

EXHIBIT “B”

Agricultural Feasibility Study

EXHIBIT "B"

KUNIA LOA RIDGE FARMLANDS

AGRICULTURAL FEASIBILITY STUDY

Tax Map Key 9-2-004:005 (por.)
Kunia, O'ahu, Hawai'i

Prepared for:
C&C Farmlands

Prepared by:



May 2010

KUNIA LOA RIDGE FARMLANDS

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A. INTRODUCTION

This Agricultural Feasibility Report relates to an agricultural subdivision to be developed on property located off Kunia Road in Kunia, O'ahu, Hawai'i (Figure 1), and identified by TMK (1) 9-2-004:005 (por.) (Figure 2) (hereby referred to as the "Property"). Figure 3 contains an aerial photograph of the Property site.

The purpose of this report is to demonstrate that the subdivision of these lands will provide feasible agricultural use for the Kunia Loa Ridge Farmlands lot purchasers or tenants, as required under Section 22-3, Subdivision and Consolidation of Land, Revised Ordinances of Honolulu and the provisions of Section 205-4.5, Hawaii Revised Statutes.

The Property consists of a total area of approximately 854.23 acres classified within the State Land Use Agricultural District, and zoned AG-1 Restricted Agricultural by the City and County of Honolulu. Under the existing zoning, the lands may be subdivided to create agricultural lots on no less than five acres. The Property is mostly fallow although the previous landowner had a couple of lessees who in turn had sub-lessees who engaged in horse and cattle grazing on portions of the leased lands. Prior to the pasture use, some of these lands were farmed for pineapple and sugar. The Property ranges in elevation from approximately 675 to 1375 feet above mean sea level.

Under the Agricultural Lands of Importance to the State of Hawai'i (ALISH) land system classification, the majority of the Kunia Loa Ridge Farmlands are designated Other Agricultural Land and unclassified land. The eastern portions of the site are classified as Unique Agriculture Land. A small portion of land near the southern boundary is designated Prime Agricultural Land.

The Property includes soils with a Land Study Bureau (LSB) Overall Productivity Rating of mostly "C", "D", and "E", which are soils considered to be of fair to poor productivity.

The Property is bounded by parcels zoned by the County as P-1 Restricted Preservation to the west and by parcels zoned AG-1 Restricted Agricultural on the north, east, and south. Agricultural activities exist on neighboring parcels. Kunia Camp is located to the north, and the Hawaii Nature Conservancy Preserve is located to the west.

C&C Farmlands LLC proposes to subdivide the parcel into 99 agricultural lots, each with a minimum of five acres in size for diversified agricultural uses. The subdivided lots would be subject to covenants and restrictions which ensure that the lots will be put to agricultural use in conformity with applicable Federal, State, and City laws and regulations.

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This report concludes that the Kunia Loa Ridge Farmlands will provide for feasible agricultural uses. Although most of the lands in the project area are rated "C", "D", and "E" soils in the Land Study Bureau rating, the application of active management practices are expected to yield favorable agricultural crop results. In addition, the majority of the lands in the project area are designated Other Agricultural Land in the ALISH, which makes it suitable for cultivation of food, feed, forage, and fiber crops. Based on the soil, rainfall, and available irrigation water, the Property is suitable for the proposed diversified agricultural uses. The Kunia Loa Ridge Farmlands project will enable the Property to revive its productive agricultural use from its mostly fallow state.

B. BACKGROUND

To understand agricultural land use within Kunia, O'ahu, Hawai'i region, an overview of agriculture use and markets is provided.

1. OVERVIEW OF KUNIA'S AGRICULTURAL LAND USE

Because plantation agriculture has declined substantially over the past three decades, an enormous supply of farmland is now available for diversified agriculture and other land uses. Plantation lands have declined from about 305,900 acres in 1968, to about 69,100 acres in 2001—a 33-year decrease of about 239,800 acres (an average decrease of about 7,270 acres per year).

On O'ahu, the amount of land released from sugar cultivation since 1968 has totaled about 37,860 acres. With the decline of the overall pineapple and sugar industries, Kunia's agricultural lands have been turning to a new era of growing diversified agricultural crops.

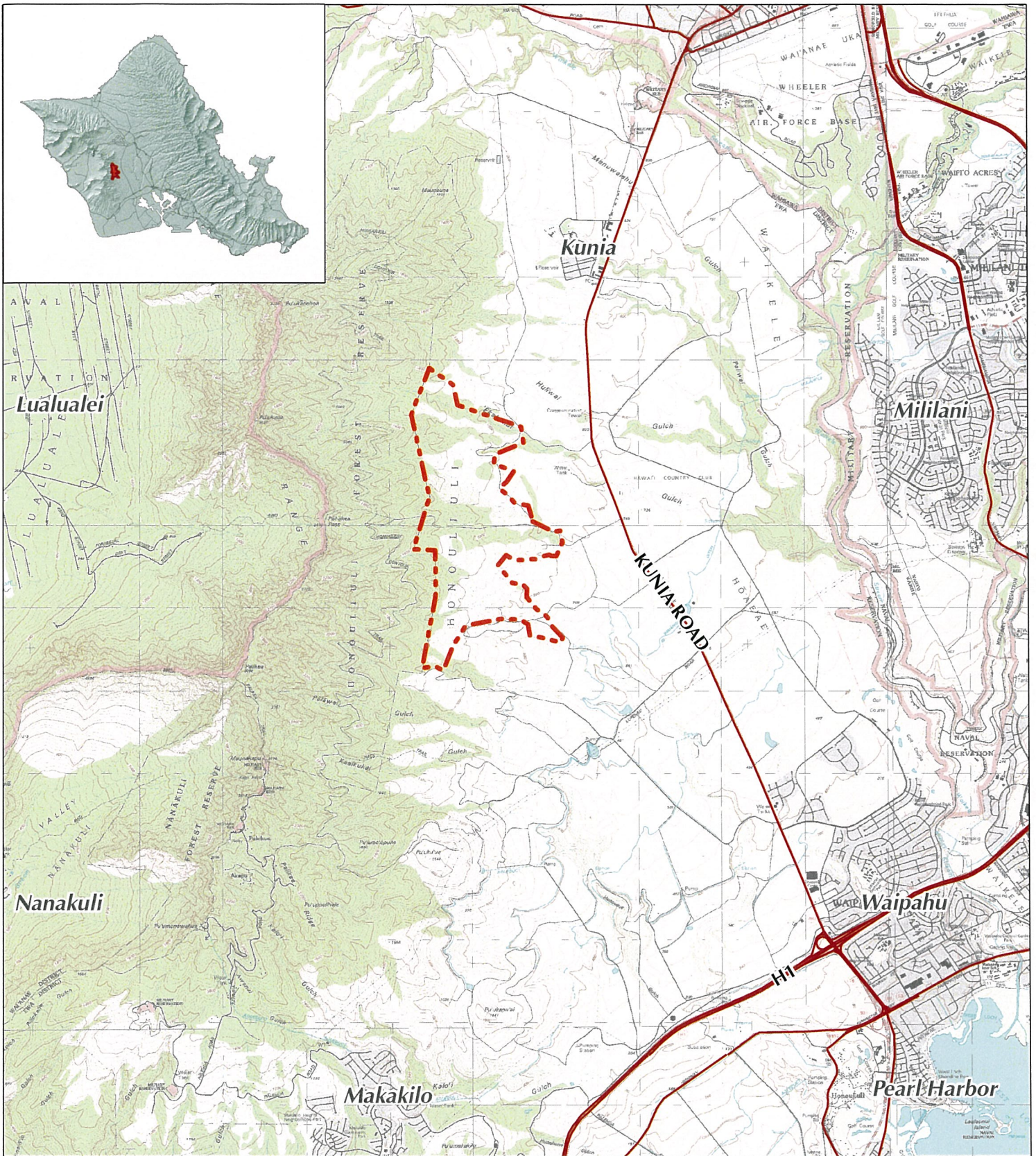
Some of the former pineapple and sugar plantation land has been converted or is scheduled to be converted to seed corn cultivation or other diversified agricultural uses. Some land is fallow, used for grazing, or is in some other low intensity agricultural use. A major issue Statewide is how to productively use the vast amount of agricultural land that is currently available with the closure of former sugar and pineapple plantations.

In Kunia, various crops are being explored, but most of the former pineapple land still remains fallow or was until recently utilized for grazing.

2. FACTORS AFFECTING CROP PRODUCTION IN HAWAI'I

Although a great many crops can be grown in Hawai'i's year-round subtropical climate, only a few crops have proven that they can be grown profitably on a large scale. The primary reasons for this are given below:

- Hawai'i's subtropical climate is not well-suited to the commercial production of major crops that grow better in the temperate mainland climates.



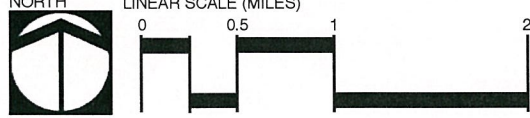

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LEGEND
 Project Site

Figure 1
 Regional Location
Kunia Loa Ridge Farmlands

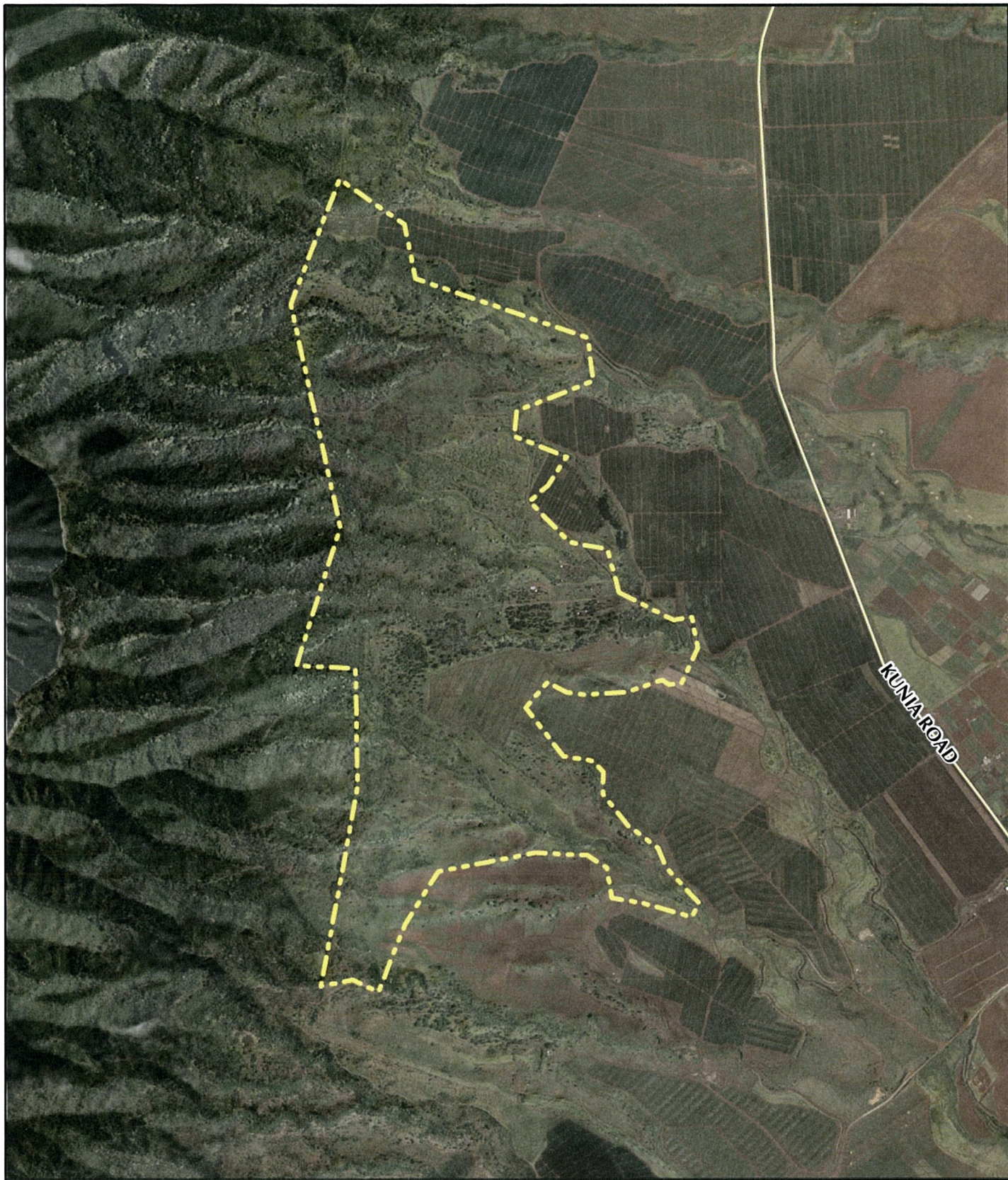
C & C Farmlands, LLC ISLAND OF O'AHU

NORTH LINEAR SCALE (MILES)

PBR HAWAII & ASSOCIATES, INC.

Source: U.S. Geological Survey
 Disclaimer: This graphic has been prepared for general planning purposes only.



LEGEND





 Project Site

Figure 3
 Aerial Photograph
 Kunia Loa Ridge Farmlands

C & C Farmlands, LLC ISLAND OF O'AHU

NORTH LINEAR SCALE (FEET)

0 1,000 2,000 4,000

Source: U.S. Geological Survey (2004)
 Disclaimer: This graphic has been prepared for general planning purposes only.

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- For certain crops, special hybrids adapted to Hawai'i's subtropical climate are yet to be developed.
- Crop pests are more prevalent and more expensive to control in Hawai'i than they are on the mainland where the cold winters kill many pests.
- Fruit-fly infestations prevent exports of many crops, or require expensive treatment.
- Most soils in Hawai'i have low nutrient levels and therefore require high expenditures for fertilizer.
- Hawai'i suffers from high farm-labor costs, largely because the agriculture industry must compete against the visitor industry and related industries for its labor, and the high cost of living.
- High overseas transportation costs increase the cost of importing agricultural supplies and equipment and, for export crops, shipping produce to market.
- For a number of crops, consumption volumes in Hawai'i are too small to support large, efficient farms (i.e., the volumes are too small to realize economies of scale).
- Trends towards crops that are certified as safe and towards a single supplier of many food items favor large farms.
- Hawai'i farmers must compete against highly efficient mainland and foreign farms which, in a number of cases, can deliver produce to Hawai'i more cheaply than it can be produced locally. This is due to economies of scale and, in comparison to Hawai'i, low costs for land, labor, supplies, fertilizer, pest control, equipment, etc.

In view of the above, the assessment of suitable crops for the Kunia lands focuses on: (1) crops that can potentially be grown profitably in Hawai'i, and (2) the size of the market that can be served from Kunia.

2.1 Potential Crops

Most of the crops that could be grown commercially in significant volumes at Kunia are the low-elevation crops that are typically grown in other farm areas throughout the State. These include:

Crops Mostly for Export Market

- Flower and Nursery Products
- Papaya
- Ginger Root
- Seed Crops
- Guava

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Crops Mostly for the Hawai'i Market:

- Asparagus
- Avocado
- Banana
- Beans—Green, Bush, &, Snap
- Bittermelon
- Cabbage, Mustard
- Corn, Sweet
- Cucumbers
- Daikon
- Eggplant
- Ginger Root
- Herbs
- Lettuce, Manoa
- Lettuces, Head & Semi-head
- Limes
- Lotus Root
- Lychee
- Mango
- Melons, Cantaloupe
- Melons, Honeydew
- Melons, Watermelons
- Onions, Dry
- Onions, Green
- Oranges
- Papaya
- Parsley
- Peas, Chinese
- Peppers, Bell
- Peppers, Green
- Pumpkins
- Squash, Oriental
- Sweet Potatoes
- Tangerines
- Tropical Specialty Fruits
- Watercress

Nearly all these crops have been produced at one time or another in Hawai'i over a number of years.

Crops grown at the cooler, higher elevations (e.g., Kula on Maui and Waimea on the Big Island) are excluded from the above list. These include: broccoli, burdock, Chinese cabbage, green (head) cabbage, carrots, cauliflower, celery, dasheen, head lettuce, Romaine lettuce, persimmons, radishes and Italian squash (zucchini).

Crops having no recent history of successful commercial production in Hawai'i and which are imported in large quantities are also excluded: apples, apricots, artichokes, cherries, endive, garlic, table grapes, kiwi, leeks, mushrooms, nectarines, peaches, pears, plums and potatoes.

3. DIVERSIFIED AGRICULTURE

Diversified agriculture includes all agricultural industries other than sugar or pineapple. Due to the closure of large plantations and the decline of the pineapple and sugar industries of Hawaii, diversified agriculture evokes hope for the future of Hawaii's agricultural industry. In 2008¹, Hawaii's agricultural farm revenue was approximately \$609.4 million. Table 1 presents a summary of diversified agriculture

¹ Latest data on the Department of Agriculture statistics is from 2008.

KUNIA LOA RIDGE FARMLANDS

sales and trends statewide and for Oahu. As noted in the table, some crop data for Oahu is not reported separately in order to avoid disclosure of Oahu's operations.

Seed crops are the highest value diversified crop statewide, fetching over \$176.6 million. The increase in seed revenue is a new record as demand for seed for ethanol production continues to remain strong. From 2004 to 2008, Oahu saw significant increases in coffee, fruits (excluding pineapples), and flowers and nursery products.

**Table 1. Diversified Agricultural Sales & Trends
Statewide and Oahu: 2004 and 2008 (in 1,000 dollars)**

ITEM	STATE			OAHU		
	2004	2008	% change	2004	2008	% change
Flowers & Nursery Products	\$95,178	\$98,607	3.6%	\$32,173	\$37,970	18.0%
Vegetables & Melons	\$67,982	\$36,632	-46.1%	\$37,661	\$17,951	-52.3%
Seed Crops	\$62,600	\$176,600	182.1%	nr	nr	
Macadamia Nuts	\$41,245	\$33,500	-18.8%	nr	nr	
Aquaculture	\$28,100	\$34,650	23.3%	nr	nr	
Fruits (excluding pineapples)	\$24,533	\$29,158	18.9%	\$2,791	\$3,937	41.1%
Coffee	\$19,880	\$29,580	48.8%	5,000	7,850	57.0%
Milk	\$20,175	\$5,460	-72.9%	nr	nr	
Cattle	\$22,534	\$24,305	7.9%	\$681	\$358	-47.4%
Eggs	\$10,670	\$8,678	-18.7%	\$8,131	nr	
Hogs	\$4,463	\$3,359	-24.7%	\$2,175	\$1,860	-14.5%
Total	\$397,360	\$480,529		\$88,612	\$69,926	

nr = not reported separately to avoid disclosure.

Source: Statistics of Hawaii Agriculture 2008

C. PROJECT DESCRIPTION

The Property is located off Kunia Road near Kunia International Golf Course in Kunia, Central O'ahu District on the island of O'ahu. The Property is identified as TMK (1) 9-2-004:005 (por.) and consists of a total area of approximately 854.23 acres. Access to the Property is from Kunia Road via an old pineapple plantation road.

The Property is one of several parcels that were formerly owned by the James Campbell Company LLC and leased to Del Monte Foods and to Oahu Sugar Company, and recently sold as large lots.

1. LAND USE CLASSIFICATIONS

The Property is entirely classified within the State Land Use Agricultural District (Figure 4). It is zoned by the City and County of Honolulu as AG-1 Restricted Agricultural (Figure 5), allowing for agricultural lots of five acres or greater in size.

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2. EXISTING USES AND SITE CONDITIONS

The Property is located on the slopes of the Waianae Mountain range in Kunia, O'ahu. The topography of the Property is generally level through a majority of the eastern boundary lots, with elevations approximately 675 feet above mean sea level with slopes of 5 to 10 percent. However, the majority of the western boundary lots have steeper slopes of 15 percent or greater, with elevations ranging from 1,000 to 1,375 feet above mean sea level.

The Property receives prevailing tradewinds that usually blow from the northeast at 10 to 20 miles per hour. The average annual rainfall for the Property is 28 inches per year. This amount is not sufficient for the year-round cultivation; most crops will require supplemental irrigation.

According to the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map, the entire Property falls within Zone D, areas in which flood hazards are undetermined. (see Figure 6).

The Property is mostly fallow although the previous landowner had a couple of lessees who in turn had sub-lessees who engaged in horse and cattle grazing on portions of the leased lands.

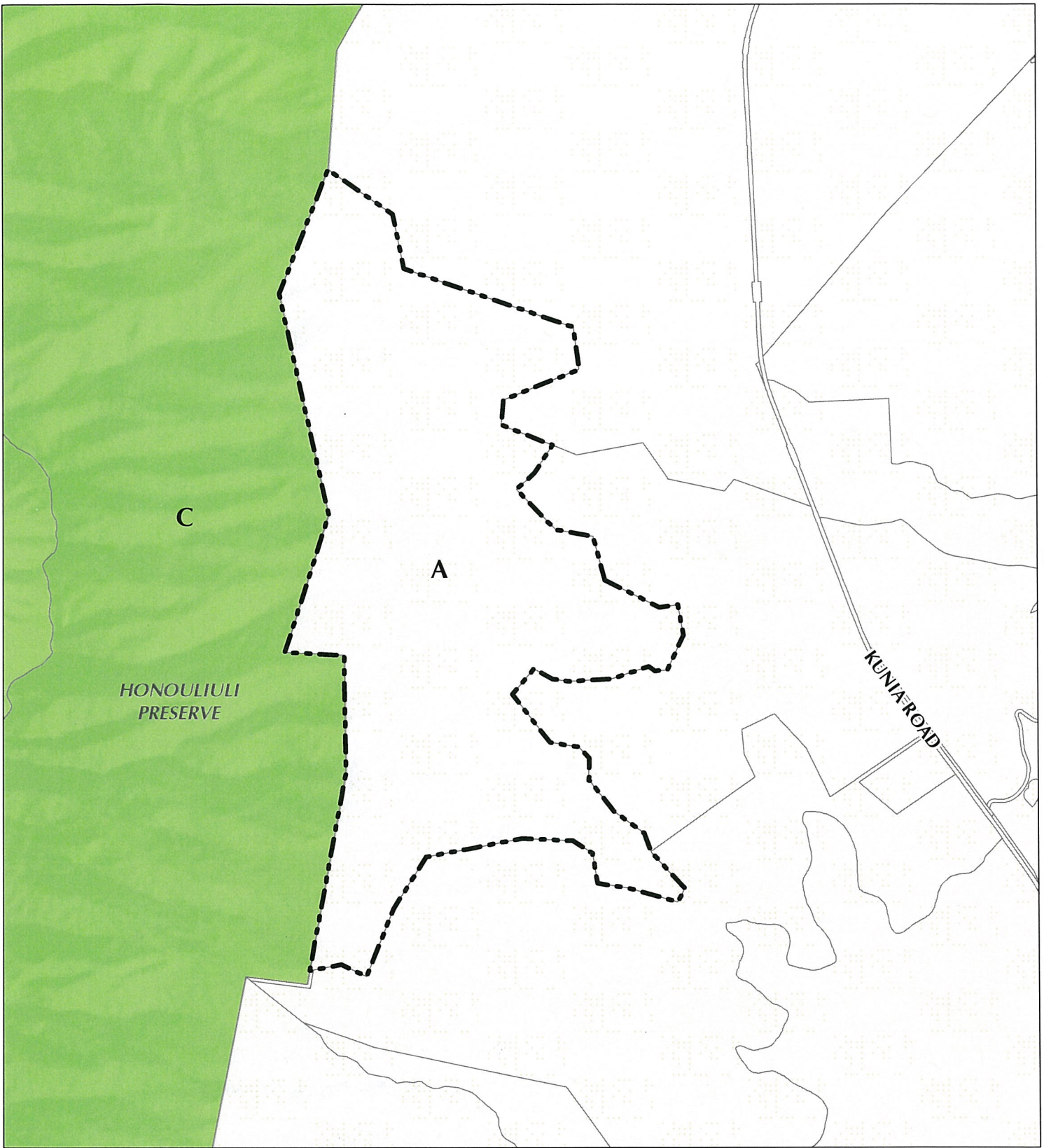
2.1 Soils Analysis

NRCS Soils Survey

According to the U.S. Department of Agriculture *Soil Survey of the Island of Kaua'i, O'ahu, Maui, Moloka'i, and Lana'i, State of Hawai'i* (1972), the Kunia Loa Ridge Farmlands project area contains six distinct soil series (Figure 7). These soil types are summarized in Table 2 and described below:






Table 2. Soils

Soil Type	Slope	Acres
(HLMG) Helemano Silty Clay	30-90% slopes	270.78
(KIB) Kawaihapai Clay Loam	2-6% slopes	26.59
(KlaB) Kawaihapai Stony Clay Loam	2-6% slopes	25.90
(KuB) Kolekole Silty Clay Loam	1-6% slopes	6.13
(KuC) Kolekole Silty Clay Loam	6-12% slopes	51.63
(KuD) Kolekole Silty Clay Loam	12-25% slopes	37.02
(KyA) Kunia Silty Clay	0-3% slopes	6.94
(KyB) Kunia Silty Clay	3-8% slopes	85.89
(KyC) Kunia Silty Clay	8-15% slopes	15.72
(McC2) Mahana Silty Clay Loam	6-12% slopes, eroded	56.60
(McD2) Mahana Silty Clay Loam	12-20% slopes, eroded	119.86
(McE2) Mahana Silty Clay Loam	20-35% slopes, eroded	86.24
(rTP) Tropohumults-Dystrandeps Association	N/A	64.94
	TOTAL	854.23



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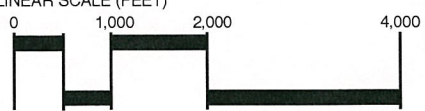

-  A: Agricultural District
-  C: Conservation District
-  R: Rural District
-  U: Urban District
-  Project Site

Source: State Land Study Bureau (2009)
 Disclaimer: This graphic has been prepared for general planning purposes only.

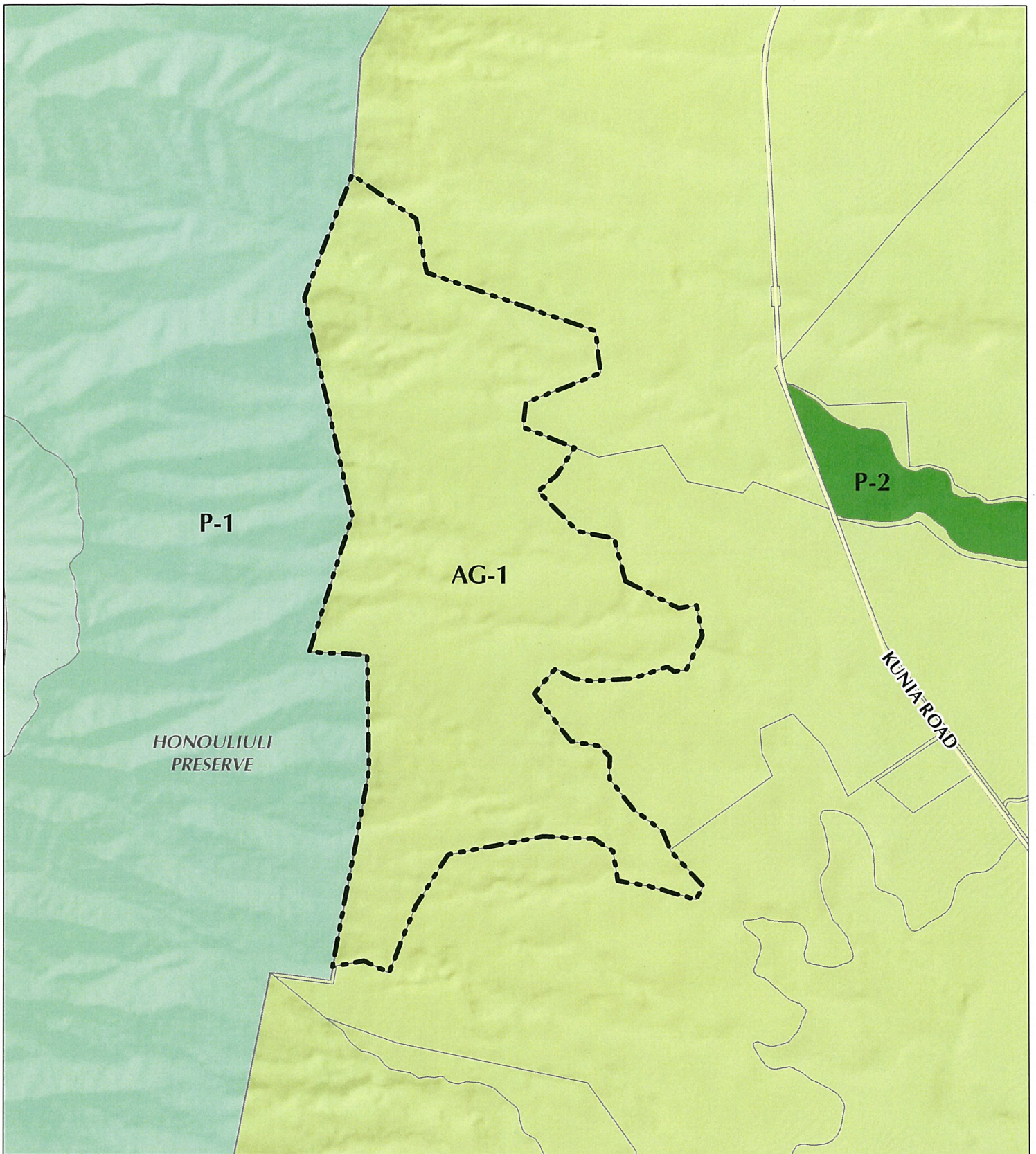
Figure 4
 State Land Use Map
 Kunia Loa Ridge Farmlands

C & C Farmlands, LLC ISLAND OF O'AHU

NORTH LINEAR SCALE (FEET)









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& ASSOCIATES, INC.



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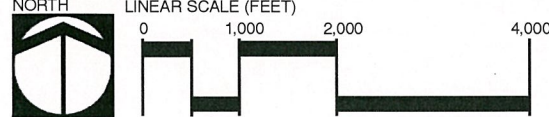
-  AG-1: Restricted Agriculture
-  P-1: Restricted Preservation
-  P-2: General Preservation
-  Project Site


Source: City & County HoLIS (2009)
 Disclaimer: This graphic has been prepared for general planning purposes only.

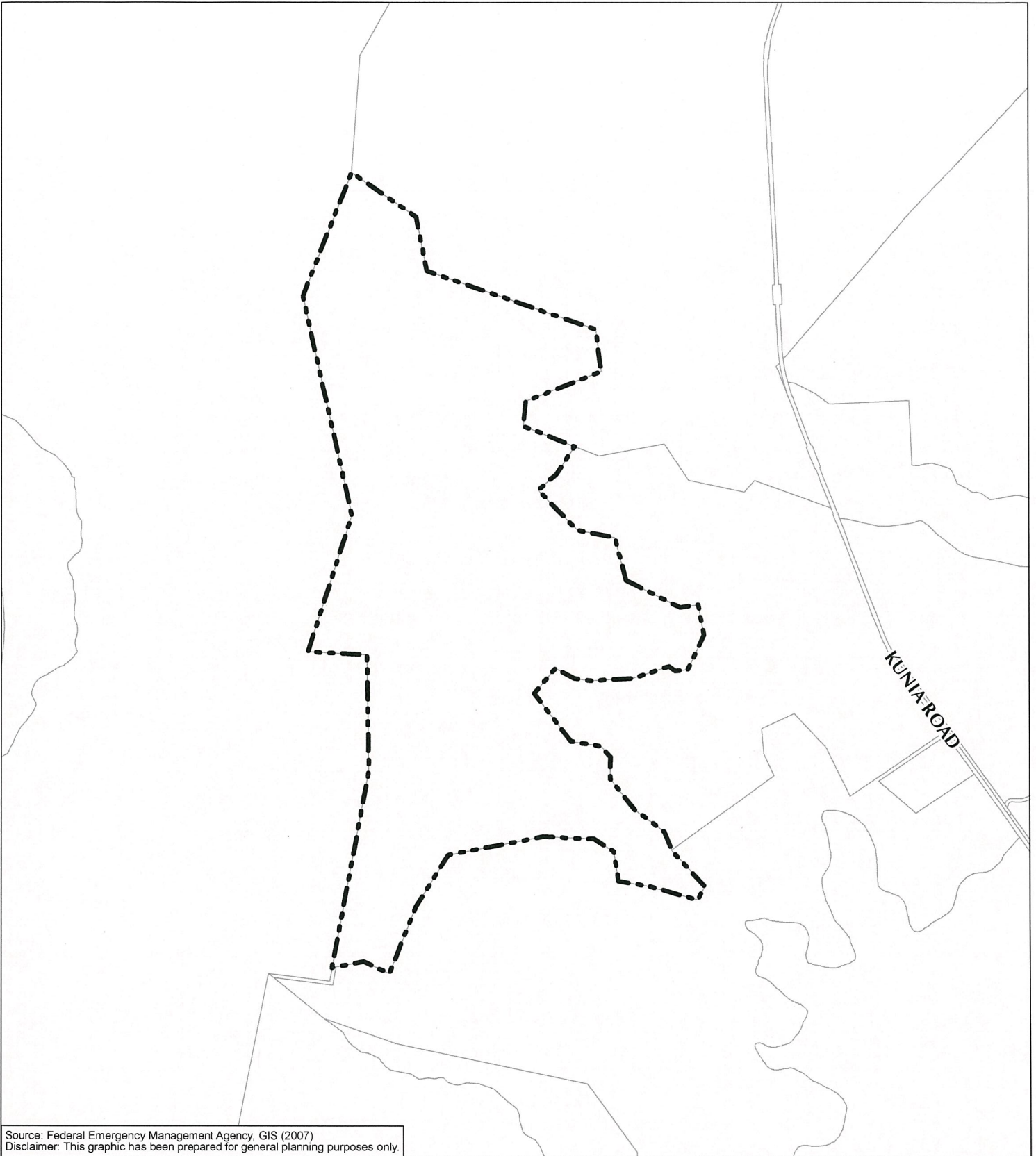
Figure 5
 City & County of Honolulu Zoning Map
 Kunia Loa Ridge Farmlands

C & C Farmlands, LLC ISLAND OF O'AHU

NORTH LINEAR SCALE (FEET)




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Source: Federal Emergency Management Agency, GIS (2007)
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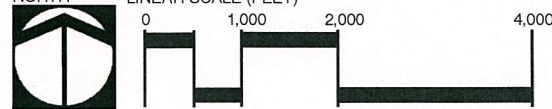

-  Floodway
-  100-Year Floodplain
-  500-Year Floodplain
-  Outside Floodplain / Minimal Flooding Area
-  Undetermined Flood Hazards
-  Project Site

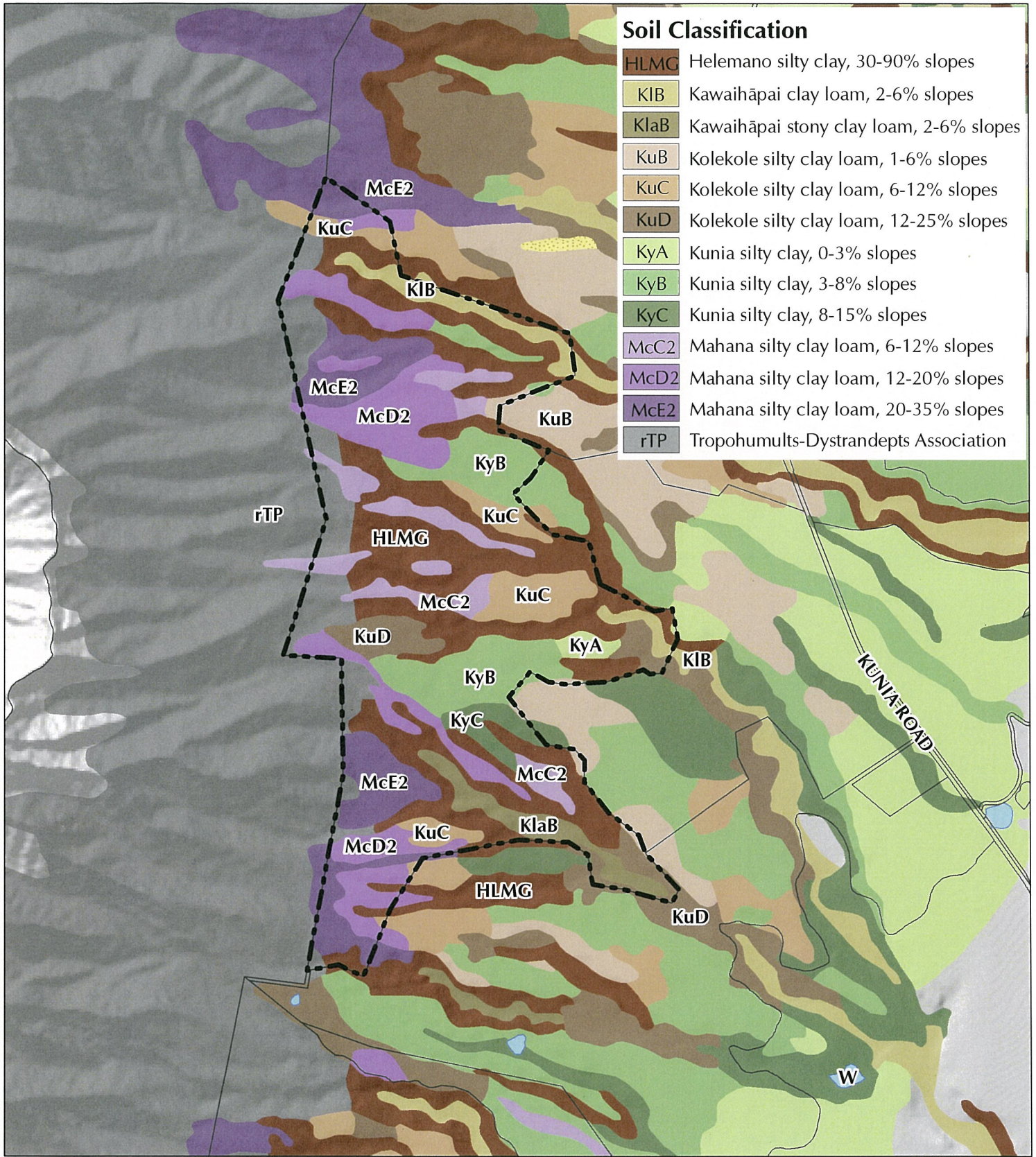
Figure 6
 Flood Insurance Rate Map
 Kunia Loa Ridge Farmlands

C & C Farmlands, LLC ISLAND OF O'AHU

NORTH LINEAR SCALE (FEET)




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Project Site

Figure 7
 NRCS Soil Survey Map
 Kunia Loa Ridge Farmlands

C & C Farmlands, LLC
 NORTH ISLAND OF OAHU

LINEAR SCALE (FEET)
 0 1,000 2,000 4,000

PBR HAWAII & ASSOCIATES, INC.

Source: Natural Resources Conservation Service, GIS (2007)
 Disclaimer: This graphic has been prepared for general planning purposes only.

KUNIA LOA RIDGE FARMLANDS

The Helemano series (HLMG) consists of very deep, well-drained soils with rapid runoff, and moderately rapid permeability. The areas with this soil are used for pastures. Natural vegetation is mainly of guava, Java plum, christmasberry, koa haole, Formosa koa, and bermudagrass.

The Kawaihapai series (KIB, KlA) consists of well-drained soils with slow to medium runoff depending on slope, and moderate permeability. It is used for sugarcane, truck crop cultivation, and pastures.

The Kolekole series (KuB, KuC, KuD) consists of well-drained soils with medium runoff, and moderately rapid permeability. This soil is used mainly for pineapple and irrigated sugarcane.

The Kunia series (KyA, KyB, KyC) consists of deep, well-drained soils with slow to medium runoff, and moderate permeability. This soil is used mainly for pineapple and irrigated sugarcane. Very little of the soil remain in natural vegetation.

The Mahana series (McC2, McD2, McE2) consists of very deep, well-drained soils with slow to very rapid runoff depending on slope, and moderately rapid permeability. Most of these soils are in brushy pasture and a small amount is in sugarcane.

Detailed Land Classification and Land Study Bureau Rating

The University of Hawai'i - Land Study Bureau developed the *Detailed Land Classification, Islands of Kaua'i, O'ahu, Maui, Moloka'i, and Lana'i* (1965 through 1972). The intent of these reports was to develop a land inventory and productivity evaluation based on statewide standards of crop yields and levels of management. A five-class productivity rating is applied using the letters A, B, C, D, and E, with A representing the class of highest productivity and E the lowest.

The soils on the Kunia Loa Ridge Farmlands site range from "A" (Excellent) to "E" (Very Poor) (Figure 8). Approximately 9.71 acres are rated "A" (Excellent), 49.73 acres are rates "B" (Good), 179.18 acres are rated "C" (Fair), 260.89 acres are rated "D" (Poor), and 354.71 acres are rated "E" (Very Poor).

The "A" to "C" soils, with the application of active management practices, is expected to yield favorable agricultural crop results. The Very Poor soils are due to steep slopes and/or cinder deposits. These "E" soils would be suitable for grazing.

ALISH System

The Agricultural Lands of Importance to the State of Hawai'i (ALISH) classification system is based primarily, but not exclusively, on the soil characteristics, the establishment of criteria for classification of lands, and the inventory of prime farm lands that meet the criteria or similar criteria for the respective classes in the national

KUNIA LOA RIDGE FARMLANDS

Natural Resources Conservation Service classification system. The ALISH system identifies and maps three broad classes of agricultural land – Prime, Unique, and Other Important Agricultural Land, as well as Unclassified Land.

According to the State Department of Agriculture, Prime Agricultural Land is land best suited for the production of food, feed, forage and fiber crops. The land has the soil quality, growing season, and moisture supply needed to produce the highest yields with the lowest inputs of energy or money, and with the least damage to the environment. The two other classes are Unique Agricultural Land and Other Important Agricultural Land, which are successively less productive soils.

Unique Agricultural Land is land other than Prime Agricultural Land that is used for the production of specific high-value food crops. The land has special qualities that make it ideal for the production of a specific crop of high quality and/or high yield when the land is treated and managed according to modern farming methods. In Hawai'i, some examples of such crops are coffee, taro, rice, watercress and non-irrigated pineapple.

Other Important Agricultural Land is land other than Prime or Unique Agricultural Land that is 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 they exhibit properties, such as seasonal wetness, erodibility, limited rooting zone, slope, flooding, or droughtiness, that exclude them from the Prime or Unique Agricultural Land classifications. These lands can be farmed satisfactorily by applying greater inputs of fertilizer and other soil amendments, drainage improvements, erosion control practices, and flood protection, and produce fair to good crop yields when managed properly.

Under the ALISH land system classification, the majority of the Kunia Loa Ridge Farmlands lands are designated Other Important Agricultural Land and Unclassified Land. Approximately 8.32 acres is designated Prime Agricultural Land. Eastern portions of the site, approximately 123.70 acres, are classified as Unique Agricultural Land. The steep and or rocky western portions of the site, approximately 351.05 acres, are Unclassified Land. The remaining portions of the site, approximately 371.16 acres, are classified as Other Important Agricultural Land (Figure 9).







2.2 Elevation and Slope Conditions

The site elevation ranges from 675 to 1,375 feet above mean sea level within the Kunia Loa Ridge Farmlands. The eastern agricultural lots are relatively flat with slopes of 5 to 10 percent. The western lots consist of land with slopes of 15 percent or greater.



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-  A: Excellent
-  B: Good
-  C: Fair
-  D: Poor
-  E: Very Poor
-  N: Not Classified

 Project Site

Figure 8

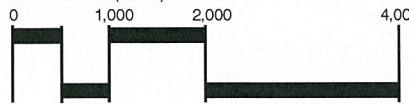
Detailed Land Study Bureau Classification Map
Kunia Loa Ridge Farmlands

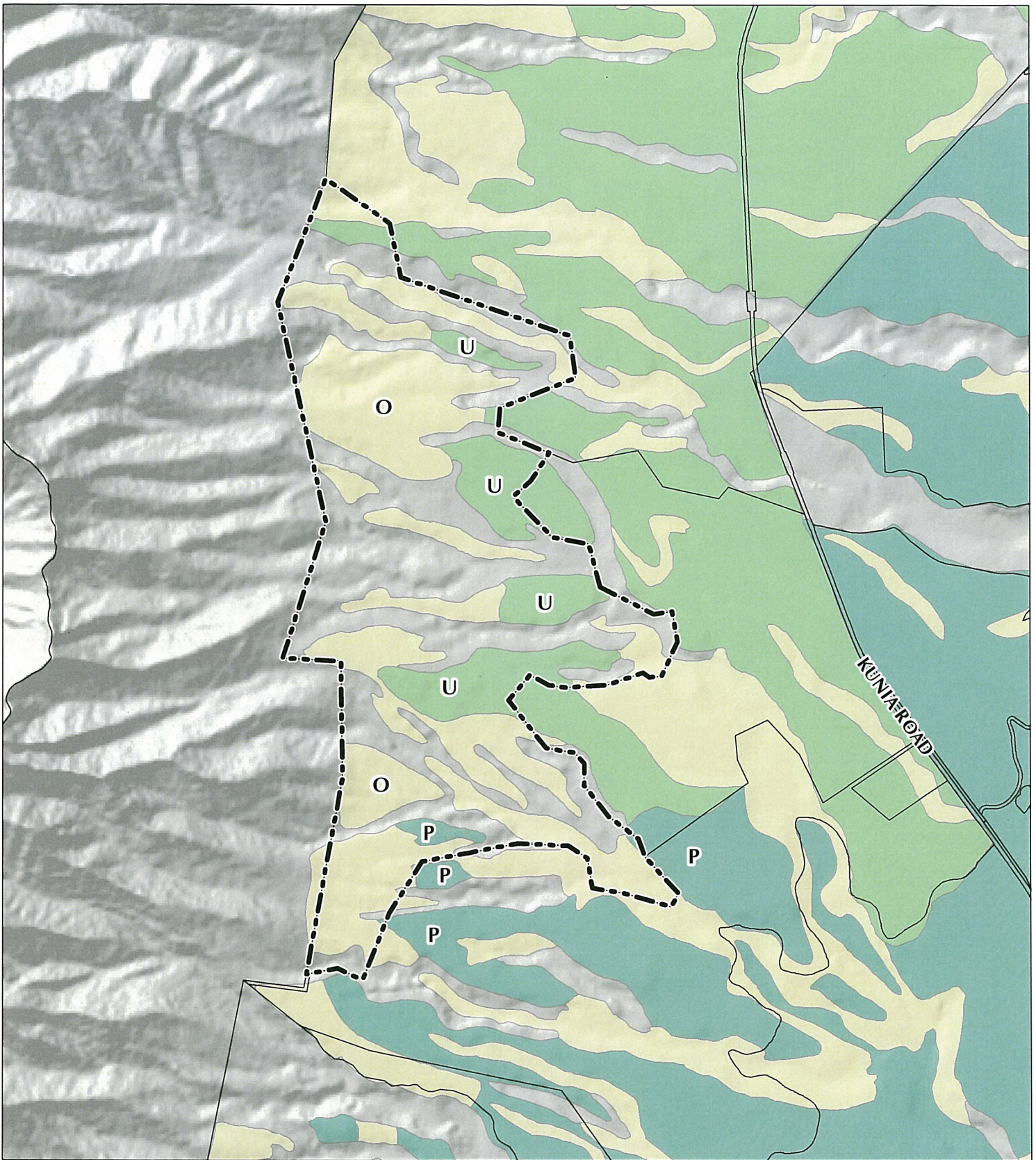
C & C Farmlands, LLC

ISLAND OF O'AHU

NORTH

LINEAR SCALE (FEET)





September 2009

LEGEND

- P: Prime ALISH
- U: Unique ALISH
- O: Other ALISH

Project Site

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

Figure 9

Agricultural Lands of Importance to the State of Hawai'i

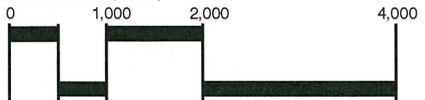
Kunia Loa Ridge Farmlands

C & C Farmlands, LLC

ISLAND OF O'AHU

NORTH

LINEAR SCALE (FEET)



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KUNIA LOA RIDGE FARMLANDS

2.3 Availability of Water

The Property has average rainfall of 28 inches per year, with the highest amount of rainfall often occurring in December and January. Most diversified agricultural activities to be conducted on the Property would require supplemental water for irrigation.

Tom Nance Water Resource Engineering (TNWRE) was retained to study the availability of the water resources. TNWRE reported that there are three (3) options for irrigation water supply to the Property: 1) Waiāhole Ditch; 2) development of an onsite well; and 3) the Kunia Water Association (KWA) system. Current plans for the Kunia Loa Ridge Farmlands include utilizing the KWA system

The KWA system is the former Del Monte Foods pineapple plantation in Kunia water system. It is to be owned and operated by the association of purchasers of the parcels that are to be irrigated by this system. According to TNWRE, major elements of the system consist of the following:

- The KWA system has three (3) well sources of supply. They are known as: Del Monte 1 (State No. 2703-01), Del Monte 3 (State No. 2803-05), and Del Monte 4 (State No. 2803-07).
- The KWA system has one (1) storage reservoir. It has a 2.0 million gallon (MG) volume, which is grossly undersized for the system, and the liner is in need of replacement. \$100,000 has been budgeted for the liner replacement and the work has been put out to bid.
- The KWA system's 12-inch transmission/distribution pipeline would be the conduit for delivery of irrigation supply from the reservoir to a connection point for the Property.
- The KWA system is labor intensive to operate as the well pumps are not automated and the system's 2.0 MG reservoir is undersized.

According to TNWRE, due to the 1,040-foot elevation of the KWA system's storage reservoir and the limited capacity of the 12-inch main, use of the KWA system water on the Property will require the following: a connection to the 12-inch main; a booster pump system at the point of connection; and a new onsite storage of sufficient volume to buffer the difference between irrigation application rates and the delivery rate from the KWA system's 12-inch pipeline. The KWA system supply rate will depend on draws by other users of the system, hopefully coordinated by the system operator. The irrigation application rates on the Property as a draft from the onsite reservoir have yet to be established. In view of these unknowns, TNWRE recommends that providing onsite storage volume equivalent to the maximum day irrigation use would be prudent.

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(Subsequent to TNWRE's study, the C&C Farmlands LLC is studying the feasibility of providing water storage equivalent to eight days of water allocation – or approximately four million gallons).

Supply Allocation to the Property. TNWRE reported that the James Campbell Company, LLC (JCC) allocated the KWA system's available supply to the various "sections" of land the system will serve based on each section's acreage of land with slopes of 15 percent (%) or less. For the Property, the land-slope allocation of supply resulted in a 14.18 percent (%) share of the available water supply. For the combined capacity of the system's three (3) wells, this would amount to 0.71 million gallons per day (MGD) if all other KWA members were also using their full shares. If other members are not using their allocations fully, a likely but not guaranteed prospect, the Property could make use of the unused supply over and above its 0.71 MGD allocation.

TNWRE notes that this allocation for the Property based on land slopes is substantially greater than actual irrigated agricultural use of the Property by previous tenants. That might be viewed as beneficial as it does make a substantial supply available to the Property. However, it also means that the Buyer/ultimate users of the Property will collectively be paying a 14.18 percent (%) share of the KWA's capital and fixed costs. If the supply allocation is more than can be realistically used on the Property, then the Buyer/ultimate users of the Property will collectively be paying more than its fair share of the system's costs. (Subsequent to TNWRE's study, C&C Farmlands LLC reported that the Property's water allocation is 500,000 gallons per day).

Allocation of KWA System Costs and Prospective Cost per 1,000 Gallons. TNWRE met with Alan Gottlieb, head of the entity that JCC has contracted to operate the KWA system, to go over the capital, fixed and variable operating costs that are the basis of billing KWA customers in some detail. In general, TNWRE found the method of cost allocation to be realistic and fair. The equivalent cost per kgal for the Property as a function of the amount of its use is tabulated below. The equivalent cost per kgal could be over \$3.00 for relatively modest use on the order of 0.1 MGD. As the amount of use increases, the cost per kgal would drop. It could drop to as low as \$1.55 per kgal when use is about 0.7 MGD. These costs do not include the booster pumping that will be necessary from the Property's point of connection to the KWA system to a new onsite storage reservoir in the Property. This might add on the order of \$0.30 per kgal if the reservoir is at about 1,200-foot elevation.

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Table 3. Monthly and Equivalent Costs per 1,000 Gallons of KWA System Water at the Point of Connection for the Property

AVERAGE DAILY USE (GALLONS)	MONTHLY CAPITAL COST (\$)	MONTHLY FIXED COST (\$)	MONTHLY VARIABLE COST (\$)	TOTAL MONTHLY COST (\$)	EQUIVALENT \$ / KGAL
0	2,162	4,111	0	6,273	--
100,000	2,162	4,111	3,750	10,023	3.34
200,000	2,162	4,111	7,500	13,773	2.30
300,000	2,162	4,111	11,250	17,523	1.95
400,000	2,162	4,111	15,000	21,273	1.77
500,000	2,162	4,111	18,750	25,023	1.67
600,000	2,162	4,111	22,500	28,773	1.60
700,000	2,162	4,111	26,250	32,523	1.55

Note: Based on 30-day month.

Summary of TNWRE's Findings and Conclusions:

1. The KWA system is labor intensive to operate as the well pumps are not automated and the system's 2.0 MG reservoir is undersized. These aspects and the pumping lift to the 1,040-foot reservoir are the reasons why the cost of the KWA system water is as high as it is.
2. The Declaration which created the KWA and the managing entity's computation of costs are well thought out, realistic, and fair. The very high cost of water, particularly at modest rates of use, is an unavoidable aspect of this system.
3. TNWRE notes that it is not in a position to judge whether the allocation of supply based on each section's acreage with land slopes equal to or less 15 percent (%) is a realistic portrayal of the potential irrigated acreage. However, TNWRE notes that for the Property, its allocated share determined in this manner exceeds its historical use.

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3. PROPOSED AGRICULTURAL SUBDIVISION

3.1 Lot Sizes and Road System

The 854.23-acre property will be subdivided into 99 lots, averaging approximately five acres in size. The Kunia Loa Ridge Farmlands will be served by a former Del Monte pineapple plantation road extending from Kunia Road. The proposed agricultural subdivision is illustrated in Figure 10 and summarized in the Table 4 below:

Table 4. Agricultural Lot Subdivision & Gross Acreages

LOT Number	AREA (acres)	LOT Number	AREA (acres)	LOT Number	AREA (acres)
1	11.767	35	6.161	69	5.558
2	5.401	36	12.423	70	5.834
3	5.310	37	5.254	71	11.245
4	5.070	38	12.129	72	21.076
5	5.422	39	10.447	73	20.675
6	12.307	40	5.226	74	15.601
7	5.037	41	5.257	75	5.075
8	15.510	42	10.499	76	5.071
9	16.142	43	10.613	77	5.038
10	21.333	44	10.410	78	10.572
11	5.530	45	5.209	79	10.072
12	11.247	46	10.620	80	10.138
13	10.823	47	16.478	81	10.116
14	5.224	48	1.647	82	10.172
15	5.216	49	5.716	83	10.461
16	10.362	50	6.807	84	10.243
17	5.293	51	10.740	85	5.160
18	5.625	52	5.284	86	10.617
19	6.064	53	5.181	87	5.619
20	16.353	54	5.150	88	10.471
21	5.181	55	5.213	89	5.204
22	5.764	56	10.544	90	5.205
23	5.433	57	10.699	91	10.460
24	5.617	58	5.241	92	5.111
25	5.177	59	10.230	93	10.399
26	5.077	60	10.232	94	16.664
27	5.102	61	5.072	95	15.189
28	5.111	62	5.237	96	10.214
29	5.111	63	35.641	97	5.036
30	5.232	64	10.100	98	5.296
31	5.189	65	5.117	99	15.258
32	5.240	66	7.000	Totals	854.23
33	5.109	67	5.154		
34	5.115	68	6.154		

Source: C&C Farmlands, LLC
Prepared by: L. Ordenez

Restrictions precluding further division of the subdivided lots by means of subdivision action, condominium property regime, or agricultural cluster will be recorded as

HONOLULU FOREST RESERVE



- DISCUSSION:
1. Proposed Lots M-1 through M-13 (Proposed Agricultural).
 2. Easement A-1 (for Access Easement) from Kuna Road to Lot M-8-B is 50 feet wide, and established in Easement A-2 to 50 feet wide (proposed) on a portion of Easement A-1 as shown on Easement Court Application 1088 (Map 23).
 3. Proposed Access Easements, E-1 to E-8 and E-9 to E-13, one or more for the Access Easements.
 4. Easements were derived from photographs in conjunction with the proposed subdivision plan, and are shown on the map. But No. 1-13 with an extension of 52,793 (662), and is for the purpose of the development of this site plan only.
 5. This subdivision does not show areas zoned out of residential use, nor does it show areas zoned out of residential use that are zoned for residential, cultural, religious, or other purposes, or the Hawaii Revised Statutes.
 6. Archaeological sites as shown were located by Cultural Surveys Hawaii, Inc. and are shown on the map.
 7. Further, this subdivision does not show nature and scenic resources, and is not subject to the provisions of the Hawaii Revised Statutes, Chapter 205, which relate to scenic resources.
 8. Lot 21 has a reserved easement for possible well site.
 9. Further, this subdivision does not show nature and scenic resources, and is not subject to the provisions of the Hawaii Revised Statutes, Chapter 205, which relate to scenic resources.

SUMMARY:

Approximate Lot	98	853,551 Acres
Approximate Site (Lot 48)	1	54,579 Acres
TOTAL NUMBER OF LOTS	99	854,230 Acres
TOTAL LOT M-B AREA		854,230 Acres

Figure 10
 Subdivision Plan
Kunia Loa Ridge Farmlands
 SUBDIVISION PLAN
 0 400 800 1,600
 LINEAR SCALE (FEET)
 ISLAND OF OAHU
 HONOLULU, HAWAII

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covenants running with the land. Notation of these restrictions on the Transfer Certificate of Title of this Land Court parcel would effectively preclude further division of the subdivided lots.

3.2 Restriction to Agricultural Use

The Kunia Loa Ridge Farmlands will result in 99 parcels, 98 of which will be sold to prospective buyers who will hold fee ownership interest in the resultant parcels. Each subdivided lot will be subject to agricultural use easements and/or covenants and restrictions to ensure that the use of lots will be restricted to agricultural activities. Pursuant to the provisions of Section 205-4.5, Hawaii Revised Statutes, and the requirements of the Subdivision Rules and Regulations, the restrictive covenants for agricultural use of the subdivided lots will be prepared prior to final subdivision approval. In addition, a disclosure document will be incorporated into all marketing, sale and conveyance documents.

D. AGRICULTURAL PLAN

The collective property of the Kunia Loa Ridge Farmlands is 854.23 acres and consists of 99 lots, averaging approximately five acres in size. Continued and/or planned agricultural activities for the subdivided lots could include vegetable crops, ornamental nurseries, fruit orchards, horse pasture and cattle grazing.

1. NRCS CONSERVATION PLAN

The first step in the agricultural development of the Property would be to create a Natural Resource and Conservation Services (NRCS) Conservation Plan for the Property. The plan will include measures to: 1) minimize soil erosion; 2) address natural water drainage; and 3) incorporate natural vegetation, as recommended by NRCS. The plan can also address windbreak design and provide windbreak tree species recommendations. Some of the practices done under NRCS auspices with an approved plan, such as the windbreak installation, may qualify for cost sharing by the United State Department of Agriculture Farm Service Agency (USDA-FSA).

The project site has been visited by a NRCS representative. The NRCS Conservation Plan would be done in conjunction with the agricultural plan. Kunia Loa Ridge Farmlands became a cooperator with the West O'ahu Soil and Water Conservation District in April of 2010. As a cooperator, Kunia Loa Ridge Farmlands will be working closely with the NRCS and the Soil and Water Conservation District to develop a conservation plan that pertains to the design and development of an internal water delivery system and farm road improvements. All individual farmers will also be encouraged to become cooperators and utilize the services of a NRCS conservation planner to help create conservation practices to best protect their individual properties

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and any impact on surrounding properties. The completed plan is then submitted to the Soil and Water Conservation District for approval.

2. AGRICULTURAL WATER REQUIREMENTS

Annual rainfall averages 28 inches, which is insufficient for irrigation on a year round basis. As such, agricultural activities conducted on the Property require supplemental water for irrigation. Water is currently supplied by the Kunia Water Association (KWA) system with current allocation of 500,000 gallons per day. This system will provide irrigation water to the proposed Kunia Loa Ridge Farmlands.

3. SOILS ANALYSIS, TOPOGRAPHY, AND GRADING AS IT RELATES TO THE AGRICULTURAL PLAN

The soil types within the agricultural area include the following: Helemano silty clay, Kawaihapai clay, Kolekole silty clay, Kunia silty clay, Mahana silty clay, and a Tropohumults-Dystrandeps association.

The Helemano series is appropriate for pastures. The Kawaihapai series is appropriate for sugarcane, truck crop cultivation, and pastures. The Kolekole and Kunia series are appropriate for pineapple and irrigated sugarcane. The Mahana series is appropriate for pastures and sugarcane.

Grading will be minimized wherever possible and the removal of non-native species for the implementation of the plan will be mitigated by best construction practices.

4. TYPES OF AGRICULTURAL USE

Subdivision of the Property is intended to continue the productive agriculture on the land. The various sizes of the subdivided lots would be attractive to purchasers interested in cultivating the agriculturally viable soils on the Property. In this regard, the manageable size of the subdivided lots and the availability of water for irrigation would encourage smaller scale diversified agricultural operations.

Historically, the Kunia region was cultivated in pineapple and sugar cane. With the closure of the Del Monte Foods pineapple plantation on Oahu and Oahu Sugar Company, and the decline of both the pineapple and sugar industry Statewide, these agricultural lands are turning to a new era of crops, including seed corn, coffee and other diversified agricultural products. Major agricultural activities in the Kunia area now or will soon include: bananas, flowers and nursery products, herbs, melons, seed crops, and vegetables. Descriptions of viable agricultural uses for the Kunia Loa Ridge Farmlands are provided below:

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4.1 Horse Pasture

Horses can be pastured at a ratio of one horse per 2.5 acres. On Oahu, commercial operators charge from \$130 to \$200 per month to stable a horse. The subdivided lots would also enable the breeding of horses. Depending on the quality of the animal, a horse can fetch prices ranging from \$10,000 to \$50,000.

There are other costs associated with raising horses. Perimeter fencing with hog wire costs about \$2.50 per lineal foot or about \$4,700 for 5 acres. Periodic wire and post replacement is usually necessary. Two or more adjacent lot owners may find it to their advantage to combine what would otherwise be separate horse boarding and rearing facilities. Cost savings for fencing includes the construction and use of joint fencing and joint stables.

4.2 Cattle Grazing

Cattle is the fifth top commodity (after seed crops, sugarcane, macadamia nuts, and coffee) for the State of Hawai'i, fetching \$24 million in 2008. However, on the island of O'ahu, cattle raising has been declining in the last few years. In 2007, 60 farms raised cattle with sales value of \$942,000. In 2008, 50 farms raised cattle, with sales value of \$358,000.

The average dress weight farm price for steers and heifers is estimated at 106.0 cents per pound in 2008, down 3.0 cents from 2007.

The average dress weight farm price for cows is estimated at 53.2 cents per pound in 2008, unchanged from a year ago (source: Statistics of Hawaii Agriculture 2008).

4.3 Seed Crops

The seed crop industry is the largest diversified agricultural industry in the State of Hawai'i valued at \$176.6 million for the 2008-2009 season. This represents a 26 percent increase from \$140.7 million in the previous season. Seed corn accounted for \$169.3 million, or 96 percent, of the total value of sales in 2008-2009. A variety of other seed crops account for the remaining 4 percent.

The seed crop industry in Hawaii currently consists of 10 farms that cultivate seed corn, soy bean, wheat, sunflower, and other seed crops.

The Hawai'i seed crop industry has received no governmental support in the form of subsidies, targeted tax credits, tax breaks, etc. to locate and operate in Hawai'i. The contribution to the Hawai'i seed crop industry is solely due to Hawai'i's natural resource competitive advantage and ability to generate three to four crop cycles per year for research.

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The table below describes the production and value of seed crop for the State of Hawai'i:

SEED CROPS: Number of farms, acreage, outshipments, and value, State of Hawaii, 2004-2005 to 2008-2009

Crop Year ²	Farms	Total Acres	Total outshipments (1000 lbs.)	Value of sales (\$1000)
2004-2005	10	3,680	6,900	62,600
2005-2006	10	4,140	7,550	77,330
2006-2007	10	4,260	10,470	103,040
2007-2008	10	5,300	8,380	140,710
2008-2009	10	5,930	10,060	176,600

Source: Statistics of Hawaii Agriculture 2008

4.4 Flowers and Nursery Products

Flowers and nursery products are among the top-ranked diversified agricultural commodities, valued at \$98.6 million in 2008; Honolulu farmers registered sales of \$38 million. Nurseries for field stock trees and ornamental plants are viable agricultural activities for the subdivided lots.

Trees and other plant material would be selected for propagation based on their market value and include native and other non-invasive tropical trees for landscape applications and woodworking. High-value hardwoods can be considered for areas that show little promise for crop farming (either because of inferior agronomic conditions or insufficient demand), and areas for which trees could provide a needed visual screen or buffer for the diversified crop farming areas.

Ornamentals can be cultivated in greenhouses, which allow growers to control environmental conditions. Plants appropriate for cultural adornment, floral arrangements, and retail sale represent markets for agricultural products.

Trees and plants may include:

Native Trees/Bushes

- 'A'ali'i (*Dodonea viscosa*)
- Alahe'e (*Canthium Odorata*)
- Hāpu'u (*Cibotium splendens*)
- Loulu (*Pritchardia mardii*)
- Kawau (*Ilex anomala*)
- Noni (*Morinda citrifolia*)
- 'Ohe'ohe (*Tetraplasandra spp.*)
- 'Ohe (Hawaiian bamboo)

² Seed crops are grown year-round with the main season from November to June.

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Native Plants

- 'Ekaha/Bird's Nest Fern (*Asplenium nidus*)
- Māmaki (*Pipturis albidis*)
- Maile (*Alyxia oliviformis*)

Cut Flowers

- Anthuriums
- Bird of Paradise (*Strelitzia reginae*)
- Calathea
- Cycads
- Ferns
- Ginger (Different varieties, avoid invasive species such as white ginger (*Hedychium coronarium*), yellow ginger (*Hedychium flavescens*), and kahili ginger (*Hedychium gardnerianum*))
- 'Ōlena (*Curcuma domestica*, turmeric)
- Pepeiao (*Auricularia olytricha*, "wood ears")
- Ti (*Cordyline fruticosa*)

In 2008, Honolulu had 270 farms encompassing 699 total acres. Below is a summary of the value of Honolulu's floriculture and nursery products:

FLORICULTURE AND NURSERY PRODUCTS: Value of grower sales, for Honolulu County, 2004-2008 (in 1,000 dollars)

Year	Cut Flowers	Orchids	Lei Flowers	Foliage	Potted Flowering Plants	All other Nursery Products	Other unspecified category	Total
2004	733	6,813	1,544	2,024	3,488	17,221	340	32,173
2005	806	6,490	1,482	2,143	3,409	17,669	400	32,399
2006	955	6,197	1,342	2,292	3,569	18,718	365	33,438
2007	952	5,922	2,507	3,201	4,413	23,200	430	40,625
2008	854	5,191	1,790	3,243	4,245	22,212	435	37,970

Source: Statistics of Hawaii Agriculture 2008

4.5 Vegetables and Melons

The subdivided lots could also be used for the cultivation of vegetables and melons.

The farm value for 19 of Hawaii's selected vegetables and melons was estimated to be at \$23.9 million in 2008, up 5 percent from the 2007 level for the same 19 crops. Cumulative production for these 19 selected vegetables and melons was 41.5 million pounds, down 4 percent from 2007.

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The Kunia region already includes vegetable farms; therefore, cultivation of vegetables is a viable option for the subdivided lots.

Vegetable and melon crops may include (yield and production information for selected crops follow the list):

- Corn (Sweet)
- Cucumbers
- Green Onions
- Head Cabbage
- Potatoes (Sweet)
- Tomatoes
- Watermelons

SWEET CORN

In 2008, Hawaii's sweet corn output was 2.2 million pounds, down 9 percent from the previous year. Total acreage in 2008 was 400 acres. Sweet corn sales were valued at \$1.2 million in 2008. The table below describes the yield and production of sweet corn for the State of Hawai'i:

SWEET CORN: Number of farms, acreage, yield, production, price, and value, State of Hawaii, 2004-2008

Year	Harvested (Acres)	Yield per acre (1000 lbs.)	Production (1000 lbs.)	Farm Price (Cents per lb.)	Value of Sales (\$1000)
2004	540	3.3	1,800	58.0	1,044
2005	410	4.1	1,700	55.0	935
2006	350	5.1	1,800	66.0	1,188
2007	450	5.3	2,400	62.0	1,488
2008	400	5.5	2,200	56.0	1,232

Source: Statistics of Hawaii Agriculture 2008

Applying the per acre annual yield of sweet corn, a 5-acre parcel would yield approximately 27,500 pounds of sweet corn. A 5-acre farm of sweet corn could potentially earn \$15,400 annually (27,500 x .56).

CUCUMBERS

In 2008, Hawaii's cucumber output was 4.8 million pounds, down 4 percent from the previous year. Total acreage in 2008 was 310 acres. Cucumber sales were valued at \$2.7 million in 2008.

Honolulu's cucumber output was 1.76 million pounds and was valued at \$1.07 million in 2008. The table below describes the yield and production of cucumbers for Honolulu:

KUNIA LOA RIDGE FARMLANDS

CUCUMBERS: Acreage, yield, production, price, and value, Honolulu, 2004-2008

Year	Harvested (Acres)	Yield per acre (1000 lbs.)	Production (1000 lbs.)	Farm Price (Cents per lb.)	Value of Sales (\$1000)
2004	195	11.5	2,250	55.0	1,238
2005	230	13.0	3,000	45.1	1,353
2006	130	12.2	1,580	49.0	774
2007	110	16.4	1,800	49.0	882
2008	95	18.5	1,760	61.0	1,074

Source: Statistics of Hawaii Agriculture 2008

Applying the per acre annual yield of cucumbers, a 5-acre parcel would yield approximately 92,500 pounds of cucumbers. A 5-acre farm of cucumbers could potentially earn \$56,425 annually (92,500 x .61).

GREEN ONIONS

In 2008, Hawaii's green onion output was 1.6 million pounds and total harvested acreage was 125 acres. Green onion sales were valued at \$1.98 million in 2008.

Honolulu's green onion output was 1.3 million pounds and was valued at \$1.5 million in 2008. The table below describes the yield and production of green onions for Honolulu:

GREEN ONIONS: Acreage, yield, production, price, and value, Honolulu, 2004-2008

Year	Harvested (Acres)	Yield per acre (1000 lbs.)	Production (1000 lbs.)	Farm Price (Cents per lb.)	Value of Sales (\$1000)
2004	115	12.2	1,400	96.0	1,344
2005	140	10.7	1,500	97.0	1,455
2006	115	10.7	1,230	97.0	1,193
2007	120	10.0	1,200	110.0	1,320
2008	105	12.4	1,300	119.0	1,547

Source: Statistics of Hawaii Agriculture 2008

Applying the per acre annual yield of green onions, a 5-acre parcel would yield approximately 62,000 pounds of cucumbers. A 5-acre farm of cucumbers could potentially earn \$73,780 annually (62,000 x 1.19).

HEAD CABBAGE

In 2008, Hawaii's head cabbage output was 9.4 million pounds, down 9.6 percent from the previous year. Total acreage in 2008 was 410 acres. Head cabbage sales were valued at \$2.8 million in 2008. The table below describes the yield and production of head cabbage for the State of Hawaii:

KUNIA LOA RIDGE FARMLANDS

HEAD CABBAGE: Acreage, yield, production, price, and value, State of Hawaii, 2004-2008

Year	Harvested (Acres)	Yield per acre (1000 lbs.)	Production (1000 lbs.)	Farm Price (Cents per lb.)	Value of Sales (\$1000)
2004	360	25.0	9,000	30.0	2,700
2005	430	22.8	9,800	28.0	2,744
2006	450	22.4	10,100	27.0	2,727
2007	440	23.6	10,400	29.0	3,016
2008	410	22.9	9,400	30.0	2,820

Source: Statistics of Hawaii Agriculture 2008

Applying the per acre annual yield of head cabbage, a 5-acre parcel would yield approximately 114,500 pounds of head cabbage. A 5-acre farm of head cabbage could potentially earn \$34,350 annually (114,500 x .30).

SWEET POTATOES

In 2008, Hawaii's sweet potato output was 8.1 million pounds, up 14 percent from the previous year. Total acreage in 2008 was 470 acres. Sweet potato sales were valued at \$4.8 million in 2008. The table below describes the yield and production of sweet potatoes for the State of Hawai'i:

Sweet Potatoes: Acreage, yield, production, price, and value, State of Hawaii, 2004-2008

Year	Harvested (Acres)	Yield per acre (1000 lbs.)	Production (1000 lbs.)	Farm Price (Cents per lb.)	Value of Sales (\$1000)
2004	400	11.5	4,600	47.0	2,162
2005	410	15.4	6,300	61.0	3,843
2006	360	16.7	6,000	74.0	4,440
2007	420	16.9	7,100	51.0	3,621
2008	470	17.2	8,100	59.0	4,779

Source: Statistics of Hawaii Agriculture 2008

Applying the per acre annual yield of sweet potatoes, a 5-acre parcel would yield approximately 86,000 pounds of sweet potatoes. A 5-acre farm of sweet potatoes could potentially earn \$50,740 annually (86,000 x .59).

TOMATOES

In 2007, Hawaii's tomato output was 14.3 million pounds and total harvested acreage was 740 acres. Tomato sales were valued at \$9.87 million in 2007. Farm price decreased to 69 cents per pound from the previous year. The table below describes the yield and production of tomatoes for the State of Hawai'i:

KUNIA LOA RIDGE FARMLANDS

TOMATOES: Number of farms, acreage, yield, production, price, and value, State of Hawaii, 2004-2008

Year	Harvested (Acres)	Yield per acre (1000 lbs.)	Production (1000 lbs.)	Farm Price (Cents per lb.)	Value of Sales (\$1000)
2004	600	28.0	16,800	66.0	11,088
2005	660	21.5	14,200	69.0	9,798
2006	700	21.0	14,700	77.0	11,319
2007	740	19.3	14,300	69.0	9,867
2008	nr	nr	nr	nr	nr

nr = not reported separately to avoid disclosure

Source: Statistics of Hawaii Agriculture 2008

Applying the per acre annual yield of tomatoes, a 5-acre parcel would yield approximately 96,500 pounds of tomatoes. A 5-acre farm of tomatoes could potentially earn \$66,585 annually (96,500 x .69).

WATERMELONS

In 2007, Hawaii's watermelon output was 13.1 million pounds and total harvested acreage was 540 acres. Watermelons fetched 30 cents per pound and sales for the state were valued at \$3.9 million in 2007. The table below describes the yield and production of watermelons for the State of Hawaii:

WATERMELON: Number of farms, acreage, yield, production, price, and value, State of Hawaii, 2004-2008

Year	Harvested (Acres)	Yield per acre (1000 lbs.)	Production (1000 lbs.)	Farm Price (Cents per lb.)	Value of Sales (\$1000)
2004	510	19.8	10,100	24.0	2,424
2005	450	25.1	11,300	27.0	3,051
2006	590	17.6	10,400	28.0	2,912
2007	540	24.3	13,100	30.0	3,930
2008	nr	nr	nr	nr	nr

nr = not reported separately to avoid disclosure

Source: Statistics of Hawaii Agriculture 2008

Applying the per acre annual yield of watermelons, a 5-acre parcel would yield approximately 121,500 pounds of watermelons. A 5-acre farm of watermelons could potentially earn \$36,450 annually (121,500 x .30).

4.6 Fruits (excluding pineapples)

The subdivided lots could be used for the cultivation of fruits.

Hawaii fruit growers harvested 58.5 million pounds of fruit, excluding pineapple, for fresh and processed utilization in 2008. This was a 13 percent decrease when compared

KUNIA LOA RIDGE FARMLANDS

to the 2007 total. Overall value fell 5 percent to \$29.2 million due to decline in the major fruits. In 2008, fruit acreage totaled 5,918 acres, 9 percent less than the 2007 total. Harvested area was down 4 percent to 4,195 acres.

The Kunia region already includes fruit farms; therefore, cultivation of fruits is a viable option for the subdivided lots.

Fruits may include (yield and production information for selected crops follow the list):

- Bananas
- Guavas
- Papayas

BANANAS

In 2008, Hawaii's banana output was pegged at 17.4 million pounds, down 32 percent from the previous year. Total acreage in 2008 was 1,300 acres. Banana sales were valued at \$8 million in 2008, down 24 percent from 2007. The table below describes the yield and production of bananas for the State of Hawai'i:

BANANAS: Number of farms, acreage, yield, production, price, and value, by State of Hawaii, 2004-2008

Year	Farms (Number)	In-Crop (Acres)	Harvested (Acres)	Yield per acre (1000 lbs.)	Production (1000 lbs.)	Farm Price (Cents per lb.)	Value of Sales (\$1000)
2004	210	1,360	1,000	16.5	16,500	49.0	8,085
2005	190	1,145	980	21.3	20,900	43.9	9,175
2006	230	1,300	1,100	20.0	22,000	49.0	10,780
2007	240	1,500	1,300	19.7	25,600	41.0	10,496
2008	230	1,300	1,100	15.8	17,400	46.0	8,004

Source: Statistics of Hawaii Agriculture 2008

Applying the per acre annual yield of bananas, a 5-acre parcel would yield approximately 79,000 pounds of bananas. A 5-acre farm of bananas could potentially earn \$36,340 annually (79,000 x .46).

GUAVAS

In 2008, Hawaii's guava output was 3.5 million pounds, down 19 percent from the previous year. Total acreage in 2008 was 180 acres. Guava sales were valued at \$553,000 in 2008. The table below describes the yield and production of guavas for the State of Hawai'i:

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GUAVAS: Number of farms, acreage, yield, production, price, and value, State of Hawaii, 2004-2008

Year	Farms (Number)	In-Crop (Acres)	Harvested (Acres)	Production (1000 lbs.)	Farm Price (Cents per lb.)	Value of Sales (\$1000)
2004	75	610	525	8,100	14.4	1,166
2005	55	665	620	8,100	13.9	1,126
2006	50	575	365	7,400	14.2	1,051
2007	70	465	170	4,300	15.7	675
2008	60	180	160	3,500	15.8	553

Source: Statistics of Hawaii Agriculture 2008

Applying the per acre annual yield (production/harvested acres) of guavas, a 5-acre parcel would yield approximately 109,375 pounds of guavas. A 5-acre farm of guavas could potentially earn \$17,281 annually ($109,375 \times .158$).

PAPAYAS

In 2008, Hawaii's papaya output was 33.5 million pounds. Total harvested acreage was 1,380 acres, up 5 percent from the previous year. Papaya sales were valued at \$14.4 million in 2008, 10 percent above 2007.

Honolulu County's papaya output was 3 million pounds. Total harvested acreage was 135 acres. Papaya sales were valued at 1.7 million in 2008. The table below describes the yield and production of papayas for Honolulu County:

PAPAYAS: Number of farms, acreage, yield, production, price, and value, for Honolulu County, 2004-2008

Year	Farms (Number)	In-Crop (Acres)	Harvested (Acres)	Yield per acre (1000 lbs.)	Production (1000 lbs.)	Farm Price (Cents per lb.)	Value of Sales (\$1000)
2004	27	95	90	29.2	2,630	44.0	1,157
2005	30	130	105	21.4	2,250	44.2	995
2006	45	190	135	18.6	2,510	54.1	1,357
2007	53	195	125	22.9	2,860	52.5	1,502
2008	57	200	135	22.2	3,000	55.7	1,669

Source: Statistics of Hawaii Agriculture 2008

Applying the per acre annual yield of papayas, a 5-acre parcel would yield approximately 111,000 pounds of papayas. A 5-acre farm of papayas could potentially earn \$61,827 annually ($111,000 \times .557$).

OTHER FRUITS AND VEGETABLES

The number of farms, acreage, yield, production, price, and value yield information for other fruits and vegetables can be found on the Hawaii Agricultural Statistics website (http://www.nass.usda.gov/Statistics_by_State/Hawaii/index.asp).

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The University of Hawai'i College of Tropical Agricultural and Human Resources (CTAHR) has cost of production studies to help estimate the economic feasibility of specific crops suited to small farming operations. Illustrative examples can be found on CTAHR's website (http://www.ctahr.hawaii.edu/ocs/CoP_spreadsheets.html).

5. OPTIONS FOR OTHER AGRICULTURAL USES

CTAHR and its Cooperative Extension Service also provide resource information and contact personnel for alternative horticultural endeavors. Joint agricultural projects with CTAHR or the Hawai'i Agricultural Research Center could be pursued on the subdivided lots.

- CTAHR: <http://www.ctahr.hawaii.edu>
- Hawaii Agricultural Research Center: <http://www.harc-hspa.com/>

Hawaii's leading industry, tourism, also benefits from agriculture. Trends in the travel industry show an increasing interest in agriculturally-based attractions, such as farm and ranch tours, plantation history museums, culinary experiences using local produce, farmers' markets, and botanical gardens and nurseries.

6. MANAGEMENT PLAN

Subdividing the 854.23-acre parcel into 99 smaller agricultural lots is intended to make the fallowed land attractive for diversified crop cultivation, pasture and other agricultural uses that coincide with the agricultural activities on the surrounding properties. The subdivided lots will have greater agricultural value when managed by multiple owners who are knowledgeable and capable of cultivating the land for agricultural pursuits.

Grubbing and grading will be required, as portions of the Property have been fallow for some time. Majority of the site is presently overgrown with an assortment of scrub grasses, shrubs, and trees. Land preparation will involve the removal of the existing non-native vegetation and the conditioning of the soil. Grading will be conducted in accordance with local ordinance and prudent agricultural practice.

A quality stand of seeded grass with a high germination percentage will be introduced for the rapid establishment of pastures, where lots will be used for grazing. Bermuda Grass (*Cynodon dactylon*) is the recommended species of grass to be seeded on the lots used for pasture. In addition to hardiness and rapid growth, Bermuda is also tolerant to salt carried on to the Property by the prevailing onshore wind.

CTAHR can also recommend other good cover crops or green manures to use, which can be found at <http://www.ctahr.hawaii.edu/sustainag/Database.asp>.

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Due to the variation in rainfall over the course of a year, an irrigation system will be required to permit more intensive pasture management. However, feed may need to be purchased during extended periods of low rainfall to balance the consumption and cost of using non-potable water to irrigate the fields.

SITE PREPARATION

Grading will be conducted in accordance with local ordinance and prudent agricultural practice, with the objective of eliminating standing bodies of water.

Due to the exposure of the Property to the northeast tradewinds, windbreaks may be required for certain crops. Windbreaks should be established prior to planting the crops. Established windbreaks are essential to the success of farming operations. Windbreaks should be irrigated and properly maintained.

SOIL IMPROVEMENT

Grading and harrowing of fallow areas shall be conducted to condition the soil for planting. No major improvements are recommended at this time, although a starter fertilizer may be required at planting.

IRRIGATION

The irrigation system should be designed to optimize the water use around the root zone and to apply nutrients on a consistent basis. An automated micro-irrigation system should be used to reduce operating costs.

WEED MANAGEMENT

Cultivation will reduce live weed populations, which may continue as Guinea Grass seed and other weed seeds will germinate each time the soil becomes moist. Glyphosate can be used for extended weed control until the planting and establishment of Bermuda or other good cover crop is accomplished.

Mulching can also be useful for weed control. Mulching aids in the proliferation of the beneficial organisms that in turn make soil nutrients more available for uptake by the crop roots. Wood chips or green waste are examples of mulch.

E. CONCLUSION

Based on the soil conditions, topography of the site, rainfall and climatic conditions, available irrigation water, and the nature and scope of the agricultural plan, the proposed Kunia Loa Ridge Farmlands will provide for the feasible agricultural use of the Property, as required under Section 22-3, Subdivision and Consolidation of Land, Revised Ordinances of Honolulu and the provisions of Section 205-4.5, Hawaii Revised Statutes.

F. REFERENCES

City and County of Honolulu Department of Planning and Permitting (2003). "Interactive GIS Maps and Data." Website: <http://gis.hicentral.com/>

State of Hawai'i Department of Business, Economic Development, and Tourism (2003). "Hawaii Statewide GIS Program."

Website: <http://www.state.hi.us/dbedt/gis/index.html>

University of Hawai'i at Mānoa College of Tropical Agriculture and Human Resources (CTAHR). Website: <http://www.ctahr.hawaii.edu/ctahr2001/>

US Department of Agriculture National Agriculture Statistics Service; State of Hawai'i Department of Agriculture (2010). "Statistics of Hawaii Agriculture 2008." Website: http://www.nass.usda.gov/Statistics_by_State/Hawaii/index.asp

US Department of Agriculture Natural Resources Conservation Service (1972). "Soil Survey of Islands of Oahu."

Website: <http://www.ctahr.hawaii.edu/soilsurvey/5is/oahuleft.htm>

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F. REFERENCES

City and County of Honolulu Department of Planning and Permitting (2003). "Interactive GIS Maps and Data." Website: <http://gis.hicentral.com/>

State of Hawai'i Department of Business, Economic Development, and Tourism (2003). "Hawaii Statewide GIS Program." Website: <http://www.state.hi.us/dbedt/gis/index.html>

University of Hawai'i at Mānoa College of Tropical Agriculture and Human Resources (CTAHR). Website: <http://www.ctahr.hawaii.edu/ctahr2001/>

US Department of Agriculture National Agriculture Statistics Service; State of Hawai'i Department of Agriculture (2010). "Statistics of Hawaii Agriculture 2008." Website: http://www.nass.usda.gov/Statistics_by_State/Hawaii/index.asp

US Department of Agriculture Natural Resources Conservation Service (1972). "Soil Survey of Islands of Oahu." Website: <http://www.ctahr.hawaii.edu/soilsurvey/5is/oahuleft.htm>

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