lands were previously part of the Honokaa Sugar Company plantation, and include documented water features and undocumented historic-era plantation features. We have no records of the land use prior to the historic sugar plantations, nor have any archaeological inventory survey-level reviews been completed for these areas.

We would like to recommend that a literature review and reconnaissance-level survey be conducted of these lands as part of the environmental assessment. In other areas of Hamakua we have also found that the consistent use over time of water ditch systems over time seems to have resulted in unique ecosystems not found elsewhere in the region.

If you have questions about this letter please contact Morgan Davis at (808) 933-7650.

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PRINCIPALS

THOMAS S. WITTEN, ASLA President

R. STAN DUNCAN, ASLA Executive Vice-President

RUSSELL Y. J. CHUNG, FASLA, LEED[®] AP Executive Vice-President

VINCENT SHIGEKUNI Vice-President

GRANT T. MURAKAMI, AICP, LEED[®]AP Principal

W. FRANK BRANDT, FASLA Chairman Emeritus

ASSOCIATES

TOM SCHNELL, AICP Senior Associate

RAYMOND T. HIGA, ASLA Senior Associate

KEVIN K. NISHIKAWA, ASLA Associate

KIMI MIKAMI YUEN, LEED^{*}AP Associate

SCOTT ALIKA ABRIGO, LEED[®]AP Associate

SCOTT MURAKAMI, ASLA, LEED^{*}AP Associate

DACHENG DONG, LEED[®]AP Associate

HONOLULU OFFICE 1001 Bishop Street, Suite 650 Honolulu, Hawai'i 96813-3484 Tel: (808) 521-5631 Fax: (808) 523-1402 E-mail: sysadmin@pbrhawaii.com

KAPOLEI OFFICE 1001 Kamokila Boulevard Kapolei Building, Suite 313 Kapolei, Hawai'i 96707-2005 Tel: (808) 535-3163

December 23, 2010

State Historic Preservation Officer State of Hawai'i DLNR – State Historic Preservation Division 601 Kamokila Blvd., Room 555 Kapolei, HI 96707

SUBJECT: ENVIRONMENTAL ASSESSMENT FOR AN AGRICULTURAL PARK AT APPROXIMATELY 1,700 ACRES OF HAWAII COUNTY LAND KAPULENA, HĀMĀKUA

Dear State Historic Preservation Officer,

Thank you for your letter dated September 10, 2009 regarding the above referenced Draft Environmental Assessment. Through the preconsultation process the project has evolved from the sale of the Kapulena lands to a partnership between the County, Hāmākua Farm Bureau, the Big Island Farm Bureau, Kamehameha Schools, the University of Hawai'i College of Agriculture and Forestry; the University of Hawai'i College of Tropical Agriculture and Human Resources; and The Kohala Center to develop an agricultural park. The new agricultural park will serve as the site for a pilot project to demonstrate best practices for sustainable and efficient grazing operations to benefit the grass-fed beef industry; as a test area for trials of orchard and other crops with potential for larger scale production; as an incubator and product handling area for trials of valueadded agricultural products; and as a technical training site to help students learn cultivation, production, planning, marketing and business strategies for agricultural enterprises. The training component of the project is designed to establish and strengthen a family-farm based agricultural community in Hāmākua.

As the planning consultant for the applicant, County of Hawai'i, Department of Finance, we acknowledge the comments from SHPD, indicating that the lands were previously part of sugar plantations and may include water features and historic-era plantation features. An Archaeological Inventory Survey for this property has been conducted and several historic-era features (rock mounds associated with field preparation) were identified, evaluated and inventoried. Additionally four pre-Contact era temporary habitation rock shelters were identified as was a rock structure that possibly is the remnants of a heiau.

State Historic Preservation Officer ENVIRONMENTAL ASSESSMENT FOR AN AGRICULTURAL PARK AT APPROXIMATELY 1,700 ACRES OF HAWAII COUNTY LAND KAPULENA, HĀMĀKUA 2 of 2

Mitigation proposed for the agricultural park is to avoid all rock shelters and the possible heiau site.

The Archaeological Inventory Survey will be included with the Draft Environmental Assessment and a copy of the DEA has been provided to your office for review.

Thank you for contributing to the development of this document. Your comments will be included in the Draft Environmental Assessment.

Sincerely,

PBR HAWAII

Catie Fernandez Planner

cc: Kenneth Van Bergen, County of Hawai'i

O:\Job25\2506.19 Hawaii County-Hamakua Lands EA\EA\Pre-Consultation\Responses to Pre-Consultation Comments\Kapulena\DLNR_SHPD.doc William P. Kenoi Mayor



Darryl J. Oliveira Fire Chief

Glen P. I. Honda Deputy Fire Chief

County of Hawai'i HAWAII FIRE DEPARTMENT 25 Aupuni Street • Suite 103 • Hilo, Hawai'i 96720

(808) 981-8394 • Fax (808) 981-2037

RECEIVED AUG 1 1 2009

PBR HAWAII

August 13, 2009

Attention: Catie Fernandez PBR Hawai'i & Associations, Inc. 1001 Bishop Street ASB Tower, Suite 650 Honolulu, Hawai'i 96813-3484

Dear Ms. Fernandez,

SUBJECT: PRE-CONSULTATION ENVIRONMENTAL ASSESSMENT HAWAI'I COUNTY HAMAKUA LANDS (KOHOLALELE & KAPULENA)

The Hawai'i Fire Department does not have any comments to offer at this time regarding the abovereferenced pre-consultation Environmental Assessment.

^<u>*</u>:*

Thank you for the opportunity to comment.

Sincerely,

DARRYL OLIVEIRA Fire Chief

RP:lc

ener ter geen en g



Hawai'i County is an Equal Opportunity Provider and Employer.



December 23, 2010

PRINCIPALS

THOMAS S. WITTEN, ASLA President

R. STAN DUNCAN, ASLA **Executive Vice-President**

RUSSELL Y. J. CHUNG, FASLA, LEED AP Executive Vice-President

VINCENT SHIGEKUNI Vice-President

GRANT T. MURAKAMI, AICP, LEED AP Principal

W. FRANK BRANDT, FASLA Chairman Emeritus

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KAPOLEI OFFICE 1001 Kamokila Boulevard Kapolei Building, Suite 313 Kapolei, Hawal'i 96707-2005 Tel: (808) 521-5631 Fax: (808) 535-3163

Darryl Oliveira, Chief Hawai'i Fire Department 25 Aupuni Street, Suite 103 Hilo, HI 96720

SUBJECT: ENVIRONMENTAL ASSESSMENT FOR AN AGRICULTURAL PARK AT APPROXIMATELY 1,700 ACRES OF HAWAII COUNTY LAND KAPULENA, HĀMĀKUA

Dear Chief Oliveria,

Thank you for your letter dated August 13, 2009 regarding the above referenced Draft Environmental Assessment. Through the pre-consultation process the project has evolved from the sale of the Kapulena lands to a partnership between the County, Hāmākua Farm Bureau, the Big Island Farm Bureau, Kamehameha Schools, the University of Hawai'i College of Agriculture and Forestry; the University of Hawai'i College of Tropical Agriculture and Human Resources; and The Kohala Center to develop an agricultural park. The new agricultural park will serve as the site for a pilot project to demonstrate best practices for sustainable and efficient grazing operations to benefit the grass-fed beef industry; as a test area for trials of orchard and other crops with potential for larger scale production; as an incubator and product handling area for trials of value-added agricultural products; and as a technical training site to help students learn cultivation, production, planning, marketing and business strategies for agricultural enterprises. The training component of the project is designed to establish and strengthen a family-farm based agricultural community in Hāmākua.

As the planning consultant for the applicant, County of Hawai'i, Department of Finance, we acknowledge that the Hawai'i Fire Department has no comments at this time.

Thank you for contributing to the development of this document. Your comments will be included in the Draft Environmental Assessment.

Sincerely,

PBR HAWAII

Catie Fernandez Planner

cc:

Kenneth Van Bergen, County of Hawai'i

O:\Job25\2506.19 Hawaii County-Hamakua Lands EA\EA\Pre-Consultation\Responses to Pre-Consultation Comments\Kapulena\HFD.doc William P. Kenoi Mayor



Harry S. Kubojiri Police Chief

> Paul K. Ferreira Deputy Police Chief

County of Hawaii

POLICE DEPARTMENT

349 Kapiolani Street • Hilo, Hawaii 96720-3998 (808) 935-3311 • Fax (808) 961-8865

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August 12, 2009

AUG 1 2009 PBR HAWAI

Ms. Catie Fernandez, Planner PBR Hawaii & Associates 1001 Bishop Street ASB Tower, Suite 650 Honolulu, HI 96813-3184

Dear Ms. Fernandez:

SUBJECT: ENVIRONMENTAL ASSESSMENTS FOR THE SALE OF HAWAII COUNTY HAMAKUA LANDS (KOHOLALELE & KAPULENA) -PRECONSULTATION

Staff, upon reviewing the provided documents and visiting the proposed site, does not anticipate any significant impact to traffic and/or public safety concerns.

Thank you for allowing us the opportunity to comment.

If you have any questions, please contact Captain Randy Apele, Commander of the Hamakua District, at 775-7533.

Sincerely,

DEREK D. PACHECO ASSISTANT POLICE CHIEF AREA I OPERATIONS BUREAU

RA:lli



December 23, 2010

PRINCIPALS

THOMAS S. WITTEN, ASLA President

R. STAN DUNCAN, ASLA Executive Vice-President

RUSSELL Y. J. CHUNG, FASLA, LEED[®]AP Executive Vice-President

VINCENT SHIGEKUNI Vice-President

GRANT T. MURAKAMI, AICP, LEED[®] AP Principal

W. FRANK BRANDT, FASLA . Chairman Emerítus

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KAPOLEI OFFICE 1001 Kamokila Boulevard Kapolei Building, Suite 313 Kapolei, Hawal'i 96707-2005 Tel: (809) 521-5631 Fax: (808) 535-3163 Derek D. Pacheco, Assistant Police Chief County of Hawai'i Police Department 349 Kapiolani Street Hilo, HI 96720-3998

SUBJECT: ENVIRONMENTAL ASSESSMENT FOR AN AGRICULTURAL PARK AT APPROXIMATELY 1,700 ACRES OF HAWAII COUNTY LAND KAPULENA, HĀMĀKUA

Dear Assistant Chief Pacheco,

Thank you for your letter dated August 12, 2009 regarding the above referenced Draft Environmental Assessment. Through the pre-consultation process the project has evolved from the sale of the Kapulena lands to a partnership between the County, Hāmākua Farm Bureau, the Big Island Farm Bureau, Kamehameha Schools, the University of Hawai'i College of Agriculture and Forestry; the University of Hawai'i College of Tropical Agriculture and Human Resources; and The Kohala Center to develop an agricultural park. The new agricultural park will serve as the site for a pilot project to demonstrate best practices for sustainable and efficient grazing operations to benefit the grass-fed beef industry; as a test area for trials of orchard and other crops with potential for larger scale production; as an incubator and product handling area for trials of value-added agricultural products; and as a technical training site to help students learn cultivation, production, planning, marketing and business strategies for agricultural enterprises. The training component of the project is designed to establish and strengthen a family-farm based agricultural community in Hāmākua.

As the planning consultant for the applicant, County of Hawai'i, Department of Finance, we acknowledge that the Police Department does not anticipate any significant impact to traffic or any public safety concerns.

Thank you for contributing to the development of this document. Your comments will be included in the Draft Environmental Assessment.

Sincerely,

PBR HAWAII Catie Fernandez

Planner

cc: Kenneth Van Bergen, County of Hawai'i

O:\Job25\2506.19 Hawaii County-Hamakua Lands EA\EA\Pre-Consultation\Responses to Pre-Consultation Comments\Kapulena\HPD.doc LINDA LINGLE Governor of Hawai'i



KATHERINE PUANA KEALOHA Director

STATE OF HAWAI'I OFFICE OF ENVIRONMENTAL QUALITY CONTROL

Telephone (808) 586-4185 Facsimile (808) 586-4186 Electronic Mail: <u>oegc@doh.hawaii.gov</u>

Department of Health 235 South Beretania Street Leiopapa A Kamehameha, Suite 702 Honolulu, Hawai'i 96813

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AUG 2 7 2009 PBR HAWAII

August 25, 2009

Catie Fernandez PBR Hawai'i & Associates, Inc. 1001 Bishop Street ASB Tower, Suite 650 Honolulu, Hawai'i 96813-3484

> Subject: Environmental Assessment for the sale of Hawai'i County Hāmākua Lands (Koholālele & Kapulena) – Preconsultation

Dear Ms. Fernandez,

Thank you for the opportunity to provide comments regarding the proposed subject action. Your letter of August 7, 2009, does not contain information about activities that will occur on the lands once the sale is final. Therefore, the Office of Environmental Quality Control does not have adequate information to provide comments at this stage.

However, we recommend that you address the primary and secondary impacts of projected activities that will be conducted on the lands after the sale.

Sincerely,

w

Katherine Puana Kealoha Director



December 23, 2010

PRINCIPALS

THOMAS S. WITTEN, ASLA President

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KAPOLEI OFFICE 1001 Kamokila Boulevard Kapolei Building, Suite 313 Kapolei, Hawai'i 96707-2005 Tel: (808) 521-5631 Fax: (808) 535-3163 Herman Tuiolosega, Acting Director State of Hawai'i, Office of Environmental Quality Control 235 S. Beretania Street, Suite 702 Honolulu, HI 96813

SUBJECT: ENVIRONMENTAL ASSESSMENT FOR AN AGRICULTURAL PARK AT APPROXIMATELY 1,700 ACRES OF HAWAII COUNTY LAND KAPULENA, HĀMĀKUA

Dear Mr. Tuiolosega,

Thank you for your office's letter dated August 25, 2009 regarding the above referenced Draft Environmental Assessment. Through the pre-consultation process the project has evolved from the sale of the Kapulena lands to a partnership between the County, Hāmākua Farm Bureau, the Big Island Farm Bureau, Kamehameha Schools, the University of Hawai'i College of Agriculture and Forestry; the University of Hawai'i College of Tropical Agriculture and Human Resources; and The Kohala Center to develop an agricultural park. The new agricultural park will serve as the site for a pilot project to demonstrate best practices for sustainable and efficient grazing operations to benefit the grass-fed beef industry; as a test area for trials of orchard and other crops with potential for larger scale production; as an incubator and product handling area for trials of value-added agricultural products; and as a technical training site to help students learn cultivation, production, planning, marketing and business strategies for agricultural enterprises. The training component of the project is designed to establish and strengthen a family-farm based agricultural community in Hāmākua.

As the planning consultant for the applicant, County of Hawai'i, Department of Finance, we acknowledge the comments from OEQC recommending evaluation of the impacts of projected activities that will be conducted on the site after the sale. Potential impacts associated with the agricultural park will be discussed in the Draft Environmental Assessment.

Thank you for contributing to the development of this document. Your comments will be included in the Draft Environmental Assessment.

Sincerely,

PBR HAWAII Catie Fernandez Planner

cc: Kenneth Van Bergen, County of Hawai'i

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

HRD09/4607

PECEIVED SEP 03 200 BB HAWAII

September 1, 2009

Catie Fernandez PBR Hawaii & Associates Inc. Honolulu Office 1001 Bishop Street ASB Tower, Suite 650 Honolulu, Hi 96813-3484

RE: Pre-consultation for the Environmental Assessments for the sale of Hawai'i County lands in Hāmākua (Koholālele & Kapulena). TMK: (3) 4-2-005: 001, (3) 4-7-005: 001, 002 and 003; (3) 4-7-006: 001, 005, 006, 007, 010, 018 and 020.

Aloha e Catie Fernandez,

The Office of Hawaiian Affairs (OHA) is in receipt of your letter requesting comments on the above-mentioned project. The County of Hawai'i is considering selling some 2,780 acres of land in Koholālele and Kapulena, Hāmākua, Hawai'i Island. OHA has reviewed the project and offers the following comments.

The Draft Environmental Assessment (DEA) must include some sort of cultural impact assessment (CIA), in accordance with Act 50, Session Laws of Hawai'i, 2000. The Hawai'i State Legislature, through Act 50, stated that "the past failure to require native Hawaiian cultural impact assessments has resulted in the loss and destruction of many important cultural resources and has interfered with the exercise of native Hawaiian culture." At the very least, interviews with cultural practitioners in the area should be conducted for the CIA. Our community resource coordinators on Hawai'i Island can assist you with locating suitable interviewees. They can be reached at 920-6418 (Hilo Office) and 327-9525 (Kona Office).

OHA requests clarification whether an archaeological inventory survey for the project will be submitted to the State Historic Preservation Division for review and approval. If so, OHA should be allowed the opportunity to comment on the criteria assigned to any cultural or archaeological sites identified within the archaeological inventory survey. Catie Fernandez September 1, 2009 Page 2

Furthermore, OHA has questions about the Ceded Lands status of the parcels the county is proposing to sell. Ceded Lands hold a considerable amount of sentimental, historical and legal significance for Native Hawaiians and OHA. These lands were illegally taken from the Hawaiian Kingdom after the 1893 overthrow and later transferred ("ceded") by the United States government to the State of Hawai'i upon statehood. Today, the state holds the Ceded Lands corpus in trust for Native Hawaiians and the general public.

The Ceded Lands status of parcels are often obscured over time as parcels are consolidated or subdivided. OHA requests assurances that none of the parcels the county proposes to sell are Ceded Lands. To this end, we ask that the DEA contain detailed histories of each parcel, and whether at any point they have been consolidated or subdivided.

If any of these parcels are in fact Ceded Lands, the proposed sale of such lands must comply with Act 176, Session Laws of Hawaii 2009. OHA has strong concerns about any transaction that would result in the depletion of the Ceded Lands corpus, as Native Hawaiians still have unrelinquished claims to those lands.

Thank you for the opportunity to comment. If you have further questions, please contact Sterling Wong by phone at (808) 594-0248 or e-mail him at <u>sterlingw@oha.org</u>.

'O wau iho no me ka 'oia'i'o,

alyour las

Clyde W. Nāmu'o Administrator

C: OHA Hilo and Kona CRC Office



PRINCIPALS

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VINCENT SHIGEKUNI Vice-President

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DACHENG DONG, LEED[®]AP *Associate*

HONOLULU OFFICE 1001 Bishop Street, Suite 650 Honolulu, Hawari 96813-3484 Tel: (808) 521-5631 Fax: (808) 523-1402 E-mail: sysadmin@pbrliawaii.com

KAPOLEI OFFICE 1001 Kamokila Boulevard Kapolei Building, Suite 313

Kapolci, Hawai'i 96707-2005 Tel: (808) 521-5631 Fax: (808) 535-3163 December 23, 2010

Clyde W. Nāmu'o, Administrator State of Hawai'i, Office of Hawaiian Affairs 711 Kapi'olani Blvd., Suite 500 Honolulu, HI 96813

SUBJECT: ENVIRONMENTAL ASSESSMENT FOR AN AGRICULTURAL PARK AT APPROXIMATELY 1,700 ACRES OF HAWAII COUNTY LAND KAPULENA, HĀMĀKUA

Dear Mr. Nāmu'o,

Thank you for your letter dated September 1, 2009 regarding the above referenced Draft Environmental Assessment. Through the preconsultation process the project has evolved from the sale of the Kapulena lands to a partnership between the County, Hāmākua Farm Bureau, the Big Island Farm Bureau, Kamehameha Schools, the University of Hawai'i College of Agriculture and Forestry; the University of Hawai'i College of Tropical Agriculture and Human Resources; and The Kohala Center to develop an agricultural park. The new agricultural park will serve as the site for a pilot project to demonstrate best practices for sustainable and efficient grazing operations to benefit the grass-fed beef industry; as a test area for trials of orchard and other crops with potential for larger scale production; as an incubator and product handling area for trials of valueadded agricultural products; and as a technical training site to help students learn cultivation, production, planning, marketing and business strategies for agricultural enterprises. The training component of the project is designed to establish and strengthen a family-farm based agricultural community in Hāmākua.

As the planning consultant for the applicant, County of Hawai'i, Department of Finance, we acknowledge the comments from The Office of Hawaiian Affairs requesting that a Cultural Impact Assessment, an Archaeological Inventory Survey and research into the status of each parcel be performed. The Draft Environmental Assessment includes a Cultural Impact Assessment, an Archaeological Inventory Survey and research into the status of the parcels proposed for the agricultural park.

Mr. Clyde Nāmu'o ENVIRONMENTAL ASSESSMENT FOR AN AGRICULTURAL PARK AT APPROXIMATELY 1,700 ACRES OF HAWAII COUNTY LAND KAPULENA, HĀMĀKUA 2 of 2

Thank you for contributing to the development of this document. Your comments will be included in the Draft Environmental Assessment.

Sincerely,

PBR HAWAII

Catie Fernandez Planner

cc: Kenneth Van Bergen, County of Hawai'i

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DEPARTMENT OF BUSINESS, ECONOMIC DEVELOPMENT & TOURISM

LINDA LINGLE GOVERNOR THEODORE E. LIU DIRECTOR MARK K. ANDERSON DEPUTY DIRECTOR ABBEY SETH MAYER DIRECTOR OFFICE OF PLANNING

OFFICE OF PLANNING

Telephone: (808) 587-2846 Fax: (808) 587-2824

235 South Beretania Street, 6th Floor, Honolulu, Hawaii 96813 Mailing Address: P.O. Box 2359, Honolulu, Hawaii 96804

Ref. No. P-12751

September 8, 2009

RECEIVED SEP 0 0 2009 PBR HAWAII

Ms. Catie Fernandez PBR Hawaii & Associates, Inc. 1001 Bishop Street ASB Tower, Suite 650 Honolulu, Hawaii 96813-3484

Dear Ms. Fernandez:

Subject: Sale of Hawaii County Hamakua Lands (Koholalele & Kapulena)
Pre-consultation for Environmental Assessments
TMK(s): 4-2-005: 1; 4-7-005: 1, 2, 3; 4-7-006: 1, 5, 6, 7, 10, 18, 20
Koholalele & Kapulena, Hamakua, Island of Hawaii

Thank you for sending the Office of Planning (OP) a pre-consultation request regarding Environmental Assessments (EA) for the above referenced proposed sale of land on the Hamakua Coast of the island of Hawaii. The lots are zoned A-40a by the County of Hawaii, and are within the Agricultural or Conservation State land use districts. We note that your letter indicates that no State land use reclassification is proposed, nor is any development planned other than what is permitted according to the current zoning and State Land Use Districts. Therefore, OP has no comments at this time. In so stating, the Office offers no judgment of either the adequacy of the document itself or the merits of the proposed sale.

If you have any questions, please contact Lorene Maki of our Land Use Division at 587-2888.

Sincerely, Abbey Seth Mayer

Directòr^a de la companya de la comp La companya de la comp La companya de la comp



PRINCIPALS

THOMAS S. WITTEN, ASLA President

R. STAN DUNCAN, ASLA Executive Vice-President

RUSSELL Y. J. CHUNG, FASLA, LEED[®] AP Executive Vice-President

VINCENT SHIGEKUNI Vice-President

GRANT T. MURAKAMI, AICP, LEED[®] AP Principal

W. FRANK BRANDT, FASLA Chairman Emeritus

ASSOCIATES

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DACHENG DONG, LEED[®]AP Associate

HONOLULU OFFICE 1001 Bishop Street, Suite 650 Honolulu, Hawari 96813-3484 Tel: (808) 521-5631 Fax: (808) 523-1402 E-mail: sysadmin@pbrhawaii.com

KAPOLEI OFFICE 1001. Kainokila Boulevard Kapolei Building, Suite 313 Kapolei, Hawai'i 96707-2005 Tel: (808) 521-5631 Fax: (808) 535-3163 December 23, 2010

Abbey Seth Mayer, Director State of Hawai'i DBEDT, Office of Planning PO Box 2359 Honolulu, HI 96804

SUBJECT: ENVIRONMENTAL ASSESSMENT FOR AN AGRICULTURAL PARK AT APPROXIMATELY 1,700 ACRES OF HAWAII COUNTY LAND KAPULENA, HĀMĀKUA

Dear Mr. Mayer,

Thank you for your letter dated September 8, 2009 regarding the above referenced Draft Environmental Assessment. Through the preconsultation process the project has evolved from the sale of the Kapulena lands to a partnership between the County, Hāmākua Farm Bureau, the Big Island Farm Bureau, Kamehameha Schools, the University of Hawai'i College of Agriculture and Forestry; the University of Hawai'i College of Tropical Agriculture and Human Resources; and The Kohala Center to develop an agricultural park. The new agricultural park will serve as the site for a pilot project to demonstrate best practices for sustainable and efficient grazing operations to benefit the grass-fed beef industry; as a test area for trials of orchard and other crops with potential for larger scale production; as an incubator and product handling area for trials of valueadded agricultural products; and as a technical training site to help students learn cultivation, production, planning, marketing and business strategies for agricultural enterprises. The training component of the project is designed to establish and strengthen a family-farm based agricultural community in Hāmākua.

As the planning consultant for the applicant, County of Hawai'i, Department of Finance, we acknowledge we acknowledge the comments from the Office of Planning confirming that the site is zoned A-40a and within the Agricultural State Land Use District. We further confirm that no State Land Use reclassification is proposed for the proposed agricultural park.

Mr. Abbey Seth Mayer ENVIRONMENTAL ASSESSMENT FOR AN AGRICULTURAL PARK AT APPROXIMATELY 1,700 ACRES OF HAWAII COUNTY LAND KAPULENA, HĀMĀKUA

2 of 2

Thank you for contributing to the development of this document. Your comments will be included in the Draft Environmental Assessment.

Sincerely,

PBR HAWAII

Catie Fernandez Planner

cc: Kenneth Van Bergen, County of Hawai'i

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Appendix Draft Environmental Assessment Comments and Responses





United States Department of the Interior

FISH AND WILDLIFE SERVICE Pacific Islands Fish and Wildlife Office 300 Ala Moana Boulevard, Room 3-122, Box 50088 Honolulu, Hawaii 96850

In Reply Refer To: 2011-TA-0106

Ms. Catie Fernandez PBR Hawaii 1001 Bishop Street Suite 650 Honolulu, Hawaii 96815 FEB 0 9 2011

Subject: Technical Assistance for the Kapulena Agricultural Park, Hawaii

Dear Ms. Fernandez:

The U. S. Fish and Wildlife Service (Service) has reviewed the Draft Environmental Assessment (EA) for the proposed Kapulena Agricultural Park in the Hamakua District on the island of Hawaii. We received your letter soliciting our comments on January 7, 2011. The Agricultural Park will be located on 1,739.807 acres and spans 10 TMKs (3rd/4-7-005:001, 002, 003, 4-7-006:001, 005, 007, 010, 018, 020). We have reviewed the project information you provided and pertinent information in our files, including data compiled by the Hawaii Biodiversity and Mapping Program and the Hawaii GAP Program. The federally endangered Hawaiian hoary bat (*Lasiurus cinereus semotus*) and Hawaiian hawk (*Buteo solitarius*) have been observed in the vicinity of the proposed project. There is no federally designated critical habitat in the project footprint. We recommend you address potential project impacts to the listed species discussed below, and include measures to minimize impacts to these resources in your Final Environmental Assessment.

Hawaiian hoary bats roost in both exotic and native woody vegetation and leave their young unattended in "nursery" trees and shrubs when they forage. If trees or shrubs suitable for bat roosting are cleared during the bat-breeding season (May to August), there is a risk that young bats could inadvertently be harmed or killed. To minimize impacts to the endangered Hawaiian hoary bat, woody plants greater than 15 feet tall should not be removed or trimmed during the bat-birthing and pup-rearing season (May 15 through August 15). Therefore, no barbed wire should be used in any fence construction. Fences constructed of barbed wire may result in bat mortality, thus no barbed wire should be utilized.

In addition, Hawaiian hawks also nest in both exotic and native woody vegetation. To avoid impacts to Hawaiian hawks, we recommend not clearing any brush or trees, or using heavy equipment within 300 feet of potential nesting sites during their breeding season (March through September). If you are unable to avoid clearing vegetation or using heavy equipment during



Ms. Catie Fernandez

these months, we recommend you conduct surveys for nests prior to any clearing activity. Please contact our office for survey methodology and recommendations for avoiding impacts to nests.

Hawaiian geese (*Branta sandvicensis*) are known to be attracted to water sources. We note that the project may have a reservoir or catchment system. We recommend lessees be made aware of the potential for attracting the Hawaiian goose to water sources. If Hawaiian geese begin visiting the site, we recommend the lessees contact our office for further guidance related to goose management.

If a project may affect listed species and is funded, authorized, or permitted by a Federal agency, then that agency is required to consult with us pursuant to section 7(a)(2) of the Endangered Species Act of 1973, as amended (ESA). If no Federal agency is involved with the project and implementation of the project could result in take of a listed animal species, the applicant should apply for an incidental take permit under section 10(a)(1)(B) of the ESA. In addition to a Federal incidental take permit, implementation of the proposed project may also require obtaining a State incidental take license.

We appreciate the opportunity to provide technical assistance in your environmental compliance process for this project. Implementation of these recommendations does not alleviate your responsibilities pursuant to the ESA if a listed species may be affected by the proposed action. If you have any questions regarding this letter, please contact Dr. Jeff Zimpfer, Fish and Wildlife Biologist, Consultation and Habitat Conservation Planning Program (phone: 808-792-9431; email: jeff_zimpfer@fws.gov).

Sincerely,

for

Loyal Mehrhoff Field Supervisor



PRINCIPALS

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R. STAN DUNCAN, ASLA Executive Vice-President

RUSSELL Y. J. CHUNG, FASLA, LEED^{*} AP Executive Vice-President

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HONOLULU OFFICE 1001 Bishop Street, Suite 650 Honolulu, Hawai'i 96813-3484 Tel: (808) 521-5631 Fax: (808) 523-1402 E-mail: sysadmin@pbrhawaii.com

KAPOLEI OFFICE 1001 Kamokila Boulevard

Kapolei Building, Suite 313 Kapolei, Hawai'i 96707-2005 Tel: (808) 521-5631 Fax: (808) 535-3163 April 12, 2011

Loyal Mehrhoff Field Manager, USFWS 300 Ala Moana Blvd., Room 3-122 Box 50088 Honolulu, HI 96850

SUBJECT: 2011-TA-0106

DRAFT ENVIRONMENTAL ASSESSMENT – KAPULENA AGRICULTURAL PARK - KAPULENA, HĀMĀKUA, HAWAI'I (TMK: (3)4-7-005:001, 002 & 003; (3)4-7-006:001, 005, 006, 007, 010, 018, 020

Dear Mr. Mehrhoff,

Thank you for your letter dated February 9, 2011 regarding the above referenced Draft Environmental Assessment. As the planning consultant for the applicant, County of Hawai'i, Department of Finance, we acknowledge comments from the US Fish and Wildlife Service (FWS).

We acknowledge your comments relating to the potential presence of the Hawaiian hoary bat and the Hawaiian hawk at the project site. We also acknowledge your confirmation that there is no federally designated critical habitat in the project footprint. As described in the flora and fauna assessment prepared for this project, native fauna was relatively sparse likely due to the overwhelming colonization of Guinea grass and ironwood trees. However, your recommended measures to minimize impacts to native faunal resources have been added to the Final Environmental Assessment:

- 1. To avoid impacts to Hawaiian hoary bats during the bat-pupping and rearing season, woody plants greater than 15 feet tall will not be removed between May 15 and August 15.
- 2. To avoid impacts to Hawaiian hawks during the nesting season, brush or tree clearing and use of heavy equipment will be avoided during the months of March through September. If brush or tree clearing, or use of heavy equipment must occur during these months, the County will contact your office before commencing a survey for nests.

2011-TA-0106 DRAFT ENVIRONMENTAL ASSESSMENT – KAPULENA AGRICULTURAL PARK - KAPULENA, HĀMĀKUA, HAWAI'I (TMK: (3)4-7-005:001, 002 & 003; (3)4-7-006:001, 005, 006, 007, 010, 018, 020 2 of 2

3. If water sources are developed that involve a reservoir or catchment system, agricultural park managers and lessees will be made aware of the potential for attracting Hawaiian geese. If geese are attracted to the water storage facilities, your office will be contacted for guidance related to goose management.

Your comments relating to these resources will be included in the Final EA so that it is available to those participating in the agricultural park as well as the general public.

Thank you for participating in the Environmental Assessment process.

Sincerely,

PBR HAWAII

Cullison

Catie Cullison Planner

CC:

Ken

Kenneth VanBergen, County of Hawai'i

O:\Job25\2506.19 Hawaii County-Hamakua Lands EA\EA\DEA\DEA - Kapulena\DEA Comments\Response to FWS.doc



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

January 10, 2011

Regulatory Branch

File Number POH-2011-00016

PBR Hawaii & Associates, Inc. Attention: Catie Fernandez 1001 Bishop Street, Suite 650 Honolulu, Hawaii 96813

Dear Ms. Fernandez:

We are in receipt of the Draft Environmental Assessment (DEA) for the proposed development of the Kapulena Agricultural Park in Kapulena, Hamakua District, Hawaii Island, Hawaii. We have assigned the project the reference number **POH-2011-00016**. Please cite the reference number in any future correspondence concerning this project.

We completed our review of the submitted document pursuant to Section 10 of the Rivers and Harbors Act of 1899 (Section 10) and Section 404 of the Clean Water Act (Section 404) and have determined that the submitted documents, appear to identify waters under the regulatory jurisdiction of the U.S. Army Corps of Engineers (the Corps) on your property.

For your information, Section 10 requires that a DA permit be obtained from the U.S. Army Corps of Engineers (the Corps) prior to undertaking any construction, dredging, or other activity occurring in, over, or under or affecting navigable waters of the U.S. For tidal waters, the shoreward limit of the Corps' jurisdiction extends to the Mean High Water Mark. Section 404 requires that a DA permit be obtained for the discharge (placement) of dredged and/or fill material into waters of the U.S., including wetlands. For tidally influenced waters, in the absence of adjacent wetlands, the shoreward limit of the Corps' jurisdiction extends to the High Tide Line, which in Hawai'i may be approximated by reference to the Mean Higher High Water Mark. For non-tidal waters, the lateral limits of the Corps' jurisdiction extend to the Ordinary High Water Mark or the approved delineated boundary of any adjacent wetlands.

The DEA identifies multiple aquatic resources within the project boundaries. The Corps of Engineers has sole authority to determine if an aquatic feature is or is not a water of the U.S., potentially subject to regulation under Section 10 and/or Section 404. We encourage the landowner of the subject property contact the Corps to request a formal jurisdictional determination prior to developing any future plans involving work in close proximity to an aquatic feature and/or its associated tributaries and wetlands. We can at that time determine whether or not the aquatic resource is subject to Corps jurisdiction and whether any proposed activity involving that resource will require a DA permit. If any water bodies are determined to be waters of the U.S., the property owner must obtain authorization from the Corps prior to work in or discharge of dredged or fill material into such water bodies.

Thank you for contacting us regarding this project and providing us with the opportunity to comment. Should you have any questions, please contact Ms. Jessie Pa'ahana at 808.438.0391 or via email at Jessie.K.Paahana@usace.army.mil. You are encouraged to provide comments on your experience with the Honolulu District Regulatory Branch by accessing our web-based customer survey form at http://www.per2.nwp.usace.army.mil/survey.html.

Sincerely,

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



PRINCIPALS

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R. STAN DUNCAN, ASLA Executive Vice-President

RUSSELL Y. J. CHUNG, FASLA, LEED^{*} AP Executive Vice-President

VINCENT SHIGEKUNI Vice-President

GRANT T. MURAKAMI, AICP, LEED[®] AP Principal

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KAPOLEI OFFICE 1001 Kamokila Boulevard Kapolei Building, Suite 313 Kapolei, Hawai'i 96707-2005 Tel: (808) 521-5631 Fax: (808) 535-3163

April 12, 2011

George P. Young, P.E. Chief, Regulatory Branch US Army Corps of Engineers, Honolulu District Fort Shafter, HI 96858-5440

SUBJECT: POH-2011-00016 DRAFT ENVIRONMENTAL ASSESSMENT – KAPULENA AGRICULTURAL PARK - KAPULENA, HĀMĀKUA, HAWAI'I (TMK: (3)4-7-005:001, 002 & 003; (3)4-7-006:001, 005, 006, 007, 010, 018, 020

Dear Mr. Young,

Thank you for your letter dated January 10, 2011 regarding the above referenced Draft Environmental Assessment. As the planning consultant for the applicant, County of Hawai'i, Department of Finance, we acknowledge comments from the Army Corps Regulatory Branch. With this letter, we confirm that no in-water work and no dredge or fill of waterbodies, including wetlands are proposed.

Your comments relating to Section 10 of the Rivers and Harbors Act and Section 404 of the Clean Water Act will be included in the Final EA so that it is available to those participating in the agricultural park as well as the general public.

Thank you for participating in the Environmental Assessment process.

Sincerely,

PBR HAWAII

lis

Catie Cullison Planner

cc: Kenneth VanBergen, County of Hawai'i

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

HRD11/5493

February 9, 2011

Catie Fernandez PBR Hawaii 1001 Bishop Street, Suite 650 Honolulu, Hawai'i 96813

Re: Draft Environmental Assessment Kapulena Agricultural Park Hāmākua, Island of Hawai'i

Aloha e Catie Fernandez,

The Office of Hawaiian Affairs (OHA) is in receipt of your December 23, 2010 request for comments on a draft environmental assessment (DEA) to support a County of Hawai'i (County) proposal to develop an agricultural park on approximately 1,739.807 acres of land (project area) encompassing multiple tax map key parcels in Hāmākua on the Island of Hawai'i. The project area was acquired by the County in 1994 in lieu of real property taxes owed and was formerly used for intensive sugar cane cultivation and is now fallowed. The Mayor is the accepting authority for the DEA.

During the conceptual planning of the Kapulena Agricultural Park (park), the County worked with a wide range of government agencies and developed partnerships with organizations such as the Hāmākua and Big Island Farm Bureaus, the Kamehameha Schools, the University of Hawai'i and the Kohala Center. OHA recognizes that the park has the potential to develop and promote sustainable ranching and farming endeavors by providing land for lessees while also providing valuable pilot programs and training opportunities for farmers who hope to engage in operations ranging in size from family farms to large-scale commercial. We look forward to seeing this potential fully achieved and are especially pleased to see the County focus on development of park plans which emphasize a family farm-based agricultural community in Hāmākua (DEA, page 2-1).

One of the fundamental objectives of the State Agricultural Function Plan is to encourage and develop diversified agriculture throughout Hawai'i which will support our local economy and contribute to reducing our dependence on imported products. We firmly believe this objective can be obtained by protecting and prioritizing initiatives on agricultural lands with the highest potential for productivity, which we feel this proposal does. Catie Fernandez PBR Hawaii February 9, 2011 Page 2 of 3

OHA is concerned about the archaeological inventory survey (AIS) conducted for the project area (DEA, Appendix C) and is labeled as a "May 2010 draft". We seek clarification on when a final version of the AIS was or will be submitted to the Department of Land and Natural Resources-State Historic Preservation Division (SHPD) for review and approval. The draft AIS identified 17 historic properties comprised of 28 component features. Your archaeological consultant, Scientific Consulting Services, Inc. (SCS) has assigned a significance assessment of criterion "D" (valuable only for information content) to 16 of these historic properties and recommended "no further work". One historic property (Site 23835) is possibly Puki'oiaka Heiau and has been assigned a significance assessment of criterion "E" (important value to the Native Hawaiian people). SCS has recommended further work at this site, consisting of archaeological data recovery excavations which are intended to confirm the functions and significance of this site.

OHA is opposed to the proposal to conduct archaeological data recovery excavations at Site 23835. The draft AIS details that four test units have already been excavated at the site and we are interested to know the scope of additional work SCS has in mind. If the County and SHPD decide that data recovery is necessary, we expect the opportunity to review the proposed scope of work detailed in a data recovery plan developed pursuant to §13-278-3, Hawaii Administrative Rules (HAR). Furthermore, §13-284-6(c), HAR require that organizations such as OHA be consulted on historic properties significant under criterion "E". We have no record of ever being consulted on the significance of and appropriate mitigation measures for Site 23835.

We also seek clarification on information detailed in the draft AIS regarding Site 28392, which is identified as a "temporary habitation" and assigned a significance assessment of criterion "D". A single test unit was excavated at this site which identified two cultural items- a basalt hammer stone and a sling stone. We seek clarification on where these cultural items are and what the proposal for their long term disposition is. Secondly, we question why additional test units were not excavated here or why data recovery is not proposed as this site has obvious potential for additional information and may quite possibly by significant under criterion "E" as well.

OHA is also concerned about the cultural impact assessment (CIA) conducted for the project (DEA, Appendix D). The CIA is also labeled (draft May 2010) and we seek clarification on when a final CIA will be produced. In reading the CIA, an emphasis seems to be placed on because of the previous intensive sugar cultivation in the project area, no historic properties will be present. The one informant interviewed in the CIA (a former sugar company worker) seems to support the belief that no historic properties are present in the project area. The same firm (SCS) who conducted the draft AIS (which did identify historic properties) also conducted the CIA. With this in mind, there seems to be a disconnect between the draft CIA and AIS which should be remedied to ensure the documents compliment each other.

Furthermore, the conclusion in the CIA that "based on no response from the above listed contacts, it is reasonable to conclude that Hawaiian rights related to gathering, access or other customary activities within the project area will not be affected and there will be no direct adverse effect upon cultural practices or beliefs" (draft CIA page 31) is fundamentally flawed as it is not supported by consultation with the Native Hawaiian community. We respectfully assert that the lack of response to the CIA consultation may be partially a result of the lack of

Catie Fernandez PBR Hawaii February 9, 2011 Page 3 of 3

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established relationships with the Native Hawaiian community in Hāmākua and we encourage you and your consultant to reassess this matter.

Thank you for the opportunity to provide comments. Should you have any questions or concerns, please contact Keola Lindsey at 594-0244 or keolal@oha.org.

'O wau iho nō me ka 'oia'i'o,

Ulgelin tori

Clyde/W. Nāmu'o Chief Executive Officer

C: OHA, East Hawai'i Community Outreach Coordinator State Historic Preservation Division- Hawai'i Island Office County of Hawai'i



PRINCIPALS

THOMAS S. WITTEN, ASLA President

R. STAN DUNCAN, ASLA Executive Vice-President

RUSSELL Y. J. CHUNG, FASLA, LEED^{*} AP Executive Vice-President

VINCENT SHIGEKUNI Vice-President

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KAPOLEI OFFICE 1001 Kamokila Boulevard Kapolei Building, Suite 313 Kapolei, Hawai'i 96707-2005 Tel: (808) 531-5631 Fax: (808) 535-3163 April 12, 2011

Clyde Nāmu'o Chief Executive Officer Office of Hawaiian Affairs 711 Kapi'olani Blvd., Suite 500 Honolulu, HI 96813

Dear Mr. Nāmu'o,

Thank you for your letter dated February 9, 2011 regarding the above referenced Draft Environmental Assessment. As the planning consultant for the applicant, County of Hawai'i, Department of Finance, we acknowledge comments from the Office of Hawaiian Affairs. With this letter, we acknowledge your support for the project concept and your concerns about elements of the archaeological inventory survey (AIS) and Cultural Impact Assessment (CIA).

With regard to the AIS, and its "draft" status, a draft version of the document was submitted to DLNR-SHPD at the end of May, 2010. The draft AIS is the same version included as Appendix C of the DEA. The SHPD Hawai'i Island Archaeology Branch has 45 days to review and comment on the draft AIS. However, the SHPD Hawai'i Island Archaeology Branch is understaffed, and the process has been significantly slowed--in the case of the Kapulena AIS, SHPD has not reviewed or commented on the draft AIS for over eight months. As soon as we are in receipt of their comments, we will revise and submit a final draft of the AIS for their approval.

With regard to a possible heiau at the site, it is not possible to confirm that Site 23835 is the remains of Pukiohi'aka Heiau. We know from historical documentation that the heiau once existed in either Kukuihaele or Kapulena Ahupua'a around 1,400 feet elevation. Later studies in the early 1900s stated that it had been "destroyed". DRAFT ENVIRONMENTAL ASSESSMENT – KAPULENA AGRICULTURAL PARK - KAPULENA, HĀMĀKUA, HAWAI'I (TMK: (3)4-7-005:001, 002 & 003; (3)4-7-006:001, 005, 006, 007, 010, 018, 020

Page | 2 of 5

The citations for the early studies are in the first two paragraphs of the Previous Archaeology Section of the AIS report. Site 23835 is the bulldozed remains of a threetiered platform. The remaining structure is 30.0 meters long by 6.0 meters wide and is 1.6 meters in maximum height. Because the platform has been bulldozed, it is not possible to know its original size. During the AIS fieldwork, it was determined that the site could be the remains of a traditional Hawaiian upland habitation site, or possibly the remains of a heiau, or the remains of a feature constructed for some other purpose.

There are numerous documented, large multi-tiered habitation sites on the Island of Hawai'i that have construction features that the Site 23835 structure also exhibits. It is also well documented, through cultural informant interview and archaeological studies, that sugarcane fields were often cleared of rock and platforms were constructed with the rock for work and break activities.

With regard to the subject of archaeological testing and recovery, during the course of the AIS fieldwork, SHPD archaeologist Morgan Davis visited the site at the request of Scientific Consultant Services, Inc. (SCS). Miss Davis viewed the site and was told of the work to be conducted. Limited subsurface testing was conducted to determine the possible functions of the platform. This is a standard, SHPD recognized and accepted practice.

Four controlled test units were excavated in the level top surface of the feature to determine the platform's function. If food midden and cooking fire features were discovered in the excavations, it would be clear that the platform was used as a habitation feature. No habitation debris, or other artifacts were recovered. Therefore, the site was likely not used for habitation. It is likely the platform was constructed for another purpose, possibly, though not definitely, it was constructed as a heiau. There was modern bottle glass and wire on the surface of the platform, but this does not prove unequivocally that the platform is a modern sugarcane feature.

During the excavation of each individual test unit, rock removed from the unit was placed on a clean tarp on the surface of the platform. After completion of each excavation, the rock removed from each test unit was replaced and the top of the platform was restored to its original appearance.

With regard to the consultation process, the draft AIS determined that Site 23835 is *possibly* a heiau, and recommended it be assessed significant under Criterion "E", assuming the possibility that it might be a heiau. There is, as of yet, no evidence that Site 23835 is a heiau. We only know that limited testing did not recover habitation remains. In all cases, SCS, as an archaeological firm makes recommendations to the SHPD. The final determination of significance is made by the SHPD in all cases. In addition, SCS recommended preservation and data recovery for Site 23835. We still

DRAFT ENVIRONMENTAL ASSESSMENT – KAPULENA AGRICULTURAL PARK - KAPULENA, HÄMÄKUA, HAWAI'I (TMK: (3)4-7-005:001, 002 & 003; (3)4-7-006:001, 005, 006, 007, 010, 018, 020

Page |3 of 5

have not received comments, the opinion, or the determination of the SHPD Archaeological Branch regarding Site 23835. OHA and other Native Hawaiian Groups will be consulted, if and when SHPD determines that the site is Significant under Criterion "E". After the SHPD determination regarding Site 23835, and after the approval of the AIS report, a preservation plan and a data recovery plan might be requested by SHPD. Data recovery measures recommended by SCS would include non-intrusive data collection, including additional documentary research and oral interview.

With regard to Site 28392, a small rock shelter along the Waikoloa Gulch, the archaeological consultant does not suggest that it qualifies for Criterion E. The floor of the shelter is just above the gulch and it is heavily disturbed when the gulch runs high. There many pieces of drift wood and river cobbles that have been pushed by flooding into the rock shelter. There is very little sediment on the rock shelter floor. The highly disturbed condition of the rock shelter floor and the lack of sediment are the two main reasons why additional subsurface testing was not conducted. The shelter was likely used as a possible temporary shelter while traveling along the gulch, and there is no evidence, such as feature construction, to indicate it was used often, or for any purpose other than temporary shelter. This is the final reason no other testing was conducted at the site. Criterion "E" is usually applied to sacred and religious sites, as well as traditional trails. Criterion "E" is not applied to temporary shelters, per long-standing SHPD practice. If SHPD requests that Site 28392 be considered significant under Criterion "E", SCS will follow SHPD guidance in the matter. With regard to possible hammerstone and possible sling stone, they are currently being curated at the Hilo SCS office. The County of Hawai'i, as the land owner, will determine the final disposition of the possible artifacts.

With regard to the Cultural Impact Assessment, The draft CIA has been reviewed by the SHPD Hawai'i Island Cultural Historian. He has provided comments and suggested additional individuals who potentially might have historical knowledge of the project area. SCS has contacted these individuals and is in the process of scheduling interviews.

We would like to also take this opportunity to clarify any misconceptions about CIAs. Firstly, the regulatory intent and the process of a CIA is to assess and document ongoing traditional cultural practices associated with a property, and to determine the potential effects of a proposed project on any known cultural practices. It is not to document historic properties, which is the regulatory intent and the process of an AIS study. Secondly, the vast majority of historic properties are not associated with ongoing cultural practices. A historic property may be significant under criteria as set forth by the National Historic Preservation Act (NHPA), or under criteria set forth by Hawai'i Administrative Rules §13-275-6, even though the property is not associated DRAFT ENVIRONMENTAL ASSESSMENT – KAPULENA AGRICULTURAL PARK - KAPULENA, HĀMĀKUA, HAWAI'I (TMK: (3)4-7-005:001, 002 & 003; (3)4-7-006:001, 005, 006, 007, 010, 018, 020

Page |4 of 5

with ongoing traditional cultural practices. The one individual SCS interviewed said that he had not seen or heard about any historic properties during the time he worked for the sugar company. SCS did not assume, based on those comments, that there were no historic properties on the project area. SCS studied numerous historic maps and aerial photos taken over many years to document the sugarcane fields that covered large portions of the project area. It was clear from those documents, and from pedestrian survey in the field, that mechanized field clearing and harvesting had greatly altered the ground surface in most of the project area. To also clarify, there is no disconnect between the information documented separately in the AIS and in the CIA. Simply because the respondent was not aware of any historic properties, SCS did not assume there were none during the AIS work. Finally, the statement has little bearing on the CIA results, the main point of which was that the respondent was not aware of any ongoing traditional cultural practices.

With regard to the conclusion of the CIA, The wording on page 31 of the CIA will be clarified. The intent is to state that the people who were interviewed responded "no" they were not aware of any traditional cultural practices carried out within the project area. The sentence will be revised to better reflect its meaning. SCS does have well established relationships with members of the Native Hawaiian community in Hāmākua, Waimea, Hilo, and other areas of Hawai'i Island. Additionally, the CIA documents contact with the Native Hawaiian community through consultation with OHA offices on O'ahu and Hawai'i island, Waimea Hawaiian Civic Club, Hawai'i Island Burial Council, and other individuals knowledgeable of Native Hawaiian practices in the region. Public notices were also placed in the Ka Wai Ola OHA Newspaper, the Hawai'i Tribune Herald and the Honolulu Advertiser (now Honolulu Star-Advertiser).

Your comments relating to the above, along with this response will be included in the Final EA so that it is available to those participating in the agricultural park as well as the general public. Thank you for participating in the Environmental Assessment process.

Sincerely,

PBR HAWAII

Cullison

Catie Cullison Planner

CC:

Kenneth VanBergen, County of Hawai'i

O:\Job25\2506.19 Hawaii County-Hamakua Lands EA\EA\DEA\DEA - Kapulena\DEA Comments\Response to OHA.doc

NEIL ABERCROMBIE GOVERNOR OF HAWAII



STATE OF HAWAII DEPARTMENT OF HEALTH P. O. BOX 3378 HONOLULU, HI 96801-3378 KEITH R. RIDLEY Acting Director of Health

> In reply, please refer to: File: EPO-I-3499

January 10, 2011

Ms. Catie Fernandez PBR Hawaii 1001 Bishop Street, Suite 650 Honolulu, Hawaii 96813

Dear Ms. Fernandez:

SUBJECT: Draft Environmental Assessment for the Kapulena Agriculture Park, Kapulena, District of Hamakua, Island of Hawaii TMKs: (3)4-7-005:001, 002 & 003; (3)4-7-006:001, 005, 006, 007, 010, 018, 020

Thank you for allowing us to review and comment on the subject document. The document was routed to the various branches of the Environmental Health Administration. We have no comments at this time, but reserve the right to future comments. We strongly recommend that you review all of the Standard Comments on our website: <u>www.hawaii.gov/health/environmental/env-planning/landuse/landuse.html</u>. Any comments specifically applicable to this application should be adhered to.

The same website also features a Healthy Community Design Smart Growth Checklist (Checklist). The Hawaii State Department of Health, <u>Built Environment Working Group</u>, recommends that State and county planning departments, developers, planners, engineers and other interested parties apply the healthy built environment principles in the Checklist whenever they plan or review new developments or redevelopments projects. We also ask you to share this list with others to increase community awareness on healthy community design.

If there are any questions about these comments please contact the Environmental Planning Office at 586-4337.

Sincerely,

eneries Salman

GENEVIEVE SALMONSON, Acting Manager Environmental Planning Office



<u>PRINCIPALS</u> THOMAS S. WITTEN, ASLA President

R. STAN DUNCAN, ASLA Executive Vice-President

RUSSELL Y. J. CHUNG, FASLA, LEED[®] AP *Executive Vice-President*

VINCEN'T SHIGEKUNI Vice-President

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KAPOLEI OFFICE 1001 Kamokila Bonlevard Kapolei Building, Suite 313 Kapolei, Hawal'i 96707-2005 Tel: (808) 521-5631 Fax: (808) 535-3163 April 12, 2011

Genevieve Salmonson State of Hawai'i Department of Health Environmental Planning Office PO Box 3378 Honolulu, HI 96801-3378

SUBJECT: DRAFT ENVIRONMENTAL ASSESSMENT – KAPULENA AGRICULTURAL PARK, KAPULENA, HĀMĀKUA, HAWAI'I - TMK: (3)4-7-005:001, 002 & 003; (3)4-7-006:001, 005, 006, 007, 010, 018, 020

Dear Ms. Salmonson,

Thank you for your letter dated January 10th, 2011 regarding the above referenced Draft Environmental Assessment. As the planning consultant for the applicant, County of Hawai'i, Department of Finance, we acknowledge comments from the Department of Health. We have reviewed the Standard Comments on your website and the Healthy Community Design Smart Growth Checklist.

Your comments relating to the resources available on the Department of Heath website will be included in the Final EA so that it is available to future users of the agricultural park.

Thank you for participating in the Environmental Assessment process.

Sincerely,

PBR HAWAII

" lism

Catie Cullison Planner

cc: Kenneth VanBergen, County of Hawai'i

O:\Job25\2506.19 Hawaii County-Hamakua Lands EA\EA\DEA\DEA - Kapulena\DEA Comments\Response to DOH.doc

NEIL ABERCROMBIE GOVERNOR OF HAWAII





STATE OF HAWAII DEPARTMENT OF LAND AND NATURAL RESOURCES LAND DIVISION

POST OFFICE BOX 621 HONOLULU, HAWAII 96809

February 10, 2011

Ms. Catie Fernandez PBR Hawaii & Associates, Inc. 1001 Bishop Street Suite 650 Honolulu, Hawaii 96813

Dear Ms. Fernandez:

Subject: Draft Environmental Assessment for the Kapulena Agricultural Park

Thank you for the opportunity to review and comment on the subject matter. The Department of Land and Natural Resources' (DLNR), Land Division distributed or made available a copy of your report pertaining to the subject matter to DLNR Divisions for their review and comment.

Other than the comments from Land Division-Hawaii District, Division of Aquatic Resources, Division of Forestry & Wildlife, Commission on Water Resource Management, Engineering Division, the Department of Land and Natural Resources has no other comments to offer on the subject matter. Should you have any questions, please feel free to call our office at 587-0414. Thank you.

Sincerely,

Mulene &. Unoli

Russell Y. Tsuji Administrator



WILLIAM J. AILA, JR. INTERIM CHARPERSON BOARD OF LAND AND NATURAL RESOURCES COMMISSION ON WATER RESOURCE MANAGEMENT

STATE OF HAWAII DEPARTMENT OF MAND NATURAL RESOURCES ND DIVISION

DEPT. OFHONOLULG, HAWAII 96809 NATURAL RESEMBLED 587-0433 STATE OF HAF444 (\$08) 587-0455

January 18, 2011

MEMORANDUM

TO:

NEIL ABERCROMBIE

GOVERNOR OF HAWAII

DLNR Agencies:

x-Div. of Aquatic Resources

Div. of Boating & Ocean Recreation

x Engineering Division

x Div. of Eorestry & Wildlife

Div. of State Parks

x Commission on Water Resource Management

Office of Conservation & Coastal Lands

x Land Division -- Hawaii District

Charlene Unoki, Assistant Administrator Draft Environmental Association FROM: Draft Environmental Assessment for Kapulena Agricultural Parks SUBJECT: LOCATION: Island of Hawaii APPLICANT: PBR Hawaii & Associates, Inc.

Transmitted for your review and comment on the above referenced document. We would appreciate your comments on this document. Please submit any comments by February 7, 2011.

If no response is received by this date, we will assume your agency has no comments. If you have any questions about this request, please contact my office at 587-0433. Thank you.

We have no objections.) We have no comments. Comments are attached. (\mathbf{V}) Signed: Date: 2

DEPARTMENT OF LAND AND NATURAL RESOURCES ENGINEERING DIVISION

LD/CharleneUnoki REF.:DEAKapulenaAgriculturalParks. Hawaii.502

COMMENTS

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- (X) We confirm that the project site, according to the Flood Insurance Rate Map (FIRM), is located in Zone X. The Flood Insurance Program does not have any regulations for developments within Zone X.
- () Please take note that the project site, according to the Flood Insurance Rate Map (FIRM), is located in Zone____.
- () Please note that the correct Flood Zone Designation for the project site according to the Flood Insurance Rate Map (FIRM) is ____.
- () Please note that the project must comply with the rules and regulations of the National Flood Insurance Program (NFIP) presented in Title 44 of the Code of Federal Regulations (44CFR), whenever development within a Special Flood Hazard Area is undertaken. If there are any questions, please contact the State NFIP Coordinator, Ms. Carol Tyau-Beam, of the Department of Land and Natural Resources, Engineering Division at (808) 587-0267.

Please be advised that 44CFR indicates the minimum standards set forth by the NFIP. Your Community's local flood ordinance may prove to be more restrictive and thus take precedence over the minimum NFIP standards. If there are questions regarding the local flood ordinances, please contact the applicable County NFIP Coordinators below:

- () Mr. Robert Sumitomo at (808) 768-8097 or Mr. Mario Siu Li at (808) 768-8098 of the City and County of Honolulu, Department of Planning and Permitting..
- () Mr. Carter Romero at (808) 961-8943 of the County of Hawaii, Department of Public Works.
- () Mr. Francis Cerizo at (808) 270-7771 of the County of Maui, Department of Planning.
- () Ms. Wynne Ushigome at (808) 241-4890 of the County of Kauai, Department of Public Works.
- () The applicant should include water demands and infrastructure required to meet project needs. Please note that projects within State lands requiring water service from the Honolulu Board of Water Supply system will be required to pay a resource development charge, in addition to Water Facilities Charges for transmission and daily storage.
- () The applicant should provide the water demands and calculations to the Engineering Division so it can be included in the State Water Projects Plan Update
- () Additional Comments:
- () Other: _____

Should you have any questions, please call Ms. Suzie S. Agraan of the Planning Branch at 587-0258.

Signed: S. CHANC, CHIEF ENGINEER Date:

IL ABERCROMBIE Sovernor of Hawaii	RECEIVED LAND DIVISION	WILLIAM J. AILA, JR. CHAIRPERSON WILLIAM D. BALFOUR, JR. SUMNER ERDMAN NEAL S. FUJIWARA DONNA FAY K. KIYOSAKI, P.E. LAWRENCE H. MIIKE, M.D., J.D.
	2011 FEB 10 P 12: 09 STATE OF HAWAII DEPARTMENT OF LAND AND NATURAL RESOURCES DEP TCOMMISSION ON WATER RESOURCE MANAGEMENT NATURAL RESOURCES HONOLULU, HAWAII 96809 STATE OF HAWAII	WILLIAM M. TAM DEPUTY DIRECTOR
	February 9, 2011	
	·	REF: N/A
TO:	Russell Tsuji, Administrator	
FROM:	William M. Tam, Deputy Director	

SUBJECT: Draft Environmental Assessment for Kapulena Agricultural Parks

Commission on Water Resource Management

FILE NO .: N/A TMK NO.: N/A

NEIL A

Thank you for the opportunity to review the subject document. The Commission on Water Resource Management (CWRM) is the agency responsible for administering the State Water Code (Code). Under the Code, all waters of the State are held in trust for the benefit of the citizens of the State, therefore, all water use is subject to legally protected water rights. CWRM strongly promotes the efficient use of Hawaii's water resources through conservation measures and appropriate resource management. For more information, please refer to the State Water Code, Chapter 174C, Hawaii Revised Statutes, and Hawaii Administrative Rules, Chapters 13-167 to 13-171. These documents are available via the Internet at http://www.hawaii.gov/dlnr/cwrm.

Our comments related to water resources are checked off below.

- 1. We recommend coordination with the county to incorporate this project into the county's Water Use and Development Plan. Please contact the respective Planning Department and/or Department of Water Supply for further information.
- 2. We recommend coordination with the Engineering Division of the State Department of Land and Natural Resources to incorporate this project into the State Water Projects Plan.
- 3. We recommend coordination with the Hawaii Department of Agriculture (HDOA) to incorporate the reclassification of agricultural zoned land and the redistribution of agricultural resources into the State's Agricultural Water Use and Development Plan (AWUDP). Please contact the HDOA for more information.
- 4. We recommend that water efficient fixtures be installed and water efficient practices implemented throughout the development to reduce the increased demand on the area's freshwater resources. Reducing the water usage of a home or building may earn credit towards Leadership in Energy and Environmental Design (LEED) certification. More information on LEED certification is available at http://www.usgbc.org/leed. A listing of fixtures certified by the EPA as having high water efficiency can be found at http://www.epa.gov/watersense/pp/index.htm,
- 5. We recommend the use of best management practices (BMP) for stormwater management to minimize the impact of the project to the existing area's hydrology while maintaining on-site infiltration and preventing polluted runoff from storm events. Stormwater management BMPs may earn credit toward LEED certification. More information on stormwater BMPs can be found at http://hawaii.gov/dbedt/czm/initiative/lid.php.

DRF-IA 06/19/2008

Russell Tsuji, Administrator Page 2 February 9, 2011

- 6. We recommend the use of alternative water sources, wherever practicable.
- 7. There may be the potential for ground or surface water degradation/contamination and recommend that approvals for this project be conditioned upon a review by the State Department of Health and the developer's acceptance of any resulting requirements related to water quality.

Permits required by CWRM:

Additional information and forms are available at http://hawaii.gov/dlnr/cwrm/resources_permits.htm.

- 8. The proposed water supply source for the project is located in a designated water management area, and a Water Use Permit is required prior to use of water.
- 9. A Well Construction Permit(s) is (are) required any well construction work begins.
- 10. A Pump Installation Permit(s) is (are) required before ground water is developed as a source of supply for the project.
- 11. There is (are) well(s) located on or adjacent to this project. If wells are not planned to be used and will be affected by any new construction, they must be properly abandoned and sealed. A permit for well abandonment must be obtained.
- 12. Ground water withdrawals from this project may affect streamflows, which may require an instream flow standard amendment.
- 13. A Stream Channel Alteration Permit(s) is (are) required before any alteration(s) can be made to the bed and/or banks of a stream channel.
- 14. A Stream Diversion Works Permit(s) is (are) required before any stream diversion works is (are) constructed or altered.
- 15. A Petition to Amend the Interim Instream Flow Standard is required for any new or expanded diversion(s) of surface water.
- 16. The planned source of water for this project has not been identified in this report. Therefore, we cannot determine what permits or petitions are required from our office, or whether there are potential impacts to water resources.

OTHER:

The water demand for this project has not been estimated. CWRM calculations for the area show a range of water demands, e.g., eggplant-1,100 gallons per acre per day; papaya-370 gallons per acre per day. We recommend that the water demands be investigated and specific strategies be developed for providing water to this project. We also recommend that the Hawaii Department of Agriculture be consulted as they operate the Lower Hamakua Irrigation Ditch system. For rainfall harvesting, we recommend that storage reservoirs are sized to accommodate water needs during extended drought conditions, and/or alternate water sources secured for drought periods. Finally, we recommed best practices for efficient irrigation (drip, micro-sprinklers, etc. when appropriate) and onfarm water conservation.

If there are any questions, please contact Neal Fujii at 587-0264.

NEIL ABERCROMBIE OVERNOR OF HAWAI



WILLIAM J'AILA, JR. NTERM CHARPERSON BOARD OF LAND AND NATURAI, RESOURCES COMMISSION ON WATER RESOURCE MANAGEMENT

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STATE OF HAWAII DEPARTMENT OF LAND AND NATURAL RESOURCES LAND DIVISION

POST OFFICE BOX 621 HONOLULU, HAWAII 96809 Phone: (808) 587-0433 Fax: (808) 587-0455

January 18, 2011

DAR 3621

MEMORANDUM



TO: **DLNR** Agencies: x Div. of Aquatic Resources Div. of Boating & Ocean Recreation x Engineering Division x Div. of Forestry & Wildlife Div. of State Parks x Commission on Water Resource Management Office of Conservation & Coastal Lands x Land Division -Hawaii District x Historic Preservation FROM: Charlene Unoki, Assistant Administrator-SUBJECT: Draft Environmental Assessment for Kapulena Agricultural Parks LOCATION: Island of Hawaii APPLICANT: PBR Hawaii & Associates, Inc.

Transmitted for your review and comment on the above referenced document. We would appreciate your comments on this document. Please submit any comments by February 7, 2011.

If no response is received by this date, we will assume your agency has no comments. If you have any questions about this request, please contact my office at 587-0433. Thank you,

We have no objections. We have no comments. Comments are attached. Signed: Date:



State of Hawa

STATE OF HAWAII DEPARTMENT OF LAND AND NATURAL RESOURCES LAND DIVISION

> POST OFFICE BOX 621 HONOLULU, HAWAII 96809 Phone: (808) 587-0433 Fax: (808) 587-0455

2011 JAN 21 1 P 12: 21 1

WILLIAM J. AILA, JR. INTERM CILIRUTERSON BOARD OF LAND AND NATURAL RESOURCES MMISSION ON WATER RESOURCE MANAGEMENT

RECEIVED LAND DIVISION HILO. HAWAII

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January 18, 2011

MEMORANDUM

TO:

DLNR Agencies:

<u>x</u> Div. of Aquatic Resources

____Div. of Boating & Ocean Recreation

<u>x</u> Engineering Division

<u>x</u> Div. of Forestry & Wildlife

___Div. of State Parks

<u>x</u> Commission on Water Resource Management

Office of Conservation & Coastal Lands

<u>x</u> Land Division – Hawaii District

FROM: Charlene Unoki, Assistant Administrator

SUBJECT: Draft Environmental Assessment for Kapulena Agricultural Parks

LOCATION: Island of Hawaii

APPLICANT: PBR Hawaii & Associates, Inc.

Transmitted for your review and comment on the above referenced document. We would appreciate your comments on this document. Please submit any comments by February 7, 2011.

If no response is received by this date, we will assume your agency has no comments. If you have any questions about this request, please contact my office at 587-0433. Thank you.

We have no objections. We have no comments. Comments are attached. Signed: Date:





WILLIAM J. AILA, JR. DITERM (ILARPERSON BOARD OF LAND AND NA TIRAL RESOURCES COMMISSION ON WATER RESOURCE MANAUEMENT

of Satin



DEPARTMENT OF LAND AND NATURAL RESOURCES LAND DIVISION POST OFFICE BOX 621 HONOLULU, HAWAII 96809 Phone: (808) 587-0433

Fax: (808) 587-0455

STATE OF HAWAII

2011 FEB - 3 P 2: 12

RECEIVEN LAND DIVISION

DEPT. OF LAND & NATURAL RESOURCES STATE OF HAWAII January 18, 2011

MEMORANDUM

TO:

DLNR Agencies:

x Div. of Aquatic Resources Div. of Boating-&-Ocean Recreation x Engineering Division

x Div. of Forestry & Wildlife_

Div. of State-Parks

x Commission on Water Resource Management

Office of Conservation & Coastal Lands

x Land Division -Hawaii District

<u>x</u> Historic Preservation

Charlene Unoki, Assistant Administrator FROM: Draft Environmental Assessment for Kapulena Agricultural Parks SUBJECT:

LOCATION: Island of Hawaii

APPLICANT: PBR Hawaii & Associates, Inc.

Transmitted for your review and comment on the above referenced document. We would appreciate your comments on this document. Please submit any comments by February 7, 2011.

If no response is received by this date, we will assume your agency has no comments. If you have any questions about this request, please contact my office at 587-0433. Thank you.

We have no objections. We have no comments. Comments are attached. Signed: Date:

NEIL ABERCROMBIE GOVERNOR OF HAWAII





WILLIAM J. AILA, JR. INTERIM CHAIRPERSON BOARD OF LAND AND NATURAL RESOURCES COMMISSION ON WATER RESOURCE MANAGEMENT

GUY H. KAULUKUKUI FIRST DEPUTY

WILLIAM M. TAM DEPUTY DIRECTOR - WATER

AQUATIC RESOURCES BOATING AND OCEAN RECREATION BUREAU OF CONVEYANCES COMISSION ON WATER RESOURCE MANAGEMENT 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

POST OFFICE BOX 621 HONOLULU, HAWAII 96809

MEMORANDUM

- TO: Charlene E. Unoki, Assistant Administrator Land Division
- FROM: Paul J. Conry, Administrator Division of Forestry and Wildlife

Vaul glow

RE: Draft Environmental Assessment for Kapulena Agricultural Parks

DATE: January 31, 2011

The Division of Forestry and Wildlife (DOFAW) received your memorandum dated January 18, 2011, relating to the above subject and provides the following comments:

- 1. DOFAW requests that a vehicular access corridor be provided to the Hanapai section of the Hamakua Forest Reserve. There is no current public access to this section of the forest reserve. This access would provide both DOFAW management and public access the forest reserve.
- 2. DOFAW requests the opportunity to remove any hazardous trees along the boundary of the forest reserve and the Kapulena project area prior to improvements being made. This will reduce the number of trees falling on fences, etc.
- 3. If grazing will occur next to the forest reserve we ask that a stock proof fence be installed and maintained to keep grazing animals out of the forest reserve.
- 4. DOFAW would like access to any water sources developed relating to this project for emergency purposes such as wildland fire fighting.

Thank you for the opportunity to comment on this item. Should you have any questions please contact Roger Imoto, our Hawaii Branch Manager at 944-4220.



April 12, 2011

PRINCIPALS

THOMAS S. WITTEN, ASLA President

R. STAN DUNCAN, ASLA Executive Vice-President

RUSSELL Y. J. CHUNG, FASLA, LEED[®] AP *Executive Vice-President*

VINCENT SHIGEKUNI Vice-President

GRANT T. MURAKAMI, AICP, LEED[®] AP *Principal*

W. FRANK BRANDT, FASLA Chairman Emeritus

ASSOCIATES

TOM SCHNELL, AICP Senior Associate

RAYMOND T. HIGA, ASLA Senior Associate

KEVIN K. NISHIKAWA, ASLA Associate

KIMI MIKAMI YUEN, LEED^{*}AP Associate

SCOTT ALIKA ABRIGO, LEED^{*}AP Associate

SCOTT MURAKAMI, ASLA, LEED[®]AP Associate

DACHENG DONG, LEED^{*}AP Associate

HONOLULU OFFICE 1001 Bishop Street, Suite 650 Honolulu, Hawa'i 96813-3484 Tel: (808) 521-5631 Fax: (808) 523-1402 E-mail: sysadmin@pbchawaii.com

KAPOLEI OFFICE

1001 Kamokila Boulevard Kapolei Building, Suite 313 Kapolei, Hawai'i 96707-2005 Tel: (808) 521-5631 Fax: (808) 535-3163 Russell Y. Tsuji DLNR, Land Division PO Box 621 Honolulu, HI 96809

SUBJECT: DRAFT ENVIRONMENTAL ASSESSMENT – KAPULENA AGRICULTURAL PARK - KAPULENA, HĀMĀKUA, HAWAI'I (TMK: (3)4-7-005:001, 002 & 003; (3)4-7-006:001, 005, 006, 007, 010, 018, 020)

Dear Mr. Tsuji,

Thank you for your letter dated February 10, 2011 regarding the above referenced Draft Environmental Assessment. As the planning consultant for the applicant, County of Hawai'i, Department of Finance, we acknowledge comments from the following divisions of the Department of Land and Natural Resources (DLNR):

Engineering Division

We acknowledge your confirmation that the project site is located in Zone X of the Flood Insurance Rate Map and there are no Flood Insurance Program regulations for development in this zone.

Commission on Water Resource Management

We acknowledge your recommendation to incorporate this project into the County's Water Use and Development Plan. We have made both the County Planning and the County Department of Water Supply aware of this project. We acknowledge your recommendation to coordinate with the Hawai'i Department of Agriculture for incorporation in the State's Agricultural Water Use and Development Plan.

With regard to alternate water sources, we recognize that the County Department of Water Supply does not have existing water facilities to serve the project. As such, a variety of water sources may be relied upon for both irrigation and potable water needs. Those water sources currently being considered include a well, reservoir or large-scale water catchment systems. We acknowledge that if a well is pursued, a Well Construction Permit and a Pump Installation Permit are required before ground water is developed as a source of supply for the project and before any well construction work begins.

DRAFT ENVIRONMENTAL ASSESSMENT – KAPULENA AGRICULTURAL PARK - KAPULENA, HĀMĀKUA, HAWAI'I (TMK: (3)4-7-005:001, 002 & 003; (3)4-7-006:001, 005, 006, 007, 010, 018, 020)

We also acknowledge that water demand for the project has not been estimated as the specific crops and acreages within the agricultural park have not been determined. The project planners have and will continue to work with the Hawai'i Department of Agriculture to arrange for use of water from the Lower Hāmākua Ditch. Efficient irrigation methods will be investigated for project development as this project offers the opportunity to demonstrate best known agricultural practices for both economic development and land and water conservation.

Division of Forestry and Wildlife

We acknowledge the Division of Forestry and Wildlife's comments. With regard to a request for a vehicular access to Hanapai section of the Hāmākua Forest Reserve and permission to allow DOFAW to remove any hazardous trees along the shared boundary between the project and the forest reserve, the County would like to coordinate with DOFAW on this issue, particularly in areas where silviculture practices are proposed. With regard to stock proof fencing, the County proposes to use stock proof fencing materials. Access to water sources developed for this project for emergency fire fighting purposes can be arranged.

Division of Aquatic Resources

We acknowledge that the Division of Aquatic Resources has no comments to this project.

Land Division

We acknowledge that the Division of Aquatic Resources has no comments to this project.

The above discussed DLNR comments along with this response will be included in the Final EA so that it is available to those participating in the agricultural park as well as the general public.

Thank you for participating in the Environmental Assessment process.

Sincerely,

PBR HAWAII

Callison

Catie Cullison Planner

cc:

Kenneth VanBergen, County of Hawai'i

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William P. Kenoi Mayor



BJ Leithead Todd Director

Margaret K. Masunaga Deputy

County of Hawai'i PLANNING DEPARTMENT

Aupuni Center • 101 Pauahi Street, Suite 3 • Hilo, Hawai'i 96720 Phone (808) 961-8288 • Fax (808) 961-8742

February 9, 2011

Ms. Catie Fernandez PBR Hawai'i 1001 Bishop Street, Suite 650 Honolulu HI 96813

Dear Ms. Fernandez:

SUBJECT: Draft Environmental Assessment Applicant: County of Hawaii Project: Kapulena Agricultural Park <u>TMK: 4-7-5:1-3 and 4-7-6:1, 5-7, 10, 18 & 20, Hāmākua, Hawai'i</u>

This is to acknowledge receipt of the Draft Environmental Assessment for the aforementioned project.

The subject parcels are all designated Agricultural by the State Land Use Commission and zoned Agricultural (A-40a) by the County.

According to the Hawai'i County Code Section 25-5-72(a)(1), Permitted uses in the Agricultural District includes "Agricultural parks".

Other than the foregoing, we have no further comments to offer. If you have questions, please contact Esther Imamura of this office at 961-8139.

Sincerely,

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BJ LEITHEAD TODD Planning Director

ETI: P:\Public\Wpwin60\ETI\Eadraftpre-Consul\Fernandez PBR Kapulena Ag Park.Rtf

xc: William P. Kenoi, Mayor

Hawai'i County is an Equal Opportunity Provider and Employer


PRINCIPALS

THOMAS S. WITTEN, ASLA President

R. STAN DUNCAN, ASLA Executive Vice-President

RUSSELL Y. J. CHUNG, FASLA, LEED[®]AP Executive Vice-President

VINCENT SHIGEKUNI Vice-President

GRANT T. MURAKAMI, AICP, LEED[®]AP Principal

W, FRANK BRANDT, FASLA Chairman Emeritus

ASSOCIATES

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KEVIN K. NISHIKAWA, ASLA Associate

KIMI MIKAMI YUEN, LEED[®]AP Associate

SCOTT ALIKA ABRIGO, LEED[®]AP Associate

SCOTT MURAKAMI, ASLA, LEED[®]AP Associate

DACHENG DONG, LEED[®]AP Associate

HONOLULU OFFICE 1001 Bishop Street, Suite 650 Honolulu, Hawa'i 90813-3484 Tel: (808) 521-5631 Fax: (808) 523-1402 E-mail: sysadmin@pbrhawaii.com

KAPOLEI OFFICE 1001 Kamokila Boulevard Kapolei Building, Suite 313 Kapolei, Hawali 96707-2005 Tele: (S08) 521-5631 Fax: (808) 535-3163 April 12, 2011

BJ Leithead Todd Planning Director 101 Pauahi Street, Suite 3 Hilo, HI 96720

SUBJECT: DRAFT ENVIRONMENTAL ASSESSMENT – KAPULENA AGRICULTURAL PARK - KAPULENA, HĀMĀKUA, HAWAI'I (TMK: (3)4-7-005:001, 002 & 003; (3)4-7-006:001, 005, 006, 007, 010, 018, 020

Dear Ms. Leithead Todd,

Thank you for your letter dated February 9, 2011 regarding the above referenced Draft Environmental Assessment. As the planning consultant for the applicant, County of Hawai'i, Department of Finance, we acknowledge comments from the Planning Department. With this letter, we confirm that the subject site is zoned A-40a and that agricultural parks are a permitted use.

Thank you for participating in the Environmental Assessment process.

Sincerely,

PBR HAWAII

ullison

Catie Cullison Planner

CC:

Kenneth VanBergen, County of Hawai'i

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DEPARTMENT OF WATER SUPPLY . COUNTY OF HAWAI'I

345 KEKŪANAO'A STREET, SUITE 20 · HILO, HAWAI'1 96720 TELEPHONE (808) 961-8050 • FAX (808) 961-8657

February 8, 2011

PBR Hawaii Attention: Catie Fernandez 1001 Bishop Street, Suite 650 Honolulu, HI 96813

DRAFT ENVIRONMENTAL ASSESSMENT KAPULENA AGRICULTURAL PARK TAX MAP KEY (3) 4-7-005:001, 002 AND 003; 4-7-006:001, 005, 006, 007, 010, 018, AND 020

We have reviewed the subject Draft Environmental Assessment (DEA) and have the following comments.

The nearest existing Department of Water Supply facility to the proposed project is a 6-inch waterline stub-out located within Velez Road, off of Honoka'a-Waipi'o Road, approximately 900 feet from Tax Map Key (3) 4-7-005:001.

The Department can concur, as stated in the subject DEA, that our existing Kukuihaele Water System does not have adequate capacity to support the proposed agricultural park at this time. Extensive improvements and additions would be required, which would include, but not be limited to, source, storage, booster pump, transmission, and distribution facilities. Currently funding is not available and no time schedule is set for such improvements by the Department.

Should there be any questions, please contact Mr. Finn McCall of our Water Resources and Planning Branch at 961-8070, extension 255.

Since àurs Milton D. Pavao, P.E. Manager-Chief Engineer

FM:dfg

12 . . .

copy - Mayor William Kenoi, County of Hawai'i

>Water, Our Most Precious Resource Ka Wai A Kāne The Department of Water Supply is an Equal Opportunity provider and employer.



April 12, 2011

PRINCIPALS THOMAS S. WITTEN, ASLA President

R. STAN DUNCAN, ASLA Executive Vice-President

RUSSELL Y. J. CHUNG, FASLA, LEED[®] AP Executive Vice-President

VINCENT SHIGEKUNI Vice-President

GRANT T. MURAKAMI, AICP, LEED[®] AP *Principal*

W. FRANK BRANDT, FASLA Chairman Emeritus

ASSOCIATES

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SCOTT MURAKAMI, ASLA, LEED[®]AP Associate

DACHENG DONG, LEED[®]AP Associate

HONOLULU OFFICE 1001 Bishop Street, Suite 650 Honolulu, Hawai'i 96813-3484 Tel: (808) 521-5631 Fax: (808) 523-1402 E-mail: sysadmin@pbrhawaii.com

KAPOLEI OFFICE 1001 Kamokila Boulevard Kapolei Building, Suite 313 Kapolei, Hawai'i 96707-2005 Tel: (808) 521-5631 Fax: (808) 535-3163 Milton D. Pavao, P.E. Department of Water Supply 345 Kekūanaō'a Street, Suite 20 Hilo, HI 96720

SUBJECT: DRAFT ENVIRONMENTAL ASSESSMENT – KAPULENA AGRICULTURAL PARK - KAPULENA, HĀMĀKUA, HAWAI'I (TMK: (3)4-7-005:001, 002 & 003; (3)4-7-006:001, 005, 006, 007, 010, 018, 020

Dear Mr. Pavao,

Thank you for your letter dated February 8, 2011 regarding the above referenced Draft Environmental Assessment. As the planning consultant for the applicant, County of Hawai'i, Department of Finance, we acknowledge comments from the Department of Water Supply (DWS). With this letter, we confirm that the nearest existing DWS facility to the proposed project is a 6-inch waterline stub-out located within Velez Road.

We also acknowledge your comments indicating that the existing Kukuihaele Water System does not have adequate capacity to support the agricultural park and that DWS does not anticipate improvements to serve the park.

Your comments relating to the existing limited water facilities will be included in the Final EA so that it is available to those participating in the agricultural park as well as the general public.

Thank you for participating in the Environmental Assessment process.

Sincerely,

PBR HAWAII

lison

Catie Cullison Planner

cc: Kenneth VanBergen, County of Hawai'i

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William P. Kenoi Mayor

William T. Takaba Managing Director



Frank J. DeMarco, P.E. Director

> Ivan M. Torigoe Deputy Director

County of Hawai'i Department of environmental management

25 Aupuni Street • Hilo, Hawai`i 96720 (808) 961-8083 · Fax (808) 961-8086 http://co.hawaii.hi.us/directory/dir envmng.htm

January 19, 2011

PBR Hawaii 1001 Bishop Street, Suite 650 Honolulu, HI 96813

Attention: Catie Fernandez

RE: DEA for Kapulena Agricultural Park TMK: 4-7-005:001, 002 & 003 TMK: 4-7-006:001, 005, 006, 007, 010, 018, 020

Dear Ms. Fernandez,

We have no comments to offer on the subject project.

Thank you for allowing us to review and comment on this project.

Sincerely,

Frank DeMarcos

Frank J. DeMarco, P.E. DIRECTOR

County of Hawai'i is an Equal Opportunity Provider and Employer.



PRINCIPALS

THOMAS S. WITTEN, ASLA President

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TOM SCHNELL, AICP Senior Associate

RAYMOND T. HIGA, ASLA Senior Associate

KEVIN K. NISHIKAWA, ASLA Associate

KIMI MIKAMI YUEN, LEED[®]AP Associate

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HONOLULU OFFICE 1001 Bishop Street, Suite 650 Honolulu, Hawai'i 96813-3484 Tel: (808) 521-5631 Fax: (808) 523-1402 E-mail: sysadmin@pbrhawaii.com

KAPOLEI OFFICE 1001 Kamokila Boulevard Kapolei Building, Suite 313 Kapolei, Hawali 196707-2005 Tel: (808) 521-5631 Fax: (808) 535-3163 April 12, 2011

Frank J. DeMarco, P.E. Director, Department of Environmental Management 25 Aupuni St. Hilo, HI 96270

SUBJECT: DRAFT ENVIRONMENTAL ASSESSMENT – KAPULENA AGRICULTURAL PARK - KAPULENA, HĀMĀKUA, HAWAI'I (TMK: (3)4-7-005:001, 002 & 003; (3)4-7-006:001, 005, 006, 007, 010, 018, 020

Dear Mr. DeMarco,

Thank you for your letter dated January 19, 2011 regarding the above referenced Draft Environmental Assessment. As the planning consultant for the applicant, County of Hawai'i, Department of Finance, we acknowledge that the Department of Environmental Management has no comments to the project.

Thank you for participating in the Environmental Assessment process.

Sincerely,

PBR HAWAII

Cullipo

Catie Cullison Planner

CC:

Kenneth VanBergen, County of Hawai'i

O:\Job25\2506.19 Hawaii County-Hamakua Lands EA\EA\DEA\DEA - Kapulena\DEA Comments\Response to DEM.doc