DAVID IGE
Governor

SHAN TSUTSUI
Lieutenant Governor

MARY ALICE EVANS
Acting Director

LAND USE COMMISSION
Department of Business, Economic Development & Tourism
State of Hawai`i

DANIEL ORODENKER
Executive Officer

BERT K. SARUWATARI
Planner

SCOTT A.K. DERRICKSON, AICP
Planner

FRED A. TALON
Drafting Technician

RILEY K. HAKODA
Chief Clerk/Planner

HAUNANI NAGLE
Administrative Assistant

December 11, 2014

RECEIVED
'14 DEC 11 P3:36
OFC. OF ENVIRONMENTAL QUALITY CONTROL

FILE COPY
DEC 2 3 2014

Ms. Jessica Wooley, Director
Office of Environmental Quality Control
235 South Beretania Street, Room 702
Honolulu, Hawaii 96813-2437

Dear Ms. Wooley:

Subject: Docket No. A11-791 HG Kaua`i Joint Venture (HoKua Place)
Environmental Impact Statement Preparation Notice (EISPN)
Proposed HoKua Place Project
Kapa`a, Kawaihau, Kaua`i, Hawai`i

We respectfully request the publication of the EISPN for the subject project in the next available issue of *The Environmental Notice*.

Enclosed please find the following:

1. Order determining the LUC will be the accepting authority of the EIS for the Project
2. OEQC Publication Form w/Project Summary Description;
3. Two paper copies of the EISPN; and
4. .Digital copy of the EISPN (pdf);
5. Digital copies of OEQC Publication Form and LUC Transmittal Letter (pdf); and
6. Summary of the Action (MS Word doc)

In addition, a CD-ROM with the LUC Order, EISPN, Publication Form, and Distribution List is enclosed for your convenience. Please feel free to contact Scott Derrickson, AICP of my office at 587-3822 should you require clarification or any further assistance.

Sincerely,

DANIEL E. ORODENKER
Executive Officer

235 SOUTH BERETANIA STREET ❖ SUITE 406 ❖ HONOLULU, HAWAI'I 96813 ❖ TEL (808) 587-3822 ❖ FAX (808) 587-3827 ❖ EMAIL: luc@dbedt.hawaii.gov
Mailing Address: P.O. Box 2359, Honolulu, Hawaii 96804

Enclosures

cc: William W.L. Yuen (w/o enclosures)
Peter T. Young (w/o enclosures)

SECTION 343-5(c), HRS, APPLICANT ACTION
SECTION 11-200-3(d), HAR, INFORMATION FORM FOR PUBLICATION IN THE ENVIRONMENTAL NOTICE OF THE OEQC

A. DATE: December 11, 2014

B. TITLE OF ACTION: HoKua Place

C. TYPE OF DOCUMENT: EISPN pursuant to Section 343-5(e), HRS (Act 172, SLH 2012)

D. NOTICE OF APPROVING AGENCY DETERMINATION ATTACHED (if any): EISPN

E. APPLICANT: HG Kaua‘i Joint Venture, LLC

CONTACT FOR APPLICANT: Ho`okuleana LLC

CONSULTANT FOR APPLICANT (if any): Ho`okuleana LLC

F. APPROVING AGENCY: State Land Use Commission

CONTACT FOR APPROVING AGENCY: Scott A.K. Derrickson, AICP; (808) 587-3822

G. ISLANDS AFFECTED BY THE ACTION: Kaua`i

H. TAX MAP KEY NUMBERS: Kaua`i (4) 4-3-03: por. 01

I. STREET ADDRESS: Olohena Road

J. NEAREST GEOGRAPHICAL LANDMARKS: Kapa`a Middle School

K. LATITUDINAL/LONGITUDINAL COORDINATES: 159°19'40.849"W; 22°4'29.186"N

L. STATUTORY/ADMINISTRATIVE AUTHORITIES: Sections 343-5(a)(1) and 343-5(e), HRS and Section 11-200-12, HAR.

M. BRIEF NARRATIVE SUMMARY OF PROPOSED ACTION: HoKua Place will consist of a mix of lots, single-family and multi-family residences, with market and affordable rates with complementary uses, located mauka of Kapa‘a town. This 97-acre development seeks to fill the housing needs of Kapa`a within the Urban Center, consistent with the Kaua`i General Plan. HoKua Place is proposed to be a sustainable community that preserves the rural-like character of Kapa`a while meeting its growing housing needs.

Approximately 97-acres of a larger 163 acre parcel will be subdivided into single family and multifamily lots providing for an approximate total of 683-multi-family units and 86-single family lots and homes. Affordable housing will be integrated in the project on-site and will conform to Kaua`i County Ordinance. In addition, the HoKua Farm Lots share some of the project infrastructure and are included in this analysis.

The project includes 14.3-acres of open space, with a 3.1-acre park adjacent to the existing Kapa`a Middle School and an area for the county's proposed relocation of the Kapa`a County swimming pool. A 1.4-acres parcel will be set aside for commercial use. Transportation improvements will include a channelized intersection on Kapa`a Bypass Road, bus stops, sidewalks and bicycle and walking paths to the Kapa`a Middle School.

N. FORM PREPARER: Ho`okuleana LLC, attention Peter T. Young

O. CONTACT INFORMATION: Ho`okuleana LLC, attention Peter T. Young
1539 Kanapu`u Drive, Kailua HI 96734
(808) 226-3567
www.Hookuleana.com
info@Hookuleana.com

HoKua Place
Section 343-5e HRS Preparation Notice
Environmental Impact Statement

Prepared for:
Accepting Authority
State of Hawai'i Land Use Commission
&
Petitioner
HG Kaua'i Joint Venture

Prepared by:
Ho`okuleana LLC
… to take responsibility …

1539 Kanapu'u Drive
Kailua, Hawai`i 96734
(808) 226-3567
www.Hookuleana.com
Info@Hookuleana.com

November 2014

HoKua Place - Section 343-5e HRS - Preparation Notice Environmental Impact Statement

HoKua Place is the name of this project. It was previously identified as Kapaʻa Highlands. The reader will note that several of the studies and references in this document carry the project's former name.

Under the provisions of Section 343-5e HRS, the applicant, HG Kauai Joint Venture, and the accepting authority, State Land Use Commission, have determined at the outset that an environmental impact statement is required for the HoKua Place Project situated at (4) 4-3-003: 001 (portion) in Kapaʻa of the Kawaihau District on the island of Kauai.

Pursuant to the requirements of Section 11-200-3, Hawaii Administrative Rules, and Section 11-200-15, Hawaii Administrative Rules, this document serves are the preparation notice for subsequent draft and final Environmental Impact Statements. After publication in the Environmental Notice there will be a thirty-day public comment period.

This document is not the EIS; it is a preparation notice for the subsequent Environmental Impact Statement. However, the reader will find that the project is described in relative detail and several studies have been prepared addressing the proposed project. In addition, during consideration of an environmental assessment rather than an environmental impact statement, this preparation notice includes some of those earlier findings and conclusions.

This EISPN document presents reviewers with the goals and objectives of the proposed action, alternatives considered, review of the project impacts and anticipated impacts of the preferred alternative, including the studies prepared to assess potentially significant impacts.

Reviewers will have the opportunity to comment on the type of information they feel should be included in the subsequent Draft EIS to comply with the content requirements established by Hawaiʻi Administrative Rules (HAR) Section 11-200-16.

Following publication of the Draft EIS, reviewers will have an opportunity to comment on its contents toward the preparation of the Final EIS. The purpose of the EIS process is to disclose to government agencies, the general public, stakeholders and decision-makers the anticipated impacts of a project and to identify feasible actions that might be taken to mitigate potential impacts.

The following studies have already been conducted to determine the potential impacts which may result from the proposed project and identify appropriate mitigation measures. They are included in this preperation notice. (Note that there was a project name change after the preparation of the studies - the project did not change - these reports address the proposed Hokua Place project.)

- Kapaʻa Housing Market Study
- Kapaʻa Highlands II Sustainability Plan
- Kapaʻa Highlands Agricultural Master Plan
- Preliminary Engineering Report Drainage Improvements
- Preliminary Engineering Report Wastewater Improvements
- Traffic Impact Assessment Report
- Botanical Survey
- Biological Surveys
- Archaeological Assessment with Subsurface Testing
- Cultural Impact Assessment

Project Name:	HoKua Place (The project was formerly referred to as Kapaʻa Highlands.)
Applicant & Property Owner:	HoKua Place HG Kauaʻi Joint Venture 9911 S. 78th Avenue Hickory Hills, IL 60457
Approving Agency:	State of Hawaiʻi Land Use Commission
Project Location:	Kawaihau District, Wailua, Kauaʻi, Hawaiʻi
TMK:	(4) 4-3-003: 001 (portion)
Land Use Classification:	County Zoning: Agriculture General Plan: Urban Center State Land Use Designation: Agriculture
Land Area:	Approximately 97-acres Portions of the remainder of parcel (4) 4-3-003:001 will be used for well and water system uses
EIS Trigger:	Use of County Lands
Approvals Required:	LUC Boundary Amendment; County Class IV Zoning & Use Permits; County Council Approval for Zoning Change; Subdivision Approval; Building Permits

Summary:
HoKua Place is mix of lots, single-family and multi-family residential (with market and affordable prices) with complementary uses. This 97-acre development seeks to fill the housing needs of Kapaʻa within the Urban Center, consistent with the Kauaʻi General Plan, as well as local planning. HoKua Place is proposed to be a sustainable community that preserves the rural-like character of Kapaʻa while meeting its growing housing needs.

Approximately 97-acres will be subdivided into single family and multifamily lots providing for an approximate total of 683-multi-family units and 86-single family lots and homes; affordable housing will be built on-site and will conform to Kauaʻi County Ordinance. In addition, HoKua Farm Lots shares some of the project infrastructure and is included in this analysis.

The project includes open space encompassing 14.3-acres; a 3.1-acre park adjacent to the existing Kapaʻa Middle School with an area for the county's proposed relocation of the Kapaʻa county swimming pool; and 1.4-acres for commercial use. Transportation improvements will include a channelized intersection on Kapaʻa Bypass Road, bus stops, sidewalks and bike and walking paths to the existing Kapaʻa Middle School.

The direct, indirect, secondary and cumulative impacts associated with the project would be localized or short-term, occurring during the construction phase.

Agencies and Organizations who were sent the Section 343-5e HRS Preparation Notice for the Environmental Impact Statement for comments:

State of Hawai‘i
Department of Agriculture
Department of Accounting & General Services
Department of Business, Economic Development & Tourism
Department of Business, Economic Development & Tourism – Technology Division
Department of Business, Economic Development & Tourism - Office of Planning
Department of Business, Economic Development & Tourism - Land Use Commission
Department of Education - Planning Branch
Department of Education - Hawai‘i State Library, Kapa‘a Library
Department of Hawaiian Home Lands
Department of Health
Department of Health - Office of Environmental Quality
Department of Land & Natural Resources
Department of Land & Natural Resources - State Historic Preservation Division
Department of Transportation
University of Hawai‘i - Environmental Center
University of Hawai‘i - Water Resources Research Center
University of Hawai‘i - Kaua‘i Community College Library
Office of Hawaiian Affairs

County of Kaua‘i
Office of the Mayor
Department of Parks & Recreation
Department of Planning
Department of Public Works
Department of Transportation
Department of Water
Fire Department
Police Department

Federal
Department of the Interior Fish and Wildlife Service

Other
The Garden Island Newspaper

Table of Contents

Chapter 1 - Introduction 8
1.1 Overview & Background 8
1.2 Purpose & Need 8
1.3 Proposed Actions 12
1.4 Responsible Agencies & Funding 14
1.5 Project Development Status & Implementation Schedule 14
1.6 Required Permits & Approvals 15
Chapter 2 - Project Description 16
2.1 Project Location 16
2.2 Project Description 19
Chapter 3 - Environmental Impact Statement Alternatives 22
3.1 Alternative 1 - No Action 22
3.2 Alternative 2 - Agricultural Subdivision - Existing Zoning 22
3.3 Alternative 3 - Residential Lot Subdivision Alternative 23
3.4 Alternative 4 - Proceed with Project as Described - Preferred Alternative 24
Chapter 4 - Environmental Setting, Impact & Mitigation 25
4.1 Introduction 25
4.1.1 Environmental Setting 25
4.1.2 Potential Environmental Impacts & Mitigation Measures 25
4.1.3 Level of Impact after Mitigation 27
4.1.4 Potential Project Impacts in Context with Applicable Requirements & Mitigation Measures.. 27
4.2 Archaeological, Historic and Cultural Resources 29
4.2.1 Environmental Setting 29
4.2.2 Potential Environmental Impacts & Mitigation Measures 50
4.2.3 Level of Impact after Mitigation 51
4.3 Biological Resources 52
4.3.1 Environmental Setting 52
4.3.2 Potential Environmental Impacts & Mitigation Measures 60
4.3.3 Level of Impact after Mitigation 61
4.4 Visual & Aesthetic Resources 62
4.4.1 Environmental Setting 62
4.4.2 Potential Environmental Impact & Mitigation Measures 63
4.4.3 Level of Impact after Mitigation 63
4.5 Geology, Soils & Slope Stability 64
4.5.1 Environmental Setting 64
4.5.2 Potential Environmental Impacts & Mitigation Measures 68
4.5.3 Level of Impact after Mitigation 69
4.6 Water Resources & Wastewater 70
4.6.1 Environmental Setting 70
4.6.2 Potential Environmental Impact & Mitigation Measures 87
4.6.3 Level of Impact after Mitigation 90
4.7 Solid Waste & Material Management 92
4.7.1 Environmental Setting 92
4.7.2 Potential Environmental Impact & Mitigation Measures 93
4.7.3 Level of Impact after Mitigation 93

4.8 Socioeconomic Conditions & Public Service Facilities 94
4.8.1 Environmental Setting 94
4.8.2 Potential Environmental Impact & Mitigation Measures 104
4.8.3 Level of Impact after Mitigation 107
4.9 Traffic 108
4.9.1 Environmental Setting 108
4.9.2 Environmental Impacts & Mitigation Measures 111
4.9.3 Level of Impact after Mitigation 121
4.10 Power & Communication 122
4.10.1 Environmental Setting 122
4.10.2 Environmental Impacts & Mitigation Measures 123
4.10.3 Level of Impact after Mitigation 125
4.11 Noise 126
4.11.1 Environmental Setting 126
4.11.2 Environmental Impacts & Mitigation Measures 126
4.11.3 Level of Impact after Mitigation 127
4.12 Climate, Air Quality & Lighting 128
4.12.1 Environmental Setting 128
4.12.2 Environmental Impacts & Mitigation Measures 128
4.12.3 Level of Impact after Mitigation 129
4.13 Natural Hazards 130
4.13.1 Environmental Setting 130
4.13.2 Potential Environmental Impact & Mitigation Measures 130
4.13.3 Level of Impact after Mitigation 131
4.14 Site Preparation & Construction 132
4.14.1 Potential Environmental Impacts 132
4.14.2 Mitigation Measures 132
4.14.3 Level of Impact after Mitigation 136
4.15 Secondary & Cumulative Impacts 137
14.15.1 Summary of Potential Contribution of the Preferred Alternative to Cumulative Effects 137
14.15.2 Irreversible & Irretrievable Commitments of Resources 139
14.15.3 Conclusion 139
Chapter 5 – Laws, Regulations, Land Use Plans & Policies 140
5.1 County of Kaua'i 140
5.1.1 County General Plan 140
5.1.2 Kapa'a-Wailua Development Plan 145
5.1.4 Kaua'i Economic Development Plan Update 146
5.2 State of Hawai'i 148
5.3 Sustainability Principles 179
5.4 Agricultural Uses 189
5.5 Federal "Cross-Cutting" Authorities 190
5.5.1 Environmental Authorities 190
5.5.2 Economic Authorities 197
Chapter 6 - Agency & Public Participation 199
6.1 Comment Letter, Scoping Letters & Letters of Support 199
6.2 Meetings with Governmental Agencies & Other Entities 200
6.3 Section 343-5e HRS Preparation Notice EIS Recipients 201

Chapter 7 - List of Preparers 202
Chapter 8 – References.....203

Exhibit A - Kapaʻa Housing Market Study
Exhibit B - Kapaʻa Highlands II Sustainability Plan
Exhibit C - Kapaʻa Highlands Agricultural Master Plan
Exhibit D - Department of Water, County of Kauaʻi Managers Report 12-10
Exhibit E - Irrigation Supply for the Kapaʻa Highlands Agricultural Subdivision Water Master Plan
Exhibit F - Preliminary Engineering Report Drainage Improvements Kapaʻa Highlands Phase II
Exhibit G - Preliminary Engineering Report Wastewater Improvements Kapaʻa Highlands Phase II
Exhibit H - Traffic Impact Assessment Report Kapaʻa Highlands Subdivision Kapaʻa, Kauaʻi, Hawaii TMK: (4) 4-3-03:01
-Comments from State of Hawaii Department of Transportation and Responses Relative to TIAR Submitted December 9, 2013
-Review of Traffic Impact Assessment Report for Kapaa Highlands Subdivision Kauai, Kapaa, TMK: (4) 4-3-003:001 dated March 26, 2014
-Traffic Consultant Response to HWY-PS 2.6887, Traffic Impact Assessment Report (December 9, 2013), Kapaa Highlands Subdivision, Kapaa, Kauai TMK: (4) 4-3-003:001 dated June 6, 2014
Exhibit I - Kapaʻa Highlands Legal Description and Map
Exhibit J - Botanical Survey Kapa`a Highlands Phase II, TMK (4) 4-3-003:001 Kaua`i, Hawai`i April-May 2012
Exhibit K - Biological Surveys Conducted on the Kapaʻa Highlands Phase II Project Site, TMK: (4) 4-3-003:001, Island of Kauaʻi, Hawaiʻi
Exhibit L - An Archaeological Assessment with Subsurface Testing for the Proposed Kapaʻa Highlands Phase II Project, Kapaʻa Ahupuaʻa, Kawaihau District, Kauaʻi TMK (4) 4-3-3: 1
Exhibit M - A Cultural Impact Assessment for the Proposed Kapaʻa Highlands Phase II, Kapa`a Ahupuaʻa, Kawaihau District, Kauaʻi
Exhibit N - Comment Letters, Scoping Letters & Letters of Support
Exhibit O - Kauaʻi County Planning Commission Tentative Subdivision Approval for HoKua Farm Lots, June 19, 2014

Chapter 1 - Introduction

This Environmental Impact Statement (EIS) preparation notice represents HoKua Place's analysis in compliance with State environmental review statutes including Chapter 343, Hawaiʻi Revised Statues (HRS). (The project was formerly referred to as Kapaʻa Highlands. Some of the Exhibits and other references carry the former name.)

This Environmental Impact Statement (EIS) preparation notice discloses and evaluates the activities proposed in the development of the HoKua Place project. The purpose of the EISPN is to inform the relevant county, state and federal agencies and the public of the likely environmental consequences of the activities in developing the HoKua Place project.

1.1 Overview & Background

HoKua Place is a proposed development of a mix of single-family and multi-family residential, market and affordable rate homes, commercial and other uses (including roads, water and wastewater systems.) This 97-acre ocean view planned community is positioned to be the pride of Kapaʻa. The development seeks to fill the housing needs of Kapaʻa within the Urban Center of the district, consistent with the Kauaʻi General Plan.

Situated in close proximity to schools and commercial areas, HoKua Place is proposed to be a sustainable community that preserves the rural-like character of Kapaʻa while meeting its growing housing needs.

HoKua Place, TMK: (4) 4-3-003:001 (portion), totals 97-acres. The subject property, HoKua Place, includes approximately 97-acres of the approximately 163-acre larger parcel. HoKua Farm Lots shares some of the infrastructure and is included in this analysis. A copy of the tentative subdivision approval for the HoKua Farm Lots is attached as Exhibit O. The project is located mauka of Kapaʻa town.

The Kapaʻa By-Pass Road separates the town and the Property. The Property is on the north-west corner of the Kapaʻa By-Pass Road and Olohena Road. Olohena Road runs along and adjacent to the east and north boundaries of the Property. The Kapaʻa Middle School is located on the northern end of the Property, fronted by Olohena Road.

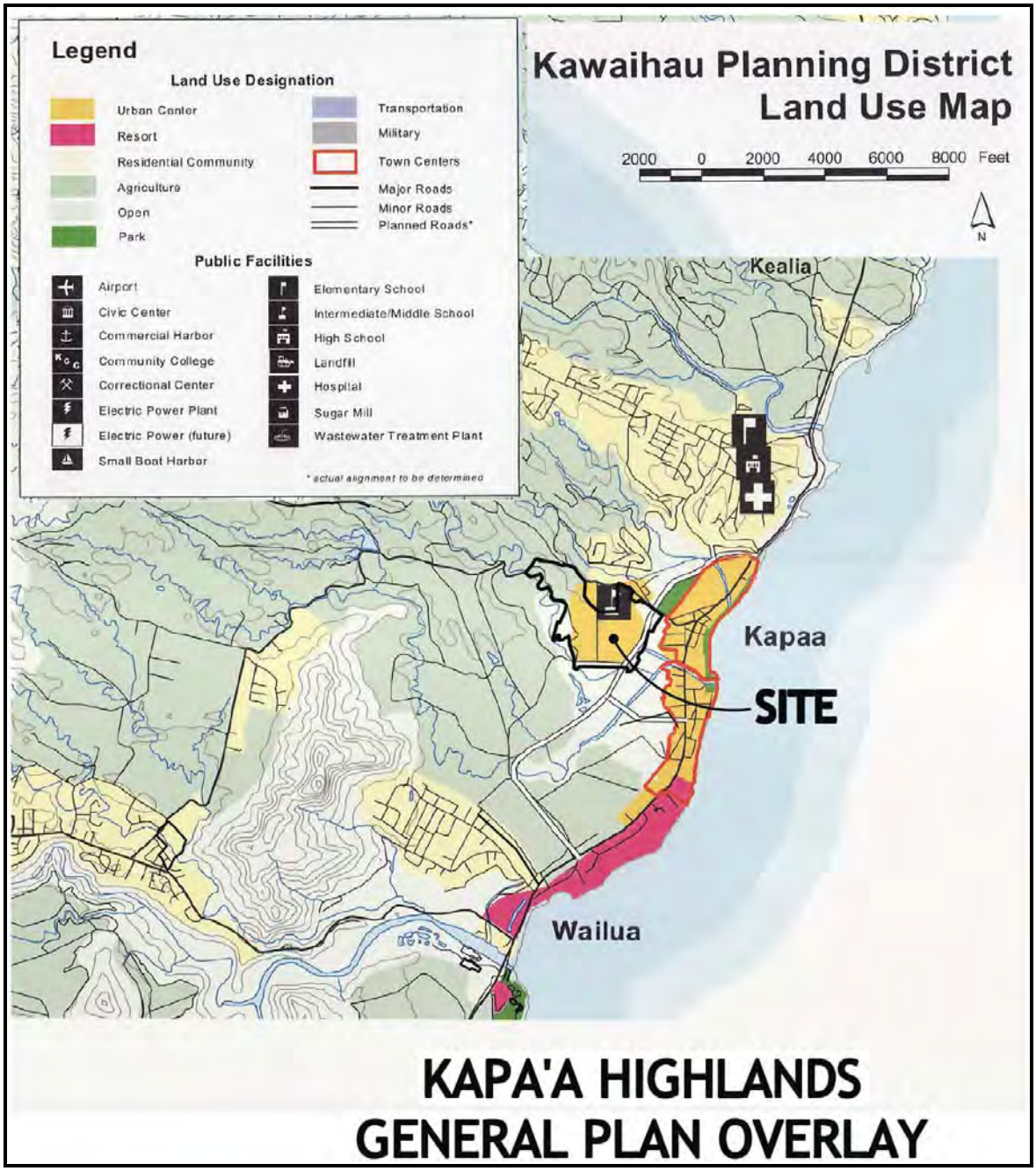
HoKua Place (formerly known as Kapaʻa Highlands II) has received letters of support from the County Mayor, County Planning Department, County Housing Department, County Department of Public Works regarding wastewater, State Department of Transportation, County Water Department and others.

1.2 Purpose & Need

HoKua Place (formerly known as Kapaʻa Highlands II) has submitted a petition to the Land Use Commission for a boundary amendment. The subject property is zoned agricultural by the County of Kauaʻi. The Kauaʻi General Plan and the Kapaʻa Town Development Plan designate the property as Urban Center. The petition is to change the Land Use District from Agricultural Land Use District to Urban District. The project will respond to the Kauaʻi General Plan's designation of the property as Urban Center and the need for housing in the area. The Kauaʻi General Plan (General Plan) is the

primary policy directing long range development, conservation, and the use and allocation of land and water resources in the County of Kaua‘i.

The General Plan establishes, through maps and text, geographic areas of the County which are intended to be used for various general purposes such as agriculture, resorts, urban communities and preservation of natural, cultural and scenic resources.



The General Plan states “One of the key policies in the Framework for preserving Kaua‘i’s rural character is to promote growth and development in compact urban areas. Urban lands comprise only four to five percent of Kaua‘i’s land area, leaving 55 percent in conservation and 40 percent in agriculture.”

The General Plan further states that land use policies for preserving Kaua‘i’s rural character should, “Enhance Urban Centers and Towns and maintain their identity by defining the Town Center and the edges of each Town. Concentrate shopping and other commercial uses in Town Centers. Encourage residential development within Urban and Town Centers and in Residential Communities contiguous to them.”

The General Plan also sets policy for urban land use designations. Policy 5.4.1.1 states:

(a) Lands included within the Urban Center designation shall be centers of government, commerce and transportation that serve the entire county or a large region. Uses may include shopping centers, government offices, churches and other institutions, office complexes, and industrial facilities. Residential or resort uses may also be located within the Urban Center designation, where compatible.
(b) Urban Center areas are typically served by wastewater collection and treatment facilities and major roads. Urban Center lands may be zoned for any type of use, including General Commercial, General Industrial, Resort and Residential.

The following are policies to provide for growth and development while preserving rural character, as described in the Kaua‘i General Plan:

(a) Allow incremental growth of Towns, contiguous to existing development. Concentrate primary shopping facilities within the Town Center. Support infill development.
(b) Provide for build-out of existing Residential Communities, to include areas zoned R-1 or higher. Allow small, neighborhood-oriented commercial sites in Residential Communities.
(e) Expansion contiguous to an existing town or residential community is preferred over a new residential community.
(f) Allow build-out of properties in existing low-density agricultural communities, including the homestead areas of Wailua, Kapa‘a, ‘Ōma‘o and Kalāheo and existing agricultural subdivisions in other parts of the island, while taking measures to assure the adequacy of County road, drainage and water supply systems.

The HoKua Place project conforms to and implements the policies of the Kaua‘i General Plan by developing within the designated Urban Center, contiguous to surrounding Kapa‘a town and its neighboring residential community, thereby preserving the rural-like character of the area.

As noted in the “Kawaihau Planning District Land Use Map” included in the Kaua‘i General Plan, the subject property has an “Urban Center” land use designation. The Kapa‘a Town Development Plan also designates the property as “Urban Center.”

The lands surrounding the property to the north is designated as “Residential” and “Urban” by the County General Plan. The Property is contiguous to existing urban lands to the south and across the bypass road. These existing urban lands are zoned urban by the County of Kaua‘i.

As discussed in the Housing Market Study prepared for HoKua Place (formerly known as Kapa‘a Highlands II), the cycle for both the economy and real estate is coming off of its 2007-2009 dramatic fall-off in overall activity and in values and Kauai’s residential markets are now at the beginning of the up-cycle.

Looking ahead, these markets are anticipated to right themselves and the county will resume a pattern of multi-year periods of both economic growth and job and personal income expansion. In turn, this will stimulate housing demand.

The Housing Market Study concluded that HoKua Place/Kapaʻa Highlands II will help to satisfy current and future housing demand, demand that has been deep and persistent, from both offshore and on-island households. It concluded that the development will sell well, particularly timed to the up cycle in the housing market.

Finally, the historically low level of permitting activity indicates there will be little or no competitive interference in the short run to this project's offerings coming from other housing development on the island. The following table describes the potential pricing at retail for each product type in the development.

KAPAA HIGHLANDS PRODUCT SALES PRICE PROJECTION

Housing Produced	Total Units	Retail Price Per Unit	Home Site Only Prices
A House Lot Package, Large Lots (10,000 sf)	36	$800,000-$950,000	$266,000-$316,000
A House Lot Package, Medium Lots (7,500 sf)	50	$650,000-$700,000	$216,000-$233,000
Multi-Family Dwellings (4 Plex, 8 DU/Ac)	500	$250,000-$350,000	
Affordable Housing Dwellings (12 DU/Ac)	183	$125,000-$175,000	

The Market Analysis notes that these expected prices, particularly the affordable ones, are below the historical trend for Kauaʻi housing. Thus, sales are expected to start up strongly. Also, as the development is weighted heavily on multifamily housing production, the projected price of $300,000 (mid-point) is well under the ten-year average for a resale condo sale (which is just under $400,000). The other components of the development plan are also well priced.

Finally, the study estimates absorption. With the up cycle noted to be underway, strong initial sales are expected in year one. This will be maintained over the following 2-4 years. With the cycle's top, sales will begin to drift downwards in somewhat a gradual fall-off. There then will be 2-3 years (two years shown) of slow sales, coinciding with the bottom of the market.

KAPAA HIGHLANDS PRODUCT CLOSING PROJECTION

Product	2016	2017	2018	2019	2020	2021	2022	2023
Large Lots	11	9	9	7				
Medium Lots	15	15	14	6				
Multi-Family	90	100	90	70	50	30	30	40
Affordable Housing	40	40	40	35	28			

The Housing Market Analysis for HoKua Place (formerly known as Kapaʻa Highlands II) is included as Exhibit A at the end of the EISPN.

1.3 Proposed Actions

The Project proposes to develop HoKua Place into an approximately 97-acre single-family and multi-family residential subdivision with other complementary uses.

Approximately 97-acres will be subdivided into single family lots ranging from 7,500 to 10,000 square feet and multifamily lots from 1-acre to 5-acre parcels. A total of 683-multi-family units and 86-single family lots and homes are planned. Open space encompassing 14.3-acres will be developed.

The affordable housing element of the project will conform to Kaua‘i County Ordinance No. 860, Kaua‘i’s new housing policy where developers contribute up to thirty percent (30%) of the total residential units for affordable housing. However, the Kaua‘i housing policy provides incentives to developers who provide the required affordable units on-site. HoKua Place will be providing all of its affordable units on site. This will provide approximately 183-affordable units, assuming twelve dwelling units per acre for this housing type. The proposed development will provide much needed affordable housing in the East Kaua‘i region.

The condominium units will be designed in a range of bedroom configurations that will best meet the demand for housing by providing designs that apply to different family types, including starter families, empty nesters, families with children, and households that qualify for affordably priced housing.

The design of the single family units will appeal to some of those in the aforementioned condominium demographic groupings, but will go further by addressing the needs of large families, families wanting to be close to the Middle School, trans-generational families needing adequate (larger and more defined) living space, and professional families or those with multiple wage-earners.

Sales prices for the market single-family lots are anticipated to be sold in the range of $216,000 to $316,000, depending upon the size and location of the lots. Market single-family houses would be in the $650,000 to $950,000 range. The market multi-family units are proposed to be sold in the range $250,000 to $350,000, depending on size and location. Affordable multi-family units would be sold in the $125,000-$175,000 price range.

A 3.1-acre park is proposed adjacent to the existing Kapa‘a Middle School. The park will have an area for the county’s proposed relocation of the Kapa‘a county swimming pool.

A 1.4-acre parcel is proposed for commercial use. A country type store and small personal service types of use are anticipated.

A remnant parcel of 1-acre on the Makai side of the Kapa‘a Bypass road is also proposed as commercial use or for sub-stations for the police and fire departments. The proposed roadway through the project will include two bus stops and sidewalks on one side. A bike and walking path is also proposed from the by-pass road up to the existing Kapa‘a Middle School.

Approximately 14.3-acres are proposed for open greenway areas. Subdivision improvements are anticipated to commence upon securing of all necessary land entitlements and building permits. The estimated cost for the subdivision improvements is $22-million.

KAPA'A HIGHLANDS
PHASE II
CONCEPT PLAN OCTOBER 22, 2011
MF - MULTI-FAMILY HOUSING
⊙ - SINGLE FAMILY HOUSING
GC - GENERAL COMMERCIAL
NEW ROADWAY
MULTI-USE PATH
0
400
800
GRAPHIC SCALE IN FEET
KAUAI GENERAL PLAN
URBAN CENTER DESIGNATION
KAPAA INTERMEDIATE SCHOOL
SOLAR FARM
POOL
PARK
GC
OPEN SPACE
ROUND ABOUT
MF 1
MF 2
MF 3
MF 4
MF 5
MF 6
MF 7
MF 8
MF 9
MF 10
MF 11
MF 12
MF 13
MF 14
MF 15
MF 16
MF 17
MF 18
MF 19
MF 20
MF 21
MF 22

Project Components include:

Mix of single-family and multi-family residential.

- 86-single family (lots ranging from 7,500 to 10,000 SqFt.)
    - $216,000.00 to $316,000.00 (Home Site Only)
    - $650,000.00 to $950,000.00 (House and Lot)
- 500-multi-family (lots from 1-5 acre parcels)
    - $250,000.00 to $350,000.00 (8 Units/Acre) (Unit Prices)
- 183-affordable units on site
    - $125,000.00 to $175,000.00 (12-Units/Acre) (Unit Prices)

Open space encompassing 14.3-acres including:

- 3.1-acre park adjacent to Kapaʻa Middle School
    - Relocation of County Swimming Pool to park
- Greenways surrounding development

Commercial Areas totaling 1.4-acres:

- Stores, personal services
- Land for police/fire sub-stations

Infrastructure Improvements:

- Water/Wastewater
    - Water Master Plan approved by County Water Department
    - Well on site to be dedicated to County Water Department or Private
    - Contributions to repairs of Kapaʻa Sewer Treatment Plant

Transportation:

- Dedication of Kapaʻa By-Pass Road to the State
- Channelized intersection on Kapaʻa Bypass Road
- Complete street multi-modal roadway running through the property
- Bus stops located along roadway
- Bike/Walking path

1.4 Responsible Agencies & Funding

HoKua Place is owned by HG Kauaʻi Joint Venture

Accepting Agency: State of Hawaiʻi Land Use Commission (LUC)

1.5 Project Development Status & Implementation Schedule

The project has been conceptualized since the summer of 2009, with cooperation and encouragement of the County Planning Department. Once LUC approval is received, County permitting will be sought. The completion time frame for the entire project to be built out is ten years.

1.6 Required Permits & Approvals

A number of permits or other approvals may be necessary prior to development of HoKua Place. The following list (Table 1.6.1) represents those permits or approvals identified to date. Additional permits might be identified subsequently if warranted by modifications, mitigation measures or refinements in final design.

Table 1.6.1 - Permits and Approvals

Permit/Approval	Applicable Activities	Applicable Areas	Regulatory Agency
Boundary Amendment - Land Use District change from Agriculture to Urban	Development/Activities on project site	Statewide	State of Hawaiʻi Land Use Commission (LUC)
Zoning	Development/Activities	Countywide	County of Kauaʻi
National Pollutant Discharge Elimination System (NPDES)	Discharge of any pollutant, altering the quality of any discharge, increasing the quantity of any discharge.	Surface streams and coastal waters of the State	State of Hawaiʻi Department of Health (DOH)
Grading Permit	Grading	Countywide	County of Kauaʻi
Subdivision Approval	Dividing or consolidating parcels of land for right-of-way.	Countywide	County of Kauaʻi
Construction/Building Permits	Construction Activities	Countywide	County of Kauaʻi

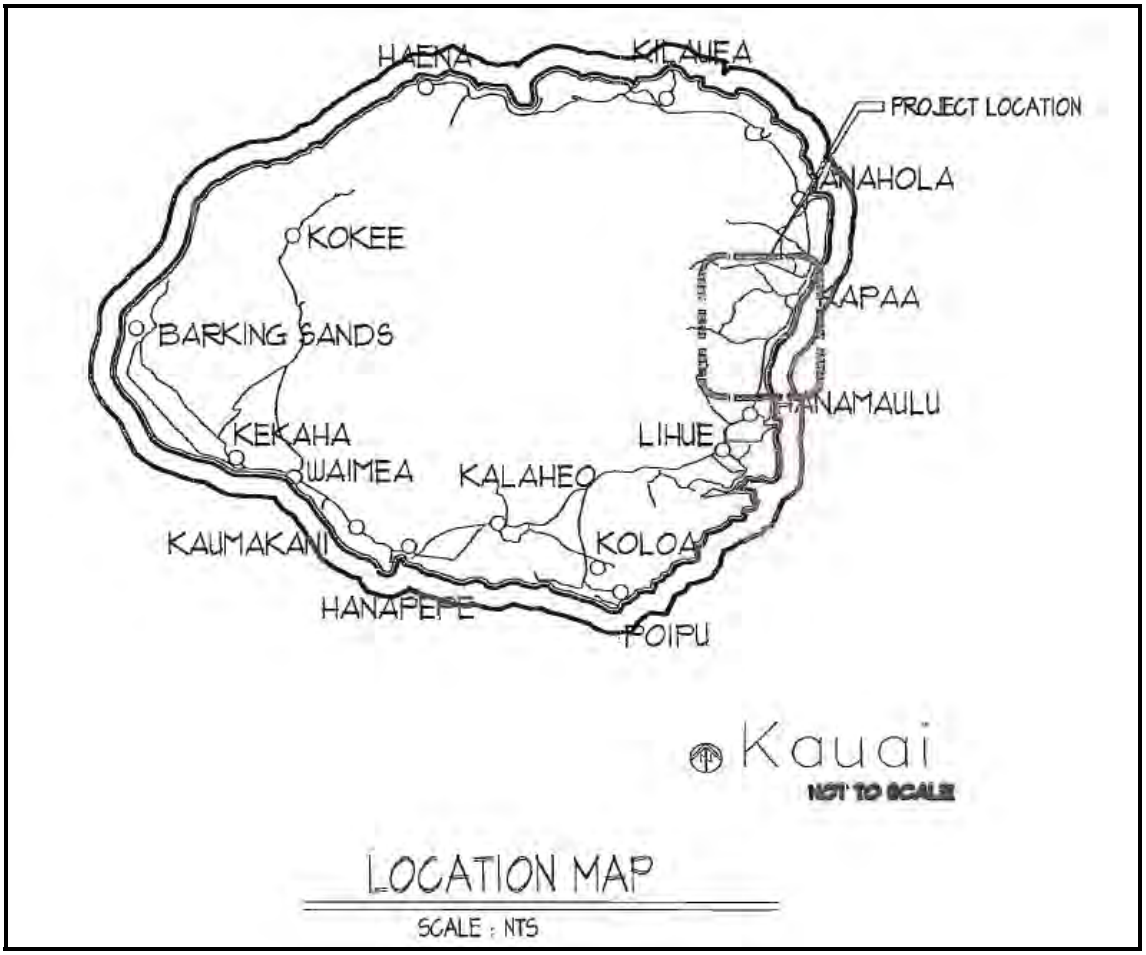
Chapter 2 - Project Description

This chapter gives a general description of the project, its location and proposed actions.

2.1 Project Location

The Kapaʻa-Wailua area is located on the eastern plain of the island of Kauaʻi, State of Hawaiʻi. Kauaʻi is the northernmost and geologically the oldest of the main Hawaiian Islands. It comprises 549-square miles of land area and 90 miles of coastline, and is the fourth largest in size and population.

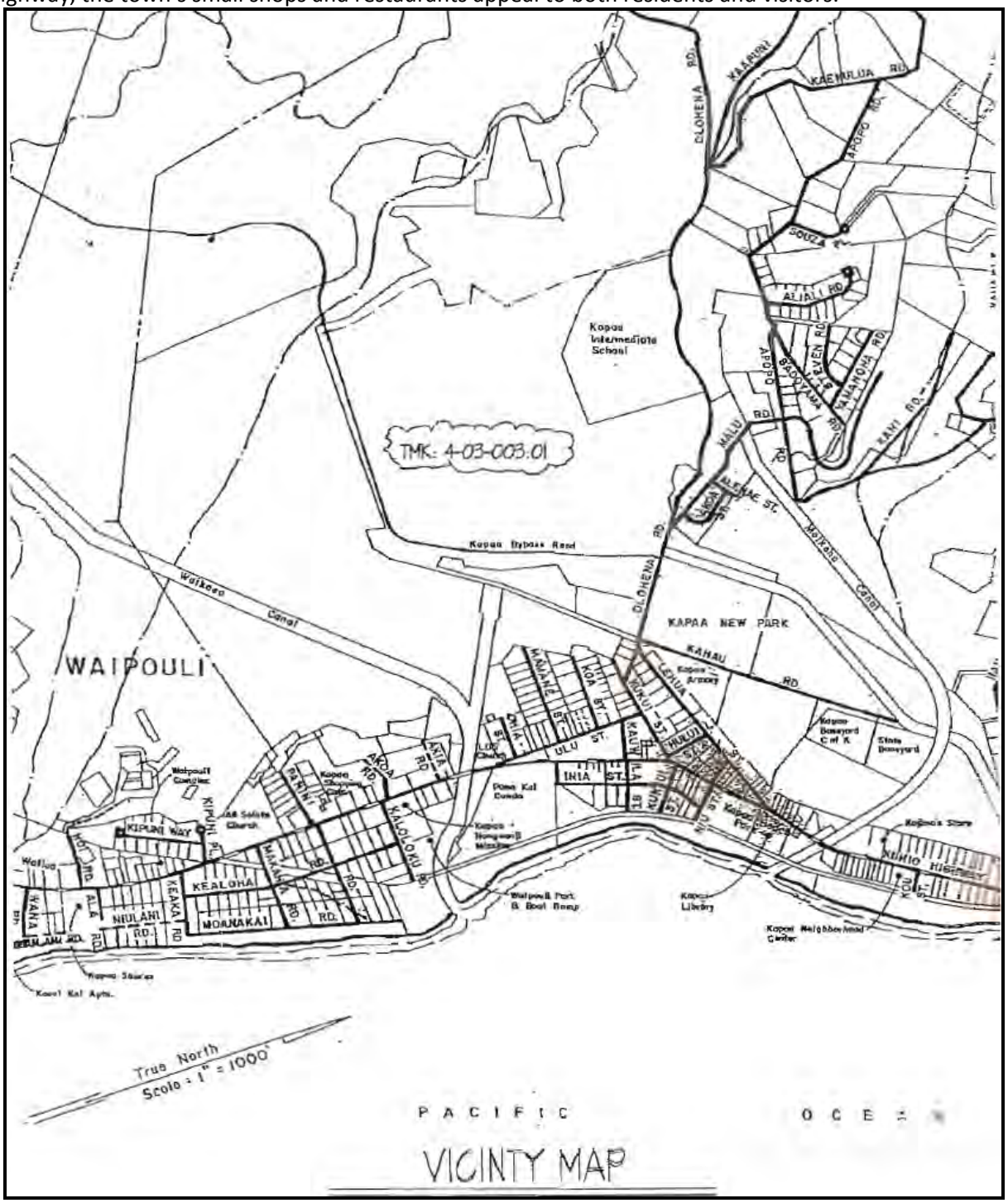
Kauaʻi is generally circular in shape with an average diametric width of 30-miles. The higher central mountainous sector is dominated by Mount Waiʻaleʻale, with a peak elevation slightly more than 5,000 feet. Except for about 10 miles of sea cliffs along the northwesterly Nāpali Coast, the overall terrain rises gently inland from the relatively flat coastal plains to the farmlands and agricultural belt, then toward the grassy uplands, rolling foothills and forest reserves before ascending the hinterlands and the rugged slopes of Mount Waiʻaleʻale.



The subject property is within the Kawaihau district which extends from the Wailua River north to Moloaʻa, including the Kapaʻa-Wailua basin, Keālia and Anahola.

The Kapaʻa-Wailua region is home to a large portion of Kauaʻi's population. An urban corridor extends along Kūhiō Highway from Haleilio Road in Wailua to Kawaihau Road at the northern edge of Kapaʻa Town. The Kapaʻa-Wailua urban corridor is vibrant and active, a "working town."

Defined and bordered by the Waikaʻea and Moikeha Canals, historic Kapaʻa Town is noted for its "western plantation" style architecture and its walkable, small town character. The canals give strong definition to the edges of the historic town. Served by sidewalks and parking on both sides of the highway, the town's small shops and restaurants appeal to both residents and visitors.



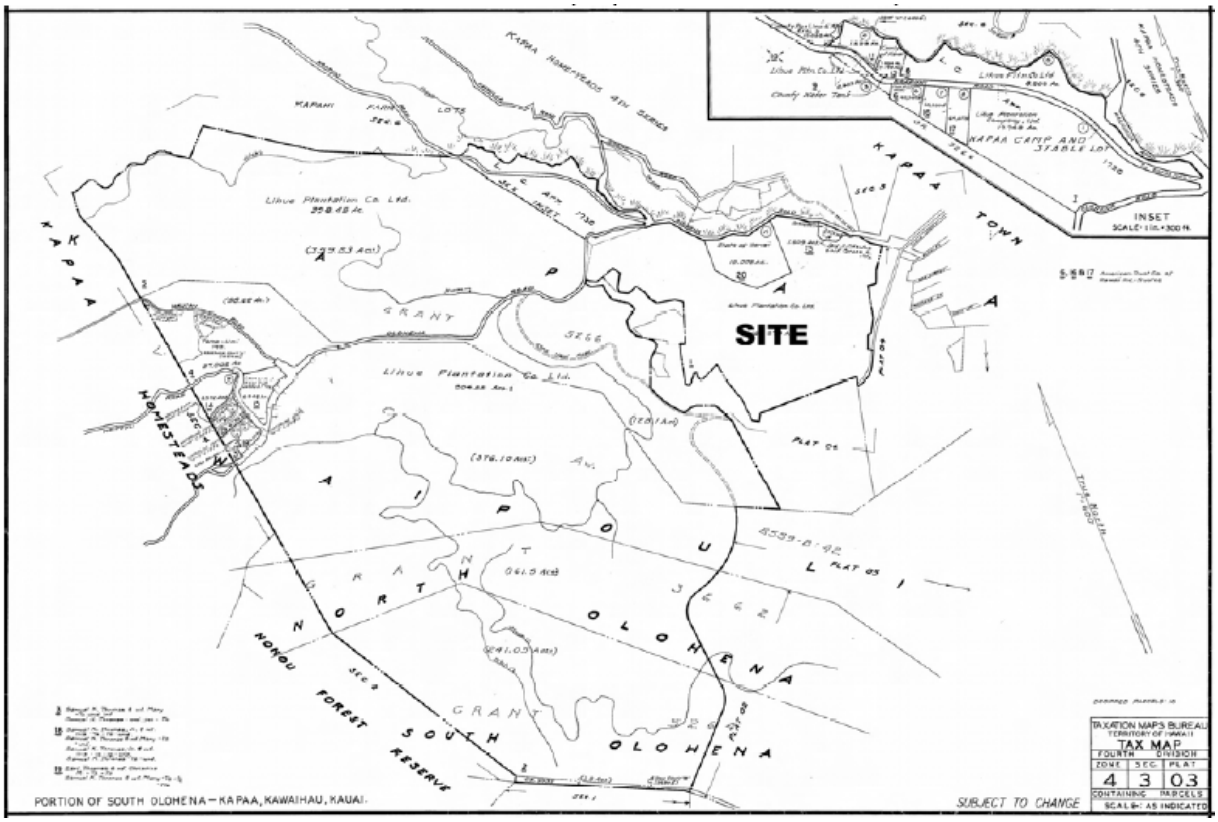
Kapaʻa Beach Park is now an open-space "town park," opening up physical and visual access between the town and the beach. While retaining and enhancing its unique historical and architectural heritage, Kapaʻa is a town with a vibrant community of businesses and neighbors. Visitors enjoy the "sense of place" and are attracted to return.

The Kapaʻa By-Pass Road furnishes an alternate route for those traveling between the North Shore and Līhuʻe. Connector roads link the By-Pass to Kūhiō Highway, providing alternatives to reach commercial areas along the coast and improving circulation within the valley. Traffic is minimized and dispersed through the road network.

The subject 97-acres of HoKua Place, is a portion of a larger parcel. The property is located in Kapaʻa, Kauaʻi, Hawaiʻi and is identified by Tax Map Key No. (4) 4-3-003:001 (portion). In addition, a portion of the larger parcel will house a well and waterline improvements as necessary.

The Subject Property is located on the north side of Kapaʻa town on former cane lands situated on a bluff adjacent to the coastal plain of Kapaʻa Town. It is bordered by Olohena Road to the north and the Kapaʻa Bypass Road on the south and east sides of the project. Kapaʻa Intermediate School is near the middle of the north portion of the property.

The Kapaʻa By-Pass Road separates the town and the Property. The subject property is surrounded by remnant sugar lands and residential uses. A Solar farm is located on HoKua Farm Lots (formerly known as Kapaʻa Highlands I) and is producing 1.18 megawatts of energy which is feeding into the Kauaʻi electric distribution grid. Across Olohena Road are single family residential neighborhoods as well as commercial areas.



2.2 Project Description

The proposed development, HoKua Place, will utilize 97-acres of land for single-family and multi-family residential, commercial uses and assorted infrastructure. Development of the Property will address a portion of the significant demand for affordable housing in the County of Kaua‘i, without significantly affecting reserve areas for foreseeable urban growth.

The approximate 97-acres proposed for development will be subdivided into single family lots ranging from 7,500 to 10,000 square feet and multi-family lots from 1-acre to 5-acre parcels.

A total of 683-multi-family units and 86-single family lots and homes are planned. Open space encompassing 14.3 acres will be developed.

A 3.1 acre park is proposed adjacent to the existing Kapa‘a Middle School. The park will have an area for the county’s proposed relocation of the Kapa‘a county swimming pool. A 1.4-acre parcel is proposed for commercial use. A country type store and small personal service types of use are anticipated.

One acre on the Makai side of the Kapa‘a Bypass road (southwest corner of Olohena and the bypass road) is proposed for future commercial use or for sub-stations for the police and fire departments.

The proposed main, multi-modal roadway through the development will include bus stops, sidewalks and a bike and walking path connecting from Kapa‘a Middle School down through the development to the round-about and facilitating green travel to and from Kapa‘a’s town core.

Subdivision improvements, including roads, water system, wastewater, utilities and others improvements, are anticipated to commence upon the securing of all necessary land entitlements and building permits. The estimated cost for the subdivision improvements is $22 million.

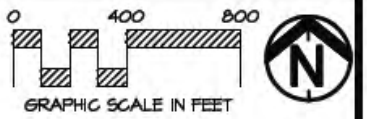
It is the intent of the proposed project to develop a sustainable community. To date, the site has already been developed with an operational 1.18 MW, four-acre solar facility on the Phase I proposed uses on the overall parcel. Additional sustainable connectivity concepts including bikeways and walkways to and from the pool, neighborhood commercial areas, the middle school and Kapa‘a’s town core are planned.

HoKua Place will be a sustainable community and will incorporate the following elements found within the HoKua Place (formerly known as Kapa‘a Highlands II) Sustainability Plan (Exhibit B).

Sustainability Programs and Plans: HoKua Place will incorporate the core principles of the various sustainability programs and plans.

Natural and Cultural Resources: No archaeological sites are known to exist on the property. Should any archaeologically significant artifacts, bones, or other indicators be uncovered during construction, HoKua Place is committed to strict compliance with State laws and rules.

Land Use: HoKua Place is consistent with local land use plans including the General Plan of the County of Kaua‘i, the Kapa‘a Town Development Plan and the Kapa‘a-Wailua Basin Community Plan.



PHASE 2 BREAKDOWN

SINGLE FAMILY R6/R8- 86 UNITS
MULTI FAMILY R14 - 683 UNITS
PARKS - 3.1 ACRES
GREENWAYS - 14.3 ACRES
ROADS - 15.2 ACRES

KAPAA HIGHLANDS PHASE II

SCALE: 1 INCH = 400 FEET
CONCEPT PLAN FEB. 2, 2009

Ho'okuleana LLC
... to take responsibility ...

Design Features: HoKua Place will include sustainable design features including strategies to reduce solar heat gain through roofs, walls and windows; using site planning and landscaping to improve natural ventilation; daylighting design; and energy efficient light fixtures.

Transportation: HoKua Place will incorporate bus stops into its road system; multi-modal interconnected roads; and complete streets design.

Economic Opportunities: HoKua Place proposes two areas for commercial uses which will provide a variety of job opportunities; construction and construction-related employment will have direct beneficial impact on the local economy during construction.

Open Space and Parks: HoKua Place proposes open space and open greenway areas encompassing 14.3-acres including a 3.1-acre park for the proposed relocation of the Kapaʻa county swimming pool.

Water Management: HoKua Place will install water efficient fixtures, appliances and high efficiency toilets to reduce indoor water use.

Energy Management: HoKua Place will incorporate energy conservation and efficiency measures; solar energy for water heating; encourage photovoltaic systems and other renewable energy sources.

Health: HoKua Place's layout and design will create an opportunity for both residents and the community to have a positive effect on their health through walkable and bikable transportation options.

Education: HoKua Place will coordinate with the DOE to ensure that the facility assessment policy is addressed. In addition, a 3.1-acre park will be included in the plan and the Kapaʻa county swimming pool will be relocated within the park.

Housing: HoKua Place conforms to the Kauaʻi County Affordable Housing Ordinance No. 860 and offers a variety of housing types that will address a portion of the housing needs of the island.

Social: HoKua Place promotes social sustainability through socially-focused actions that will support quality of life, sense of place and community livability for all residents and the community.

Chapter 3 - Environmental Impact Statement Alternatives

This chapter lists and describes the various alternatives, including the preferred alternative, for the development of the HoKua Place project.

3.1 Alternative 1 - No Action

Under the "no action" alternative, no action would be taken and the project area would be left in its current state. HoKua Place would not be built.

There would be no diverse, environmentally-conscious, residential community with single- and multi-family residential, affordable housing, commercial, a walkable street network and a range of housing options.

The land would remain in under the State Agriculture Lands Use.

Without the development, housing inventory in Kapaʻa would remain low. Affordable housing options in Kapaʻa would be limited.

The County would not have a location for their County pool and residents in Kapaʻa would not have the opportunity for pool use.

Additionally, the "no action" alternative will be contrary to Kauaʻi General Plan in that the General Plan specifically designates the property as Urban Center and discusses the need for housing in the area.

Because the No Action alternative does not meet several HoKua Place objectives and does not implement the Kauaʻi General Plan, this alternative has been rejected.

3.2 Alternative 2 - Agricultural Subdivision - Existing Zoning

Under alternative 2, the Existing Zoning Designation alternative, HoKua Place would not be built. There would be no diverse, environmentally-conscious, residential community with single- and multi-family residential, affordable housing, commercial, a walkable street network and a range of housing options.

However, the Property could still be developed as permitted under the existing State Land Use and County zoning designations. An agricultural subdivision would be built to conform to the subject properties current zoning.

The agriculture subdivision would be similar to HoKua Farm Lots (formerly known as Kapaʻa Highlands I) which adjoins the subject property. The subject property is located in the State Land Use Commission Agricultural District and within the Agriculture District of the Comprehensive Zoning Ordinance of the County of Kauaʻi (CZO).

As such, owners of subdivision lots would be required to comply with the requirements of HRS Chapter 205 and the CZO. Individual lot owners, through an Association would be required either to provide of portion of their lot for grazing of livestock as outlined in the Kapaʻa Highlands Agricultural Master Plan (Exhibit C), or obtain an amendment to conduct alternative agricultural activities.

As outlined in the Kapaʻa Highlands Agricultural Master Plan, crop suitability for the project site is low. The climate and soils at HoKua Place are not ideal for the growing of most commercially viable crops due to the poor soil, strong trade winds and the salt spray from the ocean. Additionally, due to the generally poor soils and harsh climate, the commercial crops most suited to the area are sugar and pineapple.

Both of these industries have declined in Hawaiʻi. Pineapple is no longer grown on Kauaʻi and there are limited sugar operations. With appropriate irrigation and management, both tropical orchard crops (including trees) and some vegetable crops could be grown on the property, although with some difficulty and risk given the physical conditions at the properly.

The applicant's first development plans were to include the 97-acres as part of the agriculture subdivision of HoKua Farm Lots (formerly known as Kapaʻa Highlands I). The planning department of the County of Kauaʻi expressed the desire to see a housing project on the portion of the property that is designated Urban Center in the General Plan.

Thus, HoKua Place was created to adhere to the County of Kauaʻi Planning Department's desire for housing on the subject property, as well as, the poor condition of the property for agricultural production.

Because the Existing Zoning alternative does not meet several HoKua Place objectives and does not implement the Kauaʻi General Plan, this alternative has been rejected. However, if the land use district boundary is not changed from Agriculture to Urban, this option may be considered.

3.3 Alternative 3 - Residential Lot Subdivision Alternative

Under alternative 3, residential lot subdivision alternative, development would be made but only single family housing as opposed to more dense housing options such as multi-family would be built.

Another alternative is developing the property as a residential lot subdivision for conventional single family residential uses without any commercial uses. The potential benefit of this alternative is that it addresses the need for more housing in Kapaʻa. This alternative would require reclassification of the property from the current State Agriculture District to the State Urban District as well as County residential zoning.

Typical small-lot subdivisions consisting of nothing more than single family residential uses give only one option for housing choice. HoKua Place offers a variety of housing choices rather than a conventional residential single family subdivision.

Several aspects of the design of HoKua Place contribute to a high quality of life.

The proposed development, HoKua Place, will utilize 97-acres of land for single-family and multi-family residential, commercial uses and assorted infrastructure. Development of the Property will address a portion of the significant demand for affordable housing in the County of Kauaʻi, without significantly affecting reserve areas for foreseeable urban growth.

Because the Residential Lot Subdivision alternative is contrary to the Kaua‘i General Plan in that the General Plan specifically designates the property as urban Center and discusses the need for housing in the area, this alternative was rejected.

In addition, implementation of this alternative would not avoid infrastructure demands (water, wastewater flows, solid waste disposal); 2) traffic impacts; and 3) short-term construction-related impacts (such as construction noise, construction equipment exhaust emissions, temporary traffic disruption, and fugitive dust).

3.4 Alternative 4 - Proceed with Project as Described - Preferred Alternative

The preferred alternative, alternative 4, is to proceed with the project as described in Chapter 2, Project Description. The project will respond to the Kaua‘i General Plan’s designation of the property as Urban Center and its discussion of the need for housing in the area.

HoKua Place is a well thought out residential community consistent with the Kaua‘i General Plan and is supported by the Kaua‘i County administration. It will:

1) protect natural resources and culture;
2) provide diverse housing options, transportation choices and recreation opportunities; and
3) encourage a diverse and vibrant economy

Chapter 4 - Environmental Setting, Impact & Mitigation

This chapter presents the current description of the environmental setting in the region and within the HoKua Place project area. Mitigation measures identified in this EIS have been developed to avoid, minimize, rectify or reduce the project's potential adverse environmental impacts. Mitigation measures have been considered throughout the project's planning process and incorporated into the project's design and construction plans.

The information about existing conditions, potential project impacts and potential mitigation measures presented in this Chapter has been developed through the review and use of existing information related to the project area.

4.1 Introduction

Each section in this Chapter discusses:

(a) Environmental Setting - current conditions and/or management practices in the project area related to the specific environmental subject,
(b) Potential Environmental Impacts and Mitigation Measures - the project's potential long-term operation phase impacts related to the specific environmental subject, and the potential mitigation measures that could be implemented by the project to avoid, minimize, rectify, or reduce potential substantial adverse environmental impacts, and
(c) Level of Impact after Mitigation - the project's relative potential impact that will remain after the potential mitigation measures are implemented.

4.1.1 Environmental Setting

"Environmental Setting" describes the existing environmental conditions in the project area and the region as it currently exists, before the commencement of the project. This provides a baseline for comparing "before the project" and "after the project" environmental conditions.

4.1.2 Potential Environmental Impacts & Mitigation Measures

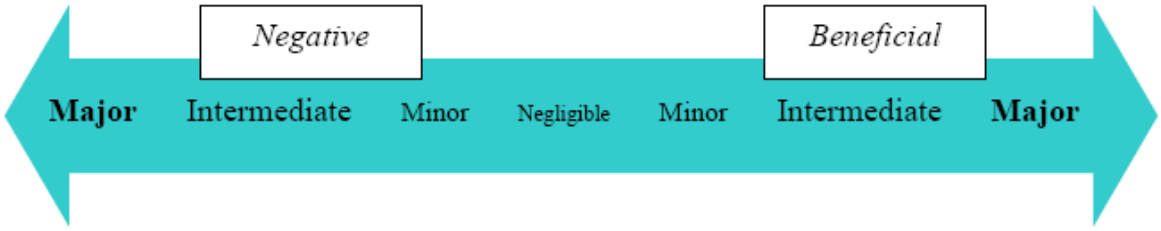
Potential environmental impacts are assessed through thresholds used to determine level of impact. "Thresholds Used to Determine Level of Impact" defines and lists specific criteria used to determine whether an impact is considered to be potentially significant.

Hawai'i Administrative Rules (HAR) Section 11-200-12 provides 13 "significance criteria" against which an action is to evaluate its potential impact. These criteria are:

1. Involves an irrevocable commitment to loss or destruction of any natural or cultural resource.
2. Curtails the range of beneficial uses of the environment.
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.
4. Substantially affects the economic welfare, social welfare and cultural practices of the community or State.
5. Substantially affects public health.

6. Involves substantial secondary impacts, such as population changes or effects on public facilities.
7. Involves a substantial degradation of environmental quality.
8. Is individually limited but cumulatively has considerable effect upon the environment or involves a commitment for larger actions.
9. Substantially affects a rare, threatened or endangered species, or its habitat.
10. Detrimentally affects air or water quality or ambient noise levels.
11. Affects or is likely to suffer damage by being located in an environmentally sensitive area such as a flood plain, tsunami zone, beach, erosion-prone area, geologically hazardous land, estuary, fresh water or coastal waters.
12. Substantially affects scenic vistas and view planes identified in County or State plans or studies.
13. Requires substantial energy consumption.

Effects were assessed for scope, scale and intensity of impacts to resources. Effects may be identified further as beneficial or negative, as well as short-term and long-term. Scope, scale and intensity can be defined on a range from negligible to major.



(Graphic: Pacific Southwest Research Station-Institute of Pacific Islands Forestry, 2009)

- **Negligible:** Resources will not be affected, or the effects will be at or near the lowest level of detection. Resource conditions will not change or will be so slight there will not be any measurable or perceptible consequence to a population, wildlife or plant community, public use and access opportunity, visitor experience, or cultural resource;

- **Minor:** Effects will be detectable but localized, small, and of little consequence to a population, wildlife or plant community, public use and access opportunity, visitor experience, or cultural resource. Mitigation, if needed to offset negative effects, will be easily implemented and likely to be successful;

- **Intermediate:** Effects will be readily detectable and localized with consequences to a population, wildlife or plant community, public use and access opportunity, visitor experience, or cultural resource. Mitigation measures will be needed to offset negative effects and will be extensive, moderately complicated to implement, and probably successful;

- **Major:** Effects will be obvious and will result in substantial consequences to a local area or regional population, wildlife or plant community, public use and access opportunity, visitor experience, or cultural resource. Extensive mitigating measures may be needed to offset negative effects and will be large-scale, very complicated to implement and may not have any guarantee of success. In some instances, major effects will include the irretrievable loss of the resource.

Time scales are defined as either short-term or long-term:

- **Short-term or Temporary:** An effect that generally will last less than a year or season;
- **Long-term:** A change in a resource or its condition that will last longer than a single year or season.

The thresholds established correspond to the above criteria and other environmental laws. Each section of the EIS presents a significance threshold for its specific environmental subject; should the project potentially cause an impact greater than the identified threshold then the potential impact will be considered to be significant.

"Mitigation Measures" identifies project-specific measures that may be needed that go beyond compliance with applicable existing rules, regulations and requirements, to reduce a potentially significant impact, as applicable. The compliance with existing applicable rules, regulations and requirements is considered a part of the existing regulatory environment, and is described above.

The mitigation measures identified in this EIS have been developed to avoid, minimize, rectify or reduce the project's potential adverse environmental impacts. Mitigation measures have been considered throughout the project's planning process and will be incorporated into the project design and construction plans. Project mitigation measures are identified and detailed in subsection 4 of sections 4.2 through 4.18.

4.1.3 Level of Impact after Mitigation

"Level of Impact after Mitigation" indicates what effect remains after application of mitigation measures, and whether the remaining effect will be considered to be significant, or not.

4.1.4 Potential Project Impacts in Context with Applicable Requirements & Mitigation Measures

The potential impacts are evaluated within the framework of the project's compliance with all applicable rules, regulations and requirements for its action type and location. The existing rules, regulations, requirements and procedures applicable to the project are considered a part of the existing regulatory environment.

Rules, regulations and requirements which may be applicable include:

- Hawai'i Administrative Rules (HAR), including (but not limited to):
    - Title 11, Chapter 23, Underground Injection Control
    - Title 11, Chapter 45, Community Noise Control
    - Title 11, Chapter 54, Water Quality Standards
    - Title 11, Chapter 55, Water Pollution Control
    - Title 11, Chapter 60, Air Pollution Control
    - Title 11, Chapter 62, Wastewater Systems
    - Title 11, Chapter 68, Litter Control
    - Title 11, Chapter 200, Environmental Impact Statement Rules
    - Title 11, Chapter 260, Hazardous Waste Management General Provisions
    - Title 11, Chapter 262, Standards Applicable to Generators of Hazardous Waste
    - Title 13, Subtitle 5, Chapter 107, Threatened and Endangered Plants

- Title 13, Subtitle 5, Chapter 124, Indigenous Wildlife, Endangered and Threatened Wildlife and Introduced Wild Birds
- Title 13, Subtitle 13, Chapter 275-284, Historic Preservation Review Process
- Title 13, Subtitle 13, Chapter 300, Burial Sites and Human Remains

- Hawaiʻi Revised Statutes (HRS), including (but not limited to):
  - Chapter 6E, Historic Preservation
  - Chapter 195D, Conservation of Aquatic Life, Wildlife and Land Plants
  - Chapter 205, State Land Use Law
  - Chapter 226, Hawaiʻi State Planning Act
  - Chapter 342D, Water Pollution Law
  - Chapter 342J, Hawaiʻi Hazardous Waste Law
  - Chapter 343, Environmental Impact Statements
  - Chapter 344, Hawaiʻi State Environmental Policy

- County of Kauaʻi ordinances, rules and requirements, including (but not limited to):
  - County of Kauaʻi General Plan
  - County of Kauaʻi Building and Planning Codes

4.2 Archaeological, Historic and Cultural Resources

This section discusses the cultural, archaeological and historic resources in the region and specific project area, the potential impact of the project on those resources and mitigation measures the project will employ to minimize those potential impacts.

4.2.1 Environmental Setting

Archaeological & Historic Resources

Exploration Associates Ltd. (EAL) conducted an archaeological assessment of the property (Exhibit L) "An Archaeological Assessment with Subsurface Testing for the Proposed Kapaʻa Highlands Phase II Project, Kapaʻa Ahupuaʻa, Kawaihau District, Kauaʻi TMK (4) 4-3-3: 1)". The purpose of the archaeological assessment is to address any archaeological and/or historic preservation concerns that might be raised by the proposed development.

The assessment included a surface survey and a report detailing methods and any finds. The archaeological assessment does not meet the requirements of an inventory-level survey per the rules and regulations of the State Historic Preservation Division/Department of Land and Natural Resources (SHPD/DLNR). However, the level of work is sufficient to address site types, locations, and allow for future work recommendations.

On January 3, 2012 and April 25, 2012 a field inspection of the HoKua Place/Kapaʻa Highlands II project area was conducted by Exploration Associates Ltd. archaeologist Nancy McMahon, M.A. Survey transects oriented north-south were spaced apart 10 m. where it was passable as guinea grass was very thick. Field observations were recorded and photographs were taken of the project area. The work was conducted under the overall supervision of principal archaeologist Nancy McMahon, M.A.

Historical research included a review of previous archaeological studies on file at the State Historic Preservation Division of the Department of Land and Natural Resources; studies of documents at Hamilton Library of the University of Hawaiʻi, Kapaʻa and Līhuʻe Public Libraries, Kauaʻi Museum, Kauaʻi Historical Society and study of maps at the Survey Office of the Department of Land and Natural Resources. Nineteenth-century Land Commission Award claim records were accessed via the Internet from the Mahele Database prepared by Waihona ʻĀina Corp.

<u>Kawaihau District</u>

The project area lies in the traditional ahupuaʻa of Kapaʻa, which was part of the ancient district of Puna (now the district is more commonly called "Kawaihau"), one of five ancient districts on Kauaʻi (King 1935: 228). Puna was the second largest district on Kauaʻi, behind Kona, and extended from the tip south of Līhuʻe to Kamalomaloʻo, just north of Keālia.

For taxation, educational and judicial reasons, new districts were created in the 1840s. The Puna District, with the same boundaries became the Līhuʻe District, named for an important town in that district.

<u>Early Historic Accounts of Kapaʻa (1830s-1900s)</u>

Although most of the historic record documents for Kauaʻi in this period revolve around missionary activities and the missions themselves, there was indication that the Kapaʻa area was being considered for new sugar cane experiments, similar to those occurring in Kōloa.

In a historic move, Ladd and Company received a 50 year lease on land in Kōloa from Kamehameha III and Kaua'i Governor Kaikio'ewa of Kaua'i. The terms of the lease allowed the new sugar company "the right of someone other than a chief to control land" and had profound effects on "traditional notions of land tenure dominated by the chiefly hierarchy" (Donohugh, 2001: 88). In 1837, a very similar lease with similar terms was granted to Wilama Ferani, a merchant and U.S. citizen based in Honolulu (Hawai'i State Archives, Interior Dept., Letters, Aug. 1837).

The lease was granted by Kauikeaouli for the lands of Kapa'a, Keālia and Waipouli for twenty years for the following purpose:

> ...for the cultivation of sugar cane and anything else that may grow on said land, with all of the right for some place to graze animals, and the forest land above to the top of the mountains and the people who are living on said lands, it is to them whether they stay or not, and if they stay, it shall be as follows: They may cultivate the land according to the instructions of Wilama Ferani and his heirs and those he may designate under him... (Hawai'i State Archives, Interior Dept., Letters, Aug. 1837).

Unlike Ladd & Company which eventually became the Kōloa Sugar Company, there is no further reference to Wilama Ferani and his lease for lands in Kapa'a, Keālia and Waipouli. In a brief search for information on Honolulu merchant, Wilama Ferani, nothing was found. It is thought that perhaps Wilama Ferani may be another name for William French, a well known Honolulu merchant who is documented as having experimented with grinding sugar cane in Waimea, Kaua'i at about the same time the 1837 lease for lands in Kapa'a, Keālia and Waipouli was signed (Joesting, 1984: 152).

In 1849, son of Wai'oli missionary, William P. Alexander, recorded a trip he took around Kaua'i. Although, he focuses on the larger mission settlements like Kōloa and Hanalei, he does mention Kapa'a:

> A few miles from Wailua, near Kapa'a we passed the wreck of a schooner on the beach, which once belonged to Capt. Bernard. It was driven in a gale over the reef, and up on the beach, where it now lies.
>
> A few miles further we arrived at Keālia. We had some difficulty crossing the river at this place, owing to the restiveness of our horses. The country here near the shore was rather uninviting, except the valley which always contained streams of water (Alexander, 1991: 123).

In later years, the notorious Kapa'a reef was to become the location of many shipwrecks once a landing was built there in the 1880s.

The first large scale agricultural enterprise in Kapa'a began in 1877 by the Makee Sugar Plantation and the Hui Kawaihau (Dole, 1916: 8). The Hui Kawaihau was originally a choral society begun in Honolulu whose membership consisted of many prominent names, both Hawaiian and haole. It was Kalākaua's thought that the Hui members could join forces with Makee, who had previous sugar plantation experience on Maui, to establish a successful sugar corporation on the east side of Kaua'i.

Captain Makee was given land in Kapa'a to build a mill and he agreed to grind cane grown by Hui members. Kalākaua declared the land between Wailua and Moloa'a, the Kawaihau District, a fifth district and for four years the Hui attempted to grow sugar cane at Kapahi, on the plateau lands above Kapa'a. After a fire destroyed almost one half of the Hui's second crop of cane and the untimely death of one of their principal advocates, Captain James Makee, the Hui began to disperse and property and

leasehold rights passed on to Makee's son-in-law and new Makee Plantation owner, Colonel Z. S. Spalding (Dole, 1916: 14).

As part of the infrastructure of the new plantation, a sugar mill was erected and the Makee Landing was built in Kapaʻa during the early years of the Makee Sugar Plantation. Following Captain Makee's death, Colonel Spalding took control of the Plantation and in 1885 moved the mill to Keālia (Cook, 1999: 51). The deteriorating stone smokestack and landing were still there well into the 1900s (Damon, 1931:359). Conde and Best (1973:180) suggest that railroad construction for the Makee Plantation started just prior to the mid 1890s. There is one reference to a railroad line leading from the Kapaʻa landing to Keālia in 1891. During Queen Liliʻuokalani's visit to Kauaʻi in the summer of 1891, the royal party was treated to music by a band, probably shipped in from Oʻahu. "The band came by ship to Kapaʻa and then by train to Keālia" (Joesting, 1984:252). This line is depicted on a 1910 USGS map which shows the line heading south from Keālia Mill and splitting near the present Coral Reef Hotel, one finger going to the old Kapaʻa Landing (Makee Landing) and another line heading mauka, crossing the present Moʻikeha Canal, traveling southwest up Lehua Street and through what is now goat pasture, along a plateau and into the mauka area behind Kapaʻa swamplands. This railroad line was part of a twenty mile network of plantation railroad with some portable track and included a portion of Keālia Valley and in the mauka regions of the plateau lands north of Keālia (Conde and Best, 1973:180).

By the late 1800s, Makee Plantation was a thriving business with more than one thousand workers employed (Cook, 1999:51). Hundreds of Portuguese and Japanese immigrants found work on Makee Plantation and the new influx of immigrants required more infrastructure. In 1883, a lease for a school lot was signed between Makee Sugar Company and the Board of Education (Kapaʻa School, 1983: 9). Stipulations found in the Portuguese immigrant contracts with Makee Sugar Company stated that "children shall be properly instructed in the public schools" (Garden Island, April 1, 1983). The original Kapaʻa School was constructed in 1883 on a rocky point adjacent to the Makee Sugar Company railroad. Traditionally, this point was known as Kaahiahi (Kapaʻa School, 1983: 10). In 1908, Kapaʻa School was moved to its present site directly mauka and up the hill at Mailehune.

As in much of the rest of Hawaiʻi, the Chinese rice farmers began cultivating the lowlands of Kapaʻa with increasing success in the latter half of the 1800s. Several Hawaiian kuleana owners leased or sold their parcels mauka of the swamp land to Chinese rice cultivators. Other Chinese rice cultivators appeased to the government for swamplands first leasing and later buying. As a result of the growing rice and sugar industries, the economic activity displaced the house lot kuleana on the makai side of the marsh for increasing commercial and residential development (Lai, 1985:148-161).

Narrow wagon roads gave way to macadamized roads in the early part of the 20th century. This new road was called the Kauaʻi Belt Road and parts of it are thought to have followed the "Old Government Road" (Cook, 1999). In Kapaʻa, the present day Kūhiō Highway probably follows the same route as the original Government Road and subsequent Kauaʻi Belt Road. The location of the kuleana awards in Kapaʻa indicates that the majority of the house lots were situated along the Government Road. LCA 3243 names a "road" as one of its boundaries.

<u>20th Century History of Kapaʻa (1900 - Present)</u>

In the early 1900s, government lands were auctioned off as town lots in Kapaʻa to help with the burgeoning plantation population. One kamaʻaina mentioned that in the 1930s and 1940s, the area north of Moʻikeha Canal in Kapaʻa was mostly settled by Portuguese families (Bushnell et al. 2002). The Japanese were also very prominent in the 1920s and 1930s largely replacing the Chinese merchants of

the turn of the century in the Kapaʻa business sector (Bushnell et al. 2002). The Board of Health, Territory of Hawaiʻi ran a dispensary in Kapaʻa at the makai edge of Niu Street near the Kapaʻa Beach Park parking lot, adjacent to the bike path starting 1926. The lot is presently vacant. A Fire Station was once located in the area now occupied by the Coral Reef Hotel and a Courthouse and jail cell once stood at the location of the present Kapaʻa Neighborhood Center. It is not known when these structures were removed or abandoned. In 1913, Hawaiian Canneries opened in Kapaʻa at the site now occupied by Pono Kai Resort (Cook, 1999: 56). Through the Hawaiian Organic Act, Hawaiian Canneries Company, Limited purchased the land they were leasing, approximately 8.75-acres, in 1923 (Bureau of Land Conveyances, Grant 8248). A 1923 sketch of the cannery shows only four structures, one very large structure assumed to be the actual cannery and three small structures makai of the cannery. A 1933 historic photograph of Kapaʻa Town shows an ironwood windbreak on the makai side of the cannery adjacent to the railroad. By 1956, 1.5-million cases of pineapple were being packed. By 1960, 3,400-acres were in pineapple and there were 250 full time employees and 1,000 seasonal employees for the Kapaʻa Cannery (Honolulu Advertiser, March 20, 1960). In 1962, Hawaiian Canneries went out of business due to competition from third world countries.

The Ahukini Terminal & Railway Company was formed in 1920 to establish a railroad to connect Anahola, Keālia, Kapaʻa to Ahukini Landing and "provide relatively cheap freight rates for the carriage of plantation sugar to a terminal outlet" (Conde and Best, 1973: 185). This company was responsible for extending the railroad line from the Makee Landing, which was no longer in use, to Ahukini Landing, and for constructing the original Waikaʻea Railroad Bridge and the Moʻikeha Makai Railroad Bridge.

In 1934, the Līhuʻe Plantation Company absorbed the Ahukini Terminal & Railway Company and Makee Sugar Company (Conde and Best, 1973: 167). The railway and rolling stock formerly owned by Makee Sugar Company became the Makee Division of the Līhuʻe Plantation. At this time, besides hauling sugar cane, the railroad was also used to haul plantation freight including "fertilizer, etc... canned pineapple from Hawaiian Canneries to Ahukini and Nāwiliwili, pineapple refuse from Hawaiian Canneries to a dump near Anahola and fuel oil from Ahukini to Hawaiian Canneries Co., Ltd." (Hawaiian Territorial Planning Board, 1940: 11). Former plantation workers and kamaʻaina growing up in Kapaʻa remember when the cannery would send their waste to the pineapple dump, a concrete pier just north of Kumukumu Stream (State Site No. 50- 30-08-789) by railroad. The structure is built over the water where the rail cars would dump the pineapple waste. The current would carry the waste to Kapaʻa which would attract fish and sharks (Bushnell et al. 2002).

Līhuʻe Plantation was the last plantation in Hawaiʻi to convert from railroad transport to trucking (Conde and Best, 1973: 167). "By 1957 the company was salvaging a part of their plantation railroad, which was being supplanted by roads laid out for the most part on or close to the old rail bed" (Ibid: 167). By 1959, the plantation had completely converted over to trucking. The Cane Haul Road which begins near the intersection of Hauaʻala Road and Kūhiō Highway is thought to date to the late 1950s and follows the alignment of the old railroad.

Severe floods in Kapaʻa in 1940 led to the dredging and construction of the Waikaʻea and Moʻikeha Canals sometime in the 1940s (Hawaii Territorial Planning Board, 1940: 7). Although the Waikaʻea Canal, bordering the Kapaʻa Pineapple Cannery, had been proposed as early as 1923, nothing was constructed until after the floods (Bureau of Land Conveyances, Grant 8248). A Master Plan for Kapaʻa, published in 1940, asks the Territorial Legislature for funds to be set aside for the completion of a drainage canal and for filling makai and mauka of the canal (Hawaii Territorial Planning Board, 1940:7). In 1955, reports came out on the dredging for coral proposed for the reef fronting Kapaʻa Beach Park

(Garden Island Newspaper, September 21, 1955). The coral was to be used for building plantation roads. This dredging was later blamed for accelerated erosion along Kapaʻa Beach (Garden Island Newspaper, October 30, 1963).

Today, there are several sea walls along the Kapaʻa Beach Park to check erosion. Old time residents claim the sandy beach in Kapaʻa was once much more extensive than it is now (Bushnell et al. 2002). Keālia Town slowly dispersed after the incorporation of Makee Sugar Company into Līhuʻe Plantation in the 1930s. Many of the plantation workers bought property of their own and moved out of plantation camps. The plantation camps which bordered Kūhiō Highway were disbanded in the 1980s. The Līhuʻe Plantation began to phase out in the last part of the 20th century. Kapaʻa Town suffered after the closing of the Kapaʻa Cannery however the growing tourist industry helped to ease the economic effects of the Cannery's closing.

HoKua Place Site

Heiau of Kapaʻa

During their expeditions around Hawaiʻi in the 1880s, collecting stories from ka poʻe kahiko, Lahainaluna students stopped in Kapaʻa and Keālia and gathered information regarding heiau of the region. All together, fourteen heiau were named in Kapaʻa and Keālia, suggesting the two ahupuaʻa were probably more politically significant in ancient times. The following Table lists the names of the ten heiau identified in the ahupuaʻa of Kapaʻa, their location if known, their type, and associated chief and priest.

The exact locations of these heiau are unknown. The locations of two of the heiau correlate with the locations of wahi pana which are known to be in close to Kuahiahi and Kaluluomoʻikeha. Kuahiahi (also spelled Kaahiahi and Keahiahi) is the rocky headland at the north end of Kapaʻa where the first Kapaʻa School was once located. Kaluluomoʻikeha is thought to be the general area near the Moʻikeha Canal and the present day Coral Reef Hotel.

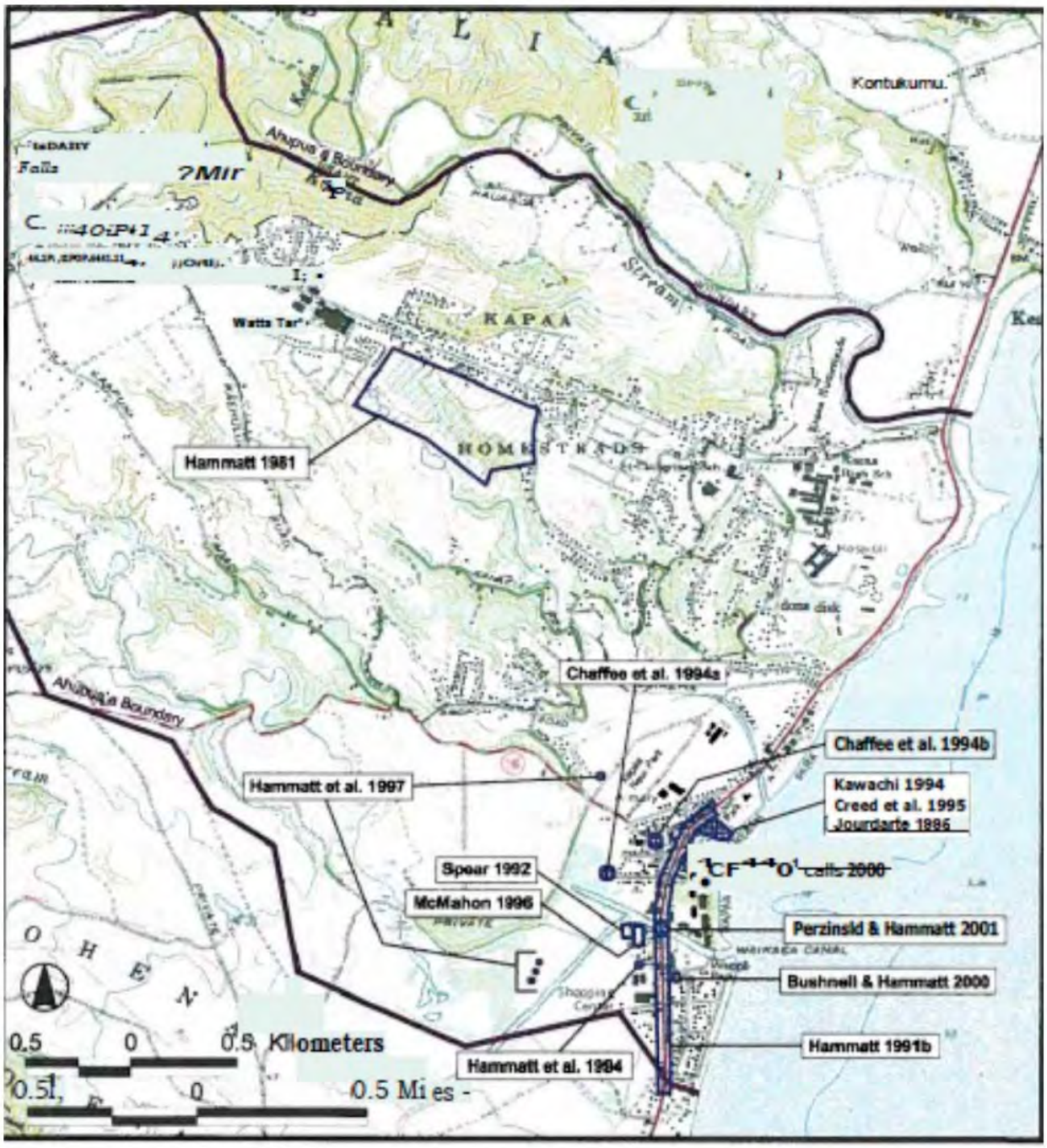
Name	Location	Type	Associated
Mailehuna	Kapa‘a (Mailehuna is the area of the present day Kapa'a School)	unknown	Kiha, Kaumuali‘i/ Lukahakona
Pueo	Kapa‘a	unknown	Kiha, Kaumuali‘i/ Lukahakona
Pahua	Kapa‘a/Kealia	unknown	Kiha/ Lukahakona
Kumalae	Kapa‘a/Kealia	unknown	Kiha/ Lukahakona
Waiehumalama	Kapa‘a/Keilia	unknown	Kiha/ Lukahakona
Napu‘upa‘akai	Kapa‘a/Kealia	unknown	Kiha/ Lukahakona
Noeamakalî‘i	Kapa‘a/Kedlia	"heiau for birth of Kaua‘i Chiefs, like Holoholoku"	Unknown
Pu‘ukoa	Kapa‘a/Kealia	"unu type heiau"	Unknown
Piouka	Kapa‘a/Kealia	"unu type heiau"	Unknown
Una	Kapa‘a/Kealia	Unknown	Kiha/ Lukahakona
Mano	Kapa‘a/Kealia	Unknown	Kiha/ Lukahakona
Kuahiahi	Kapa‘a (govn't school stands on site now)	Unknown	Kaumuali‘i/ Lukahakona
Makanalimu	Upland of Kawaihau	Unknown	Kaumuali‘i
Kaluluomoikeha	Kapa‘a	Unknown	Mo‘ikeha

Archaeological Studies and Sites in Kapa‘a Ahupua‘a

The following table outlines the archaeological research and historic properties identified in Kapa‘a Ahupua‘a. The Table provides a list of archaeological research conducted within Kapa‘a Ahupua‘a, including columns for source, location, nature of study, and findings.

Source	Location	Nature of Study	Findings
Bennett 1931	Island wide Identifies 2 sites: Site 110 Taro terraces and bowl and Site 111 A large simple dirt Hawaiian ditch	Archaeological Reconnaissance	Identifies 2 sites: Site 110 Taro terraces and bowl and Site 111 A large simple dirt Hawaiian ditch
Handy and Handy 1972	Archipelago-wide	Native Planter study	Discusses "highly developed irrigation system"
Ching 1976	Just south of the Waikaea Drainage Canal	Archaeological Reconnaissance	No significant findings
Hammatt 1981	Upland Kapa'a	Archaeological Reconnaissance	No significant findings
Hammatt 1986	Upper reaches of the Makaleha stream valley.	Archaeological Reconnaissance	No significant findings
Hammatt 1991	Along Kuhio . Highway	Subsurface Testing	Identifies two sub-surface cultural layer sites
Kikuchi and Remoaldo 1992	Around Kapa'a Town	Cemeteries of Kauai	Identifies six cemeteries
Spear 1992	South side Waikaea Canal, mauka of Kuhio Highway. (TMK: 4-5-05:04, 09)	Monitoring Report	Designated subsurface site 50-30-08-547

Source	Location	Nature of Study	Findings
Chaffee, Burgett & Spear 1994a	A house lot near the corner of Kukui and Ulu Streets in mauka Kapa'a Town. (TMK: 4-5-09:10)	Archaeological Inventory Survey	No significant findings
Chaffee, Burgett & Spear 1994b	Mamane Street Kapa'a Town. (TMK: 4-5-09:51	Archaeological Inventory Survey	No significant findings
Hammatt, Ida & Chiogioji 1994	Proposed bypass routes mauka of Kapa'a Town	Archaeological Assessment	No new field work, reviews literature
Hammatt, Ida & Folk 1994	South side Waikaea Canal, mauka of Kuhio Highway (TMK: 4-5-05:06)	Archaeological Inventory Survey	Weak cultural layer designated site 50-30-08-748
Kawachi 1994	Inia Street (Jasper) TMK 4-5-08:33	Burial Report .	Designates Site 50-30-08-871
McMahon 1994	"behind the armory in Kapa'a near the god stones" The location is uncertain & "Buzz's near the Coconut Marketplace"	Documents second hand report of burials in two locations	Bones in 3 places reported from behind the armory, 16 bodies reported from the Buzz' s restaurant. No site numbers assigned
Creed, Hammatt, Ida, Masterson & Winieski 1995	Kapa'a Sewer line project, Kuhio Highway, south and central Kapa'a Town	Archaeological Monitoring Report	Documents cultural layer of site -1848 and (an enlarged) site -1849 & recovery of thirty burials at sites —867, -868, -871, & -1894
Jourdane 1995	1382-A `Inia Street, *makai* of Kuhio Highway, central Kapa'a Town	Burial Report	Site 626
McMahon 1996	South side Waikaea Canal, mauka of Kuhio Highway (TMK: 4-5-05:08)	Archaeological Inventory Survey	No significant cultural material
Hammatt, Chiogioji, Ida & Creed 1997	Test excavations focused inland of Kapa'a Town	Archaeological Inventory Survey	Four test trenches were excavated inland of Kapa'a Town
Borthwick and Hammatt 1999	Kapa'a Seventh-Day Adventist Church at 1132 Kuhio Highway	Archaeological Monitoring and Burial Treatment Plan	Monitoring was indicated as this parcel lay within the designated Site 50-30-08-1848.



Map showing previous archaeological studies in Kapa‘a

Source	Location	Nature of Study	Findings
Bushnell and Hammatt 2000	Seventh-Day Adventist Church, *makai* of Kuhio Highway, south of the Waikaea Canal	Archaeological Monitoring Report	Minimal findings (one piece of worked bone)
Callis 2000	Kapa'a Beach Park	Burial Removal and Archaeological Monitoring Report	Human Burial
Perzinski and Hammatt 2001	KuhioHighway on the margins of the Waikaea Canal	Archaeological Monitoring Report	No significant cultural material
Elmore and Kennedy 2003	Kuhio Highway	Archaeological Monitoring Report	No significant cultural material
Dega, Michael F. and James Powell 2003	Kuhio Highway	Archaeological Monitoring Report	Human Burials •
Van Ryzin, Karl and Hallett Hammatt, 2004	Water Reservoir	Archaeological Assessment	No significant findings

The following Map and Table is a list of known historic properties within the ahupua‘a and includes columns for state site numbers, site type, location and reference.

Site # 50-30-08-	Ahupuaʻa	Site Type/ Name (if any)	Location	Site Constraints	Reference
B001	Kapaʻa	Historic Cemetery	South of bend of Kapaʻa Stream, a kilometer mauka from Kuhiö Hwy	Appears to be a discrete historic cemetery	Kikuchi and Remoaldo 1992
B002	Kapaʻa	Historic Cemetery	Just mauka from Kuhiö Highway, south of Kapaʻa Stream	Appears to be a discrete historic cemetery	Kikuchi and Remoaldo 1992
B003	Kapaʻa	Kapaʻa Public Cemetery	South of Kanaele Road, one kilometer inland of Kuhiö Highway	Appears to be a discrete historic cemetery	Kikuchi and Remoaldo 1992
B004	Kapaʻa	Historic Cemetery	North of Apopo Road, one kilometer inland of Kuhiö Highway	Appears to be a discrete historic cemetery	Kikuchi and Remoaldo 1992
B013	Kapaʻa	Historic Cemetery	Just *mauka* from Kuhiö Highway, north of the Waikaea Canal	Appears to be a discrete historic cemetery	Kikuchi and Remoaldo 1992
B014	Kapaʻa	All Saints Episcopal Church Cemetery	Just *mauka* from Kuhiö Highway, south of the Waikaea Canal	Appears to be a discrete historic cemetery	Kikuchi and Remoaldo 1992:62-65
547	Kapaʻa	sub-surface features including a firepit and a possible house foundation	South of bend of Waikaea Canal, mauka of Kuhiö Highway	Archaeological monitoring in the vicinity is recommended	Spear 1992:3
626	Kapaʻa	Burial	Inia Street, *makai* of Kuhiö Highway, central Kapaʻa	Consultation and monitoring in vicinity indicated	Jourdane 1995
748	Kapaʻa	Minimal findings, a weak cultural layer (buried A-horizon)	South of the bend of the Waikaea Canal, *mauka* of Kuhiö Highway	Considered no longer significant within project area	Hammatt et al. 1994
789	Kapaʻa/ Kealia	Historic Road	Coastal Cane Haul Road near Kawaihau Road turn off		Perzinski et al. 2000

Site # 50-30-08-	Ahupuaʻa	Site Type/ Name (if any)	Location	Site Constraints	Reference
867	Kapaʻa	1 set of human remains	Kukui Street, just *mauka* of Kuhiö Highway, Kapaʻa Town	Consultation and monitoring in vicinity indicated	Creed et al. 1995:50
868	Kapaʻa	1 set of human remains	Lehua Street *mauka* of Kuhiö Highway, Kapaʻa Town	Consultation and monitoring in vicinity indicated	Creed et al. 1995:50
871	Kapaʻa	13 sets of human remains (Creed et al. 1995:50)	Inia Street, *makai* of Kuhiö Highway	Consultation and monitoring in vicinity indicated	Kawachi 1994; Creed et al. 1995:50
1848	Kapaʻa	Cultural layer and sub-surface features	Along Kuhiö Highway between Wana Road and the Waikaea Drainage Canal	Archaeological monitoring in the vicinity is recommended	Hammatt 1991; Creed et al. 1995
1849	Kapaʻa	Cultural layer and sub-surface features; Creed et al. 1995:53 expands boundaries to incl. burial sites, - 626, -867, -868 -871, and -1894	Along Kuhiö Highway between Inia Street and Kauwila Street extending to the coast	Consultation and monitoring in vicinity indicated	Hammatt 1991; Creed et al. 1995
1894	Kapaʻa	11 sets of human remains	Ulu Street, just north of Kuhiö Highway, Kapaʻa Town	Consultation and monitoring in vicinity indicated	Creed et al. 1995:50
2075	Kapaʻa/Ke ãlia	Highway Bridge Foundation (old Kauaʻi Belt Road)	Kuhiö Highway at Kapaʻa/ Keãlia River		Bushnell et al. 2002:55
2076	Kapaʻa	Petroglyph	Rocky coast below former cane haul road (Site -789)	Preservation	Bushnell et al. 2002:55
2077	Kapaʻa	Concrete steps (related to historic beach pavilion)	Near present Kapaʻa Beach Park Pavilion		Bushnell et al. 2002:55

Site # 50-30-08-	Ahupuaʻa	Site Type/ Name (if any)	Location	Site Constraints	Reference
2078	Kapaʻa	Historic Railway Alignment (2 Railroad Bridges, & RR Culvert Foundation)	Both railroad bridges span the Moikeha Canal; the RR culvert foundation is located north of the Kapaʻa Swimming Pool.		Bushnell et al. 2002:55

Pattern of Archaeological Sites in Kapaʻa

The pattern of archaeological studies in Kapaʻa Ahupuaʻa is somewhat skewed with a dozen projects in urban Kapaʻa Town and very little work along the coast. Major archaeological sites have been found in the Kapaʻa Town area including extensive cultural layers with burials and other cultural features underlying Kūhiō Highway near All Saints Gym and near the older part of Kapaʻa Town between Waikaʻea Canal and Kapaʻa Beach Park, makai of Kūhiō Highway (Hammatt 1991; Kawachi 1994; Creed et al. 1995; Jourdane 1995; Callis 2000). The mauka-makai extent of these cultural layers has not been clearly defined. These extensive cultural deposits associated with pre-historic and early historic habitation are known to exist in a relatively narrow sand berm that makes up the physiogeography of Kapaʻa. The areas mauka of Kapaʻa Town are marshy although much of it has been filled in recent decades. The five kuleana awarded during the Mahele are located adjacent to the present highway. The more mauka studies (Spear 1992, Chaffee et al. 1994a & 1994b, Hammatt et al. 1994, 1997, McMahon 1996) are thought to be located towards the mauka fringe of the sand berm, approaching more marshy conditions and have generally reported no significant or minimal findings. Less than 1.5-km to the south of Waikaʻea Canal is another extensive subsurface, cultural deposit which is associated with a pre-contact fishing encampment located at the southern boundary of Waipouli adjacent to Uhalekawaʻa Stream (Waipouli Stream) and the ocean (Hammatt et al. 2000).

Anticipated sites based on historic and archaeological studies in mauka Kapaʻa would be evidence of cane cultivation like ditches and possible terracing for lo'i cultivation with nearby habitation sites.

Field Inspections

On January 3 and April 25, 2012 Exploration Associates Ltd. archaeologist Nancy McMahon, M.A. made field inspections on proposed HoKua Place/Kapaʻa Highlands II project area. Access was made via Olohena Road (two gates).

Because of known historic cane cultivation in this area of Kapa`a, predicted sites might be historic plantation related infrastructure such as ditches, flumes, roads, temporary cane-haul railroad berms and reservoirs. None were observed during the survey. The shallow ravine the project area were surveyed and tested, however no pre-Contact or historic era terraces or habitation sites were revealed.

The parcel contains no surface archaeological sites. The access road is related to access for construction of the buildings already present on the Phase I parcel.

Entrance off Olohena Road looking makai in the distance the Solar Farm

Remnant Road with Cattle Grazing in the Distance

View across the Project Area, Facing Makai and Northeast

Looking at the Roof of Kapa‘a Middle School

Subsurface Testing

On November 11, 2012, three trenches were excavated with a backhoe with a 24 in. width bucket. (Figure below). Trench 1 was excavated to a depth of 183 cm with a length of 10 meters. Trench 2 was excavated to a depth of 160 cm and a length of 3 m. Trench 3 was excavated to a depth of 260 cm and a length of 2.5 m. Each evinced the same soil composition. A description of the soils representing all three trenches is presented here.

Trench location, facing northeast

A representative profile description evinced the same stratigraphy consisting in all three trenches, consisting of three soil layers with only a single clear boundary delineating the topsoil from the underlying soils. Soil differences could only be determined utilizing the Munsell Color Chart. The topsoil in each trench 5 YR 4/3 reddish brown organic. The other two layers are classified as 5 YR 5/6 yellowish red [20 cmbs] and 5 YR 4/6 yellowish red [20 cmbs to base of excavation]. Characteristics are dry to very dry, crumbly, medium firm, clayey silt. It is pretty much cultivated soils. A local informant, Mr. Vasquez, who worked for the Lihue plantation most of his life Informant stated the plantation chain and ball dragged this land several times over.

Profile Test trench 2 on the left and Trench 3 on the right.

A geologic survey was undertaken on the adjacent Phase I parcel prior to the construction of a solar farm. Soils extracted and examined in test trenches revealed only agricultural soils. No buried cultural layers or plantation infrastructure was present.

Cultural Resources

A Cultural Impact Assessment (CIA) was conducted for the project; it is attached as Exhibit M. Consistent with the Office of Environmental Quality Control guidelines, the CIA methodology incorporated:

- Historic Research (conducted at the State Historic Preservation Division Library, the Hawaiʻi State Archives and the Bishop Museum where information on historic land use and past cultural traditions was sought.)
- Archaeological Review (using the library at the Department of Land and Natural Resources, State Historic Preservation Division to obtain information regarding previous archaeological and cultural studies in the Kapaʻa area.)
- Identification of Knowledgeable Informants (Hawaiian organizations, community members and cultural and lineal descendants with lineal ties to the greater Kapaʻa area, as well as others with ties to the region were contacted, including the State Historic Preservation Division (SHPD), The Office of Hawaiian Affairs (OHA), the Kauaʻi/Niʻihau Islands Burial Council, the Royal Order of Kamehameha, Kaumualiʻi Chapter, Kauaʻi County Council, Kauaʻi County Mayor, Kauaʻi Health Heritage Coastal Corridor Committee, Kauaʻi Historical Society, Kauaʻi Historic Preservation Commission.
- Interviews (Once the participant was identified, she/he was contacted and interviewed. Excerpts from the interview are used throughout the CIA report, wherever applicable.)
- Report (A CIA report was prepared that documents relevant information on traditions and practices from the historic record as well as from contemporary oral sources. The report includes cultural and historic documentation of Kapaʻa, a summary of archaeological studies, the results of community consultation and an assessment of traditional resources/traditional practices.

The project area lies in the traditional ahupuaʻa of Kapaʻa which belongs to the ancient district of Puna (now the district is more commonly called "Kawaihau"), one of five ancient districts on Kauaʻi (King 1935: 228). Puna was the second largest district on Kauaʻi, behind Kona, and extended from Kipu south of Līhuʻe to Kamalomaloʻo, just north of Keālia.

For taxation, educational and judicial reasons, new districts were created in the 1840s. The Puna District, with the same boundaries became the Līhuʻe District, named for an important town in that district. In 1878, by the act of King Kalākaua in securing a future name for the new Hui Kawaihau, created the new district of Kawaihau.

This new district encompassed the ahupuaʻa ranging from Olohena on the south to Kilauea on the north. Subsequent alterations to district boundaries in the 1920s left Kawaihau with Olohena as its southernmost boundary and Moloaʻa as its northernmost boundary (King 1935:222).

Historically, these ahupuaʻa contained two prominent landscape features, a coastal plain with sand dunes and a large marsh. An 1872 map by James Gay delineating the boundaries of Kapaʻa and adjacent lands shows that much of the makai region was a "swamp" that extended from Waipouli into Kapaʻa.

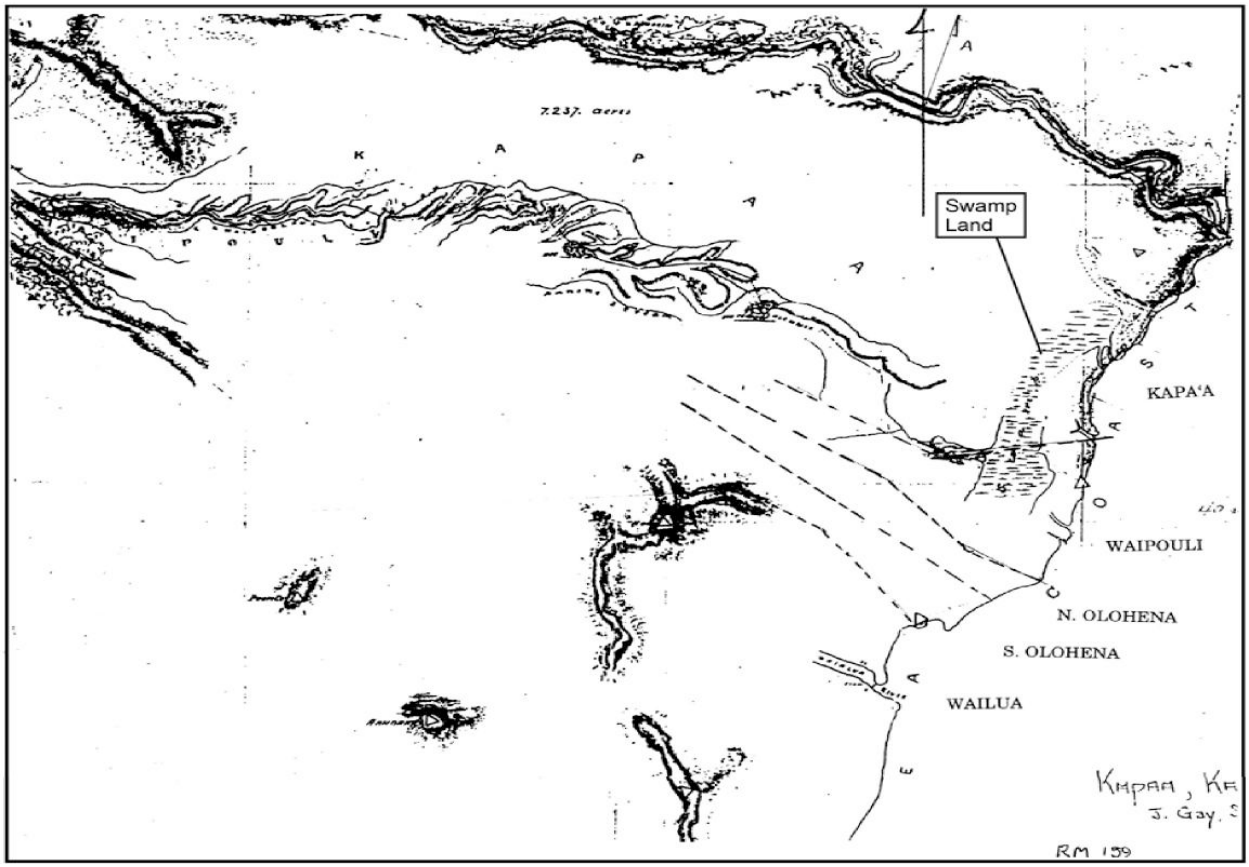
This "swamp" appears to be the most prominent natural feature of the seaward end of Waipouli and Kapaʻa. The makai areas of the ahupuaʻa can be characterized as fairly flat. Kapaʻa has an irregularly-shaped gulches and small valleys in the uplands, through which small tributary streams run, including the Kapahi, Makaleha, Moalepe and Konohiki Streams. While some of these streams combine with

other tributaries in neighboring Keālia to form Kapaʻa Stream, which empties into the ocean at the northern border of the ahupuaʻa, others flow directly into the marsh areas of Kapaʻa and Waipouli (Handy and Handy 1972:394,423; Territorial Planning Board 1940:9).

Kapaʻa Town area is built on a sand berm with ocean on the makai side and marsh on the mauka side. The sand berm was probably slightly wider here than in other localities, but dry land was probably always at a premium.

Hawaiian traditions that centered on Kapaʻa in pre-contact times suggest the significance of, and association with, the *aliʻi.* A survey of traditional mythological literature shows that Kapaʻa was prominently associated with some of the most famous legendary and historical figures including Maui, Kawelo, Mōʻikeha, Māweke, Palila, Pākaʻa and Kanaka Nunui Moe.

What few specific references there are suggest that high status habitation was focused near the coast with less intensive utilization of the uplands which were regarded as wild places. The most notable feature of the traditional accounts are the references to grasses and sedges (Kalukalu grass and Ahuawa rushes) which undoubtedly reflects in part the natural marsh lands near the coast but may also reflect transformation of the landscape through a denudation of trees by the activities of a relatively dense population harvesting slow growing trees for firewood and construction materials over many centuries.



Portion of 1872 Survey Map by James Gay, Showing Swamp Land in Puna.

The Organic Acts of 1845 and 1846 initiated the process of the Mahele, which introduced private property into Hawaiian society. In 1848 the crown and the aliʻi received their lands. The common people received their kuleana in 1850. It is through information garnered from records for Land Commission Awards (LCAs) generated during the Mahele that specific documentation of traditional life in Kapaʻa come to light.

Documents relating to Land Commission Awards (kuleana) during this period show, surprisingly, that only six individuals were awarded kuleana parcels in the relatively large ahupuaʻa of Kapaʻa. Five of the six received multiple parcels and show characteristic similarities. They are Keo (LCA #3554, 3599), Kiau (#8843), Kamapaa (#8837), Ioane Honolii (#3971) and Huluili (#3638). All five had loʻi on the mauka side of the lowland swamp area, sometimes extending a short distance up into small, shallow gulches and valleys. Each also had a separate house lot located on the makai side of the swamp, adjacent to the beach.

Interestingly, the residential "village" of Kapaʻa did not exist as a single entity, but was a series of small settlements or compounds that stretched along the shoreline of the ahupuaʻa and included (south to north) Kupanihi (Makahaikupanihi), Kalolo (Kaulolo), Puhi, and Ulukiu. The sixth individual, Ehu (#8247), was the only person to be awarded a single parcel in the upland area of Kapaʻa at Moalepe valley, approximately five miles from the shore.

A check of the Foreign Testimony (F.T.) for Kuleana Claims to Quiet Land Titles in the Hawaiian Islands (1848-50) reveals the names of three ʻauwai in Kapaʻa. Cross referencing this information with various maps gives a general indication of their location: Makahaikupanihi, along the southern border near the shore and the settlement in Waipouli; Makea, near the current Kapaʻa Public Library on the mauka side of Kūhiō Highway; and Kapaʻa, probably along the current Kanaele Road.

There were no kuleana claims found within the project area.

Burials

The coastline in Kapaʻa once contained extensive sand dunes that were documented in travels throughout the nineteenth century (Knudsen 1991; Alexander 1991). Most of the sand dunes were modified or destroyed at the onset of the twentieth century. This was due to the extensive use of the coastal areas for ranching, settlement, and new transportation routes like trains and roads.

Archaeological studies in the Kapaʻa area demonstrate the widespread prehistoric use of sand as a medium for burials. Burials have been identified along the coast and extending well mauka of the coastline into present day Kapaʻa Town. Cultural deposits found associated with burials in the Kapaʻa area shed light on the Hawaiian tradition of burying members of the ʻohana in the kulaiwi, or birth land.

For Hawaiians, "man's immortality was manifest in his bones...Even the bones of the living became symbols of the link between man's progenitors and his own eventual immortality" (Pukui et al. 1972:106). Thus, the discovery of iwi (bones) is a very sensitive issue for the Hawaiian community requiring much mediation and protocol.

No burials are believed to be present within the project area and none are known in the vicinity.

There are no sites within the property as noted on the Kawaihau Planning District Heritage Resources map above.

Interviews

A substantial effort was made to locate knowledgeable informants for the area of Kapa‘a. An attempt was made to contact as many individuals as possible. These led to the five knowledgeable parties that were interviewed for this project.

Through the consultation process, five individuals were identified as potential informants. Three had written letters of their knowledge of the area. Two others informants gave verbal interviews.

One of these spoke about the use of the lands for pasture when the Plantation ceased using the land for cane. The other informant was from the East Kaua‘i Soil and Water District and had no knowledge any plantation ditches that were still intact within the project area. The old maps he had, showed the ditch system around Twin Reservoir which is located directly across Olohena Road from this property but the maps stop before this project area. This indicates that there were no permanent plantation ditch lines on this parcel.

No Native Hawaiian informants came forward to discuss any traditional gathering associated with this project area. The Office of Hawaiian Affairs gave a list of possible individuals with extensive knowledge of traditional cultural practices and resources but none knew of any for this project area.

Gathering for Plant Resources

Hawaiians utilized upland resources for a multitude of purposes. Forest resources were gathered, for not only the basic needs of food and clothing, but for tools, weapons, canoe building, house construction, dyes, adornments, hula, medicinal and religious purposes

The present project area is dominated by alien vegetation (albezia, ginger, California grass) although some traditional cultigens (banana, bamboo, kid and historically introduced food plants (papaya)) are present as well. Within the project area itself no specific documentation was found regarding gathering of plants during traditional Hawaiian times.

During the assessment there were no ongoing practices related to traditional gathering of plant resources identified in the present project area. None of the individuals contacted for this assessment identified any native plant gathering practices within the project area.

Historic Properties

No historic properties were identified within the project area or in the vicinity. The density of identified historic properties is far greater near the coast of Kapa‘a Ahupua‘a.

Trails

Based on nineteenth and twentieth century maps the primary transportation routes mauka/makai correlated closely to the existing major roadways. During the assessment there were no trail systems identified in the proposed project area.

Plantation Ditch System or ‘Auwai

Based on the archaeological assessment (McMahon, 2012 & 2013), field checks, documentation from land records, plantations records and maps, and informants information, no remnants of these historic properties exist. Several pieces presumed to be remnant of the metal flumes (transportable irrigation) were found. It is also thought that the existing roads on the property might be filled.

Past Analysis

In researching archeological/cultural issues related to the HoKua Place/Kapa‘a Highlands II site, past environmental review documents were studied.

The Final Environmental Impact Statement and Site Selection Study for the New Kapaʻa Intermediate School by The Keith Companies in 1993 analyzed an area bordering the HoKua Place property. The study noted,

> "None of the potential school sites fall within an area identified as culturally sensitive on the County Cultural Sensitivity Maps and the sites have been historically disturbed through sugar cane cultivation and grazing activities. No archaeological, historical or cultural resources are known or expected to be present at any of the sites, however an archaeological inventory survey of the selected site will be conducted to insure that no archeological, historical or cultural resources of significance are impacted by the proposed development. Should such resources be found at the selected site, mitigation and/or preservation plans will be prepared in consultation with the State Department of Land and Natural Resources, State Historic Preservation Division, the County Planning Department, and the Kauaʻi Historic Preservation Review Commission."

It is not known if an archeological inventory study was done for the site. The FEIS also notes a letter from the State Historic Preservation Division which states,

> "A review of our records show that there are no known historic sites at these four proposed project locations."

The Final Environmental Assessment for Kūhiō Highway Improvements, Extension of Temporary Bypass Road, Kūhiō Highway to Olohena Road by the State Department of Transportation in August 2004, analyzed the property surrounding the HoKua Place project site. It states,

> "The project has been in agricultural use for over 100 years. During the course of this use, the site has been extensively disturbed and the likelihood of any archaeological or cultural artifacts remaining on site are extremely unlikely."
>
> "The project site has a long established history in sugar cane agricultural use. This use has removed the site from any cultural practices for over 100 years. The site has been fallowed in recent years and the road has been closed to the public with a gate off of Kūhiō Highway and concrete barrier walls in the vicinity of the ball field. During a site inspection several individuals were observed fishing for Samoan crab along the bridge. This practice can be conducted at any point along the canal however the bridge provided a convenient improved surface for this fishing activity. The proposed bypass road improvement will not preclude this fishing activity however the bridge location will not be suitable for fishing as the bridge will not include pedestrian easements."
>
> "Water resources are often identified as potential habitation sites however the Moʻikeha Canal is a man made and improved drainage feature therefore no habitation sites are likely to be found in the vicinity of the bridge."
>
> "The State Historic Preservation Division has not issued a determination regarding the impact of the proposed project and no statement of 'no effect' has been presented in the Draft EA. The Draft EA does state that the likelihood of finding any archaeological material is minimal as the project will not require any significant subsurface grading."

The Final Environmental Assessment Wailua Facility Plan prepared for County of Kauaʻi, Department of Public Works, Division of Wastewater Management by Fukunaga & Associates Inc. in April 2008 analyzes the Wailua area as a whole. It states,

"Wailua is known for a culturally significant area in Kaua'i, especially in the vicinity of the Wailua River. According to the Malae Heiau: Vegetation Removal and Landscaping Plan, "The lands along the Wailua River comprised a political, religious and social center for Kaua'i's paramount chiefs who resided at Wailua most of the year."

"The Wailua Complex of Heiau is identified and registered on the National and State Register of Historic Places (NRHP). Landscape elements, such as historic plantation town architecture in Kapa'a, are also known and preserved as a significant historic cultural value of Kaua'i. The State Department of Land and Natural Resources (DLNR), Historic Preservation Division recognizes historically significant structures in Kapa'a.

- Puuopae Bridge (Site #: 30089398, TMK: 4-4-02)
- Opaekaa Road Bridge (Site #: 30089377, TMK: 4-2-02:22)
- Seto Building (Site #: 30089379, TMK: 4-5-11:31)
- Kapa'a School (Site #: 30089391, TMK: 4-6-14:31)
- Kawamura Residence and Utility Shed (Site #: 30089393, TMK: 4-5-08:16)
- Wailua Complex of Heiaus (Site #: 3008502, TMK: 3-9-06:01, 4-1-02:03, 4-2-13:17)
- Kukui Heiau (Site #: 3008108, TMK: 4-3-02:01)"

"According to the DLNR, Historic Preservation Division, the Wailua WWTP service areas are within historically sensitive areas requiring careful planning and monitoring to ensure proper preservation. The proposed project is in a culturally and historically significant area. However, since the project will be in areas that have been previously disturbed, no adverse effect on significant historic sites or human burials is anticipated. Construction and the required mitigation plans will be coordinated with the State Historic Preservation Division, the Kaua'i Burial Council and the Office of Hawaiian Affairs in accordance with the Hawai'i Revised Statutes (HRS) and the Hawai'i Administrative Rules to minimize any long term negative impacts on historic sites."

4.2.2 Potential Environmental Impacts & Mitigation Measures

Archaeological, Historic and Cultural Resources

An Archaeological Assessment and A Cultural Impact Assessment was conducted for the proposed HoKua Place (formerly known as Kapa'a Highlands II). Historic research of the project area was carried out to identify any cultural resources or traditional cultural practices associated with the area encompassing the proposed HoKua Place. In addition, community consultation was conducted. An attempt was made to contact parties regarding cultural knowledge, land use history, cultural sites and traditional Hawaiian or other cultural practices in the vicinity of the project area. Five individuals came forward as knowledgeable informants. In addition to the informants, other community members shared valuable information regarding traditional land use, attitudes and practices associated with the project area.

The marshlands of Kapa'a were once a significant resource prior to Western contact. The fringes of the marsh were utilized for lo'i kalo, and other resources including the gathering of kalukalu, a type of grass utilized for kapa. Places in the marshes also served as fishponds. Vestiges of the cultural significance of the marshlands are retained in the mo'olelo and 'olelo no'eau particular to this area. With the establishment of the sugar plantations in the late nineteenth century, the marshlands were significantly altered. Marsh areas were drained and filled to create more dryland for commercial agriculture and pasture land.

Several individuals consulted and interviewed grew up fishing for ʻōpae and ʻoʻopu in the irrigation ditches which once drained the swamps. They expressed sadness at the changing of the landscape and the passing of their childhood traditions with the final draining and filling of the swamps. No further concerns regarding the marshlands were expressed other than the presumed low potential of possibly encountering habitation deposits and burials related to former LCA parcels.

The CIA report documents the use of the ʻauwai or plantation ditches for irrigation and water use by the residents up until the 1960s. The ʻauwai were also utilized for a variety of activities beyond their primary irrigation purpose. The bulk of the ʻauwai have been lost through modern pasturage, disuse and adjacent road improvements.

In general the community emphasized the importance of communicating with the ʻohana of Kapaʻa regarding changes to the land. This includes asking permission of the ʻohana, including ʻuhane (immortal spirits) for opening up the land to proposed new uses. It was stressed that this and other protocols are necessary to "open the path" for change, thus avoiding accidents and potential obstacles of a cultural nature.

4.2.3 Level of Impact after Mitigation

As noted in Exploration Associates Limited's field checks, archaeological assessment (Exhibit L) and cultural impact assessment (Exhibit M) of the property, as well as prior archeological and cultural evaluations for neighboring properties, no archaeological sites or historic preservation concerns are evident on or in the vicinity of the property.

There are no known traditional resources or cultural practices associated with the HoKua Place Project Area.

If in the unlikely event that any human remains or other significant subsurface deposits are encountered during the course of development activities, all work in the immediate area will stop and the State Historic Preservation Division will be promptly notified.

4.3 Biological Resources

This section discusses the biological resources (flora and fauna) in the region and in project area, the potential impacts of the project on those resources and mitigation measures the project will take to mitigate those potential impacts.

4.3.1 Environmental Setting

The project site has been extensively used for sugar cane cultivation for many years. The project site is currently fallow and was last cultivated over 15-years ago.

Botanical Survey

During April and May of 2012 a botanical survey was conducted on a 97 acre parcel in Kapa`a, Kaua`i, referred to as HoKua Place (formerly known as Kapaʻa Highlands II) (TMK (4)3-8-003:001). This research documented 44 vascular plant species within the survey area. Forty taxa were non-native plant species, three taxa were very common indigenous native species, and one taxon was a Polynesian introduction. (The Report is found in Exhibit J.)

That investigation concluded, "No federally listed as threatened or endangered plant species were observed within or near the survey area." (Text case was changed to sentence case - the report had this sentence in All Caps.)

Botanical Survey Methods

On April 19, 2012 and May 7, 2012, K. R. Wood (Endangered Species Specialist) and assistant Megan D. Kirkpatrick (M.S. Environmental Science) conducted a biological inventory on an undeveloped parcel of property in Kapa`a, Kaua`i (TMK [4]3-8-003:001). The survey area is approximately 97-acres of undeveloped land. The primary objectives of this field survey were to:

a. search for threatened and endangered plant species as well as species of concern;
b. provide a complete vascular plant checklist of both native and non-native plant taxa observed on property; and
c. provide a summary concerning the conservation status of all native taxa observed;

A walk-through survey method was used. Transects included walking/driving around boundaries of property (TMK (4)3-8-003:001) and several transects through the interior portions of property. Plant identifications were made in the field and were recorded. Plant names and authors of dicots and monocots follow Wagner et al. (1990) and pteridophytes follow Palmer (2003). Plants of particular interest were collected by the second author (MK) as herbarium specimen vouchers and deposited at the National Tropical Botanical Garden (NTBG) herbarium. Specimens were placed in newspaper sheets and pressed in-between cardboard herbarium presses and dried at the NTBG.

Botanical Survey Results

The study area represents a lowland non-native mesic plant community dominated by secondary vegetation of trees, shrubs, and grasses, many of which are considered invasive. The land is vacant and currently undeveloped and has a past history of grazing and sugarcane cultivation.

The non-native grass Panicum maximum (Poaceae – Guinea grass) and non-native shrub or small tree Leucaena leucocephala (Fabaceae – koa haole) are by far the dominant species found at the site.

Additional common non-native trees and shrubs include: Lantana camara (Verbenaceae – lākana), Indigofera suffruticosa (Fabaceae – indigo), Syzygium cumini (Myrtaceae – Java plum), Psidium guajava (Myrtaceae – guava), Spathodea campanulata (Bignoniaceae – African tulip), and Senna surattensis (Fabaceae – kolomona).

Several less common non-native trees and shrubs include: Clidemia hirta (Melastomataceae – Koster's curse), Cinnamomum camphora (Lauraceae – camphor tree), Falcataria moluccana (Fabaceae – albezia), Ficus microcarpa (Moraceae – Chinese banyan), and Schefflera actinophylla (Araliaceae – octopus tree).

No Hawaiian endemic species (i.e., restricted to only Hawai`i) were observed. One Polynesian introduction was observed, namely Aleurites moluccana (Euphorbiaceae – kukui tree) which is common throughout the Hawaiian Islands. The three indigenous species found at the site are quite common and include: Hibiscus tiliaceus (Malvaceae – hau) which is also often an invasive tree species, the fern species Psilotum nudum (Psilotaceae – moa), and Waltheria indica (Sterculiaceae - `uhaloa). For complete checklist of species see Table 1 which also includes the common names and status (i.e., indigenous/naturalized) category of each taxon.

In addition to the survey, a review of other reports was conducted as part of the assessment. According to the Hawai'i Natural Diversity Database, there have been no recordings of rare species or eco-systems on the subject property. Considering that the 97-acres have no natural water resources, the near proximity of residential and commercial neighborhoods and the adjacent public school, threatened or endangered birds are not expected to frequent the site.

Botanical Resources

The dominate vegetation zone along the eastern coast of Kaua‘i is made up of open guava forest with shrubs. Characteristic vegetation within this zone includes guava, Koa Haole, Lantana, Spanish clover and Bermuda grass.

Surrounding residential and commercial areas are planted with Coconut trees, common landscaping trees, bushes and ornamental plants. The areas along the Moikeha Canal banks are heavily vegetated with invasive mangrove.

Avian and Mammalian Survey

An avian and mammalian survey was conducted on an approximately 97-acre parcel of land identified as Tax Map Key (4) 3-8-003:001 located in Kapa‘a, Island of Kaua‘i.

The associated report is identified as Exhibit K in this assessment. The report describes the methods used and the results of the avian and terrestrial mammalian surveys conducted on the project site. Both surveys were conducted as part of the environmental disclosure process associated with the proposed project.

Hau bushes along southwestern bounday

The primary purpose of the surveys was to determine if there are any avian and terrestrial mammalian species currently listed, or proposed for listing under either federal or State of Hawai‘i endangered species statutes within or adjacent to the study area. The federal and State of Hawai‘i listed species status follows species identified in the following referenced documents, (Department of Land and Natural Resources (DLNR) 1998; U. S. Fish & Wildlife Service (USFWS) 2005, 2012). The avian and mammalian surveys were conducted May 21, 2012.

Avian Survey Methods

A total of six avian point count stations were sited roughly equidistant from each other within the project site. Six-minute point counts were made at each of the count stations. Each station was counted once.

Field observations were made with the aid of Leica 8 X 42 binoculars and by listening for vocalizations. Point counts were concentrated during the early morning hours, the peak of daily bird activity. Time not spent counting was used to search the remainder of the project site for species and habitats that were not detected during count sessions.

Mammalian Survey Methods

With the exception of the endangered Hawaiian hoary bat (*Lasiurus cinereus semotus*), or *‘ōpe‘ape‘a* as it is known locally, all terrestrial mammals currently found on the Island of Kaua‘i are alien species, and most are ubiquitous. The survey for terrestrial mammalian species was limited to visual and auditory detection, coupled with visual observation of scat, tracks, and other animal sign.

No trapping program or heterodyne bat detection survey methods were used during the course of this survey. A running tally was kept of all terrestrial vertebrate mammalian species detected within the project area during time spent within the project site.

Avian Survey Results

A total of 193 individual birds of 17 species, representing 13 separate families, were recorded during station counts. All 17 species recorded are alien to the Hawaiian Islands. Avian diversity and densities were in keeping with the location of the property and the habitat presently on the site.

Four species, House Finch (*Carpodacus mexicanus*), Nutmeg Mannikin (*Lonchura punctulata*), Japanese White-eye (*Zosterops japonicus*) and Zebra Dove (*Geopelia striata*) accounted for slightly more than 45 percent of all birds recorded during station counts.

The most commonly recorded species was House Finch, which accounted for 14 percent of the total number of individual birds recorded. An average of 32 individual birds was recorded per station count; a number that is about average for point counts in this area on the Island of Kaua‘i.

No avian species currently proposed or listed under either the State of Hawai‘i or federal endangered species statutes was detected during the course of the survey, nor would they be expected given the habitat currently present on the site.

Mammalian Survey Results

Four terrestrial mammalian species were detected while on the site. Numerous dogs (*Canis f. familiaris*) were heard barking from areas adjacent to the site. Tracks and scat of pig (*Sus s. scrofa*) were encountered within the site. Tracks, and scat of both horse (*Equss c. caballus*) and cow (*Bos taurus*), were also encountered within the site.

Avian Resources

The findings of the avian survey are consistent with the location of the property, and the habitat present on the site. As previously stated all of the avian species detected during the course of this survey are alien to the Hawaiian Islands.

Although not detected during this survey, the endangered Hawaiian Petrel (Pterodroma sandwichensis), and the threatened endemic sub-species of the Newell's Shearwater (Puffinus auricularis newelli) have been recorded over-flying the project site between April and the end of November each year (David, 1995; Morgan et al., 2003, 2004; David and Planning Solutions 2008).

Typical Guinea grass/koa haole shrub vegetation looking nortwest

Additionally, the Save Our Shearwaters Program has recovered both species from the general project area on an annual basis over the past three decades (Morgan et al., 2003, 2004; David and Planning Solutions, 2008; Save our Shearwater Program, 2012).

The petrel is listed as endangered, and the shearwater as threatened under both Federal and State of Hawaiʻi endangered species statutes. The primary cause of mortality in both Hawaiian Petrels and Newell's Shearwaters is thought to be predation by alien mammalian species at the nesting colonies (USFWS 1983, Simons and Hodges 1998, Ainley et al., 2001).

Collision with man-made structures is considered to be the second most significant cause of mortality of these seabird species in Hawaiʻi.

Nocturnally flying seabirds, especially fledglings on their way to sea in the summer and fall, can become disoriented by exterior lighting. When disoriented, seabirds can collide with manmade structures, and if they are not killed outright, the dazed or injured birds are easy targets of opportunity for feral mammals (Hadley 1961; Telfer 1979; Sincock 1981; Reed et al., 1985; Telfer et al., 1987; Cooper and Day, 1998; Podolsky et al. 1998; Ainley et al., 2001; Hue et al., 2001; Day et al 2003).

There are no nesting colonies nor appropriate nesting habitat for either of these listed seabird species within the current study site.

Following build out it is probable that cleared areas, especially those that are landscaped as lawns, and or parking lots will provide loafing habitat for Pacific Golden-Plover (Pluvialis fulva).

The plover is an indigenous migratory shorebird species which nests in the high Arctic during the late spring and summer months, returning to Hawaiʻi and the Tropical Pacific to spend the fall and winter months each year. They usually leave Hawaiʻi for their trip back to the Arctic in late April or the very early part of May each year. This species is a common site around the state during the late fall and winter months.

Mammalian Resources

The findings of the mammalian survey are consistent with the location of the property and the habitat currently present on the site.

No Hawaiian hoary bats were seen overflying the site. Hawaiian hoary bats are widely distributed in the lowland areas on the Island of Kauaʻi, and have been documented in and around almost all areas that still have some dense vegetation (Tomich, 1986; USFWS 1998, David, 2012).

Although no rodents were detected during the course of this survey, it is virtually certain one or more of the four established alien muridae found on Kauaʻi, roof rat (Rattus r. rattus), Norway rat (Rattus norvegicus), European house mouse (Mus musculus domesticus) and possibly Polynesian rats (Rattus exulans hawaiiensis) use various resources found within the general project area.

All of these introduced rodents are deleterious to native ecosystems and the native faunal species dependant on them.

Past Analysis

In addition the surveys conducted, past environmental review documents were reviewed - statements from reports and analysis on neighboring properties follows.

The Final Environmental Impact Statement and Site Selection Study for the New Kapaa Intermediate School by The Keith Companies in 1993 analyzed an area bordering the HoKua Place property. The study noted,

> "Typical vegetation observed throughout the service area include several types of palms, ironwood, Norfolk pine, papaya, guava, banana, mango, avocado, lantana, koa haole, hau, sugarcane, taro, java plum, and numerous grass species."
>
> "Domestic pets, feral animals, livestock and rodents make up the majority of the nonhuman mammals inhabiting the service area. The Hawaiian hoary bat, the only native land mammal can be found in the service area, while the endangered marine mammal, the monk seal, occasionally visits the area's shoreline."

The present Kapaʻa Intermediate School was described as Site #1 in the FEIS. The analysis of that site states,

> "Sites #1, #2, and #4 are or were until recently utilized for sugar cane cultivation and sugar cane is the primary botanical species present at these sites. No endangered plant or animal species are known or expected to be affected by establishment of a school at these locations."
>
> "The native Hawaiian seabird, Newell's Shearwater, listed as "threatened" under the Federal Endangered Species Act, is known to nest in the interior mountains above the Wailua area. Shearwaters leaving their nests at night can become disoriented and confused by urban lights and may become exhausted or fly into unseen objects such as utility wires, trees, buildings and automobiles. School facilities lighting can be designed and located to minimize the attraction and confusion impacts on Newell's Shearwater. Avoidance of situations where light glare projects upward or laterally, particularly during the critical fallout period of October and November, will minimize adverse impacts on this unique species."

The Final Environmental Assessment for Kūhiō Highway Improvements, Extension of Temporary Bypass Road, Kūhiō Highway to Olohena Road by the State Department of Transportation in August 2004, analyzed the property surrounding the HoKua Place project site. It states,

> "The majority of the project alignment is covered with koa haole, giant sensitive plant, and various noxious weedy species. These plants are typical of fallowed agricultural fields. The area along the Moikeha Canal banks is heavily vegetated with mangrove, which is also considered a pest. No rare, threatened or endangered species of flora were observed along the project alignment."
>
> "The site does not serve as an endangered wildlife habitat although avifauna, feral cats, dogs and rodents may be found on-site. A few egrets were observed onsite in the grassy areas outside of the project alignment. No rare or endangered species of avifauna were identified.

Fauna within the canal include mosquito fish, tilapia, crayfish and Samoan crabs. It is also likely that some ocean fish, such as barracuda, may enter the lower portions of the canal."

The Final Environmental Assessment Wailua Facility Plan prepared for County of Kauai, Department of Public Works, Division of Wastewater Management by Fukunaga & Associates Inc. in April 2008 analyzes the Wailua area as a whole. It states,

"According to the data compiled by the Hawaii Biodiversity and Mapping Program and the Hawaii Gap Analysis Program, the project area has multiple classifications of low intensity development, cultivated land, grassland, scrub shrub and wetland habitats. The predominant vegetation zone along the eastern coast of Kauai is made up of open guava forest with shrubs. Characteristic vegetation within this zone includes Guava, Koa Haole, Lantana, Spanish clover and Bermuda grass. Surrounding residential and commercial areas are planted with Coconut trees, vegetable gardens, common landscaping trees, bushes and ornamental plants. The project areas are highly disturbed, and it is unlikely that any endangered species of flora are in the areas."

"Mammals in the vicinity of the project include feral cat, roof rat, cattle, dog, pig, and the Hawaiian hoary bat. Birds that are associated with the prevalent vegetation type along the eastern coast of Kauai include cardinal, spotted dove, barred dove, mockingbird, mynah, ricebird, white eye, house sparrow, elepaio, pueo, and golden plover. 'Elepaio and pueo are native Hawaiian birds, and the golden plover is an indigenous Hawaiian bird."

"The U.S. Department of the Interior, Fish and Wildlife Service confirmed that there is no federally designated critical habitat in the proposed project area. However, the following species are observed in the project vicinity and listed as federally threatened and endangered species.

Federally threatened species: Newell's shearwater (*Puffinus auricularis newelli*)

Federally endangered species: Hawaiian petrel (*Pterodroma phaeopygia sandwichensis*); Hawaiian hoary bat (*Lasirus cinereus semotus*); Hawaiian duck (*Anas wyvilliana*); Hawaiian stilt (*Himantopus mexicanus knudseni*); Hawaiian goose (*Branta sandvicensis*); Hawaiian moorhen (*Gallinula chloropus sandvicensis*); Hawaiian coot (*Fulica alai*); Hawaiian monk seal (*Monachus schauinslandi*).

The project areas are already highly disturbed, and it is unlikely that any of the endangered or critical fauna species listed above inhabit the areas."

"Construction timing should avoid disturbance to possible nesting wetland birds in area adjacent to wetlands. Hawaiian petrel and Newell's shearwater are known to transit this area and are prone to collisions with objects in artificially-lighted areas. Artificial lighting and structures higher than the current existing vegetation will attract seabirds circling the light source, and they might collide with structures or fall to the ground. Lights should be designed to prevent the attraction of these nocturnal seabirds (i.e. no emit light upward or no light at night). Contractors need to consult with U.S. Fish and Wildlife Service if necessary."

"There are no indications of rare or endangered flora in the project area. Although the U.S. Department of Interior, Fish and Wildlife Service has confirmed that threatened and endangered

species are observed in Wailua-Kapaa area, the project sites are already highly disturbed and developed. Therefore, no negative impacts to existing plants and mammals are anticipated."

4.3.2 Potential Environmental Impacts & Mitigation Measures

Botanical

As all of the plant species recorded are either naturalized species or common indigenous species it is not expected that the development and operation of the proposed subdivision will result in deleterious impacts to any botanical species currently listed or proposed for listing under either federal or State of Hawaiʻi endangered species statutes.

The Conclusion of the Botanical Survey concluded: No threatened or endangered plant species were observed within or anywhere near the survey area during research and therefore there are no concerns about possible impacts to rare plant species at the HoKua Place (formerly known as Kapaʻa Highlands II) project. The current conditions of this study site indicate that the area has been dominated by non-native weedy species for a very long time. The senior author certified his expertise with more than 25 years conducting biological inventories within the Hawaiian Islands and has specialized in the conservation of Hawai`i's Federally Listed as Endangered plant species, including those considered Candidates for listing, Species of Concern, or Federally Listed as Threatened (USFWS 1999a, 1999b, 2004, 2010).

Seabirds

The principal potential impact that construction and operation of the HoKua Place (formerly known as Kapaʻa Highlands II) project poses to protected seabirds is the increased threat that birds will be downed after becoming disoriented by lights associated with the project during the nesting season. The two main ways that outdoor lighting could pose a threat to these nocturnally flying seabirds is if, 1) during construction it is deemed expedient, or necessary to conduct nighttime construction activities, and 2) following build-out, the potential operation of streetlights and exterior safety and security lighting.

Hawaiian hoary bat

The principal potential impact that the development of the HoKua Place (formerly known as Kapaʻa Highlands II) project poses to bats is during the clearing and grubbing phases of construction as vegetation is removed. The removal of vegetation within the project site may temporarily displace individual bats, which may use the vegetation as a roosting location.

As bats use multiple roosts within their home territories, the potential disturbance resulting from the removal of the vegetation is likely to be minimal. During the pupping season, females carrying their pups may be less able to rapidly vacate a roost site as the vegetation is cleared.

Additionally, adult female bats sometimes leave their pups in the roost tree while they forage. Very small pups may be unable to flee a tree that is being felled. Potential adverse effects from such disturbance can be avoided or minimized by not clearing woody vegetation taller than 4.6 meters (15-feet), between June 15 and September 15, the period in which bats are potentially at risk from vegetation clearing.

Critical Habitat

There is no federally delineated Critical Habitat for any species present on or adjacent to the project area. Thus the development and operation of the proposed project will not result in impacts to federally designated Critical Habitat. There is no equivalent statute under State law.

Invertebrates

No voids or lava tube entrances etc were noted on the site. Likewise, there is no evidence of standing water or streams on the site. These are two conditions that could indicate habitat for listed invertebrates.

The two listed subterranean invertebrates on the Island of Kaua‘i have only been found in the Po‘ipū/ Kukui‘ula area.

Based on this, there is no evidence of listed invertebrates on the project site.

Recommended Mitigation Measures

- All exterior lights installed in conjunction with the proposed project should be shielded to reduce the potential for interactions of nocturnally flying seabirds with external lights and man-made structures (Reed *et al.*, 1985; Telfer *et al.*, 1987). Any lighting fixtures that meet the “Dark Skies” guidelines are appropriate.
- It is recommended that woody vegetation taller than 4.6 meters (15-feet), not be cleared between June 1 and September 15, the period in which bats are potentially at risk from vegetation clearing. As an alternative to this, the areas with vegetation exceeding 15-feet that are scheduled for removal will first be reviewed by a qualified land manager, biologist, forester, etc prior to the vegetation removal. The DLNR and the USFWS will be notified if the ‘ōpe‘ape‘a is found to be in trees scheduled for removal.
- It is recommended that, where appropriate and practicable, native plant species be used in landscaping efforts. Not only is this ecologically prudent, but also if the appropriate plants are used, it will also likely save maintenance and water costs over the long term.

4.3.3 Level of Impact after Mitigation

As noted in the botanical survey by Wood & Kirkpatrick (Exhibit J) and the biological surveys (avian and mammalian) (Exhibit K) by Rana Biological Consulting Inc. of the property, as well as prior botanical and biological surveys for neighboring properties, no species currently proposed or listed as threatened or endangered under either the federal or state of Hawaii endangered species statutes were documented on the subject property.

There is no federally delineated Critical Habitat for any species present on or adjacent to the project area. Thus, the development and operation of the proposed project will not result in impacts to federally designated Critical Habitat. There is no equivalent statute under State law.

The project will follow all applicable rules and regulation and adhere to the mitigation measure described above. The project will not have a significant impact on any botanical or biological resources.

4.4 Visual & Aesthetic Resources

This section describes the existing visual, vista and viewplane conditions on within the project area, discusses the visual impacts the project may have, and identifies how the project mitigates its potential visual impacts.

4.4.1 Environmental Setting

HoKua Place entails approximately 97-acres north of Kapaʻa town. The Kapaʻa By-Pass Road separates the town and the Property.

The Property is on the north-west corner of the Kapaʻa By-Pass Road and Olohena Road. Olohena Road runs along and adjacent to the east and north boundaries of the Property. The Kapaʻa Middle School is located on the northern end of the Property fronted by Olohena Road.

Aerial view of the subject property

The southern border of the Property, along the by-pass road, is elevated approximately 55 feet above msl. The Property rises in elevation to the northern border approximately 130 feet above msl or an average upslope of less than 5%. There are particular areas of the property with 20% slopes.

Aerial view of the subject property

The Property is located on an elevated plateau and the topography of the Property affords many ocean view lots. Olohena Road bordering the northern property boundary is elevated adequately so ocean views will continue from that road.

The Property is currently fallow and is vegetated with Guinea Grass (Panicum maximum), Koa Haole (Leucaena leucocephala), and Java Plum (Syzygium cumini). Sugar cane cultivation was the last previous use of the property over fifteen years ago.

4.4.2 Potential Environmental Impact & Mitigation Measures

The project site is not part of a scenic corridor and the project will not affect scenic vistas and view planes. The proposed project will not involve significant alteration of the existing topographic character of the site and will not affect public views to and along the shoreline

Olohena Road, along the northern property of HoKua Place is well above the project site. The property slopes down approximately 5% from Olohena Road to the by-pass road to the south.

Re-vegetation with native plants will occur in areas disturbed by construction activities and overtime the vegetation near construction areas will grow and mature.

The architecture of the project will ensure that the project is compatible with its visual environment. The project will create structures which are both visually appealing and blend in with the scenery around them.

Additionally, there currently are high voltage electrical lines around part of the project's perimeter. The electrical utility (KIUC) and HoKua Place would like to run the lines underground thru the project, dependent upon funding. This would be a preventative measure to protect shearwater birds, and to beautify the historic Kapa'a town core area.

4.4.3 Level of Impact after Mitigation

The mitigation for the impacts to visual and aesthetic resources is incorporated into the project's design. Therefore, the level of the visual impact after mitigation will be less than significant.

4.5 Geology, Soils & Slope Stability

This section discusses the geology, soils and slope stability in the region and site area, the potential impact of the project on those characteristics, and mitigation measures project will employ to mitigate those potential impacts.

4.5.1 Environmental Setting

The southern border of the Property, along the by-pass road, is elevated approximately 55-feet above mean sea level (msl). The Property rises in elevation to the northern border approximately 130-feet above msl or an average upslope of 5%. There are areas of the Property with 20% slopes. The topography of the Property affords many ocean views lots.

Soils

A soil inventory report was included in the Kapaʻa Highlands Agricultural Master Plan by Agricon Hawaii LLC. The soil within the HoKua Place (formerly known as Kapaʻa Highlands II) project area primarily consists of Līhuʻe-Puhi association, deep, nearly level to steep, well drained soils with fine texture and moderately fine texture subsoil. Permeability is moderately rapid, run-off is slow and erosion hazard is slight.

The following table describes the soil types on the entire 163-acre parcel of TMK (4) 4-003-003:001, which includes the HoKua Farm Lots and HoKua Place (formerly known as Kapaʻa Highlands I and II).

Soil Type	Percent Slope	Map Unit Symbol	Acres	Percent
Hanalei silty clay	0 to 2 %	HnA	01.4	01%
Ioleau silty clay loam	2 to 6 %	IoB	44.5	27%
Ioleau silty clay loam	6 to 12 %	IoC	16.2	10%
Ioleau silty clay loam	12 to 20 %	IoD2	10.7	07%
Ioleau silty clay loam	20 to 35 %	IoE2	24.7	15%
Līhuʻe silty clay	0 to 8 %	LhB	08.4	05%
Līhuʻe silty clay	8 to 15 %	LhC	00.8	00%
Līhuʻe silty clay	15 to 25 %	LhD	04.0	02%
Mokuleia clay loam, poorly drained variant	NA	Mta	03.2	02%
Marsh	NA	MZ	00.3	00%
Pohakupu silty clay loam	0 to 8 %	PkB	00.9	01%
Puhi silty clay loam	3 to 8 %	PnB	31.9	20%
Rough Broken Land	NA	rRR	15.0	09%
		TOTAL	162.0	100%

Hanalei Series

This series consists of somewhat poorly drained to poorly drained soils on bottom lands on the Islands of Kauaʻi and Oʻahu. These soils developed in alluvium derived from basic igneous rock. They are level to gently sloping. Elevations range from nearly sea level to 300-feet. The annual rainfall amounts to 20 to 120-inches. The mean annual soil temperature is 74 F. Hanalei soils are geographically associated with Haleiwa, Hihimanu, Mokuleia and Pearl Harbor soils. These soils are used for taro, pasture, sugarcane and vegetables. The natural vegetation consists of para-grass, sensitive-plant, honohono, Java plum and guava.

TMK 4-3-3:1 Soils Map

Date: 2/28/2007

Field Office: LIHUE SERVICE CENTER
Agency: NRCS

District: EAST KAUAI SOIL AND WATER CONSERVATION DISTRICT

State and County: HI, KAUAI

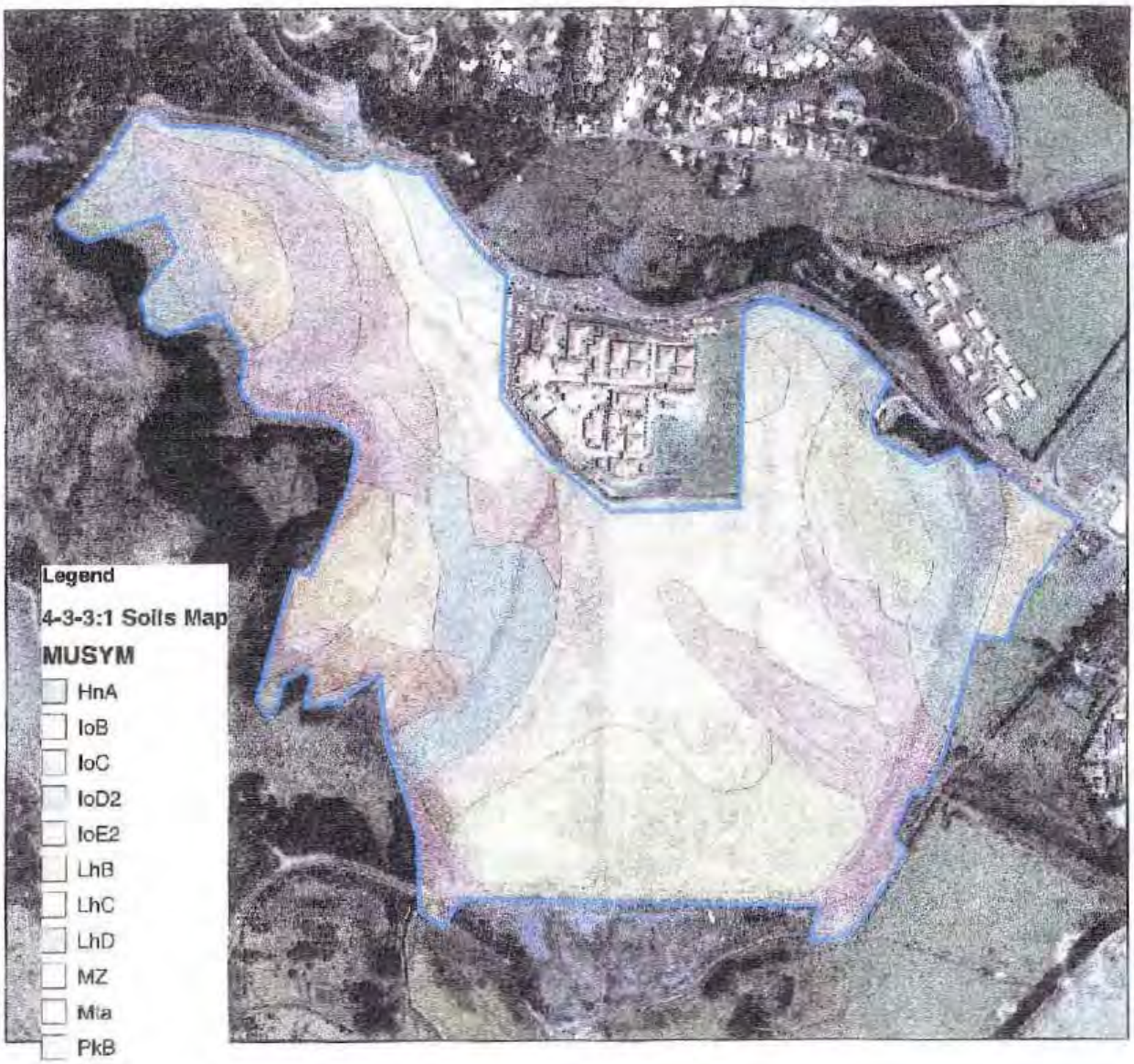


Image: highres1-1_s_hi007.sid

Nu St
Kukui St
Kawika St
Ina St
Hale St
Hulihi St
Kaiulani St
Kaiser St
Kuhio Hwy
Koa St
Mamane St
Ohia St
Akia Rd
Axoa Rd
Kaiolohia Rd
Cane Haul Rd
Akoa St
Akaiole St
Kahi Rd
Maku Rd
Apopo Rd
Alii Rd
Olohena Rd
Haul Cane Rd
0
702ft

Ioleau Series
This series consists of well-drained soils on uplands on the island of Kaua‘i. These soils developed in material weathered from basic igneous rock, probably mixed with volcanic ash. They are gently sloping to steep. Elevations range from 100 to 750-feet. The annual rainfall amounts to 40 to 70-inches. The mean annual soil temperature is 72 F. Ioleau soils are geographically associated with Līhu‘e and Puhi soils.

These soils are used for irrigated sugarcane, pasture, pineapple, irrigated orchards, irrigated truck crops, wildlife habitat and woodland. The natural vegetation consists of lantana, koa haole, guava and associated shrubs and grasses.

Līhu‘e Series
This series consists of well-drained soils on uplands on the island of Kaua‘i. These soils developed in material weathered from basic igneous rock. They are gently sloping to steep. Elevations range from nearly sea level to 800 feet. The annual rainfall amounts to 40 to 60 inches. The mean annual soil temperature is 73 F. Līhu‘e soils are geographically associated with Ioleau and Puhi soils.

These soils are used for irrigated sugarcane, pineapple, pasture, truck crops, orchards, wildlife habitat, woodland and homesites. The natural vegetation consists of lantana, guava, koa haole, joee, kikuyu-grass, molasses-grass, guinea-grass, Bermuda-grass and Java plum.

Mokuleia Series
This series consists of well-drained soils along the coastal plains on the islands of O‘ahu and Kaua‘i. These soils formed in recent alluvium deposited over coral sand. They are shallow and nearly level. Elevations range from nearly sea level to 100 feet. The annual rainfall amounts to 15 to 40 inches on O‘ahu and 50 to 100 inches on Kaua‘i. The mean annual soil temperature is 74 F. Mokuleia soils are geographically associated with Hanalei, Jaucas and Keaau soils.

In this survey area a poorly drained variant of the Mokuleia series was mapped. This soil, Mokuleia clay loam, poorly drained variant, is described in alphabetical order, along with other mapping units of this series.

These soils are used for sugarcane, truck crops and pasture. The natural vegetation consists of kiawe, klu, koa haole and Bermuda-grass in the drier areas and napier-grass, guava and joee in the wetter areas.

Marsh
Marsh consists of wet, periodically flooded areas covered dominantly with grasses and bulrushes or other herbaceous plants. Approximately 0.30-acres of the property (representing a statistically insignificant portion of the overall property) are identified as having "Marsh" soils classification. Characteristics of this soil type include “wet, periodically flooded areas” and “water stands on the surface.” However, upon inspection of the site, there are no wet areas or any standing water.

The area identified with this soil type is situated entirely within the HoKua Farm Lots (formerly known as Kapa‘a Highlands I) and is in the "Open Space" of the HoKua Farm Lots project. No construction is proposed in the project “Open Space.”

Since no construction will occur in this area, there will be no harm, changes or loss of this area.

Pohakupu Series
This series consists of well-drained soils on terraces and alluvial fans on the islands of Oʻahu and Kauaʻi. These soils formed in old alluvium derived from basic igneous material. They are nearly level to moderately sloping. Elevations range from 50 to 250-feet. The annual rainfall amounts to 40 to 50-inches. The mean annual soil temperature is 73 F. Pohakupu soils are geographically associated with Alaeloa, Papaa and Līhuʻe soils.

These soils are used for sugarcane, pineapple, truck crops, pasture and homesites. The natural vegetation consists of guava, Christmas berry, Japanese tea, koa haole and kikuyu-grass.

Puhi Series
This series consists of well-drained soils on uplands on the island of Kauaʻi. These soils developed in material derived from basic igneous rock. They are nearly level to steep. Elevations range from 175 to 500-feet. The annual rainfall amounts to 60 to 80-inches. The mean annual soil temperature is 73 F. Puhi soils are geographically associated with Līhuʻe and Kapaʻa soils.

These soils are used for sugarcane, pineapple, truck crops, orchards, pasture, woodland, wildlife habitat water supply and homesites. The natural vegetation consists of guava, Java plum, pangola-grass, kikuyu-grass, elephantopus, joee, yellow fogtail and rhodomyrtus.

Rough Broken Land
Rough broken land consists of very steep land broken by numerous intermittent drainage channels. In most places it is not stony. It occurs in gulches and on mountainsides on all the islands except Oʻahu. The slope is 40 to 70 percent. Elevations range from nearly sea level to about 8,000-feet. The local relief is generally between 25 and 500-feet. Runoff is rapid, and geologic erosion is active. The annual rainfall amounts to 25 to more than 200-inches.

These soils are variable. They are 20 to more than 60-inches deep over soft, weathered rock. In most places some weathered rock fragments are mixed with the soil material. Small areas of rock outcrop, stones and soil slips are common. Included in mapping were areas of colluvium and alluvium along gulch bottoms.

This land type is used primarily for watershed and wildlife habitat. In places it is used also for pasture and woodland. The dominant natural vegetation in the drier areas consists of guava, lantana, Natal redtop, Bermuda-grass, koa haole and molasses-grass. ʻŌhiʻa, kukui, koa and ferns are dominant in the wetter areas. Puakeawe, aʻaliʻi and sweet vernal-grass are common at the higher elevations.

4.5.2 Potential Environmental Impacts & Mitigation Measures

Applicable law will be followed to minimize soil movement, erosion and compaction during all project actions.

Both short-term construction and long-term maintenance BMPs will be included in any permit conditions. Implementation of Best Management Practices (BMPs) will ensure that the alterations to the terrain minimize erosion, water quality degradation and other environmental impacts.

4.5.3 Level of Impact after Mitigation

As noted in the Kapaʻa Highlands Agricultural Master Plan by Agricon Hawaii LLC., which includes a soil inventory report (Exhibit C), the soils at HoKua Place (formerly known as Kapaʻa Highlands II) are generally well drained and the soils can be expected to be low in organic matter. Further, the soil is not ideal for the growing of most commercially viable crops due to poor soil. No impacts on geological resources were noted in the Agricultural Master Plan or accompanying soil inventory report.

The mitigation measures proposed will further reduce the level of impact to geologic resources, which is considered less than significant without any mitigation.

4.6 Water Resources & Wastewater

This section discusses the water resources and wastewater management practices in the region and in the subject property area and the potential impacts of the project on those resources, and mitigation measures the project will employ to mitigate those potential impacts.

4.6.1 Environmental Setting

A stream exists within the HoKua Farm Lots (formerly known as Kapaʻa Highlands I), flowing from north to south along the western border of HoKua Place. The stream flows along the boundary, passes under a bridge on the By-Pass Road at the southwest corner of the property, and empties into the Waiākea drainage canal about 800' downstream from the property.

HoKua Place is committed to keeping the flow of the stream consistent to prevent any potential health and mosquito problems associated with streams when not flowing naturally.

The irrigation facility for this former sugar land is no longer available. There are numerous abandoned irrigation ditches on the property have been reduced or rendered inoperable as the property is developed.

Water Sources

With respect to water resources to be used within the project, two alternatives are considered. First, if the County Department of Water Supply makes a final decision to approve the applicant's Water Master Plan where DOW will provide HoKua Place (formerly known as Kapaʻa Highlands II) with storage for water in exchange for HoKua Place dedicating its well site to the DOW to feed the Department of Water's storage tanks and existing water system. In the event the DOW does not make final approval of the applicant's Water Master Plan, then the applicant will develop a private water system, using the well for its use within the project.

Implementation of a final alternative is based on the decision of the County Department of Water Supply; each is an acceptable alternative to the applicant.

Water Master Plan

A Water Master Plan for HoKua Place and HoKua Farm Lots (formerly known as Kapaʻa Highlands) has been approved, in concept, by the County Department of Water (DOW) (Exhibit D).

HoKua Place has a proven well site that will be dedicated to the DOW to feed the Department of Water's storage tanks and existing water system or operated privately. HoKua Place is committed to working with the DOW on pertinent water issues during the design and development phase.

Tom Nance Water Resource Engineering (TNWRE) prepared a water master plan for the development of an agricultural subdivision on site (Exhibit E - Part 1) and estimated the required water system infrastructure and the basis of its sizing.

All infrastructure improvements will be designed, constructed and conveyed in accordance with Kauaʻi Department of Water (DOW) rules, regulations, standards and policies.

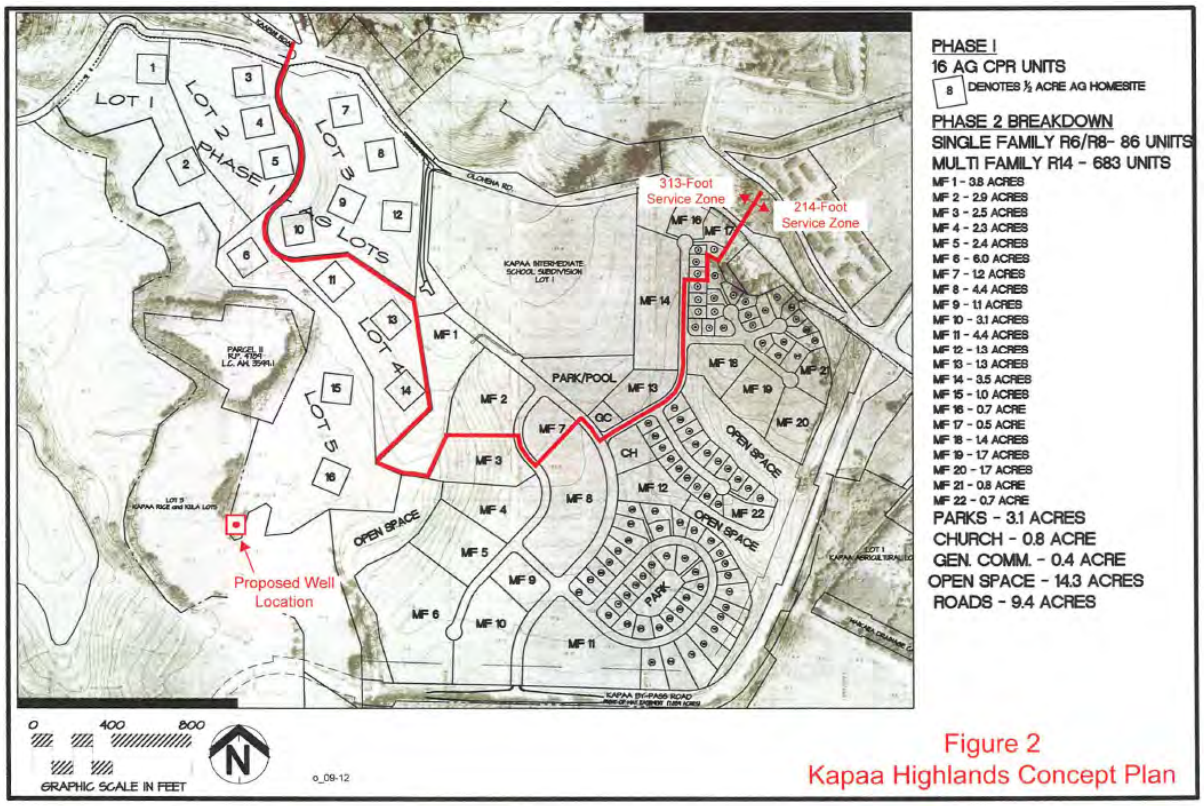


Figure 2
Kapaa Highlands Concept Plan

As presented in the earlier 2002 Kapa'a Highlands Water Master Plan, the entire project was to be served from DOW's 313-foot service zone. In the updated Water Master Plan, service to the project will be from the 313-foot and 214-foot service zones. The red line on the figure above delineates the two service zones in the project site.

The table below is a compilation of the projected average demand in each service zone based on the unit use rates in DOW's standards. Presented below is a summary of average, maximum day, and peak flow rate requirements by development phase and service zone.

Summary of Average, Maximum Day, and Peak Demands for the Kapaa Highlands Project

Service Zone	Development Phase	Average Demand (GPD)	Maximum Day (GPD)	Peak (GPD)
313-Foot	1	34,725	52,088	104,175
	2	85,830	128,745	257,490
	Totals	120,555	180,832	361,665
214-Foot	1	117,350	176,025	352,050
	2	213,020	319,530	639,060
	Totals	330,370	495,555	991,110
Totals for Both Zones		450,925	676,388	1,352,775

Well Supply

Providing the maximum day demand in a 24-hour pumping day defines the required well pumping capacity. The required capacities for both service zones combined are 158 GPM for Phase 1 and 470 GPM on completion of Phase 2.

As a part of Phase 1 water system improvements, a new well of 500 GPM capacity would be completed at the site in Lot 5 of Phase 1.

A test well that was drilled in this location was pump tested for 12 hours at 550 GPM. The test well produced water of consistently low salinity (specific conductance of 430 uS/cm and chlorides of 53 MG/L at the end of the test).

Based on these results, a sustainable capacity of 500 GPM is expectable for a properly developed well. During pump testing of the new well, the test well will be used for observation to get more complete data on aquifer response. Following this, the test well will be sealed in conformance with CWRM requirements.

The new well will have 12-inch casing, be approximately 300-feet deep and draw water exclusively from the lower (second) aquifer at depths between 220 and 300-feet. It will be outfitted with a 500 GPM, 4-pole submersible pump set at a depth of about 50-feet. Chlorination would occur at the well.

The route of the 8-inch or 12-inch, 2,600-foot long dedicated transmission pipeline in a paved roadway from the well to connect to DOW's system is shown on the map below. Based on DOW's stated preference, the connection would be to the 214-foot service zone.

As demonstrated in the calculations following, the transit time in the 2,600-foot long dedicated transmission pipeline would provide adequate chlorine contact time:

- The required CT for water with a pH of 6 to 9 and temperature of 76.2° F. is 2 (MG/L)(MIN) from the table on page 5-33 of the Hawai'i SWTR Manual.
- Volume in the 8-inch or 12-inch, 2,600-foot long pipeline is 907.6 ft3 or 6,788 gallons. The pumping rate will be 500 GPM. Therefore, the residence time in the pipeline will be 13.58 minutes.
- Free chlorine residual at the well head will be 0.5 MG/L.
- Baffle factor for the pipeline is 1.0 based on plug flow.
- Therefore: CT =(0.5 MG/L) (13.58 Min.) (1.0 BF) =6.79 » Required Value of 2

The well will be at a relatively low elevation and it, as well as the entire project area, is makai of the Underground Injection Control (UIC) line. Both of these aspects suggest that contamination of the groundwater pumped by the well may be an issue.

Fortuitously, the underlying strata provide excellent natural protection against such an occurrence.

The well will be constructed to draw water exclusively from a lower aquifer which is hydrologically separated from a poorly yielding upper aquifer by an impermeable aquiclude that is more than 100 feet thick. This means that if contaminants are released into the subsurface they will accumulate in the upper aquifer and never reach the lower aquifer tapped by the well.

Average Demand for Phase 2 of Kapaa Highlands

Service Zone	Development Parcel	No. of Units	Unit Use Rate (GPD / Unit)	Average Demand (GPD)
313-Foot	SF Residences	4	500	2,000
	MF-1	53	350	18,550
	MF-2	41	350	14,350
	MF-7	17	350	5,950
	MF-13	18	350	6,300
	MF-14	49	350	17,150
	MF-15	14	350	4,900
	MF-16	10	350	3,500
	MF-17	7	350	2,450
	Park	2.37 Acres	4,000	9,480
	General Commercial	0.4 Acres	3,000	1,200
	Total for 312-Foot Zone			85,830
214-Foot	SF Residences	82	500	41,000
	MF-3	35	350	12,250
	MF-4	32	350	11,200
	MF-5	34	350	11,900
	MF-6	84	350	29,400
	MF-8	62	350	21,700
	MF-9	15	350	5,250
	MF-10	43	350	15,050
	MF-11	62	350	21,700
	MF-12	18	350	6,300
	MF-18	20	350	7,000
	MF-19	24	350	8,400
	MF-20	24	350	8,400
	MF-21	11	350	3,850
	MF-22	10	350	3,500
	Church	0.8 Acres	4,000	3,200
	Park	0.73 Acres	4,000	2,920
	Total for 214-Foot Zone			213,020
Total for Phase 2 in Both Service Zones				298,850

With regard to developing a drinking water well makai of the UIC line, DOH has recently (May 2009) instituted a process which includes public notification and the resulting prohibition of installing any new disposal wells within 1/4-mile of the drinking water well.

The 18 homesites in the HoKua Farm Lots (formerly known as Kapa‘a Highlands I) will have individual wastewater disposal systems consisting of septic tanks and leach fields. DOH will require the five homesites that will be within 1,000-feet of the well (homesites 14, 15, and 16 and the two homesites on Parcel 11) to have DOH-approved enhanced septic systems.

As an extra precaution, all 18 of the homesites in the HoKua Farm Lots will be required to install enhanced septic systems. All of HoKua Place will be connected to the County's centralized sewer system to eliminate the wastewater treatment and disposal issue for this more densely developed area.

Reservoir Storage

Summarized below are the required reservoir storage volumes by development phase and service zone. Two criteria are applied: (1) provide the maximum day volume; and (2) provide the fire flow-rate and coincident maximum day demand for the duration of the fire with the reservoir 3/4 full at the start.

Computations of Required Reservoir Storage

Service Zone	Required Reservoir Storage	
	Phase 1 (MG)	Phase 2 (MG)
313-Foot Zone		
- Maximum Day Criterion	0.0521*	0.1808
- Fire Flowrate and Maximum Day Use Rate for Duration of the Fire, Reservoir 3/4 Full at Start	0.0229	0.3401*
214-Foot Zone		
- Maximum Day Criterion	0.1760*	0.4956*
- Fire Flowrate and Maximum Day Use Rate for Duration of the Fire, Reservoir 3/4 Full at Start	0.0298	0.3751

* Denotes required storage based on governing criterion.

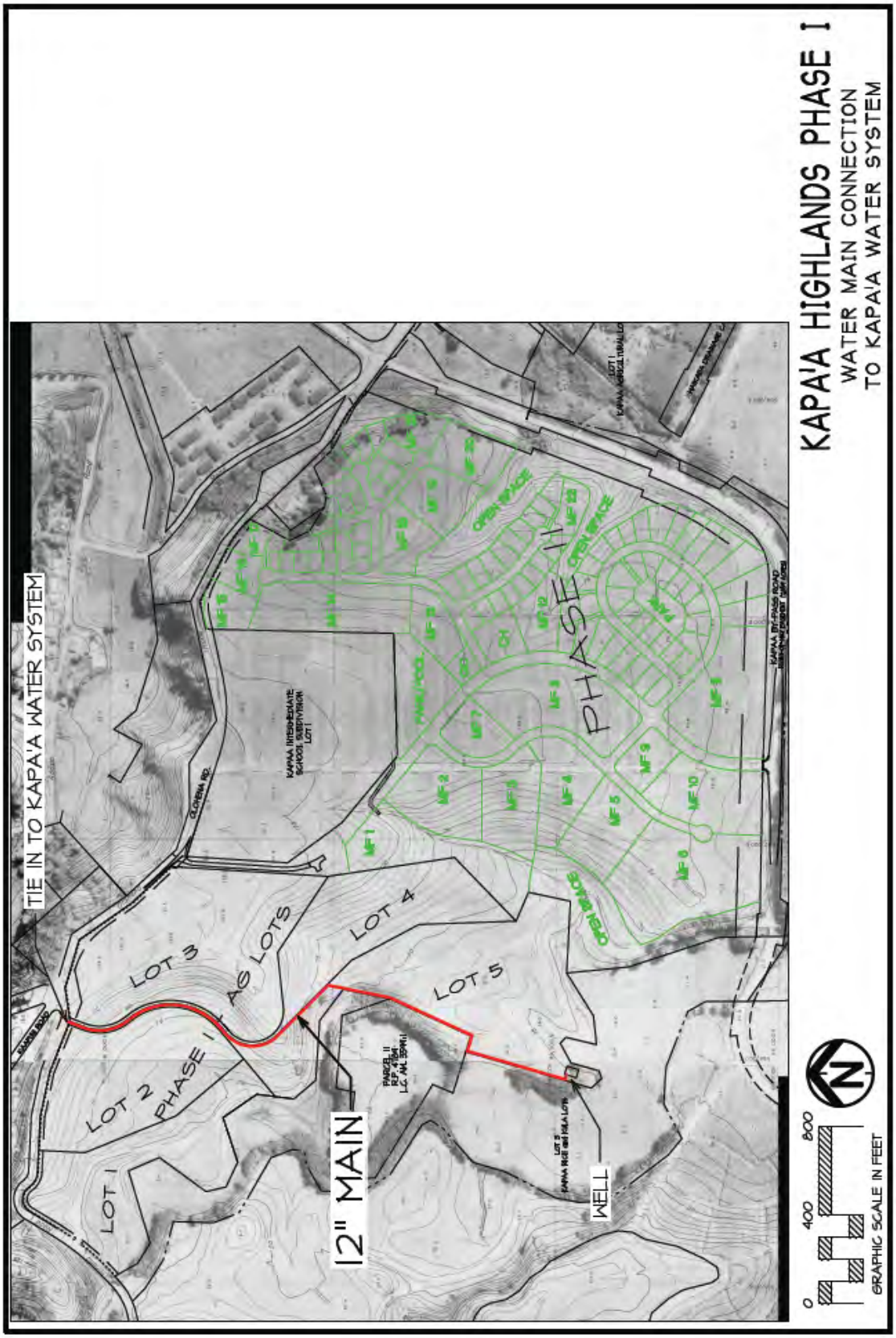
As one well pump is being provided, no credit for well inflow is taken. Fire flow-rate in both service zones of the Phase 1 area is 250-GPM for one hour. In both service zones of Phase 2, it is 2,000-GPM for two hours.

Required storage volumes are denoted by the asterisk (*) in the compilation above. DOW will allow HoKua Farm Lots (formerly known as Kapaʻa Highlands I), consisting of 18 homesites (5 units in the 313-foot zone and 13-units in the 214-foot zone) to utilize storage capacity from existing DOW storage facilities.

Additionally, DOW will provide HoKua Place with storage for water in exchange for HoKua Place dedicating its well site to the DOW to feed the Department of Water's storage tanks and existing water system. David Craddick, DOW Manager and Chief Engineer wrote in a letter to HoKua Place (formerly known as Kapaʻa Highlands II):

> "At the Department of Water, Water Board July 28th 2011 meeting, via Managers Report 12-10, in response to your letters of April 22, 2011 and May 11,2011, accepted the proposed exchange of source for storage on a dollar for dollar basis."

Prior to water meter service and/or building permit approval, the developer will complete the required water system facilities and other conditions required by DOW for the project.



Ho'okuleana LLC
... to take responsibility ...

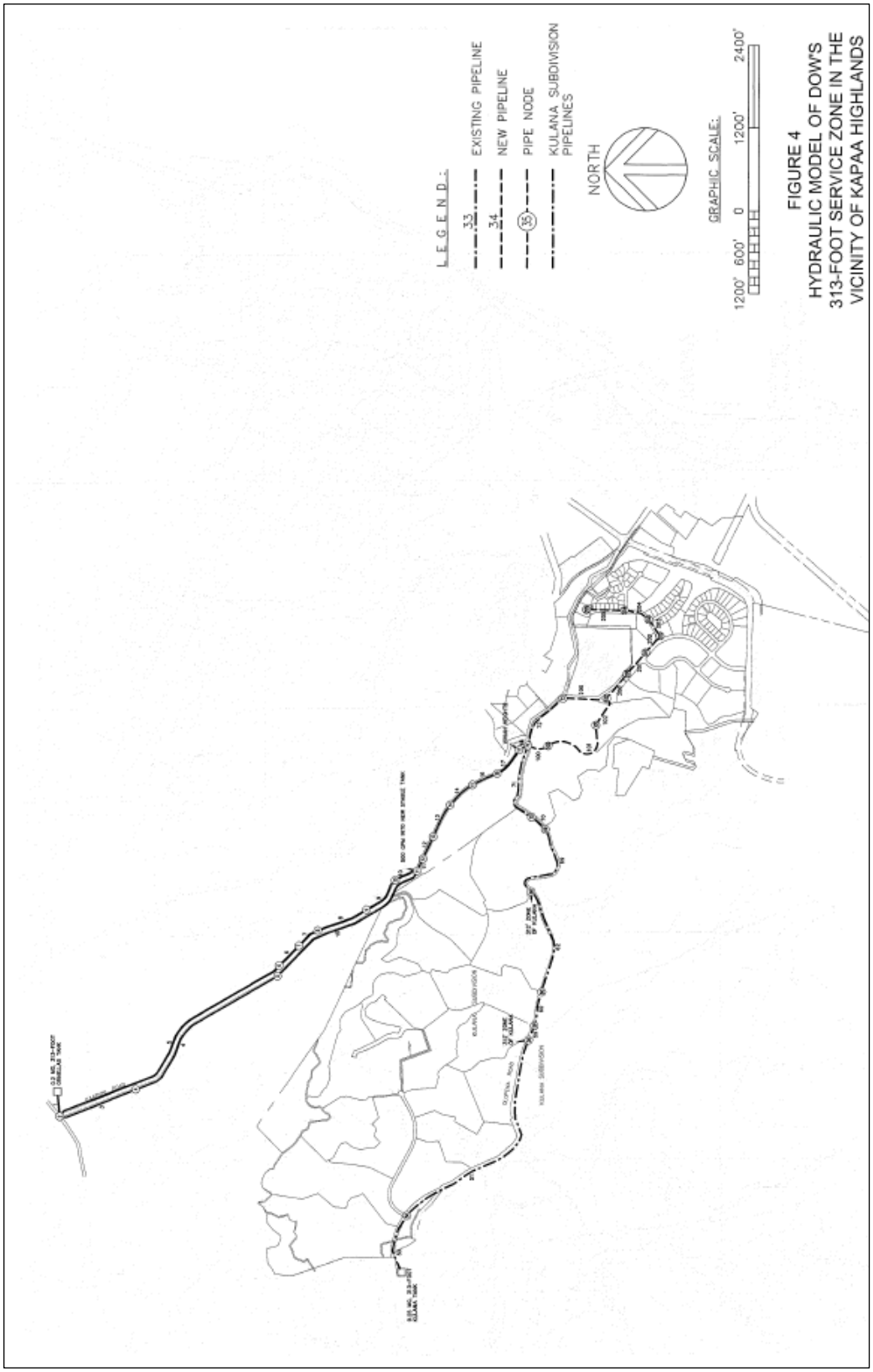


FIGURE 4
HYDRAULIC MODEL OF DOW'S
313-FOOT SERVICE ZONE IN THE
VICINITY OF KAPAA HIGHLANDS

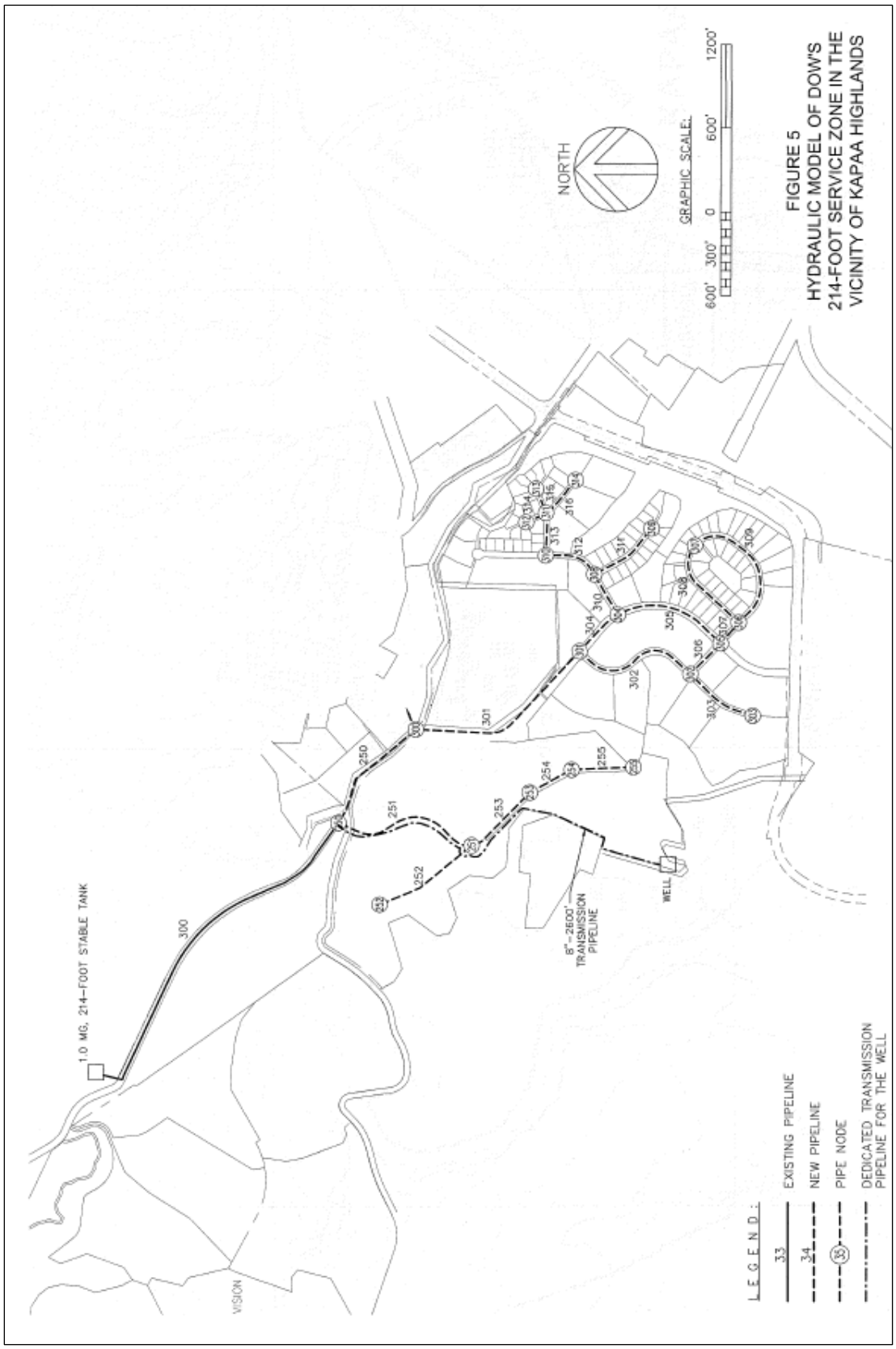


FIGURE 5
HYDRAULIC MODEL OF DOW'S 214-FOOT SERVICE ZONE IN THE VICINITY OF KAPAA HIGHLANDS

Pipeline Sizing for Peak and Fire Flow-rate Requirements

All pipelines will be ductile iron. Pipe sizing is based on two criteria: (1) to provide a minimum 40 psi residual pressure during peak flow-rate conditions, with peak flow-rate defined as the three times the average demand; and (2) to provide the required fire flow-rate with coincident maximum day demand [1.5 times average] and a minimum 20 psi residual pressure at the hydrant. For the agricultural CPR lots of Phase 1, the required fire flow-rate is 250 GPM. For the urban development in Phase 2, required flow-rates have been selected as follows:

Land Use	G P M
Single Family R6 / R8	1250
Multi-Family R 14	1500
General Commercial	2000
Church	2000

Overview of the Hydraulic Impact on DOW's Kapa'a Systems

HoKua Place will draw water from DOW's 313-foot and 214-foot systems, but the source of supply will only deliver water into the lower, 214-foot service zone. Due to the configuration and use of DOW's system, this will not adversely impact DOW's higher service zones in Kapa'a.

- At present, a substantial amount of water is conveyed from wells in the Kapa'a Homesteads 530-foot zone through the 313-foot zone and past the 248-foot PRV zone for consumption in the 214-foot zone. This ongoing transmission from the 530-foot zone to the 214-foot zone substantially exceeds the requirements of HoKua Place in the 313-foot zone.
- When the HoKua Place project comes on line, every gallon of water used in its 313-foot zone would be replaced by a similar volume of water pumped by its well into the 214-foot zone. This means that there will be no increase in the amount of water conveyed from the 530-foot zone to the 313-foot zone and therefore no impact on customers in the 530-foot zone.
- Due to this gallon-for-gallon replacement of water, it also means that it is not necessary to install a booster pump in the 214-foot zone to pump water back up into the 313-foot zone.

Summary of the Project's Infrastructure Requirements and Tentative Implementation Schedule

Phase 1 - Following approval of the water master plan by DOW, work to construct the well and the roads for Phase 1 would commence within six months. The cost of installing the necessary improvements will be covered by a Subdivision Bond prior to Phase 1 subdivision approval. Payment of facilities charges for storage and occupancy of the Phase 1 homesites would be made by the developer.

A list of the water system improvements, as they can be defined at this stage of the project's planning and engineering is provided below. Completion is expected to take two to three years.

- Drill, Case and Pump Test the Supply Well (19-inch borehole to 300-foot depth, 220-feet of solid 12-inch casing, and 80-feet of 12-inch louvered casing).
- Outfit Supply Well (500 GPM, 50 horsepower motor set at 50-foot depth; control building; chlorination; related site work).
- Well Transmission Pipeline (8-inch or 12-inch, 2,600-foot DI pipeline).
- Distribution Pipelines in the 313-Foot Service Zone (6-inch, 1820 feet of ductile iron pipeline and five service meter connections with backflow preventer assemblies. Pipe Nos. 100, 101 and 102.
- Distribution Pipelines in the 214-Foot Service Zone (6-inch, 3020 feet of ductile iron pipeline and 13 service meters with backflow preventer assemblies. Pipe Nos. 251 through 255.

- If not completed by others: 12-inch, 925-foot long pipeline from Olohena/Kaapuni intersection to Kapaʻa Intermediate School (Pipe No. 72)

Phase 2 - Water system infrastructure required for Phase 2 would not be started until all land use permits and approvals are obtained, a process that may take two to three years. A tentative list of the pipelines required to be installed, all within the project area, is given below.

- Ductile Iron Pipelines in the 313-Foot Service Zone
  - 12"-1835' (Pipe Nos. 200, 201, 202, and 206)
  - 8"-1250' (Pipe Nos. 203, 204, and 205)
- Ductile Iron Pipelines in the 214-Foot Service Zone
  - 12"-2865' (Pipe Nos. 301, 304, 310, 312, and 313)
  - 8"-5780' (Pipe Nos. 302, 303, 305 to 309, 311 and 314 to 316)

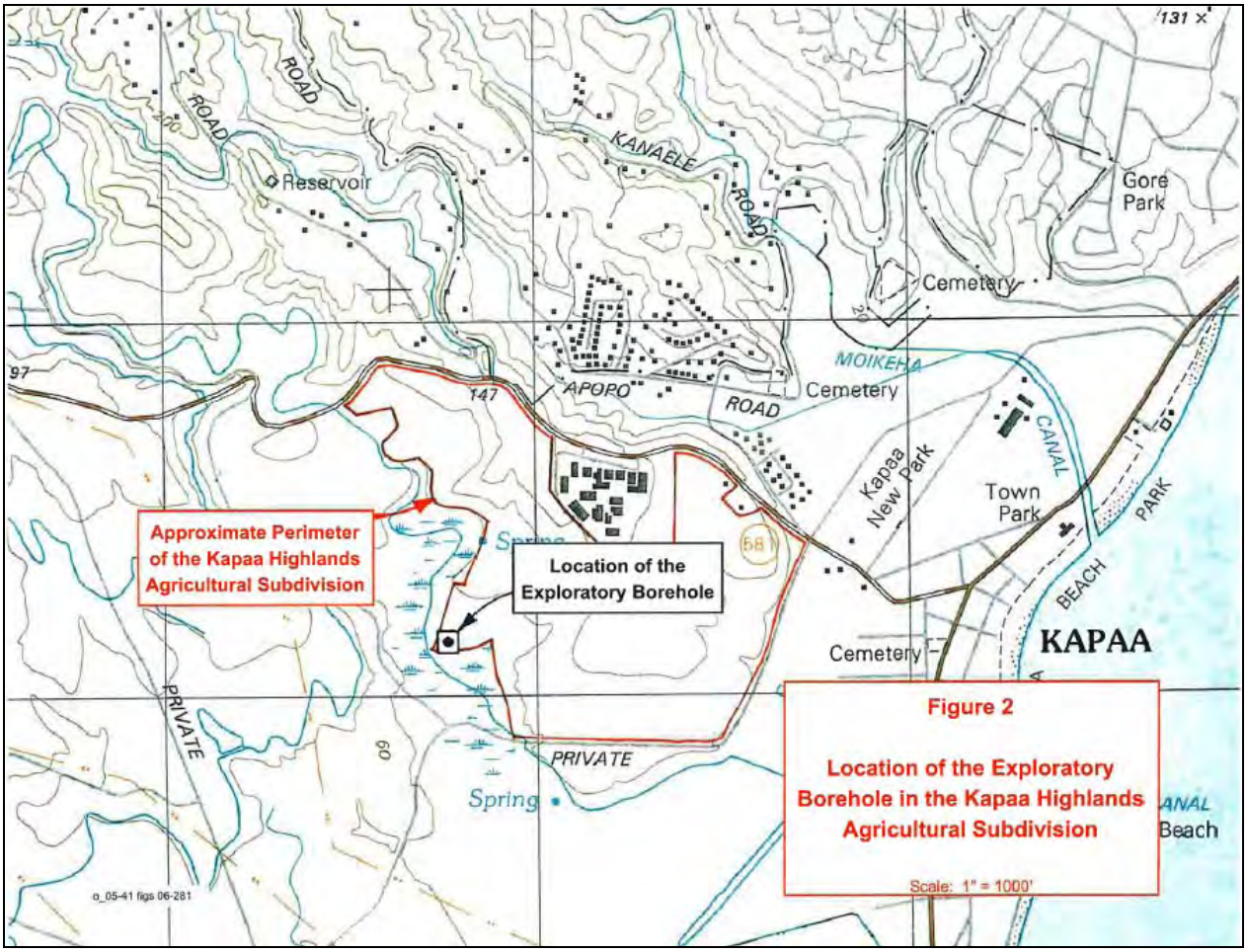


Figure 2

Location of the Exploratory Borehole in the Kapaa Highlands Agricultural Subdivision

Private Water System

In the event the County Department of Water does not give final approval to the applicant's Water Master Plan for HoKua Place (formerly known as Kapaʻa Highlands II), then the applicant will supply water to the project through a private water system, in part described above, as well as supplemental summary here and further described in (Exhibit E - Part 2).

Reservoir Storage

With regard to the reservoir storage volume, DOW's two design criteria are appropriate for the private water system: (1) provide the maximum day demand with no credit for well inflow; and (2) provide the fire flowrate with coincident maximum day demand for the duration of the fire with the largest well pump out of service and the reservoir 3/4 full at the start of the fire. For the Phase 1 fire flowrate, DOW's standards require only 250 GPM for one hour. A stricter criterion of 500 GPM for two hours is used herein. Application of the two sizing criteria results in the required storage volumes tabulated below. In all cases, the maximum day sizing criterion governs.

Summary of Computed Required Reservoir Storage Volumes*

Design Criteria	Phase 1 Ag Subd.	Phase 2 Residential	Phased 2 Ag Subd.
(1) Maximum Day Demand (Gallons)	48,000	496,275	150,000
(2) Fire Flowrate			
- Fire Flowrate (GPM)	500	2000	500
- Fire Duration (Hours)	2	2	2
- Coincident Max. Demand (GPM)	33	345	104
- Well Inflow Credit (GPM)	350	350	350
- Required Storage Volume (Gallons)	29,280	319,200	40,640

*Phase 2 storage volumes include the Phase 1 requirement.

Based on the foregoing calculations, the recommended reservoir storage is as follows:

- For Phase 1, a 50,000-gallon storage tank would be installed.
- For the Phase 2 residential project, a second tank of 500,000-gallon capacity would be installed.
- In the event that Phase 2 consists of the 34 SF residential units in an agricultural subdivision, the second tank would be 100,000 gallons.
- All storage tanks would be lined and bolted steel with a concrete floor and passive cathodic protection.
- The tanks would be located at the project's highest elevation which is adjacent to residential Lot 7 in Phase 1. The Phase 1 and Phase 2 tanks would have identical floor and spillway elevations of 142 and 160 feet, respectively.
- Except at the project's lowest elevations, pumped delivery from the storage tanks will be necessary to provide adequate delivery pressures and fire flowrates. These pumping requirements are described in the section following.

Pumped Delivery for the Distribution System

DOW's design criteria for required delivery pressures are appropriate for this private water system. These are: (1) to provide a minimum of 40 psi residual pressure during the peak flowrate condition, with peak flowrate defined as three times the average demand; and (2) to provide a minimum 20 psi residual pressure at the critical hydrant during fire flowrate at that hydrant and coincident maximum day demand throughout the system.

The onsite storage reservoir elevations will not provide adequate gravity pressure to meet either of these criteria. In each development phase, this will require parallel domestic and fire flowrate pumping systems with a generator to provide backup power. For Phase 1, the pump systems would provide up to 70 GPM for peak domestic use and a 500 GPM fire pump. For the Phase 2 residential development, the domestic pumping capacity would be increased to 700 GPM and the fire pump to 2000 GPM. All pumping systems would be sized to produce a total dynamic head of 110 feet, in effect creating a single, 270-foot service pressure zone across the entire project site.

Water System Layout

Phase 2 would consist of the 769-unit residential development. By development phase, these would consist of:

Phase 1

- 12-inch, 300-foot deep well, pump sump, and two 350 GPM pumps in the pump sump located at the makai end of the Phase 1 development area.
- A dedicated 8-inch transmission pipeline from the well pumps to the storage reservoir.
- A 50,000-gallon storage tank.
- Parallel domestic and fire flowrate pump systems at the storage tank with backup generator power.
- A distribution pipeline loop consisting of 12-inch for the section that will also serve Phase 2 and 6-inch for the remainder of the loop.

Phase 2

- No change or additions to the well, well pumps, or transmission pipeline.
- Second storage tank of 500,000-gallon capacity.
- Substantial capacity increases for the parallel domestic and fire pumping systems and generator backup power.
- Distribution pipelines of 12-, 8- and 6-inch size.

Average and Maximum Day Demands for the
Phase 1 Agricultural Subdivision and Phase 2 Residential Development

Development Phase	Land Use	Design Criterion (GPD / Unit)	Average Demand (GPD)	Maximum Demand (GPD)
1	16 SF Residential	2,000	32,000	48,000
2	86 SF Residential	500	43,000	64,500
	683 MF Residential	350	239,050	358,575
	3.1 Ac. Parks	4,000	12,400	18,600
	0.8 Ac. Church	4,000	3,200	4,800
	0.4 Ac. Commercial	3,000	1,200	1,800
	Total for Phase 2		298,850	448,275
Total for Both Phases			330,850	496,275

Average and Maximum Day Demands for Development of
Phases 1 and 2 as Agricultural Subdivisions

Development Phase	Land Use	Design Criterion (GPD / Unit)	Average Demand (GPD)	Maximum Demand (GPD)
1	16 SF Residential	2,000	32,000	48,000
2	34 SF Residential	2,000	68,000	102,000
Total for Both Phases			100,000	150,000

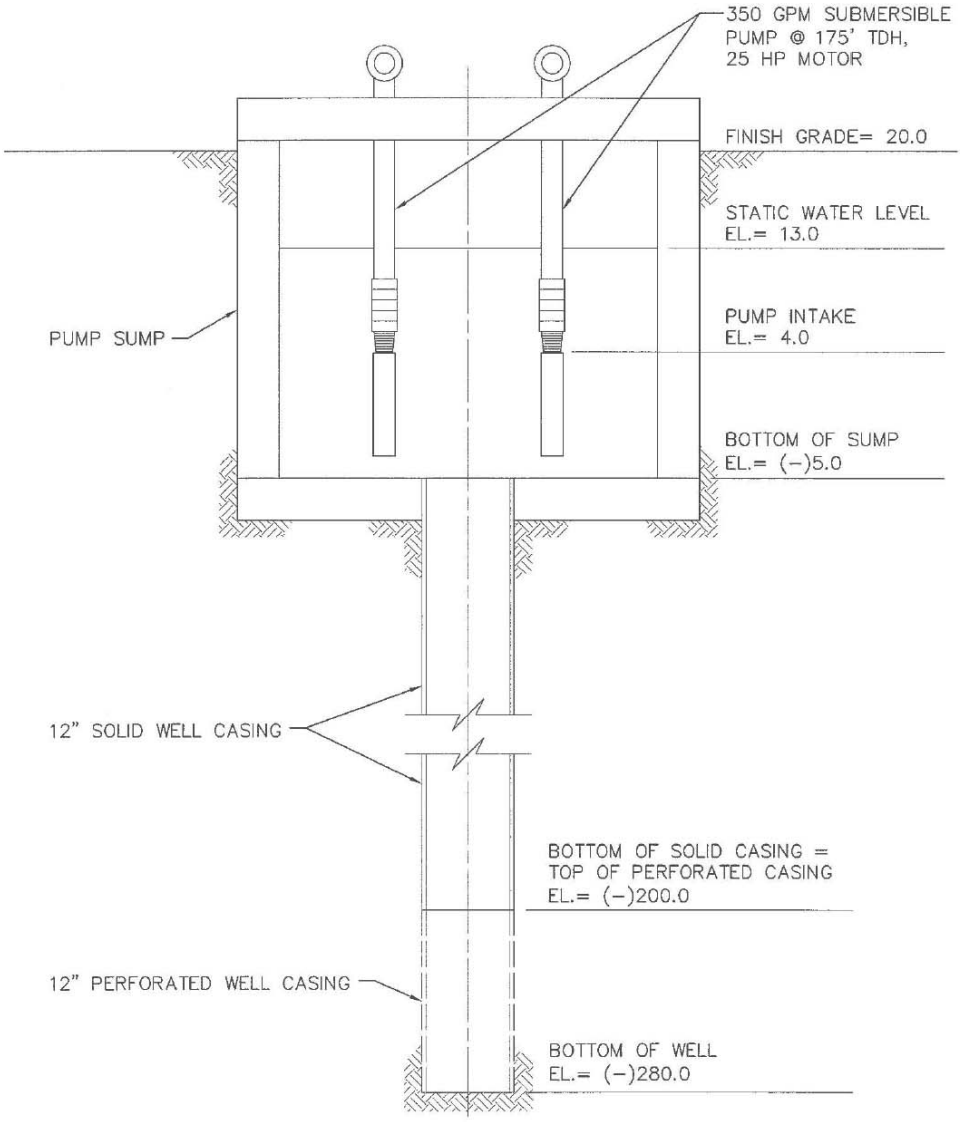
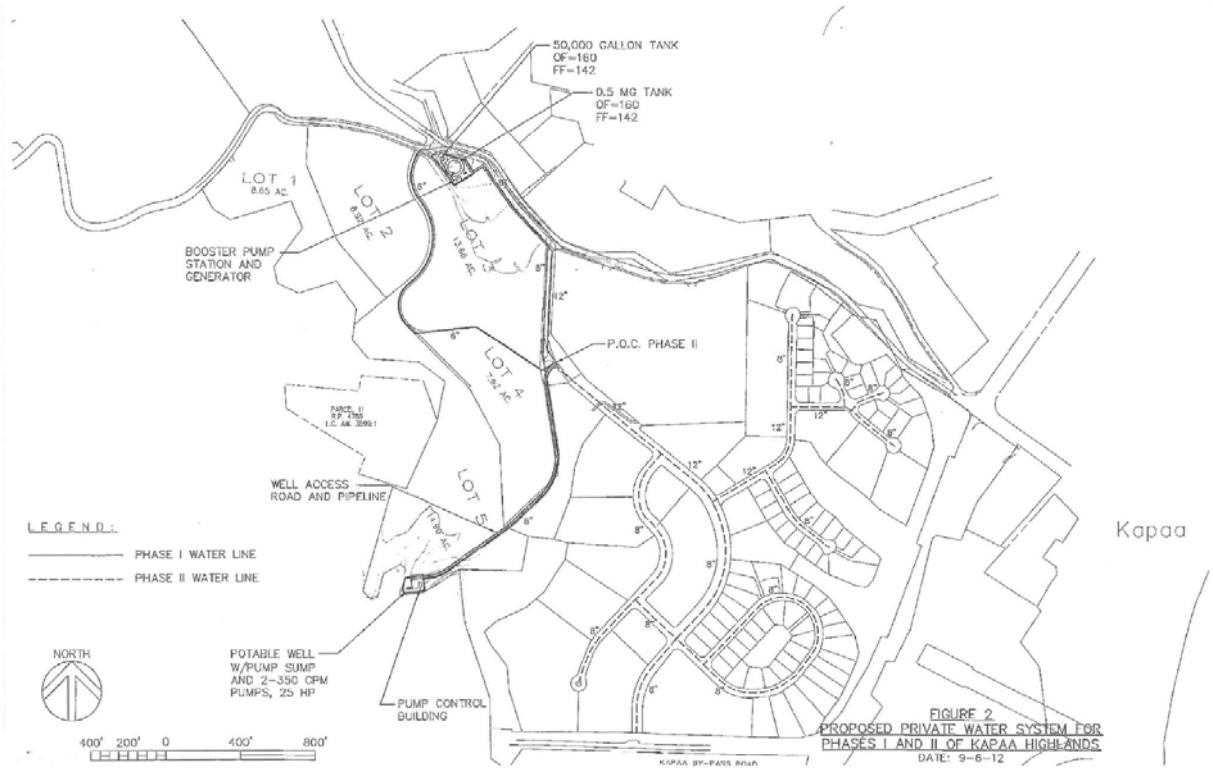


FIGURE 1
RECOMMENDED WELL DEVELOPMENT AND PUMP INSTALLATION
FOR THE KAPAA HIGHLANDS PROJECT
NOT TO SCALE

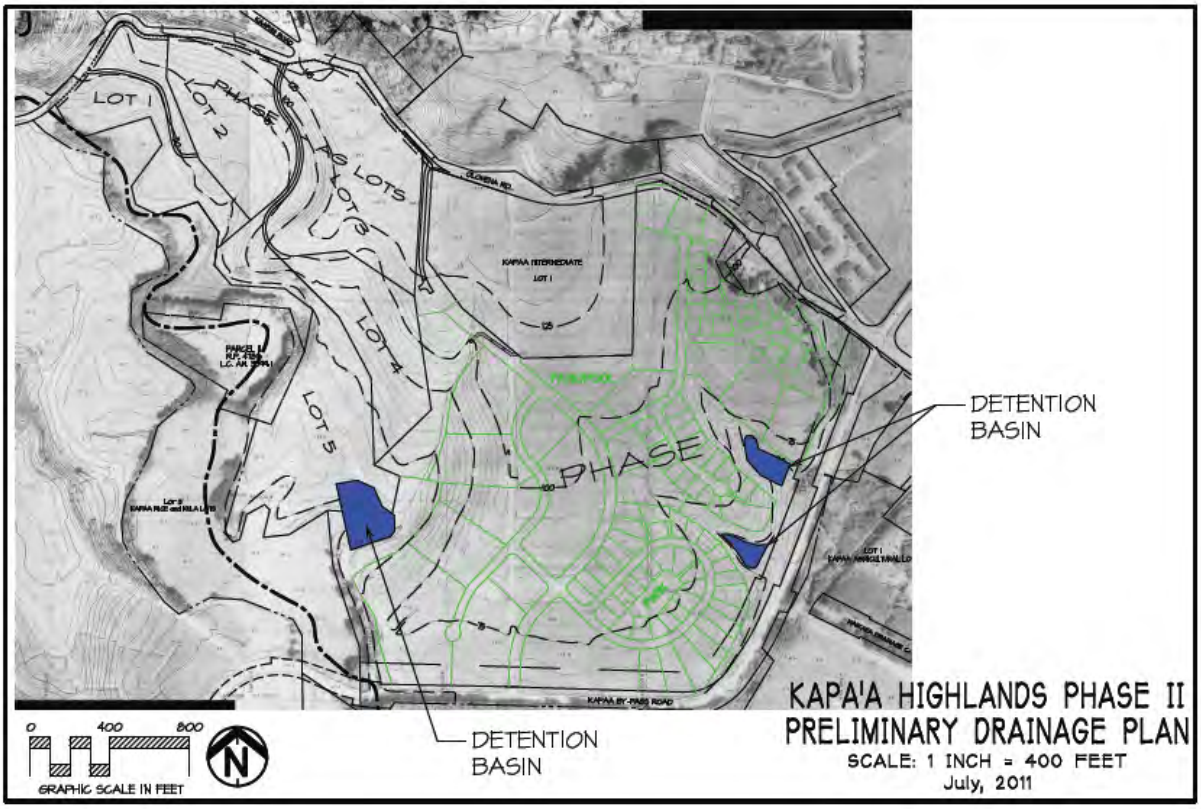


Drainage

Per the County of Kaua'i's "Storm Water Runoff System Manual" 2001, all developments of this scope are required to maintain the existing storm water flows and patterns as feasibly possible so that downstream properties are not subject to any additional storm water flows that are created by the increases in impervious surfaces of the watershed by the proposed development.

A report examining the existing drainage conditions of the property and the proposed measures to control the storm water from the proposed Phase II development is included as Exhibit F.

According to the Natural Resource Conservation Service (NRCS) soil survey the soils on the property are Ioleau and Puhi silt clay loams. The NRCS hydrologic classification for these soils is Group C for the Ioleau soils and Group B for the Puhi soils. Group B soils have a moderately low runoff potential, while the Group C soils have a moderately high runoff potential. Both soils are in Group I erosion resistance classification, which is the least erodible of the NRCS classifications.



The topography of the site varies from gently sloping, bluff top property, to steep areas that drop off into drainage gullies that lead to an unnamed stream and to the Bypass Road.

Storm water generated from each of the Phase II lots will be directed to the nearest downstream street or natural drainage way. A drainage system along the streets will collect the storm water and convey it to the detention basins shown on the map above. The detentions basins moderate the storm flows and allow infiltration back into the soil. They are sized so that the outlet peaks flows match or lower the existing storm water flows prior to the development for both small rainfall events and the 100 year storm event.

Wastewater

The County sewer treatment plant, Wailua WWTP, is located on approximately 2.1-acres of County owned land next to Lydgate Park.

The treatment plant is designated as an R-2 facility, which means the plant provides secondary treatment and disinfection. This meets the minimum requirements for wastewater treatment per Hawai‘i Administrative Rules (HAR) Title 11, Chapter 62.

It has a capacity of 1.5 million-gallons a day. It is currently operating at 500,000-gallons a day. HoKua Place will be contributing to the deferred maintenance and to the cost of repairs to the sewer treatment plant. A preliminary wastewater report has been completed and is included as Exhibit G.

The Wailua WWTP was originally constructed in 1964 and receives wastewater from the Kapaʻa, Papaloa, Waipouli and Wailua areas. The plant was originally designed to treat an average flow of 0.5-million gallons per day (mgd).

The plant has gone through four phases of construction, the most recent in 1992 to expand to the current design average daily flow of 1.5-mgd and a design peak flow capacity of 5.03-mgd. The existing collection system consists of gravity lines, pump stations and force mains. The collection system is centered in the coastal area along the Kūhiō Highway.

In the Wailua-Kapaʻa area, wastewater treatment is accomplished with Individual Wastewater Systems (IWS), such as cesspools or septic tanks, or at the County owned and operated Wailua WWTP. IWSs are assumed to be used in the parcels that have water service but no sewer service. Based on that assumption, there are approximately 4,300 residential cesspools in the Wailua-Kapaʻa area.

The discharge of raw waste water directly into the ground is not beneficial to the environment; therefore, Department of Health (DOH) now limits the construction of any new cesspools. Approximately 12% of the cesspools in the Wailua-Kapaʻa area have reported failures.

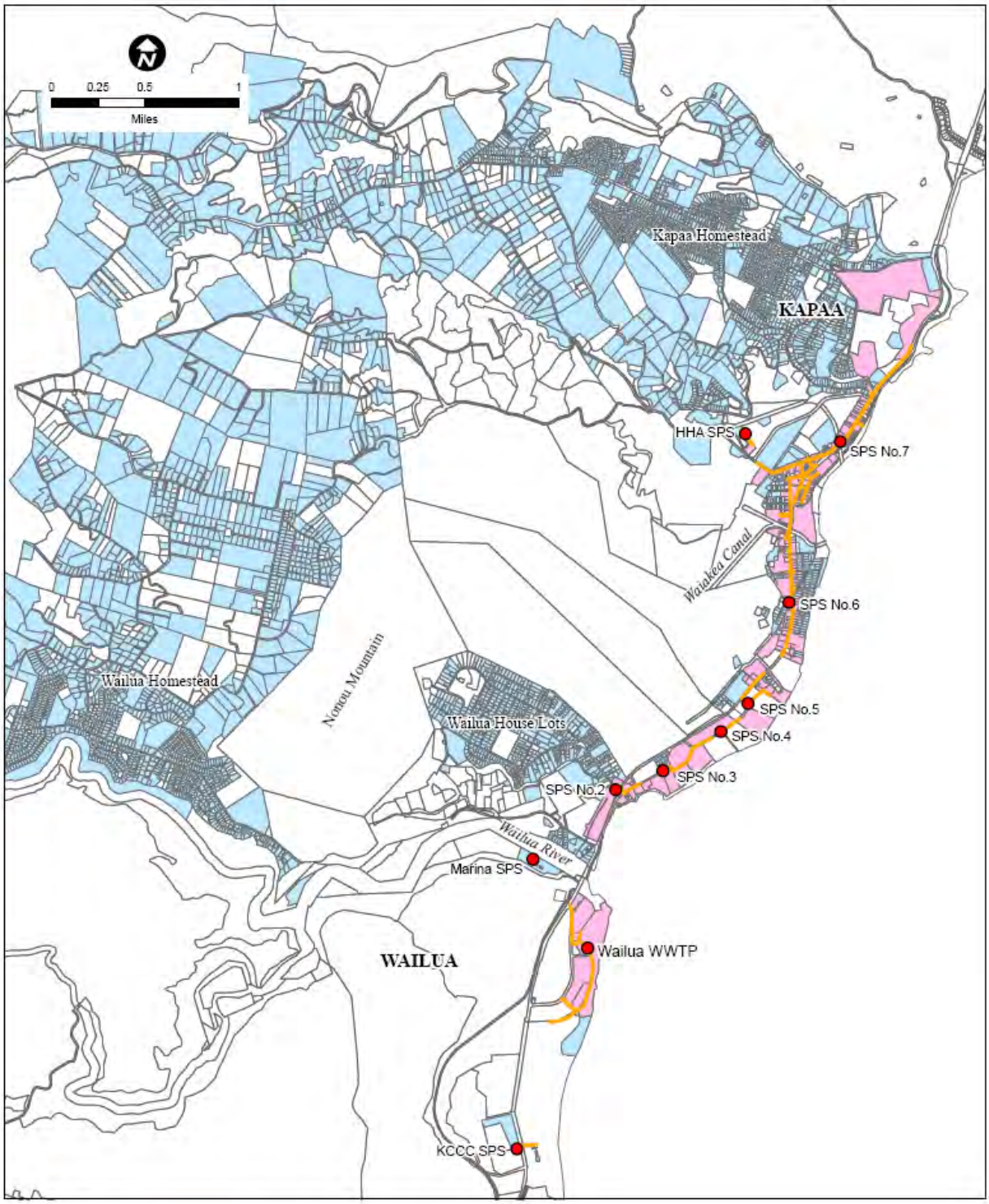
The Wailua WWTP currently uses two methods of effluent disposal, which are an ocean outfall and water reuse for irrigation at the adjacent Wailua Golf Course. Treated effluent is conveyed to the golf course by pumping out of the effluent chamber downstream of the chlorine contact basin.

Effluent sent to the ocean outfall flows by gravity to the ocean through an overflow pipe. When effluent is sent to the golf course, it is stored in a reservoir located at the golf course and is pumped out as required for irrigation.

The Sewer Design Standards, 1973 by the County of Kauaʻi, Department of Public Works, together with the Wailua Facility Plan, September 2008 by Fukunaga and Associates were the primary references for the preliminary wastewater report for HoKua Place (formerly known as Kapaʻa Highlands II) (Exhibit G) and will be abbreviated as SDS and WFP, respectively, when quoted in the following summary.

The WFP is a detailed study of the entire Wailua to Kapaʻa wastewater system completed in 2008 to guide the County with the necessary expansion and management of the system through the year 2025. It broke down projected flows to the Wailua Treatment Plant in three phases, the current and near term flows up to the year 2010, middle term flows for the 2010-2015 period, and far term flows for the years 2015 to 2025.

Wailua-Kapa'a Average Daily Wastewater Flows[1]	
Planning Interval	Average Wastewater Flow (mgd)
Current	0.70
Near Term (2010)	0.98
Middle Term (2015)	1.39
Far Term at Wailua WWTP(2025)	1.72
Kapaa Start-Up (2025)	0.40



LEGEND:

- Sewerline
- Sewer & Water Service Parcels
- Water Service Parcels (Assumed IWS)

WAILUA FACILITY PLAN **Water & Sewer Service Area**

The need for the WFP was partially based upon the rapid development that was occurring in the Wailua-Kapaʻa area during 2004-2007 period. Development has slowed considerably since this time and several of the developments anticipated in the WFP calculations have been put on hold or are no longer proposed. Of the proposed developments, the Coco Palms Hotel will be removed from the near term anticipate flows and be considered part of the middle term flows. The Coconut Beach Resort and Coconut Plantation Village will be removed from the middle term flows and be considered for the far term flows.

The proposed HoKua Place development is not expected to be at total capacity by 2015, but for the purposes of this analysis, it will be considered to be completed in the middle term planning period of the WFP. The table below is the adjusted Average Daily Flows (ADF) based upon the current flow to the Wailua Treatment Plant and adjustments due to slower development than anticipated by WFP.

Adjusted Wailua-Kapa'a Average Daily Wastewater Flows	
Planning Interval	Average Wastewater Flow (mgd)
Current	0.70
Near Term (2010)	0.98
Middle Term (2015)	1.39
Far Term at Wailua WWTP(2025)	1.72

Kapa'a Highlands Phase II Wastewater Flow Estimates	
Item	Projected Wastewater Flow (gpd)
Single Family Homes	34,400
Multi-Family Homes	170,750
Neighborhood Commercial	4,800
Total	209,950

Note: Single Family Homes assumed to have 4 occupants/unit and Multi-Family Homes have 2.5 occupants/unit.

[1] Table ES-1, WFP, September 2008

4.6.2 Potential Environmental Impact & Mitigation Measures

Water Sources

With respect to water resources to be used within the project, two alternatives are considered. First, if the County Department of Water Supply makes a final decision to approve the applicant's Water Master Plan where DOW will provide HoKua Place with storage for water in exchange for HoKua Place dedicating its well site to the DOW to feed the Department of Water's storage tanks and existing water system.

A Water Master Plan has been previously approved, in concept, by the County Department of Water (DOW). HoKua Place has a proven well site that will be dedicated to the DOW to feed the Department of Water's storage tanks. HoKua Place is committed to working with the DOW on pertinent water issues during the design and development phase.

In the event the DOW does not make final approval of the applicant's Water Master Plan, then the applicant will develop a private water system, using the well for its use within the project.

Implementation of a final alternative is based on the decision of the County Department of Water Supply; each is an acceptable alternative to the applicant.

The proposed water system will be subject to regulation as a public water system and will meet conditions of the State Department of Health, including HAR Chapter 11-20, 11-21 and 11-25.

Water Management and Conservation

The project will result in additional consumption of fresh (potable) water; however the installation of water efficient fixtures and the implementation of a water saving practices will reduce the demand for freshwater resources as noted in the HoKua Place (formerly known as Kapaʻa Highlands II) Sustainability Plan (Exhibit B).

As an overarching philosophy in all source alternatives, HoKua Place is committed to water conservation strategies to reduce consumption, conserve resources and minimize water use. The goal is to reduce the total water use through a combination of water saving equipment and strategies.

A number of measures may be implemented to facilitate conservation, including water restrictions during drier periods, public education and more efficient landscaping practices. Consumption could be significantly reduced through end-user conservation. Efficient fixtures and appliances will reduce indoor water use.

The water distribution system will be maintained to prevent water loss and homeowners and businesses will be encouraged to maintain fixtures to prevent leaks. Landscaping will emphasize climate-adapted native and other appropriate plants suitable for coastal locations. Best management practices will be designed and implemented to minimize infiltration and runoff from daily operations.

High efficiency toilets: (HETs) reduce flush volumes by no less than 20% compared to conventional ultra-low flow (ULFT) toilets. Dual-flush HETs allow users to choose one of two flushes: liquids or solids. In actual operation, dual-flush HETs average about 1.2 to 1.4 gpf. Pressure-assist HETs use a pressurized tank that creates for a more forceful flush with less water.

Faucets: Water flow is reduced by ***Flow limiters*** which are built into the faucet or are installed as after-market fittings. Aerators or laminar flow devices are types of flow limiters.

- Aeration injects air into the stream of water, displacing much of the water content.
- Laminar flow uses multiple small diameter parallel streams of water that are not aerated.

Flow control valves can limit water flow down to 1.5 to 0.5 gpm per side (hot and cold).

Showerheads: Federal law since 1994 mandates that all showerheads sold in the United States use 2.5 gpm or less. Despite this, some showerheads actually use much more than 2.5 gpm, and shower towers that include multiple showerheads or jets can total 12.5 gpm or more. A better option is a good quality low-flow showerhead designed to use 2.0 gpm or less while providing a satisfying shower.

Water conserving and Low impact landscaping: Landscaping shall be of native trees, shrubs and flowering plants as encouraged by the Kauaʻi Department of Water as part of their recommendations for water conservation. Selection and distribution of plants must be carefully planned when designing a functional landscape. Aesthetics are a primary concern, but it is also important to consider long-term maintenance goals to reduce inputs of labor, water and chemicals. Properly preparing soils and

selecting species adapted to the microclimates of a site greatly increases the success of plant establishment and growth, thereby stabilizing soils and allowing for biological uptake of pollutants.

Drainage

A Preliminary Drainage Report has been prepared. A detailed Drainage and Erosion Mitigation Plan will be prepared and submitted to the County Engineer for approval during the design and development stages. The Applicant will be providing major drainage improvements in connection with development of the property. Multiple detention ponds are proposed for the property. Additionally, a series of catch basins, drainage, pipes and culverts will be utilized to direct run off to major drainage areas on the property.

The project's proposed drainage system will be designed to minimize impacts to near shore coastal waters. Water quality treatment and detention basins will be built to prevent runoff and sedimentation from impacting groundwater resources. Prior to the occupancy of any residential or commercial unit within the project, HoKua Place shall implement and maintain storm and surface-water runoff BMPs, subject to any applicable review and approval of the State DOH, designed to prevent violations of State water quality standards as a result of storm-water discharges originating from the project. These BMPs will be documented in a declaration of covenants, conditions and restrictions that will be recorded against the property and will run with the land.

Potential water quality impacts during construction of the project will be mitigated by adherence to State and County water quality regulations governing grading, excavation and stockpiling. Construction BMPs will be utilized pertaining to grading, grubbing, stockpiling, soil erosion and sedimentation during construction. BMPs will also be implemented for long term development and operation of activities occurring on the site as part of pollution prevention measures.

BMPs include storm water runoff and non-storm water sources control measures and practices that will be implemented to minimize the discharge of erosion and other pollutants from entering into the receiving State waters.

Post construction BMPs to prevent erosion and storm water runoff after construction is completed includes the installation of drain inlets and shallow drywells within the project site, and landscaping and grassing of disturbed areas. Prior to occupancy, HoKua Place will implement and maintain storm and surface-water runoff BMPs, subject to any applicable review and approval of the DOH. Those BMPs will be designed to prevent violations of State water quality standards as a result of storm-water discharges originating from the Project.

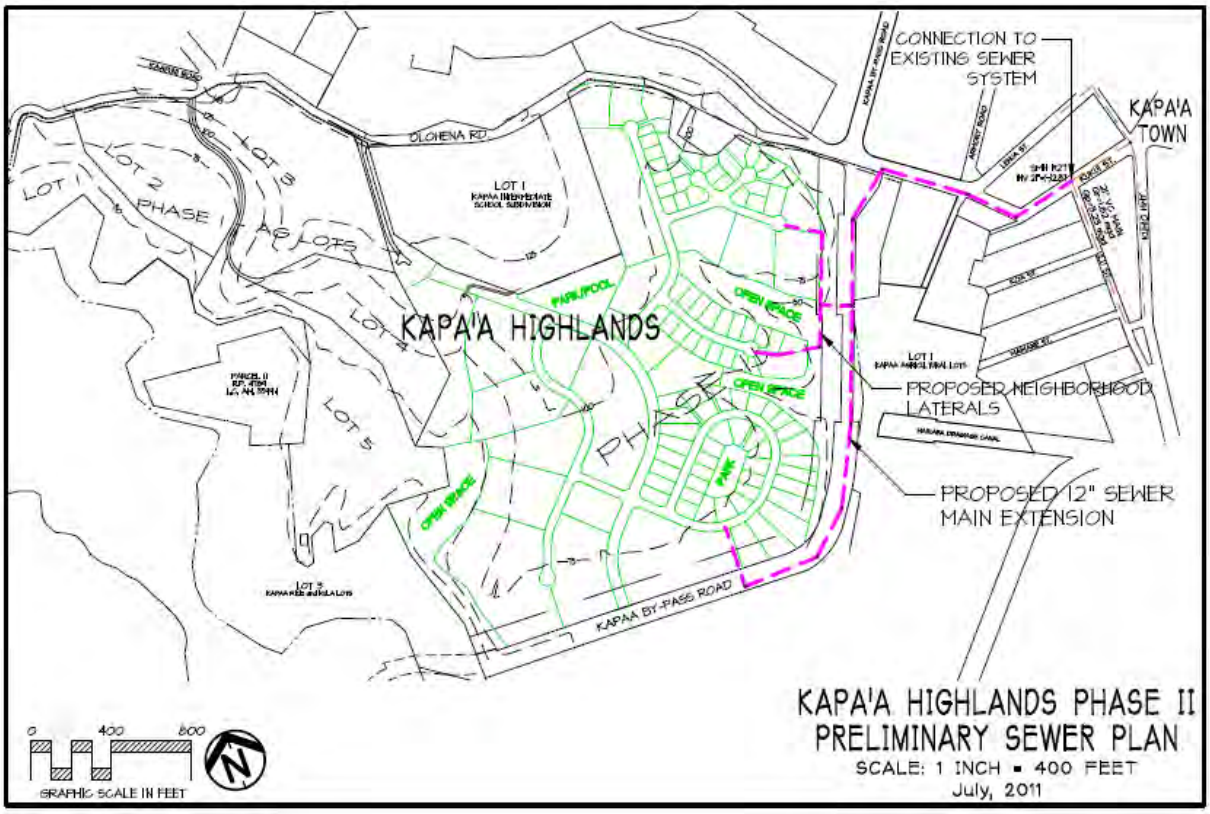
Wastewater

Based upon the projected flow of 209,950-gpd (0.21 mgd), with a max load factor of 4.1, a 12" sewer main would be required to serve the development. It would begin along the Kapaʻa By-pass Road and terminate at an existing manhole near the intersection of Ulu and Kukui Streets, shown on the map below.

The length of the main within the existing public Right-of-Ways would be about 3,400 linear feet. The wastewater line will comply with all applicable rules and regulations.

The main will connect with the County's existing sewer system. At the existing manhole connection the existing main downstream of the connection is a 21" main with a capacity of 3.2 mgd. The 21" main

currently has a peak flow of about 0.6 mgd, therefore the proposed flow is well within the capacity of the existing sewer system, including allowances for the future increases anticipated in the "Final Wailua Facility Plan", September 2008.



HoKua Place will be contributing funds to help upgrade the deferred maintenance and repair of the Kapa'a Waste Water Treatment plant. The project will not be a detriment to the capacity of the Plant.

The project's design features and policies to comply with applicable rules and regulations will include conformance to applicable provisions of the Department of Health's Administrative Rules, Chapter 11-62, "Wastewater Systems."

4.6.3 Level of Impact after Mitigation

A Water Master Plan for HoKua Place (formerly known as Kapa'a Highlands II) (Exhibit D) and the agreement for the exchange of source for storage has been approved, in concept, by the County Department of Water (DOW). HoKua Place has a proven well site that will be dedicated to the DOW to feed the Department of Water's storage tanks and existing water system. Or, a private water system will be constructed as described.

The 97-acres do not have natural water resources; therefore there are no impacts on our natural water resources for this particular project.

Mandatory compliance with requirements of the Department of Water Supply will ensure that the project has a less than significant impact on water resources or water quality.

Implementation of a water saving practices will reduce the demand for freshwater resources as noted in the HoKua Place (formerly known as Kapaʻa Highlands II) Sustainability Plan (Exhibit B).

In addition, the project will adhere to recommendations in the Preliminary Engineering Report Wastewater Improvements (Exhibit G) and Preliminary Engineering Report Drainage Improvements (Exhibit F) to ensure water, drainage ways and wastewater improvements will have a less than significant impact.

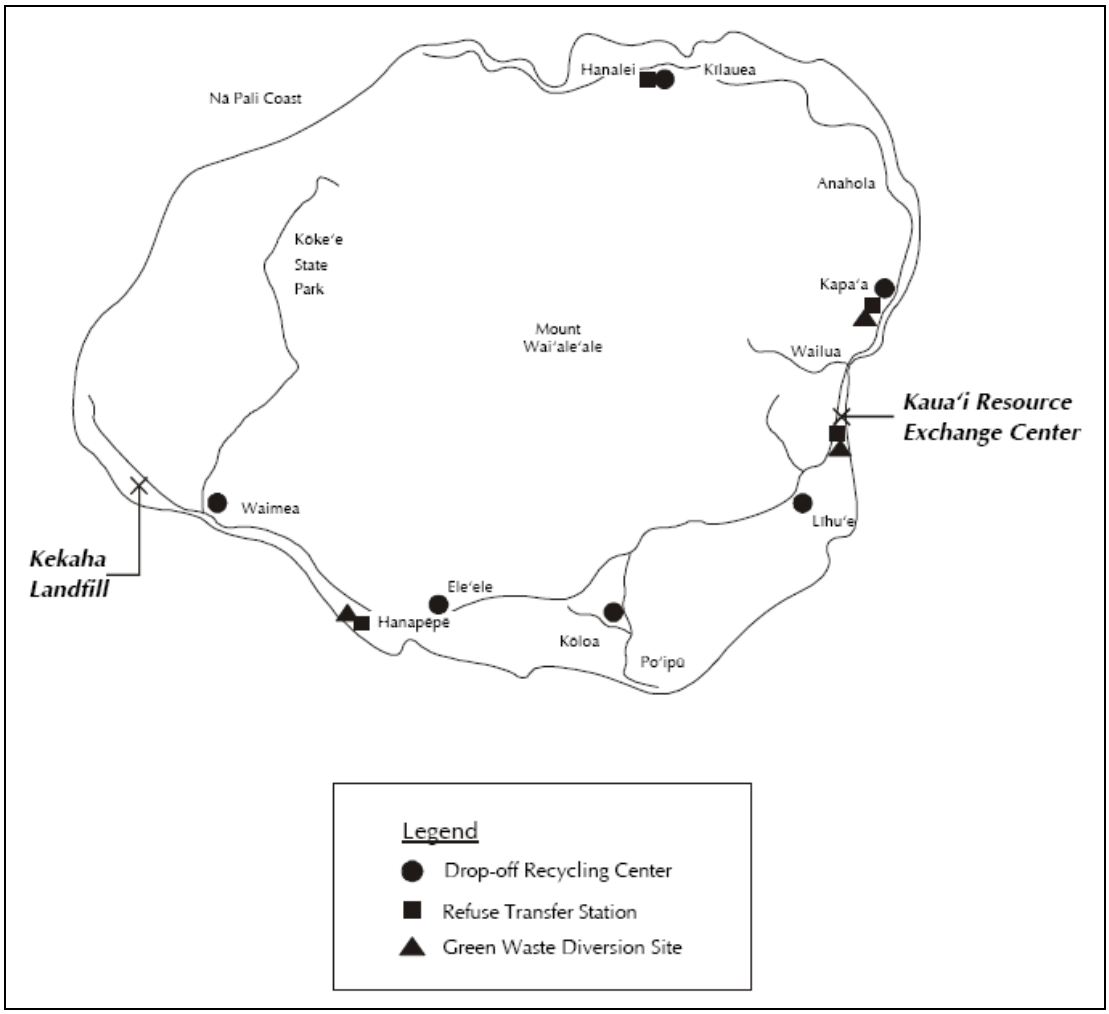
4.7 Solid Waste & Material Management

This section discusses the solid waste and materials management practices within the project area and potential impacts of the project on those practices. Measures that will be implemented by HoKua Place to reduce the possible impacts of solid waste on the environment are also presented.

4.7.1 Environmental Setting

Solid waste, as defined under Section 1004(27) of the Resource Conservation and Recovery Act (RCRA), refers to any discarded solid, semisolid, liquid, or contained gaseous materials. Currently because of the very limited use of the area, no significant amount of solid waste is produced.

The County of Kaua‘i currently provides single-family residences with solid waste disposal service on a once-per-week basis. A refuse transfer station is located in Kapa‘a town. The County of Kaua'i has one landfill to service the entire island, the Central Kaua‘i Landfill, which is located in Kekaha. Because there are only six years of capacity left in the current landfill, the County is currently pursuing a new landfill in a more central location (in the vicinity of Līhu‘e.) There is necessary capacity to accommodate the proposed development.



4.7.2 Potential Environmental Impact & Mitigation Measures

Waste generated through site development will consist predominantly of vegetation and debris. Soil and debris displaced from grading and clearing will be utilized as fill throughout the site as required, minimizing disposal and transit/relocation of the materials.

Throughout project construction and development, HoKua Place will seek to reduce, reuse, and recycle materials and waste to the greatest degree possible.

Construction materials that are rendered un-recyclable will be disposed of in the Central Kaua‘i Landfill. Green waste resulting from the project’s development will be chipped into mulch for on-site use or will be disposed of properly.

Measures and provisions to implement recycling, such as collection systems and storage for recyclables, will be incorporated to the HoKua Place project. A community management system will be in place for the residences of this project.

The management policies will encourage residences to participate in the moral ethics of respecting the surrounding environment, reduce waste and excessive consumption, and fulfill the responsibility as trustees of the environment for the present and the future generations. Residences will be invited to participate in policy and decision making.

Solid waste disposal service for the Single-family residences will be provided by the County of Kaua‘i. Private solid waste disposal will be available for the multi-family projects.

4.7.3 Level of Impact after Mitigation

Mandatory compliance with existing regulations and requirements and the implementation of the mitigation measures proposed above, will ensure that the project will have a less than significant impact in regards to solid waste management.

4.8 Socioeconomic Conditions & Public Service Facilities

This section discusses the socioeconomic conditions and public services and facilities in the region and in the project area, and the potential long-term socio-economic impacts of the HoKua Place development.

4.8.1 Environmental Setting

Population

Kaua‘i County is the fourth largest county in the state, as ranked by population and economic activity, behind the City & County of Honolulu (O‘ahu), Maui County and the Big Island of Hawai‘i.

The Kapa‘a-Wailua basin is home to a large portion of Kaua‘i’s population. An urban corridor extends along Kūhiō Highway from Haleilio Road in Wailua to Kawaihau Road, at the northern edge of Kapa‘a Town. The Kapa‘a-Wailua urban corridor is vibrant and active, a “working town.”

Kapa‘a town is located 0.3-miles south of the property. Kapa‘a is the eastside of Kaua‘i’s center of trade and employment, with numerous professional and business services. Although Līhu‘e, approximately 8-miles south of the property, is the center of county, state, and federal government services, its population is slightly less the Kapa‘a’s which has the largest resident population on the island.

Housing

The Kapa‘a-Wailua Basin community plan outlines the regional issues and opportunities that will be subjects for future community planning. A “Build-Out Analysis” of the Kapa‘a-Wailua Basin was prepared in the General Plan Update. As of 1998, this area had an estimated 4,700 dwelling units, making it the largest residential community on Kaua‘i.

Based on the General Plan Land Use Map designations, the analysis found that an additional 4,000-units could be developed if the General Plan-designated lands were fully zoned, subdivided and built out.

About 2,400 more units could be built in Urban Residential areas, about 500 more in Rural Residential areas and approximately 1,100 more units in the Agricultural areas. This would increase the housing units and population of the area by 85%.

The “Build-Out Analysis” specifically included the subject property as an “expansion area.” The new General Plan Land Use Map designates the subject property as Urban Center.

The Kawaihau Planning District has substantial capacity for additional residential development, as described in Section 6.2.3.1 (Build-Out Analysis) of the Kaua‘i General Plan:

> “Lands previously designated for urban use but as yet mostly undeveloped include an area located near Kapa‘a, south of Olohena Road. This area was previously designated for Urban Mixed Use and is shown as Urban Center on the new General Plan Land Use Map. Owned partly by the State and partly by Amfac/JMB (or its successor), this ‘expansion area’ for Kapa‘a has already accommodated the Kapa‘a Middle School.”

Market studies have shown that the population growth and correlating need and demand for housing is high on Kaua‘i. The proposed development will allow residents to purchase from a variety of housing options.

Based on the HoKua Place (formerly known as Kapaʻa Highlands II) Housing Market Study, much like the state, Kauaʻi's residential real estate supply is inflexible and constrained, but to a greater degree, the political climate is viewed as unfriendly towards any and all attempts to expand the supply of residentially zoned land, particularly at the high end and/or in areas that are highly visible (literally and figuratively).

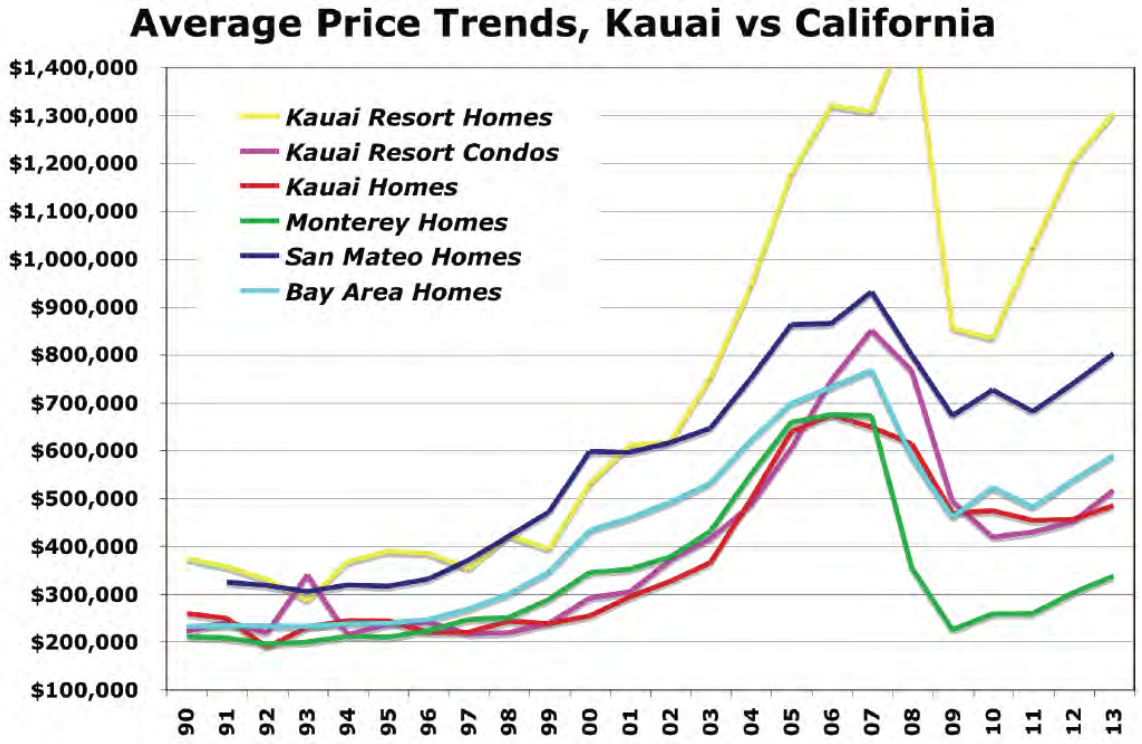
At the same time, demand for residential real estate is both flexible and strong, particularly in good economic times and over the long run. It can be, and is currently, constrained to an uncharacteristic degree, thanks to havoc in the financial markets the last few years and the drastic fall off in economic activity globally and nationally.

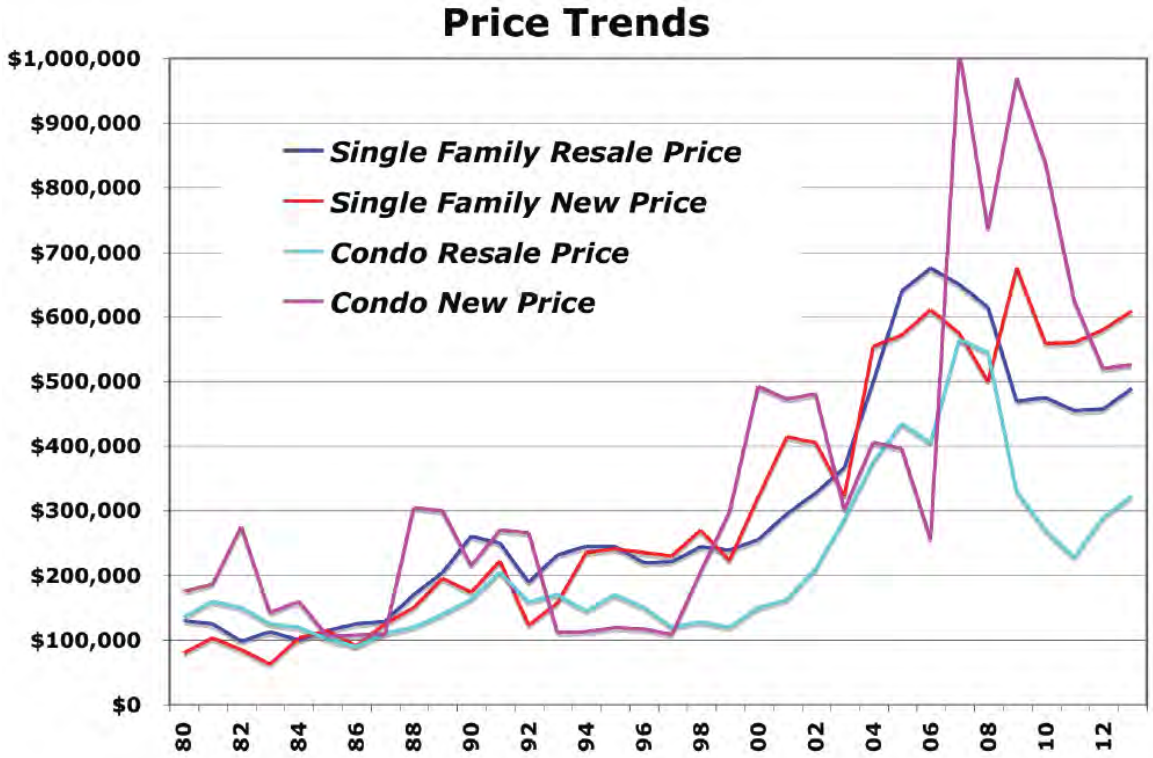
Currently, Kauaʻi's residential market shows recovery. The question is, going forward, how will they behave? The rule of thumb for the residential market is that the upswing in the cycle, the up cycle, generally lasts about 6.5 years, and is about twice as long as the down cycles.

In addition, the up cycle, trough to peak, results a tripling of the number of closings. The chart below illustrates this.

The sales and Pricing for condominiums follows:

According to the state economic forecasters, Hawaii's economy continues to grow strongly at an accelerating rate. The state has very low unemployment relative to the rest of the nation, thanks to a resurgent demand in the visitor industry, which is the major engine of economic growth in the county and the state. This, in turn has resulted in recovering and increasing real estate price trends, as noted below:





Employment & Income

The state of Hawai'i has very low unemployment relative to the rest of the nation. The latest statistics show the rate near 6-percent, the lowest level in more than two years.

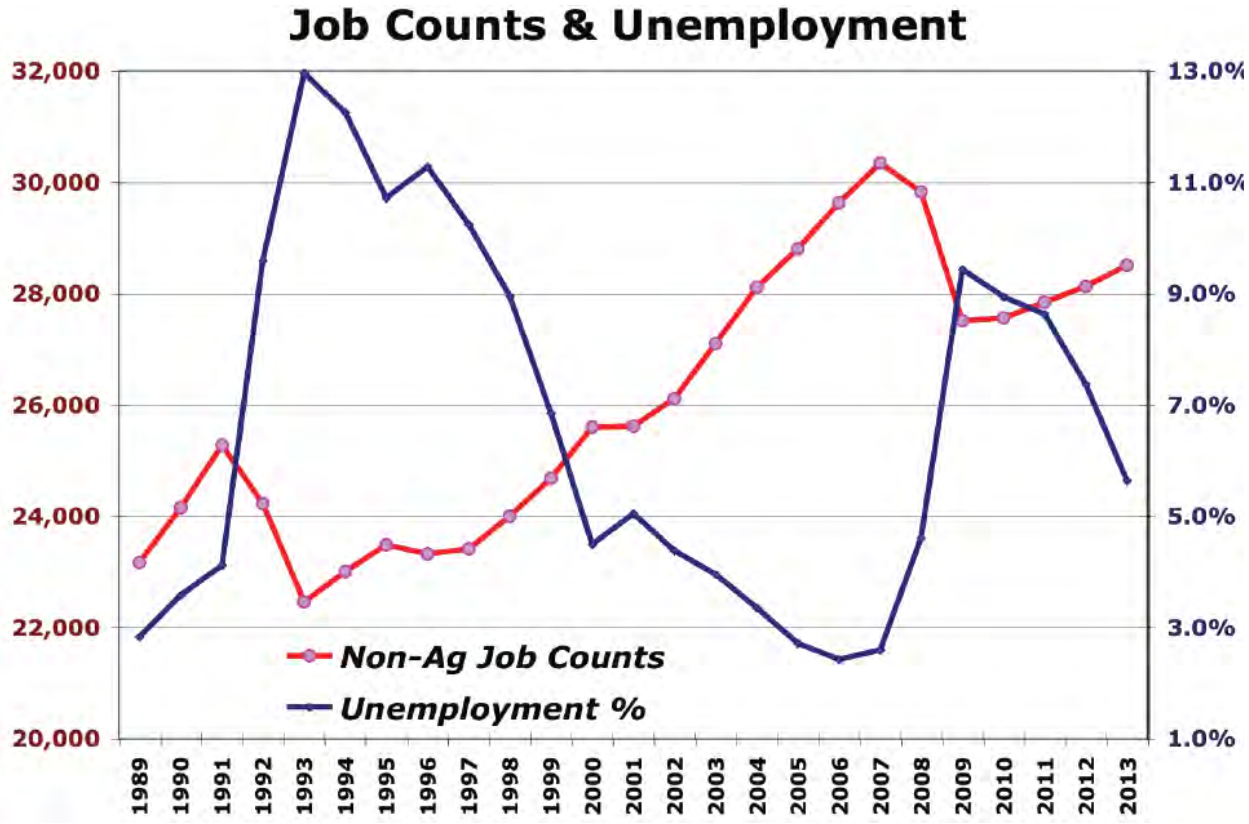
Hawai'i fared better than the nation as a whole, which experienced an increase in the average unemployment rate to 9 percent in April 2011 from 8.8 percent in March 2011.

On a county-by-county basis, Honolulu County's 4.6 percent jobless rate in April was the lowest in the state, as opposed to 7.1 percent in Maui County, 7.7 percent in Kaua'i County and 8.9 percent in Hawai'i County.

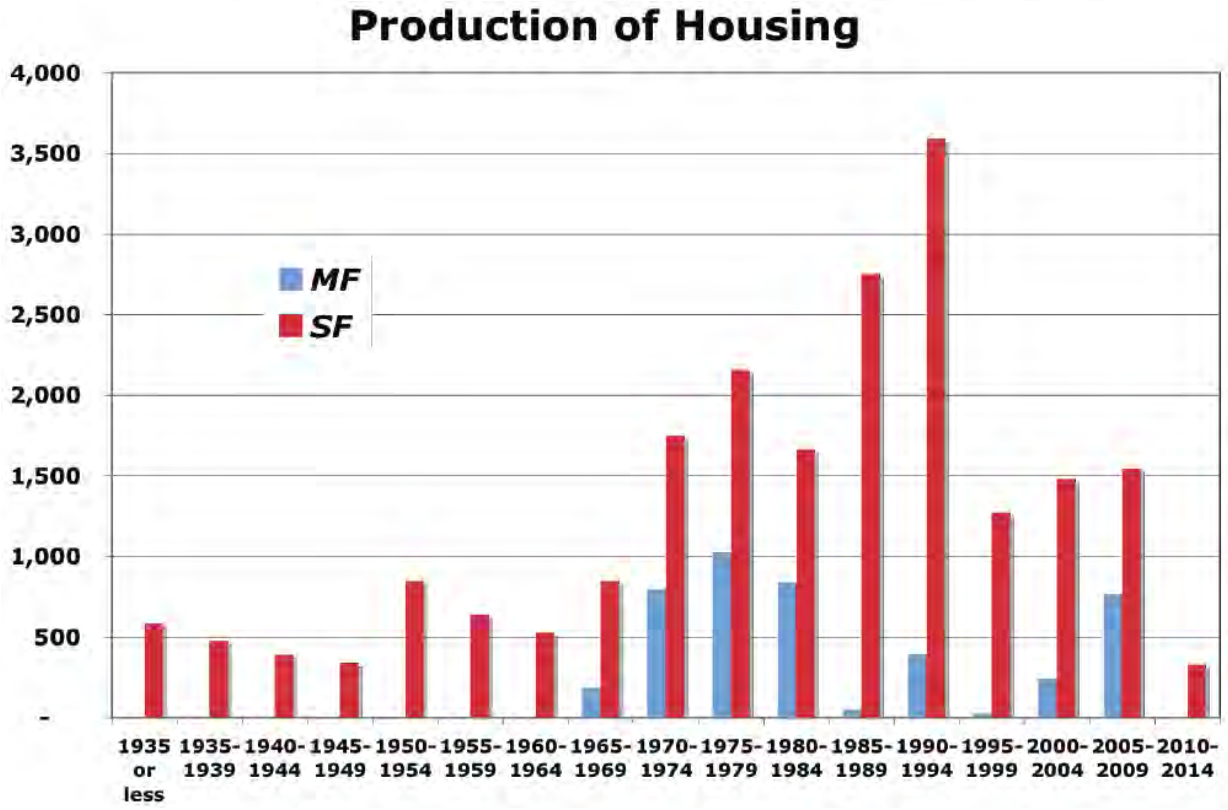
Mainland economic weakness began to affect the local economy in mid-2007, followed by a critical event that precipitated a broader downturn – the collapse of Aloha and ATA airlines early in 2008.

This pushed tourism over the cliff, leading to increasing unemployment, business failures, slackening of demand, and undercut spending levels island wide.

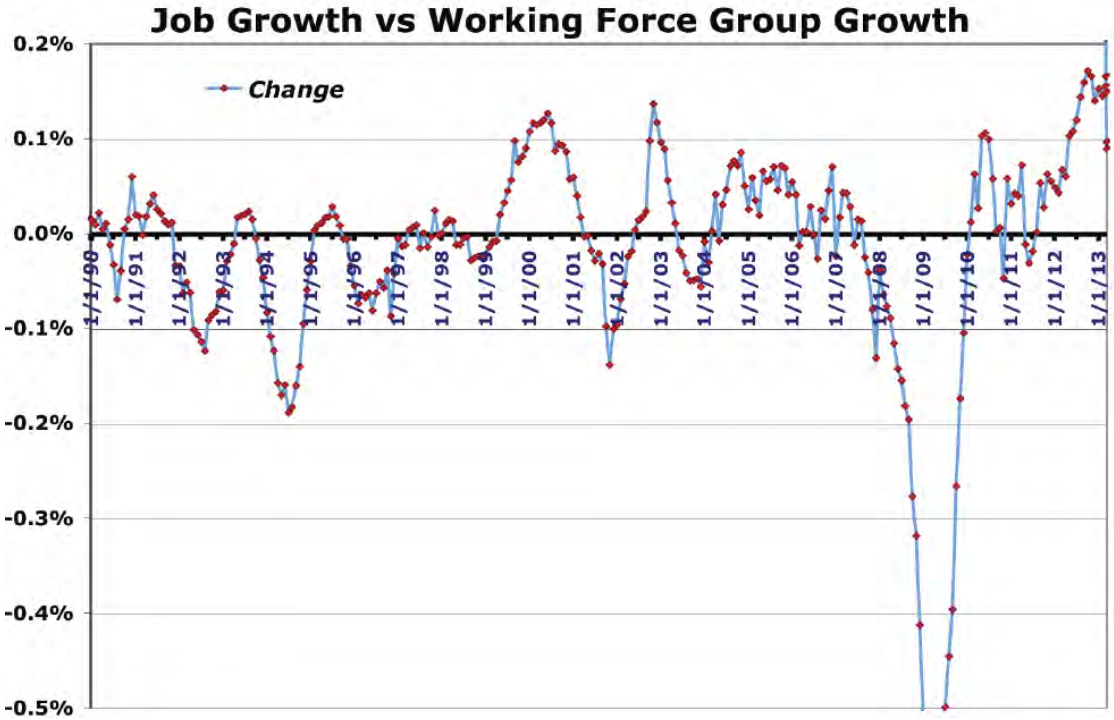
As a result, the unemployment rate on Kaua'i, traditionally among the lowest in the nation, more than doubled. As seen in the next chart, unemployment rates seem to have peaked while the job count loss has leveled out.



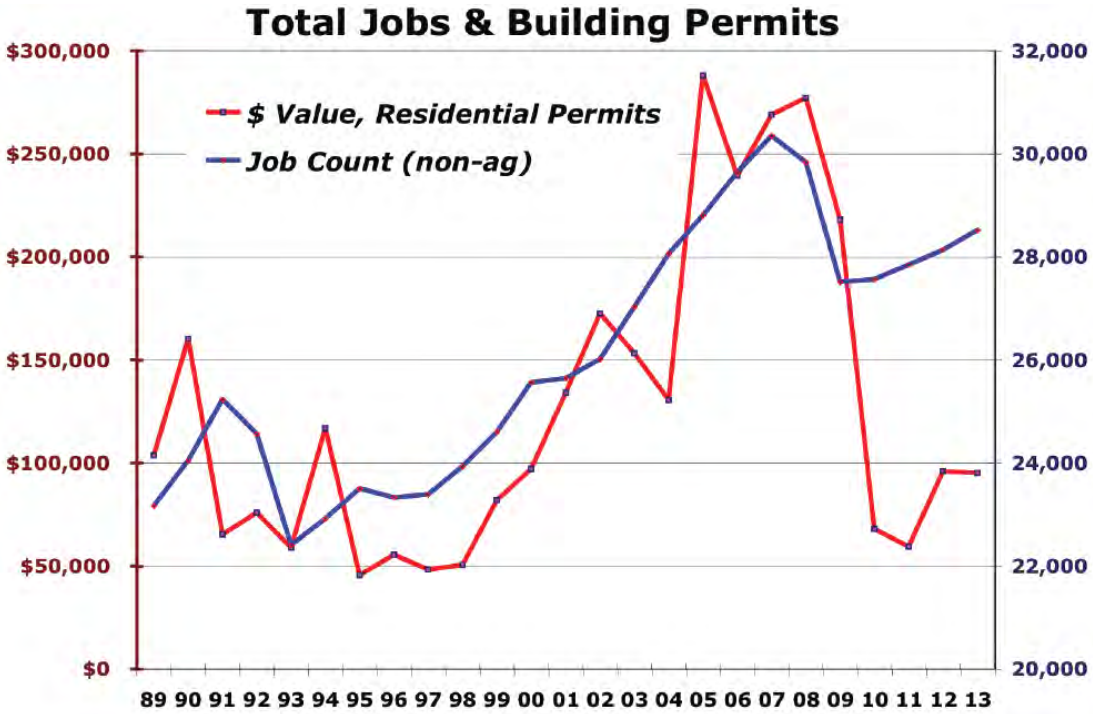
Kaua'i's construction industry has been lagging, with private building permits down significantly.



Lastly, the balance between job growth and working force (new entrants into the job market, i.e., those needing jobs) has rebounded strongly, thanks to a slight slowing growth of the population, in combination with a rebound in heath care and business services, plus a strong tourism sector and federal (defense) spending.



Notwithstanding the recent turmoil, mid to long-term indicators and foundational economic attributes have begun to look up for Kaua‘i and especially the Kapa‘a study area.



Economy

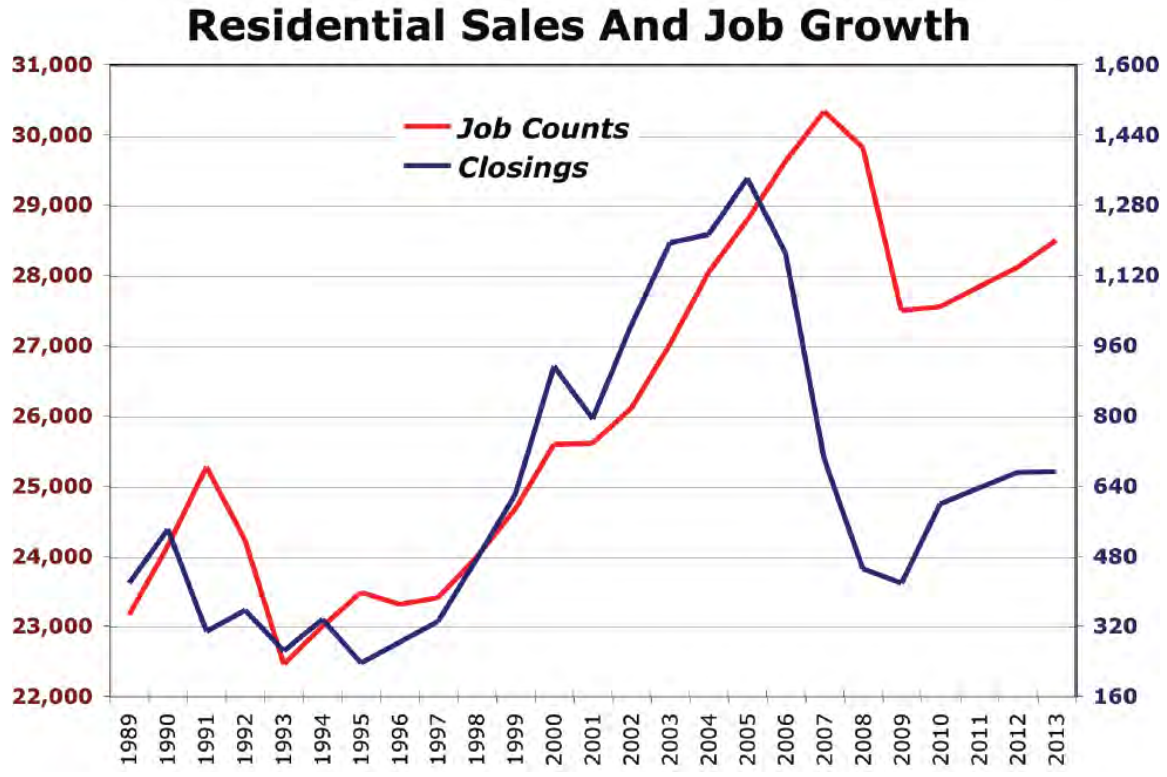
The Housing Market Study developed by The Data@Work describes and analyzes the factors and trends behind the general and specific supply and demand for housing in relation to HoKua Place (formerly known as Kapa‘a Highlands II). The entire study is included as Exhibit A.

The Data@Work is a market research firm that specializes in analyzing residential real estate markets for developers and lenders. They were retained to perform a study analyzing the market for the proposed master planned community on the island of Kaua‘i, called HoKua Place (formerly known as Kapa‘a Highlands II).

The study focused on the historical and projected market conditions and trends in accessing the ability of the project to be successful in selling its residential properties at a price and at a velocity. The study entailed collecting, comparing and analyzing information that has a bearing on the numerous aspects of market demand for the proposed project, including but not limited to publicly available real property, economic and commercial data.

The majority of the island’s roughly 52,000 residents lives and works in the coastal areas leaving the interior of Kaua‘i natural and pristine. It has one of the strongest brands in the global visitor industry, as well as arguably the most diversified visitor industry of any of the islands, combining large resort master planned communities, cruise ship visitations, time share developments and small-scale bed and breakfasts.

The breadth and depth of this economic base, like the rest of the state, rests on the county’s economy’s unique comparative advantage relative to the other visitor destinations world-wide: it has a very high quality of life, a function of a naturally beautiful setting, with a benign environment and near perfect climate.



The majority of the primary housing development is located within the Kapa‘a and Līhu‘e urban zones, with secondary sources located areas in and around Po‘ipū, Kīlauea/Hanalei, and Hanapēpē and Waimea.

Second home development is located within and around the three major resort communities, as well as in locations that are close to the coastline and/or in westward facing locales.

By way of context, housing construction hit a peak on Kaua‘i when major resorts were developed in the 1970s; recent high-volume years reach only half that level. Thereafter, many of the condominium projects that were developed targeted the offshore buyer market. Sales records show that upwards of 30% of the condo sales went to out of state buyers.

Census records have shown that a quarter of the County’s housing stock did not house residents. Thus, while the Census categorizes these units as “vacant,” they may be actually rented to vacationers, reserved by owners as a second home, or both.

Demand in the housing market hence comes from residents, investors and non-residents.

Public Services & Facilities

Police protection for the Kapa‘a, area is provided by the Kaua‘i County Police Department, with its main headquarters located in Līhu‘e. A substation is located in Kapa‘a Town approximately 0.5-mile away from the Property.

Fire protection is currently available for the Kapa‘a area by a new county fire station located on the north end of Kapa‘a town, approximately 2.0-miles away on Kūhiō Highway.

Education

In recent decades the requirement to provide land and money for schools was imposed by state and county agencies as a condition of urbanizing land. The Department of Education (DOE) collected payments of school land and cash from some developers when their projects were required to make “fair-share contributions” by the State Land Use Commission or the counties to gain project approval.

The DOE was only granted its own authority to collect impact fees by Act 245, Session Laws of Hawaii 2007.

Prior to Act 245, the State Legislature in 2005 established a School Impact Fee Working Group (hereinafter “Working Group”). The Working Group submitted its findings and recommendations in a report, Hawaii School Impact Fee Working Group Report in March 2007.

The report analyzed salient issues, including “Fair Share” practices; conducted two case studies for specific areas in Central Oahu; and offered impact fee legislative language.

The 2007 report also provided a framework, or procedure, for determining fee schedules for those areas of the state experiencing enough new residential development to create the need for new or expanded school facilities.

Act 245 incorporated many of the findings and recommendations in the 2007 Report. It allows DOE to charge impact fees within school impact districts where new public schools must be constructed or expanded to accommodate the children from new homes.

The Legislature determined that new residential developments within identified school impact districts create additional demand for public school facilities.

Therefore, developers of new housing are required to pay a portion of the cost of providing new or enlarged public schools to serve the additional students who will be living in the new housing.

The land or fees charged are based on each new development's proportionate share of the additional demand on public school facilities.

At this time, neither Kapaʻa nor any other district on Kauaʻi is designated as a School Impact Fee District. According to Heidi Meeker, Planning Section, DOE Facilities Development Branch, the DOE will not be asking the HoKua Place project for any contributions or fees at this point in time.

DOE does not have any current plans to propose an impact district in Kapaʻa. However, it is possible that a future impact district may cover Kapaʻa. In that event, HoKua Place may be required to pay impact fees, based on the fee schedule established for the district.

Representatives of HoKua Place had conversations and received information from the DOE concerning possible impacts the proposed project may have on school facilities and programs.

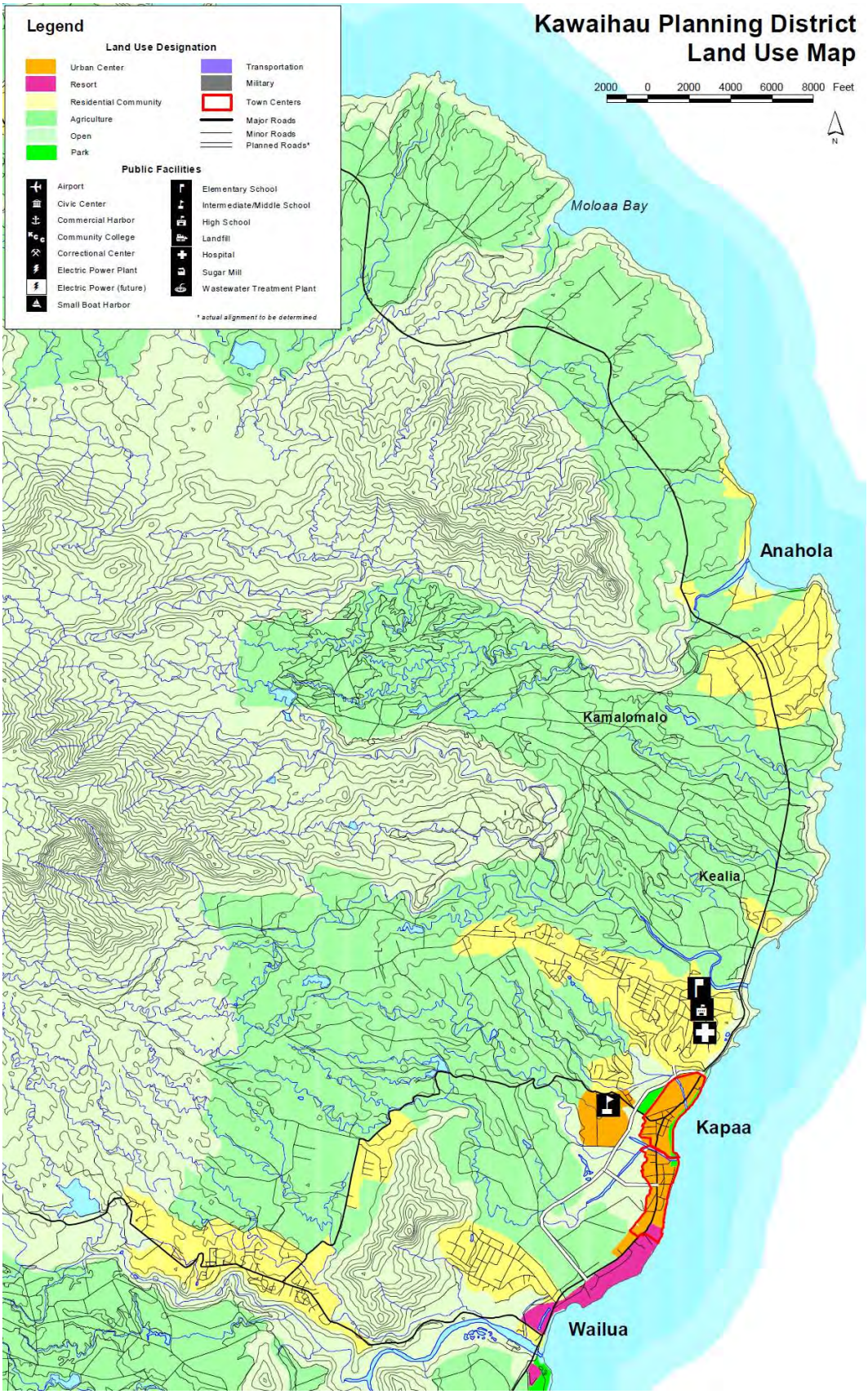
The following is a summary of information concerning existing school facilities serving HoKua Place, estimated student generation due to the project and other information concerning impacts to school facilities. This information is based on information in DOE's Classroom Utilization Report 2007-2008 (CUR 07-08.)

The Kapaʻa Middle School is adjacent and to the north of the HoKua Place project. Kapaʻa High School and Elementary School, share a campus, which is located within 2-miles of the Property.

Kapaʻa Elementary School serves grades K-5 and has capacity for 1,373 students (DOE). The 2010/2011 school year fall enrollment was 802 students (Kapaʻa Elementary School Status and Improvement Report, School Year 2010-2011).

Kapaʻa Middle School, with facilities' capacity for 1,059 students (DOE), was opened in 1997 and had a fall enrollment for the 2010/2011 school year of 635 students (Kapaʻa Middle School Status and Improvement Report, School Year 2010-2011).

Kapaʻa High School has capacity for 1,445 students (DOE) and had a 2010/2011 fall enrollment of 1,053 students (Kapaʻa High School Status and Improvement Report, School Year 2010-2011.)


Kawaihau Planning District
Land Use Map
2000 0 2000 4000 6000 8000 Feet
N
Legend
Land Use Designation
Urban Center
Resort
Residential Community
Agriculture
Open
Park
Transportation
Military
Town Centers
Major Roads
Minor Roads
Planned Roads*
Public Facilities
Airport
Civic Center
Commercial Harbor
Community College
Correctional Center
Electric Power Plant
Electric Power (future)
Small Boat Harbor
Elementary School
Intermediate/Middle School
High School
Landfill
Hospital
Sugar Mill
Wastewater Treatment Plant
* actual alignment to be determined
Moloaa Bay
Anahola
Kamalomalo
Kealia
Kapaa
Wailua

Note that all area schools have student enrollment significantly less than the capacity of each school.

This is summarized below:

School	Capacity	Enrollment	Excess Capacity
Kapaʻa Elementary	1,373	802	571
Kapaʻa Middle	1,059	635	424
Kapaʻa High	1,445	1,053	392

In discussions between HoKua Place and the DOE (Heidi Meeker), a preliminary spread sheet that calculated student generation estimates, as well as computed impact fee was provided to HoKua Place.

Below is the indicated student generation for the HoKua Place project, based on 86-single-family units and 683-multi-family units (estimated Kapaʻa-area-only SGR:)

Student Generation (Rate)	S.F.	M.F.	Student Generation (Students)	
Elementary	0.13	0.10	Elementary	82
Middle	0.06	0.05	Middle	42
High	0.10	0.03	High	32

(Per the DOE representative (Heidi Meeker), DOE does not have a problem with the estimated student count.)

(Per the DOE representative (Heidi Meeker), DOE does not have a have a problem with the general assessment that there is sufficient capacity in the Kapaʻa schools at this point in time to accommodate the students who will reside in the project.)

Recreational Facilities

There are several parks within Kapaʻa town, including a beach park, which are within walking distance of the project area. A County owned 1.9-acre park is located within walking distance from the subject property, just south east of the corner of Olohena Road and the by-pass road round-about. The park consists of a baseball field, football field, basketball courts, restroom facilities, picnic tables and a barbecue area.

Healthcare Services

Mahelona Medical Center located in Kapaʻa (approximately 2-miles away from the project) is Kauaʻi's Eastside Critical Access Hospital, providing 24-hour emergency services. The facility is part of the Kauaʻi Region of Hawaiʻi Health Systems Corporation.

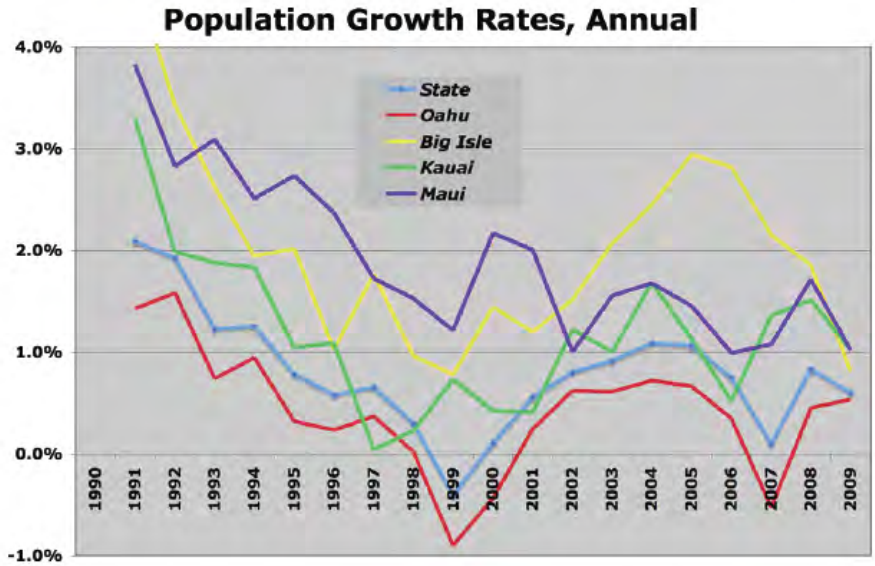
Both Kapa`a and Līhuʻe (8-miles away) provide healthcare facilities and services.

4.8.2 Potential Environmental Impact & Mitigation Measures

Population

An increasing population base via natural growth and inevitable in-migration, coupled with the intrinsic worldwide demand for Hawaiian tourism and its limited land resources, will help in a revival of the economy, along the well-established, highly-cyclical historic trend lines.

The population growth is seen in the following chart.



It is likely that the population growth for the county in the coming years will return to the long-term historical rate of slightly over 1% growth, p.a.

Housing

This project will have a positive impact on housing and population aspects of the East Kaua'i Region. The Kaua'i General Plan specifically points out the need for more housing in the area and specifically designates the subject property as Urban Center for that purpose.

HoKua Place is a well located master planned project on the Island of Kaua'i targeting primary housing demand from local and in-migrant families, as well as offshore second home demand for view estate ownership. Located in the middle of the island, the project is close to the centers of employment and resort activity, plus the airport, beaches, shopping, recreation, etc.

Development of the Property will address a portion of the significant demand for affordable housing in the County of Kaua'i, without significantly affecting reserve areas for foreseeable urban growth.

HoKua Place will respond to varying spectrums of demand for housing within Kaua'i by providing a wide range of housing opportunities inclusive of affordable housing alternatives. HoKua Place will seek to create and sustain a mixed-income community allowing for unparalleled social diversity.

Affordable housing demands exhibited a significant upward trend over the last several years. Recent market studies have indicated a current shortage of single-family housing in the East Kaua'i area. The forecast is that demand for housing will continue to increase, especially in the area of affordable housing. The proposed development will assist in alleviating some of the current supply-and-demand pressures on Kaua'i's current housing market by providing a variety of additional housing products and opportunities for long-term local residents.

In a 2010 letter to the applicant, the Planning Director wrote,

> "We are writing in general support of Three Stooges LLC's petition to amend 97-acres in Kapa'a to the Urban district. The proposed amendment is in conformance with the

County of Kaua'i's General Plan and will provide 231-units of affordable housing. Affordable housing remains an acute need on Kaua'i, even with a falling real estate market and as such the County is generally supportive of any petition that proposes additional affordable housing, particularly when contiguous to developed urban areas, infrastructure and consistent with our General Plan."

Employment & Income

Development of HoKua Place would generate employment and consequent income and taxes. On a short-term basis, the proposed development will have a direct beneficial impact on the local economy during construction through construction and construction-related employment.

HoKua Place proposes two areas for commercial uses that, ultimately, will serve to promote and provide a variety of job opportunities. A 1.4-acre parcel is proposed for commercial uses such as a country store and small personal service type uses are anticipated. A 1-acre site on the makai side of the Kapa'a Bypass Road is also proposed for commercial development or for use as sub-stations for the police and/or fire department.

Economy

By providing the opportunity for new residences on the Island of Kaua'i and generating additional real estate sales activity, the project is expected to support long-term impacts, including additional consumer expenditures, personal income and government revenue enhancement.

HoKua Place provides significant, on-going economic and fiscal benefits for residents of Kaua'i, as well as for the County and State governments. Over the long term, the residential homeowners will require various services related to home maintenance and improvement that will further support the local economy.

Public Services & Facilities

HoKua Place will have lands available for county police and fire substations on the Property. One acre on the Makai side of the Kapa'a Bypass road (southwest corner of Olohena and the bypass road) is proposed for future commercial use or for sub-stations for the police and fire departments.

Education

The proposed project will generate increased demand on student enrollment within the region. However, this demand falls well within the existing capacity of all schools serving the district, elementary, middle and high. Per the DOE representative, DOE does not have a problem with the estimated student count. Per the DOE representative, DOE does not have a have a problem with the general assessment that there is sufficient capacity in the Kapa'a schools at this point in time to accommodate the students who will reside in the project.

HoKua Place will coordinate with the DOE to ensure that the DOE's facility assessment policy and school impact fee provisions are appropriately addressed. Additionally, a 3.1-acre park is proposed adjacent to the existing Kapa'a Middle School. The park will have an area for the county's proposed relocation of the Kapa'a county swimming pool. HoKua Place also plans to develop a bike/walking path from the south of the property to the Kapa'a Middle School to facilitate biking and walking around the development.

HoKua Place will work with DOE to address any impacts to school facilities due to the project.

Recreational Facilities
HoKua Place holds respect for the environment by interlinking natural features and open space as core components of the community.

Open space and open greenway areas encompassing 14.3-acres will be developed within the project. A 3.1-acre park is proposed within the project for outdoor recreation. Land for the proposed relocation of the Kapaʻa county swimming pool will be available within the 3.1-acre park. The provision of a 3.1-acre park with a county swimming pool within the proposed development will provide residents with an opportunity for leisurely recreational activities.

Healthcare Services
Through the layout and design of HoKua Place, there is an overall opportunity for a positive effect on the health of its residents. Communities that make it easy and safe to walk and ride bikes are opening the door to a wide range of health benefits for their residents by reducing barriers to being physically active and helping individuals integrate physical activity into their daily lives.

Active living is a way of life that integrates physical activity into daily routines. For individuals, the goal is to get a total of at least 30-minutes of activity each day by, for example, walking, bicycling, playing in the park, working in the yard, taking the stairs or using recreation facilities.

For communities, the goal is to provide opportunities for people of all ages and abilities to engage in routine physical activity and to create places and policies that encourage better physical health. Such places within HoKua Place include, open space and open greenway areas encompassing 14.3-acres, a 3.1-acre park for outdoor recreation and land for the proposed relocation of the Kapaʻa county swimming pool which will provide residents with an opportunity for leisurely recreational and physical fitness activities.

4.8.3 Level of Impact after Mitigation

As noted in the Kapaʻa Housing Market Study developed by The Data@Work (Exhibit A) the project will help satisfy current and future housing demand.

Per the DOE representative Heidi Meeker, DOE does not have a have a problem with the general assessment that there is sufficient capacity in the Kapaʻa schools at this point in time to accommodate the students who will reside in the project.

The proposed development will not necessitate unreasonable public investment in infrastructure facilities or public services.

The mitigation measures proposed will increase the project's benefit to the island community and the State. Beyond these important collateral employment and economic impacts, the project will provide the area with housing opportunities, a park and relocation of the County's swimming pool for area residents. No significant impacts are anticipated.

4.9 Traffic

This section discusses the traffic in the region and the specific project area, the potential impacts of the project on traffic, and the mitigation measures HoKua Place will employ to mitigate potential impacts.

4.9.1 Environmental Setting

The proposed project is located west of Kapaʻa Town and adjacent to Kapaʻa Intermediate School, generally in the southwest quadrant of the intersection of Olohena Road and Kapaʻa Bypass. The project is a residential subdivision with single-family and multi-family residences and neighborhood supporting retail. The project has two phases. The former Kapaa Highlands development plan is summarized as follows:

Adjoining Ag - 16 Single-Family Units

HoKua Place - 86 Single-Family Lots & Units
683 Multi-Family Units
8,000 SF Neighborhood Retail

Access to and egress from Phase 1 will be via driveways along the south side of Olohena Road west of Kapa'a Intermediate School.

Access to and egress from Phase 2 will be provided via a new intersection along the north side of Kapaʻa Bypass and a new intersection along the south side of Olohena Road. These two intersections will be connected by a new curvilinear roadway running through the project. For purposes of discussion in the report, this roadway is referred to as Road 'A.'

Kapaʻa Bypass is a two-lane, two-way roadway along the southern and eastern boundaries of the project. This section of Kapaʻa Bypass is owned by the HoKua Place developer, who has entered a memorandum of understanding with State of Hawaiʻi Department of Transportation to dedicate the roadway to the State upon approval of the HoKua Place subdivision.

According to State of Hawaiʻi Department of Transportation traffic count data from 2010, Kapaʻa Bypass has a weekday traffic volume of 7,400 vehicles per day.

Olohena Road is a two-lane, two-way roadway along the northern boundary of the project. Olohena Road also provides service to Kapaʻa Intermediate School.

Kūhiō Highway though Kapaʻa Town is a two-lane, two-way State highway along the east of the study area.

The intersection of Kūhiō Highway at Kukui Street is a four-legged, signalized intersection located approximately 1,600 feet east of the project. The northbound and southbound approaches are Kūhiō Highway and the eastbound and westbound approaches are Kukui Street. The northbound and southbound left turns are protected-permissive.

The intersection of Kūhiō Highway at Kapaʻa Bypass is a three-legged, un-signalized intersection approximately two miles south of Kukui Street. The northbound and southbound approaches are Kūhiō

Highway. The eastbound approach is the Kapaʻa Bypass and is the controlled approach. The northbound approach is coned during the morning peak hours to provide on left turn and one through lane. The coning also allows the eastbound to southbound left turn to operate as a free right turn. During the afternoon peak hours and off peak hours, there is one left turn lane and two through lanes. The southbound approach has one through lane and one right turn lane. The eastbound approach has one left turn lane and one right turn lane.

The intersection Kapaʻa Bypass and Olohena Road is a four-legged roundabout. All approaches are one lane only. The north leg of the intersection is one-way southbound into the intersection. The remaining three legs are two-way.

The intersection of Olohena Road at Kaapuni Road and Kaehula Road is actually two intersections. Olohena Road is the eastbound and westbound approaches and Kaapuni Road is the STOP sign controlled approach at Olohena Road. Kaehula Road intersects Kaapuni Road west of Olohena Road.

A preliminary trip generation analysis was performed to define the scope of work and study area. This analysis determined that the proposed project will generate less than 500 trips during either the morning or afternoon peak hour. Based on "Institute of Transportation Engineers" standards, the traffic study should be a "small development: traffic impact assessment."

Accordingly, the study area was defined to include the intersection of Kapaʻa Bypass at Olohena Road and the intersections providing access to and egress from Phase 2 of the project (Kapaʻa Bypass at Road 'A' and Olohena Road at Road 'A'). Phase 1 lots are serviced by individual driveways which will have negligible traffic volumes.

State of Hawaiʻi Department of Transportation reviewed the first draft of the report and directed that the study area be expanded to include the intersections of Kūhiō Highway at Kukui Street and Kūhiō Highway at Kapaʻa Bypass.

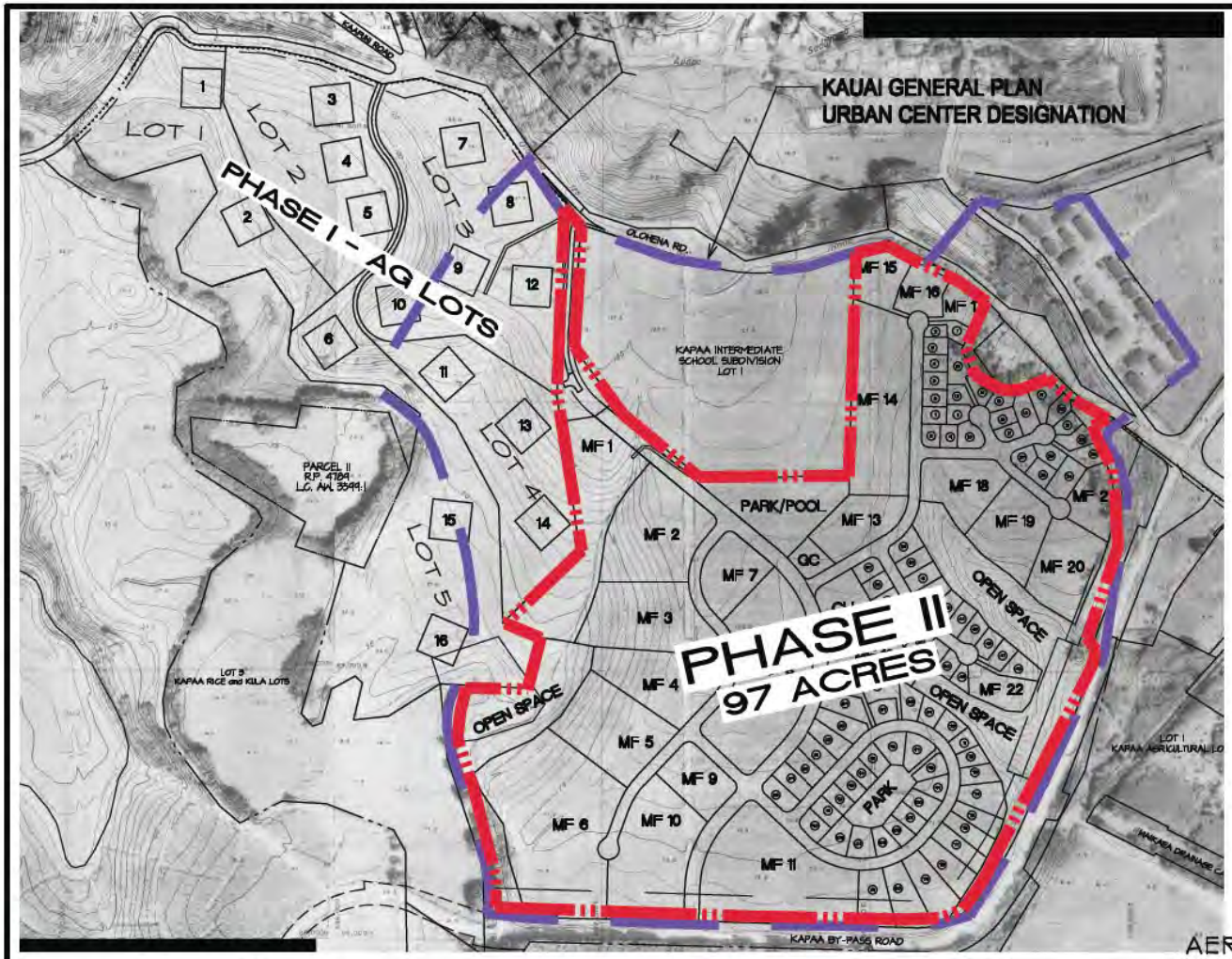
The County of Kauaʻi directed that the intersection of Olohena Road at Kaapuni Road and Kaehula Road be included in the study area.

A field reconnaissance was performed to identify existing roadway cross-sections, intersection lane configurations, traffic control devices, and surrounding land uses. Current weekday peak hour traffic volumes were obtained from manual traffic counts at the study intersections.

Existing intersection levels-of-service were determined using the methodology described in the "2000 Highway Capacity Manual". Existing deficiencies were identified based on the results of the level-of-service analysis and field observations.

Peak hour traffic that the proposed project will generate was estimated using trip generation analysis procedures recommended by the Institute of Transportation Engineers. Project generated traffic was distributed and assigned to the adjacent roadway network.

A level-of-service analysis for future traffic conditions with traffic generated by the study project was performed. The impacts of traffic generated by the proposed project were quantified and summarized. A report documenting the conclusions of the analyses performed and recommendations was prepared.



PHASE I-54 ACRES
LOTS 1-5
16 AG CPR UNITS
8 DENOTES ½ ACRE AG HOMESITE

PHASE 2 - 97 ACRES
SINGLE FAMILY R6/R8- 86 UNITS
MULTI FAMILY R14 - 683 UNITS
MF 1 - 3.8 ACRES
MF 2 - 2.9 ACRES
MF 3 - 2.5 ACRES
MF 4 - 2.3 ACRES
MF 5 - 2.4 ACRES
MF 6 - 6.0 ACRES
MF 7 - 1.2 ACRES
MF 8 - 4.4 ACRES
MF 9 - 1.1 ACRES
MF 10 - 3.1 ACRES
MF 11 - 4.4 ACRES
MF 12 - 1.3 ACRES
MF 13 - 1.3 ACRES
MF 14 - 3.5 ACRES
MF 15 - 1.0 ACRES
MF 16 - 0.7 ACRE
MF 17 - 0.5 ACRE
MF 18 - 1.4 ACRES
MF 19 - 1.7 ACRES
MF 20 - 1.7 ACRES
MF 21 - 0.8 ACRE
MF 22 - 0.7 ACRE
PARKS - 3.1 ACRES
CHURCH - 0.8 ACRE
GEN. COMM. - 0.4 ACRE
OPEN SPACE - 14.3 ACRES
ROADS - 9.4 ACRES

AERIAL TOPOGRAPHY
KAPA'A HIGHLANDS
SCALE: 1 INCH = 400 FEET
CONCEPT PLAN JULY 1, 2010

Ho'okuleana LLC
... to take responsibility ...

4.9.2 Environmental Impacts & Mitigation Measures

Phillip Rowell and Associates completed the Traffic Impact Assessment Report (TIAR) for HoKua Place (formerly known as Kapaʻa Highlands II) and the report is attached as Exhibit H of this assessment. The major finding and conclusion of the report notes:

1. The HoKua Place subdivision is located west of Kapaʻa Town and adjacent to Kapaʻa Intermediate High School. The project is a residential subdivision with single-family and multi-family residences and neighborhood supporting retail.

2. The project has two phases. Phase 1 will be 16 single-family agricultural lots. Access to and egress from these lot will via driveways along Olohena Road west of Kapaʻa Intermediate School.

3. The second phase will consists of 683-multi-family units, 86-single family lots and homes and 8,000 square feet of neighborhood supporting retail. Access to and egress from Phase 2 will be provided via a new intersection along the north side of Kapaʻa Bypass and a new intersection along the south side of Olohena Road.

4. The conclusion of the trip generation analysis is that Phases 1 and 2 will generate a total of 394 trips during the morning peak hour and 487 trips during the afternoon peak hour.

5. The level-of-service analysis of the intersection of Kūhiō Highway at Kukui Street determined that the overall intersection and all controlled movements will operate at Level-of-Service B without and with project generated traffic. There are no changes in the level-of-service of the intersections or controlled lane groups as a result of project related traffic.

6. A level-of-service analysis of the intersection of Kapaʻa Bypass at Olohena Road concluded that the eastbound approach to the roundabout is currently over-capacity (Level-of-Service E) during the morning peak hour without the project but will operate at Level-of-Service D with the project. This improvement is because eastbound to southbound traffic will be diverted from the intersection to Road A.

7. The intersection of Kūhiō Highway at Kapaʻa Bypass will operate at Level-of-Service F without and with the project during the morning and afternoon peak hours. The delay of the eastbound to northbound left turn increases even though the project adds no traffic to this movement. The delay of this movement is so long that it affects the level-of-service of the overall intersections. The proposed project adds no traffic to this movement. The proposed project adds traffic to the northbound to westbound left turn, which increases the delay to the eastbound to northbound left turn, but is not considered significant. The morning and afternoon peak hour projections for this lane group are 5 and 12 vehicles per hour, respectively.

8. Based on the results of the level-of-service analysis, no roadway improvements are recommended to accommodate project related traffic. The project actually has a positive impact as a result of constructing Road ‘A’, which will divert traffic away from the intersection of Olohena Road and Kapaʻa Bypass. The eastbound to southbound movement will be over-capacity without Road ‘A’. Traffic impacts due to the project are not considered significant.

Existing Peak Hour Traffic Volumes

Current weekday peak hour traffic volumes at the intersection of Kapaʻa Bypass at Olohena Road were obtained from manual traffic counts. The counts at the intersection of Olohena Road at Kapaʻa Bypass were performed Tuesday, May 15, 2012. The counts at the intersection of Kūhiō Highway were performed Thursday, August 8, 2013, and the counts at the intersection of Kūhiō Highway at Kapaʻa Bypass were performed on Tuesday, October 29, 2013.

The traffic counts include mopeds, motorcycles, buses, trucks and other large vehicles.

During the surveys, the following was observed at the intersection of Olohena Road at Kapaʻa Bypass:

1. The number of pedestrians crossing the approaches to the intersection are minimal, even with the bus stop and transfer site at the park along the north side of Olohena Road east of the intersection.

2. Long queues of 15 vehicles or more along the westbound approach of Olohena Road were noted during the morning peak hour.

The Kauaʻi Bus operates along Olohena Road and Kapaʻa Bypass. A major bus stop and transfer point is located along Olohena Road east of Kapaʻa Bypass in the parking lot adjacent to the park.

Level-of-Service Concept

"Level-of-Service" is a term which denotes any of an infinite number of combinations of traffic operating conditions that may occur on a given lane or roadway when it is subjected to various traffic volumes. Level-of-service (LOS) is a qualitative measure of the effect of a number of factors which include space, speed, travel time, traffic interruptions, freedom to maneuver, safety, driving comfort and convenience.

There are six levels-of-service, A through F, which relate to the driving conditions from best to worst, respectively. In general, LOS A represents free-flow conditions with no congestion. LOS F, on the other hand, represents severe congestion with stop-and-go conditions. Level-of-service D is typically considered acceptable for peak hour conditions in urban areas.

Corresponding to each level-of-service shown in the table is a volume/capacity ratio. This is the ratio of either existing or projected traffic volumes to the capacity of the intersection. Capacity is defined as the maximum number of vehicles that can be accommodated by the roadway during a specified period of time.

The capacity of a particular roadway is dependent upon its physical characteristics such as the number of lanes, the operational characteristics of the roadway (one-way, two-way, turn prohibitions, bus stops, etc.), the type of traffic using the roadway (trucks, buses, etc.) and turning movements.

Like signalized intersections, the operating conditions of intersections controlled by stop signs can be classified by a level-of-service from A to F. However, the method for determining level-of-service for un-signalized intersections is based on the use of gaps in traffic on the major street by vehicles crossing or turning through that stream. Specifically, the capacity of the controlled legs of an intersection is based on two factors:

1) the distribution of gaps in the major street traffic stream, and

2) driver judgment in selecting gaps through which to execute a desired maneuver. The criteria for level-of-service at an un-signalized intersection is therefore based on delay of each turning movement.

Existing Levels-of-Service

The results of the level-of-service analysis of the intersection of Kūhiō Highway at Kukui Street is summarized in the table "Existing Levels-of-Service - Signalized Intersections", below. Since this intersection is signalized, the volume-to-capacity ratio, delay and level-of-service is shown for the overall intersection and each controlled movement. The traffic signal timing was estimated by manually timing the traffic signals during the peak hours.

Existing Levels-of-Service - Signalized Intersections (1)

Intersection and Movement	AM Peak Hour			PM Peak Hour		
	V/C(2)	Delay(3)	LOS(4)	V/C	Delay	LOS
Kuhio Highway at Kuhio Street	Cycle Length = 60 Seconds(5)			Cycle Length = 60 Seconds		
	0.51	***11.5***	***B***	***0.49***	***11.1***	***B***
Eastbound Left & Thru	0.10	17.0	B	0.09	16.9	B
Eastbound Right	0.03	16.4	B	0.01	16.3	B
Westbound Right	0.00	16.2	B	0.01	16.2	B
Northbound Left	0.03	5.0	A	0.02	5.0	A
Northbound Thru & Right	0.68	11.5	B	0.61	10.1	B
Southbound Left & Thru	0.65	10.9	B	0.67	11.5	B
Southbound Right	0.00	4.8	A	0.00	4.8	A

NOTES:
(1) See Attachments F and G for Level-of-Service Worksheets.
(2) Volume-to-Capacity ratio.
(3) Delay is in seconds per vehicle.
(4) Level-of-Service calculated using the operations method described in *Highway Capacity Manual*. Level-of-Service is based on delay.
(5) Traffic signal cycle length determined by timing the traffic signal during peak hours.

The overall intersection operates at Level-of-Service B during both peak periods. All controlled lane groups operate at Level-of-Service A or B. This indicates good operating conditions.

The results of the level-of-service analysis of the intersection of Kapaʻa Bypass and Olohena Road are summarized in the table "Existing Levels-of-Service - Kapaʻa Bypass at Olohena Road", below.

Existing Levels-of-Service - Kapa'a Bypass at Olohena Road

Approach	AM Peak Hour		PM Peak Hour	
	Without Project		Without Project	
	V/C (1)	LOS(2)	V/C	LOS
Overall Intersection	***0.92***	***E***	***0.50***	***A***
Eastbound Approach	0.92	E	0.49	A
Westbound Approach	0.18	A	0.42	A
Northbound Approach	0.09	A	0.38	A
Southbound Approach	0.63	B	0.62	B

NOTES:
(1) V/C. denotes volume-to-capacity ratio.
(2) LOS denotes Level-of-Service.
(3) See Attachments F and G for Level-of-Service Worksheets.

For roundabout intersections, the HCS methodology calculates volume-to-capacity ratios for the intersection approaches, which is then related to the volume-to-capacity ratio definitions for levels-of-service discussed previously. The levels-of-service calculations indicate that the eastbound approach is near capacity during the morning peak hour with at volume-to-capacity ratio of 0.92. All the remaining movements operate at Level-of-Service A or B.

The results of the level-of-service analysis of the remaining un-signalized intersections are summarized in the table "Existing-Levels-of-Service of Un-signalized Intersections", below. The HCM methodology calculates only delays for controlled lane groups only. Volume-to-capacity ratios are not calculated. The 95th percentile queue lengths as reported by Synchro are also shown.

Existing Levels-of-Service of Unsignalized Intersections

	AM Peak Hour			PM Peak Hour		
Intersection, Approach and Movement	Delay (1)	LOS (2)	95th Queue(3)	Delay	LOS	95th Queue
Kuhio Highway at Kapaa Bypass	***95.3***	***F***	***NC***	***12.3***	***B***	***NC***
Eastbound Left	273.5	F	999	57.9	F	227
Eastbound Right	Uncontrolled Lane Group			Uncontrolled Lane Group		
Northbound Left	9.2	A	8	13.2	B	82
Northbound Thru	Uncontrolled Lane Group			Uncontrolled Lane Group		
Southbound Thru	Uncontrolled Lane Group			Uncontrolled Lane Group		
Southbound Right	Uncontrolled Lane Group			Uncontrolled Lane Group		
Olohena Road at Kaapuni Road	***9.8***	***A***	***NC***	***3.1***	***A***	***NC***
Eastbound Left & Thru	0.9	A	2	1.7	A	2
Westbound Thru & Right	Uncontrolled Lane Group			Uncontrolled Lane Group		
Southbound Left & Right	22.5	C	112	13.5	B	26
Kaapuni Road at Kaehula Road	***0.7***	***A***	***NC***	***0.3***	***A***	***NC***
Westbound Left & Right	11.5	B	4	11.4	B	1
Northbound Thru & Right	Uncontrolled Lane Group			Uncontrolled Lane Group		
Southbound Left & Thru	0.0	A	0	0.1	A	0

NOTES:
(1) Delay is in seconds per vehicle.
(2) LOS denotes Level-of-Service.
(3) 95th percentile queue in feet as reported by Synchro.
(4) NC = Not calculated
(5) See Attachments F and G for Level-of-Service Worksheets.

The intersection of Kūhiō Highway at Kapaʻa Bypass operates at Level-of-Service F during the morning peak hour and Level-of-Service B during the afternoon peak hour. It is the eastbound left turn lane with a delay so long that is impacts of the overall intersection, resulting in the poor level-of- service.

The intersection of Olohena Road at Kaapuni Road and Kaehula Road is actually two intersections. Olohena Road is the eastbound and westbound approaches and Kaapuni Road is the STOP sign controlled approach at Olohena Road. Kaehula Road intersects Kaapuni Road west of Olohena Road. Therefore, the level-of-service results are shown for two intersections. The intersections of Olohena Road at Kaapuni Road and Olohena Road at Kaehula Road both operate at Level-of-Service A during both peak periods.

Existing Deficiencies

The eastbound approach at the intersection of Olohena Road at Kapaʻa Bypass is at or near capacity during the morning peak hour with a volume-to-capacity ratio of 0.92 and a Level-of-Service of E. The

deficient movement is mitigated when the project is constructed as traffic will be redistributed as a result of constructing Road A through the project.

The eastbound to northbound left turns at the intersection of Kūhiō Highway at Kapaʻa Bypass operate at Level-of-Service F during both peak hours. However, the morning and afternoon volumes are only 5 and 12 vehicles, respectively. Since the volumes are so low, mitigation has been deferred. It should also be noted that the proposed development project adds no traffic to these movements.

Background Traffic Projections

Based on data in the Kauaʻi Long-Range Land Transportation Plan, population growth in the Kawaihau District, which includes Kapa'a, will be less than one percent per year until 2020. In addition, we are not aware of any approved projects in the vicinity that will impact traffic conditions along Kapa'a Bypass or Olohena Road before the design year of this project.

Therefore, for this particular study, it was assumed that there will be no significant increase in peak hour traffic at the study intersections as a result of regional background growth or traffic generated by approved new projects in the vicinity of the project.

Future 2020 background (without project) traffic volumes were estimated to be comparable to existing peak hour traffic volumes at the study intersections.

Project Trip Generation

Future traffic volumes generated by HoKua Place and HoKua Farm Lots (Phases 1 and 2) were estimated using the methodology described in the "Trip Generation Handbook" and data provided in "Trip Generation". This method uses trip generation equations or rates to estimate the number of trips that the project will generate during the peak hours of the project and along the adjacent street.

The equations used for the trip generation analysis are summarized in table "Trip Generation Equations", below. The trip generation equations for the residential uses are based on the number of planned residential units. The equations for the retail portion of the project are based on the gross leasable square footage of the retail area. The equations shown estimate the number of peak hour trips during the peak hours of the generator, which may or may not coincide with the peak hour of the adjacent street. "Trip Generation" does not note the peak hours of the generators.

A portion of the trips to and from the retail area will be from the adjacent traffic stream. These trips are referred to as "pass by trips" and are deducted from the total number of trip to estimate the number of new trips generated by the project. However, these trips are added to the driveway volumes at the retail areas. The equation for estimating the percent pass by trips is also provided. This equation is based on the gross leasable square footage of the retail area. Pass by equations are provided of the PM peak hour only.

It should be noted that the percentage of pass by trip estimated from the equation provided in the Trip Generation Handbook is 81%. State of Hawaiʻi Department of Transportation felt that this percentage was too high. It was agreed with State of Hawaiʻi Department of Transportation that 34% would be used for the trip generation calculations.

Trip Generation Equations[1]

Period & Direction		Single Family Units (Land Use Code 210)	Multi-Family Units (Land Use Code 230	Neighborhood Commercial (Land Use Code 820)	Pass By Trips
		Equation or Percent[1]	Equation or Percent[1]	Equation or Percent[1]	Equation or Percent[2]
Weekday Total		Ln(T) = 0.92 Ln(X) + 2.71	Ln(T) = 0.85 Ln(X) + 2.55	Ln(T) = 0.65 Ln (x) + 5.83	No Equation Provided
AM Peak Hour	Total	T = 0.70(X) + 12.05	Ln(T) = 0.82 Ln(X) +0.171	Ln(T) = 0.60Ln(A)+2.29	No Equation Provided
	Inbound	25%	18%	61%	
	Outbound	75%	82%	39%	
PM Peak Hour	Total	Ln(T) = 0.89Ln(X) + 9.61	T = 0.34(X) + 38.31	Ln(T) = 0.66Ln(A)+3.40	Ln (T) = - 0.29 Ln(A)+5.00
	Inbound	63%	64%	48%	50%
	Outbound	37%	36%	52%	50%

Notes:
(1) Source: Institute of Transportation Engineers, *Trip Generation, 7th Edition,* Washington, D.C., 2003
(2) Source: Institute of Transportation Engineers, *Trip Generation Handbook*, Washington, D.C., 2004, p 47
(3) T = Trips, X = Number of Units, A = Gross Leasable Square Feet

The results of the trip generation analysis are summarized in table "Trip Generation Calculations", below. The conclusion of the trip generation analysis is that Phases 1 and 2 will generate a total of 394 trips during the morning peak hour and 487 trips during the afternoon peak hour. As noted earlier, the numbers of peak hour trips shown are the trips generated during the peak hour of the generator, which may or may not coincide with the peak hours of the adjacent streets.

Trip Generation Calculations

Period & Direction		Phase 1	Phase 2								Total Project Trips (Phases 1 and 2)		
		Single Family	Single Family	Multi-Family	Neighborhood Commercial			Phase 2 Total Trip					
		16 Units	100 Units	700 Units	8,000 TLSF								
		Trips	Trips	Trips	Trips	Pass By Trips[1]	New Trips	Trips	Pass By Trips	New Trips	Total Trips	Pass By Trips	New Trips
AM Peak Hour	Total	23	82	255	34	0	34	371	0	371	394	0	394
	Inbound	6	21	46	21	0	21	88	0	88	94	0	94
	Outbound	17	61	209	13	0	13	283	0	283	300	0	300
PM Peak Hour	Total	22	111	276	118	40	78	505	96	409	527	40	487
	Inbound	14	71	177	57	20	37	305	48	257	319	20	299
	Outbound	8	40	99	61	20	41	200	48	152	208	20	188

Notes:
(1) The percentage of pass by trips is 34% of the afternoon peak hour trips.

Project trips were distributed and assigned based on existing traffic approach and departure patterns of traffic into and out of the study area as estimated from the traffic counts. Given the location of the retail, which is the center of Phase 2, it was assumed that all the pass by trips would be diverted from the internal road system of Phase 2.

Background Plus Project Projections

Background plus project traffic projections were estimated by superimposing the peak hourly traffic generated by the proposed project on the background (without project) peak hour traffic projections. This assumes that the peak hourly trips generated by the project coincide with the peak hour of the adjacent street. This represents a worse-case condition as it assumes that the peak hours of the intersection approaches and the peak hour of the study project coincide.

As noted earlier, construction of Road 'A' will divert traffic from the eastbound to southbound right turns and northbound to westbound left turns from the intersection of Olohena Road at Kapaʻa Bypass.

Traffic Impact Assessment

The traffic impact of the proposed project was assessed by analyzing changes in traffic volumes at the study intersections and changes on the level-of-service.

An analysis of the project's share of 2020 background plus project intersection approach volumes at the study intersections is summarized in table "Analysis of Project's Share of Total Intersection Approach Volumes", below. The table summarizes the project's share of total 2020 peak hour approach volumes at each intersection.

Also shown are the percentages of 2020 background plus project traffic that is the result of background growth and traffic generated by related projects. The negative percentages reflect the redistribution of traffic as a result of Road 'A'.

Analysis of Project's Share of Total Intersection Approach Volumes (1)

Intersection	Period	Existing	2020 Background Plus Project	Project Traffic	
Kukui Highway at Kukui Street	AM	1441	1453	12	0.8%
	PM	1370	1385	15	1.1%
Olohena Road at Kapaa Bypass	AM	1447	1372	-75	-5.5%
	PM	1459	1407	-52	-3.7%
Kuhio Highway at Kapaa Bypass	AM	1990	2266	276	12.2%
	PM	2176	2518	342	13.6%

Notes:
(1) Volumes shown are total intersection approach volumes or projections.
(2) Percentage of total 2015 background plus project traffic.
(3) Data to be provided in final draft report.

The percentage of project traffic at the intersection of Kūhiō Highway at Kukui Street is 0.8% during the morning peak hour and 1.1% during the afternoon peak hour. The analysis indicates that the peak hour traffic volumes at the intersection of Olohena Road at Kapaʻa Bypass will be less than existing because of the redistribution of traffic to Road 'A.'

The analysis indicates that peak hour traffic at the intersection of Kūhiō Highway at Kapaʻa Bypass will increase 12.2 % during the morning peak hour and 13.6% during the afternoon peak hour. These increases are higher than desirable but the intersection is over two miles from the project. Typically, the study area for a project that generates the amount of traffic that this project generates should be limited to one-half mile, or less.

A level-of-service analysis was performed for "without project" and "with project" conditions to confirm that the intersections will operate at an acceptable level-of-service and that there are no traffic operational deficiencies.

The results of the 2020 level-of-service analysis of the intersection of Kūhiō Highway at Kukui Street are summarized in the table "2020 Levels-of-Service – Kūhiō Highway at Kukui Street", below. The overall intersection and all controlled movements will operate at Level-of-Service B without and with project generated traffic. There are no changes in the level-of-service of the intersections or controlled lane groups as a result of project related traffic.

2020 Levels-of-Service - Kuhio Highway at Kukui Street (1)

Intersection and Movement	AM Peak Hour						PM Peak Hour					
	Without Project			With Project			Without Project			With Project		
	V/C(2)	Delay(3)	LOS(4)	V/C	Delay	LOS	V/C	Delay	LOS	V/C	Delay	LOS
Overall Intersection	Cycle Length = 60 Seconds(5)						Cycle Length = 60 Seconds					
	0.51	***11.5***	***B***	***0.51***	***11.6***	***B***	***0.49***	***11.1***	***B***	***0.50***	***11.1***	***B***
Eastbound Left & Thru	0.10	17.0	B	0.11	17.1	B	0.09	16.9	B	0.10	17.0	B
Eastbound Right	0.03	16.4	B	0.04	16.5	B	0.01	16.3	B	0.02	16.3	B
Westbound Right	0.00	16.2	B	0.00	16.2	B	0.01	16.2	B	0.01	16.2	B
Northbound Left	0.03	5.0	A	0.03	5.1	A	0.02	5.0	A	0.04	5.2	A
Northbound Thru & Right	0.68	11.5	B	0.68	11.5	B	0.61	10.1	B	0.61	10.1	B
Southbound Left & Thru	0.65	10.9	B	0.65	10.9	B	0.67	11.5	B	0.67	11.5	B
Southbound Right	0.00	4.8	A	0.00	4.8	A	0.00	4.8	A	0.00	4.8	A

NOTES:
(1) See Attachment Q and R for Level-of-Service Worksheets.
(2) Volume-to-Capacity ratio.
(3) Delay is in seconds per vehicle.
(4) Level-of-Service calculated using the operations method described in *Highway Capacity Manual*. Level-of-Service is based on delay.
(5) Traffic signal cycle length determined by timing the traffic signal during peak hours.

The results of the level-of-service analysis for the intersection of the Kapa'a Bypass at Olohena Road, the only existing study intersection, are summarized in table "Future (2020) Levels-of-Service - Kapa'a Bypass at Olohena Road", below. The Highway Capacity Manual methodology for analysis of roundabouts calculates only the volume-to-capacity ratio of each intersection approach. The volume-to-capacity ratio is then referenced to the level-of-service definitions for signalized intersection to determine the level-of-service of each approach.

Future (2020) Levels-of-Service - Kapa'a Bypass at Olohena Road

Approach	AM Peak Hour				PM Peak Hour			
	Without Project		With Project		Without Project		With Project	
	V/C (1)	LOS(2)	V/C	LOS	V/C	LOS	V/C	LOS
Overall Intersection	***0.92***	***E***	***0.83***	***D***	***0.50***	***A***	***0.64***	***B***
Eastbound Approach	0.92	E	0.83	D	0.49	A	0.43	A
Westbound Approach	0.18	A	0.19	A	0.42	A	0.42	A
Northbound Approach	0.09	A	0.05	A	0.38	A	0.30	A
Southbound Approach	0.63	B	0.63	B	0.62	B	0.64	B

NOTES:
(1) V/C. denotes volume-to-capacity ratio.
(2) LOS denotes Level-of-Service.
(3) See Attachment Q and R for Level-of-Service Worksheets.

The analysis concluded that the eastbound approach is over-capacity (Level-of-Service E) during the morning peak hour without the project but will operate at Level-of-Service D with the project. This improvement is because eastbound to southbound traffic will be diverted to Road A.

The results of the level-of-service analysis for the remaining un-signalized intersections are summarized in table "202 Levels-of-Service of Un-signalized Intersections", below. Shown are the delays, levels-of-service and 95th percentile queues.

2020 Levels-of-Service of Unsignalized Intersections

	AM Peak Hour						PM Peak Hour					
	Without Project			With Project			Without Project			With Project		
Intersection, Approach and Movement	Delay (1)	LOS (2)	95th Queue(3)	Delay	LOS	95th Queue	Delay	LOS	95th Queue	Delay	LOS	95th Queue
Kuhio Highway at Kapaa Bypass	***95.3***	***F***	***NC***	***191.4***	***F***	***NC***	***12.3***	***B***	***NC***	***42.4***	***F***	***NC***
Eastbound Left	273.5	F	999	479.7	F	1676	57.9	F	227	190.1	F	1116
Eastbound Right	Uncontrolled Lane Group			Uncontrolled Lane Group			Uncontrolled Lane Group			Uncontrolled Lane Group		
Northbound Left	9.2	A	8	9.6	A	15	13.2	B	82	21.0	C	203
Northbound Thru	Uncontrolled Lane Group			Uncontrolled Lane Group			Uncontrolled Lane Group			Uncontrolled Lane Group		
Southbound Thru	Uncontrolled Lane Group			Uncontrolled Lane Group			Uncontrolled Lane Group			Uncontrolled Lane Group		
Southbound Right	Uncontrolled Lane Group			Uncontrolled Lane Group			Uncontrolled Lane Group			Uncontrolled Lane Group		
Olohena Road at Kaapuni Road	***9.8***	***A***	***NC***	***10.1***	***B***	***NC***	***3.1***	***A***	***NC***	***3.3***	***A***	***NC***
Eastbound Left & Thru	0.9	A	2	0.9	A	2	1.7	A	2	1.5	A	2
Westbound Thru & Right	Uncontrolled Lane Group			Uncontrolled Lane Group			Uncontrolled Lane Group			Uncontrolled Lane Group		
Southbound Left & Right	22.5	C	112	24.0	C	121	13.5	B	26	14.4	B	32
Kaapuni Road at Kaehula Road	***0.7***	***A***	***NC***	***0.6***	***A***	***NC***	***0.3***	***A***	***NC***	***0.3***	***A***	***NC***
Westbound Left & Right	11.5	B	4	11.7	B	4	11.4	B	1	11.6	B	1
Northbound Thru & Right	Uncontrolled Lane Group			Uncontrolled Lane Group			Uncontrolled Lane Group			Uncontrolled Lane Group		
Southbound Left & Thru	0.0	A	0	0.0	A	0	0.1	A	0	0.1	A	0

NOTES:
(1) Delay is in seconds per vehicle.
(2) LOS denotes Level-of-Service.
(3) 95th percentile queue in feet as reported by Synchro.
(4) NC = Not calculated
(5) See Attachments Q and R for Level-of-Service Worksheets.

The intersection of Kūhiō Highway at Kapa'a Bypass will operate at Level-of-Service F without and with the project during the morning and afternoon peak hours. The delay of the eastbound to northbound left turn increases even though the project adds no traffic to this movement. The delay of this movement is so long that it affects the level-of-service of the overall intersections. The remaining un-signalized intersections will operate at Level-of-Service A without and with project traffic.

The configurations of the intersections of Kapa'a Bypass and Road 'A' and Olohena Road at Road "A" were determined before the level-of-service analysis was performed for these intersections. An assessment of the need for a separate left turn lane at both intersections was performed using FHWA's standard. If the intersection of the approaching volume and the opposing volume is left of the calculated or estimated percent of left turns, a left turn lane is not warranted. As shown, the assessment determined that a separate left turn lane is warranted at the intersection of Kapa'a Bypass at Road 'A' based both AM and PM peak hour projections and at the intersection of Olohena Road at Road 'A' based on PM peak hour projections.

Based on the results of the assessment for a separate left turn lane at the new intersections, the level-of-service analysis was performed using the following assumptions:

1. There will be a separate left turn lane for left turns from eastbound Kapa'a Bypass to northbound Road 'A.'

2. There will be a separate left turn lane for left turns westbound Olohena Road to southbound Road 'A."

3. Road 'A' approaches to both Kapa'a Bypass and Olohena Road will be one lane each for the level-of-service analysis. However, each approach may be widened to provide separate left and right turns lanes to minimize delays to right turns.

The results of the level-of-service analysis of the STOP sign controlled intersections are summarized in table "2020 Levels-of-Service – New Intersections", below. As shown, all lane groups will operate at Level-of-Service C, ore better.

2020 Levels-of-Service - New Intersections

Intersection and Movement	AM Peak Hour			PM Peak Hour		
	Delay [1]	LOS [2]	Queue [3] (Feet)	Delay	LOS	Queue (Feet)
Kapa'a Bypass at Road 'A'	***10.5***	***B***	***NC***	***4.3***	***A***	***NC***
Eastbound Left	9.2	A	9	8.8	A	24
Southbound Left & Right	30.5	D	155	12.0	B	33
Olohena Road at Road 'A'	***2.5***	***A***	***NC***	***3.4***	***A***	***NC***
Westbound Left	9.0	A	2	7.9	A	4
Northbound Left & Right	16.7	C	31	16.8	C	35

NOTES:
(1) Delay is in seconds per vehicle.
(2) LOS denotes Level-of-Service. Level-of-Service is based on delay.
(3) 95th Percentile in feet as reported by Synchro.
(4) See Attachments Q and R for Level-of-Service Analysis Worksheets.
(5) NC = Not calculated.

Project Road System

For signalized intersections, Level-of-Service D is the minimum acceptable Level-of-Service and that this standard is applicable to the overall intersection rather than each controlled lane group. Minor movements, such as left turns, and minor side street approaches may operate at Level-of-Service E or F for short periods of time during the peak hours so that the overall intersection and major movements along the major highway will operate at Level-of-Service D, or better. All volume-to-capacity ratios must be 1.00 or less.

A standard has not be established for un-signalized intersections. Therefore, Level-of-Service D is an acceptable level-of-service for any major controlled lane groups, such as left turns from a major street to a minor street. Side street approaches may operate at Level-of-Service E or F for short periods of time. This is determined from the delays of the individual lane groups. If the delay of any of the side street approaches appears to be so long that it will affect the overall level-of-service of the intersection, then mitigation measures should be accessed.

Using this standard, the Traffic Analysis concluded that no mitigation is recommended.

The eastbound to northbound left turns at the intersection of Kūhiō Highway at Kapaʻa Bypass will operate at Level-of-Service F, without and with project traffic. The proposed project adds no traffic to this movement. The proposed project adds traffic to the northbound to westbound left turn, which increases the delay to the eastbound to northbound left turn.

The level-of-service of the eastbound approach of Olohena Road to Kapa'a Bypass improves from Level-of-Service E to Level-of-Service D with project as a result of construction of Road 'A' between Kapa'a Bypass and Olohena Road, providing an alternate route and diverting traffic from the intersection. Thus, Road 'A' running through the project connecting these two intersections, distributes traffic and reduces the overcapacity condition at this intersection during the AM peak hour.

Other Traffic Related Issues

Impacts of Kapa'a Closure Bypass - Based on the traffic counts performed for this study, the Kapa'a Bypass accommodates between 600 and 700 vehicles per hour during the peak hours. A closure of the bypass would force this traffic to use Kūhio Highway. During the field reconnaissance for this project, it was noted that traffic flow along Kūhiō Highway is congested, especially during the afternoons, with very slow speeds and long delays indicating low levels-of-service. It would be difficult for the intersections along Kūhiō Highway in Kapa'a Town to accommodate this additional traffic at acceptable levels-of-service. The addition of traffic that now uses Kapa'a Bypass to current traffic along Kūhiō Highway would result in longer delays and therefore lower levels-of-service. The conclusion is that Kapa'a Bypass serves as a major mitigation to potential traffic congestion and low levels-of-service along Kūhiō Highway.

Pedestrian and Traffic - It is reasonable that there will be a small amount of pedestrian and bicycle activity along Olohena Road in the vicinity of Kapa'a Intermediate School. Some of this pedestrian activity may be generated from HoKua Place. Accordingly, the intersections into and out of the subdivisions should provide pedestrian crosswalks to accommodate this activity.

Speed Control Along Road 'A' - As noted earlier in this report, Road 'A' will provide an alternate route to Kapa'a Intermediate School since it will be a more direct route for northbound traffic. Since Road 'A' will be through a residential area, traffic calming measure should be provided to control vehicle speeds and enhance the safety of pedestrians. Measures that should be considered include four-way stops, speed humps or tables.

4.9.3 Level of Impact after Mitigation

As noted in the response letter from the Department of Transportation related to the Traffic Impact Analysis Report, as found in Exhibit H of this report, DOT concurs with the findings of that analysis. A summary of their response is noted below:

- Your justification that a traffic signal warrant and queue analysis would not be appropriate is acceptable.
- Our concern over "traffic calming" measures along Road A through the subdivision remain, since it would potentially reduce the utility that Road A would divert significant traffic; however your justification is acceptable.
- A left-turn storage lane from the Kapaa Bypass into Road A of the subdivision may be deferred for the immediate future but the subdivision is still required to provide one should traffic conditions warrant it at no cost to the Department of Transportation (DOT).
- With reference to the executed Memorandum of Agreement dated May 30, 2002, the appropriate.
- Right-of-way of the Kapaa Bypass with "No Access Permitted" except at existing access (i.e. Road A) along the project frontage, shall be dedicated to the DOT as a condition of the Land Use Commission.

4.10 Power & Communication

This section discusses the electrical power and communications facilities in the region, the potential impact of the project on those facilities, and mitigation measures HoKua Place will employ to mitigate potential impacts.

4.10.1 Environmental Setting

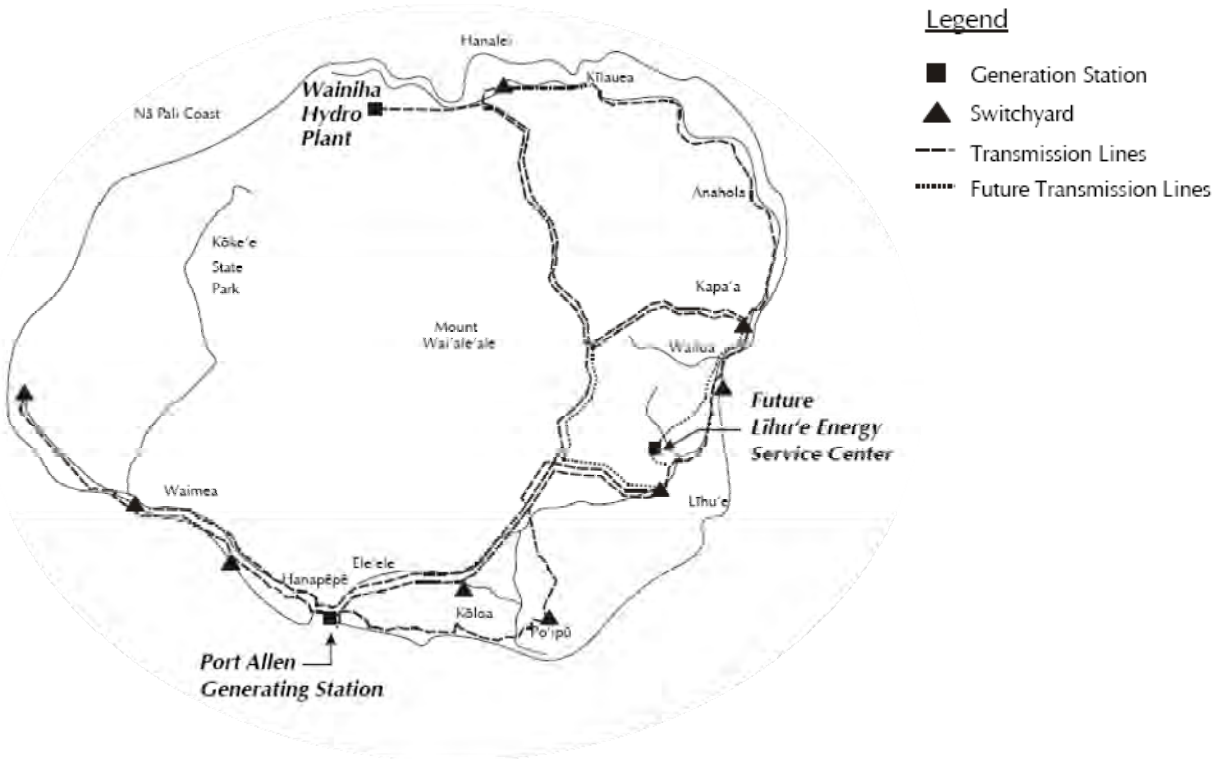
Power

Residents of the State of Hawai‘i pay the highest electricity rates in the US. The average American paid 10.5 cents/kWh in 2010. In the state of Hawai‘i, O‘ahu currently has the lowest residential electricity rates, while Lāna‘i has the highest. Residential rates on Kaua‘i average between 40-45 cents/kWh.

Hawai‘i relies on imported oil for approximately 76% of its total electricity production. The price variation across the state is largely a result of difference in power plant efficiencies, power purchasing agreement and other infrastructure.

	Kaua‘i	Oahu	State
Medium Income (2009)	$55,723	$67,019	$63,741
Electricity Price (May 2011)	44.27 cents/kWh	30.1 cents/kWh	-

The Kaua‘i Island Utility Cooperative (“KIUC”) is the sole electric utility on Kaua‘i. KIUC began serving the people of Kaua‘i on November 1, 2002, when it purchased Kaua‘i Electric from Connecticut-based Citizens Communications. KIUC is America’s newest electric cooperative, but it’s by no means the only one. It is one of approximately 900 electric cooperatives serving electric consumers in 47 states.



Like all cooperatives, KIUC operates as a not-for-profit organization that is owned and controlled by the people it serves. KIUC serves over 23,300 customers with 92% of KIUC's electricity coming from the burning of imported fossil fuels.

According to the Kaua'i General Plan, the Kawaihau region is served via a tap off the mauka transmission line that connects the Wainiha Hydroelectric Plant with Port Allen. This tap provides power via the Kapa'a Switchyard at Kapa'a Town and other developed coastal areas, as well as to residential communities in Kapa'a and Wailua Homestead areas. Kapa'a Switchyard is also linked to the Lydgate Substation and the Līhu'e Switchyard.

A photovoltaic system that can generate up to 1.18 MW of electricity is situated in HoKua Farm Lots (formerly known as Kapa'a Highlands I). Its operator entered into an agreement to sell to Kaua'i Island Utility Cooperative electricity generated from the solar farm for 20 years. "Creating more renewable energy alternatives is one of the most critical challenges we face," Kaua'i Mayor Bernard Carvalho said at a dedication ceremony for the solar farm.

The photovoltaic system project spreads over five acres and has 5,376-solar panels mounted on posts and piers. The panels average about 12-feet off the ground.

Communications
The project site is served by Hawaiian Telcom telephone lines. Numerous cell towers across the island provide cellular phone service to the area.

4.10.2 Environmental Impacts & Mitigation Measures

Power
The project will not have a significant impact on KIUC's electrical grid. The solar facility located at HoKua Farm Lots (formerly known as Kapa'a Highlands I) will be transmitting electricity to nearby KIUC transmission lines.

In a September 6, 2007 email to HoKua Place (formerly known as Kapaʻa Highlands II), Curt K. Tadani, Eastside Distribution Planner for KIUC wrote,

> "I got your message and the plans that you brought in were already approved and signed off by us on June 27, 2005 so as far as we're concerned, it should be okay".

Pursuant to Chapter 344 (State Environmental Policy) and Chapter 226 (Hawaiʻi State Planning Act), HRS, all HoKua Place activities, buildings and grounds will be designed with a significant emphasis on energy conservation and efficiency.

Efficient design practices and technologies will be the cornerstone of HoKua Place's design phase. Buildings within HoKua Place will further comply with the County of Kauaʻi Energy Conservation Code (Kauaʻi County Ordinance 890).

Furthermore, solar water heaters will be utilized as made requisite under Section 196-6.5, HRS. HoKua Place will confer with KIUC in regards to suggestions and proposals for customized demand-oriented management programs offering rebates for the installation of alternative energy efficient technologies and measures.

HoKua Place is committed to renewable energy and energy efficiently as ways to reduce environmental harm and self sufficiency. HoKua Place will continue to improve programs and create new programs as the development is initiated.

In 2009, the State Legislature codified the need for energy efficiency by enacting the statewide energy efficiency portfolio standard with a target of reducing energy consumption by 30% of forecasted energy consumption by 2030 (4,300 GWh) and beginning the process for separating efficiency from the existing renewable portfolio standard.

Hawaiʻi Revised Statutes section 46-19.6 requires all county agencies to place a "priority on processing of permit applications for construction projects incorporating energy and environmental design building standards."

To reduce net energy consumption and demand, HoKua Place will consider the implementation of elements of the United States Environmental Protection Agency (EPA) Energy Star Program; including efficient insulation, high performance windows, compact construction, efficient ventilation systems, and energy efficient lighting elements and appliances.

HoKua Place will furthermore seek to harness energy conservations and technologies to facilitate the possibility of net energy metering in building design to empower residents and tenants to reduce their electricity costs and provide energy back to the grid.

Energy conservation and efficiency measures will be implemented and emphasized where applicable in the design of HoKua Place. Energy-efficiency technologies to be considered include:

- Solar energy for water heating
- Photovoltaic systems, fuel cells, biofuels and other renewable energy sources
- Optimal utilization of daytime sunlight
- High efficiency light fixtures
- Roof and wall insulation, radiant barriers and energy efficient windows

- Optimized air-flow
- Installation of heat resistant roofing
- Intelligent Landscaping to provide for shading, dust control, and heat-mitigation
- Portable solar lighting (i.e. parking lots)

Additionally, there currently are high voltage electrical lines around part of the project's perimeter. The electrical utility and HoKua Place would like to run the lines underground thru the project, dependent upon funding and may be incorporated into the project. This would be a both a preventative measure to protect shearwater birds, and to beautify the historic Kapaʻa town core area.

Communications
The project will not have a significant impact on communication resources or services.

4.10.3 Level of Impact after Mitigation

The use of alternative/renewable energy, as well as, the implementation of energy conservation and efficiency measures, as noted in the HoKua Place (formerly known as Kapaʻa Highlands II) Sustainability Plan (Exhibit B), will serve to reduce the impact of the project on energy grids and resources. The projects energy consumption and communication needs will have a less than significant impact.

The project will not have a significant impact on KIUC's electrical grid. The solar facility located at HoKua Farm Lots (formerly known as Kapaʻa Highlands I), will be transmitting electricity to nearby KIUC transmission lines.

4.11 Noise

This section discusses the noise conditions in the region and in the project area, the potential impacts of the project on those conditions, and the mitigation measures HoKua Place will employ to mitigate those potential impacts.

4.11.1 Environmental Setting

Sound levels are fluctuating air pressure waves expressed on a logarithmic scale in decibels (abbreviated as dB). A change of 10 units on a decibel scale reflects a 10-fold increase in sound energy. A 10-fold increase in sound energy roughly translates to a doubling of perceived loudness. In general, humans can barely hear a change of 1 decibel, can usually hear a change of 3 decibels and can easily hear a change of 5 decibels. In evaluating human response to noise, acousticians compensate for people's varying abilities to discern frequency or pitch components of sound.

While a healthy young ear may be able to hear sounds over the frequency range of 20 hertz (Hz) to 20,000 Hz, the human ear is most sensitive to sounds in the middle frequency range used for human speech, and less sensitive to lower- and higher-pitched sounds. The "A" weighting scale is used to account for this varying sensitivity. Thus, most community noise standards are expressed in decibels on the A-weighted scale, abbreviated dBA.

Zero on the decibel scale corresponds to the threshold of human hearing, while sound levels of 120 dBA and higher can be painful and cause hearing damage. For reference, human speech at 10-feet is about 60-70 dBA. Noise-sensitive uses include residences, hospitals, schools, parks and similar uses. Noise could also be a sensitive issue for cultural practices and nature-watching activities.

4.11.2 Environmental Impacts & Mitigation Measures

A temporary increase in noise during construction is anticipated; however, this impact will be a minor, short term inconvenience and will be minimized by the limitations on the hours of construction activity and plans to reduce impacts of construction traffic.

Activities and use of the proposed 3.1-acre park will increase noise especially during the weekends and after school. However, the noise level will be comparable to the noise generated by the adjacent intermediate school. Additionally, the noise environment will be affected to a degree by the addition of traffic.

The development of housing on a vacant site will increase noise in the area. Buildings will be designed, oriented and located to minimize conflicts with the surrounding community activities and in a manner that avoids or minimizes the impacts on the development from noise.

Walls, fences and landscaping can be incorporated into project plans to help screen and buffer the project from the impacts of vehicular traffic as well as avoid or minimize the impacts of noise from the project on nearby residences.

In addition, best management practices that include performing construction-related activities in strict compliance with all applicable noise regulations will mitigate any temporary impacts.

HoKua Place operations are not expected to cause a significant noise impact, and no mitigation measures beyond compliance with applicable regulations, requirements, and standards, are required. However, if noise levels exceed the Department of Health's (DOH) "maximum permissible" property-line noise levels, contractors will be required to consult with DOH per Title 11, Chapter 46, HAR (Community Noise Control) prior to construction.

4.11.3 Level of Impact after Mitigation

The implementation of the mitigation measures identified will serve to further reduce the noise associated with the project. It is expected that HoKua Place will result in a negligible increase in noise and a minor increase in vehicular traffic noise, neither of which will result in a significant impact.

4.12 Climate, Air Quality & Lighting

This section discusses the air quality, climatic, and lighting conditions in the region and specific subject area, the potential impact of the project on those resources, and mitigation measures HoKua Place will employ to mitigate potential impacts.

4.12.1 Environmental Setting

Climate

While Hawaiʻi is generally characterized as being temperate, the geography of the East Shore District is notable for its breezy temperate climate. Rainfall along the east side of Kauaʻi is slightly higher than other western and inland areas on the island. Prevailing trade winds flow along the coast in the northeasterly direction.

The climate of the Kapaʻa area is mild, with average monthly temperatures ranging from 72 degrees Fahrenheit in the winter to 80 degrees Fahrenheit in the summer. The winds are from the northeast and the mean annual rainfall for the area is 60 to 80-inches.

Air Quality

In the State of Hawaiʻi, both federal and state environmental health standards pertaining to outdoor air quality are generally met due to prevalent trade winds and the absence of major stationary sources of pollutant emissions.

There are no non-attainment areas for air quality in the State of Hawaiʻi, and air quality monitoring data is thus, very limited. The ambient air quality of the project site is typically clean but heavy with particulate matter from the prevailing on shore winds.

There are no major sources of air pollution in the immediate vicinity such as agricultural burning, manufacturing plants and incinerators. Auto emissions from vehicular traffic on Kūhiō Highway and local streets are not a factor, as the project site is located north of Kūhiō Highway.

In its former use, the site would experience periods of degraded air quality when cane haul trucks were actively hauling sugar cane. Since the cessation of sugar cane cultivation in the project area, the site has reverted to an overgrown natural state and air quality has remained good.

Lighting

The absence of large, brightly-lit cities on the Island of Kauaʻi, mean that there are very few light sources or lighting impacts within the subject property.

4.12.2 Environmental Impacts & Mitigation Measures

Climate

HoKua Place will have no effect on climatic conditions and no mitigative measures are necessary.

Air Quality

While air quality will be impacted to a certain extent during the course of development, such as exhaust emissions from on-site construction equipment and construction vehicle traffic, the impact will be short-term.

In addition, best management practices that include performing construction-related activities in strict compliance with all applicable air regulations will mitigate any temporary impacts. Contractors will be required to comply with Hawaiʻi Administrative Rules, Chapter 11-60.1, "Air Pollution Control."

Increasingly stringent pollution control measures for new vehicles will also result in a decrease in vehicular emissions over time. Exhaust emission should not have any significant effect on the area because prevailing winds should disperse any exhaust gas concentration.

On-Site grading and infrastructure improvements and residential construction will result in an increase in dust. However, dust resulting from construction is anticipated to be minimal. The prevailing trade wind pattern is from the north-east directions.

Potential airborne matters will generally be carried in the south-west direction, away from the school and existing residential areas. However, on occasions, the easterly winds may carry the potential airborne matters towards the school and existing residential neighborhoods.

Construction activities shall comply with the provisions of Hawaiʻi Administrative Rules 5-11-60.11.33 on Fugitive Dust. Dust preventive measures will include:

- Planning of construction phases to minimize the amount of dust generating materials and activities, centralizing on-site vehicular traffic routes and locating of potential dust-generating equipment in areas of the least impact.
- Providing adequate water source at the site prior to start of construction.
- Landscaping and providing rapid covering of bare areas developed during construction.
- Minimizing dust from shoulders and access roads.
- Providing dust control measures during weekends, after hours, and prior to daily construction.
- Controlling dust from debris being hauled away from the site.

The implementation of dust control measures noted above is warranted during development and construction; however, potential fugitive dust emissions would be temporary and, over the long term, air quality would not be impacted by the proposed well.

Lighting

All construction activities will integrate lighting mitigation measures to reduce lighting impacts. The Newell's Shearwater birds are known to nest in the interior mountain of Wailua and Kapaʻa. The flights of these birds may be over the subject property.

The proposed development will incorporate exterior lighting that will not have adverse affects on the Newell's Shearwater birds. Additionally, any streetlights that may be installed as part of the project will be shielded to reduce the potential for interactions of nocturnally flying native birds with external lights and man-made structures.

4.12.3 Level of Impact after Mitigation

The project will not have a significant adverse impact on air quality or climate, even without mitigation. Compliance with existing requirements and the implementation of mitigation measures described above will ensure that the air quality and lighting will remain in compliance with the State laws and regulations and therefore impacts will be less than significant.

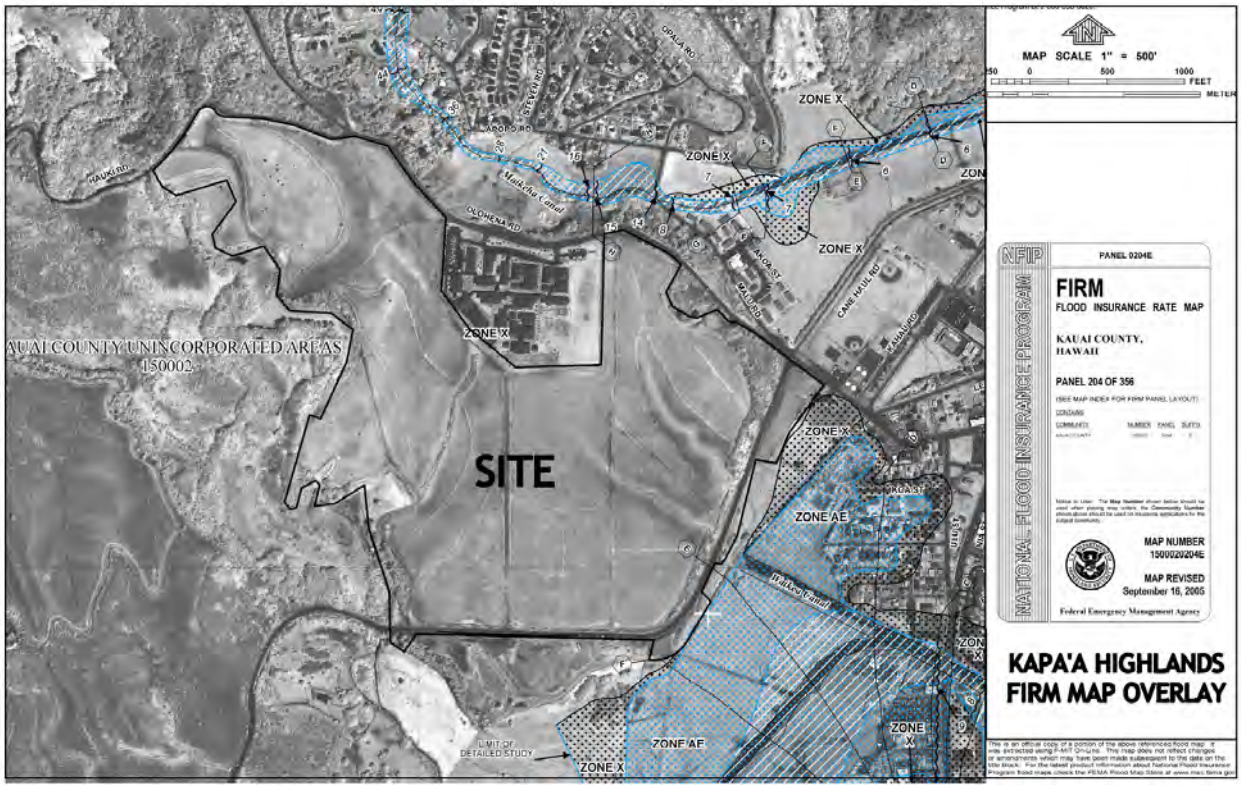
4.13 Natural Hazards

This section discusses the natural hazards which may affect the subject property including flooding, hurricanes, volcanic activity, tsunami and earthquakes.

4.13.1 Environmental Setting

Flooding

According to the Federal Emergency Management Agency's Flood Insurance Rate Map (FIRM) Community-Panel No. 1500020135 C, the project site is mostly located in Zone X. Zone X is described as areas outside of the 100- and 500-year floodplains with minimal flooding.



Other Hazards

The island of Kaua'i is uniquely exposed to hurricanes due to its exposure as the western most location in the Hawaiian Islands chain.

The project site has minimal exposure to other natural hazards, such as volcanic events and earthquakes. Additionally, the project site is not located in a tsunami zone, so tsunami inundation parameters do not apply to the proposed project.

4.13.2 Potential Environmental Impact & Mitigation Measures

Flooding

The project does not involve construction within a 100-year flood plain (Zones A or V), and it does not involve a "critical action" within a 500-year flood plain.

Site Preparation and construction of the proposed project is not anticipated to result in flooding of the project site or lower elevation properties and the project will be consistent with applicable regulations and guidance relating to floodplain management.

The project will comply with requirements of the Federal Flood Insurance Program.

Other Hazards

The Uniform Building Code (UBC) prepared by the International Conference of Building Officials, details "Prescriptive Details for Hurricane-Resistant Construction" (1991 UBC Appendix Chapter 25).

These prescriptive details help buildings withstand wind acceleration and gusts from hurricanes. Buildings within the HoKua Place will be built with these prescriptive details, where applicable.

In the long-term, the proposed project will not exacerbate any natural hazard conditions. Planning and design for the proposed project will be based on County construction-related standards.

Additionally, Impacts from natural hazards can be mitigated by adherence to appropriate civil defense evacuation procedures.

4.13.3 Level of Impact after Mitigation

The project will not have a significant impact on natural hazards. Compliance with existing requirements and the implementation of mitigation measures described above will ensure that no significant impacts are expected.

4.14 Site Preparation & Construction

This section discusses the potential site preparation and construction impacts related to the natural and built environment and the potential mitigation measures that could be employed. Site preparation and construction effects will be temporary.

No unusual site preparation or construction techniques or materials are anticipated. During site preparation and construction related activities, HoKua Place will comply with all applicable rules and regulations.

4.14.1 Potential Environmental Impacts

The project will require site preparation in order to implement the action. In some cases, this is limited vegetation removal, while others will require grading and leveling of portions of the site.

Heavy equipment including bulldozers, rippers, excavators, loaders, jack hammers, backhoes, dump trucks, pick-up trucks, boom-mounted flatbed trucks, asphaltic concrete hauling trucks, pavers and rollers will be employed.

Activities will occur in phases and involve short-term, temporary impacts from site preparation, cutting, filling, trenching, backfilling and clean-up operations. Activities and facilities may require minimal leveling of ground but will not require significant soil excavation; therefore, site preparation will have a negligible effect on the environment.

Environmental impacts associated with the site preparation and construction phase of a project are generally localized and temporary in nature. Anticipated impacts include noise from heavy construction equipment, fugitive dust from earthmoving activities, air pollutant emissions from internal combustion engines, and soil erosion and sedimentation.

Construction activities will include site preparation, foundation construction, drainage structure construction or installation, preparation of roads, and clean up. Construction will also generates solid waste in the form of packaging from building materials, detergents, paint, metals and solvents.

Because of the expected levels and timing of construction, with implementation of mitigation measures, construction-related impacts are not expected to be significant. Necessary construction-phase permits will be obtained and complied with including:

- National Pollutant Discharge Elimination System (NPDES) and component Best Management Practice (BMP) plan
- Noise permit
- Noise variance
- Oversize and Overweight Vehicles Permit (OOVP)

4.14.2 Mitigation Measures

Mitigation measures for all phases and types of project site preparation and construction includes conformance to all laws, codes, rules and regulations.

The potential construction impacts are evaluated within the framework of compliance with all applicable rules, regulations and requirements for the project type and location. Applicable rules, regulations and requirements will include OSHA, and necessary permits.

The following mitigation measures have been identified to minimize potential impacts:

Cultural, Archaeological and Historic Resources

- If in the unlikely event that any human remains or other significant subsurface deposits are encountered during the course of development activities, all work in the immediate area will stop and DLNR's State Historic Preservation Division will be promptly notified.

Biological Resources

- Landscaping within the HoKua Place project seeks to include native trees, shrubs and flowering plants, as encouraged by the Kaua‘i Department of Water, as part of their recommendations for water conservation.
- The proposed development will incorporate exterior lighting that will not have adverse affects on the Newell’s Shearwater birds.

Visual and Aesthetic Resources

- Re-vegetation will occur in areas disturbed by construction activities and overtime the vegetation near construction areas will grow and mature.
- The architecture of the project will ensure that the project is compatible with its visual environment. The project will create structures which are both visually appealing and blend in with the scenery around them.
- High voltage electrical lines around part of the project’s perimeter may be run underground, funding permitting.

Geology, Soils and Slope Stability

- Applicable law will be followed to minimize soil movement, erosion and compaction during all project actions.
- Implementation actions will include Best Management Practices (BMPs) to ensure that the alterations to the terrain minimize erosion, water quality degradation and other environmental impacts.
- Both short-term construction and long-term maintenance BMPs will be included in any permit conditions.

Water Resources and Wastewater

- HoKua Place will work with the DOW on pertinent water issues during the design and development phase.
- The proposed water system will meet conditions of the State Department of Health, including HAR Chapter 11-20, 11-21 and 11-25.
- Installation of water efficient fixtures and the implementation of a water saving practices to reduce the demand for freshwater resources.
- The water distribution system will be maintained to prevent water loss and homeowners and businesses will be encouraged to maintain fixtures to prevent leaks.
- Landscaping will emphasize climate-adapted native and other appropriate plants suitable for coastal locations.

- Best management practices will be designed and implemented to minimize infiltration and runoff from daily operations.
- The project's proposed drainage system will be designed to minimize impacts to near shore coastal waters. Water quality treatment and detention basins will be built to prevent runoff and sedimentation from impacting groundwater resources.
- Prior to the occupancy of any residential or commercial unit within the project, HoKua Place shall implement and maintain storm and surface-water runoff BMPs, subject to any applicable review and approval of the State DOH, designed to prevent violations of State water quality standards as a result of storm-water discharges originating from the project.
- Potential water quality impacts during construction of the project will be mitigated by adherence to State and County water quality regulations governing grading, excavation and stockpiling.
- BMPs will also be implemented for long term development and operation of activities occurring on the site as part of pollution prevention measures.
- HoKua Place will be contributing funds to help upgrade the deferred maintenance and repair of the Kapaʻa Waste Water Treatment plant. The project will not be a detriment to the capacity of the Plant.
- Wastewater line in Olohena and other roadways will comply with all applicable rules and regulations.
- The project's design features and policies to comply with applicable rules and regulations will include conformance to applicable provisions of the Department of Health's Administrative Rules, Chapter 11-62, "Wastewater Systems."

Solid Waste and Material Management

- Soil and debris displaced from grading and clearing will be utilized as fill throughout the site as required, minimizing disposal and transit/relocation of the materials.
- Throughout project construction and development, HoKua Place will seek to reduce, reuse, and recycle materials and waste to the greatest degree possible.
- Green waste resulting from the project's development will be chipped into mulch for on-site use or will be disposed of properly.
- Measures and provisions to implement recycling, such as collection systems and storage for recyclables, will be incorporated to the HoKua Place project. A community management system will be in place for the residences of this project.
- The management policies will encourage residences to participate in the moral ethics of respecting the surrounding environment, reduce waste and excessive consumption, and fulfill the responsibility as trustees of the environment for the present and the future generations. Residences will be invited to participate in policy and decision making.

Power and Communications

- Pursuant to Chapter 344 (State Environmental Policy) and Chapter 226 (Hawaiʻi State Planning Act), HRS, all HoKua Place activities, buildings and grounds will be designed with a significant emphasis on energy conservation and efficiency.
- Buildings within HoKua Place will further comply with the County of Kauaʻi Energy Conservation Code (Kauaʻi County Ordinance 890).
- Solar water heaters will be utilized as made requisite under Section 196-6.5, HRS.

- HoKua Place will confer with KIUC in regards to suggestions and proposals for customized demand-oriented management programs offering rebates for the installation of alternative energy efficient technologies and measures.
- HoKua Place is committed to renewable energy and energy efficiently as ways to reduce environmental harm and self sufficiency. HoKua Place will continue to improve programs and create new programs as the development is initiated.
- To reduce net energy consumption and demand, HoKua Place will consider the implementation of elements of the United States Environmental Protection Agency (EPA) Energy Star Program; including efficient insulation, high performance windows, compact construction, efficient ventilation systems, and energy efficient lighting elements and appliances.
- HoKua Place will furthermore seek to harness energy conservations and technologies to facilitate the possibility of net energy metering in building design to empower residents and tenants to reduce their electricity costs and provide energy back to the grid.
- Energy conservation and efficiency measures will be implemented and emphasized where applicable in the design of HoKua Place.

Noise

- Limitations on the hours of construction activity and plans to reduce impacts of construction traffic.
- Buildings will be designed, oriented and located to minimize conflicts with the surrounding community activities and in a manner that avoids or minimizes the impacts on the development from noise.
- Walls, fences and landscaping can be incorporated into project plans to help screen and buffer the project from the impacts of vehicular traffic as well as avoid or minimize the impacts of noise from the project on nearby residences.
- Best management practices that include performing construction-related activities in strict compliance with all applicable noise regulations will mitigate any temporary impacts.
- If noise levels exceed the Department of Health's (DOH) "maximum permissible" property-line noise levels, contractors will be required to consult with DOH per Title 11, Chapter 46, HAR (Community Noise Control) prior to construction.

Climate, Air Quality and Lighting

- Best management practices that include performing construction-related activities in strict compliance with all applicable air regulations will mitigate any temporary impacts.
- The Contractor will be required to comply with Hawai'i Administrative Rules, Chapter 11-60.1, "Air Pollution Control."
- Construction activities shall comply with the provisions of Hawai'i Administrative Rules 5-11-60.11.33 on Fugitive Dust.
- Planning of construction phases to minimize the amount of dust generating materials and activities, centralizing on-site vehicular traffic routes and locating of potential dust-generating equipment in areas of the least impact.
- Providing adequate water source at the site prior to start of construction.
- Landscaping and providing rapid covering of bare areas developed during construction.
- Minimizing dust from shoulders and access roads.
- Providing dust control measures during weekends, after hours, and prior to daily construction.
- Controlling dust from debris being hauled away from the site.
- All construction activities will integrate lighting mitigation measures to reduce lighting impacts.

- The proposed development will incorporate exterior lighting that will not have adverse affects on the Newell's Shearwater birds.
- Any streetlights that may be installed as part of the project will be shielded to reduce the potential for interactions of nocturnally flying native birds with external lights and man-made structures.

Natural Hazards

- The project will be consistent with applicable regulations and guidance relating to floodplain management.
- The project will comply with requirements of the Federal Flood Insurance Program.
- The Uniform Building Code (UBC) prepared by the International Conference of Building Officials, details "Prescriptive Details for Hurricane-Resistant Construction" (1991 UBC Appendix Chapter 25). These prescriptive details help buildings withstand wind acceleration and gusts from hurricanes. Buildings within the HoKua Place will be built with these prescriptive details, where applicable.
- Impacts from natural hazards can be mitigated by adherence to appropriate civil defense evacuation procedures.

4.14.3 Level of Impact after Mitigation

Prior to the implementation of the mitigation measures described above, the potential impact was found to be less than significant. The implementation of the mitigation measures, including best management practices and conformance with existing laws, codes and ordinances, will serve to further reduce the potential impacts related to HoKua Place construction. Site preparation and construction effects will be temporary.

4.15 Secondary & Cumulative Impacts

The proposed project does not appear to have the potential to involve any significant secondary impacts. While there are anticipated changes in several environmental and social categories, as noted above, these are anticipated and the result of implementation of the County's General Plan. These changes are less than significant.

A cumulative impact is the impact on the environment which results from the incremental impact of the action when added to other past, present and reasonably foreseeable future actions regardless of what agency or person undertakes such other actions.

Cumulative impacts can result from individually minor, but collectively significant actions taking place over a period of time.

Hence, a cumulative impact will occur when the incremental environmental effects of the Project added to other past, present, and reasonably foreseeable future actions result in substantial significant impacts.

There are direct effects from implementing the alternatives for this project and this section discusses the overall, or cumulative, effects.

HoKua Farm Lots (formerly known as Kapaʻa Highlands I) is an agricultural subdivision that is adjoining and mauka of HoKua Place. Within the HoKua Farm Lots is the previously referenced photovoltaic solar facility. Makai of the property is the Kūhiō Bypass Road and below the road is the urban center of Kapaʻa Town. Adjoining and surrounded by the property is the Kapaʻa Middle School below that is a State affordable Housing project. Mauka and south of the subject parcel are in agricultural uses and are not identified for urbanization in the County's General Plan. It is not anticipated that urbanization requests will be made on these surrounding properties; in the event they are, an amendment to the General Plan must be made.

14.15.1 Summary of Potential Contribution of the Preferred Alternative to Cumulative Effects

The following chart identifies possible resources that could be impacted individually or cumulatively by the proposed project. The analysis evaluates potential impacts in the context of the existing environment, anticipated uses, compliance with applicable rules, regulations and requirements, and mitigation measures previously identified.

Table 14.15.1 - Summary of Potential Contribution of the Preferred Alternative to Cumulative Effects

Resource Area	Effect	Cumulative Effect
Cultural, Archaeological & Historic	Less than Significant	While irrigation ditches are on the property, they have been reduced or rendered inoperable and do not contribute to the historic integrity of irrigation systems on former sugarcane lands, so the cumulative effect will be less than significant.
Biological	Less than Significant	There is no habitat or endangered plants or animals, so the cumulative effect will be less than significant.

Resource Area	Effect	Cumulative Effect
Visual & Aesthetic	Less than Significant	Developing on undeveloped land will alter the visual nature of the area; re-vegetation with native plants in areas disturbed by construction activities and appropriate architecture will ensure that the project in the context of the surrounding area is compatible with its visual environment, so the cumulative effect will be less than significant
Geology, Soils & Slope Stability	Less than Significant	There is limited identified surrounding disturbances to land; soil movement, erosion and compaction on the site will occur during construction; by implementing BMPs and following applicable laws, so the cumulative effect will be less than significant.
Water Resources & Wastewater	Less than Significant	HoKua Place will result in additional consumption of fresh (drinking) water and the creation of additional wastewater; through the installation of water efficient fixtures and water saving practices, dedication of proved well site to DOW will produce additional water into the County system, meeting applicable conditions of DOH and contributing funds to help upgrade the deferred maintenance and repair of the Kapaʻa Waste Water Treatment plant, so the cumulative effect will be less than significant.
Solid Waste & Material Management	Less than Significant	Additional solid waste will be generated; by utilizing soil and debris displaced from grading and clearing as fill throughout the site, recycling and reuse of construction wastes and implementing collection systems and storage for recyclables, the cumulative effect will be less than significant
Socioeconomic Conditions & Public Service Facilities	Less than Significant & Beneficial	HoKua Place will result in an increased population of the area; however the Kauaʻi General Plan specifically points out the need for more housing in the area and specifically designates the subject property as Urban Center for that purpose. Development of the Property will address a portion of the demand for affordable housing in the County of Kauaʻi, without significantly affecting reserve areas for foreseeable urban growth. HoKua Place will have lands available for county police and fire substations on the Property. So, the cumulative effect will be less than significant.
Power & Communications	Less than Significant	The projects energy consumption and communication needs will have a less than significant cumulative impact. The use of alternative/renewable energy, as well as, the implementation of energy conservation and efficiency measures will serve to reduce the impact of the project on energy grids and resources, so the cumulative effect will be less than significant.
Climate, Air Quality & Lighting	Less than Significant	Impacts on air quality and climate will be short term due to construction. Mitigative lighting techniques will ensure the cumulative effect will be less than significant.

Resource Area	Effect	Cumulative Effect
Traffic	Less than Significant	Based on the results of the level-of-service analysis, no roadway improvements or mitigation measures are recommended to accommodate project related traffic. The project actually has a positive impact as a result of constructing Road 'A', which will divert traffic away from the intersection of Olohena Road and Kapaʻa Bypass. The eastbound to southbound movement will be over-capacity without Road 'A'. Traffic impacts due to the project are not considered significant.
Noise	Less than Significant	It is expected that HoKua Place will result in a negligible increase in noise and a minor increase in vehicular traffic noise, however the implementation of the mitigation measures will serve to reduce the noise associated with the project, so the cumulative effect will be less than significant.
Natural Hazards	None	None
Site Preparation & Construction	Less than Significant	Site preparation and construction impacts will be short term during the construction phase of the project and mitigation measures will ensure the cumulative effect will be less than significant.

In general, the project will add a limited increment to the current level of cumulative impact. As noted previously in this chapter, impacts to the resources are estimated to be less than significant; in addition the project would not tip the balance from a less than significant to a significant level on a cumulative basis.

14.15.2 Irreversible & Irretrievable Commitments of Resources

HoKua Place will require minor commitments of both renewable and nonrenewable energy and material resources. Nonrenewable resources that will be used during the project include fuel, water and other resources necessary to develop and operate HoKua Place.

Resources that are irreversibly or irretrievably committed to a project are those that are typically used on a long-term or permanent basis; however, those used on a short-term basis that cannot be recovered (e.g., non-renewable resources) also are irretrievable.

Alteration of substrates by construction activities, visual impacts and road development will be irreversible. Construction could result in irreversible commitment of fuel for construction vehicles and equipment and irretrievable commitment of land. Additionally, construction could result in irreversible commitment and expenditure of human labor that could not then be expected in the service of other projects. These commitments of resources are neither unusual nor unexpected, given the nature of the action.

14.15.3 Conclusion

Implementation of the proposed action will not result in significant impacts that will not be able to be mitigated, to any environmental resource area. Therefore, the proposed action, in conjunction with other actions on and in the vicinity of HoKua Place, will not result in significant cumulative impacts.

Chapter 5 – Laws, Regulations, Land Use Plans & Policies

This chapter discusses laws, regulations, land use plans and policies on the County, State and Federal level in relation to HoKua Place. This chapter will explore the projects potential land use planning effects and its compatibility with existing land uses.

Compliance with existing regulations and requirements and the implementation of the mitigation measures proposed above, will ensure that HoKua Place will not result in a significant impact on current land programs and policies in the area. The implementation of the mitigation measures identified will serve to further reduce any potential impacts the project may have on land use.

Land use impacts that will result from implementing HoKua Place include temporary construction-related impacts, direct impacts associated with use of the area, and indirect impacts resulting from changes in the character and use of the area. Construction activities will be expected to result in short-term impacts on land uses. These impacts include construction noise and dust.

The potential impacts of HoKua Place are evaluated within the framework of compliance with all applicable rules, regulations and requirements for the project type and location.

Overall, since HoKua Place will be consistent with all applicable land use regulation and will not conflict with the applicable land use plans, it will not result in a significant land use planning impact in the State of Hawaiʻi or on the Island of Kauaʻi.

The following sections examine the projects compliance with applicable land use plans and policies.

5.1 County of Kauaʻi

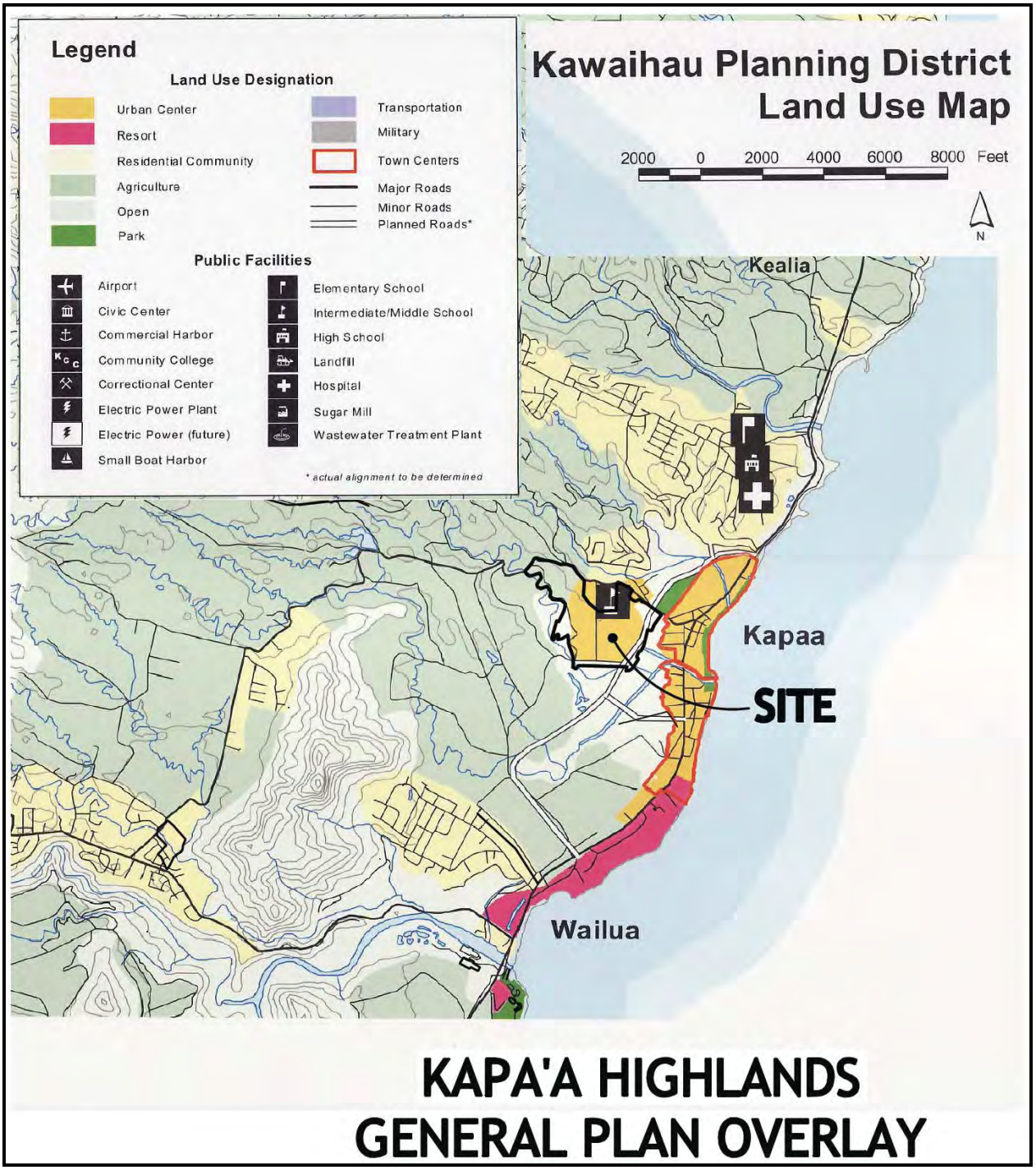
5.1.1 County General Plan

The General Plan of the County of Kauaʻi (General Plan) was adopted in 1971 and updated in November 2000. The General Plan is a statement of the County's vision for Kauaʻi and establishes strategies for achieving that vision.

The General Plan is the primary policy directing long range development, conservation, and the use and allocation of land and water resources in the County of Kauaʻi. The General Plan establishes, through maps and text, geographic areas of the County which are intended to be used for various general purposes such as agriculture, resorts, urban communities and preservation of natural, cultural and scenic resources.

Section 7-1.2 of the amended Chapter 7 of the Kauaʻi County Code states:

*"*Pursuant to the provision of the Charter for the County of Kauaʻi, the General Plan sets forth in graphics and text, policies to govern the future physical development of the county. The General Plan is intended to improve the physical environment of the County and the health, safety and general welfare of Kauaʻi's people."


Legend
Land Use Designation
Urban Center
Resort
Residential Community
Agriculture
Open
Park
Transportation
Military
Town Centers
Major Roads
Minor Roads
Planned Roads*
Public Facilities
Airport
Civic Center
Commercial Harbor
Community College
Correctional Center
Electric Power Plant
Electric Power (future)
Small Boat Harbor
Elementary School
Intermediate/Middle School
High School
Landfill
Hospital
Sugar Mill
Wastewater Treatment Plant
* actual alignment to be determined
Kawaihau Planning District
Land Use Map
2000 0 2000 4000 6000 8000 Feet
N
Kealia
Kapaa
SITE
Wailua
KAPA'A HIGHLANDS
GENERAL PLAN OVERLAY

"The General Plan states the County's vision for Kaua'i and establishes strategies for achieving that vision. The strategies are expressed in terms of policies and implementing actions. They may be augmented and changed as new strategies are developed."

"The General Plan is a direction-setting policy document. It is not intended to be regulatory. It is intended to be a guide for future amendments to the lands regulations and to be considered in reviewing specific zoning amendment and development applications."

"The vision, the maps and text policies, and the implementing actions are intended to guide the county actions and decisions. In addition, the maps and text policies are intended to guide the County in specific types of actions: making revisions to land use and land development Regulations; deciding on zoning changes; preparing and adopting Development Plans and Public Facility Plans; and preparing and adopting capital improvement plans."

The General Plan contains six major themes, each with various policies for implementation. The major themes are as follows:

1. Caring for Land, Water and Culture
2. Developing Jobs and Businesses
3. Preserving Kaua'i's Rural Character
4. Enhancing Towns & Communities and Providing for Growth
5. Building Public Facilities and Services
6. Improving Housing, Parks and Schools

In particular, the proposed reclassification of the Property responds and conforms to theme No. 6. Market studies have shown that the population growth and correlating need and demand for housing is extremely high on Kaua'i.

The proposed reclassification, which will allow residents to purchase an affordable house and lot, as well as, allow other residents to purchase a lot to design and build their own homes, will present an opportunity to address the community need for residential housing.

It should also be noted that the proposed development will assist in maintaining a viable economy as construction-related employment opportunities for residents would be generated.

The General Plan states:

"One of the key policies in the Framework for preserving Kaua'i's rural character is to promote growth and development in compact urban areas. Urban lands comprise only four to five percent of Kaua'i's land area, leaving 55 percent in conservation and 40 percent in agriculture."

The General Plan further states that land use policies for preserving Kaua'i's rural character should,

"Enhance Urban Centers and Towns and maintain their identity by defining the Town Center and the edges of each Town. Concentrate shopping and other commercial uses in Town Centers. Encourage residential development within Urban and Town Centers and in Residential Communities contiguous to them."

The General Plan also sets policy for urban land use designations. Policy 5.4.1.1 states:

(c) Lands included within the Urban Center designation shall be centers of government, commerce and transportation that serve the entire county or a large region. Uses may include shopping centers, government offices, churches and other institutions, office complexes, and industrial facilities. Residential or resort uses may also be located within the Urban Center designation, where compatible.
(d) Urban Center areas are typically served by wastewater collection and treatment facilities and major roads. Urban Center lands may be zoned for any type of use, including General Commercial, General Industrial, Resort and Residential.

The Kaua‘i General Plan includes a Land Use Map that depicts policy for long-range land uses with the following map designations: Urban Center, Resort, Residential Community, Agriculture, Open, Park, Transportation, Military.

The following are policies to provide for growth and development while preserving rural character, as described in the Kaua‘i General Plan:

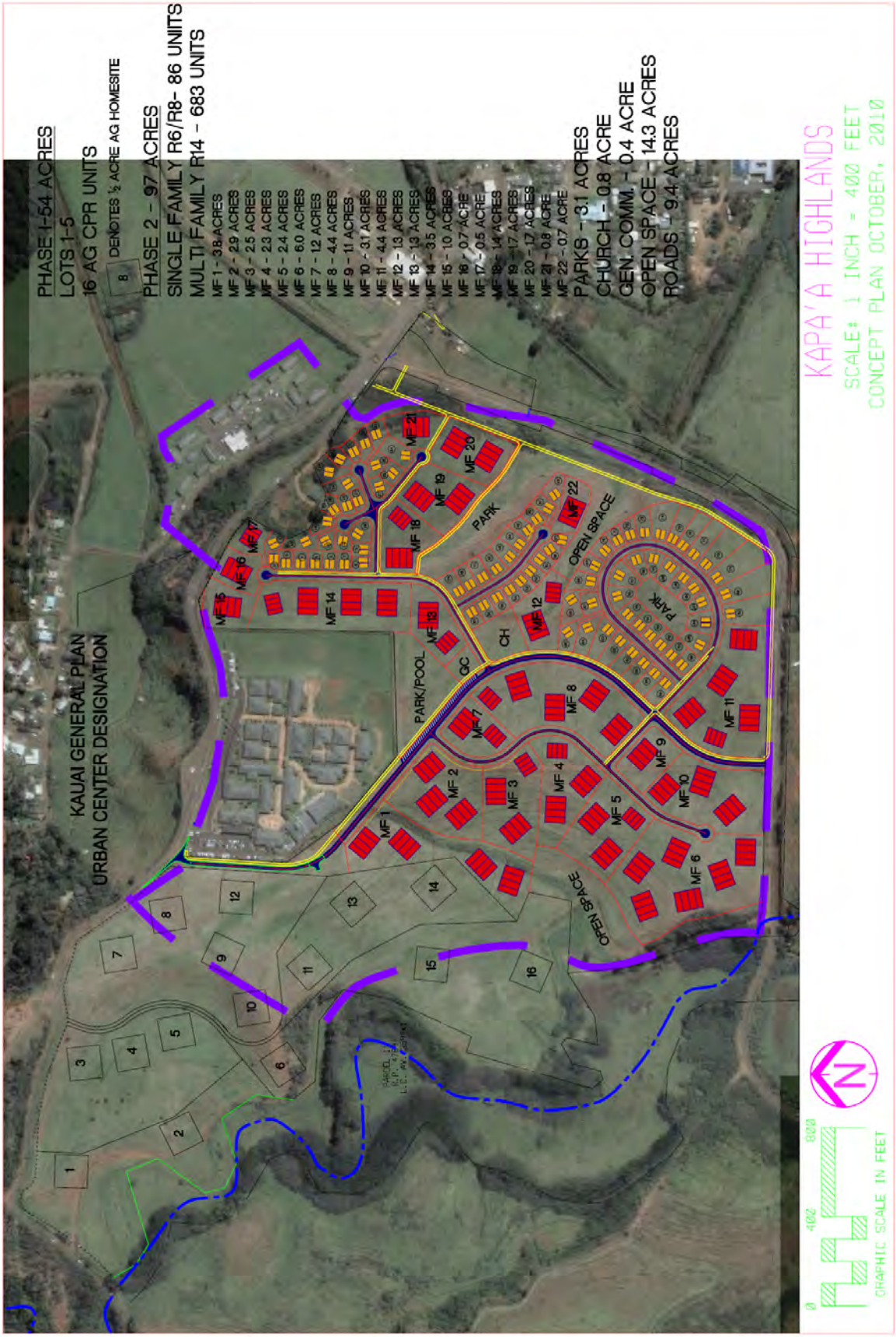
(c) Allow incremental growth of Towns, contiguous to existing development. Concentrate primary shopping facilities within the Town Center. Support infill development.
(d) Provide for build-out of existing Residential Communities, to include areas zoned R-1 or higher. Allow small, neighborhood-oriented commercial sites in Residential Communities.
(e) Expansion contiguous to an existing town or residential community is preferred over a new residential community.
(f) Allow build-out of properties in existing low-density agricultural communities, including the homestead areas of Wailua, Kapa‘a, ‘Ōma‘o and Kalāheo and existing agricultural subdivisions in other parts of the island, while taking measures to assure the adequacy of County road, drainage and water supply systems.

The HoKua Place project conforms to and implements the policies of the Kaua‘i General Plan by developing within the designated Urban Center, contiguous to surrounding Kapa‘a town and its neighboring residential community, thereby preserving the rural character of the area.

As noted in the “Kawaihau Planning District Land Use Map” included in the Kaua‘i General Plan, the subject property has an “Urban Center” land use designation.

The lands surrounding the property to the north is designated as “Residential” and “Urban” by the County General Plan. The Property is contiguous to existing urban lands to the south and across the bypass road. These existing urban lands are zoned urban by the County of Kaua‘i.

The HoKua Place project conforms to and implements the policies of the Kaua‘i General Plan by developing within the designated Urban District, contiguous to Kapa‘a town and its neighboring residential community.


PHASE 1-54 ACRES
LOTS 1-5
16 AG CPR UNITS
DENOTES ½ ACRE AG HOMESITE
PHASE 2 – 97 ACRES
SINGLE FAMILY R6/R8- 86 UNITS
MULTI FAMILY R14 – 683 UNITS
MF 1 - 3.8 ACRES
MF 2 - 2.9 ACRES
MF 3 - 2.5 ACRES
MF 4 - 2.3 ACRES
MF 5 - 2.4 ACRES
MF 6 - 6.0 ACRES
MF 7 - 1.2 ACRES
MF 8 - 4.4 ACRES
MF 9 - 1.1 ACRES
MF 10 - 3.1 ACRES
MF 11 - 4.4 ACRES
MF 12 - 1.3 ACRES
MF 13 - 1.3 ACRES
MF 14 - 3.5 ACRES
MF 15 - 1.0 ACRES
MF 16 - 0.7 ACRE
MF 17 - 0.5 ACRE
MF 18 - 1.4 ACRES
MF 19 - 1.7 ACRES
MF 20 - 1.7 ACRES
MF 21 - 0.8 ACRE
MF 22 - 0.7 ACRE
PARKS – 3.1 ACRES
CHURCH – 0.8 ACRE
GEN. COMM. - 0.4 ACRE
OPEN SPACE – 14.3 ACRES
ROADS – 9.4 ACRES
KAUAI GENERAL PLAN
URBAN CENTER DESIGNATION
PARK/POOL
GC
CH
PARK
OPEN SPACE
KAPA'A HIGHLANDS
SCALE: 1 INCH = 400 FEET
CONCEPT PLAN OCTOBER, 2010
0
400
800
GRAPHIC SCALE IN FEET

5.1.2 Kapaʻa-Wailua Development Plan

The Kapaʻa-Wailua Development Plan helps provide direction and guidance for future population growth and economic development in the district in a manner that is compatible with the protection and enhancement of community assets and coordinated with the financially prudent development of adequate supporting infrastructure and public facilities

The Main Goal of the Kapaʻa-Wailua Development Plan is:

- Implement the Kauaʻi General Plan's provision for the updating of the current community development plans; in this particular case, the Kapaʻa-Wailua Development Plan.

The Kapaʻa-Wailua Development Plan outlines the regional issues and opportunities that will be subjects for future community planning. A "Build-Out Analysis" of the Kapaʻa-Wailua Basin was prepared in the General Plan Update.

Based on the General Plan Land Use Map designations, the analysis found that an additional 4,000 units could be developed if the General Plan-designated lands were fully zoned, subdivided and built out. About 2,400 more units could be built in Urban Residential areas, about 500 more in Rural Residential areas and approximately 1,100 more units in the Agricultural areas. This would increase the housing units and population of the area by 85%.

The "Build-Out Analysis" specifically included the subject property as an "expansion area." The new General Plan Land Use Map designates the subject property as Urban Center.

5.1.3 Comprehensive Zoning Ordinance

The purpose of the Comprehensive Zoning Ordinance (CZO) is to provide regulations and standards for land development and the construction of buildings and other structures in the County of Kauaʻi. The regulations and standards prescribed in the CZO are intended to regulate development to ensure its compatibility with the overall character of the island.

The project site is zoned agriculture by the County of Kauaʻi. However, as described above, the General Plan for Kauaʻi and the Kapaʻa Town development Plan both designate the property as Urban Center.

An application to the Kauaʻi County Planning Commission and the Kauaʻi County Council for the appropriate zone change will be filed after the EIS has been accepted.

Kauaʻi County Planning Director Michael Dahilig, wrote in a March 4, 2011 regarding HoKua Place (formerly known as Kapaʻa Highlands II):

> "The proposed area is located adjacent to, and south and east of the existing Kapaʻa Middle School. The area is located in the Agriculture Zoning District. From a map and text review of the 2000 General Plan, we note that the area was re-designated from Agricultural to Urban Center and Residential Community. It appears that the 97-acres is located totally within the General Plan Urban Center area."

5.1.4 Kaua'i Economic Development Plan Update

The Kaua'i Economic Development Plan Update is intended to serve as Kaua'i's economic development "road map" for the next 5 years. It is intended to guide all stakeholders who have an influence on Kaua'i's economic future.

Economic Development Goals

In response to the critical issues impacting economic development, five goals have been established within the Kaua'i Economic Development Plan Update. Two directly pertain to the HoKua Place development.

1. To assist new and existing businesses create new jobs
   1.1 - To provide access to business planning assistance, including market research
   1.2 - To assist with permitting, licensing and regulatory issues
   1.2 - To facilitate access to start-up and expansion capital

4. To promote affordable housing
   4.1 - To develop new affordable single- and multi-family housing

Housing Vision

The Kaua'i Economic Development Plan Update lists its "Housing Vision" as the following:

- There is a continuum of housing (from homeless shelters, transitional, rental housing, and for-sale multi- and single-family homes) to meet the needs of Kaua'i's residents
- County government funding is used to leverage private and other government funding to create affordable housing
- There are lands zoned with adequate infrastructure for residential development

HoKua Place will respond to varying spectrums of demand for housing within Kaua'i by providing a wide range of housing opportunities inclusive of affordable housing alternatives. HoKua Place will seek to create and sustain a mixed-income community allowing for unparalleled social diversity.

HoKua Place will utilize 97-acres of land for single-family and multi-family residential and commercial purposes. Development of the Property will address a portion of the significant demand for affordable housing in the County of Kaua'i, without significantly affecting reserve areas for foreseeable urban growth.

The Kawaihau Planning District has substantial capacity for additional residential development, as described in Section 6.2.3.1 (Build-Out Analysis) of the Kaua'i General Plan.

> "Lands previously designated for urban use but as yet mostly undeveloped include an area located near Kapa'a, south of Olohena Road. This area was previously designated for Urban Mixed Use and is shown as Urban Center on the new GP Land Use Map. Owned partly by the State and partly by Amfac/JMB (or its successor), this "expansion area" for Kapa'a has already accommodated the Kapa'a Middle School."

In a 2010 letter to the applicant, the Planning Director wrote

> "We are writing in general support of Three Stooges LLC's petition to amend 97-acres in Kapa'a to the Urban district. The proposed amendment is in conformance with the County of Kaua'i's General Plan and will provide 231 units of affordable housing. Affordable housing remains an acute need on Kaua'i, even with a falling real estate market and as such the County is generally

supportive of any petition that proposes additional affordable housing, particularly when contiguous to developed urban areas, infrastructure and consistent with our General Plan."

HoKua Place will assist in alleviating some of the current supply-and-demand pressures on Kaua'i's current housing market by providing a variety of additional housing products and opportunities for long-term local residents.

5.2 State of Hawai‘i

5.2.1 Hawai‘i State Plan, HRS Chapter 226

Adopted in 1978 and last revised in 1991, the plan establishes a set of themes, goals, objectives, and policies meant to guide the long term growth and development within the state. The three themes are individual and family self-sufficiency, social and economic mobility, and community and social wellbeing.

HoKua Place will contribute to the diversification of the State’s economic base by generating economic benefits associated with construction and economic activity on site; and providing housing opportunities. Therefore, HoKua Place will be consistent with the Hawai‘i State Plan objectives.

Sections of the Hawai‘i State Plan which are applicable to HoKua Place are discussed in the following pages.

HAWAI‘I STATE PLAN, HRS CHAPTER 226	S	N/S	N/A
S = Supportive, N/S = Not Supportive, N/A = Not Applicable			
Section 226-4: State Goals In order to guarantee, for the present and future generations, those elements of choice and mobility that insure that individuals and groups may approach their desired levels of self-reliance and self-determination, it shall be the goal of the State to achieve:			
(1) A strong, viable economy, characterized by stability, diversity and growth, that enables the fulfillment of the needs and expectations of Hawai‘i’s present and future generations.	X		
(2) A desired physical environment, characterized by beauty, cleanliness, quiet, stable natural systems, and uniqueness, that enhances the mental and physical well-being of the people.	X		
(3) Physical, social and economic well-being, for individuals and families in Hawai’i, that nourishes a sense of community responsibility, of caring, and of participation in community life.	X		
Discussion: HoKua Place will support the State economy, provide housing opportunities and enhance the social well-being for the people of Kaua'i.			
Section 226-5: Objective and Policies for Population (A) It shall be the objective in planning for the State’s population to guide population growth to be consistent with the achievement of physical, economic, and social objectives contained in this chapter; (B) To achieve the population objective, it shall be the policy of this State to:			
(1) Manage population growth statewide in a manner that provides increased opportunities for Hawai‘i’s people to pursue their physical, social and economic aspirations while recognizing the unique needs of each county.	X		
(2) Encourage an increase in economic activities and employment opportunities on the neighbor islands consistent with community needs-and desires.	X		
(3) Promote increased opportunities for Hawai‘i’s people to pursue their socioeconomic aspirations throughout the islands.	X		
(4) Encourage research activities and public awareness programs to foster an understanding of Hawai‘i’s limited capacity to accommodate population needs and to address concerns resulting from an increase in Hawai‘i’s population.			X
(5) Encourage federal actions and coordination among major governmental agencies to promote a more balanced distribution of immigrants among states, provided that such actions do not prevent the reunion of immediate family members.			X
(6) Pursue an increase in federal assistance for states with a greater proportion of foreign immigrants relative to their state’s population.			X
(7) Plan the development and availability of land and water resources in a coordinated manner so as to provide for the desired levels of growth in each geographic area.	X		

HAWAIʻI STATE PLAN, HRS CHAPTER 226	S	N/S	N/A
S = Supportive, N/S = Not Supportive, N/A = Not Applicable			
Discussion: HoKua Place proposes two areas for commercial uses which will provide a variety of job opportunities; construction and construction-related employment will have direct beneficial impact on the local economy during construction. HoKua Place conforms with and implements the Kaua'i County Plan which specifically points out the need for more housing in the project area and specifically designates the subject property as Urban Center for that purpose. HoKua Place will provide a variety of housing opportunities, which will have a positive impact on housing and population aspects of the East Kauaʻi Region.			
Section 226-6: Objectives and Policies for the Economy in General. (A) Planning for the State's economy in general shall be directed toward achievement of the following objectives:			
(1) Increased and diversified employment opportunities to achieve full employment, increased income and job choice, and improved living standards for Hawaiʻi's people.	X		
(2) A steadily growing and diversified economic base that is not overly dependent on a few industries, and includes the development and expansion of industries on the neighbor islands.			X
(B) To achieve the general economic objectives, it shall be the policy of this State to:			
(1) Expand Hawaiʻi's national and international marketing, communication and organizational ties, to increase the State's capacity to adjust to and capitalize upon economic changes and opportunities occurring outside the State.			X
(2) Promote Hawai'i as an attractive market for environmentally and socially sound investment activities that benefit Hawaiʻi's people.			X
(3) Seek broader outlets for new or expanded Hawai'i business investments.			X
(4) Expand existing markets and penetrate new markets for Hawaiʻi's products and services.			X
(5) Assure that the basic economic needs of Hawaiʻi's people are maintained in the event of disruptions in overseas transportation.			X
(6) Strive to achieve a level of construction activity responsive to, and consistent with, state growth objectives.	X		
(7) Encourage the formation of cooperatives and other favorable marketing arrangements at the local or regional level to assist Hawaiʻi's small scale producers, manufacturers and distributors.			X
(8) Encourage labor-intensive activities that are economically satisfying and which offer opportunities for upward mobility.			X
(9) Foster greater cooperation and coordination between the government and private sectors in developing Hawaiʻi's employment and economic growth opportunities.	X		
(10) Stimulate the development and expansion of economic activities which will benefit areas with substantial or expected employment problems.			X
(11) Maintain acceptable working conditions and standards for Hawaiʻi's workers.	X		
(12) Provide equal employment opportunities for all segments of Hawaiʻi's population through affirmative action and nondiscrimination measures.	X		
(13) Stimulate the development and expansion of economic activities capitalizing on defense, dual-use, and science and technology assets, particularly on the neighbor islands where employment opportunities may be limited.			X
(14) Encourage businesses that have favorable financial multiplier effects within Hawaiʻi's economy.			X
(15) Promote and protect intangible resources in Hawai'i, such as scenic beauty and the Aloha spirit, which are vital to a healthy economy.	X		
(16) Increase effective communication between the educational community and the private sector to develop relevant curricula and training programs to meet future employment needs in general, and requirements of new, potential growth industries in particular.			X

HAWAIʻI STATE PLAN, HRS CHAPTER 226	S	N/S	N/A
S = Supportive, N/S = Not Supportive, N/A = Not Applicable			
(17) Foster a business climate in Hawai'i - including attitudes, tax and regulatory policies, and financial and technical assistance programs--that is conducive to the expansion of existing enterprises and the creation and attraction of new business and industry.			X
Discussion: The project will meet the needs of projected growth in Kaua'i. Development of the property will address a portion of the significant demand for affordable housing in the County of Kauaʻi, without significantly affecting reserve areas for foreseeable urban growth. Located on the eastern side of the island, the project is close to the centers of employment, beaches, shopping, recreation, etc. HoKua Place will respond to varying spectrums of demand for housing within Kauaʻi by providing a wide range of housing opportunities inclusive of affordable housing alternatives. HoKua Place will seek to create and sustain a mixed-income community allowing for unparalleled social diversity. Development of facilities would generate employment and have a direct beneficial impact on the local economy during construction through construction and construction-related employment. Additionally, HoKua Place proposes two areas for commercial uses that, ultimately, will serve to promote and provide a variety of job opportunities.			
Section 226-7 Objectives and policies for the economy--agriculture. (a) Planning for the State's economy with regard to agriculture shall be directed towards achievement of the following objectives:			
(1) Viability of Hawaiʻi's sugar and pineapple industries.			X
(2) Growth and development of diversified agriculture throughout the State.			X
(3) An agriculture industry that continues to constitute a dynamic and essential component of Hawaiʻi's strategic, economic and social well-being.			X
(b) To achieve the agriculture objectives, it shall be the policy of this State to:			
(1) Establish a clear direction for Hawaiʻi's agriculture through stakeholder commitment and advocacy.			X
(2) Encourage agriculture by making best use of natural resources.			X
(3) Provide the governor and the legislature with information and options needed for prudent decision making for the development of agriculture.			X
(4) Establish strong relationships between the agricultural and visitor industries for mutual marketing benefits.			X
(5) Foster increased public awareness and understanding of the contributions and benefits of agriculture as a major sector of Hawaiʻi's economy.			X
(6) Seek the enactment and retention of federal and state legislation that benefits Hawaiʻi's agricultural industries.			X
(7) Strengthen diversified agriculture by developing an effective promotion, marketing, and distribution system between Hawaiʻi's producers and consumer markets locally, on the continental United States, and internationally.			X
(8) Support research and development activities that strengthen economic productivity in agriculture, stimulate greater efficiency, and enhance the development of new products and agricultural by-products.			X
(9) Enhance agricultural growth by providing public incentives and encouraging private initiatives.			X
(10) Assure the availability of agriculturally suitable lands with adequate water to accommodate present and future needs.			X
(11) Increase the attractiveness and opportunities for an agricultural education and livelihood.			X
(12) Expand Hawaiʻi's agricultural base by promoting growth and development of flowers, tropical fruits and plants, livestock, feed grains, forestry, food crops, aquaculture, and other potential enterprises.			X
(13) Promote economically competitive activities that increase Hawaiʻi's agricultural self-sufficiency.			X
(14) Promote and assist in the establishment of sound financial programs for diversified agriculture.			X

HAWAIʻI STATE PLAN, HRS CHAPTER 226	S	N/S	N/A
S = Supportive, N/S = Not Supportive, N/A = Not Applicable			
(15) Institute and support programs and activities to assist the entry of displaced agricultural workers into alternative agricultural or other employment.			X
(16) Facilitate the transition of agricultural lands in economically non-feasible agricultural production to economically viable agricultural uses.	X		
Discussion: The subject property is in the Agriculture land use district. However, the Kauaʻi General Plan and the Kapaʻa Town Development Plan designate the property as Urban Center. The General Plan states: "One of the key policies in the Framework for preserving Kauaʻiʻs rural character is to promote growth and development in compact urban areas. Urban lands comprise only four to five percent of Kauaʻiʻs land area, leaving 55 percent in conservation and 40 percent in agriculture." The Property is currently vacant and has not been used for agriculture for over fifteen years. The Property was previously used for sugar cane by Līhuʻe Plantation and fully cultivated for many years. While the property previously was cultivated in sugar, the climate and soils at HoKua Place are not ideal for the growing of most commercially viable crops due to the poor soil, strong trade winds and the salt spray from the ocean. Thus, the property as stated in the Hawaiʻi State Plan will "facilitate the transition of agricultural lands in economically non-feasible agricultural production to economically viable agricultural uses."			
Section 226-8 Objective and policies for the economy--visitor industry. (a) Planning for the State's economy with regard to the visitor industry shall be directed towards the achievement of the objective of a visitor industry that constitutes a major component of steady growth for Hawaiʻiʻs economy.			
(b) To achieve the visitor industry objective, it shall be the policy of this State to:			
(1) Support and assist in the promotion of Hawaiʻi's visitor attractions and facilities.			X
(2) Ensure that visitor industry activities are in keeping with the social, economic and physical needs and aspirations of Hawaiʻi's people.			X
(3) Improve the quality of existing visitor destination areas by utilizing Hawaiʻi's strengths in science and technology.			X
(4) Encourage cooperation and coordination between the government and private sectors in developing and maintaining well-designed, adequately serviced visitor industry and related developments which are sensitive to neighboring communities and activities.			X
(5) Develop the industry in a manner that will continue to provide new job opportunities and steady employment for Hawaiʻi's people.			X
(6) Provide opportunities for Hawaiʻi's people to obtain job training and education that will allow for upward mobility within the visitor industry.			X
(7) Foster a recognition of the contribution of the visitor industry to Hawaiʻi's economy and the need to perpetuate the aloha spirit.			X
(8) Foster an understanding by visitors of the aloha spirit and of the unique and sensitive character of Hawaiʻi's cultures and values.			X
Discussion: HoKua Place is a residential development and will have no effect on the tourism industry.			
Section 226-9 Objective and policies for the economy--federal expenditures. (a) Planning for the State's economy with regard to federal expenditures shall be directed towards achievement of the objective of a stable federal investment base as an integral component of Hawaiʻi's economy.			
(b) To achieve the federal expenditures objective, it shall be the policy of this State to:			

HAWAIʻI STATE PLAN, HRS CHAPTER 226	S	N/S	N/A
S = Supportive, N/S = Not Supportive, N/A = Not Applicable			
(1) Encourage the sustained flow of federal expenditures in Hawaiʻi that generates long-term government civilian employment;			X
(2) Promote Hawaiʻi's supportive role in national defense, in a manner consistent with Hawaiʻi's social, environmental, and cultural goals by building upon dual-use and defense applications to develop thriving ocean engineering, aerospace research and development, and related dual-use technology sectors in Hawaiʻi's economy;			X
(3) Promote the development of federally supported activities in Hawaiʻi that respect statewide economic concerns, are sensitive to community needs, and minimize adverse impacts on Hawaiʻi's environment;			X
(4) Increase opportunities for entry and advancement of Hawaiʻi's people into federal government service;			X
(5) Promote federal use of local commodities, services, and facilities available in Hawaiʻi;			X
(6) Strengthen federal-state-county communication and coordination in all federal activities that affect Hawaiʻi; and			X
(7) Pursue the return of federally controlled lands in Hawaiʻi that are not required for either the defense of the nation or for other purposes of national importance, and promote the mutually beneficial exchanges of land between federal agencies, the State and the counties.			X
Discussion: HoKua Place is a private development and no Federal expenditures will be used.			
Section 226-10 Objective and policies for the economy--potential growth activities. (a) Planning for the State's economy with regard to potential growth activities shall be directed towards achievement of the objective of development and expansion of potential growth activities that serve to increase and diversify Hawaiʻi's economic base.			
(b) To achieve the potential growth activity objective, it shall be the policy of this State to:			
(1) Facilitate investment and employment growth in economic activities that have the potential to expand and diversify Hawaiʻi's economy, including but not limited to diversified agriculture, aquaculture, renewable energy development, creative media, and science and technology-based sectors;			X
(2) Expand Hawaiʻi's capacity to attract and service international programs and activities that generate employment for Hawaiʻi's people;			X
(3) Enhance and promote Hawaiʻi's role as a center for international relations, trade, finance, services, technology, education, culture, and the arts;			X
(4) Accelerate research and development of new energy-related industries based on wind, solar, ocean, and underground resources and solid waste;			X
(5) Promote Hawaiʻi's geographic, environmental, social, and technological advantages to attract new economic activities into the State;			X
(6) Provide public incentives and encourage private initiative to attract new industries that best support Hawaiʻi's social, economic, physical, and environmental objectives;			X
(7) Increase research and the development of ocean-related economic activities such as mining, food production, and scientific research;			X
(8) Develop, promote, and support research and educational and training programs that will enhance Hawaiʻi's ability to attract and develop economic activities of benefit to Hawaiʻi;			X
(9) Foster a broader public recognition and understanding of the potential benefits of new, growth-oriented industry in Hawaiʻi;			X
(10) Encourage the development and implementation of joint federal and state initiatives to attract federal programs and projects that will support Hawaiʻi's social, economic, physical, and environmental objectives;			x
(11) Increase research and development of businesses and services in the telecommunications and information industries; and			X

HAWAIʻI STATE PLAN, HRS CHAPTER 226	S	N/S	N/A
S = Supportive, N/S = Not Supportive, N/A = Not Applicable			
(12) Foster the research and development of non-fossil fuel and energy efficient modes of transportation.	X		
Discussion: Market studies have shown that the population growth and correlating need and demand for housing is high on Kauaʻi. The proposed development, which will allow residents to purchase an affordable unit or house and lot, as well as, allow other residents to purchase a lot to design and build their own homes, will present an opportunity to address the critical community need for residential housing. Development of facilities would generate employment and consequent income and taxes. On a short-term basis, the proposed development will have a direct beneficial impact on the local economy during construction through construction and construction-related employment. Additionally, HoKua Place proposes two areas for commercial uses that, ultimately, will serve to promote and provide a variety of job opportunities. A photovoltaic system that can generate up to 1.18 MW of electricity is situated within the HoKua Farm Lots (formerly known as Kapaʻa Highlands I). Its operator entered into an agreement to sell to KIUC electricity generated from the solar farm for 20 years.			
Section 226-10.5 Objectives and policies for the economy--information industry. (a) Planning for the State's economy with regard to telecommunications and information technology shall be directed toward positioning Hawaiʻi as a leader in broadband communications and applications in the Pacific Region.			
(b) To achieve the information industry objective, it shall be the policy of this State to:			
(1) Encourage the continued development and expansion of the telecommunications infrastructure serving Hawaiʻi to accommodate future growth in the information industry;			X
(2) Facilitate the development of new business and service ventures in the information industry which will provide employment opportunities for the people of Hawaiʻi;			X
(3) Encourage greater cooperation between the public and private sectors in developing and maintaining a well- designed information industry;			X
(4) Ensure that the development of new businesses and services in the industry are in keeping with the social, economic, and physical needs and aspirations of Hawaiʻi's people;			X
(5) Provide opportunities for Hawaiʻi's people to obtain job training and education that will allow for upward mobility within the information industry;			X
(6) Foster a recognition of the contribution of the information industry to Hawaiʻi's economy; and			X
(7) Assist in the promotion of Hawaiʻi as a broker, creator and processor of information in the Pacific.			X
Discussion: HoKua Place will be a residential development and will have no effect on the information industry.			
Section 226-11 Objectives and Policies for the Physical Environment - Land-based, Shoreline, and Marine Resources. (A) Planning for the State's physical environment with regard to land-based, shoreline and marine resources shall be directed towards achievement of the following objectives:			
(1) Prudent use of Hawaiʻiʻs land-based, shoreline, and marine resources.	X		
(2) Effective protection of Hawaiʻiʻs unique and fragile environmental resources.	X		
(B) To achieve the land-based, shoreline, and marine resources objectives, it shall be the policy of this State to:			
(1) Exercise an overall conservation ethic in the use of Hawaiʻiʻs natural resources.	X		
(2) Ensure compatibility between land-based and water-based activities and natural resources and ecological systems.	X		

HAWAIʻI STATE PLAN, HRS CHAPTER 226	S	N/S	N/A
S = Supportive, N/S = Not Supportive, N/A = Not Applicable			
(3) Take into account the physical attributes of areas when planning and designing activities and facilities.	X		
(4) Manage natural resources and environs to encourage their beneficial and multiple uses without generating costly or irreparable environmental damage.	X		
(5) Consider multiple uses in watershed areas, provided such uses do not detrimentally affect water quality and recharge functions.			X
(6) Encourage the protection of rare or endangered plant and animal species and habitats native to Hawaiʻi.	X		
(7) Provide public incentives that encourage private actions to protect significant natural resources from degradation or unnecessary depletion.			X
(8) Pursue compatible relationships among activities, facilities and natural resources.	X		
(9) Promote increased accessibility and prudent use of inland and shoreline areas for public recreational, educational and scientific purposes.	X		
Discussion: Although HoKua Place is not located on the shoreline, it will incorporate core principles of various sustainability programs and plans to address the protection of Hawaiʻi's environmental resources. HoKua Place will incorporating design features to fit development into natural features, protecting natural resources, while taking advantage of natural elements. HoKua Place will encourage protection of urban open spaces by focusing on the urban landscaping, green spaces and mixed-use development and recreational opportunities. HoKua Place will focuses on reducing and conserving water use, as well as minimizing impacts to nearby ecosystems from source to storm water systems. Energy management within HoKua Place will encourage energy conservation, energy efficiency and renewable energy.			
Section 226-12 Objective and Policies for the Physical Environment - Scenic, Natural Beauty, and Historic Resources. (A) Planning for the State's physical environment shall be directed towards achievement of the objective of enhancement of Hawaiʻi's scenic assets, natural beauty and multi-cultural/historical resources. (B) To achieve the scenic, natural beauty, and historic resources objective, it shall be the policy of this State to:			
(1) Promote the preservation and restoration of significant natural and historic resources.	X		
(2) Provide incentives to maintain and enhance historic, cultural and scenic amenities.	X		
(3) Promote the preservation of views and vistas to enhance the visual and aesthetic enjoyment of mountains, ocean, scenic landscapes and other natural features.	X		
(4) Protect those special areas, structures and elements that are an integral and functional part of Hawaiʻi's ethnic and cultural heritage.	X		
(5) Encourage the design of developments and activities that complement the natural beauty of the islands.	X		
Discussion: HoKua Place will not affect cultural or historic resources. No archaeological sites are known to exist on the property. Should any archaeologically significant artifacts, bones, or other indicators be uncovered during construction, HoKua Place is committed to strict compliance with State laws and rules. The project site is not part of a scenic corridor and the project will not affect scenic vistas and view planes. The proposed project will not involve significant alteration of the existing topographic character of the site and will not affect public views to and along the shoreline. The project design will compliment the Kapa'a environment in terms of site plan, building materials and heights.			

HAWAIʻI STATE PLAN, HRS CHAPTER 226	S	N/S	N/A
S = Supportive, N/S = Not Supportive, N/A = Not Applicable			
Section 226-13 Objectives and Policies for the Physical Environment - Land, Air, and Water Quality. (A) Planning for the State's physical environment with regard to land, air, and water quality shall be directed towards achievement of the following objectives:			
(1) Maintenance and pursuit of improved quality in Hawaiʻi's land, air and water resources.	X		
(2) Greater public awareness and appreciation of Hawaiʻi's environmental resources.			X
(B) To achieve the land, air, and water quality objectives, it shall be the policy of this State to:			
(1) Foster educational activities that promote a better understanding of Hawaiʻi's limited environmental resources.			X
(2) Promote the proper management of Hawaiʻi's land and water resources.	X		
(3) Promote effective measures to achieve desired quality in Hawaiʻi's surface, ground and coastal waters.	X		
(4) Encourage actions to maintain or improve aural and air quality levels to enhance the health and well-being of Hawaiʻi's people.	X		
(5) Reduce the threat to life and property from erosion, flooding, tsunamis, hurricanes, earthquakes, volcanic eruptions, and other natural or man-induced hazards and disasters.	X		
(6) Encourage design and construction practices that enhance the physical qualities of Hawaiʻi's communities.	X		
(7) Encourage urban developments in close proximity to existing services and facilities.	X		
(8) Foster recognition of the importance and value of the land, air and water resources to Hawaiʻi's people, their cultures and visitors.			X
Discussion: HoKua Place will employ design principles and features, were feasible, aimed at water and energy conservation and stewardship for Hawai`i's resources. The project site is located outside of the flood and tsunami zones and project construction practices will minimize threat from natural hazards. The project site is located in proximity to existing urban development and infrastructure. Through the layout and design of HoKua Place, there is an overall opportunity for a positive effect on the health of its residents. HoKua Place included open space, parks and open greenway areas encompassing 14.3-acres, a 3.1-acre park for outdoor recreation and land for the proposed relocation of the Kapaʻa county swimming pool which will provide residents with an opportunity for leisurely recreational and physical fitness activities.			
226-14 Objective and policies for facility systems--in general. (a) Planning for the State's facility systems in general shall be directed towards achievement of the objective of water, transportation, waste disposal and energy and telecommunication systems that support statewide social, economic and physical objectives.			
(b) To achieve the general facility systems objective, it shall be the policy of this State to:			
(1) Accommodate the needs of Hawaiʻi's people through coordination of facility systems and capital improvement priorities in consonance with state and county plans.	X		
(2) Encourage flexibility in the design and development of facility systems to promote prudent use of resources and accommodate changing public demands and priorities.	X		
(3) Ensure that required facility systems can be supported within resource capacities and at reasonable cost to the user.	X		
(4) Pursue alternative methods of financing programs and projects and cost-saving techniques in the planning, construction and maintenance of facility systems.	X		

HAWAIʻI STATE PLAN, HRS CHAPTER 226	S	N/S	N/A
S = Supportive, N/S = Not Supportive, N/A = Not Applicable			
Discussion: HoKua Place will be contributing to act on the deferred maintenance and to the cost of repairs to the County sewer treatment plant. Additionally, HoKua Place has a proven well site that may be dedicated to the DOW to feed the Department of Water's storage tanks. The project will have a main roadway from the Kapaʻa By-Pass Road running north through the Property to Olohena Road. The roadway will follow the county's resolution for complete roads and as such will be a multi-modal roadway. The by-pass road is owned by HoKua Place which is working with the Department of Transportation (DOT) and has been allowing for the continuous public use of the road. The by-pass road will be dedicated to DOT upon final subdivision approval. Thus, HoKua Place will be contributing to the objectives and policies of the State Plan in regards to facility systems.			
226-15 Objectives and Policies for Facility Systems - Solid and Liquid Wastes. (A) Planning for the State's facility systems with regard to solid and liquid wastes shall be directed towards the achievement of the following objectives:			
(1) Maintenance of basic public health and sanitation standards relating to treatment and disposal of solid and liquid wastes.	X		
(2) Provision of adequate sewerage facilities for physical and economic activities that alleviate problems in housing, employment, mobility, and other areas.	X		
(B) To achieve solid and liquid waste objectives, it shall be the policy of this State to:			
(1) Encourage the adequate development of sewerage facilities that complement planned growth.			X
(2) Promote re-use and recycling to reduce solid and liquid wastes and employ a conservation ethic.	X		
(3) Promote research to develop more efficient and economical treatment and disposal of solid and liquid wastes.			X
Discussion: HoKua Place will adhere to State and County sanitation standards for solid and liquid waste management. Throughout project construction and development, HoKua Place will recycle and reuse generated construction wastes, as well as, incorporate measures and provisions to implement recycling such as storage and collection systems for recyclables. BMPs will be implemented for long term development and operation of activities occurring on the site as part of pollution prevention measures. HoKua Place will be contributing funds to help upgrade the deferred maintenance and repair of the Wailua Waste Water Treatment plant.			
226-16 Objective and Policies for Facility Systems - Water. (A) Planning for the State's facility systems with regard to water shall be directed towards achievement of the objective of the provision of water to adequately accommodate domestic, agricultural, commercial, industrial, recreational and other needs within resource capacities. (B) To achieve the facility systems water objective, it shall be the policy of this State to:			
(1) Coordinate development of land use activities with existing and potential water supply.	X		
(2) Support research and development of alternative methods to meet future water requirements well in advance of anticipated needs.			X
(3) Reclaim and encourage the productive use of runoff water and wastewater discharges.	X		
(4) Assist in improving the quality, efficiency, service and storage capabilities of water systems for domestic and agricultural use.	X		
(5) Support water supply services to areas experiencing critical water problems.			X
(6) Promote water conservation programs and practices in government, private industry, and the general public to help ensure adequate water to meet long-term needs.	X		

HAWAIʻI STATE PLAN, HRS CHAPTER 226	S	N/S	N/A
S = Supportive, N/S = Not Supportive, N/A = Not Applicable			
Discussion: HoKua Place will employ design principles, where feasible, to conserve water and seek to achieve water conservation and efficiency. A Water Master Plan for HoKua Place (formerly known as Kapaʻa Highlands II) has been approved, in concept, by the Kauaʻi County Department of Water (DOW). HoKua Place has a proven well site that will be dedicated to the DOW to feed the Department of Water's storage tanks and existing water system. HoKua Place is committed to continue working with the DOW on pertinent water issues.			
226-17 Objectives and Policies for Facility Systems - Transportation. (A) Planning for the State's facility systems with regard to transportation shall be directed towards the achievement of the following objectives:			
(1) An integrated multi-modal transportation system that services statewide needs and promotes the efficient, economical, safe and convenient movement of people and goods.	X		
(2) A statewide transportation system that is consistent with and will accommodate planned growth objectives throughout the State.			X
(B) To achieve the transportation objectives, it shall be the policy of this State to:			
(1) Design, program, and develop a multi-modal system in conformance with desired growth and physical development as stated in this chapter;	X		
(2) Coordinate state, county, federal, and private transportation activities and programs toward the achievement of statewide objectives;			X
(3) Encourage a reasonable distribution of financial responsibilities for transportation among participating governmental and private parties;			X
(4) Provide for improved accessibility to shipping, docking, and storage facilities;			X
(5) Promote a reasonable level and variety of mass transportation services that adequately meet statewide and community needs;			X
(6) Encourage transportation systems that serve to accommodate present and future development needs of communities;	X		
(7) Encourage a variety of carriers to offer increased opportunities and advantages to inter-island movement of people and goods;			X
(8) Increase the capacities of airport and harbor systems and support facilities to effectively accommodate transshipment and storage needs;			X
(9) Encourage the development of transportation systems and programs which would assist statewide economic growth and diversification;			X
(10) Encourage the design and development of transportation systems sensitive to the needs of affected communities and the quality of Hawaiʻi's natural environment;			X
(11) Encourage safe and convenient use of low-cost, energy-efficient, non-polluting means of transportation;			X
(12) Coordinate intergovernmental land use and transportation planning activities to ensure the timely delivery of supporting transportation infrastructure in order to accommodate planned growth objectives; and	X		
(13) Encourage diversification of transportation modes and infrastructure to promote alternate fuels and energy efficiency.			X
Discussion: HoKua Place actively supports transportation planning and objectives of the County of Kauaʻi Transportation Department and DOT. HoKua Place will incorporate bus stops into its road system and complete streets design. HoKua Place is committed to Multi-modal, Interconnected and Concurrent Transportation for its residents and community. HoKua Place also intends upon dedicating the Kapaʻa Bypass Road to the State to achieve both State and County transportation goals and objectives.			

HAWAIʻI STATE PLAN, HRS CHAPTER 226	S	N/S	N/A
S = Supportive, N/S = Not Supportive, N/A = Not Applicable			
226-18 Objectives and Policies for Facility Systems - Energy. (A) Planning for the State's facility systems with regard to energy shall be directed toward the achievement of the following objectives, giving due consideration to all:			
(1) Dependable, efficient, and economical statewide energy systems capable of supporting the needs of the people;			X
(2) Increased energy self-sufficiency where the ratio of indigenous to imported energy use is increased;	X		
(3) Greater energy security in the face of threats to Hawaiʻi's energy supplies and systems; and	X		
(4) Reduction, avoidance or sequestration of greenhouse gas emissions from energy supply and use.	X		
(B) To achieve the energy objectives, it shall be the policy of this State to ensure the provision of adequate, reasonably priced and dependable energy services to accommodate demand.			
(C) To further achieve the energy objectives, it shall be the policy of this State to:			
(1) Support research and development as well as promote the use of renewable energy sources;	X		
(2) Ensure that the combination of energy supplies and energy-saving systems is sufficient to support the demands of growth;	X		
(3) Base decisions of least-cost supply-side and demand-side energy resource options on a comparison of their total costs and benefits when a least-cost is determined by a reasonably comprehensive, quantitative, and qualitative accounting of their long-term, direct and indirect economic, environmental, social, cultural, and public health costs and benefits;			X
(4) Promote all cost-effective conservation of power and fuel supplies through measures including: (a) Development of cost-effective demand-side management programs; (b) Education; and (c) Adoption of energy-efficient practices and technologies;	X		
(5) Ensure to the extent that new supply-side resources are needed, the development or expansion of energy systems utilizes the least-cost energy supply option and maximizes efficient technologies;	X		
(6) Support research, development, and demonstration of energy efficiency, load management, and other demand-side management programs, practices, and technologies;	X		
(7) Promote alternate fuels and energy efficiency by encouraging diversification of transportation modes and infrastructure;	X		
(8) Support actions that reduce, avoid, or sequester greenhouse gases in utility, transportation, and industrial sector applications; and			X
(9) Support actions that reduce, avoid or sequester Hawaiʻi's greenhouse gas emissions through agriculture and forestry initiatives.			X
(10) Provide priority handling and processing for all state and county permits required for renewable energy projects.			X
Discussion: HoKua Place activities, buildings and grounds will be designed with a significant emphasis on energy conservation and efficiency. HoKua Place will employ efficient design practices and technologies, where feasible. Buildings within HoKua Place will further comply with the County of Kauaʻi and State Energy Conservation rules and regulations.			
226-18.5 Objectives and policies for facility systems--telecommunications. (a) Planning for the State's telecommunications facility systems shall be directed towards the achievement of dependable, efficient, and economical statewide telecommunications systems capable of supporting the needs of the people.			
(b) To achieve the telecommunications objective, it shall be the policy of this State to ensure the provision of adequate, reasonably priced and dependable telecommunications services to accommodate demand.			X
(c) To further achieve the telecommunications objective, it shall be the policy of this State to:			
(1) Facilitate research and development of telecommunications systems and resources;			X

HAWAIʻI STATE PLAN, HRS CHAPTER 226	S	N/S	N/A
S = Supportive, N/S = Not Supportive, N/A = Not Applicable			
(2) Encourage public and private sector efforts to develop means for adequate, ongoing telecommunications planning;			X
(3) Promote efficient management and use of existing telecommunications systems and services; and			X
(4) Facilitate the development of education and training of telecommunications personnel			X
Discussion: The project site is served by Hawaiian Telcom telephone lines. Numerous cell towers across the island provide cellular phone service to the area. Therefore, the project will not have a significant impact on communication resources or services.			
Section 226-19: Objectives and policies for socio-cultural advancement--housing. (a) Planning for the State's socio-cultural advancement with regard to housing shall be directed toward the achievement of the following objectives:			
(1) Greater opportunities for Hawaiʻi's people to secure reasonably priced, safe, sanitary, and livable homes, located in suitable environments that satisfactorily accommodate the needs and desires of families and individuals, through collaboration and cooperation between government and nonprofit and for-profit developers to ensure that more affordable housing is made available to very low-, low- and moderate-income segments of Hawaiʻi's population.	X		
(2) The orderly development of residential areas sensitive to community needs and other land uses.	X		
(3) The development and provision of affordable rental housing by the State to meet the housing needs of Hawaiʻi's people.	X		
(b) To achieve the housing objectives, it shall be the policy of this State to:			
(1) Effectively accommodate the housing needs of Hawaiʻi's people.	X		
(2) Stimulate and promote feasible approaches that increase housing choices for low-income, moderate-income and gap-group households.	X		
(3) Increase homeownership and rental opportunities and choices in terms of quality, location, cost, densities, style and size of housing.	X		
(4) Promote appropriate improvement, rehabilitation and maintenance of existing housing units and residential areas.			X
(5) Promote design and location of housing developments taking into account the physical setting, accessibility to public facilities and services, and other concerns of existing communities and surrounding areas.	X		
(6) Facilitate the use of available vacant, developable and underutilized urban lands for housing.			X
(7) Foster a variety of lifestyles traditional to Hawaiʻi through the design and maintenance of neighborhoods that reflect the culture and values of the community.	X		
(8) Promote research and development of methods to reduce the cost of housing construction in Hawaiʻi.			X

HAWAIʻI STATE PLAN, HRS CHAPTER 226	S	N/S	N/A
S = Supportive, N/S = Not Supportive, N/A = Not Applicable			
Discussion: HoKua Place will have a positive impact on housing and population aspects of the East Kauaʻi Region. The Kauaʻi General Plan specifically points out the need for more housing in the area and specifically designates the subject property as Urban Center for that purpose. In a 2010 letter to HoKua Place (formerly known as Kapaʻa Highlands II), the Planning Director wrote, "We are writing in general support of Three stooges LLC's petition to amend 97 acres in Kapaʻa to the Urban district. The proposed amendment is in conformance with the County of Kauaʻi's General Plan and will provide affordable housing. Affordable housing remains an acute need on Kauaʻi, even with a falling real estate market and as such the County is generally supportive of any petition that proposes additional affordable housing, particularly when contiguous to developed urban areas, infrastructure and consistent with our General Plan." Therefore development of the Property will address a portion of the significant demand for affordable housing in the County of Kauaʻi, without significantly affecting reserve areas for foreseeable urban growth. HoKua Place will respond to varying spectrums of demand for housing within Kauaʻi by providing a wide range of housing opportunities inclusive of affordable housing alternatives. HoKua Place will seek to create and sustain a mixed-income community allowing for unparalleled social diversity.			
226-20 Objectives and policies for socio-cultural advancement--health. (a) Planning for the State's socio-cultural advancement with regard to health shall be directed towards achievement of the following objectives:			
(1) Fulfillment of basic individual health needs of the general public.			X
(2) Maintenance of sanitary and environmentally healthful conditions in Hawaiʻi's communities.	X		
(b) To achieve the health objectives, it shall be the policy of this State to:			
(1) Provide adequate and accessible services and facilities for prevention and treatment of physical and mental health problems, including substance abuse.			X
(2) Encourage improved cooperation among public and private sectors in the provision of health care to accommodate the total health needs of individuals throughout the State.			X
(3) Encourage public and private efforts to develop and promote statewide and local strategies to reduce health care and related insurance costs.			X
(4) Foster an awareness of the need for personal health maintenance and preventive health care through education and other measures.			X
(5) Provide programs, services and activities that ensure environmentally healthful and sanitary conditions.			X
(6) Improve the State's capabilities in preventing contamination by pesticides and other potentially hazardous substances through increased coordination, education, monitoring and enforcement.			X
Discussion: Through the layout and design of HoKua Place, there is an overall opportunity for a positive effect on the health of its residents. HoKua Place provides opportunities for people of all ages and abilities to engage in routine physical activity by creating places and policies that encourage better physical health, including open space and open greenway areas encompassing 14.3-acres, a 3.1-acre park for outdoor recreation and land for the proposed relocation of the Kapaʻa county swimming pool which will provide residents with an opportunity for leisurely recreational and physical fitness activities.			

HAWAIʻI STATE PLAN, HRS CHAPTER 226	S	N/S	N/A
S = Supportive, N/S = Not Supportive, N/A = Not Applicable			
226-21 Objective and policies for socio-cultural advancement--education. (a) Planning for the State's socio-cultural advancement with regard to education shall be directed towards achievement of the objective of the provision of a variety of educational opportunities to enable individuals to fulfill their needs, responsibilities, and aspirations.			
(b) To achieve the education objective, it shall be the policy of this State to:			
(1) Support educational programs and activities that enhance personal development, physical fitness, recreation and cultural pursuits of all groups.	X		
(2) Ensure the provision of adequate and accessible educational services and facilities that are designed to meet individual and community needs.	X		
(3) Provide appropriate educational opportunities for groups with special needs.			X
(4) Promote educational programs which enhance understanding of Hawaiʻi's cultural heritage.			X
(5) Provide higher educational opportunities that enable Hawaiʻi's people to adapt to changing employment demands.			X
(6) Assist individuals, especially those experiencing critical employment problems or barriers, or undergoing employment transitions, by providing appropriate employment training programs and other related educational opportunities.			X
(7) Promote programs and activities that facilitate the acquisition of basic skills, such as reading, writing, computing, listening, speaking, and reasoning.			X
(8) Emphasize quality educational programs in Hawaiʻi's institutions to promote academic excellence.			X
(9) Support research programs and activities that enhance the education programs of the State.			X
Discussion: HoKua Place will coordinate with the DOE to ensure that the DOE's facility assessment policy provisions are appropriately addressed. Additionally, a 3.1-acre park is proposed adjacent to the existing Kapaʻa Middle School. The park will have an area for the county's proposed relocation of the Kapaʻa county swimming pool. HoKua Place also plans to develop a bike/walking path from the south of the property to the Kapaʻa Middle School to facilitate biking and walking around the development.			
226-22 Objective and Policies for Socio-Cultural Advancement -Social Services. (A) Planning for the State's socio-cultural advancement with regard to social services shall be directed towards the achievement of the objective of improved public and private social services and activities that enable individuals, families, and groups to become more self-reliant and confident to improve their well-being. (B) To achieve the social service objective, it shall be the policy of the State to:			
(1) Assist individuals, especially those in need of attaining a minimally adequate standard of living and those confronted by social and economic hardship conditions, through social services and activities within the State's fiscal capacities.			X
(2) Promote coordination and integrative approaches among public and private agencies and programs to jointly address social problems that will enable individuals, families and groups to deal effectively with social problems and to enhance their participation in society.			X
(3) Facilitate the adjustment of new residents, especially recently arrived immigrants, into Hawaiʻi's communities.			X
(4) Promote alternatives to institutional care in the provision of long-term care for elder and disabled populations.			X
(5) Support public and private efforts to prevent domestic abuse and child molestation, and assist victims of abuse and neglect.			X
(6) Promote programs which assist people in need of family planning services to enable them to meet their needs.			X

HAWAIʻI STATE PLAN, HRS CHAPTER 226	S	N/S	N/A
S = Supportive, N/S = Not Supportive, N/A = Not Applicable			
Discussion: HoKua Place will assist the State with its socio-cultural advancement by providing a variety of housing opportunities for residents as well as the creation of open space and development of a park which included the relocation of a County swimming pool.			
226-23 Objective and policies for socio-cultural advancement--leisure. (a) Planning for the State's socio-cultural advancement with regard to leisure shall be directed towards the achievement of the objective of the adequate provision of resources to accommodate diverse cultural, artistic, and recreational needs for present and future generations.			
(b) To achieve the leisure objective, it shall be the policy of this State to:			
(1) Foster and preserve Hawaiʻi's multi-cultural heritage through supportive cultural, artistic, recreational, and humanities-oriented programs and activities.			X
(2) Provide a wide range of activities and facilities to fulfill the cultural, artistic, and recreational needs of all diverse and special groups effectively and efficiently.	X		
(3) Enhance the enjoyment of recreational experiences through safety and security measures, educational opportunities, and improved facility design and maintenance.	X		
(4) Promote the recreational and educational potential of natural resources having scenic, open space, cultural, historical, geological, or biological values while ensuring that their inherent values are preserved.	X		
(5) Ensure opportunities for everyone to use and enjoy Hawaiʻi's recreational resources.	X		
(6) Assure the availability of sufficient resources to provide for future cultural, artistic and recreational needs.	X		
(7) Provide adequate and accessible physical fitness programs to promote the physical and mental well-being of Hawaiʻi's people.	X		
(8) Increase opportunities for appreciation and participation in the creative arts, including the literary, theatrical, visual, musical, folk and traditional art forms.			X
(9) Encourage the development of creative expression in the artistic disciplines to enable all segments of Hawaiʻi's population to participate in the creative arts.			X
(10) Assure adequate access to significant natural and cultural resources in public ownership.			X
Discussion: HoKua Place interlinks natural features and open space as core components of the community. Open space and open greenway areas encompassing 14.3-acres will be developed within the project. A 3.1-acre park is proposed within the project for outdoor recreation. Land for the proposed relocation of the Kapaʻa county swimming pool will be available within the 3.1-acre park. The provision of a 3.1-acre park with a county swimming pool within the proposed development will provide residents with an opportunity for leisurely recreational activities.			
226-24 Objective and Policies for Socio-Cultural Advancement - Individual Rights and Personal Well-Being. (A) Planning for the State's socio-cultural advancement with regard to individual rights and personal well-being shall be directed towards achievement of the objective of increased opportunities and protection of individual rights to enable individuals to fulfill their socio-economic needs and aspirations. (B) To achieve the individual rights and personal well-being objective, it shall be the policy of this State to:			
(1) Provide effective services and activities that protect individuals from criminal acts and unfair practices and that alleviate the consequences of criminal acts in order to foster a safe and secure environment.			X
(2) Uphold and protect the national and state constitutional rights of every individual.			X

HAWAIʻI STATE PLAN, HRS CHAPTER 226	S	N/S	N/A
S = Supportive, N/S = Not Supportive, N/A = Not Applicable			
(3) Assure access to, and availability of, legal assistance, consumer protection, and other public services which strive to attain social justice.			X
(4) Ensure equal opportunities for individual participation in society.			X
Discussion: HoKua Place will assist the State with its socio-cultural advancement by providing a variety of housing opportunities for residents.			
226-25 Objective and Policies for Socio-Cultural Advancement - Culture. (A) Planning for the State's socio-cultural advancement with regard to culture shall be directed toward the achievement of the objective of enhancement of cultural identities, traditions, values, customs, and arts of Hawaiʻi's people. (B) To achieve the culture objective, it shall be the policy of this State to:			
(1) Foster increased knowledge and understanding of Hawaiʻi's ethnic and cultural heritages and the history of Hawaiʻi.			X
(2) Support activities and conditions that promote cultural values, customs and arts that enrich the lifestyles of Hawaiʻi's people and which are sensitive and responsive to family and community needs.			X
(3) Encourage increased awareness of the effects of proposed public and private actions on the integrity and quality of cultural and community lifestyles in Hawaiʻi.			X
(4) Encourage the essence of the aloha spirit in people's daily activities to promote harmonious relationships among Hawaiʻi's people and visitors.	X		
Discussion: Affordable housing option will be incorporated within the HoKua Place, allowing for a diversity and mix of housing types and options. Complete streets with walkways and bike lanes, will allow for slow movement through the project for easy social interaction.			
226-26 Objectives and Policies for Socio-Cultural Advancement - Public Safety. (A) Planning for the State's socio-cultural advancement with regard to public safety shall be directed towards the achievement of the following objectives:			
(1) Assurance of public safety and adequate protection of life and property for all people.	X		
(2) Optimum organizational readiness and capability in all phases of emergency management to maintain the strength, resources, and social and economic well-being of the community in the event of civil disruptions, wars, natural disasters, and other major disturbances.			X
(3) Promotion of a sense of community responsibility for the welfare and safety of Hawaiʻi's people.	X		
(B) To achieve the public safety objectives, it shall be the policy of this State to:			
(1) Ensure that public safety programs are effective and responsive to community needs.			X
(2) Encourage increased community awareness and participation in public safety programs.			X
(C) To further achieve public safety objectives related to criminal justice, it shall be the policy of this State to:			
(1) Support criminal justice programs aimed at preventing and curtailing criminal activities.			X
(2) Develop a coordinated, systematic approach to criminal justice administration among all criminal justice agencies.			X
(3) Provide a range of correctional resources which may include facilities and alternatives to traditional incarceration in order to address the varied security needs of the community and successfully reintegrate offenders into the community.			X
(D) To further achieve public safety objectives related to emergency management, it shall be the policy of this State to:			
(1) Ensure that responsible organizations are in a proper state of readiness to respond to major war-related, natural, or technological disasters and civil disturbances at all times.			X
(2) Enhance the coordination between emergency management programs throughout the State.			X

HAWAIʻI STATE PLAN, HRS CHAPTER 226	S	N/S	N/A
S = Supportive, N/S = Not Supportive, N/A = Not Applicable			
Discussion: HoKua Place allocates a one acre parcel for the development of sub-stations for the police and fire departments. Provision of correctional facilities falls under the jurisdiction of the PSD.			
226-27 Objectives and Policies for Socio-Cultural Advancement - Government. (A) Planning the State's socio-cultural advancement with regard to government shall be directed towards the achievement of the following objectives:			
(1) Efficient, effective, and responsive government services at all levels in the State.			X
(2) Fiscal integrity, responsibility and efficiency in the state government and county governments.			X
(B) To achieve the government objectives, it shall be the policy of this State to:			
(1) Provide for necessary public goods and services not assumed by the private sector.			X
(2) Pursue an openness and responsiveness in government that permits the flow of public information, interaction and response.			X
(3) Minimize the size of government to that necessary to be effective.			X
(4) Stimulate the responsibility in citizens to productively participate in government for a better Hawaiʻi.			X
(5) Assure that government attitudes, actions and services are sensitive to community needs and concerns.			X
(6) Provide for a balanced fiscal budget.			X
(7) Improve the fiscal budgeting and management system of the State.			X
(8) Promote the consolidation of state and county governmental functions to increase the effective and efficient delivery of government programs and services and to eliminate duplicative services wherever feasible.	X		
Discussion: HoKua Place allocates a one acre parcel for the development of sub-stations for the police and fire departments.			
Hawai'i State Plan - HRS Ch. 226 - Part III. Priority Guidelines			
226-101 Purpose. The purpose of this part is to establish overall priority guidelines to address areas of statewide concern.			
226-102 Overall Direction. The State shall strive to improve the quality of life for Hawaiʻi's present and future population through the pursuit of desirable courses of action in five major areas of statewide concern which merit priority attention: economic development, population growth and land resource management, affordable housing, crime and criminal justice, and quality education.			
226-103 Economic Priority Guidelines. (A) Priority guidelines to stimulate economic growth and encourage business expansion and development to provide needed jobs for Hawaiʻi's people and achieve a stable and diversified economy:			
(1) Seek a variety of means to increase the availability of investment capital for new and expanding enterprises. (a) Encourage investments which:			
(i) Reflect long term commitments to the State;	X		
(ii) Rely on economic linkages within the local economy;	X		
(iii) Diversify the economy;	X		
(iv) Reinvest in the local economy;	X		
(v) Are sensitive to community needs and priorities; and	X		
(vi) Demonstrate a commitment to provide management opportunities to Hawaiʻi residents.	X		
(2) Encourage the expansion of technological research to assist industry development and support the development and commercialization of technological advancements.			X
(3) Improve the quality, accessibility and range of services provided by government to business, including data and reference services and assistance in complying with governmental regulations.			X

HAWAIʻI STATE PLAN, HRS CHAPTER 226	S	N/S	N/A
S = Supportive, N/S = Not Supportive, N/A = Not Applicable			
(4) Seek to ensure that state business tax, labor laws and administrative policies are equitable, rational, and predictable.			X
(5) Streamline the building and development permit and review process, and eliminate or consolidate other burdensome or duplicative governmental requirements imposed on business, where public health, safety and welfare would not be adversely affected.			X
(6) Encourage the formation of cooperatives and other favorable marketing or distribution arrangements at the regional or local level to assist Hawaiʻi's small-scale producers, manufacturers and distributors.			X
(7) Continue to seek legislation to protect Hawaiʻi from transportation interruptions between Hawaiʻi and the continental United States.			X
(8) Provide public incentives and encourage private initiative to develop and attract industries which promise long-term growth potentials and which have the following characteristics:			
(a) An industry that can take advantage of Hawaiʻi's unique location and available physical and human resources.			X
(b) A clean industry that would have minimal adverse effects on Hawaiʻi's environment.			X
(c) An industry that is willing to hire and train Hawaiʻi's people to meet the industry's labor needs at all levels of employment.			X
(d) An industry that would provide reasonable income and steady employment.			X
(9) Support and encourage, through educational and technical assistance programs and other means, expanded opportunities for employee ownership and participation in Hawaiʻi business.			X
(10) Enhance the quality of Hawaiʻi's labor force and develop and maintain career opportunities for Hawaiʻi's people through the following actions:			
(a) Expand vocational training in diversified agriculture, aquaculture, information industry and other areas where growth is desired and feasible.			X
(b) Encourage more effective career counseling and guidance in high schools and post-secondary institutions to inform students of present and future career opportunities.			X
(c) Allocate educational resources to career areas where high employment is expected and where growth of new industries is desired.			X
(d) Promote career opportunities in all industries for Hawaiʻi's people by encouraging firms doing business in the State to hire residents.			X
(e) Promote greater public and private sector cooperation in determining industrial training needs and in developing relevant curricula and on- the-job training opportunities.			X
(f) Provide retraining programs and other support services to assist entry of displaced workers into alternative employment.			X
(B) Priority guidelines to promote the economic health and quality of the visitor industry:			
(1) Promote visitor satisfaction by fostering an environment which enhances the Aloha Spirit and minimizes inconveniences to Hawaiʻi's residents and visitors.			X
(2) Encourage the development and maintenance of well- designed, adequately serviced hotels and resort destination areas which are sensitive to neighboring communities and activities and which provide for adequate shoreline setbacks and beach access.			X
(3) Support appropriate capital improvements to enhance the quality of existing resort destination areas and provide incentives to encourage investment in upgrading, repair and maintenance of visitor facilities.			X
(4) Encourage visitor industry practices and activities which respect, preserve and enhance Hawaiʻi's significant natural, scenic, historic and cultural resources.			X
(5) Develop and maintain career opportunities in the visitor industry for Hawaiʻi's people, with emphasis on managerial positions.			X
(6) Support and coordinate tourism promotion abroad to enhance Hawaiʻi's share of existing and potential visitor markets.			X
(7) Maintain and encourage a more favorable resort investment climate consistent with the objectives of this chapter.			X

HAWAIʻI STATE PLAN, HRS CHAPTER 226	S	N/S	N/A
S = Supportive, N/S = Not Supportive, N/A = Not Applicable			
(8) Support law enforcement activities that provide a safer environment for both visitors and residents alike.	X		
(9) Coordinate visitor industry activities and promotions to business visitors through the state network of advanced data communication techniques.			X
(C) Priority guidelines to promote the continued viability of the sugar and pineapple industries:			
(1) Provide adequate agricultural lands to support the economic viability of the sugar and pineapple industries.			X
(2) Continue efforts to maintain federal support to provide stable sugar prices high enough to allow profitable operations in Hawaiʻi.			X
(3) Support research and development, as appropriate, to improve the quality and production of sugar and pineapple crops.			X
(D) Priority guidelines to promote the growth and development of diversified agriculture and aquaculture:			
(1) Identify, conserve, and protect agricultural and aquaculture lands of importance and initiate affirmative and comprehensive programs to promote economically productive agricultural and aquaculture uses of such lands.			X
(2) Assist in providing adequate, reasonably priced water for agricultural activities.			X
(3) Encourage public and private investment to increase water supply and to improve transmission, storage, and irrigation facilities in support of diversified agriculture and aquaculture.			X
(4) Assist in the formation and operation of production and marketing associations and cooperatives to reduce production and marketing costs.			X
(5) Encourage and assist with the development of a waterborne and airborne freight and cargo system capable of meeting the needs of Hawaiʻi's agricultural community.			X
(6) Seek favorable freight rates for Hawaiʻi's agricultural products from inter-island and overseas transportation operators.			X
(7) Encourage the development and expansion of agricultural and aquaculture activities which offer long-term economic growth potential and employment opportunities.			X
(8) Continue the development of agricultural parks and other programs to assist small independent farmers in securing agricultural lands and loans.			X
(9) Require agricultural uses in agricultural subdivisions and closely monitor the uses in these subdivisions.			X
(10) Support the continuation of land currently in use for diversified agriculture.			X
(E) Priority guidelines for water use and development:			
(1) Maintain and improve water conservation programs to reduce the overall water consumption rate.	X		
(2) Encourage the improvement of irrigation technology and promote the use of non-potable water for agricultural and landscaping purposes.			X
(3) Increase the support for research and development of economically feasible alternative water sources.			X
(4) Explore alternative funding sources and approaches to support future water development programs and water system improvements.			X
(F) Priority guidelines for energy use and development:			
(1) Encourage the development, demonstration and commercialization of renewable energy sources.	X		
(2) Initiate, maintain and improve energy conservation programs aimed at reducing energy waste and increasing public awareness of the need to conserve energy.	X		
(3) Provide incentives to encourage the use of energy conserving technology in residential, industrial and other buildings.			X
(4) Encourage the development and use of energy conserving and cost-efficient transportation systems.			X
(G) Priority guidelines to promote the development of the information industry:			
(1) Establish an information network that will serve as the catalyst for establishing a viable information industry in Hawaiʻi.			X

HAWAIʻI STATE PLAN, HRS CHAPTER 226	S	N/S	N/A
S = Supportive, N/S = Not Supportive, N/A = Not Applicable			
(2) Encourage the development of services such as financial data processing, products and services exchange, foreign language translations, telemarketing, teleconferencing, a twenty-four-hour international stock exchange, international banking, and a Pacific Rim management center.			X
(3) Encourage the development of small businesses in the information field such as software development, the development of new information systems and peripherals, data conversion and data entry services, and home or cottage services such as computer programming, secretarial, and accounting services.			X
(4) Encourage the development or expansion of educational and training opportunities for residents in the information and telecommunications fields.			X
(5) Encourage research activities, including legal research in the information and telecommunications fields.			X
(6) Support promotional activities to market Hawaiʻi's information industry services.			X
Discussion: HoKua Place demonstrates a long-term commitment to housing opportunities on Kauaʻi. The project will meet the needs of projected growth in Kauaʻi. Development of the property will address a portion of the significant demand for affordable housing in the County of Kauaʻi, without significantly affecting reserve areas for foreseeable urban growth. Located in the middle of the island, the project is close to the centers of employment, beaches, shopping, recreation, etc. HoKua Place will respond to varying spectrums of demand for housing within Kauaʻi by providing a wide range of housing opportunities inclusive of affordable housing alternatives. HoKua Place will seek to create and sustain a mixed-income community allowing for unparalleled social diversity. Development of facilities would generate employment and have a direct beneficial impact on the local economy during construction through construction and construction-related employment. Additionally, HoKua Place proposes two areas for commercial uses that, ultimately, will serve to promote and provide a variety of job opportunities.			
226-104 Population Growth and Land Resources Priority Guidelines. (A) Priority guidelines to effect desired statewide growth and distribution:			
(1) Encourage planning and resource management to insure that population growth rates throughout the State are consistent with available and planned resource capacities and reflect the needs and desires of Hawaiʻi's people.	X		
(2) Manage a growth rate for Hawaiʻi's economy that will parallel future employment needs for Hawaiʻi's people.			X
(3) Ensure that adequate support services and facilities are provided to accommodate the desired distribution of future growth throughout the State.	X		
(4) Encourage major State and Federal investments and services to promote economic development and private investment to the neighbor islands, as appropriate.			X
(5) Explore the possibility of making available urban land, low-interest loans, and housing subsidies to encourage the provision of housing to support selective economic and population growth on the neighbor islands.			X
(6) Seek Federal funds and other funding sources outside the State for research, program development and training to provide future employment opportunities on the neighbor islands.			X
(7) Support the development of high technology parks on the neighbor islands.			X
(B) Priority guidelines for regional growth distribution and land resource utilization:			
(1) Encourage urban growth primarily to existing urban areas where adequate public facilities are already available or can be provided with reasonable public expenditures, and away from areas where other important benefits are present, such as protection of important agricultural land or preservation of lifestyles.	X		

HAWAIʻI STATE PLAN, HRS CHAPTER 226	S	N/S	N/A
S = Supportive, N/S = Not Supportive, N/A = Not Applicable			
(2) Make available marginal or nonessential agricultural lands for appropriate urban uses while maintaining agricultural lands of importance in the agricultural district.	X		
(3) Restrict development when drafting of water would result in exceeding the sustainable yield or in significantly diminishing the recharge capacity of any groundwater area.			X
(4) Encourage restriction of new urban development in areas where water is insufficient from any source for both agricultural and domestic use.			X
(5) In order to preserve green belts, give priority to state capital-improvement funds which encourage location of urban development within existing urban areas except where compelling public interest dictates development of a noncontiguous new urban core.			X
(6) Seek participation from the private sector for the cost of building infrastructure and utilities, and maintaining open spaces.			X
(7) Pursue rehabilitation of appropriate urban areas.			X
(8) Support the redevelopment of Kakaʻako into a viable residential, industrial and commercial community.			X
(9) Direct future urban development away from critical environmental areas or impose mitigating measures so that negative impacts on the environment would be minimized.	X		
(10) Identify critical environmental areas in Hawai'i to include but not be limited to the following: watershed and recharge areas; wildlife habitats (on land and in the ocean); areas with endangered species of plants and wildlife; natural streams and water bodies; scenic and recreational shoreline resources; open space and natural areas; historic and cultural sites; areas particularly sensitive to reduction in water and air quality; and scenic resources.			X
(11) Identify all areas where priority should be given to preserving rural character and lifestyle.			X
(12) Utilize Hawaiʻi's limited land resources wisely, providing adequate land to accommodate projected population and economic growth needs while ensuring the protection of the environment and the availability of the shoreline, conservation lands, and other limited resources for future generations.	X		
(13) Protect and enhance Hawaiʻi's shoreline, open spaces and scenic resources.	X		
Discussion: HoKua Place will support the anticipated growth and housing demand in the East Kauaʻi region. The project site is surrounded by urban uses and is designated "urban center" by various County plans. The project site also avoids critical habitat and important agricultural lands.			
226-105 Crime and Criminal Justice Priority Guidelines. (A) Priority Guidelines in the Area of Crime and Criminal Justice:			
(1) Support law enforcement activities and other criminal justice efforts that are directed to provide a safer environment.			X
(2) Target state and local resources on efforts to reduce the incidence of violent crime and on programs relating to the apprehension and prosecution of repeat offenders.			X
(3) Support community and neighborhood program initiatives that enable residents to assist law enforcement agencies in preventing criminal activities.			X
(4) Reduce overcrowding or substandard conditions in correctional facilities through a comprehensive approach among all criminal justice agencies which may include sentencing law revisions and use of alternative sanctions other than incarceration for persons who pose no danger to their community.			X
(5) Provide a range of appropriate sanctions for juvenile offenders, including community-based programs and other alternative sanctions.			X
(6) Increase public and private efforts to assist witnesses and victims of crimes and to minimize the costs of victimization.			X
Discussion: HoKua Place allocates a one acre parcel for the development of a police sub-station which will help increase police presence in the area.			

HAWAIʻI STATE PLAN, HRS CHAPTER 226	S	N/S	N/A
S = Supportive, N/S = Not Supportive, N/A = Not Applicable			
226-106 Affordable housing. Priority guidelines for the provision of affordable housing:			
(1) Seek to use marginal or nonessential agricultural land and public land to meet housing needs of low- and moderate-income and gap-group households.	X		
(2) Encourage the use of alternative construction and development methods as a means of reducing production costs.			X
(3) Improve information and analysis relative to land availability and suitability for housing.			X
(4) Create incentives for development which would increase home ownership and rental opportunities for Hawaiʻi's low- and moderate-income households, gap-group households and residents with special needs.	X		
(5) Encourage continued support for government or private housing programs that provide low interest mortgages to Hawaiʻi's people for the purchase of initial owner- occupied housing.			X
(6) Encourage public and private sector cooperation in the development of rental housing alternatives.			X
(7) Encourage improved coordination between various agencies and levels of government to deal with housing policies and regulations.			X
(8) Give higher priority to the provision of quality housing that is affordable for Hawaiʻi's residents and less priority to development of housing intended primarily for individuals outside of Hawaiʻi.	X		
Discussion: HoKua Place will have a positive impact on housing and population aspects of the East Kauaʻi Region. The Kauaʻi General Plan specifically points out the need for more housing in the area and specifically designates the subject property as Urban Center for that purpose. In a 2010 letter to the HoKua Place (formerly known as Kapaʻa Highlands II), the Planning Director wrote, "We are writing in general support of Three stooges LLC's petition to amend 97 acres in Kapaʻa to the Urban district. The proposed amendment is in conformance with the County of Kauaʻi's General Plan and will provide 231 units of affordable housing. Affordable housing remains an acute need on Kauaʻi, even with a falling real estate market and as such the County is generally supportive of any petition that proposes additional affordable housing, particularly when contiguous to developed urban areas, infrastructure and consistent with our General Plan." Therefore, development of the Property will address a portion of the significant demand for affordable housing in the County of Kauaʻi, without significantly affecting reserve areas for foreseeable urban growth. HoKua Place will respond to varying spectrums of demand for housing within Kauaʻi by providing a wide range of housing opportunities inclusive of affordable housing alternatives. HoKua Place will seek to create and sustain a mixed-income community allowing for unparalleled social diversity.			
226-107 Quality education. Priority guidelines to promote quality education:			
(1) Pursue effective programs which reflect the varied district, school, and student needs to strengthen basic skills achievement;			X
(2) Continue emphasis on general education "core" requirements to provide common background to students and essential support to other university programs;			X
(3) Initiate efforts to improve the quality of education by improving the capabilities of the education work force;			X
(4) Promote increased opportunities for greater autonomy and flexibility of educational institutions in their decision-making responsibilities;			X
(5) Increase and improve the use of information technology in education by the availability of telecommunications equipment for:			X
(A) The electronic exchange of information;			X

HAWAIʻI STATE PLAN, HRS CHAPTER 226	S	N/S	N/A
S = Supportive, N/S = Not Supportive, N/A = Not Applicable			
(B) Statewide electronic mail; and			X
(C) Access to the Internet.			X
Encourage programs that increase the public's awareness and understanding of the impact of information technologies on our lives;			X
(6) Pursue the establishment of Hawaiʻi's public and private universities and colleges as research and training centers of the Pacific;			X
(7) Develop resources and programs for early childhood education;			X
(8) Explore alternatives for funding and delivery of educational services to improve the overall quality of education; and			X
Discussion: HoKua Place will coordinate with the DOE to ensure that the DOE's facility assessment policy provisions are appropriately addressed.			
226-108 Sustainability. Priority guidelines and principles to promote sustainability shall include:			
(1) Encouraging balanced economic, social, community, and environmental priorities;	X		
(2) Encouraging planning that respects and promotes living within the natural resources and limits of the State;	X		
(3) Promoting a diversified and dynamic economy;	X		
(4) Encouraging respect for the host culture;	X		
(5) Promoting decisions based on meeting the needs of the present without compromising the needs of future generations;	X		
(6) Considering the principles of the ahupuaʻa system; and			X
(7) Emphasizing that everyone, including individuals, families, communities, businesses, and government, has the responsibility for achieving a sustainable Hawaiʻi.	X		
Discussion: As noted in the HoKua Place (formerly known as Kapaʻa Highlands II) Sustainability Plan, HoKua Place will be a sustainable community and will incorporate, to the extent feasible and practicable, measures to promote energy conservation, sustainable design, environmental stewardship and protection of the natural and cultural resources into the project. In developing this HoKua Place Sustainability Plan, a variety of recognized sustainability programs and plans were reviewed, summarized and incorporated into this plan. In part, the recommendations from these programs and plans serve as guides to the sustainability actions noted in the HoKua Place Sustainability Plan.			

5.2.2 State Land Use Law, HRS Chapter 205

Administered by the Land Use Commission, all lands in the State of Hawaiʻi are classified into one of four major land use districts: urban, rural, agricultural, and conservation. Each category has a range of allowable uses.

Chapter 205, HRS, relating to the Land Use Commission, establishes four major land use districts into which all lands of the State are placed. The districts are designated Urban, Rural, Agricultural and Conservation.

The subject property is in the Agriculture land use district. The Kauaʻi General Plan and the Kapaʻa Town Development Plan designate the property as Urban Center.

The Property is currently vacant and has not been used for agriculture for over fifteen years. The Property was previously used for sugar cane by Līhuʻe Plantation and fully cultivated for many years.

HoKua Place has submitted a petition to the Land Use Commission for a boundary amendment. The petition is to change the state land use designation from Agricultural Land Use District to Urban District Land Use District.

LUC Rules § 15-15-18 sets forth the standards used by the Commission for determining urban district boundaries. The proposed reclassification conforms to those standards as shown by the following analysis:

<u>1. Lands Characterized by "city-like" Concentrations of People, Structures, Streets, Urban Level of Services and Other Related Land Uses.</u>

The Property is located adjacent to and north of the town of Kapaʻa. The Kapaʻa By-Pass Road separates the town and the Property. The Property is on the northwest corner of the Kapaʻa By-Pass Road and Olohena Road. Olohena Road runs along and adjacent to the east and north boundaries of the Property.

The town of Kapaʻa consists of a variety of commercial, resort, recreational, and single and multi-family residential uses. The Kapaʻa Middle School is located adjacent and to the north of the Property. Olohena Road fronts Kapaʻa Middle School to the north. Across Olohena Road are single family residential neighborhoods.

The Kauaʻi General Plan (General Plan) is the primary policy directing long-range development, conservation, and the use and allocation of land and water resources in the County of Kauaʻi. The General Plan establishes, through maps and text, geographic areas of the County which are intended to be used for various general purposes such as agriculture, resorts, urban communities, and preservation of natural, cultural and scenic resources.

The General Plan states:

> "One of the key policies in the Framework for preserving Kauaʻi's rural character is to promote growth and development in compact urban areas. Urban lands comprise only four to five percent of Kauaʻi's land area, leaving 55 percent in conservation and 40 percent in agriculture."

The General Plan further states that land use policies for preserving Kauaʻi's rural character should:

> "Enhance Urban Centers and Towns and maintain their identity by defining the Town Center and the edges of each Town. Concentrate shopping and other commercial uses in Town Centers. Encourage residential development within Urban and Town Centers and in Residential Communities contiguous to them."

The General Plan also sets policy for urban land use designations. Policy 5.4.1.1 states:

(a) Lands included within the Urban Center designation shall be centers of government, commerce and transportation that serve the entire county or a large region. Uses may include shopping centers, government offices, churches and other institutions, office complexes, and industrial facilities. Residential or resort uses may also be located within the Urban Center designation, where compatible.

(b) Urban Center areas are typically served by wastewater collection and treatment facilities and major roads. Urban Center lands may be zoned for any type of use, including General Commercial, General Industrial, Resort and Residential.

The following are policies to provide for growth and development while preserving rural character, as described in the Kaua‘i General Plan:

(a) Allow incremental growth of Towns, contiguous to existing development. Concentrate primary shopping facilities within the Town Center. Support infill development.
(b) Provide for build-out of existing Residential Communities, to include areas zoned R-1 or higher. Allow small, neighborhood-oriented commercial sites in Residential Communities.
(e) Expansion contiguous to an existing town or residential community is preferred over a new residential community.
(f) Allow build-out of properties in existing low-density agricultural communities, including the homestead areas of Wailua, Kapa‘a, ‘Ōma‘o and Kalāheo and existing agricultural subdivisions in other parts of the island, while taking measures to assure the adequacy of County road, drainage and water supply systems.

The HoKua Place project conforms to and implements the policies of the Kaua‘i General Plan by developing within the designated Urban District, contiguous to Kapa‘a town and its neighboring residential community, thereby preserving the rural character of the area.

<u>2.A. Proximity to Centers of Trading and Employment Except Where the Development Would Generate New Centers Of Trading and Employment.</u>

Kapa‘a town is located adjacent to and south of the property. Kapa‘a is the eastside of Kaua‘i’s center of trade and employment, with numerous professional and business services.

Although Līhu‘e, approximately 8 miles south of the property, is the center of county, state, and federal government services, its population is slightly less the Kapa‘a’s which has the largest resident population on the island.

Thus, as described previously, the proposed development conforms to and implements the Kaua‘i General Plan’s vision of residential and commercial development occurring in proximity to urban and residential areas.

<u>2.B. Availability of Basic Services such as Schools, Parks, Wastewater Systems, Solid Waste Disposal, Drainage, Water, Transportation Systems, Public Utilities, and Police and Fire Protection.</u>

The Kapa‘a Middle School (Public School) is adjacent and to the north of the property. The Kapa‘a High and Elementary Schools are located within 2-miles of the Property.

There are several parks within Kapa‘a town, including a beach park. A County owned 1.9-acre park is located within walking distance from the Property, just south east of the corner of Olohena Road and the by-pass road round-about. The park consists of a baseball field, football field, basketball courts, restroom facilities, picnic tables and a barbecue area.

HoKua Place proposes a 3.1-acre park. Land for the proposed relocation of the Kapa‘a County swimming pool will be available within the 3.1-acre park.

The County sewer treatment plant is located in Kapaʻa. It has a capacity of 1.5 million gallons a day. It is currently operating at 500,000 gallons a day. HoKua Place will be contributing to the deferred maintenance and to the cost of repairs to the sewer treatment plant. An existing sewer transmission line has adequate capacity for HoKua Place's 300,000 gallons daily use and is gravity fed. A wastewater report has been completed and is attached as an Exhibit.

With respect to solid waste, the County of Kauaʻi currently provides single-family residences with solid waste disposal service on a once-per-week basis. Private solid waste disposal will be available for the multi-family projects.

A refuse transfer station is located in Kapaʻa town. The Central Kauaʻi Landfill is currently in the process of being expanded and has the necessary capacity to accommodate the proposed development.

A Drainage Report is attached as an Exhibit. A complete and final Drainage and an Erosion Mitigation Plan will be prepared and submitted to the County Engineer for approval during the design and development phase of the project.

HoKua Place will be providing drainage improvements in connection with development of the Property. Multiple detention ponds are proposed for the property. Additionally, a series of catch basins, drainage, pipes and culverts will be utilized to direct run off to major drainage areas on the property.

HoKua Place (formerly known as Kapaʻa Highlands II) has an agreement with the County Department of Water (DOW) for water service for the project. The agreement between the Petitioner and DOW requires the landowner may dedicate a proven well to feed the Department of Water's storage tanks.

The Property is encompassed by the Kapaʻa By-Pass Road to the south and Olohena Road to the east and the north side. The by-pass road is owned by HoKua Place which is working with the Department of Transportation (DOT) and has been allowing for the continuous public use of the road. The by-pass road will be dedicated to DOT upon final subdivision approval. The DOT has stated,

> "We have met with the petitioners, Three Stooge LLC, and we will work with them to ensure that any traffic impacts from the project are analyzed and effectively mitigated."

There is a round-about located at the south east corner of Olohena Road and the Kapaʻa By-Pass Road. Kūhiō Highway is accessible from the Property by driving south on Olohena and Kūkuī Street approximately 0.5 mile.

The project will have a main roadway from the Kapaʻa By-Pass Road running north through the Property to Olohena Road. The roadway will follow the county's resolution for complete roads and as such will be a multi-modal roadway.

Bus stops will be located along the roadway. A bike/walking path from the roundabout south east of the property will follow the bypass road, connect to the main road and continue to the Kapaʻa Middle School located on the North portion of the Property.

Electrical, cable and telephone services are available for HoKua Place. Additional service infrastructure to the property is anticipated.

Police protection for the Kapaʻa, area is provided by the Kauaʻi County Police Department, with its main headquarters located in Līhuʻe. A substation is located in Kapaʻa Town approximately 0.5 miles away from the Property.

Fire protection is currently available for the Kapaʻa area by a new county fire station located on the north end of Kapaʻa town, approximately 2.0-miles away on Kūhiō Highway. The project will have lands available for county police and fire substations on the Property.

2.C. Sufficient Reserve Areas for Foreseeable Urban Growth.

HoKua Place will utilize 97-acres of land for single-family and multi-family residential and commercial purposes. Development of the Property will address a portion of the significant demand for affordable housing in the County of Kauaʻi, without significantly affecting reserve areas for foreseeable urban growth.

As noted in the "Kawaihau Planning District Land Use Map" included in the Kauaʻi General Plan, the subject property has an "Urban Center" land use designation. The Kapaʻa Town Development Plan also designates the property as "Urban Center".

The lands surrounding the property to the north is designated as "Residential" and "Urban" by the County General Plan.

The Property is contiguous to existing urban lands to the south and across the bypass road. These existing urban lands are zoned urban by the County of Kauaʻi.

3. Lands with Satisfactory Topography, Drainage, and Reasonably Free From the Danger of any Flood, Tsunami, Unstable Soil Condition, and Other Adverse Environmental Effects.

The Property slopes gently down from north to south, with elevations ranging from 130 to 55 feet. As indicated by the Flood Insurance Rate Map for the County of Kauaʻi, the Property is located within Zone X, which is an area of minimal flooding according to the Federal Emergency Management Agency.

A Drainage Report has been completed. The Property is not subject to tsunami, unstable soil conditions or other adverse environmental effects that would render it unsuitable or inappropriate for the proposed development.

The Property rises in elevation to the northern border approximately 130 feet above msl or an average upslope of 5%. Less than 25 percent of the Property has slopes in the 20 percent range.

4. Lands Contiguous with Existing Urban Areas Shall be Given More Consideration than Non-Contiguous Land, and Particularly when Indicated for Future Urban Use on State or County General Plans.

As noted in the "Kawaihau Planning District Land Use Map" included in the Kauaʻi General Plan, the subject property has an "Urban Center" land use designation. The Kapaʻa Town Development Plan also designates the property as "Urban Center."

The lands surrounding the property to the north is designated as "Residential" and "Urban" by the County General Plan.

The Property is contiguous to existing urban lands to the south and across the bypass road. These existing urban lands are zoned urban by the County of Kaua'i.

5. Lands in Appropriate Locations for New Urban Concentration and Consideration to Areas of Urban Growth as Shown on State and County General Plans.

The Kaua'i General Plan and the Kapa'a Town Development Plan designates the Property as "Urban Center". Lands to the north and east of the Property are designated as "Residential" and "Urban" by the County General Plan.

The Kapa'a urban center is to the south of the Property. Therefore, the Property is an appropriate location for new urban concentration.

The Kaua'i General Plan is the primary policy directing long-range development, conservation, and the use and allocation of land and water resources in the County of Kaua'i.

The General Plan establishes through maps and text geographic areas of the County which are intended to be used for various general purposes such as agriculture, resorts, urban communities, and preservation of natural, cultural and scenic resources.

The Subject parcel has a County land use designation of Urban.

The General Plan states:

> "One of the key policies in the Framework for preserving Kaua'i's rural character is to promote growth and development in compact urban areas. Urban lands comprise only four to five percent of Kaua'i's land area, leaving 55 percent in conservation and 40 percent in agriculture."

The Kaua'i General Plan states that land use policies for preserving Kaua'i's rural character include,

> "Enhance Urban Centers and Towns and maintain their identity by defining the Town Center and the edges of each Town. Concentrate shopping and other commercial uses in Town Centers. Encourage residential development within Urban and Town Centers and in Residential Communities contiguous to them."

The Kaua'i General Plan sets policy for urban land use designations. Policy 5.4.1.1 states:

(a) Lands included within the Urban Center designation shall be centers of government, commerce and transportation that serve the entire county or a large region. Uses may include shopping centers, government offices, churches and other institutions, office complexes, and industrial facilities. Residential or resort uses may also be located within the Urban Center designation, where compatible.

(b) Urban Center areas are typically served by wastewater collection and treatment facilities and major roads. Urban Center lands may be zoned for any type of use, including General Commercial, General Industrial, Resort and Residential.

The following are policies to provide for growth and development while preserving rural character, as described in the Kaua'i General Plan:

(a) Allow incremental growth of Towns, contiguous to existing development. Concentrate primary shopping facilities within the Town Center. Support infill development.

(b) Provide for build-out of existing Residential Communities, to include areas zoned R-1 or higher. Allow small, neighborhood-oriented commercial sites in Residential Communities.
(e) Expansion contiguous to an existing town or residential community is preferred over a new residential community.
(f) Allow build-out of properties in existing low-density agricultural communities, including the homestead areas of Wailua, Kapaʻa, ʻŌmaʻo and Kalāheo and existing agricultural subdivisions in other parts of the island, while taking measures to assure the adequacy of County road, drainage and water supply systems.

In a 2010 letter to the HoKua Place (formerly known as Kapaʻa Highlands II), the Planning Director wrote:

> "We are writing in general support of Three Stooges LLC's petition to amend 97-acres in Kapaʻa to the Urban district. The proposed amendment is in conformance with the County of Kauaʻi's General Plan and will provide 231 units of affordable housing. Affordable housing remains an acute need on Kauaʻi, even with a falling real estate market and as such the County is generally supportive of any petition that proposes additional affordable housing, particularly when contiguous to developed urban areas, infrastructure and consistent with our General Plan."

<u>6. May Include Lands Which Do Not conform to the Standards in Paragraphs (1) to (5) of LUC Rules § 15-15-18: (A) When Surrounded by or Adjacent to Existing Urban Development; and (B) Only When Those Lands Represent a Minor Portion of this District.</u>

HoKua Place believes the Property conforms to the standards in paragraphs (1) to (5) of LUC Rules § 15-15-18, it should be noted that the Property is in a general area of existing and planned urban development. Furthermore, the Property (97 acres) represents a minor portion of the Agriculture District on the island of Kauaʻi.

<u>7. Shall Not Include Lands, the Urbanization of Which Will Contribute Toward Scattered Spot Urban Development, Necessitating Unreasonable Investment in Public Infrastructure or Support Services.</u>

Urbanization of the Property will not contribute to scattered spot urban development.

The Property is located adjacent to Kapaʻa town and in close proximity to the existing residential properties and urban uses.

The County sewer treatment plant is located in Kapaʻa. It has a capacity of 1.5 million gallons a day. It is currently operating at 500,000-gallons a day. HoKua Place will be contributing to the deferred maintenance and to the cost of repairs to the sewer treatment plant. An existing sewer transmission line has adequate capacity for HoKua Place, 300,000 gallons daily use and is gravity feed.

With respect to solid waste, the County of Kauaʻi currently provides single-family residences with solid waste disposal service on a once-per-week basis. Private solid waste disposal will be available for the multi-family projects. A refuse transfer station is located in Kapaʻa town. The Central Kauaʻi Landfill is currently in the process of being expanded and has the necessary capacity to accommodate the proposed development.

A Water Master Plan has been approved, in concept, by the County Department of Water (DOW). HoKua Place (formerly known as Kapaʻa Highlands II) has a proven well site that will be dedicated to the

DOW to feed the Department of Water's storage tanks. HoKua Place is committed to working with the DOW on pertinent water issues during the design and development phase.

The Property adjoins the Kapaʻa By-Pass Road to the south and Olohena Road to the east and the north side.

The by-pass road is owned by the HoKua Place which is working with the Department of Transportation (DOT) and has been allowing for the continuous public use of the road.

The by-pass road will be dedicated to DOT upon final subdivision approval. The DOT has stated,

> "We have met with the petitioners, Three Stooges LLC, and we will work with them to ensure that any traffic impacts from the project are analyzed and effectively mitigated."

There is a round-about located at the south east corner of Olohena Road and the Kapaʻa By-Pass Road. Kūhiō Highway is accessible from the Property by driving south on Olohena and Kūkuī Street approximately 0.5 mile. The project will have a complete multi-modal roadway from the Kapaʻa By-Pass Road running north through the Property to Olohena Road.

A couple of bus stops will be located along the roadway. A bike/walking path is proposed from the south of the property to the Kapaʻa Middle School located on the North portion of the Property.

Electrical, cable and telephone services are available for all of HoKua Place. Transmission lines to the property by the respective utility companies may be required.

Adjoining the subject property is the HoKua Farm Lots project (formerly known as Kapaʻa Highlands I). It has a 1.18 mega-watt solar facility which currently is the second largest solar facility serving Kauaʻi.

Police protection for the Kapaʻa area is provided by the Kauaʻi County Police Department, with its main headquarters located in Līhuʻe. A substation is located in Kapaʻa Town approximately 0.5-miles away from the Property.

Fire protection is currently available for the Kapaʻa area by a county fire station located in Kapaʻa town approximately 2.0-miles away on Kūhiō Highway. The project will also have lands available for county police and fire substations, if needed.

Thus, the proposed development will not necessitate unreasonable public investment in infrastructure facilities or public services.

<u>8. May Include Lands with General Slope of Twenty Percent or More if the Commission Finds that those Lands are Desirable and Suitable for Urban Purposes and that the Design and Construction Controls, as Adopted by any Federal, State or County Agency, are Adequate to Protect the Public Health, Welfare and Safety, and the Public's Interest in the Aesthetic Quality of the Landscape.</u>

The southern border of the Property, along the by-pass road, is elevated approximately 55 feet above msl. The Property rises in elevation to the northern border approximately 130 feet above msl or an average upslope of 5%. Less than 25 percent of the Property has slopes in the 20 percent range.

With creative designs, landscaping, and strict adherence to governing design and construction controls, the project will protect public health, welfare and safety, and the public's interest in the aesthetic quality of the landscape.

5.2.3 Environmental Review, HRS Chapter 343 and HAR Section 11-200

HRS Chapter 343, the State of Hawaiʻi Environmental Review Law, requires that any proposed use within a conservation district, use of State land or use of State funds be subject to review. The statute and rules establish a system of environmental review and provide that environmental concerns are considered for all proposed actions on State and county lands.

As part of this review, this EIS has been prepared to ensure that environmental concerns are given appropriate consideration in decision making, along with economic and technical considerations.

5.2.4 State Environmental Policy, HRS Chapter 344

The broad goals of this policy are to conserve natural resources and enhance the quality of life in the State. It encourages productive and enjoyable harmony between people and their environment to promote efforts which will prevent or eliminate damage to the environment and biosphere, stimulate the health and welfare of humanity, and enrich the understanding of the ecological systems and natural resources important to the people of Hawaiʻi.

HoKua Place will abide by the guidelines promulgated by HRS §344-4(1)–(10), including, but not limited to, encouraging management practices which conserve natural resources and encouraging the efficient use of energy resources.

5.3 Sustainability Principles

As noted in the HoKua Place (formerly known as Kapaʻa Highlands II) Sustainability Plan, HoKua Place will be a sustainable community and will incorporate the following:

Sustainability Programs and Plans:
In developing this HoKua Place Sustainability Plan, a variety of recognized sustainability programs and plans were reviewed, summarized and incorporated into this plan. In part, the recommendations from these programs and plans serve as guides to the sustainability actions noted in this Plan. These include:

- Smart Growth
- SmartCode
- Hawaiʻi 2050 Sustainability Plan (Hawaiʻi 2050)
- OEQC Sustainable Building Design Guidelines
- Hawaiʻi BuiltGreen Program
- US Green Building Council Leadership in Energy and Environmental Design (LEED)
- ENERGY STAR Program
- Whole Building Design Guide (WBDG,) of the National Institute of Building Sciences
- EPA Low Impact Development
- One Planet Living
- Complete Streets

There are several consistent principles and themes that run through the various programs and plans. While some are broad-based and include several of these, others are focused on single issues.

Following are some of the consistent messages found in these programs and plans:

- Soft touch on the land
- Respect and protection of natural and cultural resources
- Use of natural elements (shading, ventilation, lighting, etc)
- Diversity of land uses, housing types, prices
- Live, work, play, shop and learn
- Walking, bicycle and transit transportation focused
- Reuse and minimization of waste
- Renewable and efficient electric
- People and community focused

HoKua Place will implement, to the extent feasible and practicable, measures to promote energy conservation, sustainable design, environmental stewardship and protection of the natural and cultural resources into the project. These actions are in part, based on the recommendations noted in the following sustainability programs and plans.

Natural and Cultural Resources:
No archaeological or cultural historic sites are known to exist on the property.

Brief discussions separately with historians of the subject area, Randy Wichman and Walter Smith concluded that the subject property has been in sugar cultivation since the 1800s until the early 1990s. They concurred that the subject land was consistently cultivated for sugar for nearly a hundred years.

Albert Fukushima and Stanly Vasques who were employed by Līhuʻe Plantation and worked in the subject area, said that no evidence of artifacts, bones, or other indicators of previous historic on-site activity were uncovered during the cultivation of sugar.

Additionally, Willie Sanchez who started mowing the property in 1999 after Amfac Sugar sold the property, stated that he never saw any historical or cultural items on this property and that the agricultural water system was abandoned and the interior ditches were almost flat from non-use.

In 1995 SHPD stated for the "Site Selection EIS" for the adjacent Kapaʻa Middle School that the site may not be Archaeological or Historically rich because of the consistent cultivation of sugar for nearly a hundred years.

In the late 1999, the State Historic Preservation Division (SHPD) issued a letter of "no significance" to the potential developer at that time.

Should any archaeologically significant artifacts, bones, or other indicators of previous historic on-site activity be uncovered during construction, HoKua Place is committed to their treatment being conducted in strict compliance with the requirements of SHPD.

Land Use:
Two primary planning documents address land use development in Kapaʻa, the General Plan of the County of Kauaʻi and the Kapaʻa-Wailua Development Plan.

<u>The General Plan of the County of Kauaʻi (General Plan)</u>
The General Plan of the County of Kauaʻi ("General Plan") was adopted in 1971 and updated in November 2000. The General Plan is a statement of the County's vision for Kauaʻi and establishes strategies for achieving that vision.

The General Plan contains six major themes, each with various policies for implementation. The major themes are as follows:

a. Caring for Land, Water and Culture
b. Developing Jobs and Businesses
c. Preserving Kauaʻi's Rural Character
d. Enhancing Towns & Communities and Providing for Growth
e. Building Public Facilities and Services
f. Improving Housing, Parks and Schools

In particular, the proposed reclassification of the Property responds and conforms to Theme No. 6, Improving Housing, Parks and Schools. Market studies have shown that the population growth and correlating need and demand for housing is extremely high on Kauaʻi.

The proposed reclassification, which will allow residents to purchase an affordable house and lot as well as allow other residents to purchase a lot to design and build their own homes, will present an opportunity to address the critical community need for residential housing. It should also be noted that the proposed development will assist in maintaining a viable economy as construction-related employment opportunities for residents would be generated.

Kapaʻa-Wailua Development Plan

The Kapaʻa-Wailua Development Plan outlines the regional issues and opportunities that will be subjects for future community planning. It is currently being updated.

A "Build-Out Analysis" of the Kapaʻa-Wailua Basin was prepared in the General Plan Update. As of 1998, this area had an estimated 4,700 dwelling units, making it the largest residential community on Kauaʻi.

Based on the General Plan Land Use Map designations, the analysis found that an additional 4,000 units could be developed if the General Plan-designated lands were fully zoned, subdivided and built out.

About 2,400 more units could be built in Urban Residential areas, about 500 more in Rural Residential areas and approximately 1,100 more units in the Agricultural areas. This would increase the housing units and population of the area by 85%.

The "Build-Out Analysis" specifically included the subject property as an "expansion area". The new General Plan Land Use Map designates the subject property as Urban Center.

The HoKua Place project conforms to and implements the policies of the Kauaʻi General Plan by developing within the designated Urban District, contiguous to Kapaʻa town and its neighboring residential community.

Sustainable Design Features:

Several sustainability programs and plans identify and address a wide variety of design features that may be incorporated into a development project to enhance its sustainability. These items design features include:

- **Site Planning**
  - Respect for the Land – Work with topography
  - Siting - Proximity to mass transit, shopping, employment centers, recreation, schools
  - Interconnectivity – Connection with neighbors, Multi-modal transportation
  - Intensity of Layout – Village Center; Clustering into compact villages
  - Natural/Cultural Resources – Protection of natural and cultural resources

- **Improvements Planning**
  - Alternatives – Provide a range of housing options at various price levels
  - Orientation – Ventilation; Take advantage of natural air flow
  - Shading – Eve overhang; Vegetation
  - Landscaping – Native plants; Low irrigation
  - Energy Efficiency

The objectives of HoKua Place are to create an attractive master-planned residential community with a variety of housing opportunities and mixed uses, as well as recreational resources.

Transportation:

The Property adjoins the Kapaʻa By-Pass Road to the south and Olohena Road to the east and the north side.

The by-pass road is owned by the HoKua Place which is working with the Department of Transportation (DOT) and has been allowing for the continuous public use of the road. The by-pass road is in the process of being dedicated to DOT. The agreement of transfer will include that all mitigating measures will be the shared responsibility of DOT and HoKua Place.

There is a round-about located at the south east corner of Olohena Road and the Kapaʻa By-Pass Road. Kūhiō Highway is accessible from the Property by driving south on Olohena and Kūkuī Street approximately 0.5-mile.

The project will have a main roadway from the Kapaʻa By-Pass Road running north through the Property to Olohena Road. The roadway will follow the county's resolution for complete roads and as such will be a multi-modal roadway.

A couple of bus stops will be located along the roadway. A bike/walking path from the round-about south east of the property will follow the bypass road, connect to the main road and continue to the Kapaʻa Middle School located on the North portion of the Property.

HoKua Place is committed to Multi-modal, Interconnected and Concurrent Transportation for its residents and community.

HoKua Place will include bus stops, sidewalks and a bike and walking path connecting from Kapaʻa Middle School down through the development to the round-about, facilitating green travel to and from Kapaʻa's town core.

HoKua Place will incorporate a system of interconnected roads that will provide residents alternative transportation routes within the project. The internal circulation pattern will provide safe and convenient choices for drivers, bicyclists and pedestrians.

Additional sustainable connectivity concepts including bikeways and walkways to and from the planned County pool, neighborhood commercial areas, the middle school and Kapaʻa's town core.

Through recent legislation, the State of Hawaiʻi Department of Transportation (HDOT) and county transportation departments are required to ensure the accommodation of all users of the road, regardless of their age, ability, or preferred mode of transportation. In addition, the concept of "Complete Streets" is prioritized where:

> "(T)ransportation facilities ... are planned, designed, operated and maintained to provide safe access and mobility for all users, including bicyclists, pedestrians, transit riders, freight and motorists".

Economic Opportunities:
HoKua Place provides significant, on-going economic and fiscal benefits for residents of Kauaʻi, as well as for the County and State governments.

Development of facilities would generate employment and consequently income and taxes. In addition, by providing the opportunity for new residents to the Island of Kauaʻi and generating additional real estate sales activity, the Project is expected to support long-term impacts, including additional consumer expenditures, employment opportunities, personal income and government revenue enhancement.

On a short-term basis, the proposed development will have a direct beneficial impact on the local economy during construction through construction and construction-related employment. It should also be noted that the proposed development will assist in maintaining a viable economy as construction-related employment opportunities for residents would be generated.

Over the long term, the residential homeowners will require various services related to home maintenance and improvement that will further support the local economy.

On-Site Employment Generators

HoKua Place proposes two areas for commercial uses that, ultimately, will serve to promote and provide a variety of job opportunities. A 1.4-acre parcel is proposed for commercial uses such as a country store and small personal service type uses are anticipated. A 1-acre site on the Makai side of the Kapaʻa Bypass Road is also proposed for commercial development or for use as sub-stations for the police and/or fire department

Open Space and Parks:

HoKua Place holds respect for the environment by interlinking natural features and open space as core components of the community.

There are several parks within Kapaʻa town, including a beach park. A County owned 1.9-acre park is located within walking distance from the Property, just south east of the corner of Olohena Road and the by-pass road round-about. The park consists of a baseball field, football field, basketball courts, restroom facilities, picnic tables and a barbecue area.

Open space, parks and open greenway areas encompassing 14.3-acres will be developed within the HoKua Place project. A 3.1-acre park is proposed within the project for outdoor recreation.

Land for the proposed relocation of the Kapaʻa county swimming pool will be available within the 3.1-acre park. The provision of a 3.1-acre park with a county swimming pool within the proposed development will provide residents with an opportunity for leisurely recreational activities.

HoKua Place conforms with HRS § 205-a-2(B) (3) (A) which states that CZM's objective is to "protect, preserve and, where desirable, restore or improve the quality of coastal scenic and open space resources."

No scenic, historic, cultural spaces exist or will be created on the subject site and the site is well away from the shoreline. There are no natural wildlife, forest, marine, or unique ecological preserves on or near the subject site.

Thus, open space and recreation will not be adversely affected. Park and beaches of Kapaʻa are within walking distances from the project.

The proposed project will not adversely impact scenic or open space resources. The proposed project will not involve significant alteration of the existing topographic character of the site and will not affect public views to and along the shoreline.

Water Management:
As an overarching philosophy in all source alternatives, HoKua Place is committed to water conservation strategies to reduce consumption, conserve resources and minimize water use. The goal is to reduce the total water use through a combination of water saving equipment and strategies.

A number of measures may be implemented to facilitate user-end conservation, including water restrictions during drier periods, public education and more efficient landscaping practices. Consumption could be significantly reduced through end-user conservation.

Efficient fixtures and appliances will reduce indoor water use. The water distribution system will be maintained to prevent water loss and homeowners and businesses will be encouraged to maintain fixtures to prevent leaks.

Landscaping will emphasize climate-adapted native and other appropriate plants suitable for coastal locations. Best management practices will be designed and implemented to minimize infiltration and runoff from daily operations.

HoKua Place will incorporate the following water conservation strategies.

High efficiency toilets: (HETs) reduce flush volumes by no less than 20% compared to conventional ultra-low flow (ULFT) toilets. Dual-flush HETs allow users to choose one of two flushes: liquids or solids. In actual operation, dual-flush HETs average about 1.2 to 1.4 gpf. Pressure-assist HETs use a pressurized tank that creates for a more forceful flush with less water.

Faucets: Water flow is reduced by ***Flow limiters*** which are built into the faucet or are installed as after-market fittings. Aerators or laminar flow devices are types of flow limiters.

- Aeration injects air into the stream of water, displacing much of the water content.
- Laminar flow uses multiple small diameter parallel streams of water that are not aerated.

Flow control valves can limit water flow down to 1.5 to 0.5 gpm per side (hot and cold).

Showerheads: Federal law since 1994 mandates that all showerheads sold in the United States use 2.5 gpm or less. Despite this, some showerheads actually use much more than 2.5 gpm, and shower towers that include multiple showerheads or jets can total 12.5 gpm or more. A better option is a good quality low-flow showerhead designed to use 2.0 gpm or less while providing a satisfying shower.

Water conserving and Low impact landscaping: Landscaping shall be of native trees, shrubs and flowering plants as encouraged by the Kaua‘i Department of Water as part of their recommendations for water conservation. Selection and distribution of plants must be carefully planned when designing a functional landscape. Aesthetics are a primary concern, but it is also important to consider long-term maintenance goals to reduce inputs of labor, water and chemicals. Properly preparing soils and selecting species adapted to the microclimates of a site greatly increases the success of plant establishment and growth, thereby stabilizing soils and allowing for biological uptake of pollutants.

Energy Management:
Pursuant to Chapter 344 (State Environmental Policy) and Chapter 226 (Hawai‘i State Planning Act), HRS, all HoKua Place activities, buildings and grounds will be designed with emphasis on energy conservation and efficiency.

Efficient design practices and technologies will be the cornerstone of HoKua Place's design phase. Buildings within HoKua Place will further comply with the County of Kaua'i Energy Conservation Code (Kaua'i County Ordinance 890).

Furthermore, solar water heaters will be utilized, as made requisite under Section 196-6.5, HRS.

HoKua Place will confer with KIUC in regards to suggestions and proposals for customized demand-oriented management programs offering rebates for the installation of alternative energy efficient technologies and measures.

HoKua Place is committed to renewable energy and energy efficiently as ways to reduce environmental harm and self sufficiency. HoKua Place will continue to improve programs and create new programs as the development is initiated.

Residents of the State of Hawai'i pay the highest electricity rates in the US. The average American paid 10.5 cents/kWh in 2010. In the state of Hawai'i, O'ahu currently has the lowest residential electricity rates, while Lāna'i has the highest. Residential rates on Kaua'i average between 40-45 cents/kWh.

Hawai'i relies on imported oil for approximately 76% of its total electricity production. The price variation across the state is largely a result of difference in power plant efficiencies, power purchasing agreement and other infrastructure.

	Kaua'i	Oahu	State
Medium Income (2009)	$55,723	$67,019	$63,741
Electricity Price (May 2011)	44.27 cents/kWh	30.1 cents/kWh	-

The Kaua'i Island Utility Cooperative ("KIUC") is the sole electric utility on Kaua'i. KIUC began serving the people of Kaua'i on November 1, 2002, when it purchased Kaua'i Electric from Connecticut-based Citizens Communications. KIUC is America's newest electric cooperative, but it's by no means the only one. It is one of approximately 900 electric cooperatives serving electric consumers in 47 states.

Like all cooperatives, KIUC operates as a not-for-profit organization that is owned and controlled by the people it serves. KIUC serves over 23,300 customers with 92% of KIUC's electricity coming from the burning of imported fossil fuels.

In 2009, the State Legislature codified the need for energy efficiency by enacting the statewide energy efficiency portfolio standard with a target of reducing energy consumption by 30% of forecasted energy consumption by 2030 (4,300 GWh) and beginning the process for separating efficiency from the existing renewable portfolio standard.

To reduce net energy consumption and demand, HoKua Place will consider the implementation of elements of the United States Environmental Protection Agency (EPA) Energy Star Program; including efficient insulation, high performance windows, compact construction, efficient ventilation systems, and energy efficient lighting elements and appliances.

HoKua Place will furthermore seek to harness energy conservations and technologies to facilitate the possibility of net energy metering in building design to empower residents and tenants to reduce their electricity costs and provide energy back to the grid.

Energy conservation and efficiency measures will be implemented and emphasized where applicable in the design of HoKua Place. Energy-efficiency technologies to be considered where feasible include:

- Solar energy for water heating
- Photovoltaic systems, fuel cells, biofuels and other renewable energy sources
- Optimal utilization of daytime sunlight
- High efficiency light fixtures
- Roof and wall insulation, radiant barriers and energy efficient windows
- Optimized air-flow
- Installation of heat resistant roofing
- Intelligent Landscaping to provide for shading, dust control, and heat-mitigation
- Portable solar lighting (i.e. parking lots)

Health:
Through the layout and design of HoKua Place, there is an overall opportunity for a positive effect on the health of its residents. Communities that make it easy and safe to walk and ride bikes are opening the door to a wide range of health benefits for their residents by reducing barriers to being physically active and helping individuals integrate physical activity into their daily lives.
Active living is a way of life that integrates physical activity into daily routines. For individuals, the goal is to get a total of at least 30-minutes of activity each day by, for example, walking, bicycling, playing in the park, working in the yard, taking the stairs or using recreation facilities.

For communities, the goal is to provide opportunities for people of all ages and abilities to engage in routine physical activity and to create places and policies that encourage better physical health. Such places within HoKua Place include, open space, parks and open greenway areas encompassing 14.3-acres, a 3.1-acre park for outdoor recreation and land for the proposed relocation of the Kapaʻa county swimming pool which will provide residents with an opportunity for leisurely recreational and physical fitness activities.

Education:
Schools servicing the project include Kapaʻa Elementary, Kapaʻa Middle School and Kapaʻa High School.

Kapaʻa Middle School is adjacent and to the north of the property. Kapaʻa High School and Elementary School, which share a campus, are located within 2-miles of the Property.

Kapaʻa Elementary School serves grads K-5 and is one of the largest elementary schools in the state. It shares a campus with Kapaʻa High School.

The DOE reports that Kapaʻa Elementary School's capacity is 1,373 students, and the 2009/2010 school year enrollment was 827 students.

Kapaʻa Middle School, with facilities for 1,059 students, was opened in 1997 and has an enrollment of 652 students.

Kapaʻa High School currently has a student body numbering 1,033 with a capacity of 1,445.

HoKua Place will generate increased demand on student enrollment within the region. HoKua Place will coordinate with the DOE to ensure that the DOE's facility assessment policy provisions are appropriately addressed.

Additionally, a 3.1-acre park is proposed adjacent to the existing Kapaʻa Middle School. The park will have an area for the county's proposed relocation of the Kapaʻa county swimming pool. HoKua Place also plans to develop a bike/walking path from the south of the property to the Kapaʻa Middle School to facilitate biking and walking around the development.

Housing:
HoKua Place is a well-located master planned project on the Island of Kauaʻi targeting primary housing demand from local and in-migrant families, as well as offshore second home demand for view estate ownership.

Located in the eastern urban core of the island, the project is close to the centers of employment and resort activity, plus the airport, beaches, shopping, recreation, etc. It sits above the historic town of Kapaʻa and below the foothills of the mountain chain that forms the island.

The proposed development, HoKua Place, will utilize 97-acres of land for single-family and multi-family residential and commercial purposes. Development of the Property will address a portion of the significant demand for affordable housing in the County of Kauaʻi, without significantly affecting reserve areas for foreseeable urban growth.

HoKua Place will respond to varying spectrums of demand for housing within Kauaʻi by providing a wide range of housing opportunities inclusive of affordable housing alternatives. HoKua Place will seek to create and sustain a mixed-income community allowing for unparalleled social diversity.

Affordable housing demands exhibited a significant upward trend over the last several years. Recent market studies have indicated a current shortage of single-family housing in the East Kauaʻi area.

The forecast is that demand for housing will continue to increase, especially in the area of affordable housing.

The proposed development will assist in alleviating some of the current supply-and-demand pressures on Kauaʻi's current housing market by providing a variety of additional housing products and opportunities for long-term local residents.

The Kawaihau Planning District has substantial capacity for additional residential development, as described in Section 6.2.3.1 (Build-Out Analysis) of the Kauaʻi General Plan.

> "Lands previously designated for urban use but as yet mostly undeveloped include an area located near Kapaʻa, south of Olohena Road. This area was previously designated for Urban Mixed Use and is shown as Urban Center on the new GP Land Use Map. Owned partly by the State and partly by Amfac/JMB (or its successor), this "expansion area" for Kapaʻa has already accommodated the Kapaʻa Middle School."

In a 2010 letter to the applicant, the Planning Director wrote

> "We are writing in general support of Three Stooges LLC's petition to amend 97-acres in Kapaʻa to the Urban district. The proposed amendment is in conformance with the County of Kauaʻi's

General Plan and will provide 231 units of affordable housing. Affordable housing remains an acute need on Kaua'i, even with a falling real estate market and as such the County is generally supportive of any petition that proposes additional affordable housing, particularly when contiguous to developed urban areas, infrastructure and consistent with our General Plan."

Social:

A community is composed of people, as well as places where they live; it is as much a social environment as a physical development. Thus, communities must not only be environmentally sustainable, they must also be socially sustainable.

A socially sustainable development supports more equitable distribution of resources, supports diversity within the community, meets the basic needs of residents and invests in social and human capital, thereby sustaining the quality of life and community livability for all residents into the future.

We saved the concept of Social Sustainability for the end of the analysis, to serve as a summary of the many socially-focused actions suggested about the project within the Sustainability Plan. Following are just a few of the issues previously mentioned that address and support the resource, the people and the community:

- Affordable housing will be incorporated within the development, allowing for a diversity and mix of housing types and options
- Complete streets with walkways and bile lanes, allowing for slow movement through the neighborhoods for easy social interaction
- Space for the relocated County swimming pool
- Allocation for commercial spaces, affording project residents the opportunity to work near where they live
- Proximity to the Middle School affords multi-generation al interaction and learning
- Cooperation with the State by making land available for the Kapa'a Bypass Road, helping regional residents
- Project layout and design will create an opportunity for both residents and the community to have a positive effect on their health through walkable and bikable transportation options.
- Consistency with long range planning documents, implementing the community's vision for the future

5.4 Agricultural Uses

Section 205-4.5 uses the Land Study Bureau's (LSB) soil classification productivity rating system to determine which lands are to be governed by the Chapter. The LSB ratings for HoKua Place are B, C, D and E. Land classification ratings A and B are restricted to the permitted uses as outlined in the section. The cultivation of crops and the raising of livestock are permitted uses. Uses on C, D and E lands also include crop cultivation and the raising of livestock.

While the property previously was cultivated in sugar, the climate and soils at HoKua Place are not ideal for the growing of most commercially viable crops due to the poor soil, strong trade winds and the salt spray from the ocean. Thus, a goat livestock operation provides an economically alternative agricultural use for the property.

Either the Association operation of a livestock project, or a contractual relationship between the Association and a livestock Contractor, would allow the agricultural component of the property to be managed as one unit. Individual lot owners would also have the option of compliance with alternate methods of livestock grazing or with the cultivation of agricultural crops, provided they obtained the approval of the Planning Commission of the County of Kaua‘i, Subdivision Committee, for an amendment to this Agricultural Master Plan for such alternative agricultural activities.

Livestock grazing is a permissible use within the agricultural districts as outlined under HRS Chapter 205. Section 205-4.5.

Livestock (goats) can be raised successfully at HoKua Place. Climate conditions will allow for normal pasture rotation the year around. The ratio of livestock to fenced pasture should be 3-animal units (AU) to 1-acre or better.

5.5 Federal "Cross-Cutting" Authorities

The State of Hawaiʻi Drinking Water State Revolving Fund program was established by the 1997 State Legislature as the result of the 1996 Federal amendments to the Safe Drinking Water Act. This program provides low interest loans for the construction of drinking water infrastructure projects. These projects help achieve or maintain compliance with drinking water standards, protect public health and the environment.

Since various water-related actions are proposed, this additional review and analysis is included. The following sub-sections address the proposed project's relationship to other "cross-cutting" environmental, economic, social and miscellaneous federal authorities as required by the State of Hawaiʻi's Drinking Water State Revolving Fund (DWSRF) program.

5.5.1 Environmental Authorities

Archaeological and Historic Preservation Act (16 U.S.C. § 469a-1)
This Act became law on June 27, 1960 (Public Law 86-523, 16 U.S.C. 469-469c-2). It is the purpose of this Act [16 U.S.C. 469-469c-1] to further the policy set forth in the Act entitled, "An Act to provide for the preservation of historic American sites, buildings, objects, and antiquities of national significance, and for other purposes," approved August 21, 1935 [Historic Sites Act, as amended, 16 U.S.C. 461-467] by specifically providing for the preservation of historical and Archaeological data (including relics and specimens) which might otherwise be irreparably lost or destroyed as the result of (1) flooding, the building of access roads, the erection of workmen's communities, the relocation of railroads and highways, and other alterations of the terrain caused by the construction of a dam by any agency of the United States, or by any private person or corporation holding a license issued by any such agency or (2) any alteration of the terrain caused as a result of any Federal construction project or federally licensed activity or program.

Should historic remains be encountered during construction activities, work will cease in the immediate vicinity of the site and the State Historic Preservation Division will be contacted for appropriate mitigation, if necessary. Consequently, the proposed actions are in compliance with the Act.

Clean Air Act (42 USC 7401)
The Clean Air Act (CAA) is the comprehensive federal law that regulates air emissions from stationary and mobile sources. Among other things, this law authorizes EPA to establish National Ambient Air Quality Standards (NAAQS) to protect public health and public welfare and to regulate emissions of hazardous air pollutants. One of the goals of the Act was to set and achieve NAAQS in every state by 1975 in order to address the public health and welfare risks posed by certain widespread air pollutants. The setting of these pollutant standards was coupled with directing the states to develop state implementation plans (SIPs), applicable to appropriate industrial sources in the state, in order to achieve these standards.

All applicable emission and ambient air quality standards will be met. Construction and normal operation of the proposed development will not produce on-site air emissions, will not alter air flow in the vicinity and will have no other measurable effect on the area's micro-climate. Consequently, the proposed project complies with the provision of the Clean Air Act.

Coastal Zone Management Act, 16 U.S.C. 1456 (c) 2

The Federal CZM Program was created through passage of the CZM Act of 1972. In that act, the Congress stated that it is the national policy to preserve, protect, develop, and where possible, to restore or enhance, the resources of the Nation's coastal zone for this and succeeding generations; and to encourage and assist the states to exercise effectively their responsibilities in the coastal zone through the development and implementation of management programs to achieve wise use of the land and water resources of the coastal zone, giving full consideration to ecological, cultural, historic, and esthetic values, as well as the needs for compatible economic development.

The Hawaiʻi CZM program was established in 1977 (through Chapter 205A, Hawaiʻi Revised Statutes). §205A-2 Coastal zone management program objectives include:

(1) Recreational resources; Provide coastal recreational opportunities accessible to the public.
(2) Historic resources; Protect, preserve, and, where desirable, restore those natural and manmade historic and prehistoric resources in the coastal zone management area that are significant in Hawaiian and American history and culture.
(3) Scenic and open space resources; Protect, preserve, and, where desirable, restore or improve the quality of coastal scenic and open space resources.
(4) Coastal ecosystems; Protect valuable coastal ecosystems, including reefs, from disruption and minimize adverse impacts on all coastal ecosystems.
(5) Economic uses; Provide public or private facilities and improvements important to the State's economy in suitable locations.
(6) Coastal hazards; Reduce hazard to life and property from tsunami, storm waves, stream flooding, erosion, subsidence and pollution.
(7) Managing development; Improve the development review process, communication and public participation in the management of coastal resources and hazards.
(8) Public participation; Stimulate public awareness, education, and participation in coastal management.
(9) Beach protection; Protect beaches for public use and recreation.
(10) Marine resources; Promote the protection, use, and development of marine and coastal resources to assure their sustainability.

The proposed project is not located on the coastline. None of the proposed actions involve the placement, erection or removal of materials near the coastline. The type and scale of the activities that it involves typically do not have the potential to affect coastal resources. Finally, it is consistent with the CZM objectives that are relevant to a project of this sort.

Coastal Barrier Improvement Act (Coastal Barrier Resources Act), 16 U.S.C. 3501

The Coastal Barrier Resources Act designated various undeveloped coastal barrier islands, depicted by specific maps, for inclusion in the Coastal Barrier Resources System. No coastal barriers are present in the State of Hawaiʻi.

This Act does not apply to the State of Hawaiʻi at this time; therefore the proposed project will not affect any areas protected by this Act.

Endangered Species Act, 16 U.S.C. 1536 (a) (2) and (4)

Each Federal agency shall, insure that any action authorized, funded, or carried out by such agency is not likely to jeopardize the continued existence of any endangered species or threatened species or result in the destruction or adverse modification of habitat of such species which is determined by the Secretary

(after consultation as appropriate with affected States) to be critical, unless such agency has been granted an exemption for such action. In fulfilling the requirements of this paragraph each agency shall use the best scientific and commercial data available. Each Federal agency shall confer with the Secretary on any agency action which is likely to jeopardize the continued existence of any species proposed to be listed under section 1533 of this title or result in the destruction or adverse modification of critical habitat proposed to be designated for such species.

The area is not known to have rare and/or threatened flora and fauna. The project will abide by the guidelines promulgated by HRS §344-4(1)–(10) and other laws and regulations, including, but not limited to, encouraging management practices which conserve natural resources and encouraging the efficient use of energy resources; it is therefore in compliance with the Endangered Species Act.

Environmental Justice, Executive Order 12898

The Environmental Justice Executive Order was issued in 1994. To the greatest extent practicable and permitted by law, and consistent with the principles set forth In the report on the National Performance Review, each Federal agency shall make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations in the United States and its territories and possessions, the District of Columbia, the Commonwealth of Puerto Rico, and the Commonwealth of the Marian islands.

The proposed project is located within the community of Kapaʻa. The project proposes to develop housing for area residents. The project will have a positive effect by creating employment and housing opportunities for the community and State.

Farmland Protection Policy Act, 7 U.S.C. 4202(8)

On January 1, 1987, and at the beginning of each subsequent year, the Secretary of Agriculture shall report to the Committee on Agriculture, Nutrition and Forestry of the Senate and the Committee on Agriculture of the House of Representatives on the progress made in implementing the provisions of this subtitle. Such report shall include information on (1) the effects, if any, of Federal programs, authorities and administrative activities with respect to the protection of United States farmland; and (2) the results of the reviews of existing policies and procedures required under Section 4(a) of this subtitle.

Federal agencies identify and assess any adverse effects of their programs on the preservation of farmland. The assessment is done to evaluate project's relative impact on farmland in a region, county and state. It takes into account the acreage of farmland directly converted, the potential to indirectly convert agricultural land to non-agricultural uses, impacts to individual farms, and the relative size and importance of the farms affected.

The evaluation process derives an impact rating that varies from 0 to 260 points. If an alternative receives a total score equal to or greater than 160 points, alternatives that avoid farmland must be considered.

“Farmland,” as used in the FPPA, includes prime farmland, unique farmland and land of statewide or local importance. “Farmland” subject to FPPA requirements does not have to be currently used for cropland. It can be forestland, pastureland, cropland or other land, but not water or urban built-up land.

While the property previously was cultivated in sugar, the climate and soils at HoKua Place are not ideal for the growing of most commercially viable crops due to the poor soil, strong trade winds and the salt spray from the ocean. Thus, a goat livestock operation provides an economically alternative agricultural use for the property.

As such, the project is in compliance with FPPA.

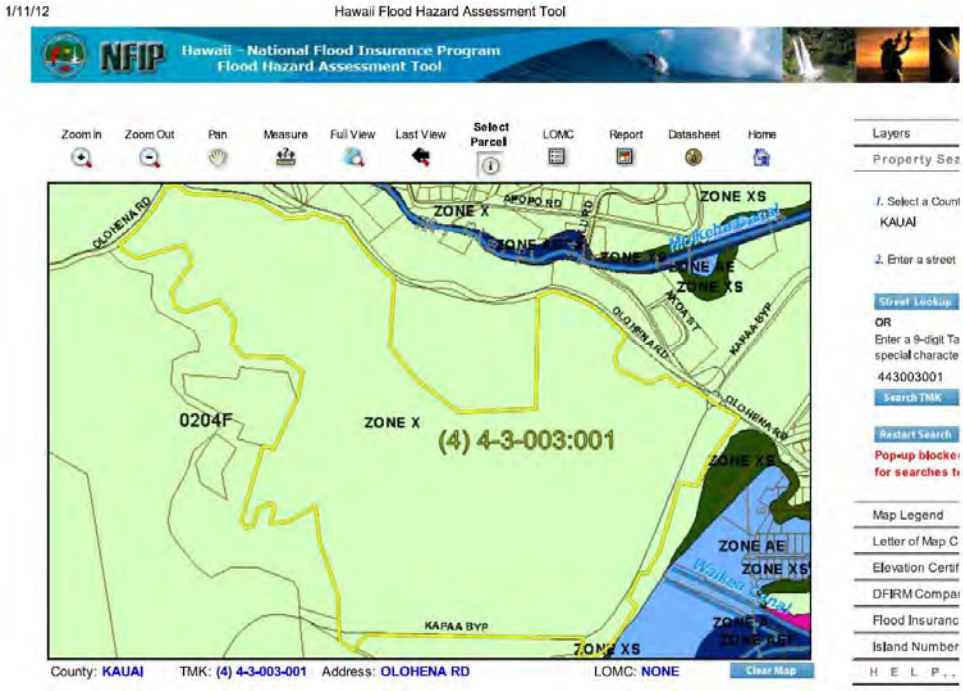
Fish and Wildlife Coordination Act (16 U.S.C. § 661)

The Fish and Wildlife Coordination Act was enacted for the purpose of recognizing the vital contribution of our wildlife resources to the Nation and to provide that wildlife conservation shall receive equal consideration and be coordinated with other features of water-resource development programs. The Fish and Wildlife Coordination Act, as amended, authorizes the Secretaries of Agriculture and Commerce to require consultation with the Fish & Wildlife Service and the fish and wildlife agencies of States where the "waters of any stream or other body of water are proposed or authorized, permitted or licensed to be impounded, diverted ... or otherwise controlled or modified" by any agency under a Federal permit or license. Consultation is to be undertaken for the purpose of "preventing loss of and damage to wildlife resources."

The proposed project will not result in the diversion of any water body and is in compliance with the Act.

Floodplain Management (Executive Order 11988, as amended by Executive Order 12148)

Signed in 1977, Executive Order 11988 requires federal agencies to avoid to the extent possible the long and short-term adverse impacts associated with the occupancy and modification of flood plains and to avoid direct and indirect support of floodplain development wherever there is a practicable alternative. In accomplishing this objective, "each agency shall provide leadership and shall take action to reduce the risk of flood loss, to minimize the impact of floods on human safety, health and welfare, and to restore and preserve the natural and beneficial values served by flood plains in carrying out its responsibilities." The amendment (EO 12148 transferred responsibilities to the Federal Emergency Management Agency (FEMA).



Based on the latest available (DLNR's on-line Flood Hazard Assessment Tool, accessed on January 11, 2012) Flood Insurance Rate Map for the area (Map 204F), shown above, the project site lies within Zone X. Zone X is described as areas outside of the 100- and 500-year floodplains with minimal flooding.

The project does not involve property acquisition, management, or construction within a 100-year flood plain (Zones A or V), and it does not involve a "critical action" within a 500-year flood plain. Consequently, it is consistent with applicable regulations and guidance relating to floodplain management.

National Historic Preservation Act (16 U.S.C. § 470)

This Act became law on October 15, 1966 (Public Law 89-665; 16 U.S.C. 470 et seq.). It shall be the policy of the Federal Government, in cooperation with other nations and in partnership with the States, local governments, Indian tribes, and private organizations and individuals to:

(1) use measures, including financial and technical assistance, to foster conditions under which our modern society and our prehistoric and historic resources can exist in productive harmony and fulfill the social, economic, and other requirements of present and future generations;
(2) provide leadership in the preservation of the prehistoric and historic resources of the United States and of the international community of nations and in the administration of the national preservation program in partnership with States, Indian tribes, Native Hawaiians, and local governments;
(3) administer federally owned, administered, or controlled prehistoric and historic resources in a spirit of stewardship for the inspiration and benefit of present and future generations;
(4) contribute to the preservation of non-federally owned prehistoric and historic resources and give maximum encouragement to organizations and individuals undertaking preservation by private means;
(5) encourage the public and private preservation and utilization of all usable elements of the Nation's historic built environment; and
(6) assist State and local governments, Indian tribes and Native Hawaiian organizations and the National Trust for Historic Preservation in the United States to expand and accelerate their historic preservation programs and activities.

Although the major burdens of historic preservation have been borne and major efforts initiated by private agencies and individuals, and both should continue to play a vital role, it is nevertheless necessary and appropriate for the Federal Government to accelerate its historic preservation programs and activities, to give maximum encouragement to agencies and individuals undertaking preservation by private means, and to assist State and local governments and the National Trust for Historic Preservation in the United States to expand and accelerate their historic preservation programs and activities.

Should historic remains be encountered during construction activities, work will cease in the immediate vicinity of the site and the State Historic Preservation Division will be contacted for appropriate mitigation, if necessary. Consequently, the proposed actions are in compliance with the Act.

Protection of Wetlands, Executive Order No. 11990 & Executive Order No. 12608

Under this Executive Order (signed in 1977,) each Federal agency must provide leadership and take action to minimize the destruction, loss or degradation of wetlands, and to preserve and enhance the natural and beneficial values of wetlands.

Each agency must avoid undertaking or providing assistance for new construction located in wetlands unless the head of the agency finds: there is no practical alternative to such construction; the proposed action includes all practical measures to minimize harm to wetlands that may result from such use. In making this finding the head of the agency may take into account economic, environmental and other pertinent factors (Section 2(a)). Each agency must also provide opportunity for early public review of any plans or proposals for new construction in wetlands.

Approximately 0.30-acres of the property (representing a statistically insignificant portion of the overall property) are identified as having "Marsh" soils classification. Characteristics of this soil type include "wet, periodically flooded areas" and "water stands on the surface." However, upon inspection of the site, there are no wet areas or any standing water.

The area identified with this soil type is situated entirely within the HoKua Farm Lots (formerly known as Kapaʻa Highlands I) and is in the "Open Space" of the HoKua Farm Lots project. No construction is proposed in the project "Open Space."

Since no construction will occur in this area, there will be no harm, changes or loss of this area.

Safe Drinking Water Act, 42 U.S.C. 300f)

The Safe Drinking Water Act (SDWA) was established to protect the quality of drinking water in the U.S. This law focuses on all waters actually or potentially designed for drinking use, whether from above ground or underground sources. The Act authorizes EPA to establish minimum standards to protect tap water and requires all owners or operators of public water systems to comply with these primary (health-related) standards. The 1996 amendments to SDWA require that EPA consider a detailed risk and cost assessment, and best available peer-reviewed science, when developing these standards. State governments, which can be approved to implement these rules for EPA, also encourage attainment of secondary standards (nuisance-related). Under the Act, EPA also establishes minimum standards for state programs to protect underground sources of drinking water from endangerment by underground injection of fluids.

All appropriate laws and regulations will be followed in the development and operation of the water system.

As identified by the U.S. Environmental Protection Agency, Region IX groundwater Office (http://www.epa.gov/safewater/sourcewater/pubs/qrg_ssamap_reg9.pdf, Accessed February 2011,) there are only two Sole Source Aquifers in Hawaiʻi. They are the Southern Oʻahu Basal Aquifer on the Island of Oʻahu and the Molokaʻi Aquifer on the island of Molokaʻi. There are no sole source aquifers on the Island of Kauaʻi where the proposed project is located. The Project will not, therefore, affect sole source aquifers and is consistent with the Act.

Wild and Scenic Rivers Act, 15 U.S.C. 1271-1287

The National Wild and Scenic Rivers System was created by Congress in 1968 to preserve certain rivers with outstanding natural, cultural and recreational values in a free-flowing condition for the enjoyment of present and future generations. The Act is notable for safeguarding the special character of these rivers, while also recognizing the potential for their appropriate use and development. It encourages river management that crosses political boundaries and promotes public participation in developing goals for river protection. Rivers may be designated by Congress or, if certain requirements are met, the Secretary of the Interior. Rivers are classified as wild, scenic or recreational.

There are no designated Wild and Scenic Rivers in the State of Hawai‘i at this time; consequently, the project is consistent with the provisions of the Wild and Scenic Rivers Act. (http://www.rivers.gov/wildriverslist.html, Accessed February 2011.)

Essential Fish Habitat Consultation Process Under The Magnuson-Stevens Fishery Conservation and Management Act (16 U.S.C. 1801)

The fish off the coasts of the United States, the highly migratory species of the high seas, the species which dwell on or in the Continental Shelf appertaining to the United States and the anadromous species which spawn in United States rivers or estuaries, constitute valuable and renewable natural resources. These fishery resources contribute to the food supply, economy and health of the Nation and provide recreational opportunities. A national program for the conservation and management of the fishery resources of the United States is necessary to prevent overfishing, to rebuild overfished stocks, to insure conservation, to facilitate long-term protection of essential fish habitats, and to realize the full potential of the Nation's fishery resources.

According to the Western Pacific Regional Fishery Management Council (WESPAC) in its *Fishery Ecosystem Plan for the Hawai‘i Archipelago (2009),* several areas of Essential Fish Habitat (EFH) and Habitat Areas of Particular Concern (HAPCs) in the Hawaiian Archipelago have been designated and approved by the Secretary of Commerce.

EFH and HAPC designations for Bottomfish and Seamount Groundfish, Crustaceans, Precious Corals, Coral Reef Ecosystems and Pelagic Management Unit Species (MUS) were approved by the Secretary on February 3, 1999 (64 FR 19068). EFH designations for Coral Reef Ecosystem MUS were approved by the Secretary on June 14, 2002 (69 FR 8336). Maps available at the National Marine Fisheries Service’s Essential Fish Habitat Mapper website do not indicate any areas of EFH near the project area. (http://sharpfin.nmfs.noaa.gov/website/EFH_Mapper/map.aspx, Accessed February 2011.)

No aspect of the project will affect Essential Fish Habitat, as it does not affect or occur near the sea.

The following is a summary table noting the Environmental Federal Cross Cutting Authorities:

Table 5.5.1.1 – Environmental Federal Cross Cutting Authorities

Environmental Authorities	Procedure	Responsible Agency
Archaeological and Historical Preservation Act	Obtain review for all projects	State Historic Preservation Office
Clean Air Act	Coordinate to assure project conforms with state implementation plan	State Department of Health, Clean Air Branch
Coastal Barrier Resources Act	Obtain review if project is located on a coastal barrier island	State Coastal Zone Management Agency
Coastal Zone Management Act	Obtain review if project is located in coastal zone	State Coastal Zone Management Agency
Endangered Species Act	Obtain review by U.S. Fish & Wildlife Service for all projects	U.S. Fish & Wildlife Service
Environmental Justice	Are low income and minority groups affected?	U.S. Environmental Protection Agency

Environmental Authorities	Procedure	Responsible Agency
Floodplain Management	Obtain review if project is located in or affects 100-year flood plain	Federal Emergency Management Agency
Protection of Wetlands	Obtain review if project area contains wetlands	U.S. Army Corps of Engineers
Farmland Protection Policy Act	Obtain review if project area contains prime farmland	Natural Resources Conservation Service-State Conservationist
Fish and Wildlife Coordination Act	Obtain review for all projects	U.S. Fish & Wildlife Service
National Historic Preservation Act	Obtain review for all projects	State Historic Preservation Office
Safe Drinking Water Act	Obtain review if project could affect sole source aquifer	State Department of Health, Safe Drinking Water Branch
Wild and Scenic Rivers Act	Obtain review if project is in area with Wild and Scenic Rivers	National Park Service
Essential Fish Habitat consultation under Magnuson-Stevens Fishery Conservation and Mgmt Act	Obtain review if it will affect essential fish habitat	National Marine Fisheries Service (NMFS)

5.5.2 Economic Authorities

Administration of the Clean Air Act and the Water Pollution Control Act with respect to Federal Contracts or Loans (Executive Order 11738)
This Executive Order prohibits the provision of Federal assistance to facilities that are not in compliance with either the Clean Water Act or the Clean Air Act unless the purpose of the assistance is to remedy the cause of the violation.

HoKua Place will comply with the requirements of the Clean Water Act and the Clean Air Act.

Demonstration Cities and Metropolitan Development Act of 1966, Pub.L. 89-754, as Amended (42 USC § 3331)
To demonstrate compliance with this Act, the Hawai‘i State Department of Health requires DWSRF assistance recipients to describe the proposed project’s effect on local development plans.

HoKua Place will comply with all requirements.

Procurement Prohibitions (Executive Order 11738, Section 306 of the Clean Air Act)
This Executive Order requires recipients of Federal assistance to certify that they will not procure goods, services or materials from suppliers who are on the EPA’s list of Clean Air Act violators.

HoKua Place will comply with all requirements.

Procurement Prohibitions (Section 508 of the Clean Water Act)
This Executive Order requires recipients of Federal assistance to certify that they will not procure goods, services or materials from suppliers who are on the EPA's list of Clean Water Act violators.

HoKua Place will comply with all requirements.

Chapter 6 - Agency & Public Participation

The scoping process for the HoKua Place involved a variety of means for input and comments.

6.1 Comment Letter, Scoping Letters & Letters of Support

Comment letters, scoping letters and letters of support for HoKua Place (formerly known as Kapaʻa Highlands II) were received from a variety of governmental agencies, businesses and individuals. The following is a list of letters received by HoKua Place related to the project. (All letters are attached as Appendix N).

- Larry Dill P.E. - County Engineer, Kauaʻi County - Department of Public Works (1/4/12)
- Stanly Vasques (1/4/12)
- Willie Sanchez (12/30/11)
- William N. Arakaki - Kauaʻi Complex Area Superintendent, State of Hawaiʻi - Department of Education (10/28/11)
- Sally Jo Manea - President of Board of Directors, Kauaʻi Path Inc. & Tommy A. Noyes, Member of the Board of Directors, Kauaʻi Path Inc. (10/17/11)
- David Vickers - Island Truss (10/14/11)
- Neil J. Clendeninn, MD, PhD, MS-arch (10/14/11)
- Kurt R. Bosshard - President, Kapaʻa Solar LLC & Trustee, Kurt Bosshard Trust (10/6/11)
- Tim Bynum - Councilmember, Kauaʻi County Council (10/5/11)
- Gary Hooser - Director, State of Hawaiʻi - Office of Environmental Quality Control (10/3/11)
- Michael A. Dahilig - Planning Director, Kauaʻi County - Department of Planning (8/31/11)
- David R. Craddick, P.E. - Manager and Chief Engineer, Kauaʻi County - Department of Water (8/22/11)
- Michael A. Dahilig - Planning Director, Kauaʻi County - Department of Planning (4/4/11)
- Bernard P. Carvalho, Jr. - Mayor, Kauaʻi County (3/1/11)
- Bernard P. Carvalho, Jr. - Mayor, Kauaʻi County (12/9/10)
- Raymond J. McCormick, P.E. - District Engineer, State of Hawaiʻi - Department of Transportation-Highways Division (11/3/10)
- Nancy McMahon - Deputy SHPO/State Archeologist and Historic Preservation Manager, State of Hawaiʻi - Department of Land and Natural Resources-Historic Preservation Division (6/28/10)
- Eugene K. Jimenez - Housing Director, Kauaʻi County - Housing Agency (3/2/10)
- Ian K. Costa - Planning Director, Kauaʻi County - Department of Planning (1/5/10)
- Edward Tschupp - Chief, Kauaʻi County - Department of Public Works-Wastewater Division & Donald M. Fujimoto - Engineer, Kauaʻi County - Department of Public Works-Wastewater Division (12/22/09)
- Chris Tadani - Eastside Distribution Planner, KIUC (9/6/07)
- Ian K. Costa - Planning Director, Kauaʻi County - Department of Planning (5/29/07)
- Don Hibbard - Administrator, State of Hawaiʻi - Department of Land and Natural Resources-Historic Preservation Division (12/14/99)
- Heidi Meeker - Planning Section, State of Hawaiʻi Department of Education - Facilities Development Branch (4/25/12)

6.2 Meetings with Governmental Agencies & Other Entities

Since 2004, HoKua Place has been meeting with various governmental agencies and other entities in the design and development of the HoKua Place project.

On October 22, 2011, Greg Allen on behalf of HoKua Place (formerly known as Kapaʻa Highlands II), gave a presentation to the Wailua-Kapaʻa Neighborhood Association.

Additionally, the following is a list of people and entities representatives of HoKua Place (formerly known as Kapaʻa Highlands II) has met with over the past 9 years.

- State of Hawaiʻi, Office of Environmental Quality Control Staff- notifying them of intent to submit Draft EA and anticipated FONSI (1/24/12)
- Bernard Carvalho - Mayor, Kauaʻi County (6+ times between 2010-2012 – last meeting 1/19/12)
- Department of Planning, County of Kauaʻi, Staff (15+ times between 2004-2012)
- Department of Housing, County of Kauaʻi, Staff (14+ times between 2004-2012)
- David R. Craddick, P.E. Manager and Chief Engineer, Bill Eddy & Staff - Department of Water, Kauaʻi County (4+ times between 2010-2012)
- Dan Davidson, Director & Staff - State of Hawaiʻi, Land Use Commission (2010 & 12/28/11)
- William N. Arakaki - Kauaʻi Complex Area Superintendent, State of Hawaiʻi - Department of Education & Bernard Carvalho - Mayor, Kauaʻi County (10/17/11)
- Kauaʻi Path Inc. (10/13/11)
- Kauaʻi County Council Members Jay Fufaro & Tim Bynum (10/3/11)
- Jessie Souki, Director - State of Hawaiʻi, Office of Planning (9/22/11)
- Andrea Suzuki – Attorney, County of Kauaʻi- Department of Water (September 2011)
- County of Kauaʻi Water Board (7/28/11)
- Larry Dill - Engineering Director, County of Kauaʻi - Department of Public Works (2+ in 2011)
- Mike Dahilig - Planning Director, County of Kauaʻi (2+ times between 2010-2011)
- Eugene Jiminez - Housing Director, County of Kauaʻi (2+ times between 2010-2011)
- Edward Tschupp - Chief, Kauaʻi County - Department of Public Works-Wastewater Division (4+ times in 2011)
- Wally Kudo & Staff Engineers - Department of Public Works, Kauaʻi County (6+ times between 2010-2011)
- County of Kauaʻi Planning Commission (8+ times between 2004-2011)
- Raymond J. McCormick, P.E. - District Engineer, State of Hawaiʻi - Department of Transportation-Highways Division (3+ times between 2010-2011)
- Tommy Contrades, Commissioner - State of Hawaiʻi, Land Use Commission (September 2011)
- Nancy McMahon - Deputy SHPO/State Archeologist and Historic Preservation Manager, State of Hawaiʻi - Department of Land and Natural Resources-Historic Preservation Division (May 2010)
- Ed Tschupp, Wynne Ushigome, Gregg Fujikawa, Ed Doi & Staff - Department of Water, County of Kauaʻi (10+ times between 2004-2010)
- Alfred Castillo, Jr. - County Attorney, County of Kauaʻi (2010)
- Ian Costa - Planning Director, County of Kauaʻi (15+ times between 2004-2009)
- Ken Rainforth - Housing Director, County of Kauaʻi (10+ times between 2004-2009)
- Matthew Pyun – County Attorney, County of Kauaʻi (2007)
- Bryan Baptist - Mayor, Kauaʻi County (6+ times between 2004-2007)

6.3 Section 343-5e HRS Preparation Notice EIS Recipients

Copies of the Section 343-5e HRS Preparation Notice Environmental Impact Statement were sent to the following entities:

Federal
U.S. Department of the Interior, Fish & Wildlife Service

State of Hawaiʻi
Department of Agriculture
Department of Business, Economic Development & Tourism - Office of Planning
Department of Education
Department of Education - Hawaiʻi State Library, Kapaʻa Branch
Department of Health
Department of Health - OEQC
Department of Land & Natural Resources
Department of Transportation
Office of Hawaiian Affairs

County of Kauaʻi
Office of the Mayor
Department of Parks & Recreation
Department of Planning
Department of Public Works
Department of Transportation
Department of Water
Fire Department
Police Department

Chapter 7 - List of Preparers

Hoʻokuleana LLC
1539 Kanapuʻu Drive
Kailua, Hawaiʻi 96734
(808) 226-3567
Info@Hookuleana.com
www.Hookuleana.com

Name	Role	Degree/School	Years Experience
Peter T. Young	Project Manager	BBA, University of Hawaiʻi, Mānoa	41
Jennifer Barra	Deputy Project Manager	MURP, University of Hawaiʻi, Mānoa BS, Natural Resources Recreation & Tourism, Colorado State University	13

Chapter 8 – References

Agor Architecture, LLC. 2011. An Evaluation of the Environmental for Kapaʻa Highlands, Phase II. Honolulu, HI.

Agricon Hawaiʻi LLC. 2007. Kapaʻa Highlands Agricultural Master Plan, Kamuela, HI.

Cassiday, Ricky. 2014. Kapaʻa Housing Market Study. Data@Work, Honolulu, HI.

Conde, Jesse C. and Gerald M. Best. 1973. Sugar Trains, Narrow Gauge Rails of Hawaiʻi. Glenwood Publishers, Felton, CA.

County of Kauaʻi. 2010. New Landfill Site http://www.kauai.gov/Government/Departments/PublicWorks/SolidWaste/NewLandfillSite/tabid/71/Default.aspx. Accessed January 2012.

County of Kauaʻi. 2007. Bill No. 2020, Draft 2, Ordinance No. 860 – A Bill for an Ordinance to Establish a New Chapter, Kauaʻi County Code 1987, as Amended, Relating to the Housing Policy for the County of Kauaʻi.

County of Kauaʻi Office of Economic Development, Kauaʻi Economic Development Board. 2004. Kauaʻi Economic Development Plan. Līhuʻe, HI.

Dole, Charles S. 1916. "The Hui Kawaihau" pp. 8-15. A Paper read at the November meeting of the Kauaʻi Historical Society on November 16, 1916. In Līhuʻe, Kauaʻi.

Exploration Associates LTD. "An Archeological Assessment for the Proposed Kapaʻa Highlands Phase II Project, Kapaʻa Ahupuaʻa, Kawaihau, Kauaʻi TMK (4) 4-3-3: 1. May 2012.

Exploration Associates LTD. "A Cultural Impact Assessment for the Proposed Kapaʻa Highlands Phase II, Kapaʻa Ahupuaʻa, Kawaihau, Kauaʻi TMK (4) 4-3-3: 1. May 2012.

Fornander, Abraham. 1916-19. Fornander Collection of Hawaiian Antiquities and Folk-Lore, with translations edited and illustrated with notes by Thomas G. Thrum, Volume 4, First series, 1916 - 1917 notes by Thomas G. Thrum, Memoirs of the Bernice P. Bishop Museum, Vols. 4, 5, 6, Honolulu, HI.

Fukunaga & Associates, Inc. 2008. Final Environmental Assessment Wailua Facility Plan. Honolulu, HI.

Handy, E.S. Craighill and Elizabeth G. Handy. 1972. Native Planters in Old Hawaiʻi: Their Life, Lore, and Environment. B.P. Bishop Museum Bulletin 233, B.P. Bishop Museum, Honolulu, HI.

Honua Engineering, Inc. 2012. Traffic Considerations, Kapaʻa Highlands Project. Hanalei, HI.

Honua Engineering, Inc. 2011. Preliminary Engineering Report Drainage Improvements, Kapaʻa Highlands – Phase II. Hanalei, HI.

Honua Engineering, Inc. 2011. Preliminary Engineering Report Wastewater Improvements, Kapaʻa Highlands – Phase II. Hanalei, HI.

Hoʻokuleana LLC. 2011. Kapaʻa Highlands II Sustainability Plan. Kailua, HI.

Joesting, Edward. 1984. Kaua V, The Separate Kingdom. University of Hawaiʻi Press and Kauaʻi Museum Association, Ltd., Honolulu.

Kapaʻa 160 LLC, Allen Family LLC, Moloaʻa Bay Ventures LLC and Department of Transportation State of Hawaiʻi. 2002. Memorandum Of Understanding – Temporary Kapaʻa by-Pass Road.

King, Robert D. 1935. "Districts in the Hawaiian Islands" In Coulter, John Wesley (compiler) A Gazetteer of the Territory of Hawaiʻi. University of Hawaiʻi Research Publications, No. 11, University of Hawaiʻi, Honolulu, HI.

Kalākaua, David. 1888. The Legends and Myths of Hawaiʻi. Edited by R.M. Dagget, Charles L. Webster and Co., New York.

Kamakau, Samuel Manaiakalani. 1976. The Works of the People of Old, Na Hana a ka Poʻe Kahiko. Bishop Museum Special Publication, No. 61, Honolulu, HI.

Lai, Violet L. assisted by Kum Pui Lai. 1985. He Was a Ram, Wong Aloiau of Hawaiʻi. Published for the Hawaiʻi Chinese History Center and the Wong Aloiau Association by University Press of Hawaiʻi, Honolulu, HI.

Nance, Tom. 2006. Irrigation Supply for the Kapaʻa Highlands Agricultural Subdivision. Tom Nance Water Resource Engineering, Honolulu, HI.

National Archives. n.d. Executive Order 11625--Prescribing additional arrangements for developing and coordinating a national program for minority business enterprise. http://www.archives.gov/federal-register/codification/executive-order/11625.html. Accessed February 2011.

National Archives. n.d. Executive Order 11738--Providing for administration of the Clean Air Act and the Federal Water Pollution Control Act with respect to Federal contracts, grants, or loans. http://www.archives.gov/federal-register/codification/executive-order/11738.html. Accessed February 2011.

National Archives. n.d. Executive Order 11990 Protection of wetlands. http://www.archives.gov/federal-register/codification/executive-order/11990.html. Accessed February 2011.

National Archives. n.d. Executive Order 12138--Creating a National Women's Business Enterprise Policy and prescribing arrangements for developing, coordinating and implementing a national program for women's business enterprise. http://www.archives.gov/federal-register/codification/executive-order/12138.html. Accessed February 2011.

National Archives. n.d. Executive Order 12432--Minority business enterprise development. http://www.archives.gov/federal-register/codification/executive-order/12432.html. Accessed February 2011.

National Archives. n.d. Executive Order 12549 Debarment and suspension. http://www.archives.gov/federal-register/codification/executive-order/12549.html. Accessed February 2011.

National Park Service. 2011. Archaeological and Historic Preservation Act. http://www.cr.nps.gov/local-law/FHPL_ArchHistPres.pdf. Accessed February 2011.

National Weather Service. 2010. Hurricanes: Unleashing Nature's Fury, A Preparedness Guide.

National Wild & Scenic Rivers. 2010. Designated Wild & Scenic Rivers. http://www.rivers.gov/wildriverslist.html. Accessed February 2011.

National Wild & Scenic Rivers. 2010. National Wild & Scenic Rivers. http://www.rivers.gov/. Accessed February 2011.

NOAA Fisheries. 2011. Essential Fish Habitat Mapper. http://sharpfin.nmfs.noaa.gov/website/EFH_Mapper/map.aspx, Accessed February 2011.

NOAA Fisheries. 1996. Magnuson-Stevens Fishery Conservation and Management Act. http://www.nmfs.noaa.gov/sfa/magact/mag1.html. Accessed February 2011.

NOAA Ocean and Coastal Resource Management. 2007. Coastal Zone Management Act. http://coastalmanagement.noaa.gov/about/czma.html#section302. Accessed February 2011.

Office of Law Revision Council. 2010. 29 USC Chapter 16 - Vocational Rehabilitation and Other Rehabilitation Services. http://uscode.house.gov/download/pls/29C16.txt. Accessed February 2011

Office of the Commissioner of Public Lands. 1929. Indices of Awards, Made by the Board of Commissioners to Quiet Land Title in the Hawaiian Islands.

PB Americas. 2009. Draft Environmental Impact Statement for the Proposed TMT Observatory.

PBR. 2005. Final Environmental Assessment Kapaʻa Homesteads Well No. 3. Kapaʻa, HI.

PlanPacific. 2000. Kauaʻi General Plan. Honolulu, HI.

State of Hawaiʻi, Department of Business, Economic Development and Tourism. 2010. State of Hawaiʻi Data Book.

State of Hawaiʻi Department of Education. 2011. Kapaʻa Elementary School, School Status and Improvement Report, School Year 2010-2011.

State of Hawaiʻi, Department of Education. 2011. Kapaʻa High School - School Status and Improvement Report, School Year 2010-2011.

State of Hawaiʻi, Department of Education. 2011. Kapaʻa Middle School - School Status and Improvement Report, School Year 2010-2011.

State of Hawaiʻi, Department of Education. 2007-2008. Schools Classroom Capacity.

State of Hawaiʻi, Department of Land and Natural Resources. DLNR's on-line Flood Hazard Assessment Tool (FHAT). 2010. http://www.arcgis.com/home/item.html?id=f243760aa84c4d26a2a5eb33c604fc5d. Accessed January 2012.

State of Hawaiʻi Department of Transportation. 2004. Final Environmental Assessment Kūhiō Highway Improvements Extension of Temporary Kapaʻa Bypass Road Kūhiō Highway to Olohena Road. Lihue, HI.

The Keith Companies. 1994. Final Environmental Impact Statement and Site Selection Study for the New Kapaʻa Intermediate School. Kapaʻa, HI.

U.S. Bureau of Reclamation. 2011. Fish And Wildlife Coordination Act (16 Usc 661-666c). http://www.usbr.gov/power/legislation/fwca.pdf. Accessed February 2011.

U.S. Department of Agriculture. 2001. USDA, Rural Development Environmental Compliance Library Coastal Barrier Resources Act. http://www.usda.gov/rus/water/ees/pdf/cbra.pdf. Accessed February 2011.

U.S. Department of Agriculture, Natural Resource Conservation Service. n.d. Farmland Conversion Impact Rating (Form AD-1006). http://www.nrcs.usda.gov/programs/fppa/AD1006.PDF. Accessed February 2011.

U.S. Department of Agriculture, Natural Resource Conservation Service. n.d. Farmland Protection Policy Act, Public Law 97-98, 7 U.S.C. 4201. http://www.nrcs.usda.gov/programs/fppa/pdf_files/FPPA_Law.pdf. Accessed February 2011.

U.S. Department of Labor. n.d. Age Discrimination Act of 1975. http://www.dol.gov/oasam/regs/statutes/age_act.htm. Accessed February 2011.

U.S. Department of Labor. n.d. Executive Order 11246. http://www.dol.gov/compliance/laws/comp-eeo.htm. Accessed February 2011.

U.S. Department of Transportation, Federal Highways Administration. n.d. Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 as amended. http://www.fhwa.dot.gov/realestate/act.htm. Accessed February 2011.

U.S. Environmental Protection Agency. 2011. Summary of the Clean Air Act. http://www.epa.gov/lawsregs/laws/caa.html. Accessed February 2011.

U.S. Environmental Protection Agency. 2011. Summary of the Safe Drinking Water Act. http://www.epa.gov/lawsregs/laws/sdwa.html. Accessed February 2011.

U.S. Environmental Protection Agency. 1997. 42. USC Sec. 2000d Title 42 – The Public Health and Welfare Chapter 21 – Civil Rights. http://www.epa.gov/civilrights/docs/42usc2000d.pdf. Accessed February 2011.

U.S. Environmental Protection Agency. n.d. Designated Sole Source Aquifers in EPA Region IX. http://www.epa.gov/safewater/sourcewater/pubs/qrg_ssamap_reg9.pdf. Accessed February 2011.

U.S. Environmental Protection Agency. n.d. Drinking Water State Revolving Fund Program Guidelines: Part VII. http://www.epa.gov/ogwdw/dwsrf/docs/guide7.html. Accessed February 2011.

U.S. Environmental Protection Agency. n.d. Executive Order Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations. http://www.epa.gov/compliance/ej/resources/policy/exec_order_12898.pdf. Accessed February 2011.

U.S. General Services Administration. 2010. Executive Order 11738. http://www.gsa.gov/portal/content/101588. Accessed February 2011.

U.S. Small Business Administration. n.d. Public Law 105-135-Dec. 2, 1997. http://www.sba.gov/sites/default/files/files/small_business.pdf. Accessed February 2011.

Vlex. 2011. 40 USC 3306 – Sec. 3306. Accommodating federal agencies. http://vlex.com/vid/sec-accommodating-federal-agencies-19241299. Accessed February 2011.

Wilson Okamoto Associates. 2007. East Kaua‘i Development Plan 2030, Commercial Focus Group Meeting Summary (Presented to CAC on January 30, 2007).

Exhibit A

Kapa‘a Housing Market Study

I. INTRODUCTION

The Data@Work is a market research firm that specializes in analyzing residential real estate markets for developers and lenders. We have been retained to perform a study analyzing the market for proposed master planned community on the island of Kauai, called Kapaa Highlands.

This study focuses on the historical and projected market conditions and trends in accessing the ability of the project to be successful in selling its residential properties at a price and at a velocity. The study entailed collecting, comparing and analyzing information that has a bearing on the numerous aspects of market demand for the proposed project, including but not limited to publicly available real property, economic and commercial data.

The author makes every effort to verify that all of the information in study and in particular the market description and analysis is accurate, but is aware that 100% accuracy is unlikely. Finally, the analysis and statements herein are based on independent research by the author.

II. PROJECT DESCRIPTION & STUDY OUTLINE

Project

Kapaa Highlands is a master planned project on the Island of Kauai targeting primary housing demand from local and in-migrant families, as well as offshore second home demand for view estate ownership. It sits above the historic town of Kapaa and below the foothills of the mountain chain that forms the island. It is equidistant from the two major resorts on the island (and at the center of the third, the Coconut Coast). Thus, it is at or close to the centers of employment and commercial activity.

As Kapaa is arguably at the center of the island, the target market for this development will be spread across a wide range of households, but mainly appealing to local families looking for reasonably priced housing that is well-located with regard to the centers of employment in the county, as well as to a good range of shopping, recreational and social facilities.

The development contains a portion of the Kapaa bypass road, a major arterial road adjacent to the property. As such, the property is accessible from three sides and is adjacent to already improved county roads. Furthermore, the property has no significant restraints relative to adequate water availability and wastewater. Finally, the Kapaa Middle School is located adjacent to the property and adds to the attractiveness of the site to the local population.

KAPAA HIGHLANDS PRODUCT MIX AND SALES PROJECTION

Product	Units
House Lot Packages, On Large Lots (10,000 sf)	36
House Lot Packages, On Medium Lots (7,500 sf)	50
Multi-Family Dwelling Units (4 Plex, 8 DU/Ac)	500
Affordable Housing Dwelling Units (12 DU/Ac)	183

The units described above include condominiums (Multi-Family pads and Affordable Housing) and single-family homes (House Lot package).

[Note that some of the House/Lot package units may be sold as home sites, depending on future demand and market conditions].

The condominium units will be designed in a range of bedroom configurations that will best meet the demand for housing by providing designs that apply to different family types, including starter families, empty nesters, families with children, and households that qualify for affordably priced housing.

The design of the single family units will appeal to some of those in the aforementioned condominium demographic groupings, but will go further by addressing the needs of large families, families wanting to be close to the Middle School, trans-generational families needing adequate (read larger and more defined) living space, and professional families or those with multiple wage-earners.

The design of the condominiums could include stacked flats and townhomes, both of which have cost and livability advantages. They will located in multi-unit buildings (four and six-plex, etc.) and laid out in a way that will be taking advantage of the site's benefits: including those of the ocean views, the cooling winds, the warming sunlight, etc. Their density would range from 8 to 12 units per acre.

The single-family units will be designed to take advantage of the area topography, as well as wind and sun direction and views. By having two different lot sizes allows for the land plan to address two demographics: the smaller lot size units would be most appropriate to starter families, and larger lot size units would be appropriate for larger families and multigenerational households.

It is worth being mindful that, generally speaking, the high cost of housing production in Hawaii, and Kauai in particular, often pushes housing prices beyond what local families, particularly workforce families, can afford. To counter that, often Kauai home purchasers include a number of income earners into the purchase, both family members and non-family members. It is this market demand segment that the larger lot size and house size units will address.

In keeping with the county's affordable housing requirement, the requisite number of units will be produced and priced according to the existing income guidelines when marketed. The current affordable requirement is 30%, and the fulfillment of that will be a benefit to the local families seeking better housing or a more convenient location.

Additionally, while the market homes will be priced to the market, and done so at the time of the start of construction, they will also be more affordably priced, relative to much of the new construction on the island. This is because the large size of the overall development (750+ units) is conducive to achieving construction economies of scale, both for infrastructure and vertical construction - which can be passed on to the consumer.

Further, these homes and condos will also be designed with the needs of local families in mind, as opposed to the offshore buyer market. This will thus 'lessen' the overall demand for them, resulting in a more moderate price point. This stands in contrast to many other new home construction projects and developments on the island and in the state, which seek to address the needs of the offshore buyer (and are priced accordingly higher).

Finally, it is important to note that this development will benefit those in the community who will not be purchasing here, but who nonetheless are in the market for affordable housing. This is because this, or any, provision of new housing acts to soften the pressures that push housing prices higher – national and local studies and data has shown that the supply of new housing into an existing market place results in a moderating trend in prices.

Study Outline

In an effort to evaluate the proposed project, the study will begin by describing the area, the housing stock and the economy. It will take account of the economic factors and trends that affect housing relative to the county and to the proposed project. Thereafter, it will describe the housing market in general, and in particular to this project. In doing so, it will describe and analyze the factors and trends behind the general and specific supply and demand for housing. And it will summarize the findings and finish with some concluding remarks and expectations.

III. OVERVIEW of COUNTY and MARKET

Subject Property's Community

Kauai County is the fourth largest county in the state, as ranked by population and economic activity, behind the City & County of Honolulu (Oahu), Maui County and the Big Island of Hawaii.

The majority of the island's roughly 52,000 residents lives and works in the coastal areas leaving the interior of Kauai natural and pristine. Kauai's weather is near perfect year round with daytime temperatures ranging from the mid 70's to the mid 80's, slightly warmer in the summer. The northeast trade winds average about 15 mph for most of the year, and provide refreshing breezes. Rain showers usually fall in the evening and early morning hours, predominantly over the mountain ranges. The temperature of the ocean ranges from 68 to 80 degrees Fahrenheit.

It has one of the strongest brands in the global visitor industry, as well as arguably the most diversified visitor industry of any of the islands, combining large resort master planned communities, cruise ship visitations, time share developments and small-scale bed and breakfasts.

The breadth and depth of this economic base, like the rest of the state, rests on the county's economy's unique comparative advantage relative to the other visitor destinations world-wide: it has a very high quality of life, a function of a naturally beautiful setting, with a benign environment and near perfect climate. Indeed, the proof of its attractiveness can be found in the quality of the number of 'rich and famous' who have bought in Hawaii, starting with Lawrence Rockefeller in 1960 (followed by John Wayne, George Harrison, Peter Gruber, Charles Schwab, Michael Dell, Ben Stiller, Oprah Winfrey, Akio Morita, Michael Creighton, etc.)

Kauai has three major resort destinations:

- **Princeville**, a 45-minute drive from the Airport, is a resort that runs across a large plateau overlooking one of the largest deep-water bays in Hawaii. The view of the sunset, looking west, is extraordinarily beautiful.

- **Poipu**, also a 45-minute drive from the airport, sits above the south shore, with numerous bays and beaches safe for swimming. It has the largest concentration of hotels and golf courses on the island. .

- **Coconut Coast**, a 20 minute drive from the airport, this area was the favored area of Hawaiian royalty and the original site of resort development on the island and, save for Waikiki, the state. It today hosts one of the largest percentage of accommodations, shops, recreation, restaurants and historical sites on the island.

The majority of the primary housing development is located within the Kapaa and Lihue urban zones, with secondary sources located areas in and around Poipu, Kilauea/Hanalei, and Hanapepe and Waimea. Second home development is located within and around the three major

resort communities, as well as in locations that are close to the coastline and/or in westward facing locales).

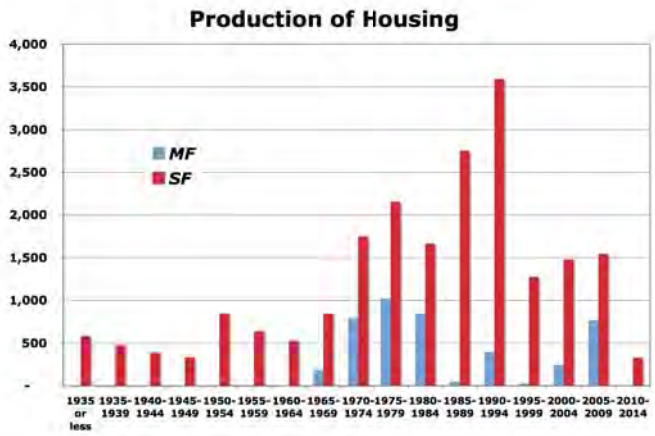
Subject Property's Housing Stock

Most of the primary housing inventory and on-going development is located within the Kapaa and Lihue urban zones. Primary housing is also concentrated, but to a lesser degree, in and around the communities of Poipu, Kilauea/Hanalei, and Hanapepe and Waimea.

Since the 1990s, Kauai's housing stock has grown faster than the population, as measured by the average annual growth rate for dwellings: it grew by 3.5% p.a. between 1990 and 2000, the highest in the State. The growth rate dropped to around 1.7% over the 2000-2010 period. Many of these new units have been targeted for the visitor or second home industry.

For instance, in 1990, the percentage of occupied housing units was about 92.5% of the county's total housing stock. By 2006, according to the Hawaii Housing Study, that dropped to 76.2 percent, the greatest rate of change among the four counties. Since 2006, however, there has been a reversal of that trend, with the percent of housing stock being build for primary homeownership has increased to 89.6%.

By way of context, housing development and construction was most active on Kauai during the time when the major resorts were developed in the 1970 and 1980s. Thereafter, primary housing production reached only half that level, save for periods of housing reconstruction that followed a major hurricane event.



In the years after the establishment of the resorts, there was a boom in condominium production, but many of these projects that were developed targeted the offshore buyer market. TMK records

show that over 70% of the condo units and 12% of the single-family homes are owned by out of state residents.

Census records have shown that a quarter of the County's housing stock did not house residents in 2000. Thus, while the Census categorizes these units as "vacant," they may be actually rented to vacationers, reserved by owners as a second home, or both. Demand in the housing market hence comes from residents, investors, and non-residents.

As a result, the average prices for housing units are skewed upwards and do not necessarily reflect residents' ability to pay for housing. Kauai housing stock is 78% owner occupied and 22% vacant, per their definition (it includes seasonal or recreational use, which itself constitutes 64% of all vacant units, with rental units constituting 20% of that total).

Indeed, housing inventory shows that about 3,000 of the 4,000 condominium units in the county, or 73%, are owned out-of-state. This would account for the high prices of condos in the county, the second highest in the state. Median resale price this May 2013 for a condo on Kauai is $323,000.

HOUSING CHARACTERISTICS OF THE MARKET

Kauai County	Units
Occupied housing units	23,051
Owner-occupied housing units	13,968
Renter-occupied housing units	9,272
Vacant housing units	6,553
For rent	1,312
Rented, not occupied	61
For sale only	251
Sold, not occupied	51
For seasonal, recreational use	4,172
All other vacant units	706
Homeowner vacancy rate (percent)	1.8%
Rental vacancy rate (percent)	12.3%

Note that the homeowner vacancy rate is low but the rental vacancy rate is high. This is indicative of a community that has high priced houses – therefore the homeowner vacancy rates are low. Additionally, as it is a very desirable place to live, there are a lot of rental units for vacation rental – and therefore the rental vacancy rate is high.

HOUSING CHARACTERISTICS OF THE MARKET, BY AREA

	Waimea	Koloa	Lihue	Kawaihau	Hanalei	Total
Detached Home	2,270	4,843	4,706	5,212	2,013	19,044
Townhouse	57	128	142	36	113	484
Condominium	0	195	326	190	366	1,082
Duplex/multiplex	85	201	24	142	22	484
Apartment	328	139	564	202	185	1,428
Co-op	0	67	107	0	0	184
Other/Not	0	179	65	148	52	345
	2,739	5,752	5,935	5,930	2,751	23,051

Note that the area of the proposed development is Kawaihau, highlighted in blue, and that area has very few dwellings that are attached units (condo, townhouse, etc.).

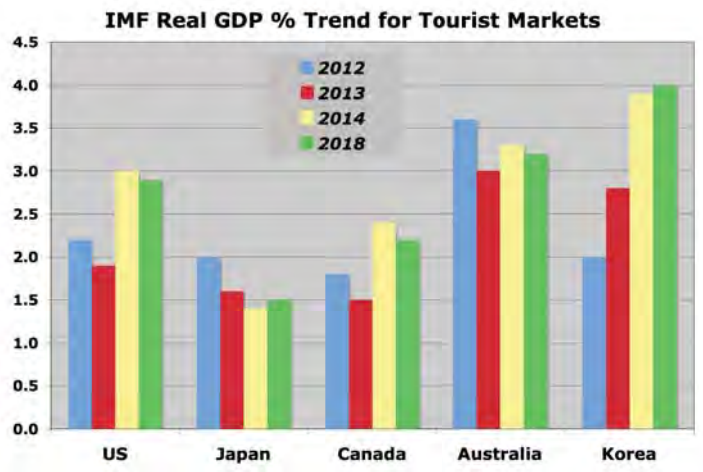
IV. THE ECONOMY

Simply put, residential for-sale and rental values move closely in synch with an area's economic growth, and economic growth is determined in the short run by the balance of trade between the area and it's major trading partners. And the mechanism by which this growth in values occurs is via rising incomes and higher job counts. We start by looking at the economic outlook for the state and the county. As the major industry is tourism, the county's significant visitor sources would be the US, Canada and Asia

As such, we look at the economic trends in all three sources.

GLOBAL ECONOMY:

The overall global economic forecast by the IMF earlier this year noted that the recovery had solidified, but the unemployment remained high. It said global financial risks have shrunk, including the chance of a fallback in economic activity (a double dip).

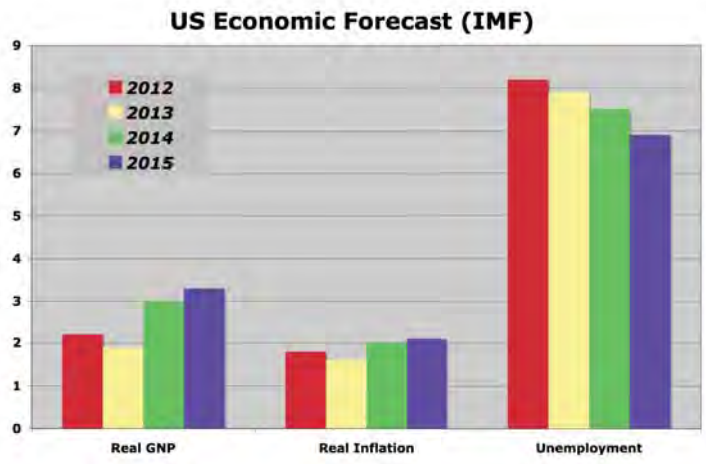


If the advanced economies continue to repair their public and financial balance sheets, and stimulate employment, and if emerging markets do not overheat their economies, global financial markets and property markets will stabilize and grow.

UNITES STATES:

The US economy is projected to grow by 3 percent in 2014, as firmer private final demand takes the burden to stimulate the economy off of federal fiscal policy. More and more, the risks to the economic outlook are abating: the recovery in housing prices and the slight growth in the job

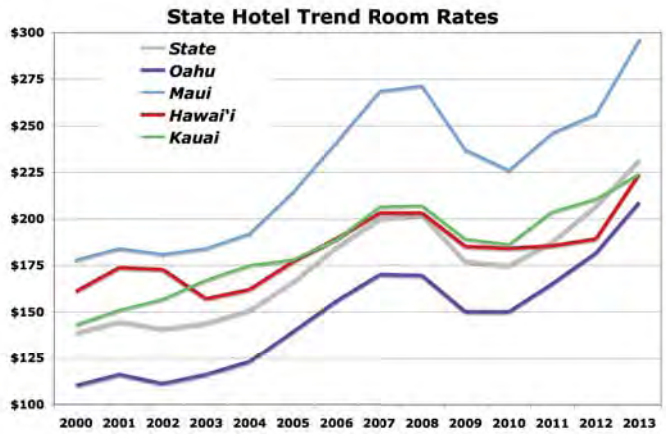
market are big positives looking ahead. Given the slack in the economy, inflation is expected to remain subdued, but with a rise in the interest rates in the cards.



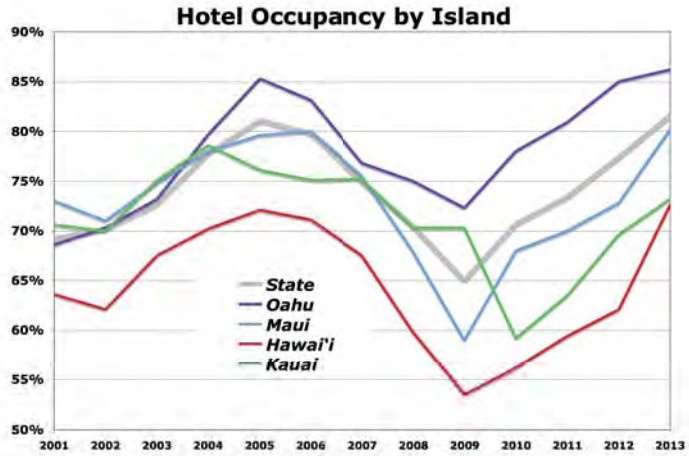
Looking ahead, the US economy will be on the rise. That, plus the perception of a growing economy, should be sufficient to grow the Hawaii state and the Oahu county economies. As an improved US economy is manifested in terms of higher visitor industry revenues, this commensurate growth in state economic activity will then put pressure on housing, via higher job counts (immigration) and incomes.

HAWAII STATE:

According to the state economic forecasters, Hawaii's economy continues to grow strongly in 2013 at an accelerating rate. The state has very low unemployment relative to the rest of the nation, thanks to a resurgent demand in the visitor industry, which is the major engine of economic growth in the county and the state (as seen below).

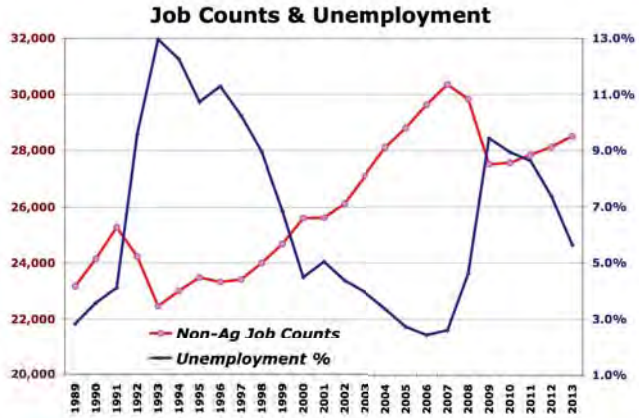


Historically, Hawaii's economy follows those of the Pacific Rim countries, which bodes well for the future.



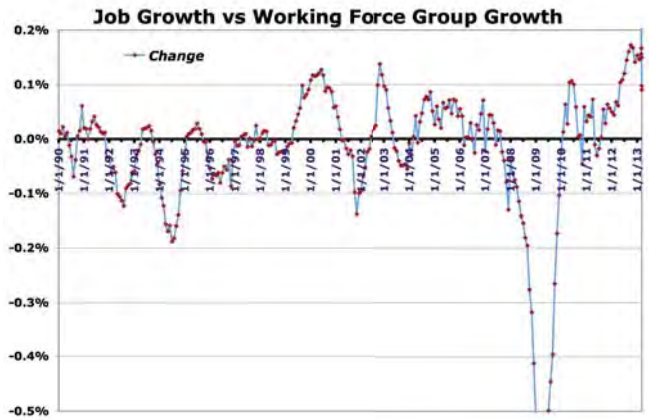
KAUAI:

Kauai is enjoying economy growth again, thanks to a resurgent demand in the visitor industry, which is the major engine of economic growth in the county and the state (as seen in job counts rising and unemployment rates falling).

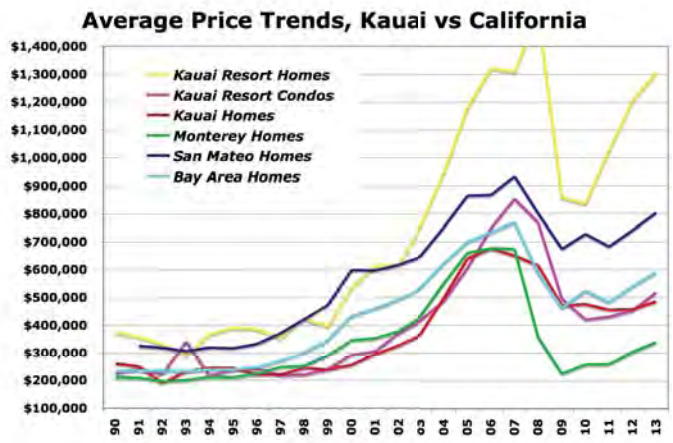


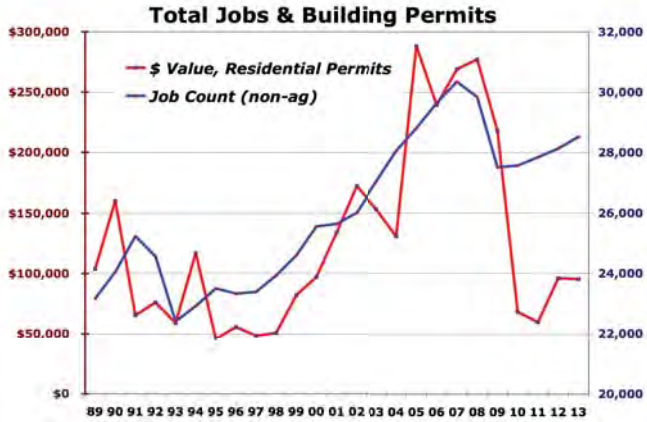
Going forward, Kauai will begin to experience tight labor conditions, with immigration occurring in order to meet rising job growth. Indeed, this is happening already, as seen next.

This chart shows that the recent growth in jobs is outpacing the natural growth in the workforce, i.e., population growth. Thus, in-migration will occur (which leads to increased housing demand).

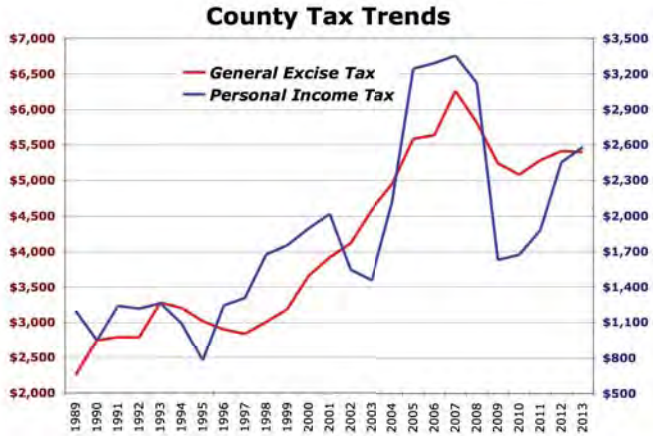


Housing demand will also grow thanks to offshore demand. As seen, when California's residential markets improve, prices (demand) for second homes in Kauai also rises.





Finally, Kauai's economy and real estate market are closely tied, as an increase in one leads to an increase in the activity of the other (per the following chart). In sum, economic indicators look to growth for the island's residential market.



V. HOUSING MARKET

Overview: Much like the state, Kauai's residential real estate supply is inflexible and constrained, but to a greater degree – the cost constraints are even tighter (higher costs of transporting material inputs to a remote locale, plus of sourcing labor in a small community), and the political climate there is generally unfavorable to housing development, particularly at the high end and/or in areas that are highly visible (but decidedly less so, relative to affordable and senior housing, as well as work force housing, which this project is proposing).

At the same time, demand for residential real estate is both flexible and strong, particularly in good economic times and over the long run. It can be, and is currently, constrained to an uncharacteristic degree, thanks to havoc in the financial markets the last few years and the drastic fall off in economic activity globally and nationally.

The first condition, limited supply, arises due to Kauai having a very small landmass, coupled with inadequate infrastructure and challenging geographic conditions (atop the aforementioned political, social and legal impediments).

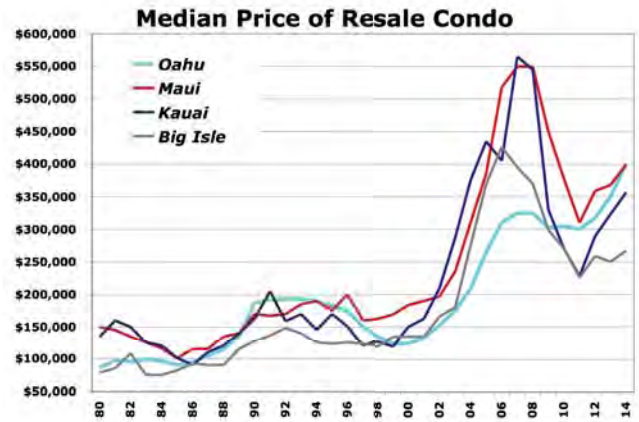
The second starts with the very high quality (defined a high quality of life, in terms of being a place that is environmentally safe, aesthetically pleasing, socially accommodating, politically stable, etc.). This is coupled by a deep and broad appreciation of that lifestyle by very large population accustomed to visiting the island (mainly West Coast and East Asia), which has one of the highest rankings in brand awareness and acceptance.

In combination, this results in a market that can dramatically volatile, up and down, in terms of sales and, to a lesser extent, prices. We note that in the past cycles, prices have been relatively 'sticky' downward, i.e., generally holding on to accumulated values. In this cycle, however, the price appreciation was so extensive and lasted so long, that the ensuing price depreciation during the down cycle has also been extensive.

Currently, Kauai's residential markets are now at the beginning of the up-cycle. The question is, going forward, how long this will last. The rule of thumb for the residential market is that the upswing in the cycle, the up cycle, generally lasts about 6.5 years, and is about twice as long as the down cycles. In addition, the up cycle, through to peak, results a tripling of the number of closings.

For the condo market, the up cycles last about 7 years, almost more than twice as long as the down cycles. In addition, the movement trough to peak of closings can be 300% or 400%, while for prices, it can be 400% or higher (note that this condition is not just particular to Kauai, but to all the neighbor islands).

The following charts illustrate this, starting with price appreciation trends.



For the condo market on Kauai, the one that relates to this project, the up cycles last about 7 years, almost more than twice as long as the down cycles.

Next, we describe the balance between supply and the demand using sales and listings island-wide for condos, as well as the indicator showing the balance between the two, MRI or Months of Remaining Inventory.

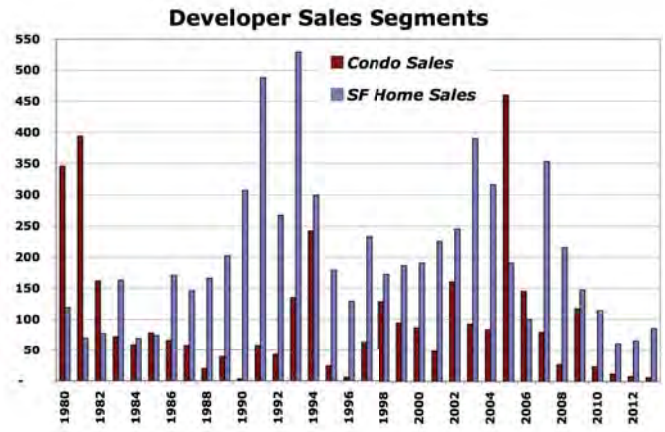
Right now, the MRI trend is declining, per the growth of sales and shrinkage of listings, indicative of a tight market. A normal reading is between 8 and 12 months, with the two balanced.

Looking ahead, we assume that the sales will continue to grow (as a function of low interest rates, plus the spread of the economic recovery in the areas where buyers of Kauai real estate reside (basically on Kauai, plus on the west coast of North America).

In this case, the proper market response to tight supply is for sellers to raise their prices. As seen in other charts, this has already started two years ago, and continues this year as well.

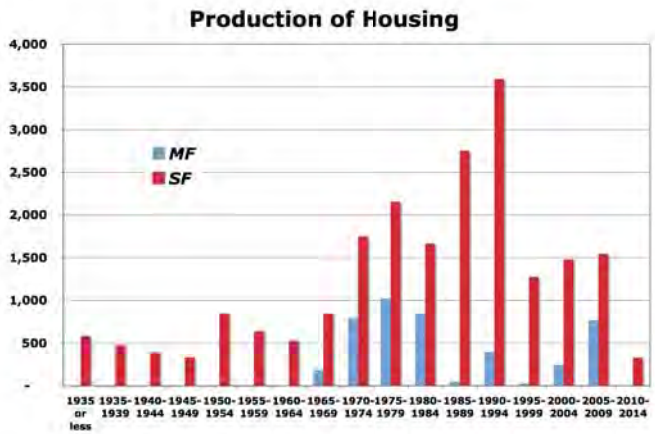
The following chart shows the price trend over the last 32 years for the four basic housing products: single-family resales and developer (newly construct4ed) sales, plus condominium resales and developer sales. As seen, the price trend over the last four years has been down, with the recovery taking hold first with single-family product, followed by condos.

Next, we look at the market for developer sales. As seen in the next chart, the level of new housing production is at a historic low. This is a condition of scarcity and it leads to price movement to the upside.



When that happens, the general public will get a sense that there is a housing shortage, and pressure will be brought politically to increase the supply of affordable housing. In and of itself, that will help to alleviate the demand existing for affordable rental units. That said, it is likely that the demand for reasonably priced housing will vastly outpace the supply.

Another way of seeing this is the long-term production of housing chart. Not only has housing production been low of late, but this also says that the current stock of housing is old, and dated.



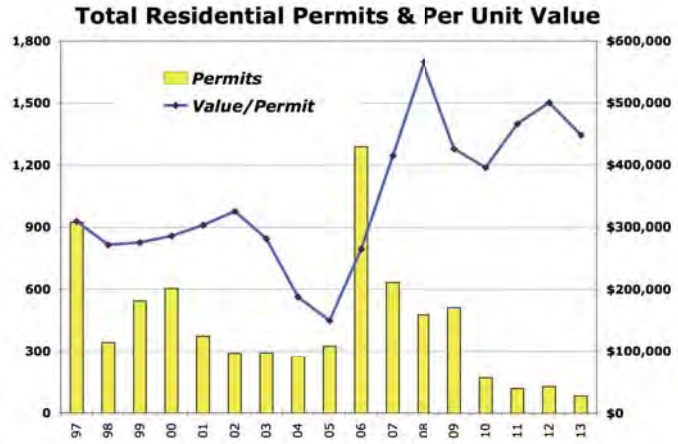
VI. FUTURE KAUAI HOUSING SUPPLY

PERMITS

The easiest way to look ahead to where the housing market is going in the short-term is by examining the activity in permits (where developers apply for permission, and pay their fees, for building residential units). A high level of activity indicates more supply is in the works, which means that more demand will be met, and the potential for prices adjusting downwards. With less supply in the works, prices will feel pressure upwards (and higher prices in the future, when demand recovers).

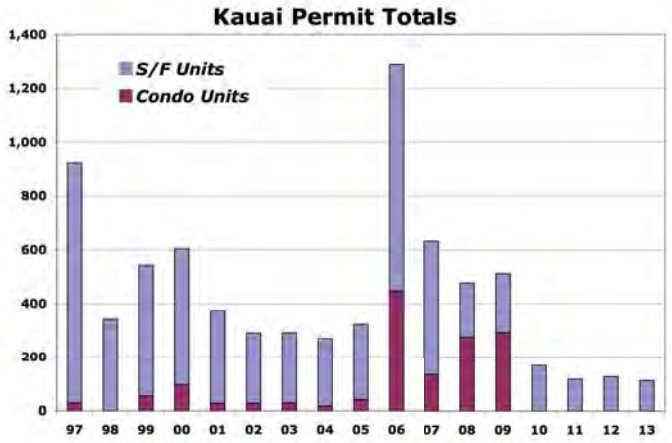
In addition, low levels of per unit value indicate that the units being built are for the lower end of the market (and vice versa). And, this has not been the case overtime on Kauai, indicating that most of the new housing has been targeted on the upper income end of the housing market.

An overview of the TOTAL RESIDENTIAL PERMITS AND VALUES Chart shows that the number of permitted units has sunk so low that it is at an all-time historical low. On the other hand, the value per permitted unit is at a record high.

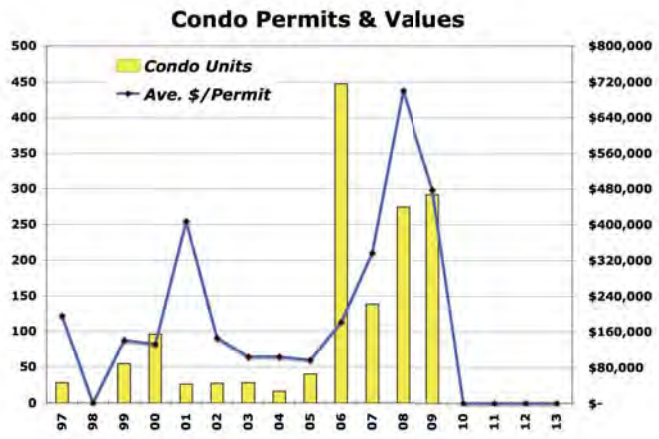


Note that the 2013 data is extrapolated, using actual data through April 2013.

The following chart shows the actual breakdown between condos and single-family homes.



As seen, the number of permits is very low – caused mainly by the condo market.



VII. HOUSING DEMAND

The prime determinant of housing demand is household formation, itself is a function of the economy and demographic and social trends. As noted above, in the short term, residential housing demand is driven by economics – specifically of job creation/income growth, as well as interest rate trends.

Incomes to buy homes, and they drive immigration, which is a prime source of housing demand (sometimes linked to population growth). This linkage is best illustrated in the RESIDENTIAL SALES & JOB GROWTH Chart.

Note how closely the two trends track one another, up until the 2004-2005 period, when high prices prevented many families from buying a house. This then shows how the lack of housing supply on an on-going basis drives prices higher, and thus lowers the sales of homes.

Further note, the gap that has opened up between the two trends starting in 2005. In previous recessions, a similar pattern occurred, with the sales of homes (blue line) picking up during the recovery. This was because a lot of families doubled up (multiple families living in one dwelling) during the recession. Thereafter, they took the economic gains they made in the recovery and invested it in housing. This will be happening in the next few years.

If the subject property were under construction, then this unmet housing demand would turn to this project as a source of housing supply.

VIII. HOUSING DEMAND POTENTIAL & PROJECTION

JOB GROWTH TO HOUSING DEMAND: In the tables below, we describe DBEDT's predictions for wage and salary job creation on Kauai for the next 10-15 years, and derive from that a general expectation for housing demand over the next five to ten years (in other words, we will translate it into housing demand). Note that the model* used here ran from 2007, but was updated in 2009

HOUSING DEMAND, FROM DBEDT'S 2035 JOB FORECAST FOR WAGE & SALARY JOBS

	2007	2015	2020	2025
Total civilian wage and salary jobs	44,077	46,900	49,500	51,900
5 Year Growth		2,823	2,600	2,400
Annual Job Growth		565	520	480
Annual Housing Demand (1.75 Jobs: 1 Home)		332	306	282

*(http://hawaii.gov/dbedt/info/economic/data_reports/2035LongRangeSeries/LRFreport_2035series_revised_Aug09.pdf)

As seen, we use the annual changes in job counts to derive housing demand on the premise that it will take an average of 1.75 new jobs to generate demand for one new house.

However, the job counts used in the charts and tables above are just the number of wage and salary jobholders, and do not encompass the self-employed or home worker. According to DBEDT's projections, self-employed workers consist of about 20% of the total work force, but are growing to 25% in the next ten to twenty years. As such, we want to add this demand for housing into our projections.

The following transforms those projections into annual job growth projections, and then summarizes it in a complete DBEDT projection table.

HOUSING DEMAND, FROM DBEDT'S 2035 JOB FORECAST, SELF-EMPLOYED

	2007	2015	2020	2025
Annual Housing Demand (1.75 Jobs: 1 Home)		332	306	282
Self Employed Housing Demand (15% of total)		33	31	28
Total Annual Housing Demand		365	336	311

Finally, we want to take into consideration offshore demand, relative to housing demand. Studies have shown that this demand varies from a low of 15% on Oahu to a high of 60% on Maui. For Kauai and our purposes here, we use a very conservative factor of 20%. Thus, the total amount of housing demanded in the future should see an increase of another 20%. The following table shows this:

HOUSING DEMAND, FROM DBEDT'S 2035 JOB FORECAST PLUS OFFSHORE DEMAND

	2007	2015	2020	2025
Total Annual Housing Demand		365	336	311
Offshore Buyer Housing Demand (20% of total)		66	61	56
Total Annual Housing Demand		431	397	367

Note that the average number of residential permits taken out in the last five years for the county is 373 units p.a., but the average over the last 2 years (projecting 2011 using YTD numbers through September, is 125 units, p.a.

In sum, housing production in the past has not satisfied housing demand, as driven by job growth, leading to higher priced housing and overcrowding in existing housing.

Looking ahead, this will only continue, as the level of permitting this year has been below what is would house just the recent growth in potential homebuyers.

IX. FORECAST

As seen earlier, the cycle for both the economy and real estate is coming off of a dramatic fall-off in overall activity and in values. Going forward, we believe the markets will right themselves and the county will resume the normal pattern of multi-year periods of both economic growth and job and personal income expansion. In turn, this will lead to housing demand. As seen in the past, the housing market will begin to overheat, manifested by rising housing prices that outrun people's rising incomes. This will lead again to an affordable housing 'crisis' – where demand outstrips supply. A major part of this problem, one of the county's own making, is that there will be limited amounts of land suitable and zoned for housing.

Given this, we believe the development this project will contribute to the satisfaction of housing demand, that has been deep and persistent, from both off-shore and on-island. We also believe that the development will be successful, particularly so in light of the coming up cycle in the housing market. Finally, the historically low level of permitting activity indicates there will little or no competitive interference coming in the short run from other housing development on the island.

The following table describes the potential pricing at the retail level for each product type in the development (note that, in the eventuality that some or all of the house/lot package units are sold as simple home sites, the prices will be lower, as reflected in the final column below).

KAPAA HIGHLANDS PRODUCT SALES PRICE PROJECTION

Housing Produced	Total Units	Retail Price Per Unit	Home Site Only Prices
A House Lot Package, Large Lots (10,000 sf)	36	$800,000-$950,000	$266,000-$316,000
A House Lot Package, Medium Lots (7,500 sf)	50	$650,000-$700,000	$216,000-$233,000
Multi-Family Dwellings (4 Plex, 8 DU/Ac)	500	$250,000-$350,000	
Affordable Housing Dwellings (12 DU/Ac)	183	$125,000-$175,000	

Given that these prices, particularly the affordable ones, are below the historical trend for housing, we expect that sales will start up strongly. We expect them then to hold this momentum over the first three years, coinciding with the market's expansion. Thereafter, they will experience a gradual fall-off, coinciding with the downturn in the cycle. After that, the market will recover, as will sales of the final units.

KAPAA HIGHLANDS PRODUCT CLOSING PROJECTION

Product	2016	2017	2018	2019	2020	2021	2022	2023
Large Lot Homes	11	9	9	7				
Medium Lot Homes	15	15	14	6				
Multi-Family Units	90	100	90	70	50	30	30	40
Affordable Housing Units	40	40	40	35	28			

Exhibit B

Kapa'a Highlands II Sustainability Plan

Kapa‘a Highlands II Sustainability Plan

Prepared by:

Ho‘okuleana LLC

... to take responsibility ...

25 Kāne‘ohe Bay Drive, Suite 212
Kailua, Hawai‘i 96734
(808) 254-2223 (O‘ahu)
(808) 329-4447 (Big Island)
www.Hookuleana.com
Info@Hookuleana.com

Table of Contents

Chapter	Page Number
1. Introduction	1
2. Sustainability Programs and Plans	10
3. Natural and Cultural Resources	17
4. Consistency with Regional Land Use Planning	18
5. Sustainable Design Features	20
6. Transportation	28
7. Economic Opportunities	30
8. Open Space and Parks	31
9. Water Management	32
10. Energy Management	35
11. Health and Active Lifestyles	37
12. Education	39
13. Housing	40
14. Social Sustainability	43

Kapa'a Highlands II Project Information

Kapa'a Highlands II is a proposed development of a mix of single-family and multi-family residential, market and affordable rate homes. This 163-acre Ocean View "Planned" community is positioned to be the pride of Kapa'a. The development seeks to fill the housing needs of Kapa'a within the Urban Center of the district. Situated in close proximity to schools and commercial areas, Kapa'a Highlands II is proposed to be a sustainable community that preserves the rural character of Kapa'a while meeting its growing housing needs.

Kapa'a Highlands II has received letters of support from the County Mayor, County Planning Department and County Housing Department. Letters of approval have been received from the County Department of Public Works regarding wastewater, State Department of Transportation and the County Water Department.

Project Name:	Kapa'a Highlands Phase II
Location:	Wailua, Kaua'i, Hawai'i
TMK:	(4) 4-3-003:001
Total Area:	163-acres
Existing Use:	Vacant, undeveloped, former sugarcane land
County Zoning:	Agriculture
General Plan Land Use Designation:	Urban Center
State Land Use:	Agricultural
Approvals Required:	LUC Boundary Amendment; County Class IV Zoning & Use Permits; County Council Approval for Zoning Change; Building Permits
Project Components:	Mix of single-family and multi-family residential.

Approximately 69-acres subdivided into:

- 86-single family (lots ranging from 5,000 to 8,000 SqFt.)
  - $180,000.00 to $250,000.00
- 683-multi-family (lots from 1-5 acre parcels)
  - $220,000.00 to $450,000.00
- Totals above include – 167-affordable units on site
  - $189,000.00 to $363,000.00

Open space encompassing 14.3-acres including:

- 3.1-acre park adjacent to Kapa'a Middle School
  - Relocation of County Swimming Pool
- Greenways surrounding development

Commercial Areas totaling 1.4-acres

- Stores, personal services
- Land for police/fire sub-stations

Project Components: Infrastructure Improvements:

Water:

- Contributions to repairs of Kapa'a Sewer Treatment Plant
- Water Master Plan approved by County Water Department
- Well on site to be dedicated to County Water Department

Transportation:

- Dedication of Kapa'a By-Pass Road to the State
- Complete multi-modal roadway running thru the property
- Bus stops located along roadway
- Bike/Walking path

Aerial Image Overlooking Kapa'a Highlands II Project Area

Kapa'a Highlands II Sustainability Plan

This Kapa'a Highlands II Sustainability Plan is a comprehensive set of goals, strategies and actions focused on improving environmental quality, economic strength and social benefit within the Kapa'a Highlands II project, as well as the broader community.

This Plan serves as a roadmap guiding Kapa'a Highlands II toward a more sustainable future, with implementation of actions through a comprehensive, inclusive stakeholder process.

Before discussing the global context of "sustainability," we explore the Hawaiian view of "' *āina* " – core to the term "sust*aina*bility."

In a traditional Hawaiian context, nature and culture are one and the same; there is no division between the two. The wealth and limitations of the land and ocean resources gave birth to and shaped the Hawaiian worldview. In Hawaiian culture, natural and cultural resources are one and the same.

All forms of the natural environment, from the skies and mountain peaks, to the watered valleys and lava plains, and to the shoreline and ocean depths are believed to be embodiments of Hawaiian gods and deities. (Maly)

'Āina – That Which Sustains the People
(Context, here, primarily provided from writings of Kepa Maly)

The *'āina*, that which feeds, nourishes and sustains life (in English referred to as "land"), *wai* (water), *kai* (ocean), and *lewa* (sky) were the foundation of life and the source of the spiritual relationship between people and their environs. Hawaiian *mo'olelo*, or traditions, express the attachment felt between the Hawaiian people and the earth around them.

In any discussion of Hawaiian land - 'āina, that which sustains the people - and its place in culture, it is also appropriate to briefly discuss traditional Hawaiian land terms, as the terms demonstrate an intimate knowledge of the environment about them. In the Hawaiian mind, all aspects of natural and cultural resources are interrelated. All are culturally significant.

Hawaiian culture revolves around the value of "aloha 'āina" or love of the land. This love is not a passing sentiment, a summer fling or a fair weather affair. It is a deep-seated commitment to the wellbeing of the earth, which sustains us like a parent.

The Hawaiian concept of malama 'āina (literally, caring for or living in harmony with the land,) demands conservation, sustainable use and enhancement of the local, regional and global environment. By simply taking care and respecting the land, it will sustain life. This straightforward relationship has been honored for thousands of years, since the Polynesians followed the stars to the shores of Hawaii.

The traditional land use in the Hawaiian Islands evolved from shifting cultivation into a stable form of agriculture around 1200 AD (Kirch, 2000). Stabilization required a new form of land use. It is widely believed 'Umi a Līloa, the ruler of the Island of Hawai'i, was the first ruler to create the ancient Hawaiian land division, according to a chiefly management system, nearly 600 years ago.

This was the *ahupua'a* land use system, which consisted of vertical landscape segments from the mountains to the near-shore ocean environment, and into the ocean as deep as a person could stand in the water (Isabella Aiona Abbott).

For hundreds of years since, on the death of all *mō'ī* (kings or queens), the new monarch re-divided the land, giving control of it to his or her favorite chiefs. The common people never owned or ruled land.

In the term *ahupua'a*, the words *ahu* (stone altar or stone mound) and *pua'a* (pig) are combined. The *pua'a* was a carved wooden image of a pig head. These stone altars served as border markers and deposition places for offerings to the agricultural god *Lono* and a high chief (*ali'i nui*), who was the god's representative.

Each *ahupua'a* in turn was ruled by a lower chief, or *ali'i 'ai*. He in turn appointed a headman, or *konohiki*. The *konohiki* served as general manager responsible for the use of an *ahupua'a* as a resource system. He in turn was assisted by specialists, or *luna*. For example, the *luna wai* was responsible for the fresh water flow and irrigation system (Kamehameha Schools, 1994).

Manageable parcels of land would typically run *mauka* (upland) to *makai* (toward to ocean) and would be marked with stonewall alignments. Tenants cultivated smaller crops for family consumption, to supply the needs of chiefs and provide tributes.

Kapu (restrictions/prohibitions) were observed as a matter of resource and land management among other things. Access to resources was tied to residency and earned as a result of taking responsibility to steward the environment and supply the needs of *ali'i*. The social structure reinforced land management.

Sustainability – United Nations Context

In 1983, the United Nations Secretary General invited Norwegian Prime Minister Gro Harlem Brundtland to chair a World Commission on Environment and Development. The Report of the Brundtland Commission, Our Common Future, was transmitted to the General Assembly as an Annex to *document A/42/427* - Development and International Co-operation: Environment, in 1987

Chapter 2, "Towards Sustainable Development" of the Brundtland "Our Common Future" defines "sustainable development" as:

> Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs. It contains within it two key concepts:
>
> - the concept of 'needs', in particular the essential needs of the world's poor, to which overriding priority should be given; and
> - the idea of limitations imposed by the state of technology and social organization on the environment's ability to meet present and future needs.
>
> In its broadest sense, the strategy for sustainable development aims to promote harmony among human beings and between humanity and nature.

Sustainability in Hawai'i (Hawai'i 2050)

The following definition, vision and guiding principles are incorporated in the Hawai'i 2050.

Definition:
A Hawai'i that achieves the following:

- Respects the culture, character, beauty and history of our state's island communities
- Strikes a balance between economic, social and community, and environmental priorities
- Meets the needs of the present without compromising the ability of future generations to meet their own needs

Vision:
Living responsibly and within our own means is top-of-mind for all individuals and organizations. We learn about the virtues and values of a sustainable Hawai'i. As a result, our goals of economic prosperity, social and community well-being and environmental stewardship are in balance and achieved.

Hawai'i 2050 Guiding Principles of Sustainability

- Balance economic, social, community and environmental priorities.
- Respect and live within the natural resources and limits of our islands.
- Achieve a diversified and dynamic economy.
- Honor the host culture.
- Make decisions based on meeting the present needs without compromising the needs of future generations.
- Principles of the ahupua'a system guide our resource management decisions.
- Everyone — individuals, families, communities, businesses and government — has a responsibility for achieving a sustainable Hawai'i.

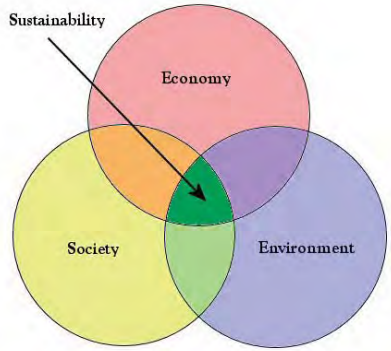
Sustainability in Hawai'i means achieving a quality of life that achieves the following goals:

- It emphasizes respect for the culture, character, beauty and history of our state's island communities.
- It strikes a balance between economic prosperity, social and community well-being, and environmental stewardship.
- It meets the needs of the present community without compromising the ability of future generations to meet their own needs.

Typically, "sustainability" is depicted in a three-themed Venn diagram (noted below,) highlighting the economy, environment and society. The achievement of sustainable development requires integration of these components at all levels.

With respect to Kapa'a Highlands II, sustainable development is achieved when it is:

- economically feasible in order to be successful as a development, while also providing for economic opportunities for future generations who reside, work or visit Kapa'a Highlands II
- protecting and preserving the environment, for today and tomorrow, serving as a model for others to follow
- addressing the needs of a wide variety of people, including their cultural values, as well as providing opportunities for people to interact, grow and learn together



Sustainability is not contradictory to growth, profit and development. Sustainability means that we plan to our limits; sustainable community development draws from and gives back to local strengths, resources and uniqueness. Local development can become more sustainable by having a better environmental, economic and social balance.

Ultimately, a goal is to meld Hawaiian traditional wisdom with modern sustainability concepts and take an integrated approach in the design and operation at Kapa'a Highlands II. This plan was created to highlight the actions of the Kapa'a Highlands II development in terms of sustainability.

In developing this plan, a variety of recognized programs and plans were reviewed, summarized and their recommendations were incorporated into this plan. These include:

- Smart Growth
- SmartCode
- Hawai'i 2050 Sustainability Plan
- OEQC Sustainable Building Design Guidelines
- Hawaii BuiltGreen Program
- US Green Building Council Leadership in Energy and Environmental Design (LEED)
- Energy Star Program
- Whole Building Design Guide (WBDG,) of the National Institute of Building Sciences
- EPA Low Impact Development
- One Planet Living

Further discussion on these programs and plans follow in the next Chapter of this Kapa'a Highlands II Sustainability Plan. Following this are chapters addressing issue-specific sustainability concerns. These include:

- **Natural and Cultural Resources:** Protecting and preserving archaeological sites, trails and dryland forest, for present and future generations
- **Land Use:** Focuses on consistency with local land use planning, fulfilling the community's vision for development in the future
- **Design Features:** Incorporating design features to fit development into natural features, protecting the resources, while taking advantage of natural elements
- **Transportation:** Focuses on sustainable modes of transportation and an improved infrastructure including: multi-modal bicycle, pedestrian and vehicular infrastructure, complete streets, etc
- **Economic Opportunities:** Encourages a vibrant economy through diversity of employment and sustainable business opportunities
- **Open Space and Parks:** Encourages protection of urban open spaces by focusing on the urban landscaping, green spaces and mixed-use development and recreational opportunities
- **Water Management**: Focuses on reducing and conserving water use, as well as minimizing impacts to nearby ecosystems from source to stormwater systems
- **Energy Management:** Encourages energy conservation, energy efficiency and renewable energy
- **Health:** Encourages healthy lifestyles through places to walk and recreate, as well as provide state of the art medical facilities to address community needs
- **Education:** Encourages understanding and practice of sustainable lifestyles, as well as providing opportunities for life-long learning
- **Housing:** Responds to the market and demographic trends and community needs, providing a broad range of housing types and price points

Anticipated beneficial impacts from the Kapa'a Highlands II project include the following:

- Provision of 86 single family homes and 683 multi-family units
- Increased housing choices, including affordable housing
- Increase housing inventory to meet future demands
- Provision of 3.1-acre park with area for relocation of Kapa'a County swimming pool
- Planned growth in an area designated for urban growth by the General Plan of the County of Kaua'i
- Provision of a pedestrian and transit-friendly community

Kapa'a Highlands II will be a sustainable community and will incorporate the following:

Sustainability Programs and Plans: Kapa'a Highlands will incorporate the core principles of the various sustainability programs and plans.

Natural and Cultural Resources: No archaeological sites are known to exist on the property. Should any archaeologically significant artifacts, bones, or other indicators be uncovered during construction, Kapa'a Highlands II is committed to strict compliance with State laws and rules.

Land Use: Kapa'a Highlands is consistent with local land use plans including the General Plan of the County of Kaua'i, the Kapa'a Town Development Plan and the Kapa'a-Wailua Basin Community Plan.

Design Features: Kapa'a Highlands II will include sustainable design features including strategies to reduce solar heat gain through roofs, walls and windows; using site planning and landscaping to improve natural ventilation; daylighting design; and energy efficient light fixtures.

Transportation: Kapa'a Highlands II will incorporate bus stops into its road system; multi-modal interconnected roads; and complete streets design.

Economic Opportunities: Kapa'a Highlands proposes two areas for commercial uses which will provide a variety of job opportunities; construction and construction-related employment will have direct beneficial impact on the local economy during construction.

Open Space and Parks: Kapa'a Highlands II proposes open space and open greenway areas encompassing 14.3-acres including a 3.1-acre park for the proposed relocation of the Kapa'a county swimming pool.

Water Management: Kapa'a Highlands II will install water efficient fixtures, appliances and high efficiency toilets to reduce indoor water use.

Energy Management: Kapa'a Highlands II will incorporate energy conservation and efficiency measures; solar energy for water heating; encourage photovoltaic systems and other renewable energy sources.

Health: Kapa'a Highlands II's layout and design will create an opportunity for both residents and the community to have a positive effect on their health through walkable and bikable transportation options.

Education: Kapa'a Highlands II will coordinate with the DOE to ensure that the facility assessment policy is addressed. In addition, a 3.1-acre park will be included in the plan and the Kapa'a county swimming pool will be relocated within the park.

Housing: Kapa'a Highlands II conforms to the Kaua'i County Affordable Housing Ordinance No. 860 and offers a variety of housing types that will address a portion of the housing needs of the island.

Social: Kapa'a Highlands II promotes social sustainability through socially-focused actions that will support quality of life, sense of place and community livability for all residents and the community.

Sustainability Programs and Plans

In developing this Kapa'a Highlands II Sustainability Plan, a variety of recognized sustainability programs and plans were reviewed, summarized and incorporated into this plan. In part, the recommendations from these programs and plans serve as guides to the sustainability actions noted in this Plan.
These include:

- Smart Growth
- SmartCode
- Hawai'i 2050 Sustainability Plan (Hawai'i 2050)
- OEQC Sustainable Building Design Guidelines
- Hawaii BuiltGreen Program
- US Green Building Council Leadership in Energy and Environmental Design (LEED)
- ENERGY STAR Program
- Whole Building Design Guide (WBDG,) of the National Institute of Building Sciences
- EPA Low Impact Development
- One Planet Living
- Complete Streets

In this chapter, these various programs and plans are summarized.

As you will see, there are several consistent principles and themes that run through the various programs and plans. While some are broad-based and include several of these, others are focused on single issues.

Following are some of the consistent messages found in these programs and plans:

- Soft touch on the land
- Respect and protection of natural and cultural resources
- Use of natural elements (shading, ventilation, lighting, etc)
- Diversity of land uses, housing types, prices
- Live, work, play, shop and learn
- Walking, bicycle and transit transportation focused
- Reuse and minimization of waste
- Renewable and efficient electric
- People and community focused

Kapa'a Highlands II will implement, to the extent feasible and practicable, measures to promote energy conservation, sustainable design, environmental stewardship and protection of the natural and cultural resources into the project. These actions are in part, based on the recommendations noted in the following sustainability programs and plans.

Smart Growth Network

In 1996, the U.S. Environmental Protection Agency joined with several non-profit and government organizations to form the Smart Growth Network. The Network was formed in response to increasing community concerns about the need for new ways to grow that boost the economy, protect the environment, and enhance community vitality.

Smart growth refers to the management of growth to make it possible "for communities to grow in ways that support economic development and jobs; create strong neighborhood with a range of housing, commercial, and transportation options; and achieve healthy communities that provide families with a clean environment." (Smart Growth Network)

There are 10 accepted principles that define Smart Growth

1. Mix land uses
2. Take advantage of compact building design
3. Create a range of housing opportunities and choices
4. Create walkable neighborhoods
5. Foster distinctive, attractive communities with a strong sense of place
6. Preserve open space, farmland, natural beauty, and critical environmental areas
7. Strengthen and direct development towards existing communities
8. Provide a variety of transportation choices
9. Make development decisions predictable, fair, and cost effective
10. Encourage community and stakeholder collaboration in development decisions

SmartCode

The SmartCode is a form-based code that incorporates Smart Growth and New Urbanism principles. It is a unified development ordinance, addressing development at all scales of design, from regional planning on down to the building signage.

The SmartCode is also a transect-based code. A "transect" is usually seen as a continuous cross-section of natural habitats for plants and animals, ranging from shorelines to wetlands to uplands. It is based on the rural-to-urban transect rather than separated-use zoning, thereby able to integrate a full range of environmental techniques.

The SmartCode is a model transect-based planning and zoning document based on environmental analysis. It addresses all scales of planning, from the region to the community to the block and building. The SmartCode is distributed by the nonprofit Center for Applied Transect Studies (CATS.)

Kapa'a Highlands II has incorporated the SmartCode principles and transects into its layout and design.

Hawai'i 2050 Sustainability Plan (Hawai'i 2050)

The Hawai'i State Plan, embodied in Chapter 226, Hawai'i Revised Statutes (HRS), serves as a guide for goals, objectives, policies, and priorities for the State.

The Hawaii State Planning Act (HRS 226) states that the State shall strive to improve the quality of life for Hawaii's present and future population through the pursuit of desirable courses of action in six major areas of statewide concern which merit priority attention: economic development, population growth and land resource management, affordable housing, crime and criminal justice, quality education and principles of sustainability.

In 2005, the legislature authorized the creations of a task force to review the Hawaii state plan and the State's planning process and to prepare the Hawai'i 2050 Plan. The creation of the Hawaii 2050 sustainability plan raises questions about the long-term limits of growth in the State and highlights the need to begin planning and acting to assure Hawaii's future. Thus, the objectives of the Hawaii 2050 sustainability plan focuses on the revitalization of the State's long-term planning process to better guide the future development of Hawaii.

The Plan offers detailed strategic actions and indicators to serve as a guide towards meeting the Plan's sustainability goals. The Plan incorporates tangible targets and benchmarks. Priority actions for 2020, to be addressed immediately, include:

1. Increase affordable housing opportunities for households up to 140% of median income.
2. Strengthen public education.
3. Reduce reliance on fossil (carbon-based) fuels.
4. Increase recycling, reuse and waste reduction strategies.
5. Develop a more diverse and resilient economy.
6. Create a sustainability ethic.
7. Increase production and consumption of local foods and products, particularly agriculture.
8. Provide access to long-term care and elderly housing.
9. Preserve and perpetuate our Kanaka Maoli and island cultural values.

In 2011, the State established sustainability as a state priority by incorporating the Hawaii 2050 sustainability plan definitions, guiding principles and goals, into chapter 226, Hawaii Revised Statutes (the Hawaii state planning act).

"Sustainability" definition was added to the Planning Act as: "achieving the following:

(1) Respect of the culture, character, beauty, and history of the State's island communities;
(2) Striking a balance between economic, social, community, and environmental priorities; and
(3) Meeting the needs of the present without compromising the ability of future generations to meet their own needs."

The Act also added "principles of sustainability" as one of the six major areas of statewide concern which merit priority attention, economic development, population growth and land resource management, affordable housing, crime and criminal justice, quality education and principles of sustainability."

OEQC's Sustainable Building Design Guidelines

The Environmental Council, as part of a "Planner's Checklist," adopted Guidelines for Sustainable Building Design in Hawai`i (October 13, 1999.) These guidelines do not constitute rules or law. A sustainable building is built to minimize energy use, expense, waste and impact on the environment. It seeks to improve the region's sustainability by meeting the needs of Hawai`i's residents and visitors today without compromising the needs of future generations. Compared to conventional projects, a resource-efficient building project will:

1. Use less energy for operation and maintenance
2. Contain less *embodied* energy (i.e. locally produced building products often contain less *embodied* energy than imported products because they require less energy-consuming transportation.)
3. Protect the environment by preserving/conserving water and other natural resources and by minimizing impact on the site and ecosystems
4. Minimize health risks to those who construct, maintain and occupy the building
5. Minimize construction waste
6. Recycle and reuse generated construction wastes
7. Use resource-efficient building materials (e.g. materials with recycled content and low embodied energy, and materials that are recyclable, renewable, environmentally benign, non-toxic, low VOC (Volatile Organic Compound) emitting, durable, and that give high life cycle value for the cost.)
8. Provide the highest quality product practical at competitive (affordable) first and life cycle costs.

In the design and construction of Kapa'a Highlands II, Three Stooges, LLC will seek to implement feasible measures to conform to these general guidelines.

Hawaii BuiltGreen Program

The Hawaii BuiltGreen Program is a statewide program to "incentivize" the designing and building of energy and resource efficient homes in Hawaii. Originally developed in 2000 by a public/private partnership between the State Dept. of Business, Economic Development & Tourism (DBEDT), USDOE and five other partners. Now promoted by the State, BIA, Hawaii utility companies and other organizations.

Hawai'i BuiltGreen is a self-certification program administered by the Building Industry Association of Hawai'i, which is a professional trade organization affiliated with the National Association of Home Builders. This is a local initiative based on homegrown knowledge of professionals familiar with the unique conditions of Hawaii. The Hawaii BuiltGreen program focuses on design choices through:

- Protecting Site Features and Functions
- Energy Performance and Comfort
- Health and Indoor Air Quality
- Durability and Materials Conservation
- Environmentally-Friendly Home Operations

US Green Building Council
Leadership in Energy and Environmental Design (LEED)

The US Green Building Council's Leadership in Energy and Environmental Design (LEED) program is a voluntary green building certification system, providing third-party verification that a building or community was designed and built using strategies aimed at improving performance across all the metrics that matter most: energy savings, water efficiency, CO_2 emissions reduction, improved indoor environmental quality, and stewardship of resources and sensitivity to their impacts.

Specific LEED programs include:

- Homes
- Neighborhood Development
- New Commercial Construction and Major Renovation projects
- Existing Building Operations and Maintenance
- Commercial Interiors projects

LEED for Homes is a voluntary rating system that promotes the design and construction of high performance "green" homes. A green home uses less energy, water and natural resources; creates less waste; and is healthier and more comfortable for the occupants.

LEED for Neighborhood Development is a collaboration between the U.S. Green Building Council, the Congress for the New Urbanism and the Natural Resources Defense Council. The LEED for Neighborhood Development Rating System integrates the principles of smart growth and green building into the first national standard for neighborhood design. LEED for Neighborhood Development recognizes development projects that successfully protect and enhance the overall health, natural environment and quality of life of our communities. The rating system encourages urban smart growth best practices, promoting the design of neighborhoods that reduce vehicle miles traveled and communities where jobs and services are accessible by foot or public transit.

ENERGY STAR Program

ENERGY STAR is a joint program of the U.S. Environmental Protection Agency and the U.S. Department of Energy.

In 1992, the US Environmental Protection Agency (EPA) introduced ENERGY STAR as a voluntary labeling program designed to identify and promote energy-efficient products to reduce greenhouse gas emissions. Computers and monitors were the first labeled products. Through 1995, EPA expanded the label to additional office equipment products and residential heating and cooling equipment. In 1996, EPA partnered with the US Department of Energy for particular product categories.

The ENERGY STAR label is now on major appliances, office equipment, lighting, home electronics, and more. EPA has also extended the label to cover new homes and commercial and industrial buildings.

National Institute of Building Sciences
Whole Building Design Guide (WBDG)

The goal of 'Whole Building' Design is to create a successful high-performance building by applying an integrated design and team approach to the project during the planning and programming phases. The WBDG program is a collaborative effort among federal agencies, private sector companies, non-profit organizations and educational institutions. In buildings, to achieve a truly successful holistic project, these design objectives must be considered in concert with each other:

- Accessible: to address the specific needs of disabled people.
- Aesthetics: the physical appearance and image of building elements and spaces
- Cost-Effective: weighing options during concepts, design development and value engineering
- Functional/Operational: spatial needs and requirements, system performance durability and efficiency
- Historic Preservation: whereby building elements and strategies are classifiable into preservation, rehabilitation, restoration or reconstruction.
- Productive: physical and psychological comfort—including air distribution, lighting, workspaces, systems, and technology.
- Secure/Safe: physical protection of occupants and assets from man-made and natural hazards.
- Sustainable: Pertains to environmental performance of building elements and strategies.

Land Use and Development Practices - Low Impact Development (LID)

Land use practices can improve air quality, reduce stormwater runoff, increase energy efficiency and reduce greenhouse emissions to improve the quality of life for citizens. LID is a land development approach that allows land to be developed but in a manner that helps lessen potential environmental impacts. LID employs principles such as preserving and recreating natural landscape features, minimizing effective imperviousness to create functional and appealing site drainage that treat stormwater as a resource rather than a waste product.

By implementing LID principles and practices, water can be managed in a way that reduces the impact of built areas and promotes the natural movement of water within an ecosystem or watershed. LID has been characterized as a sustainable stormwater practice by the Water Environment Research Foundation and others.

In general, implementing integrated LID practices can result in enhanced environmental performance while at the same time reducing development costs when compared to traditional stormwater management approaches. LID techniques promote the use of natural systems, which can effectively remove nutrients, pathogens and metals from stormwater.

Conservation designs can be used to minimize the generation of runoff by preserving open space. Examples of Conservation Design include:

- Cluster development
- Open space preservation
- Reduced pavement widths (streets, sidewalks)
- Shared driveways

One Planet Living

One Planet Living is a vision of a sustainable world, in which people everywhere can enjoy a high quality of life within the productive capacity of the planet, with space left for wildlife and wilderness. Organizations around the world are using the one planet living approach to take measurable steps towards genuine sustainability. From zero carbon buildings to procurement policies that support the green economy, one planet living solutions are cost-effective, creative, inspirational and replicable.

- Zero Carbon - Making buildings more energy efficient and delivering all energy with renewable technologies
- Zero Waste - Reducing waste, reusing where possible, and ultimately sending zero waste to landfill
- Sustainable Transport - Encouraging low carbon modes of transport to reduce emissions, reducing the need to travel
- Sustainable Materials - Using sustainable and healthy products, such as those with low embodied energy, sourced locally, made from renewable or waste resources
- Local and Sustainable Food - Choosing low impact, local, seasonal and organic diets and reducing food waste
- Sustainable Water - Using water more efficiently in buildings and in the products we buy; tackling local flooding and water course pollution
- Land and Wildlife - Protecting and restoring existing biodiversity and natural habitats through appropriate land use and integration into the built environment
- Culture and Heritage - Reviving local identity and wisdom; supporting and participating in the arts
- Equity and Local Economy - Creating bioregional economies that support fair employment, inclusive communities and international fair trade
- Health and Happiness - Encouraging active, sociable, meaningful lives to promote good health and well being

Complete Streets

Complete Streets are designed and operated to enable safe access for all users. Pedestrians, bicyclists, motorists and transit riders of all ages and abilities must be able to safely move along and across a complete street. Complete Streets make it easy to cross the street, walk to shops and bicycle to work. They allow buses to run on time and make it safe for people to walk to and from train stations.

By adopting a Complete Streets policy, communities direct their transportation planners and engineers to routinely design and operate the entire right of way to enable safe access for all users, regardless of age, ability or mode of transportation. This means that every transportation project will make the street network better and safer for drivers, transit users, pedestrians and bicyclists – making your town a better place to live.

Natural and Cultural Resources

The preservation of the natural and cultural resources is essential for a prosperous and sustainable future. Kapa'a Highlands II holds respect for the culture and the environment and will interlink natural features and cultural features as core components of the community. Archaeological and cultural sites will be protected and maintained with appropriate treatment and buffers from adjacent uses, as necessary.

No archaeological or cultural historic sites are known to exist on the property.

Brief discussions separately with historians of the subject area, Randy Wichman, Walter Smith and Albert Fukushima, concluded that the subject property has been in sugar cultivation since the 1800s until the early 1990s.

Albert Fukushima, who was employed by Lihue Plantation and worked in the subject area, said that no evidence of artifacts, bones, or other indicators of previous historic on-site activity were uncovered during the cultivation of sugar. Randy Wichman and Walter Smith concurred that the subject land was consistently cultivated for sugar for nearly a hundred years.

In 1995 SHPD stated for the "Site Selection EIS" for the adjacent Kapa'a Middle School that the site may not be Archaeological or Historically rich because of the consistent cultivation of sugar for nearly a hundred years.

In the late 1999, the State Historic Preservation Division (SHPD) issued a letter of "no significance" to the potential developer at that time.

There exists sparingly, evidence of inactive sugar irrigation ditches. Nearly all have lost their banks and flattened out. Currently, SHPD has requested that the applicant record the locations of the remaining remnants of the former irrigation ditches prior to the development stages. The Applicant is committed to conducting and Archaeological Inventory Survey at the time of design and development phase in order to properly record the remains of the plantation irrigation ditches.

Should any archaeologically significant artifacts, bones, or other indicators of previous historic on-site activity be uncovered during construction, the Applicant is committed to their treatment being conducted in strict compliance with the requirements of SHPD.

Additionally, whenever existing rock walls must be removed, the rocks from these walls will be set aside and reused in the construction of new screen, buffer and retaining walls built within Kapa'a Highlands II. Whenever feasible, rocks from Kapa'a Highlands II will be used for such walls (minimize importation of rock from offsite).

Greenbelts

Greenbelts are undeveloped areas that surround the developed areas. Greenbelt is a strategic planning tool to prevent urban sprawl by keeping land permanently open. The purpose of the Greenbelt is to prevent urban sprawl, prevent neighboring towns from merging into one another, and to preserve the setting and the character of the area. Approximately 14.3-acres are proposed for open greenway areas.

Consistency with Regional Land Use Planning

Consistency with local land use planning documents is an essential element of sustainability. The local plans articulate and illustrate the community's vision. Without consistency with that vision, a development project cannot be sustainable.

Two primary planning documents address land use development in Kapa'a, the General Plan of the County of Kaua'i and the Kapa'a-Wailua Basin Community Plan. Following are brief summaries of each.

The General Plan of the County of Kaua'i (General Plan)

The General Plan of the County of Kauai ("General Plan") was adopted in 1971 and updated in November 2000. The General Plan is a statement of the County's vision for Kaua'i and establishes strategies for achieving that vision. Section 7-1.2 of the amended Chapter 7 of the Kauai County Code states:

Pursuant to the provision of the Charter for the County of Kaua'i, the General Plan sets forth in graphics and text, policies to govern the future physical development of the county. The General Plan is intended to improve the physical environment of the County and the health, safety and general welfare of Kaua'i's people.

The General Plan states the County's vision for Kaua'i and establishes strategies for achieving that vision. The strategies are expressed in terms of policies and implementing actions. They may be augmented and changed as new strategies are developed.

The General Plan is a direction-setting policy document. It is not intended to be regulatory. It is intended to be a guide for future amendments to the lands regulations and to be considered in reviewing specific zoning amendment and development applications.

The vision, the maps and text policies, and the implementing actions are intended to guide the county actions and decisions. In addition, the maps and text policies are intended to guide the County in specific types of actions: making revisions to land use and land development Regulations; deciding on zoning changes; preparing and adopting Development Plans and Public Facility Plans; and preparing and adopting capital improvement plans.

The General Plan contains six major themes, each with various policies for implementation. The major themes are as follows:

1. Caring for Land, Water and Culture
2. Developing Jobs and Businesses
3. Preserving Kaua'i's Rural Character
4. Enhancing Towns & Communities and Providing for Growth
5. Building Public Facilities and Services
6. Improving Housing, Parks and Schools

In particular, the proposed reclassification of the Property responds and conforms to Theme No. 6. Market studies have shown that the population growth and correlating need and demand for housing is extremely high on Kaua'i.

The proposed reclassification, which will allow residents to purchase an affordable house and lot as well as allow other residents to purchase a lot to design and build their own homes, will present an opportunity to address the critical community need for residential housing. It should also be noted that the proposed development will assist in maintaining a viable economy as construction-related employment opportunities for residents would be generated.

Kapa'a-Wailua Basin Community Plan

The Kapa'a-Wailua Basin community plan outlines the regional issues and opportunities that will be subjects for future community planning. A "Build-Out Analysis" of the Kapa'a-Wailua Basin was prepared in the General Plan Update. As of 1998, this area had an estimated 4,700 dwelling units, making it the largest residential community on Kauai.

Based on the General Plan Land Use Map designations, the analysis found that an additional 4,000 units could be developed if the General Plan-designated lands were fully zoned, subdivided and built out. About 2,400 more units could be built in Urban Residential areas, about 500 more in Rural Residential areas and approximately 1,100 more units in the Agricultural areas. This would increase the housing units and population of the area by 85%.

The "Build-Out Analysis" specifically included the subject property as an "expansion area". The new General Plan Land Use Map designates the subject property as Urban Center.

The Kapa'a Highlands II project conforms to and implements the policies of the Kaua'i General Plan by developing within the designated Urban District, contiguous to Kapa'a town and its neighboring residential community.

Sustainable Design Features

Thoughtful planning of site, neighborhood and improvements design, incorporating mixed-use land uses, walkable streets, encouraging walking, bicycling and public transportation, and respect for the natural and cultural features creates opportunities for more environmentally-responsible and sustainable development. These sustainable neighborhoods are beneficial to the community, the individual and the environment.

Several sustainability programs and plans (noted previously in Chapter 2) identify and address a wide variety of design features that may be incorporated into a development project to enhance its sustainability. These items design features include:

- **Site Planning**
  - Respect for the Land – Work with topography
  - Siting - Proximity to mass transit, shopping, employment centers, recreation, schools
  - Interconnectivity – Connection with neighbors, Multi-modal transportation (to be discussed in another section of this Plan)
  - Intensity of Layout – Village Center; Clustering into compact villages
  - Natural/Cultural Resources – Protection of natural and cultural resources (to be addressed in another section of this Plan)

- **Improvements Planning**
  - Alternatives – Provide a range of housing options at various price levels (to be discussed in another section of this Plan)
  - Orientation – Ventilation; Take advantage of natural air flow
  - Shading – Eve overhang; Vegetation
  - Landscaping – Native plants; Low irrigation
  - Energy Efficiency – (to be discussed in another section of this Plan)

The objectives of Kapa'a Highlands II are to create an attractive master-planned residential community with a variety of housing opportunities and mixed uses, as well as recreational resources.

<u>Site Planning</u>

As a mixed-use community, the objectives of Kapa'a Highlands II are to:

- Create a diverse, sustained community of mixed uses, including residential, retail and commercial spaces, recreational spaces, and open space.
- Cultivate intrinsic respect for the land and natural surroundings, develop an inherent Hawaiian sense of place and nourish a sustaining living environment.
- Provide housing for the working families of Hawai'i nearby areas of workforce demand, resultantly improving overall quality of life through the reduction of commuting and facilitation of everyday function.
- Openly embrace a diversity of people and activities through offering mixed uses and housing types.
- Contribute to the social fabric of the community by providing infrastructure and facilities, and by including recreational, and civic sites.
- Engender and incorporate intelligent, planned sustainability by design.
- Emphasize non-vehicular transit for mainstream community-wide travel.

Kapa'a Highlands II is strategically located north of Kapa'a town. The Kapa'a By-Pass Road separates the Kapa'a town and the Kapa'a Highlands II development. Kapa'a Highlands II is on the north-west corner of the Kapa'a By-Pass Road and Olohena Road. Olohena Road runs along and adjacent to the east and north boundaries of the Property. The Kapa'a Middle School is located on the northern end of the Property fronted by Olohena Road. The area also has a long-standing and growing residential base.

This area will continue to be the focus of such development as the Island's population grows. This region is also the near commercial and industrial heart of Kaua'i, serving the needs of the visitor, residents and other industries of the western half of the Island.

Kapa'a Highlands II is a compact, mixed-use, master-planned community offering a wide range of housing types and affordability, and a variety of businesses and employment opportunities with supporting retail, commercial, infrastructure, recreational and open space uses.

The Project proposes to develop Phase II of Kapa'a Highlands into an approximately 97-acre single-family and multi-family residential subdivision. Approximately 69-acres will be subdivided into single family lots ranging from 5,000 to 8,000 square feet and multi-family lots from 1-acre to 5-acre parcels. A total of 683 multi-family units and 86 single family units are planned. Open space encompassing 14.3-acres will be developed and associated infrastructure (e.g., new roadways, utilities, drainage, wastewater). Affordable housing will be provided in accordance with County of Kaua`i requirements.

A 3.1-acre park is proposed adjacent to the existing Kapa'a Middle School. The park will have an area for the county's proposed relocation of the Kapa'a county swimming pool. A 0.4-acre parcel is proposed for commercial use. A country type store and small personal service types of use are anticipated. A remnant parcel of a one acre on the Makai side of the Kapa a Bypass road is also proposed as commercial use or for sub-stations for the police and fire departments. Approximately 14.3-acres are proposed for open greenway areas.

The site is presently fallow, undeveloped, and predominantly vegetated with weeds. The undesirable dumping of old cars, appliances, rubbish associated with undeveloped lands continue to exist on the property. The proposed project will increase the productive use of the property and significantly upgrade the immediate vicinity.

The proposed development will have minimal impact in terms of agriculture. Although the Property was previously used as part of large scale agricultural activities, it is presently fallow, and undeveloped. With the closing of the sugar plantations on Kaua'i, close proximity to existing residential areas, and demand for affordable housing, large-scale agricultural operations were not deemed feasible.

Construction of the proposed development will involve grading, excavation and trenching of presently undeveloped areas within the project site. The project will require alteration of existing landforms to create more efficient land development areas. Appropriate engineering, design and construction measures will be undertaken to minimize potential erosion of soils during construction.

On-Site grading and infrastructure improvements and residential construction will result in an increase in dust, storm run-offs and noise. The prevailing trade wind pattern is from the north-east directions. Potential airborne matters will generally be carried in the south-west direction, away from the school and existing residential areas. However, on occasions, the westerly winds may carry the potential

airborne matters towards the school and existing residential neighborhoods. Construction noise relating to infrastructure installations will be expected.

In the short term, during construction, measures will be taken to minimize impacts such as increased dust, noise and traffic. Construction activities shall comply with the provisions of Hawaii Administrative Rules, S-11-60.11.33 on Fugitive Dust. Dust preventive measures will include;

- Planning of construction phases to minimize the amount of dust generating materials and activities, centralizing on-site vehicular traffic routes and locating of potential dust-generating equipment in areas of the least impact.
- Provide adequate water source at the site prior to start of construction.
- Landscape and provide rapid covering of bare areas developed during construction.
- Minimize dust from shoulders and access roads.
- Provide dust control measures during weekends, after hours, and prior to daily construction.
- Control dust from debris being hauled away from the site.

A national Pollutant Discharge Elimination System (NPDES) general permit will be acquired prior to construction to minimize storm run-offs during construction.

Mitigation measures will be instituted following site-specific assessments, incorporating structural and non-structural BMPs such as minimizing soil exposure and implementing erosion control measures such as silt fences and sediment basins. Following construction, erosion is anticipated to decrease since the soils will have been graded, built over, paved over or landscaped. Landscaping in turn will provide erosion control. Mass grading of the development areas will be in compliance with the County of Kaua'i's grading ordinance requirements and will require NPDES permit from the State DOH for storm water construction activities, including BMPs to minimize off-site impacts.

The Property is encompassed by the Kapa'a By-Pass Road to the south and Olohena Road to the east and the north side. The by-pass road is owned by the Applicant and the Applicant intends to dedicate said road to the Department of Transportation (DOT) for continued public use.

There is a round-about located at the south east corner of Olohena Road and the Kapa'a By-Pass Road. Kuhio Highway is accessible from the Property by driving south on Olohena and Kukui Street approximately 0.5 mile. The project will have a complete multi-modal roadway from the Kapa'a By-Pass Road running north through the Property to Olohena Road. A couple of bus stops will be located along the roadway. A bike/walking path is proposed from the south of the property to the Kapa'a Middle School located on the North portion of the Property.

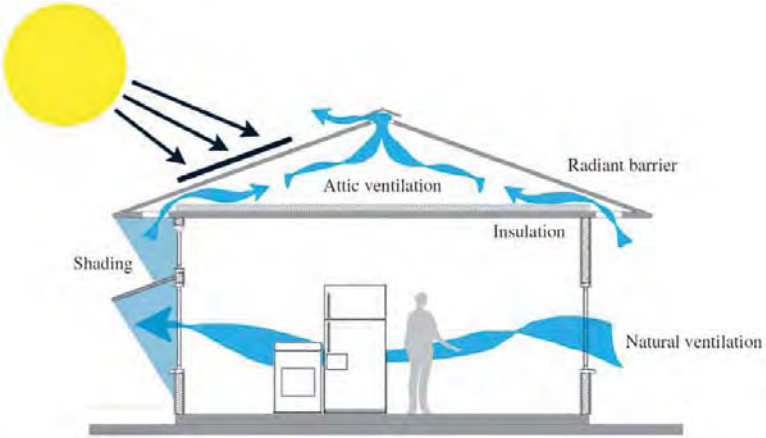
Improvements Planning

There are three major sources of unwanted heat in homes: direct solar impacts on a building and through windows and skylights; heat transfer and infiltration, of exterior high temperatures, through the materials and elements of the structure; and the internal heat produced by appliances, equipment and inhabitants.

The DBEDT Field Guide for Energy Performance, Comfort and Value in Hawaii Homes provides a number of recommended ways to incorporate effective design options to address home temperatures. These items to be considered in the development of Kapa'a Highlands II are summarized and illustrated below:

Design for Comfort and Value

A. Control Heat Gain: Use strategies to reduce solar heat gain through roofs, walls and windows.
   1. Orient and arrange building to control heat gain
   2. Landscape and design outdoor surfaces to reduce air temperatures and glare; minimize paving area and use grassed and planted areas to provide lowered site temperatures, shade and evaporative cooling
   3. Shade roofs, walls and windows with:
      a. Architectural elements such as eaves, awnings and carports, and
      b. Window treatments such as blinds and shutters
   4. Use insulation and/or radiant heat barriers in roofs and walls exposed to the sun
   5. Use high performance windows (Low-e, spectrally selective, or tinted glazing) to keep solar heat out of interior spaces while admitting daylight
   6. Use light colored roofing and wall finishes
   7. Shade or insulate materials with high thermal mass, such as concrete floors, to avoid heat build-up and uncomfortably hot surface temperatures



B. Use Natural Ventilation: Provide ample fresh air ventilation for living spaces and areas where hot air and humidity accumulate, such as attics, high ceiling spaces, kitchens, bathrooms and laundry areas.
   1. Orient buildings to maximize the cooling potential of prevailing winds and minimize morning and afternoon heat gain
   2. Design floor plans and opening placement and type to provide effective cross ventilation with good air circulation throughout room areas and at body level
   3. Provide generous screened openings well protected from the rain

   4. Use architectural design elements such as vents and casement windows to improve interior air circulation
   5. Enhance natural ventilation with fans as needed:
      a. Use ceiling and whole house fans to provide comfort on warm, humid or still days
      b. Use solar powered attic vent fans when appropriate and economically feasible

Shaded areas stay cooler

Consistent with the principles and recommendations noted in the DBEDT publication *Hawai'i Homeowner's Guide to Energy, Comfort & Value*, to the extent feasible and practical, Kapa'a Highlands II will incorporate the following:

Site Planning and Landscaping

Orientation of homes is important. Try to minimize the area of east- and west-facing walls and windows because they are difficult to shade from the sun.

Landscaping and the design of outdoor surfaces can reduce air temperatures and glare. Landscaping minimizes paving area provides lowered site temperatures, shade and evaporative cooling.

Low impact landscaping. Selection and distribution of plants must be carefully planned when designing a functional landscape. Aesthetics are a primary concern, but it is also important to consider long-term maintenance goals to reduce inputs of labor, water, and chemicals. Properly preparing soils and selecting species adapted to the microclimates of a site greatly increases the success of plant establishment and growth, thereby stabilizing soils and allowing for biological uptake of pollutants. Dense, healthy plant growth offers such benefits as pest resistance (reducing the need for pesticides) and improved soil infiltration from root growth. Low impact landscaping can thus reduce impervious surfaces, improve infiltration potential and improve the aesthetic quality of the site.

Protect and retain existing landscaping and natural features. Select plants that have low water and pesticide needs, and generate minimum plant trimmings. Use compost and mulches. This will save water and time.

Examples of Low Impact Landscaping

- Planting native, drought tolerant plants
- Converting turf areas to shrubs and trees
- Reforestation
- Encouraging longer grass length
- Planting wildflower meadows rather than turf along medians and in open space

Control Heat Gain

By using strategies to reduce solar heat gain through roofs, walls and windows, a house can stay cool. Roofs, walls, windows and outdoor flooring can be shaded with architectural elements such as eaves, awnings and carports, and shutters.

Walls

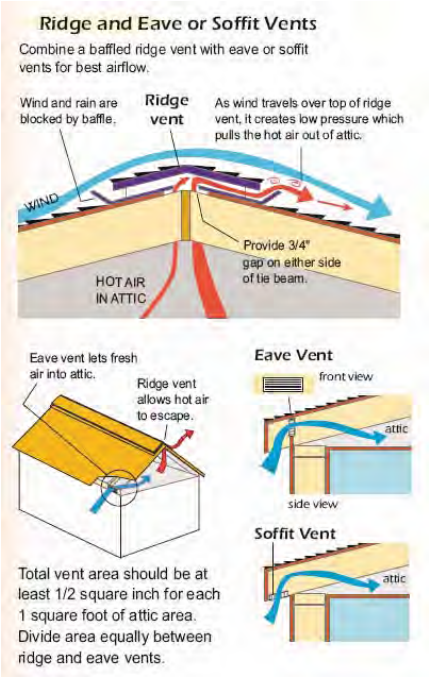
Unshaded walls can get very hot and make your home uncomfortable. The best "cool wall" strategy is shading with overhanging eaves, lanais, or landscaping. If complete shade isn't feasible, use insulation or radiant barriers in the exposed walls. Use a white exterior finish to improve cool wall performance.

Windows

The use of high performance windows (Low-e, spectrally selective, or tinted glazing) helps keep solar heat out of interior spaces while admitting daylight. Overhangs, awning and trees can keep the sun from striking windows directly.

Roofs and Roofing Material

A cool roof is essential for a comfortable home. Insulation keeps roofs and homes cool by blocking heat on the roof thus, the attic, the ceiling and the rest of the house stay cool and comfortable. Installing a white roof will keep a home cooler.



Ventilation is another tool for keeping homes cool. For houses with attics good ventilation is recommended. Ridge and Eave or Soffit Vents work as well. If a ridge vent is not feasible, use a solar powered vent fan in combination with eave or soffit vents, to push warm air out of the house and attic.

Solar Water Heating

Minimizing the energy required for water heating is the most important energy saving step for a Hawaii home. Conventional water heating is a big expense and accounts for about 40% of the utility bill in a Hawaii house.

Hawaii was the first state in the nation to require solar water heaters in new home construction. Act 204 SLH 2008, requires all building permits for single-family homes issued after Jan. 1, 2010, to include solar water heaters. Exceptions are allowed where homes have poor sunlight; if it is cost-prohibitive after 15 years; when the dwelling has a substitute renewable energy source; or if there is an approved tankless water heater and another appliance, both powered by gas.

Additionally insulating hot water supply lines and pipes with at least ½" foam or 1" fiberglass insulation and setting heater thermostats adjustable for 120F or less, can add additional energy savings to a homeowner.

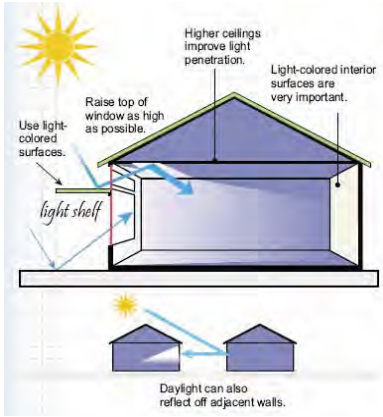
Photovoltaic systems

Alternative energy sources such as photovoltaics and fuel cells that are now available in new products and applications will be available as a house feature option. Renewable energy sources provide a great symbol of emerging technologies for the future.

Lighting

Energy Efficient Light Design

Energy efficient light design features help minimize electric lighting energy demand and heat gain. An efficient lighting system uses fluorescent lamps as the primary light source and may selectively use incandescent (also halogen, a type of incandescent) for accent lighting and for applications where the light is usually off (like exterior lights on motion sensor controls). Modern fluorescent lighting can provide excellent color rendering and be free of flicker and hum. Additionally, start up is nearly instantaneous with electronic instant-start and rapid-start ballasts. Fluorescent lamps last 10 to 20 times longer than incandescents, saving energy all the while, so the lifetime cost is much lower and fluorescent lights do not emit as much heat as incandescents.

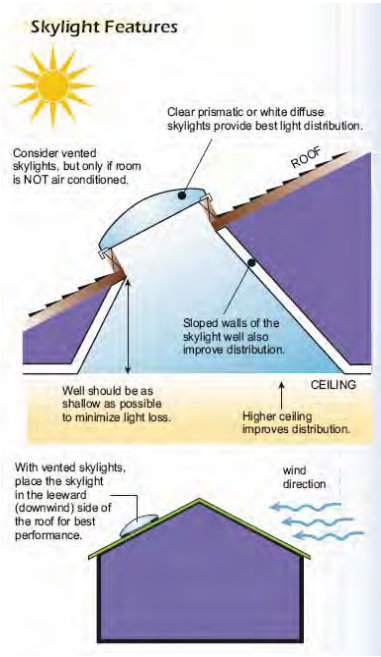


Providing controls such as timers, dimmers, sensors and separate fan/light controls to limit power use to the times and levels needed, also helps reduce lighting power consumption.

The use of solar powered landscape lighting when economically feasible is another energy saving design feature which can be used for both residential homes as well as business and civic buildings and spaces.

Daylighting

Daylighting is the use of natural sunlight to light interior spaces. Using controlled, filtered and indirect daylighting to light interior spaces reduces electric lighting loads. The effectiveness of daylighting can be increased with generous wall openings, open floor plans and light colored interior finishes.



Windows are usually a home's main source of daylight. Blocking direct sunlight and bouncing light on to the ceiling helps facilitate daylighting. Minimizing areas of east- or west-facing windows and using blue or green glass help.

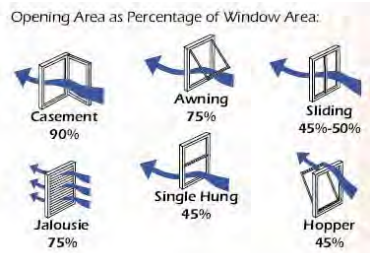
Skylights (traditional, vented, tubular) can provide significant daylighting opportunities.

Light-colored interior finishes are critical for good light distribution thus, white ceiling is recommended.

Rooms with higher ceilings and narrow floor plans are easier to daylight. Consider several smaller skylights instead of one larger skylight for better light distribution.

Natural Ventilation

Kapa'a Highlands II will optimize air-flow by designing homes that capture cooling breezes to keep homes comfortable. Utilizing natural ventilation also helps reduce health hazards such as mold and mildew.



Buildings should be oriented to maximize the cooling potential of prevailing winds and minimize morning and afternoon heat gain. Floor plan design will include effective cross ventilation with good air circulation throughout room areas and at body level.

Providing generous screened openings and using architectural design elements such as vents and casement windows will improve interior air circulation.

Ceiling fans are a great way to enhance natural ventilation. Use ceiling and whole house fans to provide comfort on warm, humid or still days.

Transportation

The Property is encompassed by the Kapa'a By-Pass Road to the south and Olohena Road to the east and the north side. The by-pass road is owned by the Kapa'a Highlands II which is working with the Department of Transportation (DOT) and has been allowing for the continuous public use of the road. The by-pass road is in the process of being dedicated to DOT. The agreement of transfer will include that all mitigating measures will be the shared responsibility of DOT and Kapa'a Highlands II.

There is a round-about located at the south east corner of Olohena Road and the Kapa'a By-Pass Road. Kuhio Highway is accessible from the Property by driving south on Olohena and Kūkuī Street approximately 0.5-mile. The project will have a main roadway from the Kapa'a By-Pass Road running north through the Property to Olohena Road. The roadway will follow the county's resolution for complete roads and as such will be a multi-modal roadway. A couple of bus stops will be located along the roadway. A bike/walking path from the round-about south east of the property will follow the bypass road, connect to the main road and continue to the Kapa'a Middle School located on the North portion of the Property. Kapa'a Highlands II is continuing to work with the DOT on potential traffic issues.

Transportation, housing, land use and infrastructure need to be integrated and incorporated into Kaua'i's long-term transportation policies as the population continues to grow in the years ahead. The Kaua'i General Plan, includes the following policies:

Bus Transit.

- Continue to operate The Kauá i Bus; seek to increase ridership and expand service, subject to the availability of funds.
- Improve bus stops to increase safety and convenience of service.
  - Improvements to pullover areas along roadways in order to create safe and accessible bus stops.
  - Designated areas at housing projects (particularly those with elderly and disabled residents) that provide safe and accessible paratransit stops.

Bikeways.

- Support funding to develop Kaua'i's bikeway system to provide for alternative means of transportation, recreation, and visitor activities (economic development).

Regional Highways and Roads.

- Use General Plan policies concerning rural character, preservation of historic and scenic resources, and scenic roadway corridors as part of the criteria for long-range highway planning and design. The goal of efficient movement of through traffic should be weighed against community goals and policies relating to community character, livability, and natural beauty.
- Consider transportation alternatives to increasing the size and capacity of roadways. Alternatives include increased utilization of public transit.
- Planning for the Kapa'a By-Pass should incorporate connector roads between the By-Pass and the coastal highway and between the By-Pass and roads serving the valley.
- The State and the County should jointly undertake a study of the existing roadway network and the future transportation needs within the Kapa'a-Wailua homesteads area.

- Reserve corridors for future roadways as shown on the General Plan Land Use Map. The corridors are conceptual only and are subject to environmental assessment and evaluation of alternative alignments.

Kapa'a Highlands II is committed to Multi-modal, Interconnected and Concurrent Transportation for its residents and community.

Multi-modal Interconnected Roads and Streets

The proposed main complete, multi-modal roadway through the development will include bus stops, sidewalks and a bike and walking path connecting from Kapa'a Middle School down through the development to the round-about, facilitating green travel to and from Kapa'a's town core.

Kapa'a Highlands II incorporates multiple road interconnections with neighbors.

Kapa'a Highlands II will incorporate a system of interconnected roads that will provide residents alternative transportation routes within the project. The internal circulation pattern will provide safe and convenient choices for drivers, bicyclists and pedestrians.

Additional sustainable connectivity concepts including bikeways and walkways to and from the planned County pool, neighborhood commercial areas, the middle school and Kapa 'a's town core are planned.

Complete Streets

Through recent legislation, the State of Hawaii Department of Transportation (HDOT) and county transportation departments are required to ensure the accommodation of all users of the road, regardless of their age, ability, or preferred mode of transportation. In addition, the concept of "Complete Streets" is prioritized where:

> "(T)ransportation facilities ... are planned, designed, operated and maintained to provide safe access and mobility for all users, including bicyclists, pedestrians, transit riders, freight and motorists".

In addition to providing vehicle access, roadway networks are a vital part of the livability of our communities. Complete streets will provide an ease of use and access to destinations by providing an appropriate path of travel for all users, and enhance the ability to move people and goods throughout the state and its counties.

Additionally, complete streets principles will help contribute to a clean and secure energy future for Hawaii by offering flexibility and better accommodation for safe transit, walking, bicycling and alternate fuel vehicles that together, will decrease demand for imported oil.

Complete Streets are streets for everyone. They are designed and operated to enable safe access for all users. Pedestrians, bicyclists, motorists and public transportation users of all ages and abilities are able to safely move along and across a complete street.

Complete Streets make it easy to cross the street, walk to shops, and bicycle to work. They allow buses to run on time and make it safe for people to walk to and from transit stations.

Economic Opportunities

Kapa'a Highlands II provides significant, on-going economic and fiscal benefits for residents of Kaua'i, as well as for the County and State governments.

Development of facilities would generate employment and consequent income and taxes. In addition, by providing the opportunity for new residents to the Island of Kaua'i and generating additional real estate sales activity, the Project is expected to support long-term impacts, including additional consumer expenditures, employment opportunities, personal income and government revenue enhancement.

On a short-term basis, the proposed development will have a direct beneficial impact on the local economy during construction through construction and construction-related employment. It should also be noted that the proposed development will assist in maintaining a viable economy as construction-related employment opportunities for residents would be generated.

Over the long term, the residential homeowners will require various services related to home maintenance and improvement that will further support the local economy.

On-Site Employment Generators

Kapa'a Highlands II proposes two areas for commercial uses that, ultimately, will serve to promote and provide a variety of job opportunities. A 0.4-acre parcel is proposed for commercial uses such as a country store and small personal service type uses are anticipated. A 1-acre site on the Makai side of the Kapa'a Bypass Road is also proposed for commercial development or for use as sub-stations for the police and/or fire department.

Open Space and Parks

Kapa'a Highlands II holds respect for the environment by interlinking natural features and open space as core components of the community.

There are several parks within Kapa'a town, including a beach park. A County-owned 1.9-acre park is located within walking distance from the Property, just south east of the corner of Olohena Road and the by-pass road round-about. The park consists of a baseball field, football field, basketball courts, restroom facilities, picnic tables and a barbecue area.

Open space and open greenway areas encompassing 14.3-acres will be developed within the project. A 3.1-acre park is proposed within the project for outdoor recreation. Land for the proposed relocation of the Kapa'a county swimming pool will be available within the 3.1-acre park. The provision of a 3.1-acre park with a county swimming pool within the proposed development will provide residents with an opportunity for leisurely recreational activities.

Kapa'a Highlands II is conforms with HRS § 205-a-2(B) (3) (A) which states that CZM's objective is to "protect, preserve and, where desirable, restore or improve the quality of coastal scenic and open space resources."

The policies to achieve this objective are as follows:

1. Identify valued scenic resources in the coastal zone management area;
2. Ensure that new developments are compatible with their visual environment by designing and locating such developments to minimize the alteration of natural landforms and existing public views to and along the shoreline;
3. Preserve, maintain, and, where desirable, improve and restore shoreline open space and scenic resources; and
4. Encourage those developments which are not coastal dependent to locate in inland area.

No scenic, historic, cultural spaces exist or will be created on the subject site and the site is well away from the shoreline. There are no natural wildlife, forest, marine, or unique ecological preserves on or near the subject site. Thus, open space and recreation will not be adversely affected. Park and beaches of Kapa'a are within walking distances from the project.

The proposed project will not adversely impact scenic or open space resources. The proposed project will not involve significant alteration of the existing topographic character of the site and will not affect public views to and along the shoreline.

Water Management

As an overarching philosophy in all source alternatives, Kapa'a Highlands II is committed to water conservation strategies to reduce consumption, conserve resources and minimize water use. The goal is to reduce the total water use through a combination of water saving equipment and strategies.

A number of measures may be implemented to facilitate end-use conservation, including water restrictions during drier periods, public education and more efficient landscaping practices. Consumption could be significantly reduced through end-user conservation.

Efficient fixtures and appliances will reduce indoor water use. The water distribution system will be maintained to prevent water loss and homeowners and businesses will be encouraged to maintain fixtures to prevent leaks. Landscaping will emphasize climate-adapted native and other appropriate plants suitable for coastal locations. Best management practices will be designed and implemented to minimize infiltration and runoff from daily operations.

WaterSense

WaterSense, a partnership program by the U.S. Environmental Protection Agency, seeks to protect the future of our nation's water supply by offering people a simple way to use less water with water-efficient products, new homes, and services. WaterSense brings together a variety of stakeholders to:

- Promote the value of water efficiency.
- Provide consumers with easy ways to save water, as both a label for products and an information resource to help people use water more efficiently.
- Encourage innovation in manufacturing.
- Decrease water use and reduce strain on water resources and infrastructure.

The program seeks to help consumers make smart water choices that save money and maintain high environmental standards without compromising performance. Products and services that have earned the WaterSense label have been certified to be at least 20 percent more efficient without sacrificing performance.

If one in every 10 homes in the United States were to install WaterSense labeled faucets or faucet accessories in their bathrooms, it could save 6 billion gallons of water per year, and more than $50 million in the energy costs to supply, heat, and treat that water!

Water Efficient Fixtures

Water is a finite resource—even though about 70 percent of the Earth's surface is covered by water, less than 1 percent is available for human use. Each American uses an average of 100 gallons of water a day at home. We can all use 30 percent less water by installing water-efficient fixtures and appliances. The average household spends as much as $500 per year on their water and sewer bill and can save about $170 per year by installing water-efficient fixtures and appliances.

Water-efficient fixtures reduce water and sewer costs, reduce demand on water supplies and treatment facilities, and reduce heating energy consumption and associated greenhouse gas emissions.

High efficiency toilets: (HETs) reduce flush volumes by no less than 20% compared to conventional ultra-low flow (ULFT) toilets. Dual-flush HETs allow users to choose one of two flushes: liquids or solids. In actual operation, dual-flush HETs average about 1.2 to 1.4 gpf. Pressure-assist HETs use a pressurized tank that creates for a more forceful flush with less water.

Faucets: Water flow is reduced by ***Flow limiters*** which are built into the faucet or are installed as after-market fittings. Aerators or laminar flow devices are types of flow limiters.

- Aeration injects air into the stream of water, displacing much of the water content.
- Laminar flow uses multiple small diameter parallel streams of water that are not aerated.

Flow control valves can limit water flow down to 1.5 to 0.5 gpm per side (hot and cold).

Showerheads: Federal law since 1994 mandates that all showerheads sold in the United States use 2.5 gpm or less. Despite this, some showerheads actually use much more than 2.5 gpm, and shower towers that include multiple showerheads or jets can total 12.5 gpm or more. A better option is a good quality low-flow showerhead designed to use 2.0 gpm or less while providing a satisfying shower.

Groundwater

A Water Master Plan has been approved, in concept, by the County Department of Water (DOW). Kapa'a Highlands II has a proven well site that will be dedicated to the DOW to feed the Department of Water's storage tanks and existing water system. Kapa'a Highlands II is committed to working with the DOW on pertinent water issues during the design and development phase.

The proposed water system will be subject to regulation as a public water system and will meet conditions of the State Department of Health, including HAR Chapter 11-20, 11-21 and 11-25.

Kapa'a Highlands, Phase II consists of approximate 97-acres on the eastern half of the 163.123-acres of Kapa'a Highlands. The proposed development is not anticipated to have significant adverse impacts on ground water because no active water systems are on the 97-acres. The irrigation facility for this former sugar land is no longer available.

A stream exists on Kapa'a Highlands I, flowing from north to south along the western border of the 163.123-acres of Kapa'a Highlands II. Kapa'a Highlands II is committed to keeping the flow of the stream consistent to prevent any potential health and mosquito problems associated with streams when not flowing naturally.

Storm and Surface Water Runoff

A Preliminary Drainage Report has been prepared. A detailed Drainage and Erosion Mitigation Plan will be prepared and submitted to the County Engineer for approval during the design and development stages. The Applicant will be providing major drainage improvements in connection with development of the property. Multiple detention ponds are proposed for the property. Additionally, a series of catch basins, drainage, pipes and culverts will be utilized to direct run off to major drainage areas on the property.

The project's proposed drainage system will be designed to minimize impacts to near shore coastal waters. Water quality treatment and detention basins will be built to prevent runoff and sedimentation from impacting groundwater resources. Prior to the occupancy of any residential or commercial unit within the project, Kapa'a Highlands II shall implement and maintain storm and surface-water runoff BMPs, subject to any applicable review and approval of the State DOH, designed to prevent violations of State water quality standards as a result of storm-water discharges originating from the project. These BMPs will be documented in a declaration of covenants, conditions and restrictions that will be recorded against the property and will run with the land.

Potential water quality impacts during construction of the project will be mitigated by adherence to State and County water quality regulations governing grading, excavation and stockpiling. The County's grading ordinance includes provisions related to reducing and minimizing the discharge of pollutants associated with soil disturbing activities in grading, grubbing and stockpiling.

Construction BMPs will be utilized in compliance with County ordinances pertaining to grading, grubbing, stockpiling, soil erosion and sedimentation during construction. BMPs will also be implemented for long term development and operation of activities occurring on the site as part of pollution prevention measures.

BMPs include storm water runoff and non-storm water sources control measures and practices that will be implemented to minimize the discharge of erosion and other pollutants from entering into the receiving State waters. The erosion control plan for the proposed project include temporary and permanent control measures BMPs that will be implemented in accordance with Chapter 10 of the Hawai'i County Code.

Post construction BMPs to prevent erosion and storm water runoff after construction is completed includes the installation of drain inlets and shallow drywells within the project site, and landscaping and grassing of disturbed areas.

Prior to occupancy, Kapa'a Highlands II will implement and maintain storm and surface-water runoff BMPs, subject to any applicable review and approval of the DOH. Those BMPs will be designed to prevent violations of State water quality standards as a result of storm-water discharges originating from the Project.

Wastewater

Kapa'a Highlands II The project will be contributing to the deferred maintenance and repair of the Kapa'a Waste Water Treatment plant. The project will not be a detriment to the capacity of the Plant.

Energy Management

Pursuant to Chapter 344 (State Environmental Policy) and Chapter 226 (Hawai'i State Planning Act), HRS, all Kapa'a Highlands II activities, buildings and grounds will be designed with a significant emphasis on energy conservation and efficiency. Efficient design practices and technologies will be the cornerstone of Kapa'a Highlands II's design phase. Buildings within Kapa'a Highlands II will further comply with the County of Kaua'i Energy Conservation Code (Kaua'i County Ordinance 890). Furthermore, solar water heaters will be utilized as made requisite under Section 196-6.5, HRS. Kapa'a Highlands II will confer with KIUC in regards to suggestions and proposals for customized demand-oriented management programs offering rebates for the installation of alternative energy efficient technologies and measures

	Kaua'i	Oahu	State
Medium Income (2009)	$55,723	$67,019	$63,741
Electricity Price (May 2011)	44.27 cents/kWh	30.1 cents/kWh	-

Kapa'a Highlands II is committed to renewable energy and energy efficiently as ways to reduce environmental harm and self sufficiency. Kapa'a Highlands II will continue to improve programs and create new programs as the development is initiated.

Residents of the State of Hawaii pay the highest electricity rates in the US. The average American paid 10.5 cents/kWh in 2010. In the state of Hawaii, O'ahu currently has the lowest residential electricity rates, while Lana'i has the highest. Residential rates on Kaua'i average between 40-45 cents/kWh. Hawaii relies on imported oil for approximately 76% of its total electricity production. The price variation across the state is largely a result of difference in power plant efficiencies, power purchasing agreement and other infrastructure.

The Kaua'i Island Utility Cooperative ("KIUC") is the sole electric utility on Kaua'i. KIUC began serving the people of Kauai on November 1, 2002, when it purchased Kauai Electric from Connecticut-based Citizens Communications. KIUC is America's newest electric cooperative, but it's by no means the only one. It is one of approximately 900 electric cooperatives serving electric consumers in 47 states. Like all cooperatives, KIUC operates as a not-for-profit organization that is owned and controlled by the people it serves. KIUC serves over 23,300 customers with 92% of KIUC's electricity coming from the burning of imported fossil fuels.

In 2009 the State Legislature codified the need for energy efficiency by enacting the statewide energy efficiency portfolio standard with a target of reducing energy consumption by 30% of forecasted energy consumption by 2030 (4,300 GWh) and beginning the process for separating efficiency from the existing renewable portfolio standard.

Energy efficiency in homes and buildings

- Hawai'i Revised Statutes section 46-19.6 requires all county agencies to place a "priority on processing of permit applications for construction projects incorporating energy and environmental design building standards."

To reduce net energy consumption and demand, Kapa'a Highlands II will consider the implementation of elements of the United States Environmental Protection Agency (EPA) Energy Star Program; including efficient insulation, high performance windows, compact construction, efficient ventilation systems, and energy efficient lighting elements and appliances.

Kapa'a Highlands II will furthermore seek to harness energy conservations and technologies to facilitate the possibility of net energy metering in building design to empower residents and tenants to reduce their electricity costs and provide energy back to the grid.

Energy conservation and efficiency measures will be implemented and emphasized where applicable in the design of Kapa'a Highlands II. Energy-efficiency technologies to be considered include:

- Solar energy for water heating
- Photovoltaic systems, fuel cells, biofuels and other renewable energy sources
- Optimal utilization of daytime sunlight
- High efficiency light fixtures
- Roof and wall insulation, radiant barriers and energy efficient windows
- Optimized air-flow
- Installation of heat resistant roofing
- Intelligent Landscaping to provide for shading, dust control, and heat-mitigation
- Portable solar lighting (i.e. parking lots)

A photovoltaic system that can generate up to 1.18 MW of electricity is situated in Phase I of the Kapa'a Highlands project. Its operator entered into an agreement to sell to Kaua'i Island Utility Cooperative electricity generated from the solar farm for 20 years. "Creating more renewable energy alternatives is one of the most critical challenges we face," Kauai Mayor Bernard Carvalho said at a dedication ceremony for the solar farm.

The project spreads over five acres of a 165-acre property, and has 5,376 solar panels mounted on posts and piers. The panels average about 12-feet off the ground.

Health and Active Lifestyles

Through the layout and design of Kapa'a Highlands II, there is an overall opportunity for a positive effect on the health of its residents. Communities that make it easy and safe to walk and ride bikes are opening the door to a wide range of health benefits for their residents. They are reducing barriers to being physically active and helping individuals integrate physical activity into their daily lives.

Active living is a way of life that integrates physical activity into daily routines. For individuals, the goal is to get a total of at least 30 minutes of activity each day by, for example, walking, bicycling, playing in the park, working in the yard, taking the stairs, or using recreation facilities. For communities, the goal is to provide opportunities for people of all ages and abilities to engage in routine physical activity and to create places and policies that encourage better physical health.

The burden of physical inactivity:
The Problem:

- 25% of adults are sedentary
- 60% of adults not active enough

The Outcome:

- Obesity, cardiovascular disease, cancer, diabetes, depression
- Physical inactivity is a primary factor in over 250,000 deaths annually.
- Medical costs associated with physical inactivity and its consequences may exceed $76 billion annually. (hawaii.gov/health/healthy-lifestyles)

Walkable and bikable communities increase active living. Active living can improve health by:

- Reducing the risk of dying prematurely.
- Reducing the risk of dying from heart disease.
- Reducing the risk of developing diabetes, colon cancer and high blood pressure.
- Reducing feelings of depression and anxiety.
- Helping control weight.
- Helping build and maintain healthy bones, muscles and joints.
- Promoting psychological well being. (Michigan Department of Community Health)

Growing body of evidence:

- San Diego study: 70 minutes more physical activity/week among residents in walkable neighborhood; 35% vs. 60% overweight (Saelens, Sallis, et. al. 2003)
- 6 lb weight difference in sprawling vs. compact counties
- King County study: 5% increase in neighborhood's "walkability index" correlated with 32% increase in active transportation; 0.23 point reduction in BMI (Frank, Sallis, et. al. 2006) (hawaii.gov/health/healthy-lifestyles)

Community Design Policies Work! The Task Force on Community Preventive Services concluded that:

- Community-scale policies & design are effective
  - Zoning for compact, mixed-use development
  - Transit-oriented development
  - Policies related to street design & connectivity

- Street-scale policies & design are effective:
  - Traffic calming
  - Street lighting
  - Improving street crossings (hawaii.gov/health/healthy-lifestyles)

Education

Schools servicing the project include Kapa'a Elementary, Kapa'a Middle School and Kapa'a High School.

Kapa'a Middle School borders the project site to the north. Kapa'a Elementary School and Kapa'a High School share a campus which is approx imately 2-miles from the project site.

Kapa'a Elementary School serves grads K-5 and is one of the largest elementary schools in the state. It shares a campus with Kapa'a High School. Kapa'a E lementary School's capacity is 1,373 students, and the 2009/2010 school year enrollment was 827 students (Department of Education, 2010a).

Kapa'a Middle School, with facilities for 1,059 students, was opened in 1997 and has an enrollment of 652 students (Department of Education, 2010b).

Kapa'a High School currently has a student body numbering 1,033 with a capacity of 1,445 (Department of Education, 2010c).

The proposed project will generate increased demand on student enrollment within the region. Kapa'a Highlands II will coordinate with the DOE to ensure that the DOE's facility assessment policy provisions are appropriately addressed.

Additionally, a 3.1-acre park is proposed adjacent to the existing Kapa'a Middle School. The park will have an area for the county's proposed relocation of the Kapa'a county swimming pool. Kapa'a Highlands II also plans to develop a bike/walking path from the south of the property to the Kapa'a Middle School to facilitate biking and walking around the development.

Housing

Kapa'a Highlands II is a well located master planned project on the Island of Kaua'i targeting primary housing demand from local and in-migrant families, as well as offshore second home demand for view estate ownership. Located in the middle of the island, the project is close to the centers of employment and resort activity, plus the airport, beaches, shopping, recreation, etc. It sits above the historic town of Kapaa and below the foothills of the mountain chain that forms the island.

The proposed development, Kapa'a Highlands Phase II, will utilize 163-acres of land for single-family and multi-family residential and commercial purposes. Development of the Property will address a portion of the significant demand for affordable housing in the County of Kaua'i, without significantly affecting reserve areas for foreseeable urban growth.

Kapa'a Highlands II will respond to varying spectrums of demand for housing within Kaua'i by providing a wide range of housing opportunities inclusive of affordable housing alternatives. Kapa'a Highlands II will seek to create and sustain a mixed-income community allowing for unparalleled social diversity.

Affordable housing demands exhibited a significant upward trend over the last several years. Recent market studies have indicated a current shortage of single-family housing in the East Kaua'i area. The forecast is that demand for housing will continue to increase, especially in the area of affordable housing. The proposed development will assist in alleviating some of the current supply-and-demand pressures on Kaua'i's current housing market by providing a variety of additional housing products and opportunities for long-term local residents.

The Kawaihau Planning District has substantial capacity for additional residential development, as described in Section 6.2.3.1 (Build-Out Analysis) of the Kaua'i General Plan. "Lands previously designated for urban use but as yet mostly undeveloped include an area located near Kapa'a, south of Olohena Road. This area was previously designated for Urban Mixed Use and is shown as Urban Center on the new GP Land Use Map. Owned partly by the State and partly by Amfac/JMB (or its successor), this "expansion area" for Kapa'a has already accommodated the Kapa'a Middle School."

In a 2010 letter to the applicant, the Planning Director wrote "We are writing in general support of Three Stooges LLC's petition to amend 97-acres in Kapa'a to the Urban district. The proposed amendment is in conformance with the County of Kaua'i's General Plan and will provide 231 units of affordable housing. Affordable housing remains an acute need on Kaua'i, even with a falling real estate market and as such the County is generally supportive of any petition that proposes additional affordable housing, particularly when contiguous to developed urban areas, infrastructure and consistent with our General Plan."

Current Housing Stock

The housing stock on Kaua'i is primarily single family, 69%, with attached housing only at 31%. Around 40% of all single-family homes are built on lots sized less than 10,000 sf. The condominium stock is 64% fee-simple and 34% leasehold. It is also only 10% owner occupied, with the balance of the units investor-owned, either in a rental pool, or part of a hotel operation. About 30% of the condo units were built since 1990, with most of the rest around 25 years or more in age. 38% of the condominium units are one bedrooms, with two bedrooms at 45%.

Housing Mix

The target market for this development is relatively broad, as Kapa'a is arguably at the center of the island, with strong retail and recreational facilities, and easy commute to two out of the three major resort areas on the island. The demand for affordable housing is also significant. The proposed development will not only address a critical community need, it will also provide residents with a unique opportunity to purchase a lot and construct a home that best fits their needs on the proposed development's market-priced lots.

Kapa'a Highlands II – Market Housing Mix (2010 dollars)

Type	Average Sales Price	Lot Size	Total Units
Single-Family Lots	$180,000 to $250,000	5,000 to 8,000 Sq. Ft.	86-lots
Multi-Family Units	$220,000 to $450,000	1 to -acre Parcels	683-units

Kapa'a Highlands II – Affordable Housing Mix (2010 dollars)

Type	Average Sales Price	Lot Size	Total Units
Single-Family	$189,000 to $363,000	1,100 to 1,200 Sq. Ft. living area	13-lots
Multi-Family Units	$189,000 to $363,000	750 to 1,200 Sq. Ft. living area	154-units

Affordable Housing

An affordable housing element of the project is proposed and will conform to Kaua'i County Ordinance No. 860, Kaua'i's new housing policy wherein developers contribute up to thirty percent (30%) of the total residential units for affordable housing.

The Kaua'i housing policy provides incentives to developers who provide the required affordable units on-site and for providing single family affordable units. Kapa'a Highlands will be providing all of its affordable units on site and will include affordable single family units. This will reduce the number of affordable units required from approximately 205 units (30%) to approximately 167 units (21.7%), assuming a mix of 13 single family units and 154 multi-family units. The number of affordable units required will fluctuate depending on how many affordable single family units are provided. The proposed development will provide much needed affordable housing in the East Kaua'i region.

Under the proposed development's preliminary marketing concept, the affordable units are anticipated to be sold in the range of $189,000.00 to $363,000.00, which will be affordable to families earning from 80% up to 140% of the County's annual median income.

Anticipated Buyer Markets

The proposed products respond to the market opportunities identified above as follows:

Entry-level markets – Those units designated as affordable units, as well as many of the multifamily market units are conceived to appeal to entry-level markets, typified by the rapidly increasing 25- to 34-year-old Echo Boom cohort.

Move-up markets – Kapa'a Highlands II's single-family lot products could appeal to move-up markets and growing families.

- The first level move-up market, typified by persons aged 35 to 44, is projected to grow particularly rapidly in the 2020 to 2030 period as the Echo Boomers mature.
- A more affluent move-up market could also be attracted to the views, convenient location and lifestyle offerings at Kapa'a Highlands II.

Based on the Project location, development concept and the comparison projects surveyed, some 75% of Kapa'a Highlands II residents are anticipated to be long-term Island residents. However, some product types could also appeal to second home buyers, relocating retirees or others that may come from off-Island

There has been strong demand historically for these products offerings at these price ranges, and the future should be no different. The location is very desirable, particularly for local buyers, but also for offshore second homeowners who want to feel a part of a 'normal' (but new or upgraded) neighborhood (to say nothing of wanting to take advantage of the views).

Despite current economic conditions, there is capacity amongst prospective buyers, thanks to a strong build up in their own home equity. Coupled with a desire to secure a central location for their home, there should be a goodly number of lots purchased when they come to market (particularly if there is advanced notification).

Social Sustainability

A community is composed of people, as well as places where they live; it is as much a social environment as a physical development. Thus, communities must not only be environmentally sustainable, they must also be socially sustainable.

A socially sustainable development supports more equitable distribution of resources, supports diversity within the community, meets the basic needs of residents and invests in social and human capital, thereby sustaining the quality of life and community livability for all residents into the future.

Socially sustainable development includes the following:

- recognizes, respects and values cultural and social diversity;
- preserve and maintains a high quality of life for all of its residents;
- meets basic needs of food, shelter, education, work, income and safe living and working;
- is equitable, ensuring that the benefits of development are distributed fairly across society;
- promotes education, creativity and the development of human potential;
- preserves our cultural and biological heritage, thus strengthening our sense of connectedness to our history and environment;
- is democratic, promoting citizen participation and involvement;
- promotes the context of "Live Aloha," with people living together harmoniously and in mutual support and respect for each other

We saved the concept of Social Sustainability for the end of the analysis, to serve as a summary of the many socially-focused actions suggested in prior sections of this Sustainability Plan. Following are just a few of the issues previously mentioned:

- Affordable housing will be incorporated within the development, allowing for a diversity and mix of housing types and options
- Complete streets with walkways and bile lanes, allowing for slow movement through the neighborhoods for easy social interaction
- Space for the relocated County swimming pool
- Allocation for commercial spaces, affording project residents the opportunity to work near where they live
- Proximity to the Middle School affords multi-generation al interaction and learning
- Cooperation with the State by making land available for the Kapa'a Bypass Road, helping regional residents
- Project layout and design will create an opportunity for both residents and the community to have a positive effect on their health through walkable and bikable transportation options.
- Consistency with long range planning documents, implementing the community's vision for the future

Exhibit C

Kapa'a Highlands Agricultural Master Plan

Kapaa Highlands
Agricultural Master Plan

June 1, 2007

Agricon Hawaii LLC
P.O. Box 95
Kamuela, HI 96743

Table of Contents

Summary....1
Description....1
Environmental Suitability....2
Crop Suitability....2
Livestock....3
HRS 205 Compliance....4
Conclusion....5
Exhibit "A" Subdivision Map....6
Exhibit "B" Soils Map....8
Exhibit "C" Soils Inventory Report....10
Exhibit "D" LSB Map 100....24
Exhibit "E" LSB Map 107....26
Exhibit "F" Economics For Goats....28

A. SUMMARY

Livestock (goats) can be raised successfully at Kapaa Highlands. Climate conditions will allow for normal pasture rotation the year around. The ratio of livestock to fenced pasture should be 3 animal units (AU) to 1 acre or better.

The climate and soils at Kapaa Highlands are not ideal for the growing of most commercially viable crops due to the poor soil, strong trade winds, and the salt spray from the ocean.

Goats are sold for their meat value and the local markets on all of the islands are excellent. The intended markets for goats raised on the property are the local Kauai market and the Honolulu market.

The Economics for Goats included in this report provides a picture of expected revenue and classifications of operating expenses associated with a livestock (goat) operation ("Project").

The Association of Condominium Owners of the Kapaa Highlands Condominium ("Association") may choose to operate the Project on behalf of participating owners. Alternatively, the Association may choose to enter into a contractual relationship with a livestock contractor pursuant to a license agreement in which the livestock contractor will pay an annual rent per acre to graze the property, plus a percentage of gross profits.

Livestock grazing is a permissible use within the agricultural districts as outlined under Hawaii Revised Statutes (HRS) Chapter 205, Section 205-4.5.

B. DESCRIPTION

The Kapaa Highlands Subdivision is located in Kapaa, above the Kapaa Bypass Road and adjacent to Kapaa Middle School. The property is further identified by Kauai Tax Map Key No. (4) 4-3-03:01. The total land area is 163.125 acres and the combined grazing area is approximately 101.573 acres.

Almost all of the property is located in the State Land Use Commission Agricultural District and within the Agriculture District of the Comprehensive Zoning Ordinance of the County of Kauai (CZO). As such, owners of subdivision lots will be required to comply with the requirements of HRS Chapter 205 and the CZO. Individual lot owners, through the Association, will be required either to provide a portion of their lot for the grazing of livestock as outlined in this Agricultural Master Plan, or to obtain an amendment to this Agricultural Master Plan to conduct alternative agricultural activities. The Kapaa Highlands is shown on the map attached hereto as Exhibit "A".

C. ENVIRONMENTAL SUITABILITY

1. Climate

The property is exposed to the northeast trade winds and, due to the proximity of the property to the ocean the trade winds will carry some salt spray to the property. This is problematic for most commercial crops, but should have no impact on livestock and minimal impact on salt resistant grasses. Annual rainfall is generally between 40 and 50 inches.

2. Soil

The soils are generally well-drained, dark reddish-brown silty clay and silty clay loam. The soil depth is generally between 10 and 15 inches.

The property was previously planted to sugar cane and due to the nature of sugar cane cultivation, these soils can be expected to be low in organic matter and have a low pH (very acid).

A Soils Map for the property is attached hereto as Exhibit "B", and a Soils Inventory (containing technical descriptions of soil types) is attached hereto as Exhibit "C".

The Land Study Bureau Land Classification for this property is B, C, D and E lands, as shown on the Detailed Land Classification Maps attached hereto as Exhibits "D" and "E".

3. Drainage

All the soils on the property are well drained indicating that, if good conservation practices are used, they should not erode.

D. CROP SUITABILITY

Due to the generally poor soils and harsh climate, the commercial crops most suited to the area are sugar and pineapple. Both of these industries are declining in Hawaii. Pineapple is no longer grown on Kauai and there is only one sugar mill that remains in operation. With appropriate irrigation and management, both tropical orchard crops (including trees) and some vegetable crops could be grown on the property, although with some difficulty and risk given the physical conditions at the property.

E. LIVESTOCK

1. Association Project

The Association may choose to operate the Project on behalf of all participating owners. In such case, the Association would be responsible for the rotation, care and marketing of the animals. The participating owners would be responsible for providing fixed assets (fences, gates, and water systems) on the owners' lots. The participating owners would be required to pay their proportionate share of all operational costs to the Association, and would be entitled to their proportionate share of all profits generated by the Project.

2. Contractor Operation

As an alternative, the Association could hire an independent contractor ("Contractor") to operate the Project. In such a case, the Contractor would own the goats and be responsible for the rotation, care, and marketing of the animals. The Association, through the participating owners, would be responsible for the fixed assets. These assets would include the fences, gates, and water systems. The Contractor would pay the Association a fixed rent per acre of pasture plus a percentage of gross profits, and would be responsible for normal maintenance of the fixed assets associated with the livestock operation.

3. Individual Goat Operators

The Owner may elect to engage in individual goat raising operations within the Owner's Agricultural Area of the Owner's Lot ("Owner's Operation"). In such case, the following shall apply:

a. The Owner shall be solely responsible for the costs of the Owner's Operation.

b. The Owner shall raise a minimum of three (3) goats for each acre within the Owner's Agricultural Area.

c. The Owner shall submit reports to, and as required by, the Association providing pertinent information concerning the Owner's Operation and in such detail as to comply with and satisfy the reporting requirement contained in the Agricultural Subdivision Agreement and the County Subdivision Approval.

4. Goat Husbandry

It is recommended that a breeding herd with a ratio of 1 buck to 50 does be maintained. Does will produce an average 1.5 kids per year. Kids can be weaned at approximately 5 to 6 months and should be separated from the breeding herd at this point. The gestation period for a doe is approximately 5 months.

The carrying capacity of the pasture at Kapaa Highlands is approximately 3 to 4 animal units (AU) to the acre. The breeding herd that consists of bucks and does is considered to be one AU per animal. Kids are ½ AU per animal. Therefore, assuming all of the owners became participants in the Project, there would be 101.573 acre of pasture available to carry 355 AU at 3.5 AU per acre. Attached hereto as Exhibit "F" is a spreadsheet entitled "Economics for Goats" which contains detailed assumptions regarding carrying capacity.

The breeding herd should be given good pasture and be kept on a strict health program so that its production of kids is at its optimum. The herd should be wormed every 30 to 60 days and provided with a mineral supplement. The water requirement for goats is between 2 and 3 gallons per day per AU. This will be dependent upon climatic conditions. Supplemental feeding is generally not required unless rainfall diminishes over several months to a point where the grass growth is insufficient to maintain the herd. At this point, the contractor has the option of providing supplemental feed or moving some or all of the goats to another location.

Goats are marketed at between 6 and 9 months of age at a weight of between 60 and 80 pounds. The estimate market price per goat ranges from $140 and $180. The primary market is the Kauai Island market that commands a higher price. The secondary market is Honolulu. The freight to Honolulu is paid by the buyer. Goats are generally sold to individuals who slaughter them for their meat. The market in Hawaii for goats is very stable.

The Economics for Goats spreadsheet contains details on the economics of the livestock (goat) operation.

F. HRS 205 COMPLIANCE

Hawaii Revised Statutes Chapter 205 establishes classifications of lands and requirements for land use. Section 205-4.5 defines permissible uses within the agricultural districts. This section also defines the soil classification rating that applies to the Chapter.

Section 205-4.5 uses the Land Study Bureau's (LSB) soil classification productivity rating system to determine which lands are to be governed by the Chapter. The LSB ratings for Kapaa Highlands are B, C, D and E. Land classification ratings A and B are restricted to the permitted uses as outlined in the section. The cultivation of crops and the raising of livestock are permitted uses. Uses on C, D and E lands also include crop cultivation and the raising of livestock.

G. CONCLUSION

The climate and soils at Kapaa Highlands are not ideal for the growing of most commercially viable crops due to the poor soil, strong trade winds, and the salt spray from the ocean. Thus a livestock operation provides an economically viable agricultural use for the property.

Either the Association operation of a livestock project, or a contractual relationship between the Association and a livestock Contractor, would allow the agricultural component of the property to be managed as one unit. Individual lot owners would also have the option of compliance with alternate methods of livestock grazing or with the cultivation of agricultural crops, provided they obtained the approval of the Planning Commission of the County of Kauai, Subdivision Committee, for an amendment to this Agricultural Master Plan for such alternative agricultural activities.

Livestock grazing is a permissible use within the agricultural districts as outlined under HRS Chapter 205, Section 205-4.5.

Exhibit "A"

Subdivision Map

Exhibit "B"

Soils Map

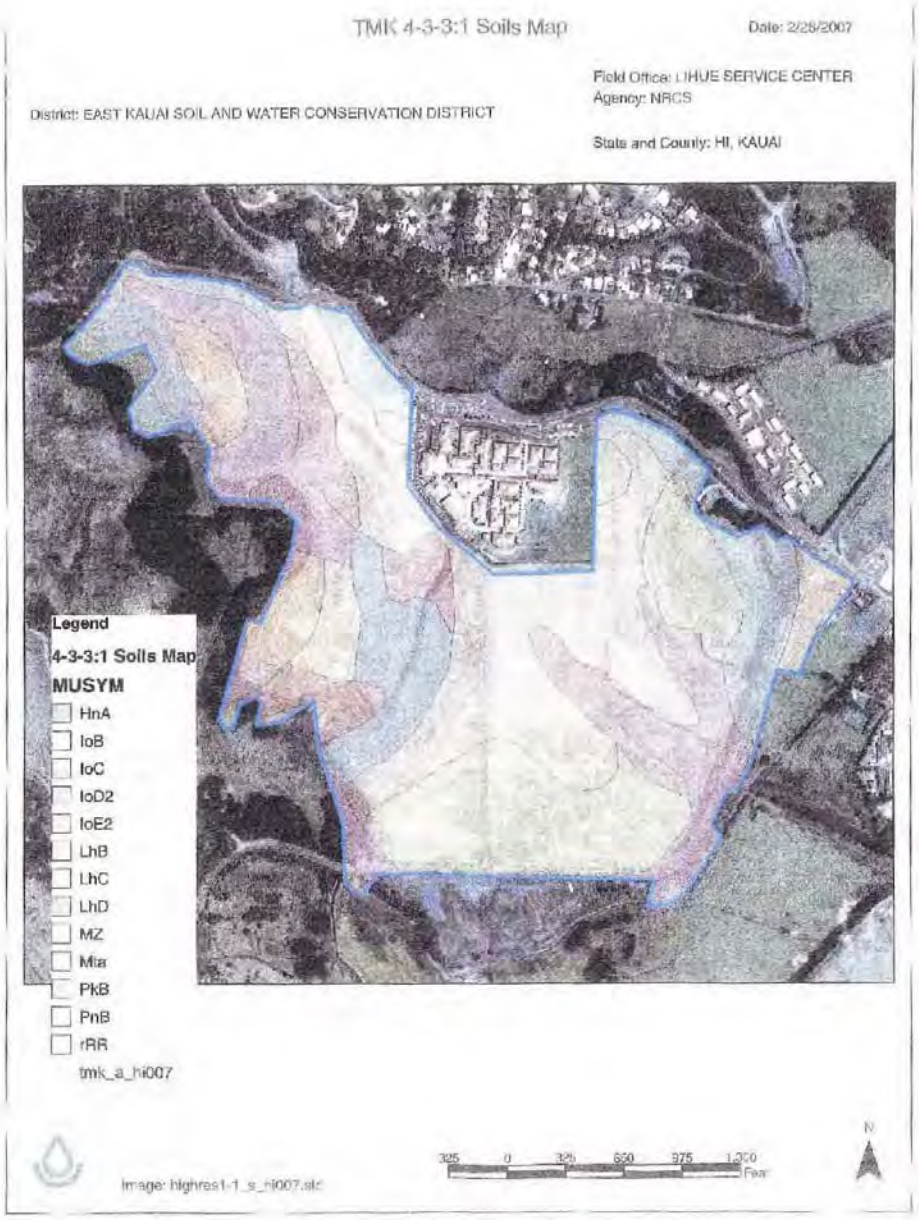


Exhibit "C"

Soils Inventory Report

Soils Inventory Report

TMK (4) 4-3-3:1

Map Unit Symbol	Acres	Percent
HnA	1.4	1%
IoB	44.5	27%
IoC	16.2	10%
IoD2	10.7	7%
IoE2	24.7	15%
LhB	8.4	5%
LhC	0.8	0%
LhD	4	2%
Mta	3.2	2%
MZ	0.3	0%
PkB	0.9	1%
PnB	31.9	20%
rRR	15	9%
Total:	162	

Hanalei Series

This series consists of somewhat poorly drained to poorly drained soils on bottom lands on the islands of Kauai and Oahu. These soils developed in alluvium derived from basic igneous rock. They are level to gently sloping. Elevations range from nearly sea level to 300 feet. The annual rainfall amounts to 20 to 120 inches. The mean annual soil temperature is 74° F. Hanalei soils are geographically associated with Haleiwa, Hihimanu, Mokuleia, and Pearl Harbor soils.

These soils are used for taro, pasture, sugarcane, and vegetables. The natural vegetation consists of paragrass, sensitiveplant, honohono, Java plum, and guava.

Hanalei silty clay, 0 to 2 percent slopes (HnA).

This soil is on stream bottoms and flood plains. Included in the areas mapped on Kauai along the Waimea River and in Waipaoiki Valley are small areas where the surface layer is 8 to 10 inches of reddish-brown silty clay. Included in the areas mapped on Oahu were small areas of very deep, well-drained alluvial soils and small areas of very poorly drained to poorly drained clay soils that are strongly mottled and are underlain by peat, muck, or massive marine clay.

In a representative profile the surface layer, about 10 inches thick, is dark-gray and very dark gray silty clay that has dark-brown and reddish mottles. The subsurface layer is very dark gray and dark-gray silty clay about 3 inches thick. The subsoil, about 13 inches thick, is mottled, dark gray and dark grayish-brown silty clay loam that has angular blocky structure. The substratum is stratified alluvium. The soil is strongly acid to very strongly acid in the surface layer and neutral in the subsoil.

Permeability is moderate. Runoff is very slow, and the erosion hazard is no more than slight. The available moisture capacity is about 2.1 inches per foot of soil. Roots penetrate to the water table. Flooding is a hazard.

Representative profile: Island of Kauai, lat. 22°12'37.8" N. and long. 159°28'47" W.

Ap-0 to 6 inches, dark-gray (10YR 4/1) silty clay; common distinct mottles of dark brown (7.5YR 4/4), red (2.5YR 5/8), and dark reddish brown (5YR 3/4) ; weak, coarse and medium, granular structure; very hard, friable, sticky and plastic; abundant fine and medium roots; many fine and medium pores; very strongly acid; abrupt, wavy boundary. 4 to 6 inches thick.

A1g-6 to 10 inches, very dark gray (10YR 3/1) silty clay; many distinct mottles of dark reddish brown (5YR 3/4), yellowish red (5YR 4/8), dark brown (7.5YR 4/4), and dark grayish brown (10YR 4/2); weak, coarse, prismatic structure; very hard, firm, sticky and plastic; abundant fine and medium roots; common fine and medium pores; strongly acid; gradual, smooth boundary. 3 to 5 inches thick.

A3g-10 to 13 inches, mixed, very dark gray (10YR 3/1) and dark gray (10YR 4/1) silty clay; many distinct mottles of yellowish red (5YR 4/8) and dark reddish brown (2.5YR 3/4); weak, coarse, prismatic structure; very hard, firm, sticky and plastic; common medium and fine roots; many fine and medium pores, slightly acid; gradual, smooth boundary. 2 to 4 inches thick.

B21g-13 to 18 inches, mixed, dark-gray (10YR 4/1) and dark grayish-brown (10YR 4/2) silty clay loam; many distinct mottles of strong brown and dark red (2.5YR 3/6); massive, but a few pockets have weak, medium, angular blocky structure; hard, firm, sticky and plastic; few medium and fine roots; many fine and medium pores; neutral; gradual, smooth boundary. 4 to 7 inches thick.

B22g-18 to 26 inches, dark grayish-brown (10YR 4/2) silty clay loam; many distinct mottles of dark red (2.5YR 3/6) and strong brown (7.5YR 5/6); weak, coarse, prismatic structure breaking to weak, fine and medium, angular blocky; slightly hard, firm, sticky and plastic; few medium and fine roots; many fine and medium pores; neutral; gradual, smooth boundary. 7 to 9 inches thick.

C-26 to 36 inches, dark grayish-brown (10YR 4/2) silty clay loam; common distinct mottles of strong brown (7.5YR 5/6), dark red (2.5YR 3/6), and red (2.5YR 4/6); massive; slightly hard, friable, sticky and plastic; few medium roots; many, fine and medium, tubular pores; slightly acid; water stands above this layer.

The A horizon ranges from 10YR to 2.5Y in hue, from 3 to 4 in value, and from 1 to 2 in chroma. Mottles range from a few faint ones to many distinct ones. The B horizon ranges from 10YR to 2.5Y in hue, from 2 to 4 in value, and from 1 to 2 in chroma. Mottles in the B and C horizons range from few to many. The depth to the seasonal high water table ranges from 2 to 5 foot. The C horizon is stratified. It ranges from silty clay to sand in texture.

This soil is used for taro, pasture, and sugarcane. (Capability classification IIw, irrigated or nonirrigated; sugarcane group 3; pasture group 7; woodland group 4)

Hanalei silty clay, 2 to 6 percent slopes (HnB).

On this soil, runoff is slow and the erosion hazard is slight. This soil is used for sugarcane, taro, and pasture. (Capability classification IIw, irrigated or nonirrigated; sugarcane group 3; pasture group 7; woodland group 4)

Hanalei stony silty clay, 2 to 6 percent slopes (HoB).

This soil has a profile like that of Hanalei silty clay, 0 to 2 percent slopes, except that it is stony. Runoff is slow, and the erosion hazard is slight. Stones hinder machine cultivation.

This soil is used for sugarcane and pasture. (Capability classification IIw, irrigated or nonirrigated; sugarcane group 3; pasture group 7; woodland group 4)

Hanalei silty clay, deep water table, 0 to 6 percent slopes (HrB).

This soil has a profile like that of Hanalei silty clay, 0 to 2 percent slopes, except that it has fewer mottles and the water table is at a depth of more than 3 feet. Included in mapping were small areas of stony soils.

This soil is used for sugarcane, taro, pasture, and vegetables. (Capability classification IIw, irrigated or nonirrigated; sugarcane group 3; pasture group 7; woodland group 4)

Hanalei silty clay loam, 0 to 2 percent slopes (HmA).

This soil has a profile like that of Hanalei silty clay, 0 to 2 percent slopes, except for the texture of the surface layer. Also, this soil is underlain by sand at a depth of 30 to 50 inches. Included in mapping was an area on the Hanalei River bottom that is less than 30 inches deep over sand.

This soil is used for taro, pasture, and sugarcane. (Capability classification IIw, irrigated or nonirrigated; sugarcane group 3; pasture group 7; woodland group 4)

Hanalei peaty silty clay loam, 0 to 2 percent slopes (HpA).

This soil has a profile like that of Hanalei silty clay, 0 to 2 percent slopes, except for the texture of the surface layer. Also, the water table is at the surface.

This soil is used for pasture. (Capability classification IVw, irrigated or nonirrigated; sugarcane group 3; pasture group 7; woodland group 4)

Ioleau Series

This series consists of well-drained soils on uplands on the island of Kauai. These soils developed in material weathered from basic igneous rock, probably mixed with volcanic ash. They are gently sloping to steep. Elevations range from 100 to 750 feet. The annual rainfall amounts to 40 to 70 inches. The mean annual soil temperature is 72° F. Ioleau soils are geographically associated with Lihue and Puhi soils.

These soils are used for irrigated sugarcane, pasture, pineapple, irrigated orchards, irrigated truck crops, wildlife habitat, and woodland. The natural vegetation consists of lantana, koa haole, guava, and associated shrubs and grasses.

Ioleau silty clay loam, 6 to 12 percent slopes (IoC).

This soil is on ridgetops in the uplands.

In a representative profile the surface layer is darkbrown and yellowish-red silty clay loam 15 inches thick. The subsoil, 40 to 60 inches thick, is dark-brown and dark reddish-brown silty clay that has subangular blocky structure and is very compact in place. The substratum is soft, weathered rock. The soil is very strongly acid to extremely acid throughout.

Permeability is slow. Runoff is medium, and the erosion hazard is moderate. The available water capacity is about 1.4 inches per foot of soil. Roots penetrate to a depth of 15 to 25 inches or to the plow depth.

Representative profile: Island of Kauai, lat. 22°07'32.9" N. and long. 157°13'03" W.

Ap1-0 to 6 inches, dark-brown (7.5YR 3/4) silty clay loam, brown (7.5YR 4/4) when dry; cloddy, breaking to moderate, fine and very fine, subangular blocky structure; hard, firm, sticky and plastic; abundant medium and fine roots and plentiful very fine roots; very strongly acid; abrupt, wavy boundary. 6 to 8 inches thick.

Ap2-6 to 15 inches, mixture of yellowish-red (5YR 4/6) silty clay loam, strong brown (7.5YR 5/6) when dry; massive; slightly hard, friable, sticky and plastic; and yellowish-red (5YR 4/8) silty clay, reddish brown (5YR 4/4) when dry; strong, very fine, subangular blocky structure; hard, firm, sticky and plastic; few medium roots and plentiful fine and very fine roots; common fine pores; very strongly acid, abrupt, wavy boundary. 7 to 10 inches thick.

B21t-15 to 27 inches, dark reddish-brown (5YR 3/4) silty clay, reddish brown (5YR 4/4) when dry; strong, fine and very fine, subangular blocky structure; very hard, firm, sticky and plastic; very few fine and very fine roots; common very fine pores; very compact in place; many moderately thick clay films on ped faces; very strongly acid; clear, wavy boundary. 5 to 12 inches thick.

B22t-27 to 36 inches, dark-brown (7.5YR 3/2) silty clay, yellowish red (5YR 3/6) in pores, dark brown (7.5YR 4/4) when dry; strong, fine and very fine, subangular blocky structure; very hard, firm, sticky and plastic; very few fine and very fine roots; few medium pores and many very fine pores; compact in place; many moderately thick clay films on ped faces and in pores; few pebbles; very strongly acid; clear, wavy boundary. 9 to 11 inches thick.

B23t-38 to 57 inches, dark-brown (7.5YR 3/3) light silty clay, dark brown (7.5YR 4/4) in pores, dark brown (7.5YR 4/4) when dry; strong, fine and very fine, subangular blocky structure; slightly hard, firm, slightly sticky and slightly plastic; few medium, fine, and very fine roots; many very fine pores; patchy, moderately thick clay films on ped faces; continuous in pores; few pebbles; extremely acid; clear, wavy boundary. 15 to 22 inches thick.

B24t-57 to 61 inches, dark reddish-brown (5YR 3/4) silty clay loam, reddish brown (5YR 4/4) when dry; moderate, fine and very fine, subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; no roots; many very fine pores; patchy, moderately thick clay films on ped faces; continuous in pores; extremely acid.

The A horizon ranges from 5YR to 10YR in hue. In places the texture of the A horizon is clay loam. The B horizon ranges from 2.5YR to 7.5YR in hue, from 3 to 4 in value, and from 2 to 6 in chroma. The depth to the very compact B21t ranges from 15 to 25 inches.

This soil is used for sugarcane, pasture, pineapple, orchards, and truck crops. (Capability classification IIIe, irrigated or nonirrigated; sugarcane group I; pineapple group 6; pasture group 6; woodland group 6)

Ioleau silty clay loam, 2 to 6 percent slopes (IoB).

This soil has a profile like that of Ioleau silty clay loam, 6 to 12 percent slopes, except that it is 10 to 20 inches deeper to the compact layer. Runoff is slow, and the erosion hazard is slight. Roots penetrate to a depth of 25 to 40 inches.

This soil is used for sugarcane, pasture, pineapple, orchards, and truck crops. (Capability classification IIe, irrigated or nonirrigated; sugarcane group 1; pineapple group 5; pasture group 6; woodland group 6)

Ioleau silty clay loam, 12 to 20 percent slopes, eroded (IoD2).

This soil is similar to Ioleau silty clay loam, 6 to 12 percent slopes, except that it is moderately steep and part of the surface layer has been removed by erosion. Runoff is rapid, and the erosion hazard is moderate to severe.

This soil is used for sugarcane, pineapple, and pasture. (Capability classification IVe, irrigated or nonirrigated; sugarcane group 1; pineapple group 6; pasture group 6; woodland group 6)

Ioleau silty clay loam, 20 to 35 percent slopes, eroded (IoE2).

This soil is similar to Ioleau silty clay loam, 6 to 12 percent slopes, except that it is steep and most of the surface layer has been removed by erosion. Runoff is rapid, and the erosion hazard is severe.

This soil is used for pasture, woodland, sugarcane, pineapple, and water supply. (Capability classification VIe, nonirrigated; pasture group 6; woodland group 6)

Lihue Series

This series consists of well-drained soils on uplands on the island of Kauai. These soils developed in material weathered from basic igneous rock. They are gently sloping to steep. Elevations range from nearly sea level to 800 feet. The annual rainfall amounts to 40 to 60 inches. The mean annual soil temperature is 73° F. Lihue soils are geographically associated with Ioleau and Puhi soils.

These soils are used for irrigated sugarcane, pineapple, pasture, truck crops, orchards, wildlife habitat, woodland, and homesites. The natural vegetation consists of lantana, guava, koa haole, joee, kikuyugrass, molassesgrass, guineagrass, bermudagrass, and Java plum.

Lihue silty clay, 0 to 8 percent slopes (LhB).

This soil is on the tops of broad interfluves in the uplands. Included in mapping were small areas of a soil that has a very dark grayish-brown surface layer and a mottled subsoil.

In a representative profile the surface layer is duskyred silty clay about 12 inches thick. The subsoil, more than 48 inches thick, is derk-red and dark reddish-brown, compact silty clay that has subangular blocky structure. The substratum is soft, weathered rock. The surface layer is strongly acid. The subsoil is slightly acid to neutral.

Permeability is moderately rapid. Runoff is slow, and the erosion hazard is no more than slight. The available water capacity is about 1.5 inches per foot of soil. In places roots penetrate to a depth of 5 feet or more.

Representative profile: Island of Kauai, lat. 21°59'06.7" N. and long. 159°21'50" W.

Ap1-0 to 6 inches, dusky-red (2.5YR 3/2) silty clay, yellowish red (5YR 4/6) when dry; cloddy breaking to weak, fine and medium, subangular blocky structure; very hard, firm, sticky and plastic; abundant roots; common very fine and fine pores; many black concretions; strong effervescence with hydrogen peroxide; strongly acid; abrupt, smooth boundary. 4 to 8 inches thick.

Ap2-6 to 12 inches, dusky-red (2.5YR 3/2) silty clay, yellowish red (5YR 4/6) when dry; massive; very hard, friable, sticky and plastic; many roots; many very fine and fine pores; many, very fine, black concretions; strong effervescence with hydrogen peroxide; strongly acid; abrupt, smooth boundary. 4 to 8 inches thick.

B21-12 to 21 inches, dark reddish-brown (2.5YR 3/4) silty clay, red (2.5YR 4/6) when dry; moderate, medium to very fine, subangular blocky structure; hard, friable, sticky and plastic; abundant roots; many very fine and fine pores; many, fine, black concretions; moderate effervescence with hydrogen peroxide; nearly continuous glaze on ped surfaces, glaze looks like clay films; slightly acid; clear, broken boundary. 7 to 10 inches thick.

B22-21 to 27 inches, dark reddish-brown (2.5YR 3/4) silty clay, red (2.5YR 4/6) when dry; strong, very fine, subangular blocky structure; very hard, friable, sticky and plastic; many roots; many very fine and fine pores; nearly continuous glaze on ped faces; common, black concretions; weak effervescence with hydrogen peroxide; few, fine, black, manganese dioxide stains on ped faces; neutral; clear, smooth boundary. 5 to 8 inches thick.

B23-27 to 48 inches, dark reddish-brown (2.5YR 3/4) silty clay, red (2.5YR 4/6) when dry; strong, very fine, subangular and angular blocky structure; hard, firm, sticky and plastic; few roots; many very fine and fine pores; continuous glaze on ped faces, glaze looks like thick clay films; superimposed on the glaze is dark-red (10R 3/6) material that looks like pseudosand under magnification; large, black coatings on primary structural units; neutral; gradual, smooth boundary. 15 to 30 inches thick

B24-48 to 60 inches, dark-red (2.5YR 3/6) silty clay, red (2.5YR 4/6) when dry; strong, very fine, subangular and angular blocky structure; hard, firm, slightly sticky and plastic; no roots; many very fine and fine pores; thin, patchy coatings that look like clay films; many distinct pressure cutans; ped surfaces have superimposed on them stringy, dark-red (10R 3/6) pseudosand or frostlike coatings; this condition is more prevalent than in the B23 horizon; neutral.

The A horizon ranges from 10R to 5YR in hue, from 2 to 3 in chroma, and from 2 to 3 in value. The B horizon ranges from 10R to 2.5YR in hue and from 4 to 6 in chroma.

This soil is used for sugarcane, pineapple, pasture, truck crops, orchards, wildlife habitat, and homesites. (Capability classification IIe, irrigated or nonirrigated; sugarcane group 1; pineapple group 5; pasture group 5; woodland group 5)

Lihue silty clay, 8 to 15 percent slopes (LhC).

On this soil, runoff is slow and the erosion hazard is slight. This soil is used for sugarcane, pineapple, pasture, truck crops, orchards, wildlife habitat, and homesites. (Capability classification IIIe, irrigated or nonirrigated; sugarcane group 1; pineapple group 6; pasture group 5; woodland group 5)

Lihue silty clay, 15 to 25 percent slopes (LhD).

On this soil, runoff is medium and the erosion hazard is moderate. This soil is used for sugarcane, pineapple, pasture, wildlife habitat, and woodland. (Capability classification IVe, irrigated or nonirrigated; sugarcane group 1; pineapple group 6; pasture group 5; woodland group 5)

Lihue silty clay, 25 to 40 percent slopes, eroded (LhE2).

This soil is similar to Lihue silty clay, 0 to 8 percent slopes, except that the surface layer is thin. Runoff is rapic, and the erosion hazard is severe.

This soil is used for pasture, woodland, and wildlife habitat. Small areas are used for pineapple and sugarcane. (Capability classification VIe, nonirrigated; pasture group 5; woodland group 5)

Lihue gravelly silty clay, 0 to 8 percent slopes (LIB).

This soil is similar to Lihue silty clay, 0 to 8 percent slopes, except that it contains ironstone-gibbsite pebbles and has brighter colors in the B horizon. Included in mapping in the Eleele area and north of the town of Hanamaulu were small areas of soils that have a dark yellowish-brown, friable subsoil.

This soil is used for sugarcane, pasture, and homesites. (Capability classification IIe, irrigated or nonirrigated; sugarcane group 1; pineapple group 5 ; pasture group 5 ; woodland group 5)

Lihue gravelly silty clay, 8 to 15 percent slopes (LIC).

On this soil, runoff is slow and the erosion hazard is slight. Included in mapping were areas where the slope is as much as 25 percent.

This soil is used for sugarcane, pasture, wildlife habitat, and homesites. (Capability classification IIIe, irrigated or nonirrigated; sugarcane group 1; pineapple group 6; pasture group 5; woodland group 5)

Marsh

Marsh (MZ) consists of wet, periodically flooded areas covered dominantly with grasses and bulrushes or other herbaceous plants. It occurs as small, low-lying areas along the coastal plains. Water stands on the surface, but marsh vegetation thrives. The water is fresh or brackish, depending on proximity to the ocean. Included in mapping were small areas of mangrove swamp and small areas of open water. (Capability classification VIIIw, nonirrigated)

Mokuleia Series

This series consists of well-drained soils along the coastal plains on the islands of Oahu and Kauai. These soils formed in recent alluvium deposited over coral sand. They are shallow and nearly level. Elevations range from nearly sea level to 100 feet. The annual rainfall amounts to 15 to 40 inches on Oahu and 50 to 100 inches on Kauai. The mean annual soil temperature is 74° F. Mokuleia soils are geographically associated with Hanalei, Jaucas, and Keaau soils.

In this survey area a poorly drained variant of the Mokuleia series was mapped. This soil, Mokuleia clay loam, poorly drained variant, is described in alphabetical order, along with other mapping units of this series.

These soils are used for sugarcane, truck crops, and pasture. The natural vegetation consists of kiawe, klu, koa haole, and bermudagrass in the drier areas and napiergrass, guava, and joee in the wetter areas.

Mokuleia clay loam (Mt).

This soil occurs as small areas on the coastal plains. It is nearly level. Included in mapping were small areas of Jaucas soils; small areas of very deep, well-drained soils in drainageways; and small areas of poorly drained clay soils underlain by reef limestone.

In a representative profile the surface layer is very dark grayish-brown clay loam about 16 inches thick. The next layer, 34 to more than 48 inches thick, is dark-brown and light-gray, single-grain sand and loamy sand. The surface layer is neutral in reaction, and the underlying material is moderately alkaline.

Permeability is moderate in the surface layer and rapid in the subsoil. Runoff is very slow, and the erosion hazard is no more than slight. The available water capacity is about 1.8 inches per foot in the surface layer and about 1.0 inches per foot in the subsoil. In places roots penetrate to a depth of 5 feet or more.

Representative profile: Island of Oahu, lat. 21°34'49" N. and long. 158°10'09" W.

Ap-0 to 16 inches, very dark grayish-brown (10YR 3/2) Clay loam, dark grayish brown (10YR 4/2) when dry; moderate, very fine and fine, granular and subangular blocky structure; hard, firm, sticky and plastic; plentiful fine roots; many, very fine and fine, interstitial pores; few, fine and very fine, tubular pores; common wormholes and worm casts; horizon consists of about 25 percent coral sand; slight effervescence with hydrogen peroxide; violent effervescence with hydrochloric acid; neutral; abrupt, wavy boundary. 10 to 16 inches thick.

IIC1-16 to 22 inches, dark-brown (10YR 4/3) loamy sand, brown (10YR 5/3) when dry; massive; soft, slightly hard, nonsticky and nonplastic; plentiful fine roots; porous; few pieces of reef limestone; horizon consists of about 80 percent coral sand; violent effervescence with hydrochloric acid; moderately alkaline; abrupt, smooth boundary. 6 to 20 inches thick.

IIC2-22 to 50 inches, light-gray (10YR 7/2), moist and dry, coral sand; single grain; loose when moist or dry, nonsticky and nonplastic; few fine roots; porous; few pieces of coral; violent effervescence with hydrochloric acid; moderately alkaline.

The depth to coral sand ranges from 12 to 30 inches. The A horizon ranges from 10YR to 5YR in hue and from 1 to 3 in value when moist and 3 to 5 when dry. It ranges from 1 to 3 in chroma when moist and 1 to 3 when dry. The IIC1 horizon ranges from 10YR to 7.5YR in hue, from 3 to 6 in value when moist and 4 to 7 when dry, and from 1 to 3 in chroma.

This soil is used for sugarcane, truck crops, and pasture. Capability classification IIs if irrigated, VIs if nonirrigated; sugarcane group 1; pasture group 3)

Mokuleia clay (Mtb).

This soil has a profile like that of Mokuleia clay loam, except for the texture of the surface layer. It is nearly level. Permeability is slow in the surface layer. Workability is difficult because of the sticky, plastic clay.

This soil is used for sugarcane and pasture. (Capability classification IIIs if irrigated, VIs if nonirrigated; sugarcane group 1; pasture group 3)

Mokuleia fine sandy loam (Mr).

This soil occurs on the eastern and northern coastal plains of Kauai. It is nearly level. This soil has a profile like that of Mokuleia clay loam, except for the texture of the surface layer.

Permeability is moderately rapid in the surface layer and rapid in the subsoil. Runoff is very slow, and the erosion hazard is slight. The available water capacity is about 1 inch per foot in the surface layer and 0.7 inch per foot in the subsoil. Included in mapping were small areas where the slope is as much as 8 percent.

This soil is used for pasture. (Capability classification IIIs if irrigated, IVs if nonirrigated; sugarcane group 1; pasture group 3)

Mokuleia loam (Ms).

This soil has a profile like that of Mokuleia clay loam, except that the surface layer is loam and in most places is about 8 inches thick. It is nearly level.

This soil is used for sugarcane, truck crops, and pasture. (Capability classification IIs if irrigated, VIs if nonirrigated; sugarcane group 1; pasture group 3)

Mokuleia clay loam, poorly drained variant (Mta).

This soil occurs on Kauai. It is nearly level. The soil is poorly drained, and in this way, it differs from other soils of the Mokuleia series. The surface layer is dark brown to black and is mottled.

This soil is used for sugarcane, taro, and pasture. (Capability classification IIIw, irrigated or nonirrigated; sugarcane group 3; pasture group 3)

Pohakupu Series

This series consists of well-drained soils on terraces and alluvial fans on the islands of Oahu and Kauai. These soils formed in old alluvium derived from basic igneous material. They are nearly level to moderately sloping. Elevations range from 50 to 250 feet. The annual rainfall amounts to 40 to 60 inches. The mean annual soil temperature is 73° F. Pohakupu soils are geographically associated with Alaeloa, Papaa, and Lihue soils.

These soils are used for sugarcane, pineapple, truck crops, pasture, and homesites. The natural vegetation consists of guava, Christmas berry, Japanese tea, koa haole, and kikuyugrass.

Pohakupu silty clay loam, 0 to 8 percent slopes (PkB).

This soil has smooth slopes and occurs on terraces and alluvial fans. The slopes are mainly 3 to 8 percent. Included in mapping were small areas of Alaeloa and Waialua soils and small areas where the slope is as much as 15 percent. Also included on Kauai were small areas where the texture is silty clay and small areas that have a hue of 2.5YR in the subsoil.

In a representative profile the surface layer is dark reddish-brown silty clay loam about 13 inches thick. The subsoil, 40 to more than 60 inches thick, is dark reddishbrown and dark-brown silty clay loam that has angular and subangular blocky structure. The substratum is strongly weathered gravel. The soil is slightly acid to medium acid.

Permeability is moderately rapid. Runoff is slow, and the erosion hazard is slight. The available water capacity is about 1.5 inches per foot of soil. In places roots penetrate to a depth of 5 feet or more.

Representative profile: Island of Oahu, lat. 21°22'53" N. and long. 157°45'16" W.

Ap-0 to 13 inches, dark reddish-brown (5YR 3/3) silty clay loam, reddish brown (5YR 4/3) when dry; strong, very fine, subangular blocky structure; hard, friable, sticky and plastic; abundant roots; many very fine and fine pores; common wormholes and worm casts; moderate effervescence with hydrogen peroxide; slightly acid; abrupt, smooth boundary. 8 to 13 inches thick.

B21-13 to 21 inches, dark reddish-brown (5YR 3/3) silty clay loam, reddish brown (5YR 4/4) when dry; moderate, very fine, subangular blocky structure; hard, friable, slightly sticky and plastic; abundant roots; many, very fine and fine, tubular pores; common, patchy pressure cutans; slight effervescence with hydrogen peroxide; slightly acid; abrupt, smooth boundary. 4 to 9 inches thick.

B22-21 to 38 inches, dark-brown (7.5YR 3/4) silty clay loam, brown (7.5YR 4/4) when dry; strong, very fine, blocky and subangular blocky structure; hard, friable, sticky and plastic; plentiful roots; many, very fine and fine, tubular pores; continuous pressure cutans on ped surfaces; few highly weathered pebbles; many black stains in pores and on peds; stains show strong effervescence with hydrogen peroxide; slightly acid; clear, irregular boundary. 4 to 17 inches thick.

B23-38 to 50 inches, dark-brown (7.5YR 3/4) silty clay loam, brown (7.5YR 4/4) when dry; strong, very fine, angular and subangular blocky structure; hard, friable, sticky and plastic; few roots; many, very fine and fine, tubular pores; strong, continuous pressure cutans; few highly weathered pebbles; common black stains that effervesce with hydrogen peroxide; slightly acid; clear, irregular boundary. 12 to 20 inches thick.

B3-50 to 76 inches, dark-brown (7.5YR 3/4) silty clay loam, brown (7.5YR 4/4) when dry; strong, very fine, angular and subangular blocky structure; hard, friable, slightly sticky and plastic; few roots; many, very fine and fine tubular pores; nearly continuous pressure cutans; few highly weathered pebbles; few, fine, black stains that effervesce with hydrogen peroxide; slightly acid.

Effervescence with hydrogen peroxide ranges from slight to moderate in the upper part of the profile and from slight to none below. The structure in the B horizon ranges from moderate to strong. In places a few boulder cores occur within the lower part of the profile. The A horizon ranges from 2 to 3 in chroma and value when moist. The B horizon ranges from 7.5YR to 5YR in hue and from 3 to 4 in chroma and value when moist.

This soil is used for pasture, truck crops, and homesites on Oahu and for sugarcane and pineapple on Kauai. (Capability classification IIe if irrigated, IIIe if nonirrigated; sugarcane group 1; pasture group 6; woodland group 5)

Pohakupu silty clay loam, 8 to 15 percent slopes (PkC).

On this soil, runoff is slow to medium and the erosion hazard is slight to moderate. Workability is slightly difficult because of the slope.

Included in mapping were small areas where the surface layer and part of the subsoil have been removed. Also included, near the drainageways, were areas where the slope ranges from 15 to 25 percent.

This soil is used for pasture. (Capability classification IIIe, nonirrigated; sugarcane group 1; pasture group 6; woodland group 5)

Puhi Series

This series consists of well-drained soils on uplands on the island of Kauai. These soils developed in material derived from basic igneous rock. They are nearly level to steep. Elevations range from 175 to 500 feet. The annual rainfall amounts to 60 to 80 inches. The mean annual soil temperature is 73° F. Puhi soils are geographically associated with Lihue and Kapaa soils.

These soils are used for sugarcane, pineapple, truck crops, orchards, pasture, woodland, wildlife habitat, water supply, and homesites. The natural vegetation consists of guava, Java plum, pangolagrass, kikuyugrass, elephantopus, joee, yellow foxtail, and rhodomyrtus.

Puhi silty clay loam, 0 to 3 percent slopes (PnA).

This soil is on broad interfluves on the uplands.

In a representative profile the surface layer is brown silty clay loam about 12 inches thick. The subsoil, about 48 inches thick, is reddish-brown and dark reddish-brown silty clay loam and silty clay that has subangular blocky structure. The substratum is silty clay. The surface layer is very strongly acid. The subsoil is slightly acid to medium acid.

Permeability is moderately rapid. Runoff is very slow, and there is no erosion hazard. The available water capacity is about 1.3 inches per foot of soil. In places, roots penetrate to a depth of 5 feet or more.

Representative profile: Island of Kauai, lat. 22°01'14" N. and long. 159°23'8.1" W.

Ap-0 to 12 inches, brown (10YR 4/3) silty clay loam, brown (10YR 4/3) when rubbed, yellowish brown (10YR 5/4) when dry; moderate, very fine, subangular blocky structure; hard, friable, slightly sticky and slightly plastic; abundant roots; many, very fine and fine, tubular pores and common interstitial pores; many gritty particles that are hard to break down; delayed effervescence with hydrogen peroxide; very strongly acid; abrupt, wavy boundary. 11 to 14 inches thick.

B21-12 to 21 inches, reddish-brown (5YR 4/4) silty clay loam, yellowish red (5YR 4/6) when dry; weak, very fine and fine, subangular blocky structure; hard, friable, slightly sticky and slightly plastic; plentiful fine and very fine roots; many very fine pores and common fine pores; nearly continuous, shiny glaze on peds; patchy coatings that look like clay films on some peds; medium acid; gradual, smooth boundary. 7 to 11 inches thick.

B22-21 to 33 inches, dark reddish-brown (5YR 3/4) silty clay loam, yellowish red (5YR 4/6) when dry; common black specks; moderate, very fine and fine, sub angular blocky structure; hard, friable, slightly sticky and slightly plastic; plentiful fine and very fine roots; many very fine pores and common fine pores; nearly continuous, shiny glaze on peds, patchy coatings that look like clay films on some peds; stringy coatings of stronger chroma; slightly acid; gradual, smooth boundary. 10 to 14 inches thick.

B23-33 to 41 inches, dark reddish-brown (2.5YR 3/4) silty clay loam, yellowish red (5YR 4/6) when dry; moderate, very fine, subangular blocky structure; hard, friable, slightly sticky and plastic; few very fine roots; many very fine pores and common medium pores; continuous, shiny glaze on peds ; patchy coatings that look like clay films on peds ; many shiny particles; many, very fine, black specks; medium acid; gradual, smooth boundary. 6 to 9 inches thick.

B24-41 to 90 inches, dark reddish-brown (5YR 3/3) silty clay, yellowish red (5YR 4/8) when dry; strong, very fine and fine, subangular blocky structure; hard, firm, sticky and plastic; few very fine roots; many very fine and fine pores and common medium pores; continuous, shiny glaze on peds; many, very fine, black specks and shiny particles; medium acid.

The A horizon ranges from 7.5YR to 10YR in hue, from 2 to 4 in value, and from 2 to 4 in chroma. The B horizon ranges from 2.5YR to 7.5YR in hue, from 3 to 4 in value, and from 3 to 4 in chroma.

This soil is used for sugarcane, pineapple, orchards, truck crops, pasture, and homesites. (Capability classification IIs, irrigated or nonirrigated; sugarcane group 1; pineapple group 4; pasture group 8; woodland group 7)

Puhi silty clay loam, 3 to 8 percent slopes (PnB).

On this soil, runoff is slow and the erosion hazard is slight. This soil is used for sugarcane,

pineapple, orchards, pasture, truck crops, and homesites. (Capability classification IIc, irrigated or nonirrigated; sugarcane group 1; pineapple group 6; pasture group 8; woodland group 7)

Puhi silty clay loam, 8 to 15 percent slopes (PnC).

On this soil, runoff is slow and the erosion hazard is slight. This soil is used for sugarcane, pineapple, pasture, and orchards. (Capability classification IIIe, irrigated or nonirrigated; sugarcane group 1; pineapple group 6; pasture group 8; woodland group 7)

Puhi silty clay loam, 15 to 25 percent slopes (PnD).

On this soil, runoff is medium and the erosion hazard is moderate. Included in mapping were small, eroded areas.

This soil is used for sugarcane, pineapple, orchards, pasture, woodland, wildlife habitat, and water supply. (Capability classification IVe, irrigated or nonirrigated; sugarcane group 1; pineapple group 6; pasture group 8; woodland group 7)

Puhi silty clay loam, 25 to 40 percent slopes (PnE).

On this soil, runoff is rapid and the erosion hazard is severe.

This soil is used for pasture, woodland, wildlife habitat, and water supply. (Capability classification VIe, nonirrigated; pasture group 8; woodland group 7)

Rough Broken Land

Rough broken land (rRR) consists of very steep land broken by numerous intermittent drainage channels. In most places it is not stony. It occurs in gulches and on mountainsides on all the islands except Oahu. The slope is 40 to 70 percent. Elevations range from nearly sea level to about 8,000 feet. The local relief is generally between 25 and 500 feet. Runoff is rapid, and geologic erosion is active. The annual rainfall amounts to 25 to more than 200 inches.

These soils are variable. They are 20 to more than 60 inches deep over soft, weathered rock. In most places some weathered rock fragments are mixed with the soil material. Small areas of rock outcrop, stones, and soil slips are common. Included in mapping were areas of colluvium and alluvium along gulch bottoms.

This land type is used primarily for watershed and wildlife habitat. In places it is used also for pasture and woodland. The dominant natural vegetation in the drier areas consists of guava, lantana, Natal redtop, bermudagrass, koa haole, and molassesgrass. Ohia, kukui, koa, and ferns are dominant in the wetter areas. Puakeawe, aalii, and sweet vernalgrass are common at the higher elevations. (Capability classification VIIe, nonirrigated)

Exhibit "D"

LSB Map 100

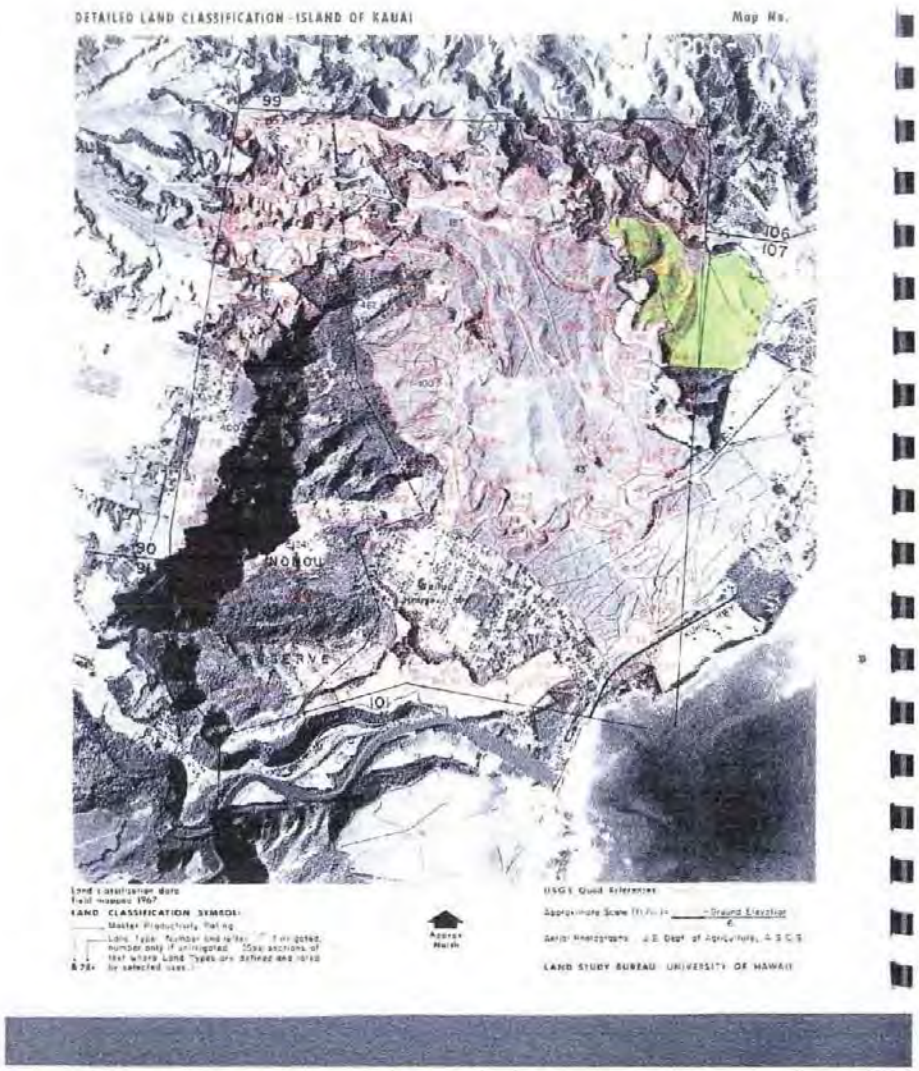


EXHIBIT "D"

Exhibit "E"

LSB Map 107

EXHIBIT "E"

Exhibit "F"

Economics For Goats

Economics for Goats

01-Jun-07

General Assumptions:	Ratio	Units
Acreage		102
Animal units per acre		3.5
Total animal units (AU)		357
Breeding herd :		206
Bucks (1)	3%	6
Does (30)	97%	200
Kids per doe per year	1.5	300
Total animal units (AU)		356

Note: Bucks & Does = 1 AU each, Kids = 1/2 AU each.

Annual Revenue from Goat Sales:		Ratio	Units	Unit Price	Annual Revenue
Local Kauai Sales		75%	225	$ 160	$ 35,968
Honolulu Sales (FOB Lihue)		25%	75	$ 140	$ 10,491
	Totals		300		$ 46,458

Expense:	Units	Unit Cost	Fixed Cost	Annual Cost
Labor:				
Part-time labor (hours)	520	$ 15.00		$ 7,800
Feed:				
Barley-Corn (per head)	206	$ 2.90		$ 597
Minerals:				
Mineral block (per head)	206	$ 12.00		$ 2,472
Veterinary Supplies:				
Worming (per head)	206	$ 1.20		$ 247
Water:				
Annual requirement (3 gallons per head per day)	206	$ 2.03		$ 417
Repair & Maintenance:				
Repair fences, gates, water system			$ 1,200	$ 1,200
Vehicle - Repair , Maintenance and Fuel			$ 2,000	$ 2,000
Hauling Goats (per head):	206	$ 0.70		$ 144
Total Direct Costs				$ 14,878
Overhead:				
Lease Rent (unit cost per acre per year)		$ 35.00		$ 3,570
Administration			$ 500	$ 500
Management			$ 5,000	$ 5,000
Other			$ 250	$ 250
Total Overhead				$ 9,320
Net Operating Profit (Loss)				$ 22,260

Exhibit D

Department of Water, Kaua'i County
Manger's Report 12-10

MANAGER'S REPORT 12-10:

July 21, 2011

Re: Kapaa Highland Request

RECOMMENDATION:

Your concurrence is requested to allow the staff to enter into an agreement in accordance with Part III Section XII of the rules with Kapaa Highland subject to county attorney concurrence. This exchange should be on a dollar for dollar basis not gallon for gallon.

BACKGROUND:

The developer is proposing the following exchange: the developer will give the DOW undeveloped water and in return, the DOW will provide the developer with storage for the developer's project; both will be built to department standards.

The project has a large portion of land that shows in the community plan to be affordable housing though not currently zoned as such. I have checked with the county housing department and the Mayor's office and both want to see the affordable housing go forward. This concurrence is verbal.

The planned storage for planned water exchange will allow this project to move forward when other developments have been stopped due to inadequate storage. There appears to be an overall county benefit and the implementation would be subject to finally getting the storage and source completed.

Our storage project is scheduled to be completed in 3-4 years. The source development could be sooner. The issue with this proposal is wells in different locations have different yields and DOW storage is only subject to available funds.

The developer has drilled a well and tested it. The well is too crooked to be used as a normal source of water and have to be redrilled in another location. The next one may not provide the same yield. It is low enough risk that this is being recommended.

Respectfully submitted,

David R. Craddick, P.E.
Manager and Chief Engineer

Department of Water County of Kaua'i

Water has no substitute.....Conserve it

August 22, 2011

Mr. Gregg Allen
161 Wailua Road
Kapaa, HI 96746

Dear Mr. Allen:

Subject: Water Master Plan for the Kapa'a Highlands Project on TMK: 4-3-03:001

At the Department of Water, Water Board July 28th 2011 meeting, via Managers Report 12-10, in response to your letters of April 22, 2011 and May 11, 2011, accepted the proposed exchange of source for storage on a dollar for dollar basis. This acceptance is based on your commitment to proceed with zoning changes in your development to match the county zoning. That zoning change requires affordable housing in certain portions of your proposed development.

This acceptance is based on building permits and County water meter service not being issued if the source and storage requirements have not been completed as of the date of requested building permit approval. We ask that you submit a proposed draft of an agreement to memorialize this action. We would expect that this agreement runs with the land.

If you have any questions, please contact Mr. Gregg Fujikawa at (808) 245-5416.

Sincerely,

David R. Craddick, P.E.
Manager and Chief Engineer

GF/WE:bdm
Bill/Gregg Allen Response Letter/July Board Mtg.

4398 Pua Loke St., P.O. Box 1706, Lihue, HI 96766 Phone: 808-245-5400
Engineering and Fiscal Fax: 808-245-5813, Operations Fax: 808-245-5402, Administration Fax: 808-246-8628

Exhibit E

Irrigation Supply For the Kapa'a Highlands Agricultural Subdivision
Water Master Plan

TNWRE
Tom Nance Water
Resource Engineering

No. of pages: 8
Email: gallen@harbormall.net

Original ☑ will ☐ will not be mailed to you.

October 27, 2006
06-281 (05-41)

MEMORANDUM

TO: Greg Allen

FROM: Tom Nance

SUBJECT: Irrigation Supply for the Kapaa Highlands Agricultural Subdivision

Introduction

This memo report assesses the feasibility of developing an onsite well (or wells) to provide the necessary irrigation supply for the Kapaa Highlands Agricultural Subdivision. The total area of the project is 163 acres. Wagner Engineering Services, Inc. has determined that up to 113 acres of the site is suitable for agricultural use (Figure 1). The Kauai Department of Water (DOW) standards require an average supply for irrigation for 2500 GPD/acre. For 113 acres, this translates to a year-round average of 0.283 MGD. Applying a maximum seasonal use factor of 1.5 results in a required summertime supply capability of 0.424 MGD (equivalent to 295 GPM operating continuously).

Results of an Onsite Exploratory Borehole

To investigate the possibility of providing the irrigation supply with an onsite well or wells, an exploratory borehole was drilled and pump tested. The location of this exploratory borehole is shown on Figures 1 and 2. Ground elevation at the well site is 25 feet. It was drilled to a depth of 260 feet or 235 feet below sea level. During the course of drilling, two separate aquifers were encountered. The upper aquifer has a static water level of about 19 feet above sea level (MSL) and it extends to a depth of about 80 feet (ie. to 55 feet below sea level). It has very limited yield (less than 30 GPM) as it is essentially a collection of water in the soil mantle perched on poorly permeable Koloa lavas beneath it.

The strata between 80- and 210-foot depth are poorly permeable and function as an aquiclude separating the upper and lower aquifers. The lower aquifer, which starts at 210-foot depth and extends below the 260-foot depth of the exploratory borehole, has a static water level about 13 feet (MSL). This lower aquifer is quite productive.

A pump test was run at my direction to define the potential yield and quality of water from the lower aquifer. Using a combination of casing and grout, water from the upper aquifer was sealed off for this test. Results of the 12-hour test conducted on October 19, 2006 are presented on Figures 3, 4, and 5. A series of flowrate steps were run initially to define hydraulic performance (Figure 3). Using a curve

500 Ala Moana Boulevard, Suite [illegible] | Honolulu, Hawaii 96813-4811 | Phone: (808) 537-1141 | Fax: (808) 238-7551 | Email: tom@[illegible]

fitting technique, these results define expectable drawdown for a range of pumping rates (Figure 4). For example, at 500 GPM, the drawdown would be 7.5 feet.

The remainder of the 12-hour test was run at 550 GPM to see if any salinity change would occur. These results are shown on Figure 5 and Table 1. The salinity (as measured by conductivity) actually decreased for the first two hours and stabilized after that. Chlorides of just 53 MG/L demonstrate that the water is quite fresh and obviously suitable for irrigation use.

Conclusions and Recommendations Regarding the Irrigation Supply

1. Results of the exploratory borehole demonstrate that an adequate irrigation supply for the Agricultural Subdivision can be developed from a single onsite well located in the near proximity of the exploratory borehole.

2. The finished dimensions of the production well should be based on the following:

   a. A 17-inch borehole should be drilled to 300-foot depth.

   b. 220 feet of 8-inch solid casing and 80 feet of 8-inch perforated casing should be installed in the borehole.

   c. The annular space from 220 feet to the ground surface should be sealed with cement grout.

   d. Final pump testing at rates up to 550 GPM should be conducted to confirm the well's yield.

3. A companion report by ITC Water Management describes the delivery components of the irrigation system based on the following:

   a. A 7.5 horsepower, 450 GPM submersible pump and motor should be installed in the well at a depth of 30 to 40 feet.

   b. The well pump should deliver water to an adjacent storage tank of at least 30,000 gallons in size. Well pump cycles would be controlled by a level switch in the tank.

   c. An on-demand pump station of up to 600 GPM capacity should be installed next to the tank to draw water from the tank and deliver it to users in the agricultural subdivision.

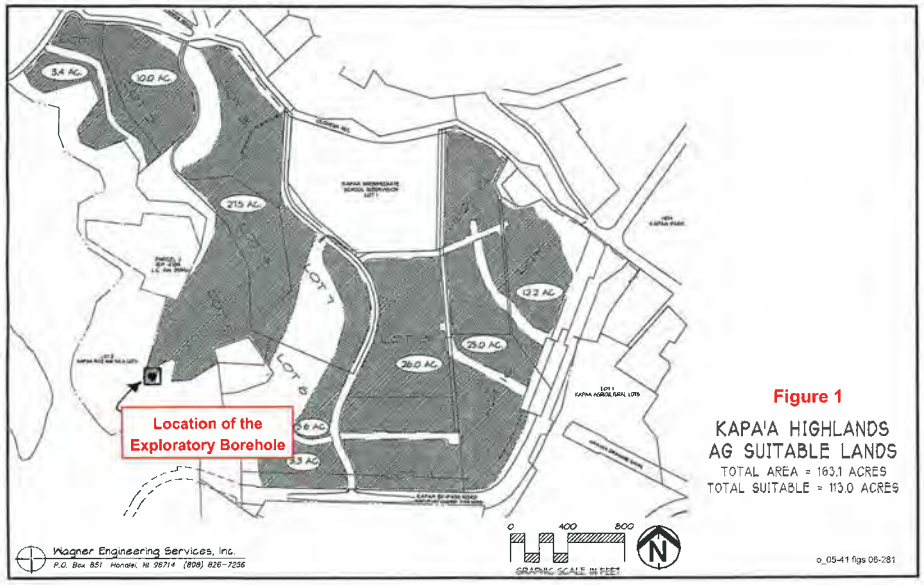
Attachments

Specific Conductance and Chlorides of Samples
Collected During the 12-Hour Pump Test on October 19, 2006

Sample Time	Pumping Rate (GPM)	Specific Conductance (µS/cm @ 25° C.)	Chlorides (MG/L)
10:05	317	468	55
10:30	317	449	54
11:00	438	440	54
11:30	529	436	53
12:00	528	432	53
13:00	527	430	53
14:00	527	429	53
15:00	527	429	53
16:00	528	429	53
17:00	529	428	53
18:00	531	429	53
19:00	532	430	53
20:00	533	431	53
21:00	533	431	53
22:00	533	431	53

Notes: 1. Specific conductance measured in the TNWRE office using a HACH Sension5 meter calibrated with a 12.88 mS/cm standard.

2. Chlorides determined by mercuric nitrate titration in the TNWRE office. Samples were diluted 10 fold.


Location of the Exploratory Borehole
Figure 1
KAPA'A HIGHLANDS
AG SUITABLE LANDS
TOTAL AREA = 163.1 ACRES
TOTAL SUITABLE = 113.0 ACRES
Wagner Engineering Services, Inc.
P.O. Box 851 Honolei, HI 96714 (808) 826-7236
GRAPHIC SCALE IN FEET
o_05-41 figs 06-281

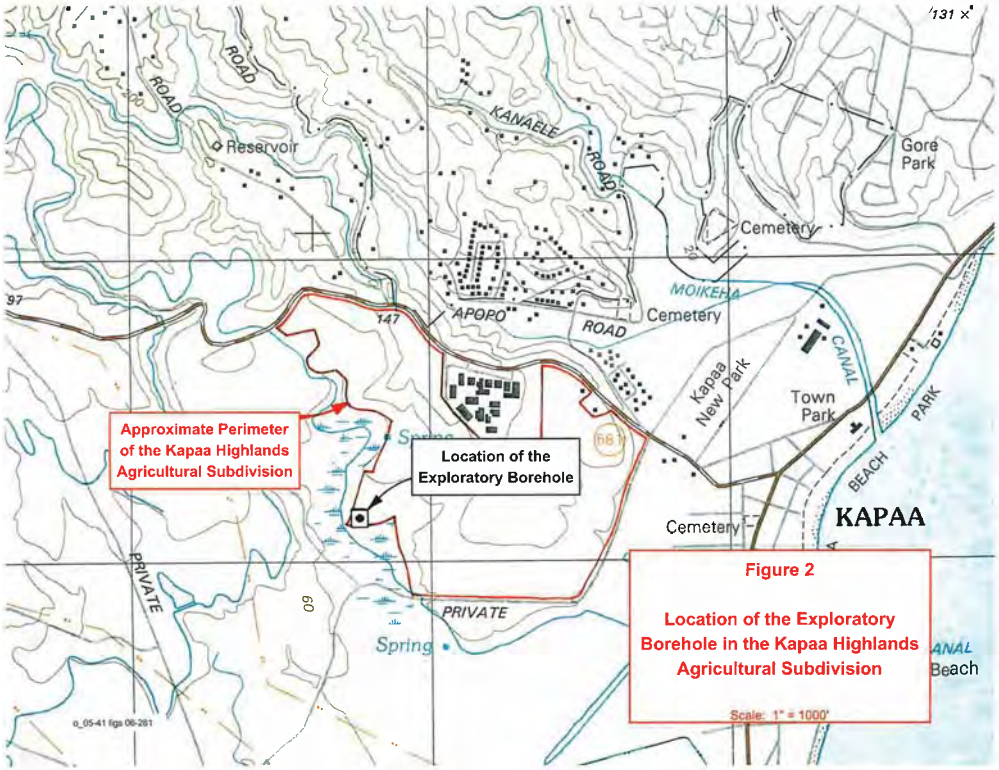

Approximate Perimeter of the Kapaa Highlands Agricultural Subdivision
Location of the Exploratory Borehole
Reservoir
KANAELE
ROAD
APOPO
ROAD
MOIKEHA
Cemetery
Gore Park
Kapaa New Park
Town Park
CANAL
PARK
BEACH
KAPAA
PRIVATE
Spring
Figure 2
Location of the Exploratory Borehole in the Kapaa Highlands Agricultural Subdivision
Scale: 1" = 1000'
o_05-41 figs 06-281

Figure 3. Pumping Rate and Water Level During the 12-Hour Test

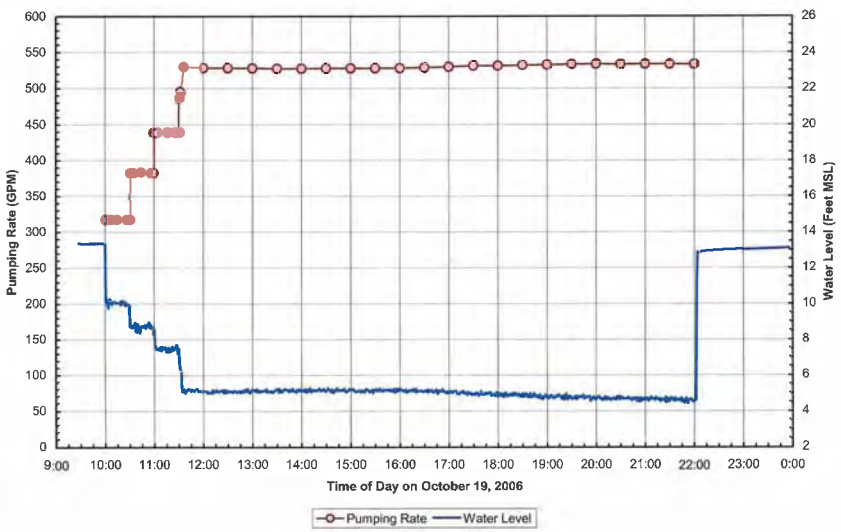


Figure 4. Hydraulic Performance of the Well Based on Step Test Data

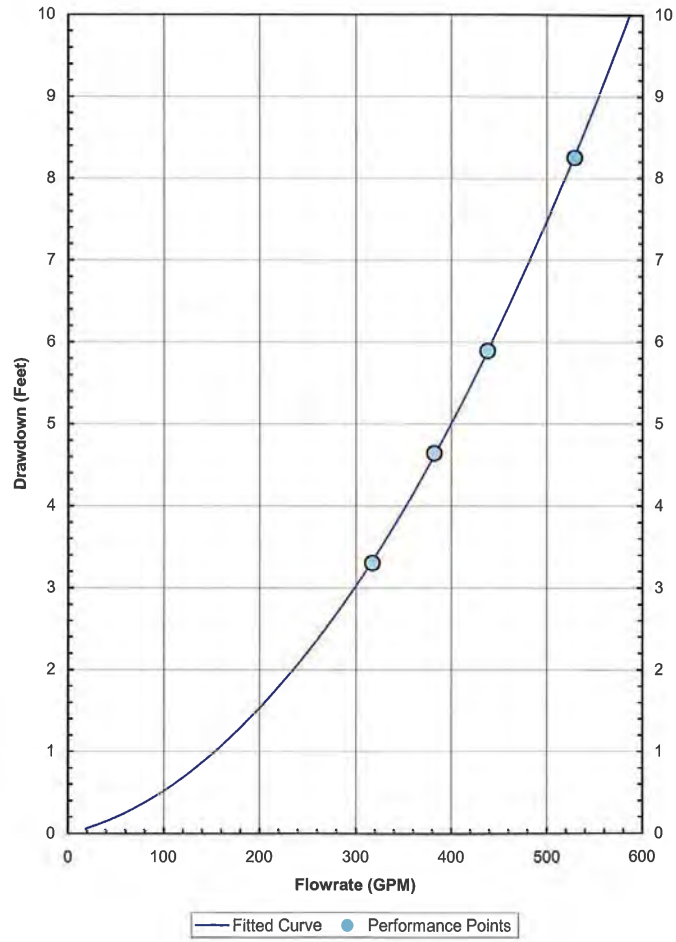


Figure 5. Pumped Water Conductivity through the 12-Hour Test

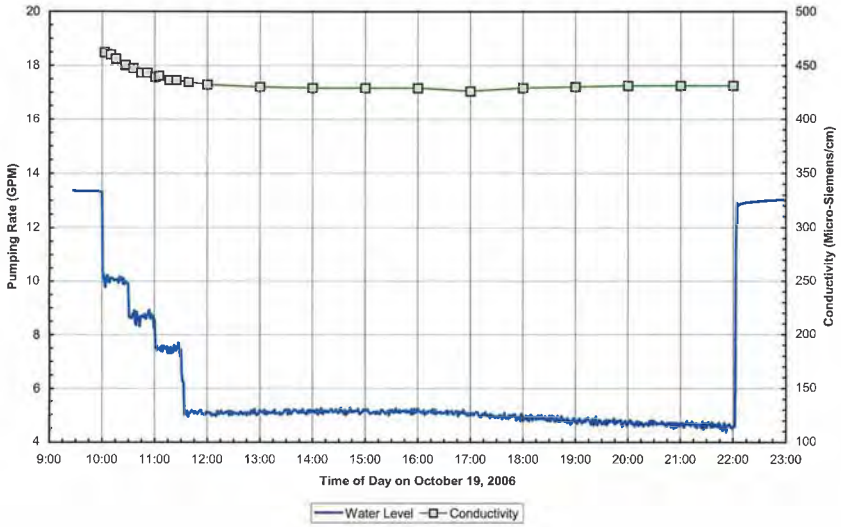


Exhibit E - Part 2

Private Water System

BELLES GRAHAM PROUDFOOT
WILSON & CHUN, LLP
ATTORNEYS AT LAW

MICHAEL J. BELLES
MAX W.J. GRAHAM, III
DONALD H. WILSON
JONATHAN T. CHUN

Federal I.D. No. 99-0313661

OF COUNSEL
DAVID W. PROUDFOOT

COUNSEL
LORNA A. NISHIMITSU

WATUMULL PLAZA
4334 RICE STREET, SUITE 202
LIHUE, KAUAI, HAWAII 96766-1388

TELEPHONE NO: (808) 245-4705
FACSIMILE NO: (808) 245-3277
E-MAIL: mail@kauai-law.com

October 2, 2012

Mr. David R. Craddick
Manager & Chief Engineer
Department of Water
County of Kauai
P. O. Box 1706
Lihue, Kauai, Hawaii 96766

VIA EMAIL & HAND DELIVERY

Re: **Kapaa Highlands Subdivision (S-99-45)**
(fna Kūlana Kai/Kauai Highlands)
Subdivision Of Parcel 1 Being A Portion Of
Grant 5266 To Rufus P. Spalding Into Lots 1 To 18, Inclusive
Kapaa and Waipouli, Kauai, Hawaii
Kauai Tax Map Key No. (4) 4-3-003:001 (por.)
Owner: Allen Family LLC; Moloaa Bay Ventures, LLC; and The Three Stooges LLC

Dear Mr. Craddick:

I am writing to you on behalf of the above-identified applicants ("Applicants") in the Kapaa Highlands Subdivision matter ("Subdivision"). In lieu of obtaining water for the Subdivision from the public water system operated by the Department of Water ("Department"), the Applicants have decided to construct an on-site private water system ("PWS").

The PWS is described in an enclosed Memorandum dated September 12, 2012 prepared by Tom Nance of Tom Nance Water Resource Engineering ("Nance Report"). The essential design specifications are described below.

A. Private Water System.

1. The Applicants will construct a well ("Well") and two storage tanks ("Tanks") on-site.

2. The Well will be located along the south boundary of Lot 5, as shown in Figure 3 of the Nance Report.

3. The Storage Tanks will be located on the north boundary of Lot 3, as shown in Figure 3 of the Nance Report.

4. The Well design is shown on Figure 2 of the Nance Report. The Well will be twelve (12) inches in diameter and operated by two identical 100 gallons per minute ("GPM") pumps, each driven by 7.5 horsepower motors. The first pump will supply the needs of the Subdivision, which is 97,310 gallons per day ("GPD") maximum day use, and the second will serve as a standby pump.

5. Based on the water needs for 50 farm dwelling units, the total maximum day demand is 93,750 GPD. The two 50,000 gallon Tanks will be adequately sized to provide necessary storage plus fire flowrate protection. The Tanks will be lined with bolted steel with reinforced concrete base and passive cathodic protection (zinc anode rods).

6. The pipelines ("Pipelines") for the PWS will be sized to provide: fire flowrate with coincident maximum day demand and a minimum residual pressure of 20 psi (velocities not exceeding 10 fps); and peak flowrate with minimum residual pressure of 40 psi (maximum velocity in Pipelines of 6 fps). NSF-approved, high density polyethylene (HPDE), pipes will be used for the PWS. The Pipeline system is shown on Figure 3 of the Nance Report.

7. Pursuant to the Agricultural Master Plan submitted in this matter, the agricultural activities in the Subdivision will be limited to a goat raising operation ("Goat Project"). The Goat Project will require minimal water (at the most, 3,560 GPD), which will be supplied by the PWS.

8. The on-site Tank elevations will not provide adequate gravity pressure to meet the Department's delivery pressure requirements. Providing the necessary pressure would be done with parallel domestic and fire flowrate pumping systems with a generator to provide back power. These pump systems would provide up to 70 GPM for peak domestic use and 500 GPM for the fire flowrate condition. Both pumping systems would be sized to produce a total dynamic head of 110 feet, in effect creating a single, 270-foot service pressure zone across the entire project site.

B. Modification Of Requirements.

The Applicants are requesting the Department and/or the Board of Water Supply ("Water Board") to grant a modification from the Department's Water System Standards for the PWS as follows:

1. DOW Rule Part 3, Section XII, provides as follows:

"**SECTION XII – MODIFICATION OF REQUIREMENTS**

When conditions pertaining to any subdivision are such that the public may be properly served with water and with fire protection without full and strict compliance with these rules and regulations, or where the subdivision site or layout is such that the public interest will be adequately protected, such modification thereof as is reasonably necessary or expedient, and not contrary to law or the intent and purposes of these rules and regulations, may be made by the Department."

2. As part of the Subdivision in this case, the Applicants propose to have water for potable, fire, and agricultural uses for the Subdivision supplied by the PWS.

3. The PWS does not comply strictly with all of the Department's Water System Standards ("DOW Standards") which typically apply to the DOW's public water systems. These differences are set forth in the enclosed Comparison Of Kapaa Highlands PWS With DOW Water System Standards.

4. The Applicants are requesting the Department and/or the Water Board to find that the PWS: will properly serve the water and fire protection needs of the Subdivision without full and strict compliance with the DOW Standards; that, given the fact that the Subdivision will be served by the PWS, the public interest will be adequately protected by the PWS; that the differences between the PWS and the DOW Standards are, under all of the circumstances of this case, reasonably necessary and expedient; and that such differences are not contrary to the law or the intent or purposes of the DOW Rules.

Based on the above, the Applicants are requesting the Department and/or the Water Board to approve the proposed PWS for the Subdivision, together with the requested modifications. In the event this matter needs to be referred to the Water Board, then I am requesting that it be placed on the next available agenda of the Water Board. For these purposes, I have enclosed a Supporting Information For The Board Of Water Supply, County of Kauai in compliance with the Department's requirements for persons wishing to testify at Water Board Meetings.

Thank you very much for your consideration of this request.

Sincerely yours,

BELLES GRAHAM PROUDFOOT
WILSON & CHUN, LLP

Max W. J. Graham, Jr.

MWJG:jgm
Enclosures
cc: Mr. Greg Allen, Jr., w/encls. (via email only)
Andrea A. Suzuki, Esq., w/encls. (via email only)
Mr. William Eddy, DOW, w/encls. (via email only)
Mr. Gregg Fujikawa, DOW, w/encls. (via email only)
Mr. Dale A. Cua, Staff Planner, w/encls. (via email only)

TNWRE
Tom Nance Water
Resource Engineering

No. of pages: 7
Email: gallen@harbormalt.net
mwg@kauai-law.com
greg@tnwre.com

Original ☑ will ☐ will not be mailed to you.

September 10, 2012
12-177 | 09-12

MEMORANDUM

To: Greg Allen

From: Tom Nance

Subject: Sizing and Layout of a Private Water System to Supply the Kapaa Highlands Project

Introduction

This memo and its attachments present the sizing and layout of major infrastructure elements of a private water system that would be developed to supply the Kapaa Highlands project. The basis of the water system sizing assumes the project would be developed in two phases. Phase 1 would consist of 16 residential units on five lots in an agricultural subdivision. Phase 2 would consist of an urban residential development comprised of 86 SF residential units, 683 MF residential units, and parks (3.1 ac.), church (0.8 ac.), commercial (0.4 ac.), roads (9.4 ac.), and unirrigated open space (14.3 ac.). In the event that land use entitlements are not obtained for the residential development, Phase 2 would consist of 34 residential units on seven lots in an agricultural subdivision.

Required Water Supply

Due to the size of the residential lots in the agricultural subdivision, which vary from 1.47 to 6.67 acres in size for the Phase 1 development, an allocation of 2000 GPD as the average demand per residential lot is recommended, a rate which is four times greater than the Kauai Department of Water (DOW) design standard for single family residential units. For the residential subdivision in Phase 2, use of DOW's design criteria is recommended. Based on these recommendations, Tables 1 and 2 are tabulations of the average and maximum day demands for the private water system. Maximum day demand is defined as 1.5 times the average demand, also in accord with DOW design standards.

Required Water System Capacities

Well Supply. DOW's design criterion for well pumping capacity is to provide the maximum day demand in a 24-hour pumping day with the largest well pump out of service. For Phase 1, this requirement amounts to 48,000 GPD, equivalent to 33 GPM. With the addition of the Phase 2 residential development, this requirement becomes 496,275 MGD, equivalent to 345 GPM. If Phase 2 was limited to the agricultural subdivision, the ultimate well supply requirement would be 150,000 GPD or 104 GPM.

A test well, identified as State No. 0419-05, was drilled and pump tested in October 2006. Over its 260-foot drilled depth, two aquifers were encountered. The upper aquifer can not provide a sufficient source of supply and it is also potentially subject to contamination due to its shallow depth. The lower and confined aquifer was reached at a depth of about 215 feet or 190 feet below sea level. Its piezometric head was about 13 feet above sea level or about 10 feet below ground. Pump testing showed that a properly designed well to exclusively tap this lower aquifer could develop up to 500 GPM of low salinity (chlorides of 55 MG/L), potable quality water. At its depth and overlying confining layers, it is not subject to contamination.

The low ground elevation (about 20 feet), high piezometric head (about 13 feet above sea level), and modest drawdown (3 feet or less at 350 GPM) provide the opportunity to develop one well configured with a pump sump that would enable two pumps to draw from the same well, thereby providing the necessary standby pumping capacity for a stand-alone system with a single well. The recommendation herein is to drill a new 12-inch well to 300-foot depth, complete it with a pump sump as shown on Figure 1, and outfit it with two, 25 horsepower, 350 GPM submersible pumps. Either of the 350 GPM pumps would provide the ultimate maximum demand requirement with the other providing full back-up capacity.

Reservoir Storage. With regard to the reservoir storage volume, DOW's two design criteria are appropriate for the private water system: (1) provide the maximum day demand with no credit for well inflow; and (2) provide the fire flowrate with coincident maximum day demand for the duration of the fire with the largest well pump out of service and the reservoir 3/4 full at the start of the fire. For the Phase 1 fire flowrate, DOW's standards require only 250 GPM for one hour. A stricter criterion of 500 GPM for two hours is used herein. Application of the two sizing criteria results in the required storage volumes tabulated below. In all cases, the maximum day sizing criterion governs.

Summary of Computed Required Reservoir Storage Volumes*

Design Criteria	Phase 1 Ag Subd.	Phase 2 Residential	Phased 2 Ag Subd.
(1) Maximum Day Demand (Gallons)	48,000	496,275	150,000
(2) Fire Flowrate			
- Fire Flowrate (GPM)	500	2000	500
- Fire Duration (Hours)	2	2	2
- Coincident Max. Demand (GPM)	33	345	104
- Well Inflow Credit (GPM)	350	350	350
- Required Storage Volume (Gallons)	29,280	319,200	40,640

*Phase 2 storage volumes include the Phase 1 requirement.

Based on the foregoing calculations, the recommended reservoir storage is as follows:

- For Phase 1, a 50,000-gallon storage tank would be installed.
- For the Phase 2 residential project, a second tank of 500,000-gallon capacity would be installed.
- In the event that Phase 2 consists of the 34 SF residential units in an agricultural subdivision, the second tank would be 100,000 gallons.
- All storage tanks would be lined and bolted steel with a concrete floor and passive cathodic protection.
- The tanks would be located at the project's highest elevation which is adjacent to residential Lot 7 in Phase 1. The Phase 1 and Phase 2 tanks would have identical floor and spillway elevations of 142 and 160 feet, respectively.
- Except at the project's lowest elevations, pumped delivery from the storage tanks will be necessary to provide adequate delivery pressures and fire flowrates. These pumping requirements are described in the section following.

Pumped Delivery for the Distribution System. DOW's design criteria for required delivery pressures are appropriate for this private water system. These are: (1) to provide a minimum of 40 psi residual pressure during the peak flowrate condition, with peak flowrate defined as three times the average demand; and (2) to provide a minimum 20 psi residual pressure at the critical hydrant during fire flowrate at that hydrant and coincident maximum day demand throughout the system.

The onsite storage reservoir elevations will not provide adequate gravity pressure to meet either of these criteria. In each development phase, this will require parallel domestic and fire flowrate pumping systems with a generator to provide back up power. For Phase 1, the pump systems would provide up to 70 GPM for peak domestic use and a 500 GPM fire pump. For the Phase 2 residential development, the domestic pumping capacity would be increased to 700 GPM and the fire pump to 2000 GPM. All pumping systems would be sized to produce a total dynamic head of 110 feet, in effect creating a single, 270-foot service pressure zone across the entire project site.

Water System Layout

Figure 2 illustrates all of the water system components described above with the assumption that Phase 2 would consist of the 769-unit residential development. By development phase, these would consist of:

Phase 1
- 12-inch, 300-foot deep well, pump sump, and two 350 GPM pumps in the pump sump located at the makai end of the Phase 1 development area.
- A dedicated 8-inch transmission pipeline from the well pumps to the storage reservoir.
- A 50,000-gallon storage tank.
- Parallel domestic and fire flowrate pump systems at the storage tank with backup generator power.
- A distribution pipeline loop consisting of 12-inch for the section that will also serve Phase 2 and 6-inch for the remainder of the loop.

Phase 2
- No change or additions to the well, well pumps, or transmission pipeline.
- Second storage tank of 500,000-gallon capacity.
- Substantial capacity increases for the parallel domestic and fire pumping systems and generator backup power.
- Distribution pipelines of 12-, 8-, and 6-inch size.

cc: Max Graham [Email Only]
greg@tnwre.com

Attachments

Table 1

Average and Maximum Day Demands for the
Phase 1 Agricultural Subdivision and Phase 2 Residential Development

Development Phase	Land Use	Design Criterion (GPD / Unit)	Average Demand (GPD)	Maximum Demand (GPD)
1	16 SF Residential	2,000	32,000	48,000
2	86 SF Residential	500	43,000	64,500
	683 MF Residential	350	239,050	358,575
	3.1 Ac. Parks	4,000	12,400	18,600
	0.8 Ac. Church	4,000	3,200	4,800
	0.4 Ac. Commercial	3,000	1,200	1,800
	Total for Phase 2		298,850	448,275
Total for Both Phases			330,850	496,275

Table 2

Average and Maximum Day Demands for Development of
Phases 1 and 2 as Agricultural Subdivisions

Development Phase	Land Use	Design Criterion (GPD / Unit)	Average Demand (GPD)	Maximum Demand (GPD)
1	16 SF Residential	2,000	32,000	48,000
2	34 SF Residential	2,000	68,000	102,000
Total for Both Phases			100,000	150,000

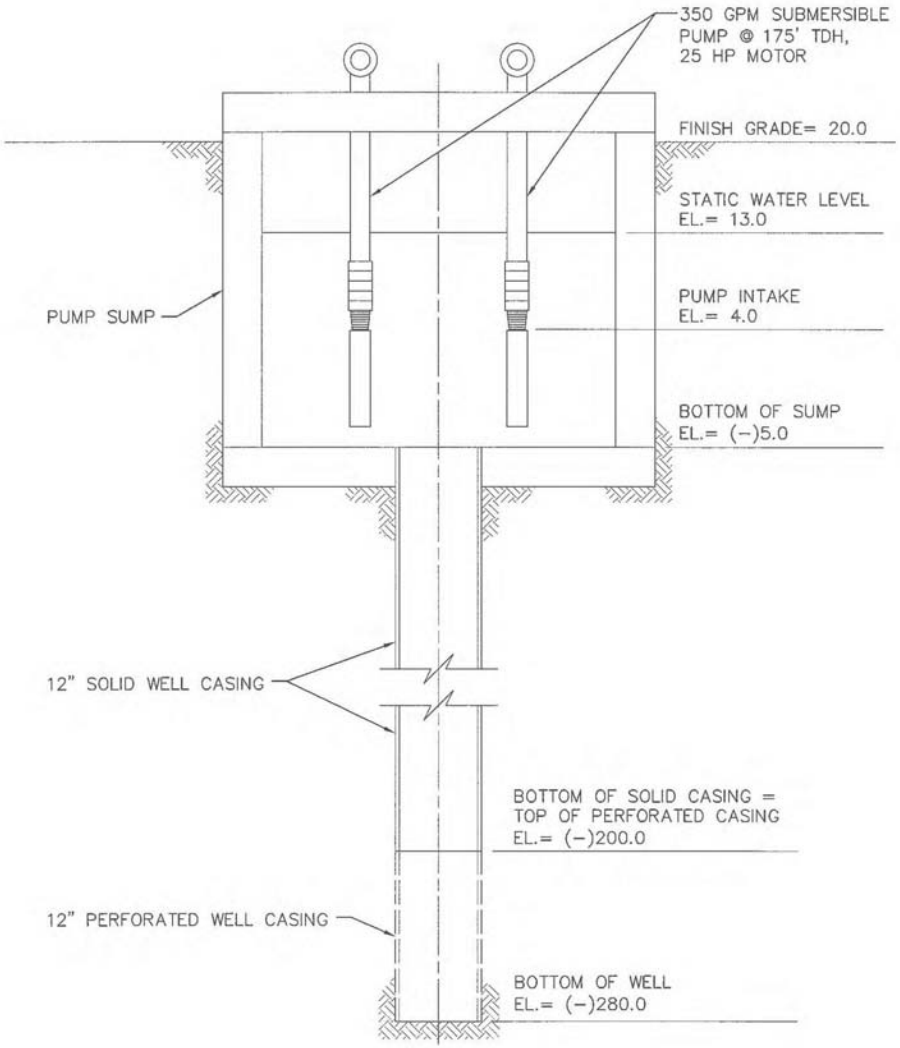


FIGURE 1
RECOMMENDED WELL DEVELOPMENT AND PUMP INSTALLATION
FOR THE KAPAA HIGHLANDS PROJECT
NOT TO SCALE

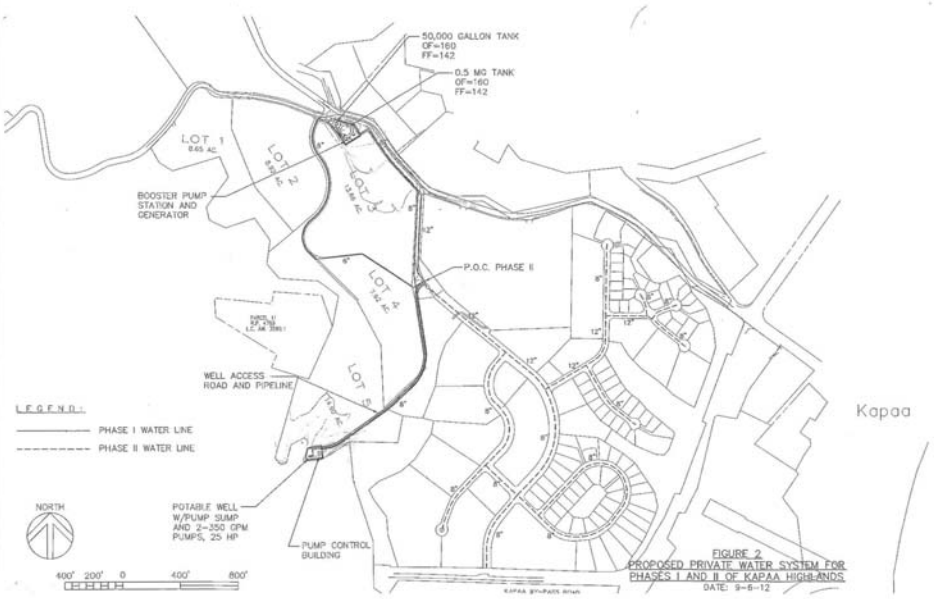


FIGURE 2
PROPOSED PRIVATE WATER SYSTEM FOR PHASES I AND II OF KAPAA HIGHLANDS
DATE: 9-6-12

TNWRE
Tom Nance Water
Resource Engineering

No. of pages: 7
Email: gallen@harbormail.net
mwg@kauai-law.com
greg@tnwre.com

Original ☑ will ☐ will not be mailed to you.

September 12, 2012
12-183 | 09-12

MEMORANDUM

To: Greg Allen

From: Tom Nance

Subject: Basis of Design of the Private Water System for the Kapaa Highlands Agricultural Subdivision

Introduction

This memo and its attachments describe the basis of design for a private water system to serve the 12-lot Kapaa Highlands Agricultural Subdivision. Figure 1 depicts the 12-agricultural lots and the 50-half acre homesites that ultimately would be developed on the 12 lots. The water system would consist of: one 12-inch, 300-foot deep well outfitted with two 100 GPM pumps, one of which would provide back up capacity; two side-by-side and identical 50,000-gallon storage reservoirs located next to Homesite 7, the highest elevation on the property; two parallel pumping systems to provide pressure and flowrates for peak and fire flowrate conditions; and 8- and 6-inch distribution pipelines.

As described herein, there are differences between the standards used for the private system's design and the standards of the Kauai Department of Water (DOW). These differences are noted and discussed as appropriate in the sections following.

Required Water Supply

The agricultural use in the subdivision will be for raising goats for which no specific water allocation is made. An average demand of 1250 GPD for each of the 50-half acre homesites is recommended, a use rate which is 2.5 times DOW's standard for single family residential units. The higher use rate is an appropriate allowance due to the larger than typical size of the homesites.

For the 50 homesites, the total average demand is 62,500 GPD. In conformance with DOW's standards, maximum day use is defined as 1.5 times the average demand. For the 50 homesites, the total maximum day demand is 93,750 GPD.

560 N. Nimitz Hwy. - Suite 213 • Honolulu, Hawaii 96817 • Phone: (808) 537-1141 • Fax: (808) 538-7757 • Email: tom@tnwre.com

Required Well Supply

Well Configuration. A test well, identified as State No. 0419-05, was drilled and pump tested at the makai end of the project site in October 2006. Over its 260-foot drilled depth, two aquifers were encountered. The upper aquifer can not provide a sufficient source of supply and it is also potentially subject to contamination due to its shallow depth. The lower and confined aquifer was reached at a depth of about 215 feet or 190 feet below sea level. Its piezometric head was about 13 feet above sea level or about 10 feet below ground. Pump testing showed that a properly designed well to exclusively tap this lower aquifer could develop up to 500 GPM of low salinity (chlorides of 55 MG/L), potable quality water. At its depth and due to the presence of the overlying and poorly permeable confining layers, this lower aquifer is not subject to contamination.

The low ground elevation (about 20 feet), high piezometric head (about 13 feet above sea level), and modest drawdown provide the opportunity to develop one well configured with a pump sump that would enable two pumps to draw from the same well, thereby providing the necessary standby pumping capacity for a stand-alone system with a single well. The recommendation herein is to drill a new 12-inch well to 300-foot depth and complete it with a pump sump and two pumps as shown on Figure 2. This will enable one pump to provide the required supply and the other pump to provide full back up capacity.

Required Well Pumping Capacity. DOW's design criteria of having the well pumping capacity capable of delivering the maximum day use in a 24-hour pumping day with the largest well pump out of service is adopted for the private water system. The project's 93,750 GPD maximum day use translates to a required well pump capacity of 65 GPM. The proposal herein is to install two identical 100 GPM pumps, each driven by 7.5 horsepower motors. Either pump would provide the required capacity with the other as standby.

Reservoir Storage

DOW's two reservoir storage sizing criteria are appropriate for the private water system. The first, to provide the maximum day use with no credit for well inflow, translates to a required storage volume of 93,750 gallons. The second is to provide the fire flowrate plus the coincident maximum day demand for the duration of the fire with the reservoir 3/4 full at the start of the fire. There is credit for well inflow with the largest well pump considered to be out of service.

For an agricultural subdivision, DOW standards require a fire flowrate of 250 GPM for one hour. A stricter standard of 500 GPM for two hours is adopted for the private water system. With one of the two 100 GPM well pumps on, this higher fire flowrate and longer duration translates to reservoir storage of 74,417 gallons (calculation below). The first criterion governs.

$$\frac{4}{3}(120\,\text{min})\left(500 + \frac{93{,}750}{1{,}440} - 100\right) = 74{,}417 \text{ gallons}$$

Proposed reservoir storage consists of two, side-by-side and identical 50,000-gallon tanks with 142- and 160-foot floor and spillway elevations, respectively. The storage tanks would be lined and bolted steel with reinforced concrete base and passive cathodic protection consisting of zinc anode rods suspended in the water. DOW's standards require storage tanks to be constructed of reinforced concrete. However, lined and bolted steel tanks have a successful operating history in Hawaii. With two side-by-side tanks, one can be taken offline when necessary for maintenance with no interruption of service to customers.

Pumping Systems for Peak and Fire Flowrate Design Conditions

DOW's design criteria for required delivery pressures are appropriate for this private water system. These are: (1) to provide a minimum of 40 psi residual pressure during the peak flowrate condition, with peak flowrate defined as three times the average demand; and (2) to provide a minimum 20 psi residual pressure at the critical hydrant during fire flowrate at that hydrant and coincident maximum day demand throughout the system.

The onsite storage reservoir elevations will not provide adequate gravity pressure to meet either of these delivery pressure requirements. Providing the necessary pressure would be done with parallel domestic and fire flowrate pumping systems with a generator to provide back up power. These pump systems would provide up to 70 GPM for peak domestic use and 500 GPM for the fire flowrate condition. Both pumping systems would be sized to produce a total dynamic head of 110 feet, in effect creating a single, 270-foot service pressure zone across the entire project site.

Distribution Pipelines

The design criteria used for pipeline sizing for the private system are equivalent to DOW's standards. Pipelines shall be sized to provide: (1) fire flowrate with coincident maximum day demand and a minimum residual pressure of 20 psi at the critical hydrant with velocities not exceeding 10 fps; and (2) peak flowrate with a minimum residual pressure of 40 psi and a maximum velocity in pipelines of 6 fps.

DOW's standards require pipelines to be of ductile iron or PVC, the latter conforming to ASTM C-900. However, NSF-approved, high density polyethylene (HPDE) pipes will be used for the private water system. SDR (pressure ratings) of the HDPE pipe will be selected so as not to exceed 60 percent of the recommended working pressure rating. Hazen-Williams "C" values of 130 will be used for all

September 12, 2012
12-183 | 09-12

HDPE pipes. This is less (ie. more conservative) than manufacturer's suggested values of 140 to 150 but greater than DOW's standards for ductile iron and PVC pipes.

Water System Layout

Figure 3 illustrates the water system components as described above. There would be a dedicated 6-inch pipeline from the well to the storage tanks. Distribution pipeline sizing, driven by the fire flowrate sizing criterion, would be 8- and 6-inch to the last hydrants and 4-inch beyond the last hydrants.

cc: Max Graham [Email Only]
greg@tnwre.com

Attachments

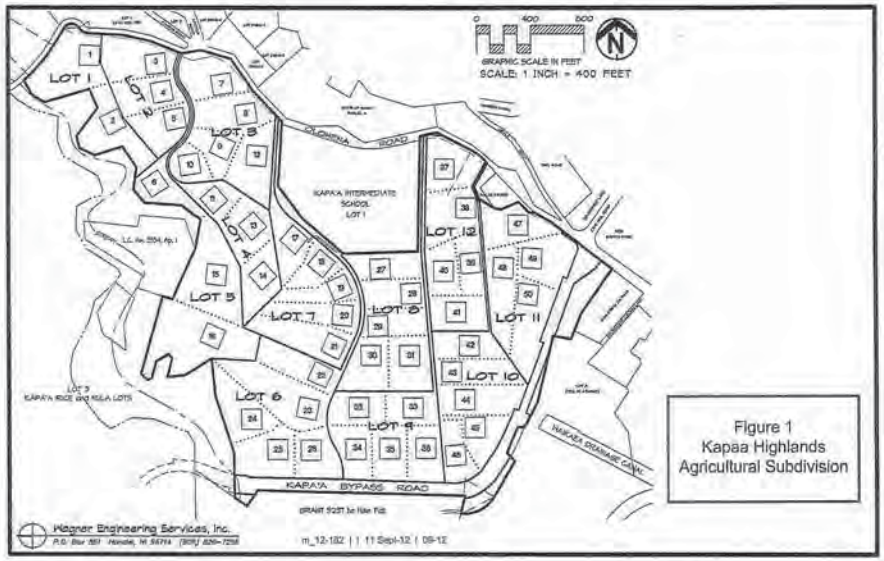


Figure 1
Kapaa Highlands
Agricultural Subdivision

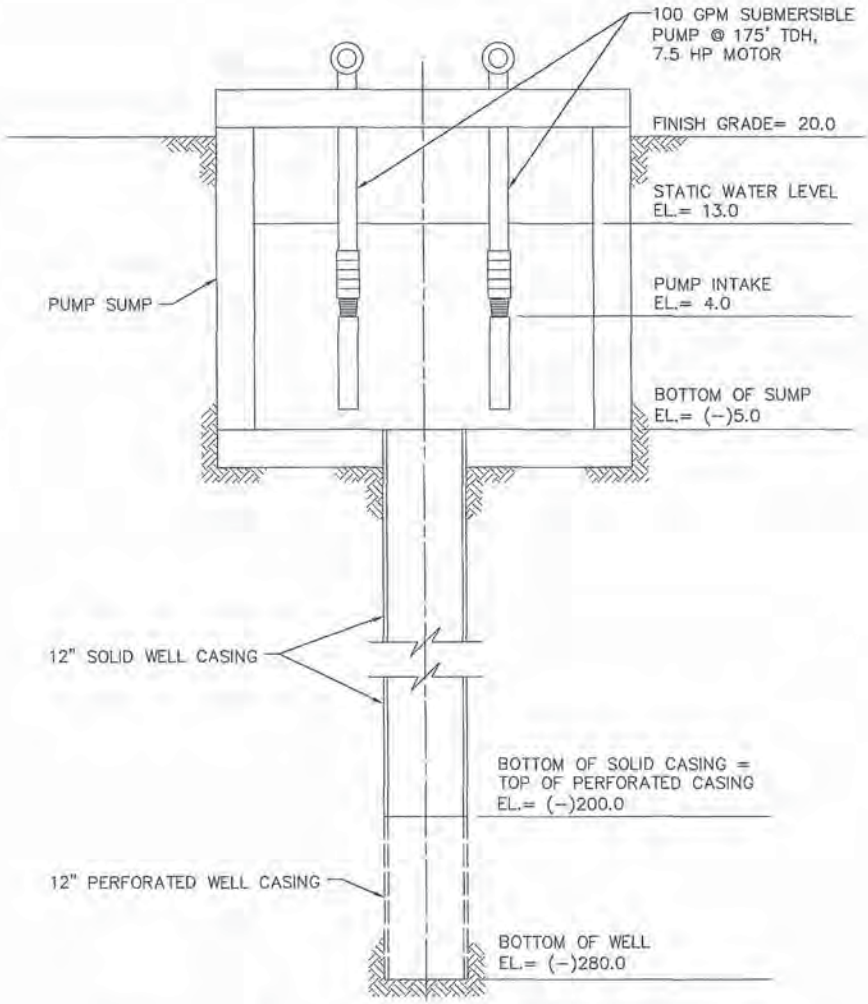


FIGURE 2
RECOMMENDED WELL DEVELOPMENT AND PUMP INSTALLATION
FOR THE KAPAA HIGHLANDS AGRICULTURAL SUBDIVISION
NOT TO SCALE

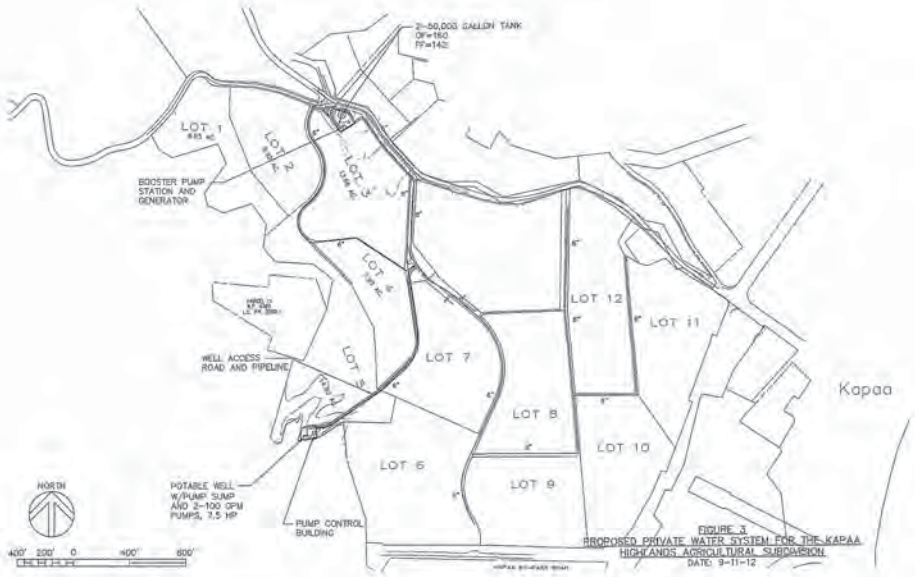


FIGURE 3
PROPOSED PRIVATE WATER SYSTEM FOR THE KAPAA HIGHLANDS AGRICULTURAL SUBDIVISION
DATE: 9-11-12

Table 1

Cost Estimate of the Major Water System Components for Kapaa Highlands Phase I

Item Description	Quantity	Unit	Unit Price	Amount	Total
Drill, Case, and Pump Test Supply Well					
Mobilization		LS		15,000	
Drill 12-Inch Pilot Hole	300	LF	150	45,000	
Video Log Pilot Hole	1	EA	2,500	2,500	
Test Pump Pilot Hole	1	EA	12,500	12,500	
Ream Pilot Hole to 19 Inches	300	LF	125	37,500	
12" Solid Casing	220	LF	175	38,500	
12" Perforated Casing	80	LF	200	16,000	
Furnishing and Installing grout	215	LF	60	12,900	
Plumbness and Alignment Test	1	EA	3,000	3,000	
Furnishing and Installing Test Pump	1	EA	15,000	15,000	
Development and Test Pumping	72	HRS	250	18,000	
Demobilization		LS		5,000	
Total					$220,900
Well Site Work and Pump Outfitting					
Site Earthwork	450	CY	50	22,500	
Site Basecourse	805	SY	20	16,100	
Site Fencing	348	LF	35	12,180	
Site Gate	1	EA	2,500	2,500	
Site Drainage System		LS		15,000	
Wet Well Sump and Cover at Well Casing		LS		60,000	
Submersible Pump (350 GPM, 4-Pole, 25 HP)	2	EA	45,000	90,000	
Discharge Unit, includes Support Pads and Piping		LS		25,000	
Pump Control Building		LS		35,000	
Chlorination System		LS		25,000	
Control Building Mechanical		LS		15,000	
Pump and Building Electrical		LS		50,000	
KIUC Transformer Pad and Ducts		LS		35,000	
Metering, Motor Control Center, SCADA System		LS		150,000	
Back Generator with Fuel Tank (60 KW)		LS		40,000	
Transfer Switch for Generator		LS		3,000	
KIUC Facility Charge for Service (OH Service Available)		LS		50,000	
Total					$646,280
New Well Access Road (from existing culdesac)					
Access Road Excavation and Preparation	1,530	LF	50	76,500	
Basecourse	3,400	SY	25	85,000	
Drainage and Erosion Control		LS		30,000	
Total					$191,500

Table 1

Cost Estimate of the Major Water System Components for Kapaa Highlands Phase I

Item Description	Quantity	Unit	Unit Price	Amount	Total
0.05 MG Tank					
Site Earthwork	1,935	CY	40	77,400	
Basecourse	1,890	SY	20	37,800	
Gravel Fill	452	SY	15	6,780	
Site Fencing	590	LF	35	20,650	
Site Gate	1	EA	2,500	2,500	
Site Drainage System		LS		20,000	
Tank Drainage System		LS		25,000	
Pipe Valves and Fittings		LS		15,000	
0.05 MG Steel Tank With Concrete Floor		LS		150,000	
Tank Level Transmitter System		LS		15,000	
Pipe and Tank Testing		LS		15,000	
Erosion and Dust Control		LS		10,000	
Construction Survey		LS		5,000	
Total					$400,130
Booster System					
Sitework for Booster Pump Station		LS		25,000	
Booster Station Connection Piping & Valves		LS		30,000	
Domestic Booster Pump Station (VFD 25 to 70 gpm, 5 HP)		LS		25,000	
Fire Pump Station (500 GPM at 110-ft TDH, 20 HP)		LS		80,000	
Power and Control Connections		LS		30,000	
MCC for both station with SCADA Controls		LS		125,000	
Back Generator with Fuel Tank (60 KW)		LS		50,000	
Transfer Switch for Generator		LS		3,000	
Total					$368,000
Pipeline in Phase I Subdivision (includes 8-inch well feed line)					
Main Installation Access and Site Preparation		LS		50,000	
12" HDPE Pipe	1,500	LF	85	127,500	
8" HDPE Pipe	3,115	LF	55	171,325	
6" HDPE Pipe	2,256	LF	40	90,240	
12" GV w/VB	2	EA	3,000	6,000	
8" GV w/VB	3	EA	2,500	7,500	
6" GV w/VB	2	EA	2,000	4,000	
12" DI Fittings	5	EA	1,800	9,000	
8" DI Fittings	6	EA	1,200	7,200	
6" DI Fittings	4	EA	800	3,200	
Fire Hydrant w/GV	5	EA	3,500	17,500	
Pipe Testing and Chlorination		LS		25,000	
Erosion and Dust Control		LS		30,000	
Construction Survey		LS		15,000	
Total					$563,465
	Total for Construction				**$2,390,275**
	Engineering Design (8%)				**190,725**
	Construction Management (3%)				**73,000**
	Total Cost				**$2,654,000**

Table 2

Cost Estimate of the Major Water System Components
for Kapaa Highlands Phase 2 Residential Project

Item Description	Quantity	Unit	Unit Price	Amount	Total
0.50 MG Tank and Booster Station					
Tank Foundation Earthwork	504	CY	40	20,160	
Basecourse	980	SY	20	19,600	
Tank Drainage System		LS		35,000	
Pipe Valves and Fittings		LS		30,000	
0.50 MG Steel Tank With Concrete Floor		LS		750,000	
Tank Level Transmitter System		LS		15,000	
Pipe and Tank Testing		LS		20,000	
Erosion and Dust Control		LS		15,000	
Construction Survey		LS		5,000	
Total					$909,760
Booster System (Upgrade both Booster Pump Stations)					
Modify Booster Pump Station		LS		40,000	
Booster Station Connection Piping & Valves		LS		45,000	
Domestic Booster Pump Station (VFD 200 to 625 gpm, 25 HP)		LS		120,000	
Fire Pump Station (2000 GPM at 110-ft TDH, 75 HP)		LS		125,000	
Power and Control Connections		LS		30,000	
Modify Existing MCC for New Pump Stations		LS		80,000	
New Back Generator with Fuel Tank for Fire Pump (175kw)		LS		75,000	
Transfer Switch for Generator		LS		6,000	
Total					$521,000
Pipeline in Phase 2 Subdivision					
Main Installation Access and Site Preparation		LS		60,000	
12" HDPE Pipe	2,100	LF	85	178,500	
8" HDPE Pipe	6,830	LF	50	341,500	
12" GV w/VB	3	EA	3,000	9,000	
8" GV w/VB	10	EA	2,500	25,000	
12" DI Fittings	6	EA	1,800	10,800	
8" DI Fittings	15	EA	1,200	18,000	
Fire Hydrant w/GV	14	EA	3,500	49,000	
Pipe Testing and Chlorination		LS		40,000	
Erosion and Dust Control		LS		30,000	
Construction Survey		LS		15,000	
Total					$776,800
	Total for Construction				**$2,207,560**
	Engineering Design (8%)				**176,440**
	Construction Management (3%)				**66,000**
	Total Cost				**$2,450,000**

o_09-12

Exhibit F

Preliminary Engineering Report Drainage Improvements
Kapa‘a Highlands Phase II

Preliminary Engineering Report
Drainage Improvements

KAPAA HIGHLANDS – PHASE II

Prepared for:
Greg Allen
161 Wailua Rd.
Kapa'a, HI 96746

Prepared by:
Honua Engineering, Inc.
P. O. Box 851
Hanalei, HI 96714

Project Description

The Kapa'a Highlands Subdivision is on former cane lands situated on a bluff adjacent to the coastal plain of Kapa'a Town. It is bordered by Olohena Road to the north and the Kapa'a Bypass Road on the south and east sides of the project. Kapa'a Intermediate School is near the middle of the north portion of the property. Phase I of the development will consist of five agricultural lots on the west side of the property. The remainder of the property to the south and east of the school are proposed to be developed during Phase II of the subdivision. The proposed Phase II development will consist of 86 single and 683 multi-family units, plus a neighborhood commercial site, parks, and a church site as shown on Exhibit 1. Ground elevation of the development ranges from 20 to 180 feet above mean sea level.

Per the County of Kauai's "Storm Water Runoff System Manual" 2001, all developments of this scope are required to maintain the existing stormwater flows and patterns as feasibly possible so that downstream properties are not subject to any additional stormwater flows that are created by the increases in impervious surfaces of the watershed by the proposed development. The report examines the existing drainage conditions of the property and the proposed measures to control the stormwater from the proposed Phase II development.

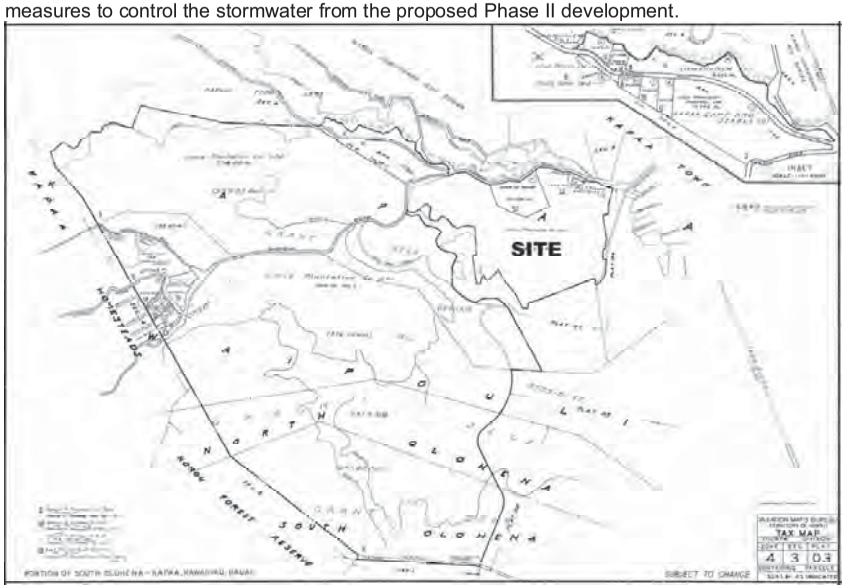


Figure 1: Tax Map Key 4-3-03 (4th Division)

Existing Conditions:

The property is located along Olohena Road about ½ mile mauka of Kapaa Town. The property rises from the coastal flat lands of Kapaa to an elevation of about 140 feet above mean sea level (msl). The Temporary Kapaa Bypass Road passes through a portion of the property along the east and south sides of the property. An unnamed stream flows along the west side of the property. The stream flows along the boundary, passes under a bridge on the By-Pass Road at the southwest corner of the property, and empties into the Waikaea drainage canal about 800' downstream from the property. Near the middle of the property on the north side, along Olohena Road, is the Kapaa Intermediate School site.

The Lihue Plantation had planted a majority of the 163-acre property in sugar cane, which since the property-changed owners has been allowed to go fallow. The Phase II portion of the property is approximately 97-acres. The fallow lands are presently overgrown with grass and remnant cane. A portion of the property on the northwest side near the unnamed stream is being used for cattle pasture. There are numerous abandoned irrigation ditches on the property that will be filled or rendered inoperable as the property is developed. There is also a small amount of the property that is overly steep for farming and is presently covered in brush and trees.

According to the Natural Resource Conservation Service (NRCS) soil survey the soils on the property are Ioleau and Puhi silt clay loams. The NRCS hydrologic classification for these soils is Group C for the Ioleau soils and Group B for the Puhi soils. Group B soils have a moderately low runoff potential, while the Group C soils have a moderately high runoff potential. Both soils are in Group I erosion resistance classification, which is the least erodible of the NRCS classifications.

The topography of the site varies from gently sloping, bluff top property, to steep areas that drop off into drainage gullies that lead to the unnamed stream and to the Bypass Road. The topography is illustrated on Exhibit 1 from aerial mapping done in 1975 for the County of Kauai.

Proposed Phase II:

The proposed Phase II development will consist of 86 single and 683 multi-family units, plus a neighborhood commercial site, parks, and a church site as shown on Exhibit 1. Stormwater generated from each of the Phase II lots will be directed to the nearest downstream street or natural drainageway. A drainage system along the streets will collect the stormwater and convey it to the detention basins shown on Exhibit 1. The detentions basins moderate the storm flows and allow infiltration back into the soil. They are sized so that the outlet peaks flows match or lower the existing stormwater flows prior to the development for both small rainfall events and the 100 year storm event.

.

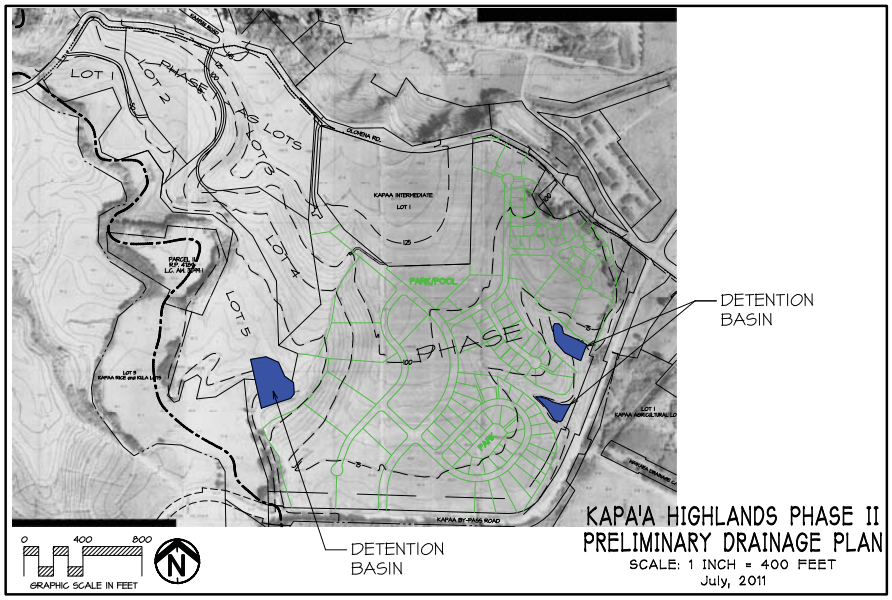


Exhibit G

Preliminary Engineering Report Wastewater Improvements
Kapa‘a Highlands Phase II

Preliminary Engineering Report
Wastewater Improvements

KAPAA HIGHLANDS – PHASE II

Prepared for:
Greg Allen
161 Wailua Rd.
Kapa'a, HI 96746

Prepared by:
Honua Engineering, Inc.
P. O. Box 851
Hanalei, HI 96714

July 11, 2011
Project No: 1892

Project Description

The Kapa'a Highlands Subdivision is on former cane lands situated on a bluff adjacent to the coastal plain of Kapa'a Town. It is bordered by Olohena Road to the north and the Kapa'a Bypass Road on the south and east sides of the project. Kapa'a Intermediate School is near the middle of the north portion of the property. Phase I of the development will consist of five agricultural lots on the west side of the property. The remainder of the property to the south and east of the school are proposed to be developed during Phase II of the subdivision. The proposed Phase II development will consist of 86 single and 683 multi-family units, plus a neighborhood commercial site, parks, and a church site as shown on Exhibit 1. Ground elevation of the development ranges from 20 to 180 feet above mean sea level. Due to it's high density the Phase II development will require connection to the Wailua-Kapa'a Sewer System. The following report reviews the anticipated wastewater flows, the adequacy of the existing sewer collection system, and the proposed improvements needed to provide service for the development of Phase II.

Basis of Design

The *Sewer Design Standards, 1973* by the County of Kauai, Department of Public Works, together with the *Wailua Facility Plan, September 2008* by Fukunaga and Associates were the primary references for this report and will be abbreviated as SDS and WFP, respectively, when quoted in the report.

The WFP is a detailed study of the entire Wailua to Kapa'a wastewater system completed in 2008 to guide the County with the necessary expansion and management of the system through the year 2025. It broke down projected flows to the Wailua Treatment Plant in three phases, the current and near term flows up to the year 2010, middle term flows for the 2010-2015 period, and far term flows for the years 2015 to 2025.

Wailua-Kapa'a Average Daily Wastewater Flows[1]	
Planning Interval	Average Wastewater Flow (mgd)
Current	0.70
Near Term (2010)	0.98
Middle Term (2015)	1.39
Far Term at Wailua WWTP(2025)	1.72
Kapaa Start-Up (2025)	0.40

The need for the WFP was partially based upon the rapid development that was occurring in the Wailua-Kapaa area during 2004-2007 period. Development has slowed considerably since this time and several of the developments anticipated in the WFP calculations have been put on hold or are no longer proposed. Of the proposed developments, the Coco Palms Hotel will be removed from the near term anticipate flows and be considered part of the middle term flows. The Coconut Beach Resort and Coconut Plantation Village will be removed from the middle term flows and be considered for the far term flows.

The proposed Kapa'a Highlands development is not expected to be at total capacity by 2015, but for the purposes of this report, it will be considered to be completed in the middle term planning period of the WFP. The table below is the adjusted Average Daily Flows (ADF) based upon the current flow to the Wailua Treatment Plant and adjustments due to slower development than anticipated by WFP.

Adjusted Wailua-Kapa'a Average Daily Wastewater Flows	
Planning Interval	Average Wastewater Flow (mgd)
Current	0.70
Near Term (2010)	0.98
Middle Term (2015)	1.39
Far Term at Wailua WWTP(2025)	1.72

Kapa'a Highlands Phase II Wastewater Flow Estimates	
Item	Projected Wastewater Flow (gpd)
Single Family Homes	34,400
Multi-Family Homes	170,750
Neighborhood Commercial	4,800
Total	209,950

Note: Single Family Homes assumed to have 4 occupants/unit and Multi-Family Homes have 2.5 occupants/unit.

[1] Table ES-1, WFP, September 2008

Preliminary Design

Based upon the projected flow of 209,950 gpd (0.21 mgd), with a max load factor of 4.1, a 12" sewer main would be required to serve the development. The location of the main is shown on Exhibit 1. It would begin along the Kapa'a By-pass Road and terminate at an existing manhole near the intersection of Ulu and Kukui Streets. The length of the main within the existing public Right-of-Ways would be about 3,400 linear feet. At the existing manhole connection the existing main downstream of the connection is a 21" main with a capacity of 3.2 mgd. The 21" main currently has a peak flow of about 0.6 mgd, therefore the proposed flow is well within the capacity of the existing sewer system, including allowances for the future increases anticipated in the "Final Wailua Facility Plan", September 2008.

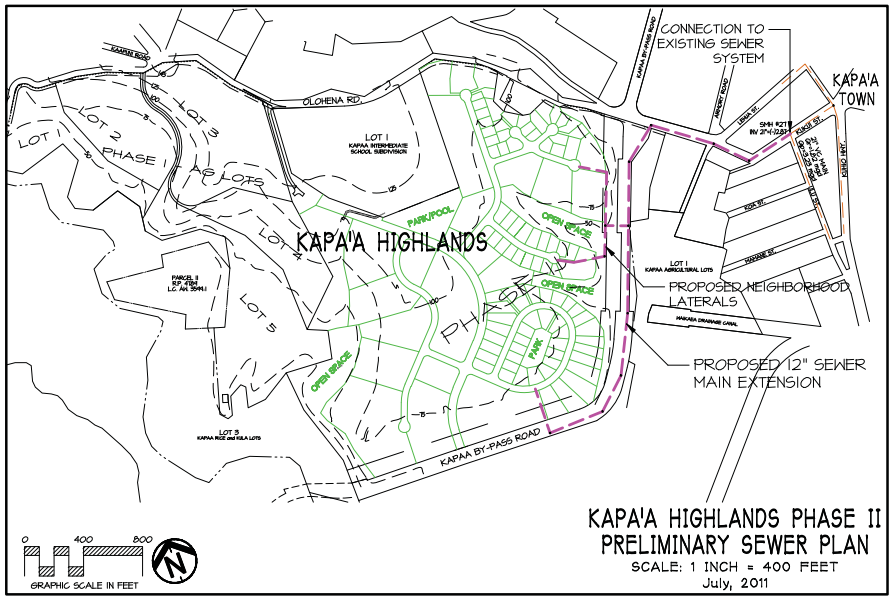

CONNECTION TO EXISTING SEWER SYSTEM
KAPA'A TOWN
KAPA'A HIGHLANDS
PHASE I
PHASE II
LOT 1
LOT 2
LOT 3
LOT 4
LOT 5
LOT 6
LOT 7
LOT 8
LOT 9
LOT 10
LOT 11
LOT 12
LOT 13
LOT 14
LOT 15
LOT 16
LOT 17
LOT 18
LOT 19
LOT 20
LOT

Exhibit H

Traffic Impact Assessment Report Kapa'a Highlands Subdivision
Kapa'a, Kaua'i, Hawai'i
TMK: (4) 4-3-03:01

Phillip Rowell and Associates
47-273 'D' Hui Iwa Street Kaneohe, Hawaii 96744 Phone: (808) 239-8206 FAX: (808) 239-4175 Email:prowell@hawii.rr.com

December 9, 2013

Mr. Greg Allen
Kapa'a Highlands
161 Wailua Road
Kapa'a Hawaii 96746

Re: Traffic Impact Assessment Report Kapa'a Highlands Subdivision
Kapa'a, Kauai, Hawaii
TMK: (4) 4-3-03:01

Phillip Rowell and Associates have completed the following Traffic Impact Assessment Report (TIAR) for Kapa'a Highlands Subdivision. The report is presented in the following format:

A. Project Location and Description
B. Purpose and Objective of Study
C. Study Approach
D. Description of Existing Streets and Intersection Controls
E. Existing Peak Hour Traffic Volumes
F. Public Transportation
G. Level-of-Service Concept
H. Existing Levels-of-Service
J. Background Traffic Projections
K. Project Trip Generation
L. Background Plus Project Projections
M. Traffic Impact Assessment
N. Project Road System
O. Other Traffic Related Issues
P. Summary and Recommendations

A. Project Location and Description

1. The proposed project is located west of Kapa'a Town and adjacent to Kapa'a Intermediate School, generally in the southwest quadrant of the intersection of Olohena Road and Kapa'a Bypass. See Attachment A.

2. The project is a residential subdivision with single-family and multi-family residences and neighborhood supporting retail. The project has two phases as shown on Attachment B. The development plan is summarized as follows:

Phase 1	Phase 2
16 Single-Family Units	100 Single-Family Units
	700 Multi-Family Units
	8,000 SF Neighborhood Retail

3. Access to and egress from Phase 1 will be via driveways along the south side of Olohena Road west of Kapa'a Intermediate School.

4. Access to and egress from Phase 2 will be provided via a new intersection along the north side of Kapa'a Bypass and a new intersection along the south side of Olohena Road. These two intersections will be connected by a new curvilinear roadway running through the project. For purposes of discussion in the report, this roadway is referred to as Road 'A.'

B. Purpose and Objective of Study

1. Quantify and describe the traffic related characteristics of the proposed project.

2. Identify potential deficiencies adjacent to the project that will impact traffic operations in the vicinity of the proposed project.

C. Study Approach

1. A preliminary trip generation analysis was performed to define the scope of work and study area. This analysis determined that the proposed project will generate less than 500 trips during either the morning or afternoon peak hour. Based on Institute of Transportation Engineers standards, the traffic study should be a "small development: traffic impact assessment."[1] Accordingly, the study area was defined to include the intersection of Kapa'a Bypass at Olohena Road and the intersections providing access to and egress from Phase 2 of the project (Kapaa Bypass at Road 'A' and Olohena Road at Road 'A'). Phase 1 lots are serviced by individual driveways which will have negligible traffic volumes.

   State of Hawaii Department of Transportation reviewed the first draft of the report and directed that the study area be expanded to include the intersections of Kuhio Highway at Kukui Street and Kuhio Highway at Kapaa Bypass. See Attachment O.

   The County of Kauai directed that the intersection of Olohena Road at Kaapuni Road and Kaehula Road be included in the study area. See Attachment P.

2. A field reconnaissance was performed to identify existing roadway cross-sections, intersection lane configurations, traffic control devices, and surrounding land uses.

3. Current weekday peak hour traffic volumes were obtained from manual traffic counts at the study intersections.

4. Existing intersection levels-of-service were determined using the methodology described in the *2000 Highway Capacity Manual*. Existing deficiencies were identified based on the results of the level-of-service analysis and field observations.

5. Peak hour traffic that the proposed project will generate was estimated using trip generation analysis procedures recommended by the Institute of Transportation Engineers. Project generated traffic was distributed and assigned to the adjacent roadway network.

6. A level-of-service analysis for future traffic conditions with traffic generated by the study project was performed.

[1] Institute of Transportation Engineers, *Transportation and Land Development*, Washington, D.C., 2002, p. 3-6

7. The impacts of traffic generated by the proposed project were quantified and summarized.

8. A report documenting the conclusions of the analyses performed and recommendations was prepared.

D. Description of Existing Streets and Intersection Controls

Kapa'a Bypass is a two-lane, two-way roadway along the southern and eastern boundaries of the project. This section of Kapa'a Bypass is owned by the Kapa'a Highlands developer, who has entered a memorandum of understanding with State of Hawaii Department of Transportation to dedicate the roadway to the State upon approval of Kapa'a Highlands subdivision[2]. According to State of Hawaii Department of Transportation traffic count data from 2010, Kapa'a Bypass has a weekday traffic volume of 7,400 vehicles per day.

Olohena Road is a two-lane, two-way roadway along the northern boundary of the project. Olohena Road also provides service to Kapa'a Intermediate School.

Kuhio Highway though Kapaa Town is a two-lane, two-way State highway along the east of the study area.

Existing Intersections

The intersection of Kuhio Highway at Kukui Street is a four-legged, signalized intersection located approximately 1,600 feet east of the project. The northbound and southbound approaches are Kuhio Highway and the eastbound and westbound approaches are Kukui Street. The northbound and southbound left turns are protected-permissive.

The intersection of Kuhio Highway at Kapaa Bypass is a three-legged, unsignalized intersection approximately two miles south of Kukui Street. The northbound and southbound approaches are Kuhio Highway. The eastbound approach is the Kapaa Bypass and is the controlled approach. The northbound approach is coned during the morning peak hours to provide on left turn and one through lane. The coning also allows the eastbound to southbound left turn to operate as a free right turn. During the afternoon peak hours and off peak hours, there is one left turn lane and two through lanes. The southbound approach has one through lane and one right turn lane. The eastbound approach has one left turn lane and one right turn lane.

The intersection Kapa'a Bypass and Olohena Road is a four-legged roundabout. All approaches are one lane only. The north leg of the intersection is one-way southbound into the intersection. The remaining three legs are two-way.

The intersection of Olohena Road at Kaapuni Road and Kaehula Road is actually two intersections. Olohena Road is the eastbound and westbound approaches and Kaapuni Road is the STOP sign controlled approach at Olohena Road. Kaehula Road intersects Kaapuni Road west of Olohena Road.

The intersection configurations are summarized on Attachment C.

[2] Honua Engineering, Inc., *Traffic Considerations Kapa'a Highlands Project*, March 28, 2012

E. Existing Peak Hour Traffic Volumes

Current weekday peak hour traffic volumes at the intersection of Kapa'a Bypass at Olohena Road were obtained from manual traffic counts. The counts at the intersection of Olohena Road at Kapaa Bypass were performed Tuesday, May 15, 2012. The counts at the intersection of Kuhio Highway were performed Thursday, August 8, 2013, and the counts at the intersection of Kuhio Highway at Kapaa Bypass were performed on Tuesday, October 29, 2013.

The traffic counts include mopeds, motorcycles, buses, trucks and other large vehicles.

During the surveys, the following was observed at the intersection of Olohena Road at Kapaa Bypass:

1. The number of pedestrians crossing the approaches to the intersection are minimal, even with the bus stop and transfer site at the park along the north side of Olohena Road east of the intersection.

2. Long queues of 15 vehicles or more along the westbound approach of Olohena Road were noted during the morning peak hour.

The existing peak hour traffic volumes are summarized on Attachments D and E.

F. Public Transportation

The Kauai Bus operates along Olohena Road and Kapa'a Bypass. A major bus stop and transfer point is located along Olohena Road east of Kapa'a Bypass in the parking lot adjacent to the park.

G. Level-of-Service Concept

"Level-of-Service" is a term which denotes any of an infinite number of combinations of traffic operating conditions that may occur on a given lane or roadway when it is subjected to various traffic volumes. Level-of-service (LOS) is a qualitative measure of the effect of a number of factors which include space, speed, travel time, traffic interruptions, freedom to maneuver, safety, driving comfort and convenience.

There are six levels-of-service, A through F, which relate to the driving conditions from best to worst, respectively. The characteristics of traffic operations for each level-of-service are summarized in Table 1. In general, LOS A represents free-flow conditions with no congestion. LOS F, on the other hand, represents severe congestion with stop-and-go conditions. *Level-of-service D is typically considered acceptable for peak hour conditions in urban areas.*[3]

Corresponding to each level-of-service shown in the table is a volume/capacity ratio. This is the ratio of either existing or projected traffic volumes to the capacity of the intersection. Capacity is defined as the maximum number of vehicles that can be accommodated by the roadway during a specified period of time. The capacity of a particular roadway is dependent upon its physical

[3] Institute of Transportation Engineers, *Transportation Impact Analyses for Site Development: A Recommended Practice*, 2006, page 60

characteristics such as the number of lanes, the operational characteristics of the roadway (one-way, two-way, turn prohibitions, bus stops, etc.), the type of traffic using the roadway (trucks, buses, etc.) and turning movements.

Table 1 Level-of-Service Definitions for Signalized Intersections[1]

Level of Service	Interpretation	Volume-to-Capacity Ratio[2]	Stopped Delay (Seconds)
A, B	Uncongested operations; all vehicles clear in a single cycle.	0.000-0.700	<20.0
C	Light congestion; occasional backups on critical approaches	0.701-0.800	20.1-35.0
D	Congestion on critical approaches but intersection functional. Vehicles must wait through more than one cycle during short periods. No long standing lines formed.	0.801-0.900	35.1-55.0
E	Severe congestion with some standing lines on critical approaches. Blockage of intersection may occur if signal does not provide protected turning movements.	0.901-1.000	55.1-80.0
F	Total breakdown with stop-and-go operation	>1.001	>80.0

Notes:
(1) Source: *Highway Capacity Manual*, 2000.
(2) This is the ratio of the calculated critical volume to Level-of-Service E Capacity.

Like signalized intersections, the operating conditions of intersections controlled by stop signs can be classified by a level-of-service from A to F. However, the method for determining level-of-service for unsignalized intersections is based on the use of gaps in traffic on the major street by vehicles crossing or turning through that stream. Specifically, the capacity of the controlled legs of an intersection is based on two factors: 1) the distribution of gaps in the major street traffic stream, and 2) driver judgement in selecting gaps through which to execute a desired maneuver. The criteria for level-of-service at an unsignalized intersection is therefore based on delay of each turning movement. Table 2 summarizes the definitions for level-of-service and the corresponding delay.

Table 2 Level-of-Service Definitions for Unsignalized Intersections(1)

Level-of-Service	Expected Delay to Minor Street Traffic	Delay (Seconds)
A	Little or no delay	<10.0
B	Short traffic delays	10.1 to 15.0
C	Average traffic delays	15.1 to 25.0
D	Long traffic delays	25.1 to 35.0
E	Very long traffic delays	35.1 to 50.0
F	See note (2) below	>50.1

Notes:
(1) Source: *Highway Capacity Manual*, 2000.
(2) When demand volume exceeds the capacity of the lane, extreme delays will be encountered with queuing which may cause severe congestion affecting other traffic movements in the intersection. This condition usually warrants improvement of the intersection.

H. Existing Levels-of-Service

The results of the level-of-service analysis of the intersection of Kuhio Highway at Kukui Street is summarized in Table 3. Since this intersection is signalized, the volume-to-capacity ratio, delay and level-of-service is shown for the overall intersection and each controlled movement. The traffic signal timing was estimated by manually timing the traffic signals during the peak hours.

Table 3 Existing Levels-of-Service - Signalized Intersections (1)

Intersection and Movement	AM Peak Hour			PM Peak Hour		
	V/C(2)	Delay(3)	LOS(4)	V/C	Delay	LOS
Kuhio Highway at Kuhio Street	Cycle Length = 60 Seconds(5)			Cycle Length = 60 Seconds		
	0.51	***11.5***	***B***	***0.49***	***11.1***	***B***
Eastbound Left & Thru	0.10	17.0	B	0.09	16.9	B
Eastbound Right	0.03	16.4	B	0.01	16.3	B
Westbound Right	0.00	16.2	B	0.01	16.2	B
Northbound Left	0.03	5.0	A	0.02	5.0	A
Northbound Thru & Right	0.68	11.5	B	0.61	10.1	B
Southbound Left & Thru	0.65	10.9	B	0.67	11.5	B
Southbound Right	0.00	4.8	A	0.00	4.8	A

NOTES:
(1) See Attachments F and G for Level-of-Service Worksheets.
(2) Volume-to-Capacity ratio.
(3) Delay is in seconds per vehicle.
(4) Level-of-Service calculated using the operations method described in *Highway Capacity Manual*. Level-of-Service is based on delay.
(5) Traffic signal cycle length determined by timing the traffic signal during peak hours.

The overall intersection operates at Level-of-Service B during both peak periods. All controlled lane groups operate at Level-of-Service A or B. This indicates good operating conditions.

The results of the level-of-service analysis of the intersection of Kapa'a Bypass and Olohena Road are summarized in Table 4. For roundabout intersections, the HCS methodology calculates volume-to-capacity ratios for the intersection approaches, which is then related to the volume-to-capacity ratio definitions for levels-of-service discussed previously. The levels-of-service calculations indicate that the eastbound approach is near capacity during the morning peak hour with a volume-to-capacity ratio of 0.92. All the remaining movements operate at Level-of-Service A or B.

Table 4 Existing Levels-of-Service - Kapa'a Bypass at Olohena Road

Approach	AM Peak Hour		PM Peak Hour	
	Without Project		Without Project	
	V/C (1)	LOS(2)	V/C	LOS
Overall Intersection	***0.92***	***E***	***0.50***	***A***
Eastbound Approach	0.92	E	0.49	A
Westbound Approach	0.18	A	0.42	A
Northbound Approach	0.09	A	0.38	A
Southbound Approach	0.63	B	0.62	B

NOTES:
(1) V/C. denotes volume-to-capacity ratio.
(2) LOS denotes Level-of-Service.
(3) See Attachments F and G for Level-of-Service Worksheets.

The results of the level-of-service analysis of the remaining unsignalized intersections are summarized in Table 5. The HCM methodology calculates only delays for controlled lane groups only. Volume-to-capacity ratios are not calculated. The 95th percentile queue lengths as reported by Synchro are also shown.

Table 5 Existing Levels-of-Service of Unsignalized Intersections

Intersection, Approach and Movement	AM Peak Hour			PM Peak Hour		
	Delay (1)	LOS (2)	95th Queue(3)	Delay	LOS	95th Queue
Kuhio Highway at Kapaa Bypass	***95.3***	***F***	***NC***	***12.3***	***B***	***NC***
Eastbound Left	273.5	F	999	57.9	F	227
Eastbound Right	Uncontrolled Lane Group			Uncontrolled Lane Group		
Northbound Left	9.2	A	8	13.2	B	82
Northbound Thru	Uncontrolled Lane Group			Uncontrolled Lane Group		
Southbound Thru	Uncontrolled Lane Group			Uncontrolled Lane Group		
Southbound Right	Uncontrolled Lane Group			Uncontrolled Lane Group		
Olohena Road at Kaapuni Road	***9.8***	***A***	***NC***	***3.1***	***A***	***NC***
Eastbound Left & Thru	0.9	A	2	1.7	A	2
Westbound Thru & Right	Uncontrolled Lane Group			Uncontrolled Lane Group		
Southbound Left & Right	22.5	C	112	13.5	B	26
Kaapuni Road at Kaehula Road	***0.7***	***A***	***NC***	***0.3***	***A***	***NC***
Westbound Left & Right	11.5	B	4	11.4	B	1
Northbound Thru & Right	Uncontrolled Lane Group			Uncontrolled Lane Group		
Southbound Left & Thru	0.0	A	0	0.1	A	0

NOTES:
(1) Delay is in seconds per vehicle.
(2) LOS denotes Level-of-Service.
(3) 95th percentile queue in feet as reported by Synchro.
(4) NC = Not calculated
(5) See Attachments F and G for Level-of-Service Worksheets.

The intersection of Kuhio Highway at Kapaa Bypass operates at Level-of-Service F during the morning peak hour and Level-of-Service B during the afternoon peak hour. It is the eastbound left turn lane with a delay so long that is impacts of the overall intersection, resulting in the poor level-of-service.

The intersection of Olohena Road at Kaapuni Road and Kaehula Road is actually two intersections. Olohena Road is the eastbound and westbound approaches and Kaapuni Road is the STOP sign controlled approach at Olohena Road. Kaehula Road intersects Kaapuni Road west of Olohena Road. Therefore, the level-of-service results are shown for two intersections. The intersections of Olohena Road at Kaapuni Road and Olohena Road at Kaehula Road both operate at Level-of-Service A during both peak periods.

I. Existing Deficiencies

The eastbound approach at the intersection of Olohena Road at Kapaa Bypass is at or near capacity during the morning peak hour with a volume-to-capacity ratio of 0.92 and a Level-of-Service of E. The deficient movement is mitigated when the project is constructed as traffic will be redistributed as a result of constructing Road A through the project. This redistribution will be addressed later in this report as part of the traffic impact analysis of the project.

The eastbound to northbound left turns at the intersection of Kuhio Highway at Kapaa Bypass operate at Level-of-Service F during both peak hours. However, the morning and afternoon volumes are only 5 and 12 vehicles, respectively. Since the volumes are so low, mitigation has been deferred. It should also be noted that the proposed development project adds no traffic to these movements.

J. Background Traffic Projections

Based on data in the *Kauai Long-Range Land Transportation Plan*[4], population growth in the Kawaihau District, which includes Kapa'a, will be less than one percent per year until 2020. Also, we are not aware of any approved projects in the vicinity that will impact traffic conditions along Kapa'a Bypass or Olohena Road before the design year of this project. Therefore, for this particular study, it was assumed that there will be no significant increase in peak hour traffic at the study intersections as a result of regional background growth or traffic generated by approved new projects in the vicinity of the project. Future 2020 background (without project) traffic volumes were estimated to be comparable to existing peak hour traffic volumes at the study intersections.

K. Project Trip Generation

Future traffic volumes generated by Kapa'a Highlands Subdivision (Phases 1 and 2) were estimated using the methodology described in the *Trip Generation Handbook*[5] and data provided in *Trip Generation*[6]. This method uses trip generation equations or rates to estimate the number of trips that the project will generate during the peak hours of the project and along the adjacent street.

[4] Austin, Tsutsumi & Associates, *Kauai Long-Range Land Transportation Plan*, May 2004

[5] Institute of Transportation Engineers, *Trip Generation Handbook*, Washington, D.C., 2004, p. 7-12

[6] Institute of Transportation Engineers, *Trip Generation, 7th Edition*, Washington, D.C., 2003

The equations used for the trip generation analysis are summarized in Table 6. The trip generation equations for the residential uses are based on the number of planned residential units. The equations for the retail portion of the project are based on the gross leasable square footage of the retail area. The equations shown estimate the number of peak hour trips during the peak hours of the generator, which may or may not coincide with the peak hour of the adjacent street. *Trip Generation* does not note the peak hours of the generators.

A portion of the trips to and from the retail area will be from the adjacent traffic stream. These trips are referred to as "pass by trips" and are deducted from the total number of trip to estimate the number of new trips generated by the project. However, these trips are added to the driveway volumes at the retail areas. The equation for estimating the percent pass by trips is also provided. This equation is based on the gross leasable square footage of the retail area. Pass by equations are provided of the PM peak hour only.

It should be noted that the percentage of pass by trip estimated from the equation provided in the *Trip Generation Handbook* is 81%. State of Hawaii Department of Transportation felt that this percentage was too high. It was agreed with State of Hawaii Department of Transportation that 34% would be used for the trip generation calculations. Refer to Attachment O.

Table 6 Trip Generation Equations(1)

Period & Direction		Single Family Units (Land Use Code 210)	Multi-Family Units (Land Use Code 230	Neighborhood Commercial (Land Use Code 820)	Pass By Trips
		Equation or Percent(1)	Equation or Percent(1)	Equation or Percent(1)	Equation or Percent(2)
Weekday Total		Ln(T) = 0.92 Ln(X) + 2.71	Ln(T) = 0.85 Ln(X) + 2.55	Ln(T) = 0.65 Ln (x) + 5.83	No Equation Provided
AM Peak Hour	Total	T = 0.70(X) + 12.05	Ln(T) = 0.82 Ln(X) +0.171	Ln(T) = 0.60Ln(A)+2.29	No Equation Provided
	Inbound	25%	18%	61%	
	Outbound	75%	82%	39%	
PM Peak Hour	Total	Ln(T) = 0.89Ln(X) + 9.61	T = 0.34(X) + 38.31	Ln(T) = 0.66Ln(A)+3.40	Ln (T) = - 0.29 Ln(A)+5.00
	Inbound	63%	64%	48%	50%
	Outbound	37%	36%	52%	50%

Notes:
(1) Source: Institute of Transportation Engineers, *Trip Generation, 7th Edition*, Washington, D.C., 2003
(2) Source: Institute of Transportation Engineers, *Trip Generation Handbook*, Washington, D.C., 2004, p 47
(3) T = Trips, X = Number of Units, A = Gross Leasable Square Feet

The results of the trip generation analysis are summarized in Table 7. The conclusion of the trip generation analysis is that Phases 1 and 2 will generate a total of 394 trips during the morning peak hour and 487 trips during the afternoon peak hour. As noted earlier, the numbers of peak hour trips shown are the trips generated during the peak hour of the generator, which may or may not coincide with the peak hours of the adjacent streets.

Table 7 Trip Generation Calculations

		Phase 1	Phase 2								Total Project Trips (Phases 1 and 2)		
		Single Family	Single Family	Multi-Family	Neighborhood Commercial			Phase 2 Total Trip					
		16 Units	100 Units	700 Units	8,000 TLSF								
Period & Direction		Trips	Trips	Trips	Trips	Pass By Trips(1)	New Trips	Trips	Pass By Trips	New Trips	Total Trips	Pass By Trips	New Trips
AM Peak Hour	Total	23	82	255	34	0	34	371	0	371	394	0	394
	Inbound	6	21	46	21	0	21	88	0	88	94	0	94
	Outbound	17	61	209	13	0	13	283	0	283	300	0	300
PM Peak Hour	Total	22	111	276	118	40	78	505	96	409	527	40	487
	Inbound	14	71	177	57	20	37	305	48	257	319	20	299
	Outbound	8	40	99	61	20	41	200	48	152	208	20	188

Notes:
(1) The percentage of pass by trips is 34% of the afternoon peak hour trips.

Project trips were distributed and assigned based on existing traffic approach and departure patterns of traffic into and out of the study area as estimated from the traffic counts. Given the location of the retail, which is the center of Phase 2, it was assumed that all the pass by trips would be diverted from the internal road system of Phase 2. The project trip assignments for Phases 1 and 2 are shown on Attachment H and I, respectively.

L. Background Plus Project Projections

Background plus project traffic projections were estimated by superimposing the peak hourly traffic generated by the proposed project on the background (without project) peak hour traffic projections. This assumes that the peak hourly trips generated by the project coincide with the peak hour of the adjacent street. This represents a worse-case condition as it assumes that the peak hours of the intersection approaches and the peak hour of the study project coincide.

As noted earlier, construction of Road 'A' will divert traffic from the eastbound to southbound right turns and northbound to westbound left turns from the intersection of Olohena Road at Kapaa Bypass. The redistribution of traffic is summarized on Attachment J.

The resulting background plus project peak hour traffic projections are shown in Attachments K and L.

M. Traffic Impact Assessment

The traffic impact of the proposed project was assessed by analyzing changes in traffic volumes at the study intersections and changes on the level-of-service.

Changes in Total Intersection Volumes

An analysis of the project's share of 2020 background plus project intersection approach volumes at the study intersections is summarized in Table 8. The table summarizes the project's share of total 2020 peak hour approach volumes at each intersection. Also shown are the percentages of 2020 background plus project traffic that is the result of background growth and traffic generated by related projects. The negative percentages reflect the redistribution of traffic as a result of Road 'A'.

Table 8 Analysis of Project's Share of Total Intersection Approach Volumes (1)

Intersection	Period	Existing	2020 Background Plus Project	Project Traffic	
Kukui Highway at Kukui Street	AM	1441	1453	12	0.8%
	PM	1370	1385	15	1.1%
Olohena Road at Kapaa Bypass	AM	1447	1372	-75	-5.5%
	PM	1459	1407	-52	-3.7%
Kuhio Highway at Kapaa Bypass	AM	1990	2266	276	12.2%
	PM	2176	2518	342	13.6%

Notes:
(1) Volumes shown are total intersection approach volumes or projections.
(2) Percentage of total 2015 background plus project traffic.
(3) Data to be provided in final draft report.

The percentage of project traffic at the intersection of Kuhio Highway at Kukui Street is 0.8% during the morning peak hour and 1.1% during the afternoon peak hour. The analysis indicates that the peak hour traffic volumes at the intersection of Olohena Road at Kapaa Bypass will be less than existing because of the redistribution of traffic to Road 'A.'

The analysis indicates that peak hour traffic at the intersection of Kuhio Highway at Kapaa Bypass will increase 12.2 % during the morning peak hour and 13.6% during the afternoon peak hour. These increases are higher than desirable but the intersection is over two miles from the project. Typically, the study area for a project that generates the amount of traffic that this project generates should be limited to one-half mile, or less.

Changes of Levels-of-Service

A level-of-service analysis was performed for "without project" and "with project" conditions to confirm that the intersections will operate at an acceptable level-of-service and that there are no traffic operational deficiencies.

The results of the 2020 level-of-service analysis of the intersection of Kuhio Highway at Kukui Street are summarized in Table 9. The overall intersection and all controlled movements will

operate at Level-of-Service B without and with project generated traffic. There are no changes in the level-of-service of the intersections or controlled lane groups as a result of project related traffic.

Table 9 2020 Levels-of-Service - Kuhio Highway at Kukui Street (1)

Intersection and Movement	AM Peak Hour						PM Peak Hour					
	Without Project			With Project			Without Project			With Project		
	V/C(2)	Delay(3)	LOS(4)	V/C	Delay	LOS	V/C	Delay	LOS	V/C	Delay	LOS
Overall Intersection	Cycle Length = 60 Seconds(5)						Cycle Length = 60 Seconds					
	0.51	***11.5***	***B***	***0.51***	***11.6***	***B***	***0.49***	***11.1***	***B***	***0.50***	***11.1***	***B***
Eastbound Left & Thru	0.10	17.0	B	0.11	17.1	B	0.09	16.9	B	0.10	17.0	B
Eastbound Right	0.03	16.4	B	0.04	16.5	B	0.01	16.3	B	0.02	16.3	B
Westbound Right	0.00	16.2	B	0.00	16.2	B	0.01	16.2	B	0.01	16.2	B
Northbound Left	0.03	5.0	A	0.03	5.1	A	0.02	5.0	A	0.04	5.2	A
Northbound Thru & Right	0.68	11.5	B	0.68	11.5	B	0.61	10.1	B	0.61	10.1	B
Southbound Left & Thru	0.65	10.9	B	0.65	10.9	B	0.67	11.5	B	0.67	11.5	B
Southbound Right	0.00	4.8	A	0.00	4.8	A	0.00	4.8	A	0.00	4.8	A

NOTES:
(1) See Attachment M for AM peak hour Level-of-Service Worksheets and Attachment N for PM peak hour Level-of-Service Worksheets.
(2) Volume-to-Capacity ratio.
(3) Delay is in seconds per vehicle.
(4) Level-of-Service calculated using the operations method described in *Highway Capacity Manual*. Level-of-Service is based on delay.
(5) Traffic signal cycle length determined by timing the traffic signal during peak hours.

The results of the level-of-service analysis for the intersection of the Kapa'a Bypass at Olohena Road, the only existing study intersection, are summarized in Table 10. The Highway Capacity Manual methodology for analysis of roundabouts calculates only the volume-to-capacity ratio of each intersection approach. The volume-to-capacity ratio is then referenced to the level-of-service definitions for signalized intersection to determine the level-of-service of each approach.

Table 10 Future (2020) Levels-of-Service - Kapa'a Bypass at Olohena Road

Approach	AM Peak Hour				PM Peak Hour			
	Without Project		With Project		Without Project		With Project	
	V/C (1)	LOS(2)	V/C	LOS	V/C	LOS	V/C	LOS
Overall Intersection	***0.92***	***E***	***0.83***	***D***	***0.50***	***A***	***0.64***	***B***
Eastbound Approach	0.92	E	0.83	D	0.49	A	0.43	A
Westbound Approach	0.18	A	0.19	A	0.42	A	0.42	A
Northbound Approach	0.09	A	0.05	A	0.38	A	0.30	A
Southbound Approach	0.63	B	0.63	B	0.62	B	0.64	B

NOTES:
(1) V/C. denotes volume-to-capacity ratio.
(2) LOS denotes Level-of-Service.
(3) See Attachment M for AM peak hour Level-of-Service Worksheets and Attachment N for PM peak hour Level-of-Service Worksheets.

The analysis concluded that the eastbound approach is over-capacity (Level-of-Service E) during the morning peak hour without the project but will operate at Level-of-Service D with the project. This improvement is because eastbound to southbound traffic will be diverted to Road A.

The results of the level-of-service analysis for the remaining unsignalized intersections are summarized in Table 11. Shown are the delays, levels-of-service and 95th percentile queues.

Table 11 2020 Levels-of-Service of Unsignalized Intersections

Intersection, Approach and Movement	AM Peak Hour						PM Peak Hour					
	Without Project			With Project			Without Project			With Project		
	Delay (1)	LOS (2)	95th Queue(3)	Delay	LOS	95th Queue	Delay	LOS	95th Queue	Delay	LOS	95th Queue
Kuhio Highway at Kapaa Bypass	***95.3***	***F***	***NC***	***191.4***	***F***	***NC***	***12.3***	***B***	***NC***	***42.4***	***E***	***NC***
Eastbound Left	273.5	F	999	479.7	F	1676	57.9	F	227	190.1	F	1116
Eastbound Right	Uncontrolled Lane Group			Uncontrolled Lane Group			Uncontrolled Lane Group			Uncontrolled Lane Group		
Northbound Left	9.2	A	8	9.6	A	15	13.2	B	82	21.0	C	203
Northbound Thru	Uncontrolled Lane Group			Uncontrolled Lane Group			Uncontrolled Lane Group			Uncontrolled Lane Group		
Southbound Thru	Uncontrolled Lane Group			Uncontrolled Lane Group			Uncontrolled Lane Group			Uncontrolled Lane Group		
Southbound Right	Uncontrolled Lane Group			Uncontrolled Lane Group			Uncontrolled Lane Group			Uncontrolled Lane Group		
Olohena Road at Kaapuni Road	***9.8***	***A***	***NC***	***10.1***	***B***	***NC***	***3.1***	***A***	***NC***	***3.3***	***A***	***NC***
Eastbound Left & Thru	0.9	A	2	0.9	A	2	1.7	A	2	1.5	A	2
Westbound Thru & Right	Uncontrolled Lane Group			Uncontrolled Lane Group			Uncontrolled Lane Group			Uncontrolled Lane Group		
Southbound Left & Right	22.5	C	112	24.0	C	121	13.5	B	26	14.4	B	32
Kaapuni Road at Kaehula Road	***0.7***	***A***	***NC***	***0.6***	***A***	***NC***	***0.3***	***A***	***NC***	***0.3***	***A***	***NC***
Westbound Left & Right	11.5	B	4	11.7	B	4	11.4	B	1	11.6	B	1
Northbound Thru & Right	Uncontrolled Lane Group			Uncontrolled Lane Group			Uncontrolled Lane Group			Uncontrolled Lane Group		
Southbound Left & Thru	0.0	A	0	0.0	A	0	0.1	A	0	0.1	A	0

NOTES:
(1) Delay is in seconds per vehicle.
(2) LOS denotes Level-of-Service.
(3) 95th percentile queue in feet as reported by Synchro.
(4) NC = Not calculated
(5) See Attachment M for AM peak hour Level-of-Service Worksheets and Attachment N for PM peak hour Level-of-Service Worksheets.

The intersection of Kuhio Highway at Kapaa Bypass will operate at Level-of-Service F without and with the project during the morning and afternoon peak hours. The delay of the eastbound to northbound left turn increases even though the project adds no traffic to this movement. The delay of this movement is so long that it affects the level-of-service of the overall intersections.

The remaining unsignalized intersections will operate at Level-of-Service A without and with project traffic.

The results of the level-of-service analysis of the new STOP sign controlled intersections are summarized in Table 12. As shown, all lane groups will operate at Level-of-Service C, or better.

Table 12 2020 Levels-of-Service - New Intersections

Intersection and Movement	AM Peak Hour Delay [1]	AM Peak Hour LOS [2]	AM Peak Hour Queue [3] (Feet)	PM Peak Hour Delay	PM Peak Hour LOS	PM Peak Hour Queue (Feet)
Kapa'a Bypass at Road 'A'	***6.5***	***A***	***NC***	***5.3***	***A***	***NC***
Eastbound Left & Thru	6.2	A	10	5.3	A	24
Southbound Left & Right	16.5	C	93	12.0	B	33
Olohena Road at Road 'A'	***3.0***	***A***	***NC***	***3.7***	***A***	***NC***
Westbound Left & Thru	1.5	A	2	1.5	A	4
Northbound Left & Right	17.1	C	36	16.8	C	35

NOTES:
(1) Delay is in seconds per vehicle.
(2) LOS denotes Level-of-Service. Level-of-Service is based on delay.
(3) 95th Percentile in feet as reported by Synchro.
(4) See Attachment M for AM peak hour Level-of-Service Worksheets and Attachment N for PM peak hour Level-of-Service Worksheets.
(5) NC = Not calculated.

N. Project Road System

For signalized intersections, Level-of-Service D is the minimum acceptable Level-of-Service[7] and that this standard is applicable to the overall intersection rather than each controlled lane group. Minor movements, such as left turns, and minor side street approaches may operate at Level-of-Service E or F for short periods of time during the peak hours so that the overall intersection and major movements along the major highway will operate at Level-of-Service D, or better. All volume-to-capacity ratios must be 1.00 or less[8].

A standard has not been established for unsignalized intersections. Therefore, we have used a standard that Level-of-Service D is an acceptable level-of-service for any major controlled lane groups, such as left turns from a major street to a minor street. Side street approaches may operate at Level-of-Service E or F for short periods of time. This is determined from the delays of the individual lane groups. If the delay of any of the side street approaches appears to be so long that it will affect the overall level-of-service of the intersection, then roadway improvements should be identified and accessed.

Using this standard, no additional roadway improvements are recommended to accommodate project related traffic.

The eastbound to northbound left turns at the intersection of Kuhio Highway at Kapaa Bypass will operate at Level-of-Service F, without and with project traffic. The proposed project adds no traffic to this movement. The proposed project adds traffic to the northbound to westbound left turn, which increases the delay to the eastbound to northbound left turn.

[7] Institute of Transportation Engineers, *Transportation Impact Analyses for Site Development: A Recommended Practice*, 2006, page 60.

[8] Transportation Research Board, *Highway Capacity Manual*, Washington, D.C., 2000, p. 16-35.

The level-of-service of the eastbound approach of Olohena Road to Kapa'a Bypass improves from Level-of-Service E to Level-of-Service D with project as a result of construction of Road 'A' between Kapa'a Bypass and Olowena Road, providing an alternate route and diverting traffic from the intersection. Thus, Road 'A' running through the project connecting these two intersections, redistributes traffic and reduces traffic of the overcapacity movement at this intersection during the AM peak hour.

O. Other Traffic Related Issues

1. Impacts of Closing Kapaa Bypass

Based on the traffic counts performed for this study, the Kapa'a Bypass accommodates between 600 and 700 vehicles per hour during the peak hours. A closure of the bypass would force this traffic to use Kuhio Highway. During the field reconnaissance for this project, it was noted that traffic flow along Kuhio Highway is congested, especially during the afternoons, with very slow speeds and long delays indicating low levels-of-service. It would be difficult for the intersections along Kuhio Highway in Kapa'a Town to accommodate this additional traffic at acceptable levels-of-service. The addition of traffic that now uses kapa'a Bypass to current traffic along Kuhio Highway would result in longer delays and therefore lower levels-of-service. The conclusion is that Kapa'a Bypass serves as a major mitigation to potential traffic congestion and low levels-of-service along Kuhio Highway.

2. Pedestrian and Traffic

It is reasonable that there will be a small amount of pedestrian and bicycle activity along Olohena Road in the vicinity of Kapa'a Intermediate School. Some of this pedestrian activity may be generated from Kapa'a Highlands Subdivision. Accordingly, the intersections into and out of the subdivisions should provide pedestrian crosswalks to accommodate this activity.

3. Speed Control Along Road 'A'

As noted earlier in this report, Road 'A' will provide an alternate route to Kapa'a Intermediate School since it will be a more direct route for northbound traffic. Since Road 'A' will be through a residential area, traffic calming measure should be provided to control vehicle speeds and enhance the safety of pedestrians. Measures that should be considered include four-way stops, speed humps or tables.

P. Summary and Recommendations

1. Kapa'a Highlands subdivision is located west of Kapa'a Town and adjacent to Kapa'a Intermediate High School. The project is a residential subdivision with single-family and multi-family residences and neighborhood supporting retail.

2. The project has two phases. Phase 1 will be 16 single-family agricultural lots. Access to and egress from these lot will via driveways along Olohena Road west of Kapa'a Intermediate School.

3. The second phase will consists of 100 single-family units, 700 multi-family units and 8,000 square feet of neighborhood supporting retail. Access to and egress from Phase 2 will be provided via a new intersection along the north side of Kapa'a Bypass and a new intersection along the south side of Olohena Road.

4. The conclusion of the trip generation analysis is that Phases 1 and 2 will generate a total of 394 trips during the morning peak hour and 487 trips during the afternoon peak hour.

5. The level-of-service analysis of the intersection of Kuhio Highway at Kukui Street determined that the overall intersection and all controlled movements will operate at Level-of-Service B without and with project generated traffic. There are no changes in the level-of-service of the intersections or controlled lane groups as a result of project related traffic.

6. A level-of-service analysis of the intersection of Kapa'a Bypass at Olohena Road concluded that the eastbound approach to the roundabout is currently over-capacity (Level-of-Service E) during the morning peak hour without the project but will operate at Level-of-Service D with the project. This improvement is because eastbound to southbound traffic will be diverted from the intersection to Road A.

7. The intersection of Kuhio Highway at Kapaa Bypass will operate at Level-of-Service F without and with the project during the morning and afternoon peak hours. The delay of the eastbound to northbound left turn increases even though the project adds no traffic to this movement. The delay of this movement is so long that it affects the level-of-service of the overall intersections. The proposed project adds no traffic to this movement. The proposed project adds traffic to the northbound to westbound left turn, which increases the delay to the eastbound to northbound left turn, but is not considered significant. The morning and afternoon peak hour projections for this lane group are 5 and 12 vehicles per hour, respectively. Traffic impacts due to the project are not considered significant.

8. Based on the results of the level-of-service analysis, no roadway improvements are recommended to accommodate project related traffic. The project actually has a positive impact as a result of constructing Road 'A', which will divert traffic away from the intersection of Olohena Road and Kapaa Bypass. The eastbound to southbound movement will be over-capacity without Road 'A'.

Respectfully submitted,
PHILLIP ROWELL AND ASSOCIATES

Phillip J. Rowell, P.E.
Principal

PHILLIP JAMES ROWELL
LICENSED PROFESSIONAL ENGINEER
No. 6878 - C
HAWAII U.S.A.
EXPIRATION DATE: 30 APRIL 2014
THIS WORK WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION

List of Attachments

A. Project Location of Kauai

B. Subdivision Plan

C. Existing Lane Configurations

D. Existing AM Peak Hour Traffic Volumes

E. Existing PM Peak Hour Traffic Volumes

F. Level-of-Service Worksheets for Existing AM Peak Hour Conditions

G. Level-of-Service Worksheets for Existing PM Peak Hour Conditions

H. Phase 1 Trip Assignments

I. Phase 2 Trip Assignments

J. Reassignment of Existing Trips

K. 2020 Background Plus Project AM Peak Hour Traffic Projections

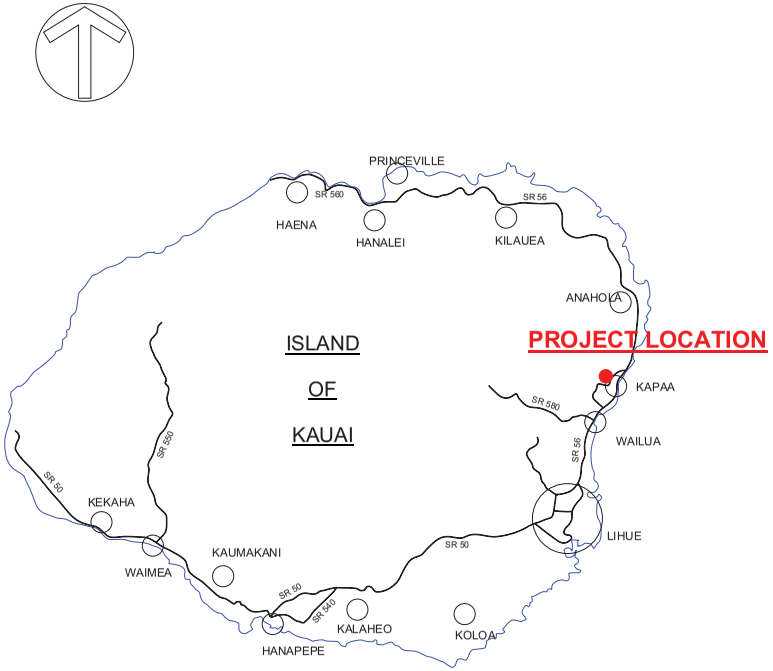
L. 2020 Background Plus Project PM Peak Hour Traffic Projections

M. Level-of-Service Worksheets for 2020 Background Plus Project AM Peak Hour Conditions

N. Level-of-Service Worksheets for 2020 Background Plus Project PM Peak Hour Conditions

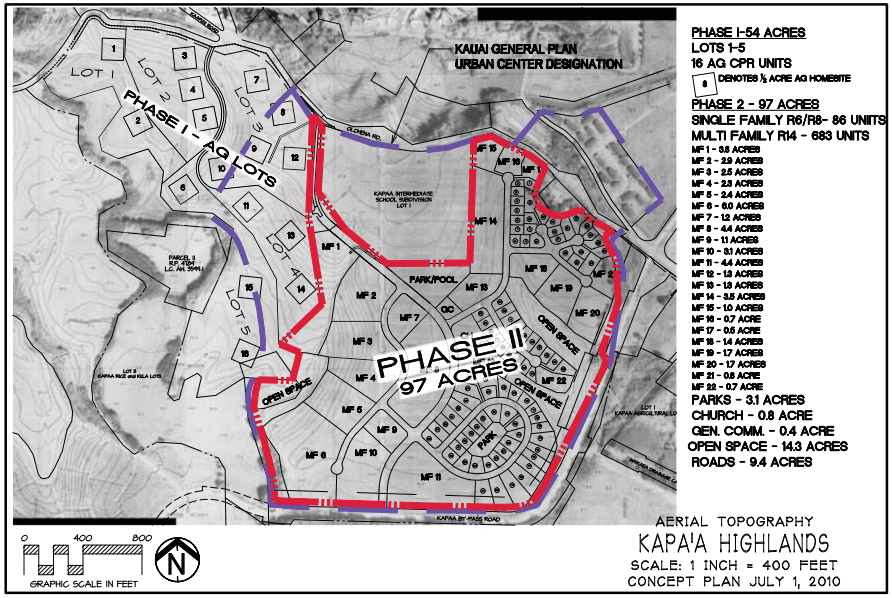
O. Comments from State of Hawaii Department of Transportation and Responses

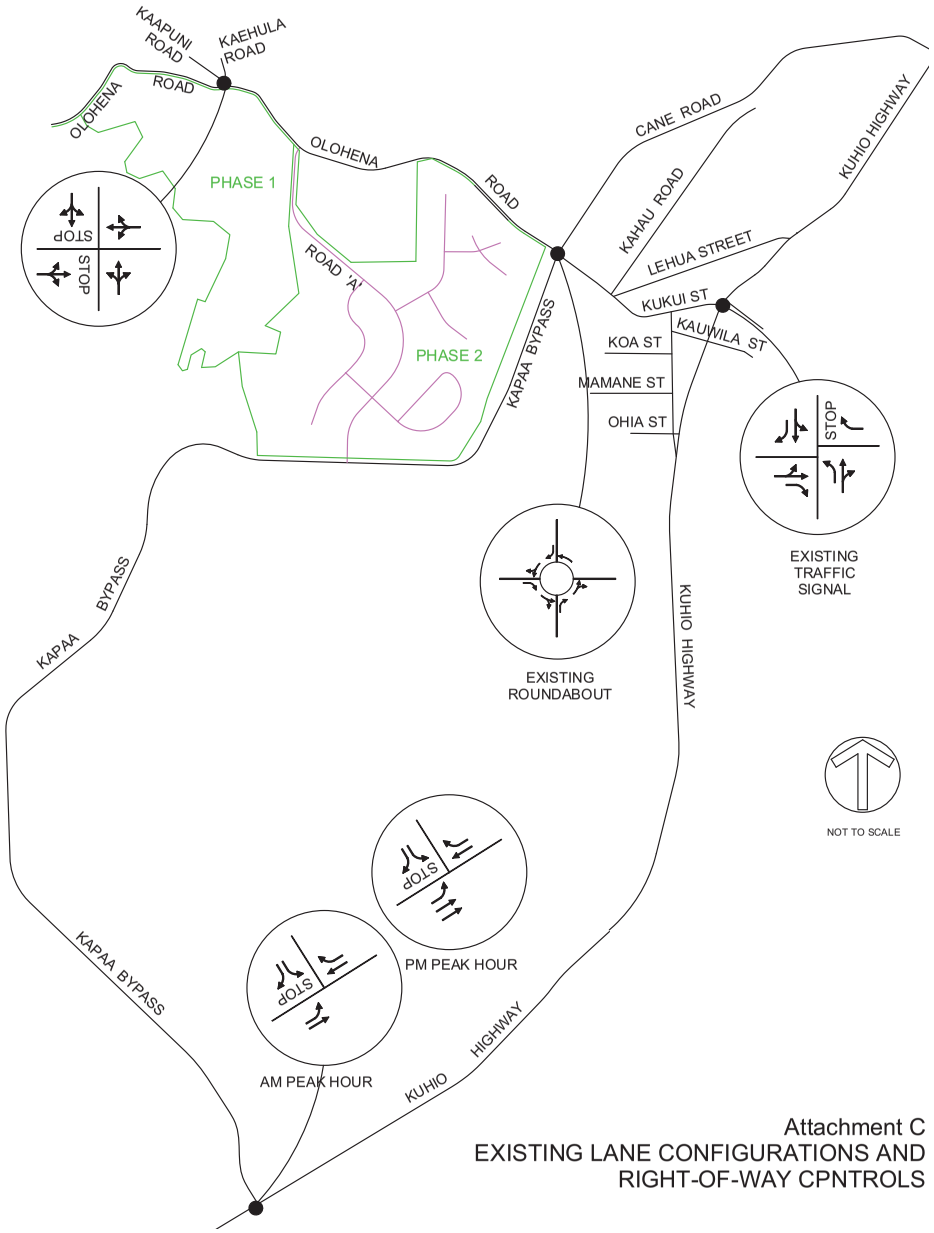
P. Comments from County of Kauai Department of Public Works and Responses



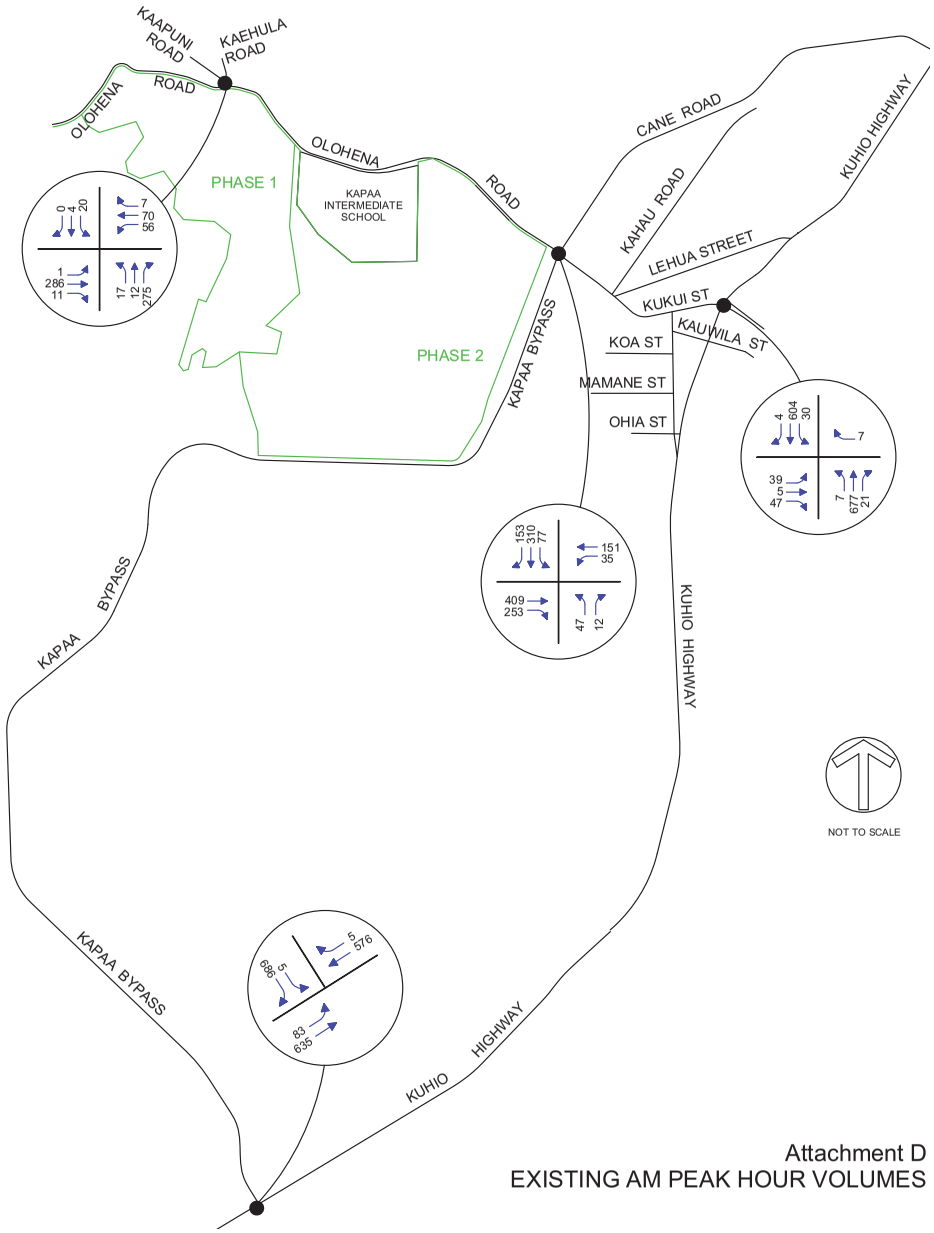
Attachment A
PROJECT LOCATION ON KAUAI

Attachment B
Subdivision Plan
(Provided By Others)

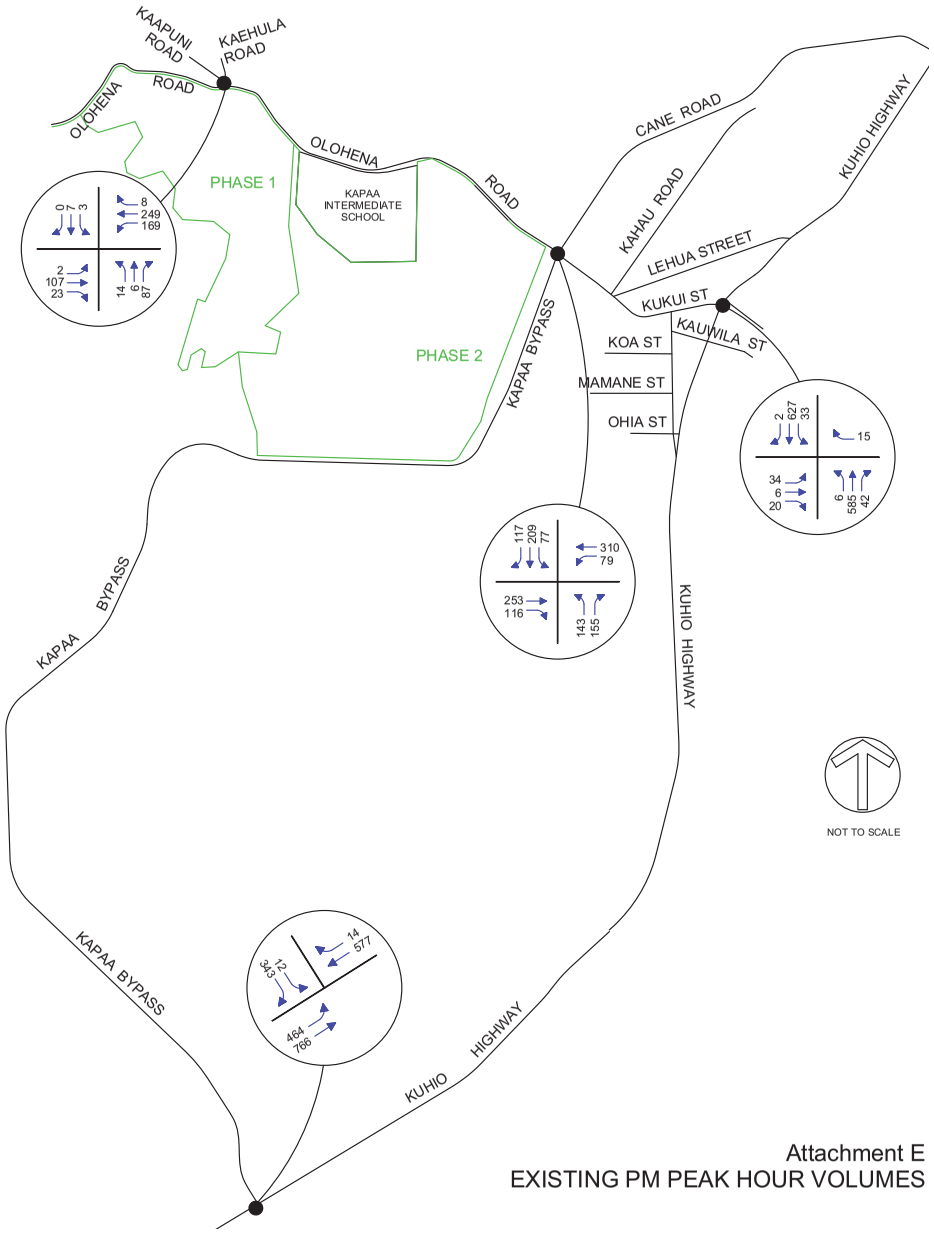




Attachment C
EXISTING LANE CONFIGURATIONS AND
RIGHT-OF-WAY CPNTROLS



Attachment D
EXISTING AM PEAK HOUR VOLUMES



Attachment E
EXISTING PM PEAK HOUR VOLUMES

Attachment F
Level-of-Service Worksheets for Existing AM Peak Hour Conditions

HCM Signalized Intersection Capacity Analysis
1: KUKUI STREET & KUHIO HIGHWAY 11/15/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0			4.0	4.0	4.0			4.0	4.0
Lane Util. Factor		1.00	1.00			1.00	1.00	1.00			1.00	1.00
Frt		1.00	0.85			0.86	1.00	1.00			1.00	0.85
Flt Protected		0.96	1.00			1.00	0.95	1.00			1.00	1.00
Satd. Flow (prot)		1783	1583			1611	1770	1854			1858	1583
Flt Permitted		0.96	1.00			1.00	0.28	1.00			0.95	1.00
Satd. Flow (perm)		1783	1583			1611	523	1854			1774	1583
Volume (vph)	39	5	47	0	0	7	7	677	21	30	604	4
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	42	5	51	0	0	8	8	736	23	33	657	4
RTOR Reduction (vph)	0	0	37	0	0	6	0	2	0	0	0	2
Lane Group Flow (vph)	0	47	14	0	0	2	8	757	0	0	690	2
Turn Type	Perm		Perm			custom	Perm			Perm		Perm
Protected Phases		4						2			6	
Permitted Phases	4		4			8	2			6		6
Actuated Green, G (s)		16.0	16.0			16.0	36.0	36.0			36.0	36.0
Effective Green, g (s)		16.0	16.0			16.0	36.0	36.0			36.0	36.0
Actuated g/C Ratio		0.27	0.27			0.27	0.60	0.60			0.60	0.60
Clearance Time (s)		4.0	4.0			4.0	4.0	4.0			4.0	4.0
Lane Grp Cap (vph)		475	422			430	314	1112			1064	950
v/s Ratio Prot								c0.41				
v/s Ratio Perm		0.03	0.03			0.00	0.02				0.39	0.00
v/c Ratio		0.10	0.03			0.00	0.03	0.68			0.65	0.00
Uniform Delay, d1		16.6	16.3			16.2	4.9	8.1			7.9	4.8
Progression Factor		1.00	1.00			1.00	1.00	1.00			1.00	1.00
Incremental Delay, d2		0.4	0.1			0.0	0.1	3.4			3.1	0.0
Delay (s)		17.0	16.4			16.2	5.0	11.5			10.9	4.8
Level of Service		B	B			B	A	B			B	A
Approach Delay (s)		16.7			16.2			11.4			10.9	
Approach LOS		B			B			B			B	

Intersection Summary			
HCM Average Control Delay	11.5	HCM Level of Service	B
HCM Volume to Capacity ratio	0.51		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	66.2%	ICU Level of Service	C
Analysis Period (min)	15		

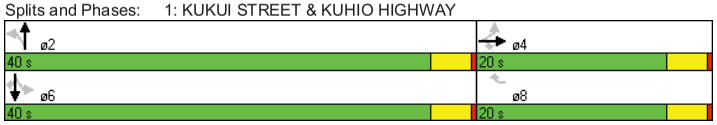
c Critical Lane Group

Queues
1: KUKUI STREET & KUHIO HIGHWAY 11/15/2013

Lane Group	EBT	EBR	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations								
Volume (vph)	5	47	7	7	677	30	604	4
Lane Group Flow (vph)	47	51	8	8	759	0	690	4
Turn Type		Perm	custom	Perm		Perm		Perm
Protected Phases	4				2		6	
Permitted Phases		4	8	2		6		6
Minimum Split (s)	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
Total Split (s)	20.0	20.0	20.0	40.0	40.0	40.0	40.0	40.0
Total Split (%)	33.3%	33.3%	33.3%	66.7%	66.7%	66.7%	66.7%	66.7%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag								
Lead-Lag Optimize?								
v/c Ratio	0.10	0.11	0.01	0.03	0.68		0.65	0.00
Control Delay	17.3	6.6	0.0	5.1	12.0		11.5	3.5
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0
Total Delay	17.3	6.6	0.0	5.1	12.0		11.5	3.5
Queue Length 50th (ft)	13	0	0	1	160		141	0
Queue Length 95th (ft)	34	21	0	5	270		241	3
Internal Link Dist (ft)	1654				6852		2720	
Turn Bay Length (ft)								
Base Capacity (vph)	475	460	591	314	1114		1064	951
Starvation Cap Reductn	0	0	0	0	0		0	0
Spillback Cap Reductn	0	0	0	0	0		0	0
Storage Cap Reductn	0	0	0	0	0		0	0
Reduced v/c Ratio	0.10	0.11	0.01	0.03	0.68		0.65	0.00

Intersection Summary
Cycle Length: 60
Actuated Cycle Length: 60
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 55
Control Type: Pretimed

Splits and Phases: 1: KUKUI STREET & KUHIO HIGHWAY



HCM Unsignalized Intersection Capacity Analysis
2: OLOHENA ROAD & KAPAA BYPASS 11/15/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Right Turn Channelized												
Volume (veh/h)	0	409	253	35	151	0	47	0	12	77	310	153
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	445	275	38	164	0	51	0	13	84	337	166
Approach Volume (veh/h)		720			202			64			587	
Crossing Volume (veh/h)		459			51			528			253	
High Capacity (veh/h)		965			1331			913			1135	
High v/c (veh/h)		0.75			0.15			0.07			0.52	
Low Capacity (veh/h)		782			1112			736			935	
Low v/c (veh/h)		0.92			0.18			0.09			0.63	

Intersection Summary				
Maximum v/c High		0.75		
Maximum v/c Low		0.92		
Intersection Capacity Utilization		73.5%	ICU Level of Service	D

HCM Unsignalized Intersection Capacity Analysis
3: KAPAA BYPASS & KUHIO HIGHWAY 11/15/2013

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	5	686	83	635	576	5
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	5	746	90	690	626	5
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)		10				
Median type	None					
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1497	626	632			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1497	626	632			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	96	0	91			
cM capacity (veh/h)	122	484	951			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	751	90	690	626	5
Volume Left	5	90	0	0	0
Volume Right	746	0	0	0	5
cSH	488	951	1700	1700	1700
Volume to Capacity	1.54	0.09	0.41	0.37	0.00
Queue Length 95th (ft)	999	8	0	0	0
Control Delay (s)	273.5	9.2	0.0	0.0	0.0
Lane LOS	F	A			
Approach Delay (s)	273.5	1.1		0.0	
Approach LOS	F				

Intersection Summary				
Average Delay		95.3		
Intersection Capacity Utilization		79.5%	ICU Level of Service	D
Analysis Period (min)		15		

HCM Unsignalized Intersection Capacity Analysis
4: OLOHENA ROAD & KAAPUNI ROAD

11/15/2013

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Volume (veh/h)	29	275	66	77	306	15
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	32	299	72	84	333	16
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	155				476	114
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	155				476	114
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	98				38	98
cM capacity (veh/h)	1425				536	939

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	330	155	349
Volume Left	32	0	333
Volume Right	0	84	16
cSH	1425	1700	547
Volume to Capacity	0.02	0.09	0.64
Queue Length 95th (ft)	2	0	112
Control Delay (s)	0.9	0.0	22.5
Lane LOS	A		C
Approach Delay (s)	0.9	0.0	22.5
Approach LOS			C

Intersection Summary			
Average Delay		9.8	
Intersection Capacity Utilization		52.1%	ICU Level of Service A
Analysis Period (min)		15	

HCM Unsignalized Intersection Capacity Analysis
5: KAEHULA ROAD & KAAPUNI ROAD

11/15/2013

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	24	0	87	19	1	298
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	26	0	95	21	1	324
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	431	105			115	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	431	105			115	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	96	100			100	
cM capacity (veh/h)	581	950			1474	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	26	115	325
Volume Left	26	0	1
Volume Right	0	21	0
cSH	581	1700	1474
Volume to Capacity	0.04	0.07	0.00
Queue Length 95th (ft)	4	0	0
Control Delay (s)	11.5	0.0	0.0
Lane LOS	B		A
Approach Delay (s)	11.5	0.0	0.0
Approach LOS	B		

Intersection Summary			
Average Delay		0.7	
Intersection Capacity Utilization		26.5%	ICU Level of Service A
Analysis Period (min)		15	

Attachment G
Level-of-Service Worksheets for Existing PM Peak Hour Conditions

HCM Signalized Intersection Capacity Analysis
1: KUKUI STREET & KUHIO HIGHWAY

11/15/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0			4.0	4.0	4.0			4.0	4.0
Lane Util. Factor		1.00	1.00			1.00	1.00	1.00			1.00	1.00
Frt		1.00	0.85			0.86	1.00	0.99			1.00	0.85
Flt Protected		0.96	1.00			1.00	0.95	1.00			1.00	1.00
Satd. Flow (prot)		1788	1583			1611	1770	1844			1858	1583
Flt Permitted		0.96	1.00			1.00	0.26	1.00			0.95	1.00
Satd. Flow (perm)		1788	1583			1611	489	1844			1776	1583
Volume (vph)	34	6	20	0	0	15	6	585	42	33	627	2
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	37	7	22	0	0	16	7	636	46	36	682	2
RTOR Reduction (vph)	0	0	16	0	0	12	0	4	0	0	0	1
Lane Group Flow (vph)	0	44	6	0	0	4	7	678	0	0	718	1
Turn Type	Perm		Perm			custom	Perm			Perm		Perm
Protected Phases		4						2			6	
Permitted Phases	4		4			8	2			6		6
Actuated Green, G (s)		16.0	16.0			16.0	36.0	36.0			36.0	36.0
Effective Green, g (s)		16.0	16.0			16.0	36.0	36.0			36.0	36.0
Actuated g/C Ratio		0.27	0.27			0.27	0.60	0.60			0.60	0.60
Clearance Time (s)		4.0	4.0			4.0	4.0	4.0			4.0	4.0
Lane Grp Cap (vph)		477	422			430	293	1106			1066	950
v/s Ratio Prot								0.37				
v/s Ratio Perm		0.02	0.01			0.01	0.01				c0.40	0.00
v/c Ratio		0.09	0.01			0.01	0.02	0.61			0.67	0.00
Uniform Delay, d1		16.5	16.2			16.2	4.9	7.6			8.1	4.8
Progression Factor		1.00	1.00			1.00	1.00	1.00			1.00	1.00
Incremental Delay, d2		0.4	0.1			0.0	0.2	2.5			3.4	0.0
Delay (s)		16.9	16.3			16.2	5.0	10.1			11.5	4.8
Level of Service		B	B			B	A	B			B	A
Approach Delay (s)		16.7			16.2			10.1			11.4	
Approach LOS		B			B			B			B	

Intersection Summary			
HCM Average Control Delay	11.1	HCM Level of Service	B
HCM Volume to Capacity ratio	0.49		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	69.9%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Queues
1: KUKUI STREET & KUHIO HIGHWAY

11/15/2013

Lane Group	EBT	EBR	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations								
Volume (vph)	6	20	15	6	585	33	627	2
Lane Group Flow (vph)	44	22	16	7	682	0	718	2
Turn Type		Perm	custom	Perm		Perm		Perm
Protected Phases	4				2		6	
Permitted Phases		4	8	2		6		6
Minimum Split (s)	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
Total Split (s)	20.0	20.0	20.0	40.0	40.0	40.0	40.0	40.0
Total Split (%)	33.3%	33.3%	33.3%	66.7%	66.7%	66.7%	66.7%	66.7%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag								
Lead-Lag Optimize?								
v/c Ratio	0.09	0.05	0.03	0.02	0.61		0.67	0.00
Control Delay	17.3	8.3	0.1	5.2	10.5		12.1	3.5
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0
Total Delay	17.3	8.3	0.1	5.2	10.5		12.1	3.5
Queue Length 50th (ft)	12	0	0	1	132		151	0
Queue Length 95th (ft)	33	14	0	5	223		257	2
Internal Link Dist (ft)	1654				6852		2720	
Turn Bay Length (ft)								
Base Capacity (vph)	477	438	631	293	1111		1066	951
Starvation Cap Reductn	0	0	0	0	0		0	0
Spillback Cap Reductn	0	0	0	0	0		0	0
Storage Cap Reductn	0	0	0	0	0		0	0
Reduced v/c Ratio	0.09	0.05	0.03	0.02	0.61		0.67	0.00

Intersection Summary
Cycle Length: 60
Actuated Cycle Length: 60
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 55
Control Type: Pretimed

Splits and Phases: 1: KUKUI STREET & KUHIO HIGHWAY

HCM Unsignalized Intersection Capacity Analysis
2: OLOHENA ROAD & KAPAA BYPASS

11/15/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Right Turn Channelized												
Volume (veh/h)	0	253	116	79	310	0	143	0	155	77	209	117
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	275	126	86	337	0	155	0	168	84	227	127
Approach Volume (veh/h)		401			423			324			438	
Crossing Volume (veh/h)		397			155			359			578	
High Capacity (veh/h)		1014			1226			1045			877	
High v/c (veh/h)		0.40			0.34			0.31			0.50	
Low Capacity (veh/h)		826			1017			854			704	
Low v/c (veh/h)		0.49			0.42			0.38			0.62	

Intersection Summary			
Maximum v/c High	0.50		
Maximum v/c Low	0.62		
Intersection Capacity Utilization	88.5%	ICU Level of Service	E

HCM Unsignalized Intersection Capacity Analysis
3: KAPAA BYPASS & KUHIO HIGHWAY

11/15/2013

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	12	343	464	766	577	14
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	13	373	504	833	627	15
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)		10				
Median type	None					
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	2052	627	642			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2052	627	642			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	41	13	46			
cM capacity (veh/h)	22	426	938			

Direction, Lane #	EB 1	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	386	504	416	416	627	15
Volume Left	13	504	0	0	0	0
Volume Right	373	0	0	0	0	15
cSH	441	938	1700	1700	1700	1700
Volume to Capacity	0.87	0.54	0.24	0.24	0.37	0.01
Queue Length 95th (ft)	227	82	0	0	0	0
Control Delay (s)	57.9	13.2	0.0	0.0	0.0	0.0
Lane LOS	F	B				
Approach Delay (s)	57.9	5.0			0.0	
Approach LOS	F					

Intersection Summary			
Average Delay	12.3		
Intersection Capacity Utilization	69.4%	ICU Level of Service	C
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
4: OLOHENA ROAD & KAAPUNI ROAD

11/15/2013

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Volume (veh/h)	20	87	169	257	110	30
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	22	95	184	279	120	33
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	463				461	323
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	463				461	323
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	98				78	95
cM capacity (veh/h)	1098				547	718

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	116	463	152
Volume Left	22	0	120
Volume Right	0	279	33
cSH	1098	1700	577
Volume to Capacity	0.02	0.27	0.26
Queue Length 95th (ft)	2	0	26
Control Delay (s)	1.7	0.0	13.5
Lane LOS	A		B
Approach Delay (s)	1.7	0.0	13.5
Approach LOS			B

Intersection Summary			
Average Delay	3.1		
Intersection Capacity Utilization	39.2%	ICU Level of Service	A
Analysis Period (min)	15		

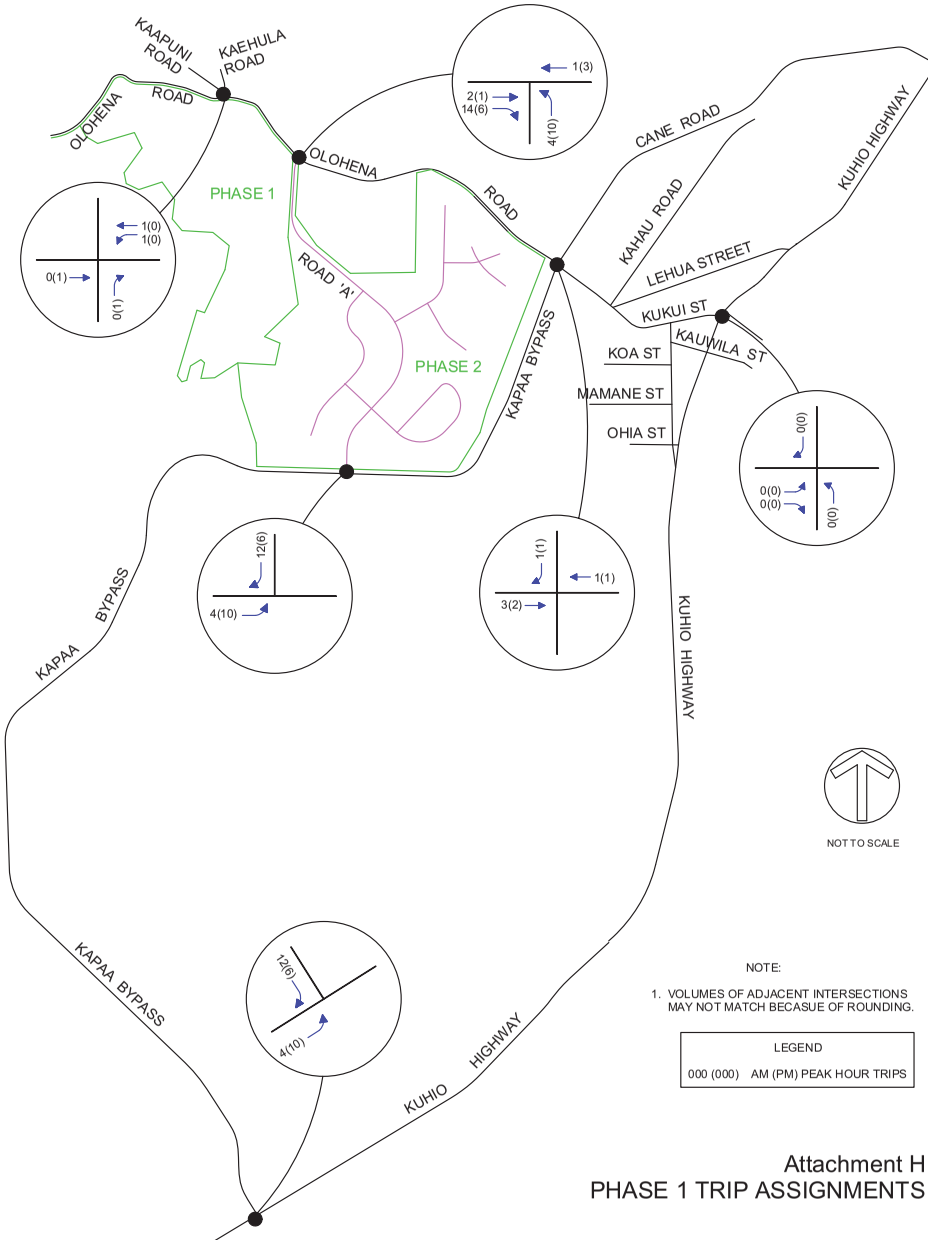
HCM Unsignalized Intersection Capacity Analysis
5: KAEHULA ROAD & KAAPUNI ROAD

11/15/2013

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	10	0	263	14	2	130
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	11	0	286	15	2	141
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	439	293			301	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	439	293			301	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	98	100			100	
cM capacity (veh/h)	574	746			1260	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	11	301	143
Volume Left	11	0	2
Volume Right	0	15	0
cSH	574	1700	1260
Volume to Capacity	0.02	0.18	0.00
Queue Length 95th (ft)	1	0	0
Control Delay (s)	11.4	0.0	0.1
Lane LOS	B		A
Approach Delay (s)	11.4	0.0	0.1
Approach LOS	B		

Intersection Summary			
Average Delay		0.3	
Intersection Capacity Utilization		24.7%	ICU Level of Service A
Analysis Period (min)		15	



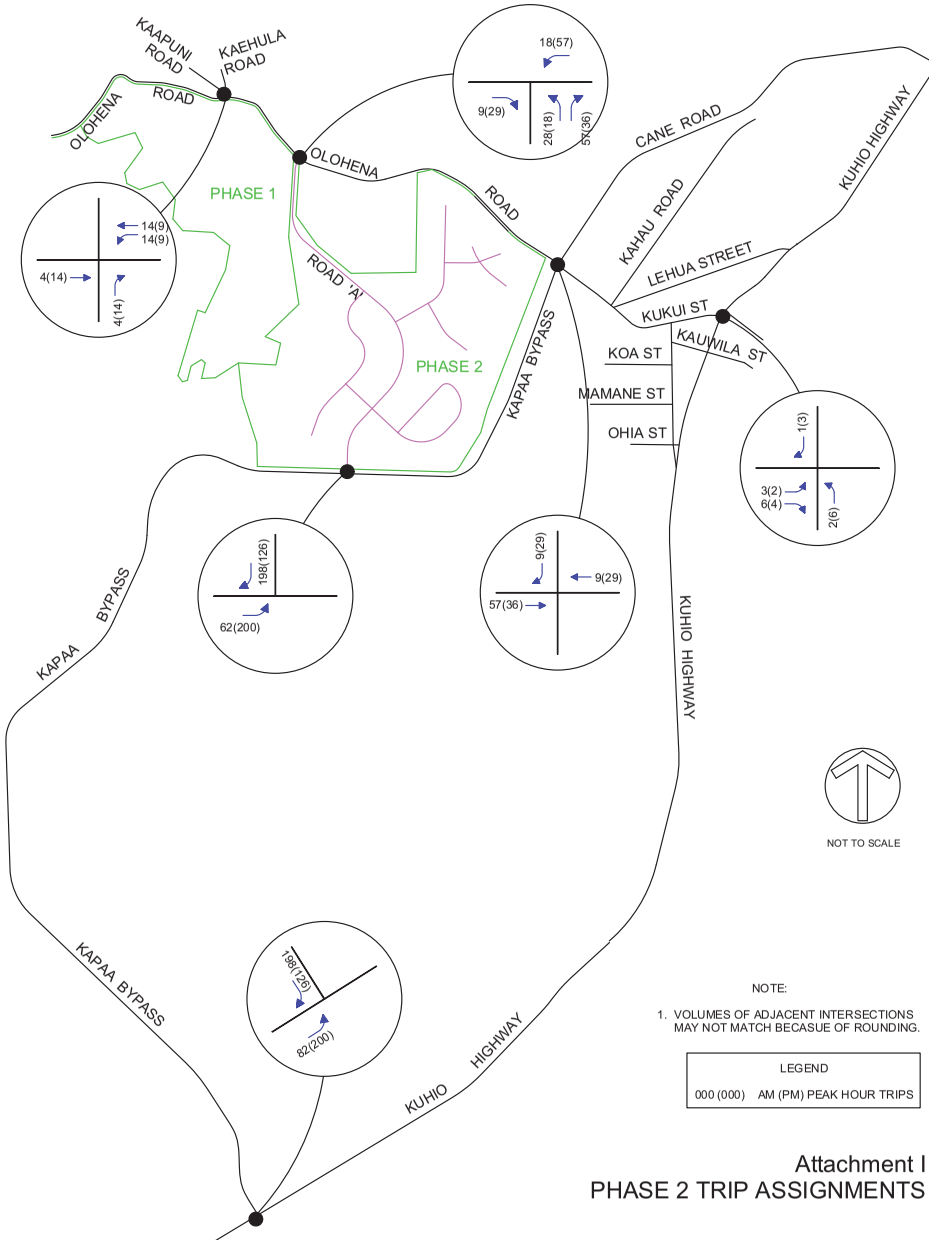
NOTE:

1. VOLUMES OF ADJACENT INTERSECTIONS MAY NOT MATCH BECASUE OF ROUNDING.

LEGEND

000 (000) AM (PM) PEAK HOUR TRIPS

Attachment H
PHASE 1 TRIP ASSIGNMENTS

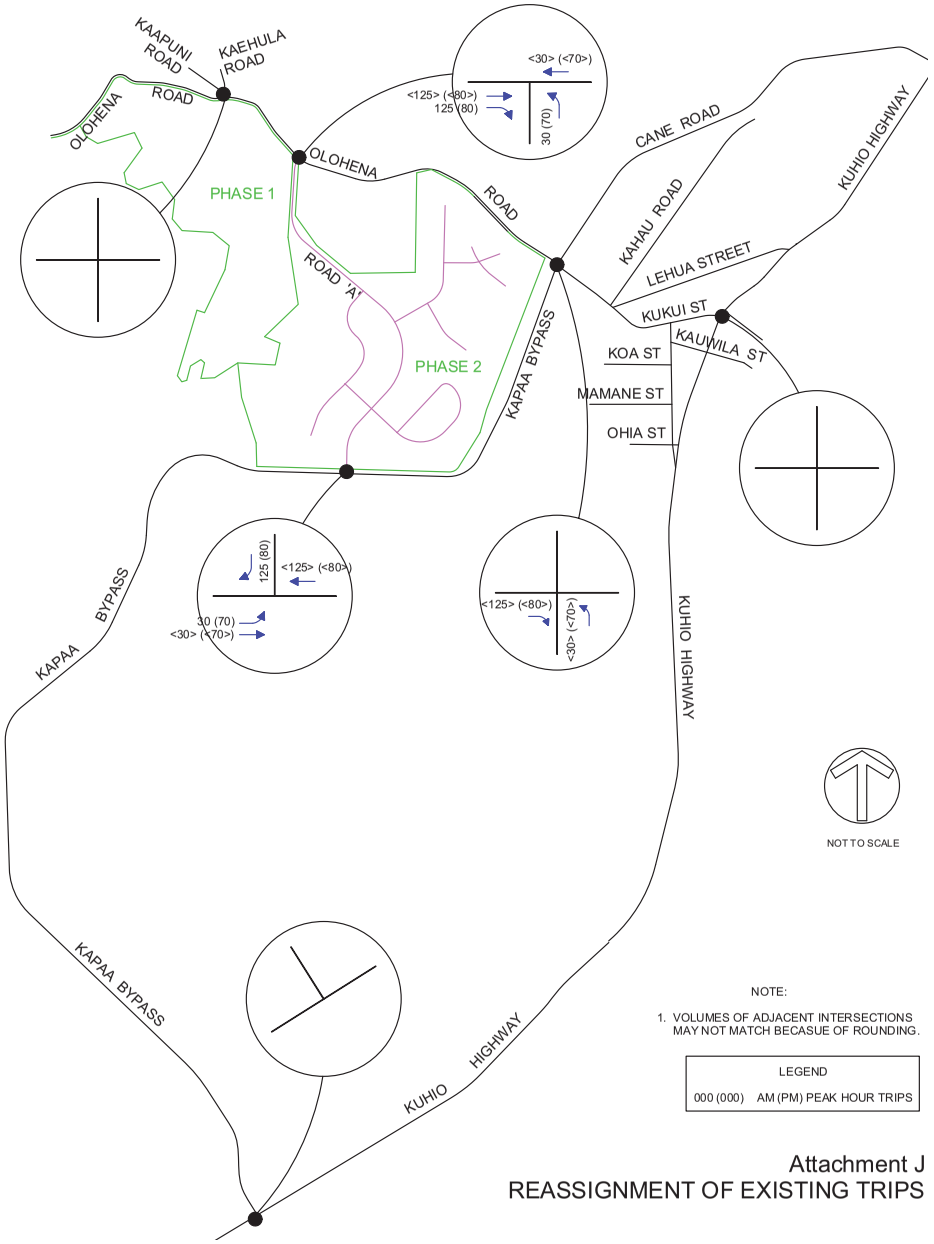


NOTE:

1. VOLUMES OF ADJACENT INTERSECTIONS MAY NOT MATCH BECASUE OF ROUNDING.

LEGEND	
000 (000)	AM (PM) PEAK HOUR TRIPS

Attachment I
PHASE 2 TRIP ASSIGNMENTS

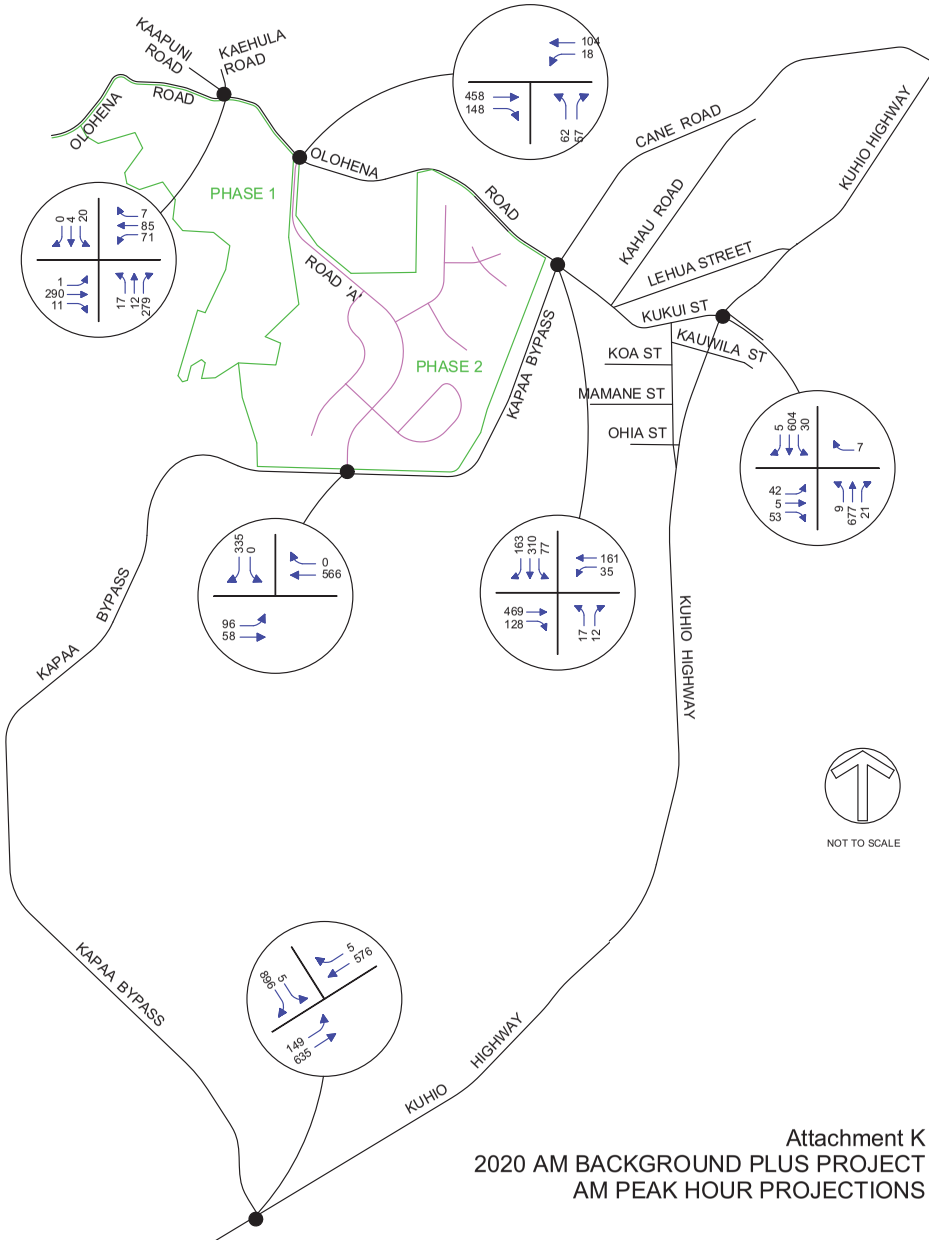


NOTE:

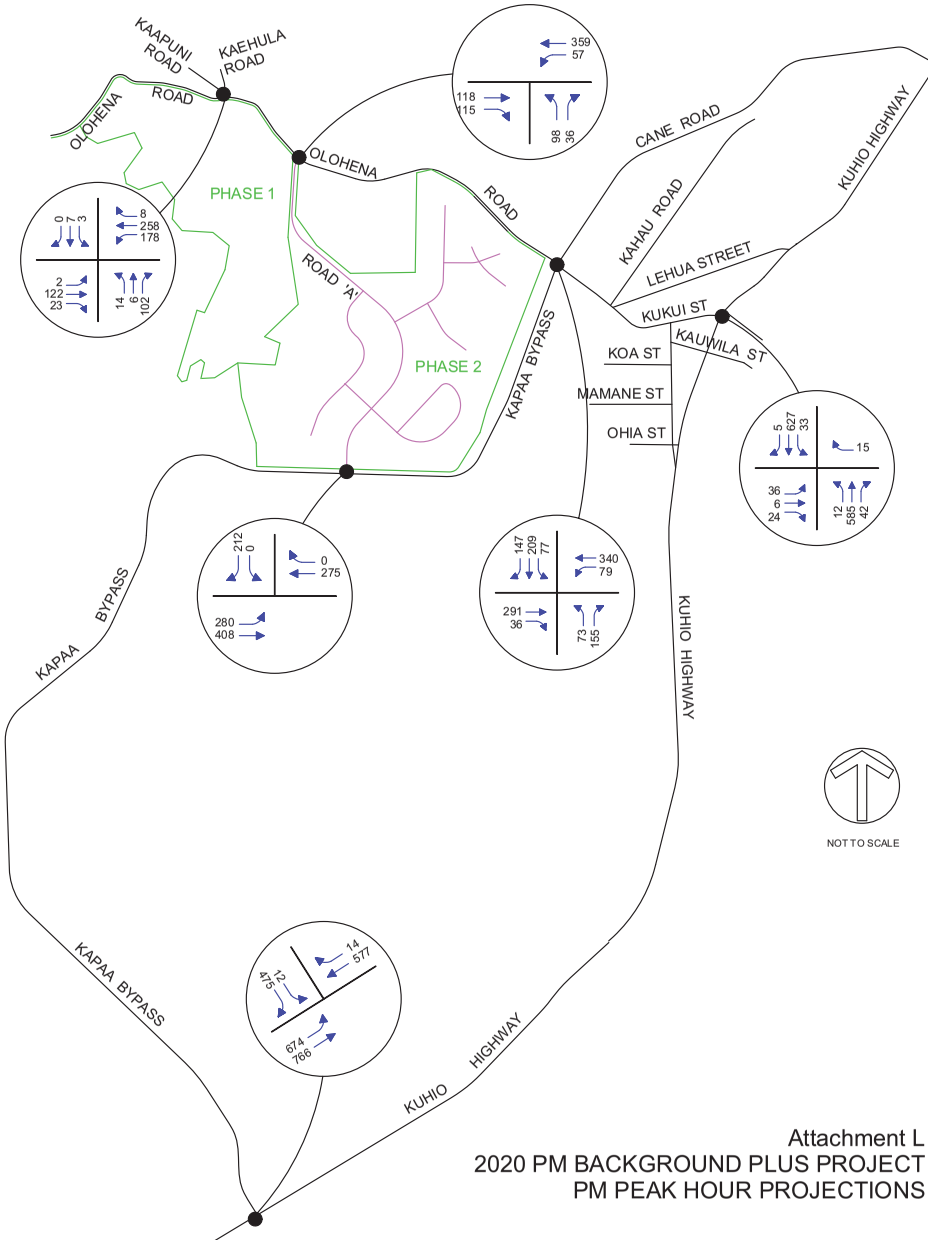
1. VOLUMES OF ADJACENT INTERSECTIONS MAY NOT MATCH BECASUE OF ROUNDING.

LEGEND	
000 (000)	AM (PM) PEAK HOUR TRIPS

Attachment J
REASSIGNMENT OF EXISTING TRIPS



Attachment K
2020 AM BACKGROUND PLUS PROJECT
AM PEAK HOUR PROJECTIONS



Attachment L
2020 PM BACKGROUND PLUS PROJECT
PM PEAK HOUR PROJECTIONS

Attachment M
Level-of-Service Worksheets for 2020 Background Plus Project
AM Peak Hour Conditions

HCM Signalized Intersection Capacity Analysis
1: KUKUI STREET & KUHIO HIGHWAY

12/2/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0			4.0	4.0	4.0			4.0	4.0
Lane Util. Factor		1.00	1.00			1.00	1.00	1.00			1.00	1.00
Frt		1.00	0.85			0.86	1.00	1.00			1.00	0.85
Flt Protected		0.96	1.00			1.00	0.95	1.00			1.00	1.00
Satd. Flow (prot)		1782	1583			1611	1770	1854			1858	1583
Flt Permitted		0.96	1.00			1.00	0.28	1.00			0.95	1.00
Satd. Flow (perm)		1782	1583			1611	523	1854			1774	1583
Volume (vph)	42	5	53	0	0	7	9	677	21	30	604	5
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	46	5	58	0	0	8	10	736	23	33	657	5
RTOR Reduction (vph)	0	0	43	0	0	6	0	2	0	0	0	2
Lane Group Flow (vph)	0	51	15	0	0	2	10	757	0	0	690	3
Turn Type	Perm		Perm			custom	Perm			Perm		Perm
Protected Phases		4						2			6	
Permitted Phases	4		4			8	2			6		6
Actuated Green, G (s)		16.0	16.0			16.0	36.0	36.0			36.0	36.0
Effective Green, g (s)		16.0	16.0			16.0	36.0	36.0			36.0	36.0
Actuated g/C Ratio		0.27	0.27			0.27	0.60	0.60			0.60	0.60
Clearance Time (s)		4.0	4.0			4.0	4.0	4.0			4.0	4.0
Lane Grp Cap (vph)		475	422			430	314	1112			1064	950
v/s Ratio Prot								c0.41				
v/s Ratio Perm		0.03	0.04			0.00	0.02				0.39	0.00
v/c Ratio		0.11	0.04			0.00	0.03	0.68			0.65	0.00
Uniform Delay, d1		16.6	16.3			16.2	4.9	8.1			7.9	4.8
Progression Factor		1.00	1.00			1.00	1.00	1.00			1.00	1.00
Incremental Delay, d2		0.5	0.2			0.0	0.2	3.4			3.1	0.0
Delay (s)		17.1	16.5			16.2	5.1	11.5			10.9	4.8
Level of Service		B	B			B	A	B			B	A
Approach Delay (s)		16.7			16.2			11.4			10.9	
Approach LOS		B			B			B			B	

Intersection Summary			
HCM Average Control Delay	11.6	HCM Level of Service	B
HCM Volume to Capacity ratio	0.51		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	66.2%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Queues
1: KUKUI STREET & KUHIO HIGHWAY

12/2/2013

Lane Group	EBT	EBR	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations								
Volume (vph)	5	53	7	9	677	30	604	5
Lane Group Flow (vph)	51	58	8	10	759	0	690	5
Turn Type		Perm	custom	Perm		Perm		Perm
Protected Phases	4				2		6	
Permitted Phases		4	8	2		6		6
Minimum Split (s)	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
Total Split (s)	20.0	20.0	20.0	40.0	40.0	40.0	40.0	40.0
Total Split (%)	33.3%	33.3%	33.3%	66.7%	66.7%	66.7%	66.7%	66.7%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag								
Lead-Lag Optimize?								
v/c Ratio	0.11	0.12	0.01	0.03	0.68		0.65	0.01
Control Delay	17.4	6.4	0.0	5.3	12.0		11.5	3.2
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0
Total Delay	17.4	6.4	0.0	5.3	12.0		11.5	3.2
Queue Length 50th (ft)	14	0	0	1	160		141	0
Queue Length 95th (ft)	36	23	0	6	270		241	3
Internal Link Dist (ft)	1654				6852		2720	
Turn Bay Length (ft)								
Base Capacity (vph)	475	465	591	314	1114		1064	952
Starvation Cap Reductn	0	0	0	0	0		0	0
Spillback Cap Reductn	0	0	0	0	0		0	0
Storage Cap Reductn	0	0	0	0	0		0	0
Reduced v/c Ratio	0.11	0.12	0.01	0.03	0.68		0.65	0.01

Intersection Summary
Cycle Length: 60
Actuated Cycle Length: 60
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 55
Control Type: Pretimed

Splits and Phases: 1: KUKUI STREET & KUHIO HIGHWAY

HCM Unsignalized Intersection Capacity Analysis
2: OLOHENA ROAD & KAPAA BYPASS

12/2/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Right Turn Channelized												
Volume (veh/h)	0	469	128	35	161	0	17	0	12	77	310	163
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	510	139	38	175	0	18	0	13	84	337	177
Approach Volume (veh/h)		649			213			32			598	
Crossing Volume (veh/h)		459			18			593			232	
High Capacity (veh/h)		965			1365			866			1155	
High v/c (veh/h)		0.67			0.16			0.04			0.52	
Low Capacity (veh/h)		782			1143			695			953	
Low v/c (veh/h)		0.83			0.19			0.05			0.63	

Intersection Summary			
Maximum v/c High	0.67		
Maximum v/c Low	0.83		
Intersection Capacity Utilization	75.6%	ICU Level of Service	D

HCM Unsignalized Intersection Capacity Analysis
3: KAPAA BYPASS & KUHIO HIGHWAY

12/2/2013

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	5	896	149	635	576	5
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	5	974	162	690	626	5
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)		10				
Median type	None					
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1640	626	632			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1640	626	632			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	94	0	83			
cM capacity (veh/h)	91	484	951			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	979	162	690	626	5
Volume Left	5	162	0	0	0
Volume Right	974	0	0	0	5
cSH	487	951	1700	1700	1700
Volume to Capacity	2.01	0.17	0.41	0.37	0.00
Queue Length 95th (ft)	1676	15	0	0	0
Control Delay (s)	479.7	9.6	0.0	0.0	0.0
Lane LOS	F	A			
Approach Delay (s)	479.7	1.8		0.0	
Approach LOS	F				

Intersection Summary			
Average Delay	191.4		
Intersection Capacity Utilization	92.5%	ICU Level of Service	F
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
4: OLOHENA ROAD & KAAPUNI ROAD

12/2/2013

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Volume (veh/h)	29	279	71	92	310	15
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	32	303	77	100	337	16
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	177				493	127
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	177				493	127
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	98				36	98
cM capacity (veh/h)	1399				523	923

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	335	177	353
Volume Left	32	0	337
Volume Right	0	100	16
cSH	1399	1700	534
Volume to Capacity	0.02	0.10	0.66
Queue Length 95th (ft)	2	0	121
Control Delay (s)	0.9	0.0	24.0
Lane LOS	A		C
Approach Delay (s)	0.9	0.0	24.0
Approach LOS			C

Intersection Summary			
Average Delay	10.1		
Intersection Capacity Utilization	53.7%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
5: KAEHULA ROAD & KAAPUNI ROAD

12/2/2013

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	24	0	102	19	1	301
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	26	0	111	21	1	327
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	451	121			132	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	451	121			132	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	95	100			100	
cM capacity (veh/h)	566	930			1454	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	26	132	328
Volume Left	26	0	1
Volume Right	0	21	0
cSH	566	1700	1454
Volume to Capacity	0.05	0.08	0.00
Queue Length 95th (ft)	4	0	0
Control Delay (s)	11.7	0.0	0.0
Lane LOS	B		A
Approach Delay (s)	11.7	0.0	0.0
Approach LOS	B		

Intersection Summary			
Average Delay	0.6		
Intersection Capacity Utilization	26.6%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
6: KAPAA BYPASS & ROAD 'A'

12/2/2013

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Volume (veh/h)	96	58	0	566	0	335
Peak Hour Factor	0.87	0.87	0.90	0.90	0.80	0.80
Hourly flow rate (vph)	110	67	0	629	0	419
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	629				602	314
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	629				602	314
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	88				100	42
cM capacity (veh/h)	953				409	726

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	177	629	419
Volume Left	110	0	0
Volume Right	0	629	419
cSH	953	1700	726
Volume to Capacity	0.12	0.37	0.58
Queue Length 95th (ft)	10	0	93
Control Delay (s)	6.2	0.0	16.5
Lane LOS	A		C
Approach Delay (s)	6.2	0.0	16.5
Approach LOS			C

Intersection Summary			
Average Delay	6.5		
Intersection Capacity Utilization	74.2%	ICU Level of Service	D
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
7: OLOHENA ROAD & ROAD 'A' 12/2/2013

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	458	148	18	104	62	57
Peak Hour Factor	0.95	0.95	0.91	0.91	0.80	0.80
Hourly flow rate (vph)	482	156	20	114	78	71
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			638		714	560
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			638		714	560
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			98		80	87
cM capacity (veh/h)			946		390	528

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	638	134	149
Volume Left	0	20	78
Volume Right	156	0	71
cSH	1700	946	446
Volume to Capacity	0.38	0.02	0.33
Queue Length 95th (ft)	0	2	36
Control Delay (s)	0.0	1.5	17.1
Lane LOS		A	C
Approach Delay (s)	0.0	1.5	17.1
Approach LOS			C

Intersection Summary			
Average Delay		3.0	
Intersection Capacity Utilization		46.7%	ICU Level of Service A
Analysis Period (min)		15	

Attachment N
Level-of-Service Worksheets for 2020 Background Plus Project
PM Peak Hour Conditions

HCM Signalized Intersection Capacity Analysis
1: KUKUI STREET & KUHIO HIGHWAY 11/15/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0			4.0	4.0	4.0			4.0	4.0
Lane Util. Factor		1.00	1.00			1.00	1.00	1.00			1.00	1.00
Frt		1.00	0.85			0.86	1.00	0.99			1.00	0.85
Flt Protected		0.96	1.00			1.00	0.95	1.00			1.00	1.00
Satd. Flow (prot)		1787	1583			1611	1770	1844			1858	1583
Flt Permitted		0.96	1.00			1.00	0.26	1.00			0.95	1.00
Satd. Flow (perm)		1787	1583			1611	489	1844			1776	1583
Volume (vph)	36	6	24	0	0	15	12	585	42	33	627	5
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	39	7	26	0	0	16	13	636	46	36	682	5
RTOR Reduction (vph)	0	0	19	0	0	12	0	4	0	0	0	2
Lane Group Flow (vph)	0	46	7	0	0	4	13	678	0	0	718	3
Turn Type	Perm		Perm			custom	Perm			Perm		Perm
Protected Phases		4						2			6	
Permitted Phases	4		4			8	2			6		6
Actuated Green, G (s)		16.0	16.0			16.0	36.0	36.0			36.0	36.0
Effective Green, g (s)		16.0	16.0			16.0	36.0	36.0			36.0	36.0
Actuated g/C Ratio		0.27	0.27			0.27	0.60	0.60			0.60	0.60
Clearance Time (s)		4.0	4.0			4.0	4.0	4.0			4.0	4.0
Lane Grp Cap (vph)		477	422			430	293	1106			1066	950
v/s Ratio Prot								0.37				
v/s Ratio Perm		0.03	0.02			0.01	0.03				c0.40	0.00
v/c Ratio		0.10	0.02			0.01	0.04	0.61			0.67	0.00
Uniform Delay, d1		16.6	16.2			16.2	4.9	7.6			8.1	4.8
Progression Factor		1.00	1.00			1.00	1.00	1.00			1.00	1.00
Incremental Delay, d2		0.4	0.1			0.0	0.3	2.5			3.4	0.0
Delay (s)		17.0	16.3			16.2	5.2	10.1			11.5	4.8
Level of Service		B	B			B	A	B			B	A
Approach Delay (s)		16.7			16.2			10.0			11.4	
Approach LOS		B			B			B			B	

Intersection Summary			
HCM Average Control Delay	11.1	HCM Level of Service	B
HCM Volume to Capacity ratio	0.50		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	69.9%	ICU Level of Service	C
Analysis Period (min)	15		

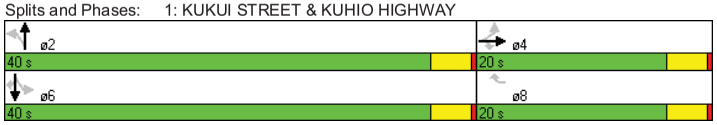
c Critical Lane Group

Queues
1: KUKUI STREET & KUHIO HIGHWAY 11/15/2013

Lane Group	EBT	EBR	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations								
Volume (vph)	6	24	15	12	585	33	627	5
Lane Group Flow (vph)	46	26	16	13	682	0	718	5
Turn Type		Perm	custom	Perm		Perm		Perm
Protected Phases	4				2		6	
Permitted Phases		4	8	2		6		6
Minimum Split (s)	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
Total Split (s)	20.0	20.0	20.0	40.0	40.0	40.0	40.0	40.0
Total Split (%)	33.3%	33.3%	33.3%	66.7%	66.7%	66.7%	66.7%	66.7%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag								
Lead-Lag Optimize?								
v/c Ratio	0.10	0.06	0.03	0.04	0.61		0.67	0.01
Control Delay	17.3	8.0	0.1	5.5	10.5		12.1	3.2
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0
Total Delay	17.3	8.0	0.1	5.5	10.5		12.1	3.2
Queue Length 50th (ft)	13	0	0	2	132		151	0
Queue Length 95th (ft)	34	15	0	7	223		257	3
Internal Link Dist (ft)	1654				6852		2720	
Turn Bay Length (ft)								
Base Capacity (vph)	476	441	631	293	1111		1066	952
Starvation Cap Reductn	0	0	0	0	0		0	0
Spillback Cap Reductn	0	0	0	0	0		0	0
Storage Cap Reductn	0	0	0	0	0		0	0
Reduced v/c Ratio	0.10	0.06	0.03	0.04	0.61		0.67	0.01

Intersection Summary
Cycle Length: 60
Actuated Cycle Length: 60
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 55
Control Type: Pretimed

Splits and Phases: 1: KUKUI STREET & KUHIO HIGHWAY



HCM Unsignalized Intersection Capacity Analysis
2: OLOHENA ROAD & KAPAA BYPASS

12/2/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Right Turn Channelized												
Volume (veh/h)	0	291	36	79	340	0	73	0	155	77	209	147
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	316	39	86	370	0	79	0	168	84	227	160
Approach Volume (veh/h)		355			455			248			471	
Crossing Volume (veh/h)		397			79			400			535	
High Capacity (veh/h)		1014			1302			1011			908	
High v/c (veh/h)		0.35			0.35			0.25			0.52	
Low Capacity (veh/h)		826			1086			823			732	
Low v/c (veh/h)		0.43			0.42			0.30			0.64	

Intersection Summary				
Maximum v/c High	0.52			
Maximum v/c Low	0.64			
Intersection Capacity Utilization	77.3%	ICU Level of Service	D	

HCM Unsignalized Intersection Capacity Analysis
3: KAPAA BYPASS & KUHIO HIGHWAY

12/2/2013

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	12	475	674	766	577	14
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	13	516	733	833	627	15
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)		10				
Median type	None					
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	2509	627	642			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2509	627	642			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	0	0	22			
cM capacity (veh/h)	5	426	938			

Direction, Lane #	EB 1	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	529	733	416	416	627	15
Volume Left	13	733	0	0	0	0
Volume Right	516	0	0	0	0	15
cSH	208	938	1700	1700	1700	1700
Volume to Capacity	2.55	0.78	0.24	0.24	0.37	0.01
Queue Length 95th (ft)	1116	203	0	0	0	0
Control Delay (s)	190.1	21.0	0.0	0.0	0.0	0.0
Lane LOS	F	C				
Approach Delay (s)	190.1	9.8			0.0	
Approach LOS	F					

Intersection Summary			
Average Delay	42.4		
Intersection Capacity Utilization	81.0%	ICU Level of Service	D
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
4: OLOHENA ROAD & KAAPUNI ROAD

12/2/2013

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Volume (veh/h)	20	102	178	266	125	30
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	22	111	193	289	136	33
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	483				492	338
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	483				492	338
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	98				74	95
cM capacity (veh/h)	1080				525	704

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	133	483	168
Volume Left	22	0	136
Volume Right	0	289	33
cSH	1080	1700	552
Volume to Capacity	0.02	0.28	0.31
Queue Length 95th (ft)	2	0	32
Control Delay (s)	1.5	0.0	14.4
Lane LOS	A		B
Approach Delay (s)	1.5	0.0	14.4
Approach LOS			B

Intersection Summary			
Average Delay	3.3		
Intersection Capacity Utilization	41.1%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
5: KAEHULA ROAD & KAAPUNI ROAD

12/2/2013

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	10	0	272	14	2	145
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	11	0	296	15	2	158
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	465	303			311	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	465	303			311	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	98	100			100	
cM capacity (veh/h)	555	736			1250	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	11	311	160
Volume Left	11	0	2
Volume Right	0	15	0
cSH	555	1700	1250
Volume to Capacity	0.02	0.18	0.00
Queue Length 95th (ft)	1	0	0
Control Delay (s)	11.6	0.0	0.1
Lane LOS	B		A
Approach Delay (s)	11.6	0.0	0.1
Approach LOS	B		

Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	25.2%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
6: KAPAA BYPASS & ROAD 'A'

12/2/2013

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Volume (veh/h)	280	408	275	0	0	212
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	304	443	299	0	0	230
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	299				1351	299
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	299				1351	299
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	76				100	69
cM capacity (veh/h)	1262				126	741

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	748	299	230
Volume Left	304	0	0
Volume Right	0	0	230
cSH	1262	1700	741
Volume to Capacity	0.24	0.18	0.31
Queue Length 95th (ft)	24	0	33
Control Delay (s)	5.3	0.0	12.0
Lane LOS	A		B
Approach Delay (s)	5.3	0.0	12.0
Approach LOS			B

Intersection Summary			
Average Delay	5.3		
Intersection Capacity Utilization	74.6%	ICU Level of Service	D
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
7: OLOHENA ROAD & ROAD 'A'

12/2/2013

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	118	115	57	359	98	36
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	128	125	62	390	107	39
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			253		705	191
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			253		705	191
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			95		72	95
cM capacity (veh/h)			1312		384	851

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	253	452	146
Volume Left	0	62	107
Volume Right	125	0	39
cSH	1700	1312	450
Volume to Capacity	0.15	0.05	0.32
Queue Length 95th (ft)	0	4	35
Control Delay (s)	0.0	1.5	16.8
Lane LOS		A	C
Approach Delay (s)	0.0	1.5	16.8
Approach LOS			C

Intersection Summary			
Average Delay	3.7		
Intersection Capacity Utilization	52.9%	ICU Level of Service	A
Analysis Period (min)	15		

Attachment O
Comments from State of Hawaii Department of Transportation and Responses
Relative to DRAFT TIAR Submitted June 6, 2012

	Comment	Response
1.	The study area is too limited. The limits of the study area needs to be expanded to include the Kuhio Highway/Olohena Road intersection, Kuhio Highway/Temporary Kapaa Bypass Road intersection and other intersections along Kuhio Highway to a point where the development's project generated traffic impact is less than 3%.	Per our telephone conversation, we believe that the Kuhio Highway/Olohena Road intersection referred to is the intersection of Kuhio Highway at Kukui Street. It was also agreed that the study area would be expanded to include the two intersections noted. Based on the traffic distribution patterns noted during the traffic counts and the existing street network, only a small amount of will have a destination along Kuhio Highway between Kukui Street and Kapaa Bypass.
2.	The traffic volumes from the Kapaa County swimming pool and park on the 3.1 acre park site shall be in the trip generation and distribution calculations.	Based on trip generation data provided in Trip Generation, 8th Edition, the park will generate less than five (5) trips per hour during either the a morning or afternoon peak hour. This amount of traffic is too little to impact the level-of-service calculations. Therefore, this project was not included in the trip generation calcuations.
3.	The average pass-by trip percentage of approximately 80% for land use 820 appears to be too high for the commercial uses. The pass-by trip percentage shall be validated.	Per our telephone conversation, it was agreed that the trip generation calculations would be revised to use a pass-by percentage of 34% rather than 80%. The report has been revised accordingly.

Attachment P
Comments from County of Kauai Department of Public Works and Responses
Relative to DRAFT TIAR Submitted June 6, 2012

	Comment	Response
1 & 2	Comments not related to TIAR.	
3.	The Traffic Impact Assessment Report (TIAR) needs to be finalized. The report states "A preliminary trip generation analysis was performed to define the scope of work and the study area." in compliance with Hawaii Administrative Rule 16–115-9 which states "all plans, specifications, maps, reports, survey descriptions, and every sheet in a set of design drawings prepared by or under the supervision of a licensed professional engineer, architect, land surveyor, or landscape architect **shall** be stamped with the authorized seal or stamp when filed with public officials, and under the seal or stamp, the authentication **shall** state, "This work was prepared by me or under my supervision," be signed by the licensee, and **shall** state the expiration date of the licensee.	Performing a preliminary trip generation study to define the scope of work is always the first step in the TIAR process. I think the reviewer has interpreted this to mean that the entire TIAR is "preliminary," which is not the case. The TIAR used the trip generation analysis discussed Section K (page 6) of the report. The remainder of the paragraph talks about attaching my engineer's seal. This is provided on the signature page of the report.
4	The TIAR needs to evaluate the development impacts and mitigation actions needed to improve the existing 3-way, skewed intersection of Olohena, Kaapuni and Kaehulua Roads. The report indicates Road 'A' will provide an alternate route to Kapaa Intermediate School since it will be a more direct route for northbound traffic. We are concerned that increased traffic volumes would increase the likelihood of accidents at the 3-way intersection. Realignment of the roadway angles of the intersection may be warranted to increase sight distances and ease turning movements at the intersection.	This intersection was added to the report. The proposed project added little traffic to the intersection and had a minimal impact on the turning movements. Therefore, the TIAR does not provide any recommendation to improve this intersection.
5	The Kapaa Bypass Road is under the jurisdiction of the State Department of Transportation (DOT), Highways Division. Comments relating to access and traffic improvements need to be solicited from State DOT, Highways Division.	See Attachment S.
6 - 24	Comments not related to TIAR.	

Comments from State of Hawaii Department of Transportation[1] and Responses Relative to TIAR Submitted December 9, 2013

	Comment	Response
1.	In Section K - Project Trip Generation, there is a typographical error for PM single-family units and the AM/PM multifamily formulas should be from 7:00-9:00 and from 4:00 to 6:00 rather than peak hour of generator.	Acknowledged.
2.	In Section M - Traffic Impact Assessment, the southern termini of the Kapaa Bypass being more than two miles away from the project does not alter the fact that the bypass is a limited access facility so traffic on the bypass has limited chance to disperse to other destinations. The trip distribution and volumes at the southern termini was no shown in any table. The increase in the amount of traffic is substantial at 12.2% AM and 13.6% PM. The results of the analysis of the Kuhio Highway at Kapaa Bypass intersection in Table 11 (2020 Level-of-Service (LOS) at Unsignalized Intersections) indicates significant increases in delay (LOS F becoming much worse LOS F) for the East to North (left turn out of the bypass) in both AM and PM, and moderate delay increase for the North to West (left turn into the bypass) (LOS B going to C) in the PM. We do not agree with the TIAR conclusion that the project contribution to these LOS conditions is not significant. A traffic signal warrant analysis for the intersection shall be prepared. Queuing analysis of the left-turn movements are required and queuing onto Kuhio Highway and Kapaa Bypass shall not be allowed. Transportation improvements shall be recommended to mitigate project generated impacts.	First, the project trip assignments are shown on Attachments H, I and J of the TIAR. Trip distributions are not typically included in a TIAR. The critical movement at this intersection is the eastbound to northbound left turn, which is 5 vehicles per hour during the morning peak hour and 12 vehicles per hour during the afternoon peak hour. The volumes of this movement did not change as a result of project generated traffic as the project did not add traffic to this movement. All outbound traffic from the project will make right turns at the intersection, which is a free movement during the morning peak hour and STOP sign controlled during the afternoon peak hour. It was determined that a signal warrant analysis of this intersection was not appropriate since the eastbound to southbound right turn is a free movement and therefore would not be considered in the side street approach volume and the eastbound to northbound volumes do not even approach the minimum approach volumes to trigger the signal warrants, which is 80 vehicles per hour for the Four Hour Volume Warrant. Lastly, since the developer has provided the Kapaa Bypass, he has already done more than his fair share to mitigate traffic in the Kapaa area. Without the Kapaa Bypass, traffic volumes and traffic congestion along Kuhio Highway in Kapaa would be intolerable.
3.	In Section M, the TIAR also makes reference to the project Road A serving as a alternative route from Olohena Road to the Kapaa Bypass, diverting traffic fro and thereby improving LOS at the roundabout (Olohena Road and Kapaa Bypass). However, since Road A will pass through the Project's Phase 2 residential area the TIAR recommended that various traffic calming measure, including all-way stops, be provided for pedestrian safety. Being that the foregoing objectives are in conflict with each other, the traffic diversion and LOS improvement must be verified. Otherwise, mitigation improvements at the eastbound approach of the roundabout my be required to achieve acceptable LOS.	The traffic calming recommendations for Road A are intended to slow traffic down, not to force traffic to another roadway. A simple look at the map indicates that Road A will be a shorter trip for traffic between Olohena Road, including traffic to and from the Kapaa Intermediate School, and the southern part of Kapaa Bypass. Since traffic will take the shorter route, in terms of time and distance, it is appropriate to divert some traffic to Road A, especially during the morning peak hour when the eastbound approach of Olohena Road to the roundabout operates at a low LOS E.
4.	The northern end of the Kapaa Bypass Road intersection with Kuhio Highway shall be included in the TIAR. Although it is a single lane, one-way road from Kuhio Highway to the Olohena Roundabout, the entry intersections needs to be evaluated.	Per our discussions with the Planning Branch of SDOT, it was agreed that the study area would be expanded to include the intersection of Kuhio Highway at Kukui Street and the southern intersection of Kuhio Highway at Kapaa Bypass. Since Kapaa Bypass at the northern intersection of Kuhio Highway at Kapaa Bypass is one-way southbound, any project traffic added to the intersection would be free flow southbound. Since the movement is free flowing, it would no be considered in the LOS analysis.
5.	A left -turn warrant study should be conducted for the Kapaa Bypass Road intersection with Road A and a conceptual configuration of the intersection should be provided in the TIAR. Queuing onto the through lanes of the Kapaa Bypass Road shall not be allowed. Access to the Kapaa Bypass Road must be coordinated with and constructed to the satisfaction of the Highways Division, Kauai District Engineer.	First, both the FHWA and NCHRP data that are presented as "warrants" are actually "guidelines." It was decided that a separate left turn lane along Kapaa Bypass at Road A was not "needed" since this movement was projected to operate at LOS A during both morning and afternoon peak hours and that the 95th percentile queues are less than one vehicle. Refer to Table 12, page 14.

1

NEIL ABERCROMBIE
GOVERNOR

GLENN M. OKIMOTO
DIRECTOR

Deputy Directors
FORD N. FUCHIGAMI
RANDY GRUNE
AUDREY HIDANO
JADINE URASAKI

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

IN REPLY REFER TO:
HWY-PS 2.6887

March 26, 2014

Mr. Phillip J. Rowell, P.E.
Phillip Rowell and Associates
47-273 D Hui Iwa Street
Kaneohe, Hawaii 96744

Dear Mr. Rowell:

Subject: Traffic Impact Assessment Report for Kapaa Highlands Subdivision
Kauai, Kapaa, TMK: (4) 4-3-003: 001

Thank you for the opportunity to review the subject Traffic Impact Assessment Report (TIAR) dated December 9, 2013, which evaluates the traffic impact of the proposed Kapaa Highlands Subdivision, a two-phase development consisting of a total of approximately 116 single-family and 700 multi-family units and an 8,000 square feet (SF) neighborhood retail area. The project is located approximately at the intersection of Olohena Road and the (temporary) Kapaa Bypass Road, State Route 5600, with proposed access to both roads. Olohena Road ends on the west side of the intersection with the Kapaa Bypass Road and continues as Kukui Street on the east side of the intersection and Kukui Street which intersects with Kuhio Highway, State Route 56. The Kapaa Bypass Road continues southwest past the proposed subdivision and intersects with Kuhio Highway to the south of Kapaa, thereby bypassing a heavily used segment of Kuhio Highway.

The portion of the Kapaa Bypass that borders the proposed subdivision is still privately owned, however the land owner has agreed by Memorandum of Understanding to dedicate the land under the road upon final subdivision approval being granted.

We have the following comments:

1. In Section K - Project Trip Generation, there is a typographical error for PM single-family units and the AM/PM multi-family formulas should be from 7:00-9:00 am and 4:00-6:00 pm rather than peak hour of generator.

2. In Section M - Traffic Impact Assessment, the southern termini of the Kapaa Bypass being more than two miles away from the project does not alter the fact that the bypass is a limited access facility so traffic on the bypass has limited chance to disperse to other destinations. The trip distribution and volume at the southern termini was not shown in any table. The increase in the amount of traffic is substantial at 12.2% AM and 13.6% PM. The results of the analysis of the Kuhio Highway at Kapaa Bypass Road intersection in Table 11 (2020 Level of Service (LOS) of Unsignalized Intersections) indicates significant increases in delay (LOS F becoming much worse LOS F) for the East to North (left-turn out of the bypass) in both AM and PM, and a moderate delay

increase for the North to West (left-turn into the bypass) (LOS B going to C) in PM. We do not agree with the TIAR conclusion that the project contribution to these LOS F conditions is not significant. A traffic signal warrant analysis of the intersection shall be prepared. Queuing analysis of the left-turn movements are required and queuing onto Kuhio Higway and Kapaa Bypass Road shall not be allowed. Transportation improvements shall be recommended to mitigate project generated impacts.

3. In Section M, the TIAR also makes reference to the project Road A serving as an alternative route from Olohena Road to the Kapaa Bypass, diverting traffic from and thereby improving LOS at the roundabout (Olohena Road and Kapaa Bypass). However, since Road A will pass through the project's Phase 2 residential area the TIAR recommends that various traffic calming measures, including possible all-way stops, be provided for pedestrian safety. Being that the foregoing objectives are in conflict with each other, the traffic diversion and LOS improvement must be verified. Otherwise, mitigation improvements at the eastbound approach of the roundabout may be required to achieve acceptable LOS.

4. The northern end of the Kapaa Bypass Road at its intersection with Kuhio Highway shall be included in the TIAR. Although it is a single lane, one-way road from Kuhio Highway to the Olohena Roundabout, the entry intersection needs to be evaluated.

5. A left-turn warrant study should be conducted for the Kapaa Bypass Road intersection with Road A and a conceptual configuration of the intersection should be provided in the TIAR. Queuing onto the through lanes of the Kapaa Bypass Road shall not be allowed. Access to the Kapaa Bypass Road must be coordinated with and constructed to the satisfaction of the Highways Division, Kauai District Engineer.

If there are any questions, please contact Ken Tatsuguchi, Engineering Program Manager, Highways Planning Branch, at 587-1830. Please reference File Review Number 2014-006 in all contacts and correspondence regarding these comments.

Very truly yours,

GLENN M. OKIMOTO, Ph.D.
Director of Transportation

c: Mr. Greg Allen, Kapaa Highlands

NEIL ABERCROMBIE
GOVERNOR

COPY

FORD N. FUCHIGAMI
INTERIM DIRECTOR

Deputy Directors
RANDY GRUNE
AUDREY HIDANO
ROSS M. HIGASHI
JADINE URASAKI

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

IN REPLY REFER TO:
HWY-PS 2.7311

June 6, 2014

Mr. Phillip J. Rowell, P.E.
Phillip Rowell and Associates
47-273 D Hui Iwa Street
Kaneohe, Hawaii 96744

Dear Mr. Rowell:

Subject: Traffic Consultant Response to HWY-PS 2.6887, Traffic Impact Assessment Report (December 9, 2013), Kapaa Highlands Subdivision, Kapaa, Kauai
TMK: (4) 4-3-003:001

Thank you for your response, transmitted by Greg Allen on April 9, 2014, via email, to our comment letter, HWY-PS 2.6887, dated March 26, 2014, on the traffic impact of the proposed Kapaa Highlands Subdivision.

We amend our prior comments as follows:

1. Comment 2 – Your justification that a traffic signal warrant and queue analysis would not be appropriate is acceptable.

2. Comment 3 – Our concern over "traffic calming" measures along Road A through the subdivision remain, since it would potentially reduce the utility that Road A would divert significant traffic; however your justification is acceptable.

3. Comment4 – Your explanation is acceptable.

4. Comment 5 – A left-turn storage lane from the Kapaa Bypass into Road A of the subdivision may be deferred for the immediate future but the subdivision is still required to provide one should traffic conditions warrant it at no cost to the Department of Transportation (DOT).

With reference to the executed Memorandum of Agreement dated May 30, 2002, the appropriate right-of-way of the Kapaa Bypass with "No Access Permitted" except at existing access (i.e. Road A) along the project frontage, shall be dedicated to the DOT as a condition of the Land Use Commission.

If you have any questions, please contact Gary Ashikawa, Systems Planning Engineer, Highways Division, Planning Branch, at 587-6336. Please reference file review number 2014-006-1 in all contacts and correspondence regarding these comments.

Very truly yours,

FORD N. FUCHIGAMI
Interim Director of Transportation

c: Mr. Greg Allen, Kapaa Highlands, LLC

Exhibit I

Kapa'a Highlands Legal Description and Maps

Portion of Parcel 1

All of that certain parcel of land, being a portion of Parcel 1 of Tax Map Key 4-3-03 (4th Division), being a portion of Grant 5266 to Rufus P. Spalding situate at Kapaa, Kauai, Hawaii and more particularly described as follows:

Beginning at the "+" on a concrete driveway at the East corner of this parcel of land at the North corner of Grant 8216 to Joe Martins on the Southwest side of Olohena Road, the coordinates of which referred to Government Survey Triangulation Station "NONOU" being 5,660.65 feet North and 11,159.65 feet East and running by azimuths measured clockwise from True South:

1.	35 ° 59'	385.90	feet along Grant 8216 to Joe Martin to a pipe;
2.	22 ° 52'	212.20	feet along Grant 8216 to Joe Martin; and Kapaa Agricultural Lot 1 to a pipe;
3.	100 ° 09'	134.70	feet along Kapaa Agricultural Lot 1 to a pipe;
4.	13 ° 38'	502.70	feet along Kapaa Agricultural Lot 1 to a pipe;
5.	27 ° 12'	171.70	feet along Kapaa Agricultural Lot 1 to a pipe;
6.	37 ° 25'	44.50	feet along Kapaa Agricultural Lot 1 to a "+" on the rock;
7.	96 ° 52'	41.00	feet along Kapaa Agricultural Lot 1 to a pipe;
8.	24 ° 40'	202.40	feet along Kapaa Agricultural Lot 1 to a pipe;
9.	318 ° 05'	87.36	feet along Kapaa Agricultural Lot 1 to a pipe;
10.	30 ° 57'	297.55	feet along Kapaa Agricultural Lot 1 to a pipe;
11.	Thence along Kapaa Agricultural Lot 1 on a curve to the right with a radius of 253.97 feet, the chord azimuth and distance being: 62 ° 33' 30" 266.22 feet to a pipe;		
12.	94 ° 10'	11.52	feet along Kapaa Agricultural Lot 1 to a pipe;
13.	194 ° 30'	134.28	feet along the Cane Haul Road Right-of-Way (Part 4) and Grant 5237 to Hee Fat to a pipe;

Wagner Engineering Services, Inc.
P.O. Box 651 • Lihue, HI 96766 • (808) 245-7756

14. 91 ° 26' 1538.50 feet along Grant 5237 to Hee Fat to a pipe;

15. 34 ° 24' 140.00 feet along Grant 5237 to Hee Fat and the Cane Haul Road Right-of-Way (part 4) to a pipe;

16. 124 ° 24' 109.44 feet along Grant 5237 to Hee Fat;

17. 179 ° 07' 328.20 feet along Lot 3, Kapaa Rice and Kula Lots to a pipe;

18. 161 ° 57' 433.00 feet along Lot 3, Kapaa Rice and Kula Lots to a pipe;

19. 174 ° 26' 278.80 feet along Lot 3, Kapaa Rice and Kula Lots to a pipe;

20. 58 ° 03' 228.00 feet along Lot 3, Kapaa Rice and Kula Lots to a pipe;

21. 83 ° 46' 130.50 feet along Lot 3, Kapaa Rice and Kula Lots;

22. 193 ° 34' 142.10 feet along Lot 3, Kapaa Rice and Kula Lots;

23. 134 ° 25' 37.50 feet along Lot 3, Kapaa Rice and Kula Lots;

24. 61 ° 13' 102.60 feet along Lot 3, Kapaa Rice and Kula Lots;

25. 15 ° 18' 130.60 feet along Lot 3, Kapaa Rice and Kula Lots;

26. 71 ° 49' 37.10 feet along Lot 3, Kapaa Rice and Kula Lots;

27. 137 ° 54' 63.20 feet along Lot 3, Kapaa Rice and Kula Lots;

28. 196 ° 07' 588.10 feet along Lot 3, Kapaa Rice and Kula Lots;

29. 287 ° 25' 74.30 feet along L.C. Aw. 3554:1 to Keo;

30. 204 ° 43' 402.60 feet along L.C. Aw. 3554:1 to Keo to a pipe;

31. 191 ° 23' 213.70 feet along Lot 3, Kapaa Rice and Kula Lots to a pipe;

Wagner Engineering Services, Inc.
P.O. Box 851 • Hanalei, HI 96714 • (808)826-7256

32. 127 ° 12' 175.90 feet along Lot 3, Kapaa Rice and Kula Lots to a pipe;

33. 93 ° 47' 270.70 feet along Lot 3, Kapaa Rice and Kula Lots to a pipe;

34. 139 ° 40' 130.10 feet along Lot 3, Kapaa Rice and Kula Lots to a pipe;

35. 187 ° 18' 168.60 feet along Lot 3, Kapaa Rice and Kula Lots to a pipe;

36. 145 ° 21' 184.30 feet along Lot 3, Kapaa Rice and Kula Lots to a pipe;

37. 71 ° 54' 211.50 feet along Lot 3, Kapaa Rice and Kula Lots;

38. 115 ° 21' 123.70 feet along Lot 3, Kapaa Rice and Kula Lots;

39. 166 ° 33' 92.20 feet along Lot 3, Kapaa Rice and Kula Lots;

40. 216 ° 24' 260.40 feet along Lot 3, Kapaa Rice and Kula Lots to a pipe;

41. 156 ° 33' 153.00 feet along Lot 3, Kapaa Rice and Kula Lots to a pipe;

42. 73 ° 13' 340.60 feet along Lot 3, Kapaa Rice and Kula Lots to a pipe;

43. 122 ° 08' 107.50 feet along Lot 3, Kapaa Rice and Kula Lots to a pipe;

44. 150 ° 30' 118.03 feet along Lot 3, Kapaa Rice and Kula Lots to a pipe;

45. 226 ° 13' 49.22 feet along Olohena Road to a pipe;

46. Thence along Olohena Road on a curve to the left with a radius of 1,115.00 feet, the chord azimuth and distance being:
218 ° 45' 289.79 feet
to a P-K nail;

Wagner Engineering Services, Inc.
P.O. Box 851 • Hanalei, HI 96714 • (808)826-7256

47. 211 ° 17' 145.50 feet along Olohena Road to a P-K nail;

48. Thence along Olohena Road on a curve to the right with a radius of 65.00 feet, the chord azimuth and distance being:
268 ° 48' 30" 109.67 feet
to a pipe;

49. Thence along Olohena Road on a curve to the left with a radius of 87.10 feet, the chord azimuth and distance being:
299 ° 32' 78.54 feet
to a pipe;

50. 272 ° 44' 249.69 feet along Olohena Road to a pipe;

51. 281 ° 55' 203.19 feet along Olohena Road to a pipe;

52. 291 ° 21' 251.40 feet along Olohena Road to a pipe;

53. 261 ° 28' 149.18 feet along Olohena Road to a pipe;

54. 286 ° 25' 226.46 feet along Olohena Road to a pipe;

55. 325 ° 04' 288.93 feet along Olohena Road to a pipe;

56. 317 ° 06' 310.87 feet along Olohena Road to a pipe;

57. 3 ° 37' 476.50 feet along Lot 2, Olohena Road widening parcel and Lot 1, Kapaa Intermediate School, and along the remainder of Grant 5266 to Rufus P. Spalding to a pipe;

58. 323 ° 35' 304.65 feet along Lot 1, Kapaa Intermediate School, and along the remainder of Grant 5266 to Rufus P. Spalding to a pipe;

59. 309 ° 45' 390.14 feet along Lot 1, Kapaa Intermediate School, and along the remainder of Grant 5266 to Rufus P. Spalding to a pipe;

60. 268 ° 25' 554.33 feet along Lot 1, Kapaa Intermediate School, and along the remainder of Grant 5266 to Rufus P. Spalding to a pipe;

Wagner Engineering Services, Inc.
P.O. Box 851 • Hanalei, HI 96714 • (808)826-1216

61. 181 ° 14' 848.53 feet along Lot 1, Kapaa Intermediate School, and Lot 2, Olohena Road widening Parcel and along the remainder of Grant 5266 to Rufus P. Spalding to a pipe;

62. 257 ° 37' 127.84 feet along Olohena Road;

63. 297 ° 22' 265.20 feet along Olohena Road to a pipe;

64. 298 ° 02' 25.00 feet along Olohena Road to a pipe;

65. Thence along Olohena Road on a curve to the right with a radius of 375.00 feet, the chord azimuth and distance being:
307 ° 06' 30" 118.30 feet;
to a pipe;

66. 316 ° 11' 29.85 feet along Olohena Road to a pipe;

67. 28 ° 30' 203.12 feet along TMK: 4-3-03:13 and along the remainder of Grant 5266 to Rufus P. Spalding to a pipe;

68. 335 ° 00' 100.00 feet along TMK: 4-3-03:13 and along the remainder of Grant 5266 to Rufus P. Spalding to a pipe;

69. 301 ° 35' 130.00 feet along TMK: 4-3-03:13 and along the remainder of Grant 5266 to Rufus P. Spalding to a pipe;

70. 278 ° 40' 50.00 feet along TMK: 4-3-03:13 and along the remainder of Grant 5266 to Rufus P. Spalding to a pipe;

71. 246 ° 30' 140.00 feet along TMK: 4-3-03:13 and along the remainder of Grant 5266 to Rufus P. Spalding to a pipe;

72. 316 ° 11' 110.00 feet along TMK: 4-3-03:13 and along the remainder of Grant 5266 to Rufus P. Spalding to a pipe;

Wagner Engineering Services, Inc.
P.O. Box 851 • Hanalei, HI 96714 • (808)826-1216

73.	272 ° 20'	46.00	feet along TMK: 4-3-03:13 and along the remainder of Grant 5266 to Rufus P. Spalding to a pipe;
74.	300 ° 02'	135.22	feet along Olohena Road;
75.	307 ° 00'	566.89	feet along Olohena Road to the point of beginning and containing an AREA of 163.125 Acres.

SUBJECT, HOWEVER to an easement for the Temporary Kapaa By-Pass Road Right-of-Way containing an AREA of 7.859 Acres.

ALSO, SUBJECT, HOWEVER to Easements E-1, E-2, E-3 (60.00 ft. wide) and E-4 for electrical transmission lines and poles and containing areas of 79,706 s.f., 31,444 s.f., 21,431 s.f., and 1,947 s.f., respectively.

Also subject to a 20 ft. future road widening setback line along Olohena Road.

WAGNER ENGINEERING SERVICES, INC.

RONALD J. WAGNER
LICENSED PROFESSIONAL LAND SURVEYOR
No. 5074
HAWAII, USA

November 13, 1997
P.O. Box 851
Hanalei, Hawaii 96714

Ronald J. Wagner
Ronald J. Wagner
Licensed Professional Land
Surveyor Certificate No. 5074

Wagner Engineering Services, Inc.
P.O. Box 851 • Hanalei, HI 96714 • (808)826-7255

URBAN STATE LAND USE
Portion of Parcel 1

All of that certain parcel of land being the Urban State Land Use District portion of Parcel 1 of Tax Map Key 4-3-03 (4th Division), being a portion of Grant 5266 to Rufus P. Spalding situate at Kapaa, Kauai, Hawaii and more particularly described as follows:

Beginning at the East corner of this parcel of land on the Southwest side of Olohena Road, the coordinates of which referred to Government Survey Triangulation Station "NONOU" being 5,934.74 feet North and 10,795.91 feet East and running by azimuths measured clockwise from True South:

1.	35 ° 13'	14.72	feet over and across Parcel 1, Tax Map Key 4-3-03 along Kapaa By-Pass Road right-of-way easement;
2.	305 ° 13'	121.57	feet over and across Parcel 1, Tax Map Key 4-3-03 along Kapaa By-Pass Road right-of-way easement;
3.	Thence over and across Parcel 1, Tax Map Key 4-3-03 along Kapaa By-Pass Road right-of-way Easement on a curve to the right with a radius of 50.00 feet, the chord azimuth and distance being: 344 ° 48' 44" 63.74 feet;		
4.	Thence over and across Parcel 1, Tax Map Key 4-3-03 along Kapaa By-Pass Road right-of-way Easement on a curve to the left with a radius of 1,030.00 feet, the chord azimuth and distance being: 22 ° 40' 14" 62.45 feet;		
5.	20 ° 56'	150.64	feet over and across Parcel 1, Tax Map Key 4-3-03 along Kapaa By-Pass Road right-of-way easement;
6.	110 ° 56'	30.00	feet over and across Parcel 1, Tax Map Key 4-3-03 along Kapaa By-Pass Road right-of-way easement;
7.	20 ° 56'	500.00	feet over and across Parcel 1, Tax Map Key 4-3-03 along Kapaa By-Pass Road right-of-way easement;

Honua Engineering, Inc.
P.O. Box 851, Hanalei, HI 96714

8. 290 ° 56' 30.00 feet over and across Parcel 1, Tax Map Key 4-3-03 along Kapaa By-Pass Road right-of-way easement;

9. 20 ° 56' 531.65 feet over and across Parcel 1, Tax Map Key 4-3-03 along Kapaa By-Pass Road right-of-way easement;

10. 110 ° 56' 30.00 feet over and across Parcel 1, Tax Map Key 4-3-03 along Kapaa By-Pass Road right-of-way easement;

11. Thence over and across Parcel 1, Tax Map Key 4-3-03 along Kapaa By-Pass Road right-of-way easement on a curve to the right with a radius of 940.00 feet, the chord azimuth and distance being:
22 ° 33' 53.04 feet;

12. 24 ° 10' 136.41 feet over and across Parcel 1, Tax Map Key 4-3-03 along Kapaa By-Pass Road right-of-way easement;

13. Thence over and across Parcel 1, Tax Map Key 4-3-03 along Kapaa By-Pass Road right-of-way easement on a curve to the right with a radius of 940.00 feet, the chord azimuth and distance being:
29 ° 13' 165.49 feet;

14. 34 ° 16' 129.33 feet over and across Parcel 1, Tax Map Key 4-3-03 along Kapaa By-Pass Road right-of-way easement;

15. Thence over and across Parcel 1, Tax Map Key 4-3-03 along Kapaa By-Pass Road right-of-way easement on a curve to the right with a radius of 265.00 feet, the chord azimuth and distance being:
63 ° 01' 254.92 feet;

16. 91 ° 46' 938.55 feet over and across Parcel 1, Tax Map Key 4-3-03 along Kapaa By-Pass Road right-of-way easement;

17. 91 ° 04' 580.00 feet over and across Parcel 1, Tax Map Key 4-3-03 along Kapaa By-Pass Road right-of-way easement;

18. 181 ° 04' 10.00 feet over and across Parcel 1, Tax Map Key 4-3-03 along Kapaa By-Pass Road right-of-way easement;

19. 93 ° 59' 104.46 feet over and across Parcel 1, Tax Map Key 4-3-03 along Kapaa By-Pass Road right-of-way easement;

20. 179 ° 07' 165.42 feet along Lot 3, Kapaa Rice and Kula Lots to a pipe;

21. 161 ° 57' 433.00 feet along Lot 3, Kapaa Rice and Kula Lots to a pipe;

22. 174 ° 26' 278.80 feet along Lot 3, Kapaa Rice and Kula Lots to a pipe;

23. 273 ° 00' 324.19 feet over and across Parcel 1, Tax Map Key 4-3-03;

24. 192 ° 00' 193.74 feet over and across Parcel 1, Tax Map Key 4-3-03;

25. 113 ° 12' 141.30 feet over and across Parcel 1, Tax Map Key 4-3-03;

26. 225 ° 54' 399.65 feet over and across Parcel 1, Tax Map Key 4-3-03;

27. 171 ° 26' 478.33 feet over and across Parcel 1, Tax Map Key 4-3-03;

28. 261 ° 26' 128.70 feet over and across Parcel 1, Tax Map Key 4-3-03;

29. 233 ° 35' 89.98 feet over and across Parcel 1, Tax Map Key 4-3-03;

30.	323 ° 35'	47.54	feet along Lot 1, Kapaa Intermediate School;
31.	309 ° 45'	390.14	feet along Lot 1, Kapaa Intermediate School;
32.	268 ° 25'	554.33	feet along Lot 1, Kapaa Intermediate School;
33.	181 ° 14'	848.53	feet along Lot 1, Kapaa Intermediate School, and Lot 2, Olohena Road widening Parcel;
34.	257 ° 37'	127.84	feet along Olohena Road;
35.	297 ° 22'	265.20	feet along Olohena Road to a pipe;
36.	298 ° 02'	25.00	feet along Olohena Road to a pipe;

37. Thence along Olohena Road on a curve to the right with a radius of 375.00 feet, the chord azimuth and distance being:
307 ° 06' 30" 118.30 feet;
to a pipe;

38.	316 ° 11'	29.85	feet along Olohena Road to a pipe;
39.	28 ° 30'	203.12	feet along TMK: 4-3-03:13;
40.	335 ° 00'	100.00	feet along TMK: 4-3-03:13;
41.	301 ° 35'	130.00	feet along TMK: 4-3-03:13;
42.	278 ° 40'	50.00	feet along TMK: 4-3-03:13;
43.	246 ° 30'	140.00	feet along TMK: 4-3-03:13;
44.	316 ° 11'	110.00	feet along TMK: 4-3-03:13;
45.	272 ° 20'	46.00	feet along TMK: 4-3-03:13;
46.	300 ° 02'	135.22	feet along Olohena Road;

47.	307 ° 00'	111.44	feet along Olohena Road to the point of beginning and containing an AREA of 96.060 Acres.

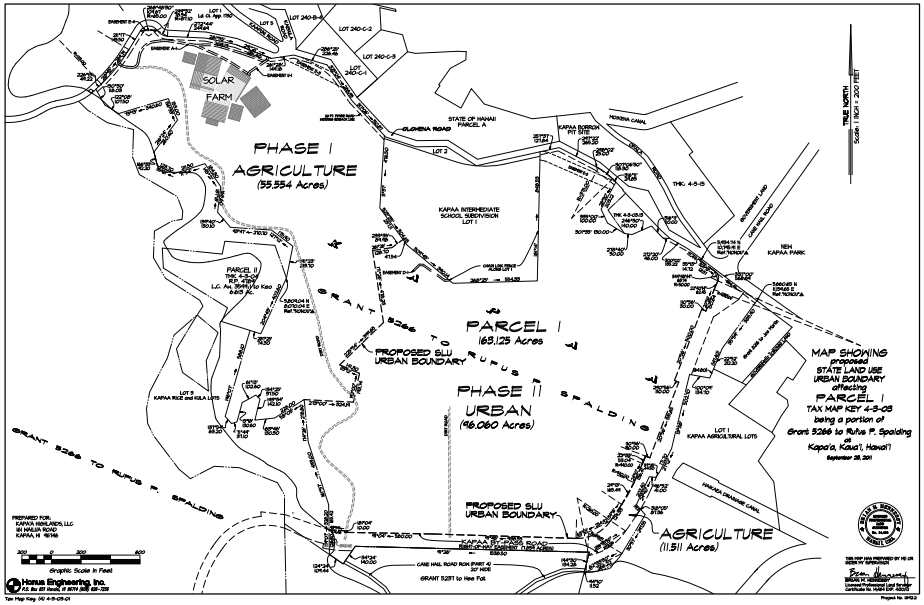
HONUA ENGINEERING INC.

September 23, 2011
P.O. Box 851
Hanalei, Hawaii 96714

Brian M. Hennessy
Licensed Professional Land Surveyor
Certificate No. 14484
Expires: 04/30/2012

Exhibit J

Botanical Survey
Kapa‘a Highlands Phase II
TMK (4) 4-3-003:001
Kaua‘i, Hawai‘i



Botanical Survey
Kapa`a Highlands Phase II
TMK (4) 4-3-003:001
Kaua`i, Hawai`i
April-May
2012

Prepared by

Kenneth R. Wood[1] / Research Biologist
Megan Kirkpatrick / M.S. Environmental Science
[1]P. O. Box 745, `Ele`ele, Kaua`i, Hawai`i, U.S.A. 96705
kwood@ntbg.org

TABLE OF CONTENTS

Summary…….3

Study Area..……...…….……3

Survey Methods……..4

Description of Vegetation....…..…….....……4

Conclusion……...…...……5

Checklist (Table 1)……...…….6

Survey Area (Figure 1 & 2)…….…….....8

References…….…..9

Botanical Survey
Kapa`a Highlands Phase II
TMK (4) 4-3-003:001
Kaua`i, Hawai`i
April 2012

Kenneth R. Wood, Research Biologist, & Megan Kirkpatrick, M.S. Environmental Science
P.O. Box 745, `Ele`ele, Kaua`i, Hawai`i, U.S.A. 96705, kwood@ntbg.org,

Summary: During April and May of 2012 a botanical survey was conducted on a 97 acre parcel in Kapa`a, Kaua`i, referred to as Kapa`a Highlands Phase II (TMK (4)3-8-003:001). This research documented 44 vascular plant species within the survey area. Forty taxa were non-native plant species, three taxa were very common indigenous native species, and one taxon was a Polynesian introduction (Table 1). NO FEDERALLY LISTED AS THREATENED OR ENDANGERED PLANT SPECIES WERE OBSERVED WITHIN OR NEAR THE SURVEY AREA. This report includes a general description of the study site; the methods of survey; and a vascular plant checklist of all plant species observed.

STUDY AREA. On April 19, 2012 and May 7, 2012, K. R. Wood (Endangered Species Specialist) and assistant Megan D. Kirkpatrick (M.S. Environmental Science) conducted a biological inventory on an undeveloped parcel of property in Kapa`a, Kaua`i (TMK [4]3-8-003:001) (Figures 1 & 2). The survey area is approximately 97 acres of undeveloped land. The primary objectives of this field survey were to:

a) search for threatened and endangered plant species as well as species of concern;
b) provide a complete vascular plant checklist of both native and non-native plant taxa observed on property; and
c) provide a summary concerning the conservation status of all native taxa observed;

SURVEY METHODS. A walk-through survey method was used. Transects included walking/driving around boundaries of property (TMK (4)3-8-003:001) and several transects through the interior portions of property. Plant identifications were made in the field and were recorded by the author (Table 1). Plant names and authors of dicots and monocots follow Wagner et al. (1990) and pteridophytes follow Palmer (2003). Plants of particular interest were collected by the second author (MK) as herbarium specimen vouchers and deposited at the National Tropical Botanical Garden (NTBG) herbarium. Specimens were placed in newspaper sheets and pressed in-between cardboard herbarium presses and dried at the NTBG.

DESCRIPTION OF VEGETATION.

The study area represents a lowland non-native mesic plant community dominated by secondary vegetation of trees, shrubs, and grasses, many of which are considered invasive. The land is vacant and currently undeveloped and has a past history of grazing and sugarcane cultivation. The non-native grass *Panicum maximum* (Poaceae – Guinea grass) and non-native shrub or small tree *Leucaena leucocephala* (Fabaceae – koa haole) are by far the dominant species found at the site. Additional common non-native trees and shrubs include: *Lantana camara* (Verbenaceae – lākana), *Indigofera suffruticosa* (Fabaceae – indigo), *Syzygium cumini* (Myrtaceae – Java plum), *Psidium guajava* (Myrtaceae – guava), *Spathodea campanulata* (Bignoniaceae – African tulip), and *Senna surattensis* (Fabaceae – kolomona). Several less common non-native trees and shrubs include: *Clidemia hirta* (Melastomataceae – Koster's curse), *Cinnamomum camphora* (Lauraceae – camphor tree), *Falcataria moluccana* (Fabaceae – albezia), *Ficus microcarpa* (Moraceae – Chinese banyan), and *Schefflera actinophylla* (Araliaceae – octopus tree). No Hawaiian endemic species (i.e., restricted to only Hawai`i) were observed. One Polynesian introduction was observed, namely *Aleurites moluccana* (Euphorbiaceae – kukui tree) which is common throughout the Hawaiian islands. The three indigenous species found at the site are quite common and include: *Hibiscus tiliaceus* (Malvaceae – hau) which is also often an invasive tree species, the fern species *Psilotum nudum* (Psilotaceae – moa), and Waltheria indica (Sterculiaceae - `uhaloa). For complete checklist of species see Table 1 which also includes the common names and status (i.e., indigenous/naturalized) category of each taxon.

CONCLUSION.

NO THREATENED OR ENDANGERED PLANT SPECIES WERE OBSERVED WITHIN OR ANYWHERE NEAR THE SURVEY AREA DURING RESEARCH -and therefore there are no concerns about possible impacts to rare plant species at the Kapa`a Highlands Phase II project. The current conditions of this study site indicate that the area has been dominated by non-native weedy species for a very long time. The senior author certifies his expertise with more than 25 years conducting biological inventories within the Hawaiian Islands and has specialized in the conservation of Hawai`i's *Federally Listed as Endangered* plant species, including those considered *Candidates* for listing, *Species of Concern*, or *Federally Listed as Threatened* (USFWS 1999a, 1999b, 2004, 2010).

TABLE 1. Checklist of Vascular Plants Observed in Kapa`a Highlands Phase II Survey Area (TMK (4) 4-3-003:001)

Status Symbols: ind=Indigenous (naturally occurring in Hawai`i, yet found in other areas of the world), nat=Naturalized (non-native), pol=Polynesian introduction. Note: Checklist alphabetical by genus. Flowering plants follow Wagner et al. 1990; pteridophytes follow Palmer 2003.

FAMILY	GENUS / SPECIES	COMMON NAME	STATUS
Asparagaceae	Agave sisalana Perrine	sisal, sisal hemp, century plant, malina	nat
Asteraceae	Ageratum conyzoides L.	maile hohono, maile honohono, maile kula	nat
Euphorbiaceae	Aleurites moluccana (L.) Willd.	kukui, kuikui, candlenut	pol
Blechnaceae	Blechnum appendiculatum Willd.		nat
Poaceae	Brachiaria mutica (Forssk.) Stapf	California grass, Para grass	nat
Fabaceae	Canavalia cathartica Thouars	maunaloa	nat
Fabaceae	Chamaecrista nictitans (L.) Moench var. glabrata (Vogel) H. S. Irwin & Barneby	partridge pea, laukī	nat
Poaceae	Chloris barbata (L.) Sw.	swollen fingergrass, mauʻu lei	nat
Lauraceae	Cinnamomum camphora (L.) J.Presl	camphor tree	nat
Melastomataceae	Clidemia hirta (L.) D.Don	Koster's curse	nat
Asteraceae	Cyanthillium cinereum (L.) H.Rob.	little ironweed	nat
Thelypteridaceae	Cyclosorus dentatus (Forssk.) Ching	paiʻiʻihā	nat
Poaceae	Cynodon dactylon (L.) Pers.	Bermuda grass, mānienie	nat
Cyperaceae	Cyperus pilosus Vahl		nat
Poaceae	Eragrostis brownii (Kunth) Nees ex Steud.	sheepgrass	nat
Fabaceae	Falcataria moluccana (Miq.) Barneby & J.W.Grimes		nat
Moraceae	Ficus microcarpa L.f.	Chinese banyan, Malayan banyan	nat
Cyperaceae	Fimbristylis miliacea (L.) Vahl		nat
Malvaceae	Hibiscus tiliaceus L.	hau	ind
Lamiaceae	Hyptis pectinata (L.) Poit.	comb hyptis	nat
Fabaceae	Indigofera suffruticosa Mill.	indigo, ʻinikō, ʻinikoa, kolū	nat
Verbenaceae	Lantana camara L.	lākana, lāʻau kalakala, lanakana (Niʻihau),	nat

FAMILY	GENUS / SPECIES	COMMON NAME	STATUS
Fabaceae	Leucaena leucocephala (Lam.) de Wit	koa haole, ēkoa, lilikoa	nat
Malvaceae	Malvastrum coromandelianum (L.) Garcke	false mallow	nat
Poaceae	Melinis repens (Willd.) Zizka	Natal redtop, Natal grass	nat
Fabaceae	Mimosa pudica L.	sensitive plant, sleeping grass, pua hilahila	nat
Fabaceae	Neonotonia wightii (Wight & Arn.) Verdc.		nat
Lomariopsidaceae	Nephrolepis brownii (Desv.) Hovenkamp & Miyam.		nat
Poaceae	Panicum maximum Jacq.	Guinea grass	nat
Asteraceae	Parthenium hysterophorus L.	false ragweed, Santa Maria	nat
Asteraceae	Pluchea carolinensis (Jacq.) G.Don	sourbush, marsh fleabane	nat
Myrtaceae	Psidium guajava L.	common guava, kuawa,	nat
Psilotaceae	Psilotum nudum (L.) P.Beauv.	moa, moa nahele	ind
Euphorbiaceae	Ricinus communis L.	castor bean, pā'aila	nat
Araliaceae	Schefflera actinophylla (Endl.) Harms	octopus tree, umbrella tree	nat
Poaceae	Schizostachyum sp.	'ohe	nat
Fabaceae	Senna surattensis (Burm.f.) H.S.Irwin & Barneby	kolomona, kalamona	nat
Malvaceae	Sida spinosa L.	prickly sida	nat
Bignoniaceae	Spathodea campanulata P.Beauv.	African tulip tree, fountain tree	nat
Asteraceae	Sphagneticola trilobata (L.) Pruski	wedelia	nat
Verbenaceae	Stachytarpheta jamaicensis (L.) Vahl	Jamaica vervain, ōwī	nat
Myrtaceae	Syzygium cumini (L.) Skeels	Java plum, jambolan plum	nat
Acanthaceae	Thunbergia fragrans Roxb.	white thunbergia, sweet clock-vine	nat
Sterculiaceae	Waltheria indica L.	'uhaloa, 'ala'ala pū loa	ind

Figure 1. Aerial Image of Kapa`a Highlands Project Area.

Figure 2. Kapa`a Highlands Phase II concept plan.

REFERENCES

Palmer, D. D. 2003. Hawai`i's Ferns and Fern Allies. University of Hawai`i Press, Honolulu.

USFWS (United States Fish and Wildlife Service). 1999a. U.S. Fish and Wildlife Service species list, plants. March 23, 1999. Pacific Islands Office, Honolulu, HI.

USFWS (United States Fish and Wildlife Service). 1999b. Endangered and threatened wildlife and plants. 50 CFR 17.11 and 17.12. December 31, 1999.

USFWS (United States Fish and Wildlife Service). 2004. Hawaiian Islands Plants: Updated June 15, 2004, Listed and Candidate Species, as Designated under the U.S. Endangered Species Act. 17pp.

USFWS (United States Fish and Wildlife Service). 2010. Endangered and Threatened Wildlife and Plants; Determination of Endangered Status for 48 Species on Kaua'i and Designation of Critical Habitat. Federal Register Vol. 75, No. 70, April 13, 2010, pages 1895919008

Wagner, W.L., D.R. Herbst, and S.H. Sohmer. 1990. Manual of the flowering plants of Hawaii. 2 vols. University of Hawaii Press and Bishop Museum Press, Honolulu. Bishop Museum Special Publication 83.

Exhibit K

Biological Surveys
Conducted on the Kapa'a Highlands Phase II Project Site
TMK: (4)-3-003:001, Island of Kaua'i, Hawai'i

Biological Surveys Conducted on the Kapa'a Highlands Phase II Project Site, TMK: (4)-3-003:001, Island of Kaua'i, Hawai'i

Prepared by:

Reginald E. David
Rana Biological Consulting, Inc.
P.O. Box 1371
Kailua-Kona, Hawai'i 96745

&

Prepared for:
Greg Allen
Kapa'a Highlands

May 24, 2012

Table of Contents

EXECUTIVE SUMMARY 3
INTRODUCTION AND BACKGROUND 5
GENERAL SITE DESCRIPTION 5
METHODS 8
- BOTANICAL SURVEY METHODS 8
- AVIAN SURVEY METHODS 8
- MAMMALIAN SURVEY METHODS 8

RESULTS 9
- BOTANICAL SURVEY 9
- AVIAN SURVEY RESULTS 9
- MAMMALIAN SURVEY RESULTS 9

DISCUSSION 11
- AVIAN RESOURCES 11
- MAMMALIAN RESOURCES 12

POTENTIAL IMPACTS TO PROTECTED SPECIES 12
- BOTANICAL 12
- SEABIRDS 12
- HAWAIIAN HOARY BAT 12

CRITICAL HABITAT 13
RECOMMENDATIONS 13
GLOSSARY 14
LITERATURE CITED 15
APPENDIX A 19

Executive Summary

Biological field surveys were conducted on an approximately 97-acre parcel of land identified as Tax Map Key (4) 3-8-003:001 located in Kapaʻa, Island of Kauaʻi. The owners are proposing to develop these lands as Phase II of the Kapaʻa Highlands subdivision

The primary purpose of the surveys was to determine if there are any botanical, avian and terrestrial mammalian species currently listed, or proposed for listing under either federal or State of Hawaiʻi endangered species statutes within or adjacent to the study area. The avian and mammalian surveys were conducted May 21, 2012, and the botanical survey was conducted on April 19 and May 7, 2012.

No species currently proposed or listed as threatened or endangered under either the federal or state of Hawaii endangered species statutes was documented during the course of the biological surveys conducted on the subject property in April and May, 2012.

There is no federally delineated Critical Habitat for any species present on or adjacent to the project area. Thus the development and operation of the proposed project will not result in impacts to federally designated Critical Habitat. There is no equivalent statute under State law.

Potential Impacts to Protected Species

Botanical

As all of the plant species recorded are either naturalized species or common indigenous species it is not expected that the development and operation of the proposed subdivision will result in deleterious impacts to any botanical species currently listed or proposed for listing under either federal or State of Hawaiʻi endangered species statutes.

Seabirds

The principal potential impact that construction and operation of the Kapaʻa Highlands Phase II project poses to protected seabirds is the increased threat that birds will be downed after becoming disoriented by lights associated with the project during the nesting season. The two main ways that outdoor lighting could pose a threat to these nocturnally flying seabirds is if, 1) during construction it is deemed expedient, or necessary to conduct nighttime construction activities, and 2) following build-out, the potential operation of streetlights and exterior safety and security lighting.

Hawaiian hoary bat

The principal potential impact that the development of the Kapaʻa Highlands Phase II project poses to bats is during the clearing and grubbing phases of construction as vegetation is removed. The removal of vegetation within the project site may temporarily displace individual bats, which may use the vegetation as a roosting location. As bats use multiple roosts within their home territories, the potential disturbance resulting from the removal of the vegetation is likely to be minimal. During the pupping season, females

carrying their pups may be less able to rapidly vacate a roost site as the vegetation is cleared. Additionally, adult female bats sometimes leave their pups in the roost tree while they forage. Very small pups may be unable to flee a tree that is being felled. Potential adverse effects from such disturbance can be avoided or minimized by not clearing woody vegetation taller than 4.6 meters (15-feet), between June 15 and September 15, the period in which bats are potentially at risk from vegetation clearing.

Introduction and Background

An avian and mammalian survey was conducted on an approximately 97-acre parcel of land identified as Tax Map Key (4) 3-8-003:001 located in Kapa'a, Island of Kaua'i (Figure 1). The owners are proposing to develop these lands as Phase II of the Kapa'a Highlands subdivision.

This report describes the methods used and the results of the avian and terrestrial mammalian surveys conducted on the project site by this author and a summary of the results of the botanical surveys conducted on the site by Wood and Kirkpatrick (2012)[1]. Both surveys were conducted as part of the environmental disclosure process associated with the proposed project.

The primary purpose of the surveys was to determine if there are any botanical, avian and terrestrial mammalian species currently listed, or proposed for listing under either federal or State of Hawai'i endangered species statutes within or adjacent to the study area. The federal and State of Hawai'i listed species status follows species identified in the following referenced documents, (Department of Land and Natural Resources (DLNR) 1998; U. S. Fish & Wildlife Service (USFWS) 2005, 2012). The avian and mammalian surveys were conducted May 21, 2012, and the botanical survey was conducted on April 19 and May 7, 2012.

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

General Site Description

The approximately 97 acre project site is bound to the north by Olohena Road (SR 581) and Kapa'a Middle School, to the east and south by the Kapa'a Bypass Road and to the west by undeveloped land and a new solar power generating facility (Figure 1). The site is made up of gently rolling hills that attain a maximum elevation of ~ 45 meters above mean sea level in the northwestern corner, sloping *makai* in an east-southeast direction down to an elevation of approximately ~ 6 meters ASL at the intersection of Olohena Road and the Kapa'a Bypass Road.

The site has a long history of sugar cultivation, followed by use as cattle pasturage. The vegetation currently on the site is dominated almost to the exclusion of native species by Guinea grass (*Panicum maximum*), *koa haole* (*Leucaena leucocephala*), lantana (*Lantana camara*), with Java plum trees (*Syzygium cuminii*), doted across the landscape (Figure 2). The southwestern boundary of the site has fairly dense stands of *hau* (*Hibiscus tiliaceus)* along the boundary (Figure 3).

[1] Wood, K.R., and M. Kirkpatrick. 2012. Botanical Survey Kapa'a Highlands Phase II TMK (4) 4-3-003:001 Kaua'i, Hawai'i April-May 20212, is appended to this document as Appendix A.

Figure 2 – Typical Guinea grass/koa haole shrub vegetation looking nortwest

Figure 3 – Hau bushes along southwestern bounday

Methods

Plant names mostly follow *Manual of the Flowering Plants of Hawai'i* (Wagner et al., 1990, 1999). The avian phylogenetic order and nomenclature used in this report follows the *AOU Check-List of North American Birds* (American Ornithologists' Union, 1998), and the 42nd through the 52nd supplements to the Check-List (American Ornithologists' Union, 2000; Banks et al., 2002, 2003, 2004, 2005, 2006, 2007, 2008; Chesser et al., 2009, 2010, 2011). Mammalian species scientific names follow (Tomich, 1986). Place names follow (Pukui et al., 1974).

Botanical Survey Methods

The botanical survey was conducted using a pedestrian (walking) transect methodology to cover the project area. Wood and Kirkpatrick's methodologies are detailed in Appendix A.

Avian Survey Methods

A total of six avian point count stations were sited roughly equidistant from each other within the project site. Six-minute point counts were made at each of the count stations. Each station was counted once. Field observations were made with the aid of Leica 8 X 42 binoculars and by listening for vocalizations. Point counts were concentrated during the early morning hours, the peak of daily bird activity. Time not spent counting was used to search the remainder of the project site for species and habitats that were not detected during count sessions.

Mammalian Survey Methods

With the exception of the endangered Hawaiian hoary bat (*Lasiurus cinereus semotus*), or *'ōpe'ape'a* as it is known locally, all terrestrial mammals currently found on the Island of Kaua'i are alien species, and most are ubiquitous. The survey for terrestrial mammalian species was limited to visual and auditory detection, coupled with visual observation of scat, tracks, and other animal sign. No trapping program or heterodyne bat detection survey methods were used during the course of this survey. A running tally was kept of all terrestrial vertebrate mammalian species detected within the project area during time spent within the project site.

Results

Botanical Survey

A total of 44 species of vascular plants were identified from the survey area. Three of the species detected *moa* (*Psilotum nudum*), *hau* (*Hibiscus tiliaceus*) and *'uhaloa* (*Waltheria indica*) are common indigenous species in the Islands. One species *kukui* (*Aleurites moluccana*) is a Polynesian introduction (Wood and Kirkpatrick, 2012).

Wood and Kirkpatrick did not detect any botanical species currently listed as endangered or threatened under either federal or State of Hawai'i endangered species statutes. For a detailed description of their findings please see Appendix A.

Avian Survey Results

A total of 193 individual birds of 17 species, representing 13 separate families, were recorded during station counts (Table 1). All 17 species recorded are alien to the Hawaiian Islands (Table 1).

Avian diversity and densities were in keeping with the location of the property and the habitat presently on the site. Four species, House Finch (*Carpodacus mexicanus*), Nutmeg Mannikin (*Lonchura punctulata*), Japanese White-eye (*Zosterops japonicus*) and Zebra Dove (*Geopelia striata*) accounted for slightly more than 45 percent of all birds recorded during station counts. The most commonly recorded species was House Finch, which accounted for 14 percent of the total number of individual birds recorded. An average of 32 individual birds was recorded per station count; a number that is about average for point counts in this area on the Island of Kaua'i.

No avian species currently proposed or listed under either the State of Hawai'i or federal endangered species statutes was detected during the course of this survey, nor would they be expected given the habitat currently present on the site.

Mammalian Survey Results

Four terrestrial mammalian species were detected while on the site. Numerous dogs (*Canis f. familiaris*) were heard barking from areas adjacent to the site. Tracks and scat of pig (*Sus s. scrofa*) were encountered within the site. Tracks, and scat of both horse (*Equss c. caballus*) and cow (*Bos taurus*), were also encountered within the site.

Table 1 – Avian Species Kapa'a Highlands Phase II Point Counts

Common Name	*Scientific Name*	*ST*	*RA*
	GALLIFORMES		
	PHASIANIDAE – Pheasants & Partridges		
	Phasianinae – Pheasants & Allies		
Red Junglefowl	*Gallus gallus*	A	1.50
	PELECANIFORMES		
	ARDEIDAE - Herons, Bitterns & Allies		
Cattle Egret	*Bubulcus ibis*	A	0.83
	COLUMBIDAE - Pigeons & Doves		
Spotted Dove	*Streptopelia chinensis*	A	2.00
Zebra Dove	*Geopelia striata*	A	2.67
	PASSERIFORMES		
	CETTIIDAE - Cettia Warblers & Allies		
Japanese Bush-Warbler	*Cettia diphone*	A	1.17
	ZOSTEROPIDAE - White-eyes		
Japanese White-eye	*Zosterops japonicus*	A	1.17
	TIMALIIDAE - Babblers		
Chinese Hwamei	*Garrulax canorus*	A	0.50
	TURDIDAE - Thrushes		
White-rumped Shama	*Copsychus malabaricus*	A	1.17
	STURNIDAE - Starlings		
Common Myna	*Acridotheres tristis*	A	2.50
	EMBERIZIDAE - Emberizids		
Red-crested Cardinal	*Paroaria coronata*	A	1.00
	CARDINALIDAE - Cardinals Saltators & Allies		
Northern Cardinal	*Cardinalis cardinalis*	A	1.67
	ICTERIDAE - Blackbirds		
Western Meadowlark	*Sturnella neglecta*	A	0.67
	FRINGILLIDAE - Fringilline and Carduleline Finches & Allies		
	Carduelinae - Carduline Finches		
House Finch	*Carpodacus mexicanus*	A	4.50
	ESTRILDIDAE - Estrildid Finches		
	Estrildinae - Estrildine Finches		
Red Avadavat	*Amandava amandava*	A	0.56
Nutmeg Mannikin	*Lonchura punctulata*	A	4.33
Chestnut Munia	*Lonchura atricapilla*	A	2.17
Java Sparrow	*Padda oryzivora*	A	1.33

Key to Table 1

ST Status

A Alien – Introduced to the Hawaiian Islands by humans

RA Relative Abundance - Number of birds detected divided by the number of count stations (6)

Discussion

Botanical Resources

Only nine percent of the plant species (~4/~44) detected on the subject property were either indigenous or early Polynesian introductions. This proportion is remarkably low for lowland areas on Kaua'i, and graphically illustrates the highly disturbed and depauperate nature of the native vegetation present on this site. Please see Appendix A for a more detailed discussion of the botanical resources present on the site.

Avian Resources

The findings of the avian survey are consistent with the location of the property, and the habitat present on the site. As previously stated all of the avian species detected during the course of this survey are alien to the Hawaiian Islands.

Although not detected during this survey, the endangered Hawaiian Petrel (*Pterodroma sandwichensis*), and the threatened endemic sub-species of the Newell's Shearwater (*Puffinus auricularis newelli*) have been recorded over-flying the project site between April and the end of November each year (David, 1995; Morgan *et al*., 2003, 2004; David and Planning Solutions 2008). Additionally, the Save Our Shearwaters Program has recovered both species from the general project area on an annual basis over the past three decades (Morgan *et al*., 2003, 2004; David and Planning Solutions, 2008; Save our Shearwater Program, 2012).

The petrel is listed as endangered, and the shearwater as threatened under both Federal and State of Hawai'i endangered species statutes. The primary cause of mortality in both Hawaiian Petrels and Newell's Shearwaters is thought to be predation by alien mammalian species at the nesting colonies (USFWS 1983, Simons and Hodges 1998, Ainley *et al*., 2001). Collision with man-made structures is considered to be the second most significant cause of mortality of these seabird species in Hawai'i. Nocturnally flying seabirds, especially fledglings on their way to sea in the summer and fall, can become disoriented by exterior lighting. When disoriented, seabirds can collide with manmade structures, and if they are not killed outright, the dazed or injured birds are easy targets of opportunity for feral mammals (Hadley 1961; Telfer 1979; Sincock 1981; Reed *et al*., 1985; Telfer *et al*., 1987; Cooper and Day, 1998; Podolsky *et al*. 1998; Ainley *et al*., 2001; Hue *et al*., 2001; Day *et al* 2003). There are no nesting colonies nor appropriate nesting habitat for either of these listed seabird species within the current study site.

Following build out it is probable that cleared areas, especially those that are landscaped as lawns, and or parking lots will provide loafing habitat for Pacific Golden-Plover (*Pluvialis fulva*). The plover is an indigenous migratory shorebird species which nests in the high Arctic during the late spring and summer months, returning to Hawai'i and the Tropical Pacific to spend the fall and winter months each year. They usually leave Hawai'i for their

trip back to the Arctic in late April or the very early part of May each year. This species is a common site around the state during the late fall and winter months.

Mammalian Resources

The findings of the mammalian survey are consistent with the location of the property and the habitat currently present on the site. We did not record Hawaiian hoary bats overflying the site. Hawaiian hoary bats are widely distributed in the lowland areas on the Island of Kaua'i, and have been documented in and around almost all areas that still have some dense vegetation (Tomich, 1986; USFWS 1998, David, 2012).

Although no rodents were detected during the course of this survey, it is virtually certain one or more of the four established alien muridae found on Kaua'i, roof rat (*Rattus r. rattus*), Norway rat (*Rattus norvegicus*), European house mouse (*Mus musculus domesticus*) and possibly Polynesian rats (*Rattus exulans hawaiiensis*) use various resources found within the general project area. All of these introduced rodents are deleterious to native ecosystems and the native faunal species dependant on them.

Potential Impacts to Protected Species

Botanical

As all of the plant species recorded are either naturalized species or common indigenous species it is not expected that the development and operation of the proposed subdivision will result in deleterious impacts to any botanical species currently listed or proposed for listing under either federal or State of Hawai'i endangered species statutes.

Seabirds

The principal potential impact that construction and operation of the Kapa'a Highlands Phase II project poses to protected seabirds is the increased threat that birds will be downed after becoming disoriented by lights associated with the project during the nesting season. The two main ways that outdoor lighting could pose a threat to these nocturnally flying seabirds is if, 1) during construction it is deemed expedient, or necessary to conduct nighttime construction activities, and 2) following build-out, the potential operation of streetlights and exterior safety and security lighting.

Hawaiian hoary bat

The principal potential impact that the development of the Kapa'a Highlands Phase II project poses to bats is during the clearing and grubbing phases of construction as vegetation is removed. The removal of vegetation within the project site may temporarily displace individual bats, which may use the vegetation as a roosting location. As bats use multiple roosts within their home territories, the potential disturbance resulting from the removal of the vegetation is likely to be minimal. During the pupping season, females carrying their pups may be less able to rapidly vacate a roost site as the vegetation is cleared. Additionally, adult female bats sometimes leave their pups in the roost tree while they forage. Very small pups may be unable to flee a tree that is being felled. Potential

adverse effects from such disturbance can be avoided or minimized by not clearing woody vegetation taller than 4.6 meters (15-feet), between June 15 and September 15, the period in which bats are potentially at risk from vegetation clearing.

Critical Habitat

There is no federally delineated Critical Habitat for any species present on or adjacent to the project area. Thus the development and operation of the proposed project will not result in impacts to federally designated Critical Habitat. There is no equivalent statute under State law.

Recommendations

- All exterior lights installed in conjunction with the proposed project should be shielded to reduce the potential for interactions of nocturnally flying seabirds with external lights and man-made structures (Reed *et al.*, 1985; Telfer *et al.*, 1987). Any lighting fixtures that meet the "Dark Skies" guidelines are appropriate.

- It is recommended that woody vegetation taller than 4.6 meters (15-feet), not be cleared between June 1 and September 15, the period in which bats are potentially at risk from vegetation clearing.

- It is recommended that, where appropriate and practicable, native plant species be used in landscaping efforts. Not only is this ecologically prudent, but also if the appropriate plants are used, it will also likely save maintenance and water costs over the long term.

Glossary

Alien – Introduced to Hawai'i by humans
Commensal – Animals that share human food and lodgings, such as rats, mice cats and dogs.
Crepuscular – Twilight hours
Endangered – Listed and protected under the Endangered Species Act of 1973, as amended (ESA) as an endangered species
Endemic – Native to the Hawaiian Islands and unique to Hawai'i
Indigenous – Native to the Hawaiian Islands, but also found elsewhere naturally
*maka*i – Down-slope, towards the ocean
Muridae – Rodents, including rats, mice and voles, one of the most diverse families of mammals
Naturalized – A plant or animal that has become established in an area that it is not indigenous to
Nocturnal – Night-time, after dark
'Ōpe'ape'a – Endemic endangered Hawaiian hoary bat (*Lasiurus cinereus semotus*)
Pelagic – An animal that spends its life at sea – in this case seabirds that only return to land to nest and rear their young
Phylogenetic – The evolutionary order that organisms are arranged by
Ruderal – Disturbed, rocky, rubbishy areas, such as old agricultural fields and rock piles
Sign – Biological term referring to tracks, scat, rubbing, odor, marks, nests, and other signs created by animals by which their presence may be detected
Threatened – Listed and protected under the ESA as a threatened species.

ASL – Above mean sea level
DLNR – Hawai'i State Department of Land & Natural Resources
DOFAW – Division of Forestry and Wildlife
ESA – Endangered Species Act of 1973, as amended
TMK – Tax Map Key
USFWS – United State Fish & Wildlife Service

Literature Cited

Ainley, D. G, R. Podolsky, L. Deforest, G. Spencer, and N. Nur. 2001. The Status and Population Trends of the Newell's Shearwater on Kaua'i: Insights from Modeling, *in*: Scott, J. M, S. Conant, and C. Van Riper III (editors) *Evolution, Ecology, Conservation, and Management of Hawaiian Birds: A Vanishing Avifauna*. Studies in Avian Biology No. 22: Cooper's Ornithological Society, Allen Press, Lawrence, Kansas. (Pg. 108-123).

American Ornithologist's Union. 1998. *Check-list of North American Birds*. 7th edition. AOU. Washington D.C. 829pp.

_____. 2000. Forty-second supplement to the American Ornithologist's Union *Check-list of North American Birds*. Auk 117:847-858.

Banks, R. C., C. Cicero, J. L. Dunn, A. W. Kratter, P. C. Rasmussen, J. V. Remsen, Jr., J. D. Rising, and D. F. Stotz. 2002. Forty-third supplement to the American Ornithologist's Union *Check-list of North American Birds*. Auk 119:897-906.

_____. 2003 Forty-fourth supplement to the American Ornithologist's Union *Check-list of North American Birds*. Auk 120:923-931.

_____. 2004 Forty-fifth supplement to the American Ornithologist's Union *Check-list of North American Birds*. Auk 121:985-995.

_____. 2005 Forty-sixth supplement to the American Ornithologist's Union *Check-list of North American Birds*. Auk 122:1031-1031.

_____. 2006 Forty-seventh supplement to the American Ornithologist's Union *Check-list of North American Birds*. Auk 123:926-936.

Banks, R. C., C. R. Terry Chesser, C. Cicero, J. L. Dunn, A. W. Kratter, I. J. Lovette, P. C. Rasmussen, J. V. Remsen, Jr., J. D. Rising, and D. F. Stotz. 2007 Forty-eighth supplement to the American Ornithologist Union *Check-list of North American Birds*. Auk 124:1109-1115.

Banks, R. C., C. R. Terry Chesser, C. Cicero, J. L. Dunn, A. W. Kratter, I. J. Lovette, P. C. Rasmussen, J. V. Remsen, Jr., J. D. Rising, and D. F. Stotz, and K. Winker. 2008 Forty-ninth supplement to the American Ornithologist Union *Check-list of North American Birds*. Auk 125:758-768.

Chesser, R. T., R. C. Banks, F. K. Barker, C. Cicero, J. L. Dunn, A. W. Kratter, I. J. Lovette, P. C. Rasmussen, J. V. Remsen, Jr., J. D. Rising, and D. F. Stotz, and K. Winker. 2009. Fiftieth supplement to the American Ornithologist Union *Check-list of North American Birds*. Auk 126:1-10.

_____. 2010. Fifty-first supplement to the American Ornithologist Union *Check-list of North American Birds*. Auk 127:726-744.

Chesser, R. T., R. C. Banks, F. K. Barker, C. Cicero, J. L. Dunn, A. W. Kratter, I. J. Lovette, P. C. Rasmussen, J. V. Remsen, Jr., J. D. Rising, and D. F. Stotz, and K. Winker. 2011. Fifty-second supplement to the American Ornithologist Union *Check-list of North American Birds*. Auk 128: 600-613.

Cooper, B. A and R. H. Day. 1994. Kauai endangered seabird study. Volume 1: Interactions of Dark-rumped Petrels and Newell's Shearwaters with utility structures on Kauai, Hawaii: Final Report, TR-105847-V1, Electric Power Research Institute, Palo Alto, California.

Cooper, B. A and R. H. Day. 1998. Summer Behavior and Mortality of Dark-rumped Petrels and Newells' Shearwaters at Power Lines on Kauai. Colonial Waterbirds, 21 (1): 11-19.

Day, R. H., B. Cooper, and T. C. Telfer. 2003. Decline of Townsend's (Newell's Shearwaters (*Puffinus auricularis newelli*) on Kauai, Hawaii. The Auk 120: 669-679.

David, R. E. 2012. Unpublished field notes – Kaua'i 1980 - 2012.

David, R. E., R. H. Day, and B. A. Cooper 2002. Results of Newell's Shearwater Surveys at the Kaluahonu, Moalepe and Anahola Memorial Colonies, Island of Kaua'i, Hawai'i, July 2002. Prepared for Planning Solutions, Inc., and Kaua'i Electric.

David, R. E., and Planning Solutions 2008. 2007 Save Our Shearwaters Program End of Year Report: Prepared for: Kaua'i Island Utility Cooperative & The Hawai'i Department of Land and Natural Resources, Division of Forestry and Wildlife.

Department of Land and Natural Resources (DLNR). 1998. Indigenous Wildlife, Endangered And Threatened Wildlife And Plants, And Introduced Wild Birds. Department of Land and Natural Resources. State of Hawaii. Administrative Rule §13-134-1 through §13-134-10, dated March 02, 1998.

Hadley, T. H. 1961. Shearwater calamity on Kauai. Elepaio 21:60.

Hawai'i Department of Land and Natural Resources (HDLNR). 1998. Indigenous Wildlife, Endangered and Threatened Wildlife and Plants, and Introduced Wild Birds. State of Hawai'i. Administrative Rule §13-134-1 through §13-134-10.

Hue, D., C. Glidden, J. Lippert, L. Schnell, J. MacIvor and J. Meisler. 2001. Habitat Use and Limiting Factors in a Population of Hawaiian Dark-rumped Petrels on Mauna Loa, Hawai'i. , *in:* : Scott, J. M, S. Conant, and C. Van Riper III (editors) *Evolution, Ecology, Conservation, and Management of Hawaiian Birds: A Vanishing Avifauna*. Studies in Avian Biology No. 22. Cooper's Ornithological Society, Allen Press, Lawrence, Kansas (Pg. 234-242).

Morgan, C., P. White, and R. E. David. 2003. Habitat Conservation Plan: Kaua'i Island Utility Cooperative: Working Paper No. 2 - Data Analysis: Interpreting the Save Our Shearwaters Bird Recovery Database (1979-2002) for Habitat Conservation Planning. Prepared for: Kaua'i Island Utility Cooperative.

_____. 2004 Habitat Conservation Plan: Kaua'i Island Utility Cooperative: Data Report and

Analysis: Save Our Shearwaters Bird Program 2003 Update. Prepared for: Kaua'i Island Utility Cooperative.

Podolsky, R., D.G. Ainley, G. Spencer, L. de Forest, and N. Nur. 1998. "Mortality of Newell's Shearwaters Caused by Collisions with Urban Structures on Kaua'i". Colonial Waterbirds 21:20-34.

Pukui , M. K., S. H. Elbert, and E. T. Mookini 1976. *Place Names of Hawaii*. University of Hawaii Press. Honolulu, Hawai'i. 289 pp.

Reed, J. R., J. L Sincock, and J. P. Hailman 1985. Light Attraction in Endangered Procellariform Birds: Reduction by Shielding Upward Radiation. Auk 102: 377-383.

Save our Shearwaters 2012. Unpublished SOS data 1979 – 2011.

Simons, T. R., and C. N. Hodges. 1998. Dark-rumped Petrel (*Pterodroma phaeopygia*). *In* A. Poole and F. Gill (editors). The Birds of North America, No. 345. The Academy of Natural Sciences, Philadelphia, PA. and the American Ornithologists Union, Washington, D.C.

Sincock, J. L. 1981. Saving the Newell ' s Shearwater. Pages 76-78 in Proceedings of the Hawaii Forestry and Wildllife Conference, 2-4 October 1980. Department of Land and Natural Resources, State of Hawaii, Honolulu.

Telfer, T. C. 1979. Successful Newell's Shearwater Salvage on Kauai. 'Elepaio 39:71

Telfer, T. C. , J. L. Sincock, G. V. Byrd, and J. R. Reed. 1987. Attraction of Hawaiian seabirds to lights: Conservation efforts and effects of moon phase. Wildlife Society Bulletin 15:406-413.

Tomich, P.Q. 1986. *Mammals in Hawaii*. Bishop Museum Press. Honolulu, Hawaii. 37 pp.

U.S. Fish & Wildlife Service (USFWS) 1983. Hawaiian Dark-Rumped Petrel & Newell's Manx Shearwater Recovery Plan. USFWS, Portland, Oregon. February 1983.

_____. Recovery Plan for the Hawaiian Hoary Bat. U.S. Fish & Wildlife Service, Portland, Oregon.

_____. 2005. Endangered and Threatened Wildlife and Plants. 50CFR 17:11 and 17:12 (Tuesday, November 1, 2005).

_____. 2012. USFWS Threatened and Endangered Species System (TESS), online at http://ecos.fws.gov/tess_public/StartTESS.do Last accessed on May22, 2012.

Wagner, W.L., D.R Herbst, and S.H. Sohmer. 1990. *Manual of the Flowering Plants of Hawai'i*. University of Hawaii Press, Honolulu, Hawaii 1854 pp.

Wagner, W.L. and D.R. Herbst. 1999. *Supplement to the Manual of the Flowering Plants of Hawai'i*, pp. 1855-1918. *In:* Wagner, W.L., D.R. Herbst, and S.H. Sohmer, Manual of the flowering plants of Hawai'i. Revised edition. 2 vols. University of Hawaii Press and Bishop Museum Press, Honolulu.

Wood, K.R., and M. Kirkpatrick. 2012. Botanical Survey Kapa'a Highlands Phase II TMK (4) 4-3-003:001 Kaua'i, Hawai'i April-May 2012. Prepared for Greg Allen.

Appendix A

Wood, K.R., and M. Kirkpatrick. 2012.
Botanical Survey Kapa‘a Highlands Phase II
TMK (4) 4-3-003:001
Kaua‘i, Hawai‘i April-May 2012.

Exhibit L

An Archaeological Assessment for the Proposed Kapa`a Highlands Phase II Project
Kapa‘a Ahupua‘a, Kawaihau, Kaua‘i

An Archaeological Assessment With Subsurface Testing for the Proposed Kapa`a Highlands Phase II Project, Kapa`a Ahupua`a, Kawaihau, Kaua`i TMK (4) 4-3-3: 1

By

Nancy McMahon, M.A. and Wendy Tolleson, M.A.

Prepared for:
Three Stooges LLC

Exploration Associates, Ltd

Revised September 2013

INTRODUCTION 1
Project Background 1
Scope of Work 1
Methods 5
Natural Setting 5
HISTORICAL BACKGROUND 6
From Puna District to Kawaihau District 6
Heiau of Kapa`a 9
The Mahele: Kapa'a Land Commission Awards 10
Early Historic Accounts of Kapa`a (1830's-1900's) 11
20th Century History of Kapa`a (1900 - Present) 13
PREVIOUS ARCHAEOLOGICAL RESEARCH 15
Archaeological Studies and Sites in Kapa`a Ahupua`a 15
Pattern of Archaeological Sites in Kapa`a 21
RESULTS OF FIELD WORK 23
Pedestrian Survey 23
Subsurface Testing 23
RECOMMENDATIONS 29
REFERENCES 30
APPENDIX A 35
Photos of the Area Surveyed with Figure Numbers 36
APPENDIX B 40
State Historic Preservation Letters Pertinent to this Project 41
APPENDIX C 42
Soil Survey for Solar Farm on Phase I Property 43

LIST OF FIGURES

Figure 1. USGS Map of the Project Area. 2

Figure 2. Project location and surveyed area outlined in purple. 3

Figure 3. Project development map. 3

Figure 4. Aerial View of the Kapa`a Highlands Phase II Looking West. 4

Figure 5. Aerial View of the Kapa`a Highlands Phase II Looking *Mauka*. 4

Figure 6. Map showing previous archaeological studies in Kapa`a. 17

Figure 7. Map of previously documented archaeological sites in Kapa`a. 21

Figure 8. Trench locations. 23

Figure 9. Profile Test Trench 2 on left and Trench 3 on right 24

Figure 10. Entrance off Olohena Road looking *Makai* the Solar Farm in the Distance 24

Figure 11. Remnant Road with Cattle Grazing in the Distance. 25

Figure 12. Lower Elevation Outside Area from the Access Road. 26

Figure 13. View Across the Project Area, Facing *Makai* and Northeast. 27

Figure 14. Looking at the Roof of Kapa`a Middle School. 28

APPENDIX A 35

Figure 1. View of Project Area from the gate at the top of Olohena Road. 36

Figure 2. Solar Farm and Equipment Buildings 37

Figure 3. Cattle Grazing in the Project Area 37

Figure 4. Fence in the left side of photo indicating property boundary 38

Figure 5. Goats Grazing in the Project Area. 39

LIST OF TABLES

Table 1. Heiau of Kapa`a 9

Table 2. Mahele Land Claims in Kapa`a Ahupua`a 10

Table 3. Previous Archaeological Studies in Kapa`a 15

Table 4. Historic Properties in Kapa`a Ahupua`a 18

INTRODUCTION

Project Background

At the request of Three Stooges LLC., Exploration Associates Ltd. (EAL) conducted an archaeological assessment of a parcel of land (referred to hereafter as Kapa`a Highlands Phase II) in Kapa`a (in TMK 4-3-3:1) (Figures 1 & 2). The survey was performed to address any historic preservation or cultural impact issues that might affect the proposed development.

The proposed development, Kapa`a Highlands Phase II, project involves the development of a residential subdivision on a 97 acre parcel. Approximately 69 acres will be subdivided into residential lots both single family and multi-family units. In addition the breakdown of Phase II will include: roads - 9.4 acres; church - 0.8 acres; general commercial - 0.4 acres; parks - 3.1 acres and open space - 14.3 acres.

Scope of Work

The purpose of this archaeological investigation is to address any archaeological and/or historical concerns. The proposed work includes a surface survey, subsurface testing, and a report detailing methods and any finds. This archaeological work meets the requirements of an inventory-level survey per the rules and regulations of (State Historic Preservation Division/Department of Land and Natural Resources) SHPD/DLNR. The level of work is sufficient to address site types, locations, and allow for future mitigation recommendations if appropriate. Any property over 50 years of age must be evaluated for historic Significance on the National Register of Historic places, and include remnant pr-contact and historic period site.

The scope of work includes:

- Historical research includes study of archival sources, historic maps, Land Commission Awards and previous archaeological reports to construct a history of land use and to determine if archaeological sites have been recorded on or near this property.
- Pedestrian survey of 100% of the subject parcel to identify any surface archaeological features and investigate and assess the potential for impact to such sites, and limited subsurface testing to identify any subsurface sensitive areas that may require further investigation or mitigation before the project proceeds.
- Preparation of a report which will include the results of the historical research and the fieldwork with an assessment of archaeological potential based on that research with recommendations for further archaeological work, if appropriate. It also will provide mitigation recommendations if there are archaeologically sensitive areas that require further consideration.

Figure 1. USGS Map Showing Project Area

Figure 2. Project location and surveyed area outlined in purple.

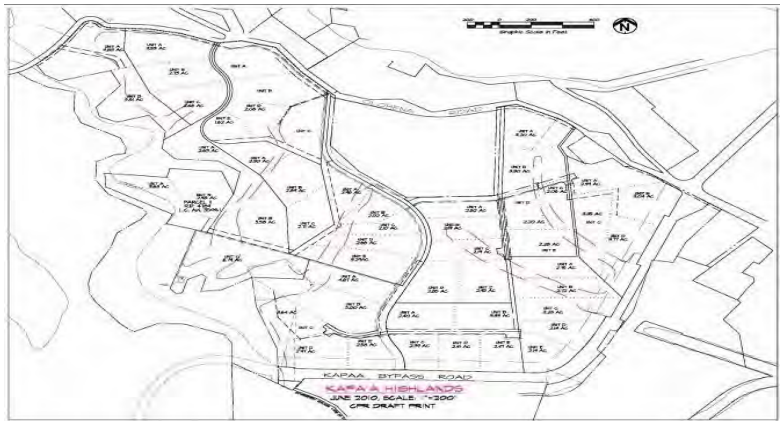


Figure 3. Project development map.

Figure 4 Aerial View of the Kapa`a *Highlands Phase II Looking West.*

Figure 5. Aerial View of Kapa`a *Highlands Phase II Looking Mauka.*

Methods

On January 3, 2012 and April 25, 2012 and November 11, 2012 a survey of the Kapa`a Highlands Phase II project area was conducted by Exploration Associates Ltd. by archaeologist Nancy McMahon, M.A. Survey transects oriented north-south were spaced 10 m. apart where possible through thick guinea grass. Field observations were recorded and photographs were taken of the project area, the surrounding area, and the backhoe trenches. Three test trenches were machine excavated to examine the soils and determine if any stratigraphy or buried cultural deposits was present. Soils were classified using a Munsell color chart, then photographed.

Historical research includes a review of previous archaeological studies on file at the State Historic Preservation Division of the Department of Land and Natural Resources; studies of documents at Hamilton Library UH Manoa, the Kapa`a and Lihue Public Libraries, the Kaua'i Museum, the Kaua`i Historical Society and from the study of maps at the Survey Office of the Department of Land and Natural Resources. Nineteenth-century Land Commission Award claim records were accessed via the Internet from the *Mahele* Database prepared by Waihona `Aina Corp.

Natural Setting/Project Area

The subject parcel is located north of Kapa`a town on former cane lands situated on a bluff adjacent to the coastal plain. It is bordered by Olohena Road to the north and the Kapa`a Bypass Road on the south and east. Kapaa Intermediate School is located on state land near the middle of the northern portion of the property. A Phase I parcel has an existing solar farm and equipment building.

The southern border of the project area is adjacent to the by-pass road within an elevation of approximately 55 feet above msl. The topography or the project area rises in elevation to the northern border approximately 130 feet above msl or an average increase of less than 5%. There are particular areas of the property with 20% slopes. The project area is currently fallow and is vegetated with Guinea Grass (*Panicum maximum*), Koa Haole (*Leucaena leucocephala*), and Java Plum (*Syzygium cumini*). The last cultivation of sugar cane on the project area was 15 years ago, but due to the poor soil, strong trade winds and the salt spray from the ocean, the viability of agricultural crops is limited. Solar farming, goat and cattle grazing are the current utilization of the property

Foote et al (1972) described the soil in this area as Lihue-Puhi association, deep, nearly level to steep, well drained soils with fine texture and moderately fine texture subsoil. Permeability is moderately rapid, run-off is slow and erosion hazard is slight. The mean annual rainfall throughout the study area is about 22 inches per year. Average temperatures in the region range from the 60s to the low 90s, Fahrenheit. Temperature differences between day and night are about 15 degrees. The consistent direction of the tradewinds is from the northeast at between 10 and 15 miles per hour.

HISTORICAL BACKGROUND

From Puna District to Kawaihau District

The *ahupua`a* of Kapa`a belongs in the ancient district of Puna, one of five ancient districts on Kaua`i (King 1935: 228). Puna was the second largest district on Kaua`i, behind Kona, and extended from Kipu, south of Lihue to Kama`oma`o`o, just north of Kealia. For taxation, educational and judicial reasons, new districts were created in the 1840s. The Puna District, with the same boundaries became the Lihu`e District, named for an important town in that district. In 1878, King Kalakau'a in securing a future name for the new *Hu`i* Kawaihau, created the new district of Kawaihau. This new district encompassed the *ahupua`a* ranging from Olohena on the south to Kilauea on the north. Subsequent alterations to district boundaries in the 1920s left Kawaihau with Olohena as its southernmost boundary and Moloa'a as its northernmost boundary (King 1935:222).

Traditional and Legendary Accounts of Kapa`a

A more in depth study of the legends and mythology of Kapa`a can be found in the Cultural Impact Assessment for the Proposed Kapa`a Highlands Phase II [EAL 2012]. Just a few of some of the legends of the area are included in this report.

Palila and Ka`ea

High in the *mauka* region of Kapa`a in the Makaleha mountains at a place called Ka`ea, is reported to be the supernatural banana grove of the Kaua`i kupua or demigod Palila, grandson of Hina (Handy and Handy 1972:424). In a 1913 edition of the newspaper Ka`oko`a Joseph Akina describes Pahla's banana grove:

> The stalk could hardly be surrounded by two men, and was about 35 feet high from the soil to the lowest petiole. The length of the cluster from stem to lowest end of the bunch of bananas was about 1 3/4 fathoms long (one anana and one muku). There were only two bananas on each about 4 inches around the middle. There were just two bananas, one on the east side and one on the west, each about a foot or more in length. The one on the east side was tartish, like a *waiawi* (Spanish guava) in taste and the one on the west was practically tasteless. The diameter of the end of the fruit stem of this banana seemed to be about 10 feet. This kind of banana plant and its fruit seemed almost supernatural... (Akina, 1913:5).

Ka Lulu o Mo`ikeha

Kapa`a was the home of the legendary Mo`ikeha. Born at Waipi`o on the island of Hawai`i, Mo`ikeha sailed to Kahiki (Tahiti), the home of his grandfather Maweke, after a disastrous flood. On his return to Hawai`i, he settled at Kapa`a, Kaua`i. Kila, Mo`ikeha's favorite of three sons by the Kaua`i chiefess Ho`oipoikamalani, was born at Kapa'a and was said

to be the handsomest man on the island. It was Kila who was sent by his father back to Kahiki to slay his old enemies and retrieve a foster son, the high chief La`amaikahiki (Handy and Handy 1972:424; Beckwith 1970:352-358; Kalakaua 1888:130-135; Fornander 1916, vol.4 pt.1:160). Mo`ikeha's love for Kapa`a is related in the *`olelo no`eau*: Ka lulu o Mo`ikeha i ka laula o Kapa`a. "The calm of Moikeha in the breadth of Kapa`a" (Pukui, 1983: 157).

"Lulu-o-Mo`ikeha" is described as being situated "near the landing and the school of Waimahanalua" (Akina, 1913: 5). The landing in Kapa`a was known as the Makee Landing and was probably constructed in the late 1870s, along with the Makee sugar mill. Today, in place of the old Makee Landing is part of a breakwater located on the north side of Mo`ikeha Canal near the present day Coral Reef Hotel, and approximately half-a-mile north of Waikaea Bridge.

Akina (1913) tells the story of how Mo`ikeha's son, Kila stocks the islands with the fish *akule*, *kawakawa* and *`opelu.* When Kila travels to Kahiki, he seeks out his grandfather Maweke and explains that he is the child of Mo`ikeha. When Maweke asks Kila if Mo`ikeha is enjoying himself, Kila answers with the following chant:

> My father enjoys the billowing clouds over Pohaku-pili,
>
> The sticky and delicious poi,
>
> With the fish brought from Puna,
>
> The broad-backed shrimp of Kapalua,
>
> The dark-backed shrimp of Pohakuhapai,
>
> The potent awa root of Maiaki`i,
>
> The breadfruit laid in the embers at Makialo,
>
> The large heavy taros of Keahapana
>
> The crooked surf of Makalwa too
>
> The bending hither and thither of the reed and rush blossoms,
>
> The swaying of the kalukalu grasses of Puna The large, plump, private parts of my mothers,
>
> Of Ho`oipoikamalanai and Hinau`u, The sun that rises and sets,
>
> He enjoys himself on Kaua`i,
>
> All of Kaua`i is Mo`ikeha's. (Akina, 1913: 6)

Maweke was delighted and when the boy is questioned as to his purpose, Kila tells his grandfather he is seeking fish for his family. Maweke tells Kila to lead the fish back to his homeland. This is how Kila led the *akule, kawakawa* and *opelu* to Hawai`i.

Paka`a and the wind gourd of La`amaomao (Keahiahi)

Kapa`a also figures prominently in the famous story of Paka`a, and the wind gourd of La`amaomao. Paka`a was the son of Kuanu`uanu, a high-ranking retainer of the Big Island ruling chief Keawenuie`umi (the son and heir to the legendary

Chief, Umi), and La`amaomao, the most beautiful girl of Kapa`a and member of a family of high status *kahuna.* Kuanu`uanu left the island of Hawai`i, traveled throughout the other islands and finally settled on Kaua`i, at Kapa`a. It was there that he met and married La`amaomao, although he never revealed his background or high rank to her until the day a messenger arrived, calling Kuanu`uanu back to the court of Keawenuia` umi.

Intent on seeking out his real father and making himself known to him, Paka`a prepared for the journey to the Big Island. His mother presented to him a tightly covered gourd containing the bones of her grandmother, also named La`amaomao, the goddess of the winds. With the gourd and chants taught to him by his mother, Paka`a could command the forces of all the winds in Hawai`i. While this story continues on at length about Paka`a and his exploits on the Big Island and later on Moloka`i, it will not be dwelt upon further here. It is important to note that several versions of this story do include the chants which give the traditional names of all of the winds at all the districts on all the islands, preserving them for this and future generations (Nakuina 1990; Rice 1923:69-89; Beckwith 1970:86-87; Thrum 1923:53-67; Fornander 1918-19 vol. 5 pt.1:78- 128).

Frederick Wichman (1998:84) writes that Paka`a grew up on a headland named Keahiahi. Here, Paka`a learned to catch *malolo*, his favorite fish. After studying the ocean and devising his plan to fabricate a sail, Paka`a wove a sail in the shape of a crab claw and tried it out on his uncle's canoe. One day, after going out to catch *malolo*, he challenged the other fishermen to race to shore. He convinced them to fill his canoe with fish suggesting it was the only way he could truly claim the prize if he won:

> The fishermen began paddling toward shore. They watched as Paka`a paddled farther out to sea and began to fumble with a pole that had a mat tied to it. It looked so funny that they began to laugh, and soon they lost the rhythm of their own paddling. Suddenly Paka`a's mast was up and the sail filled with wind. Paka`a turned toward shore and shot past the astonished fishermen, landing on the beach far ahead of them. That night, Paka`a, his mother, and his uncle had all the *ma`o`o* they could eat (Wichman 1998:85).

Kaweloleimakua

Kapa`a is also mentioned in traditions concerning Kawelo (Kaweloleimakua), Ka`ililauokekoa (Mo`ikeha's daughter, or granddaughter, dependent on differing versions of the tale), the mo 'o Kalamainu'u and the origins of the *hina`i hinalea* or the fish trap used to catch the hinalea fish, and the story of Lonoikamakahiki (Fornander 1917, vol.4 pt.2:318, vol.4 pt. 3:704- 705; Rice 1923:106-108; Thrum 1923:123-135; Kamakau 1976:80).

Kalukalu grass of Kapa`a

"Kiimoena kalukalu Kapa`a" or "Kapa`a is like the *kalukalu* mats" is a line from a chant recited by Lonoikamakahiki. Kalukalu is a sedge grass, apparently used for weaving mats (Fornander 1917, Vol. IV, Pt. 2, pp. 318-19). Pukui (1983: 187) associates the kalukalu with lovers in "ke kalukalu moe ipo o Kapa`a; the *kalukalu* of Kapa`a that sleeps with the lover". According to Wichman (1998:84), "a kalukalu mat was laid on the ground under a tree, covered with a thick pile of grass, and a second mat was thrown over that for a comfortable bed", thus the association with lovers. Kaua`i was famous for this peculiar grass, and it probably grew around the marshlands of Kapa`a. It is thought to be extinct now, but an old-time resident of the area recalled that it had edible roots, "somewhat like peanuts." Perhaps it was a famine food source (Kapa`a Elementary School 1933:VI).

Heiau of Kapa`a

During their expeditions around Hawai`i in the 1880's, collecting stories from *ka po`e kahiko,* Lahainaluna students stopped in Kapa`a and Kealia and gathered information regarding *heiau* of the region. Altogether, fourteen *heiau* were named in Kapa`a and Kealia, suggesting the two *ahupua`a* were probably more politically significant in ancient times. Table 1 lists the names of the ten *heiau* identified in the *ahupua`a* of Kapa`a, their location if known, their type, and associated chief and priest.

Table 1. *Heiau* of Kapa‘a

Name	Location	Type	Associated
Mailehuna	Kapa‘a (Mailehuna is the area of the present day Kapa`a School)	Unknown	Kiha, Kaumuali‘i/ Lukahakona
Pueo	Kapa‘a	Unknown	Kiha, Kaumuali‘i/
Pahua	Kapa‘a/Kealia	Unknown	Kiha/ Lukahakona
Kumalae	Kapa‘a/Kealia	Unknown	Kiha/ Lukahakona
Waiehumalama	Kapa‘a/Keilia	Unknown	Kiha/ Lukahakona
Napu‘upa‘akai	Kapa‘a/Kealia	Unknown	Kiha/ Lukahakona
Noeamakali`i	Kapa‘a/Kedlia	Heiau for birth of Kaua`ii Chiefs, like Holoholoku	Unknown
Pu'ukoa	Kapa‘a/Kealia	Unu type heiau	Unknown
Piouka	Kapa‘a/Kealia	Unu type heiau	Unknown
Una	Kapa‘a/Kealia	Unknown	Kiha/ Lukahakona
Mano	Kapa‘a/Kealia	Unknown	Kiha/ Lukahakona
Kuahiahi	Kapa‘a (govmt) school stands on site now)	Unknown	Kaumuali‘i/ Lukahakona
Makanalimu	Upland of Kawaihau	Unknown	Kaumuali‘i
Kaluluomoikeha	Kapa‘a	Unknown	Moikeha

The exact locations of these *heiau* are unknown. The locations of two of the *heiau* correlate with the locations of *wahi pana* which are known to be close to Kuahiahi and Kaluluomo'ikceha. Kuahiahi (also spelled Kaahiahi and Keahiahi) is the rocky headland at the north end of Kapa'a where the first Kapa`a School was once located. Kaluluomo`ikeha is thought to be the general area near the Mo`ikeha Canal and the present day Coral Reef Hotel.

The Mahele: Kapa'a Land Commission Awards

The Organic Acts of 1845 and 1846 initiated the process of the *Mahele*, the division of Hawaiian lands, which introduced private property into Hawaiian society. In 1848 the crown and the *ali`i* received their lands. The common people received their *kuleana* in 1850. It is through records for Land Commission Awards (LCAs) generated during the Mahele that specific documentation of traditional life in Kapa`a Ahupua`a comes to light. During the *Mahele*, Kapa'a was taken as Crown Lands (Office of the Commissioner of Public Lands of the Territory of Hawaii, 1929). The i1i of *Paikahawai* and *Ulakiu* in Kapa`a *Ahupua`a* were retained as Government Lands.

Table 2. Mahele Land Claims in Kapa`a Ahupua`a

LCA Number	Ahupua'a	Claimant	´Ili of the Ahupua'a	Village/Farm	Land Use	Number of Āpana
3971	Kapa`a	Honolii,	Kapana	Kupanihi Village	6 *lo'i* (uncult), house lot	2 (2 acres, 1 rood, 1 rod)
3554	Kapa`a	Keo	Kahanui	Puhi Village	15 *lo'i*, house lot	2 (7 acres, 1 rood, 17 rods)
3638	Kapa`a	Huluili	Maeleele	Kaloko Village	12-15 *lo'i*, house lot	2 (5 acres, 1 rood, 19 rods)
8247	Kapa`a	Ehu	Moalepe/Noalepe		20 *lo'i*,	1 (3 rods)
8837	Kapa`a	Kamapaa	Ulukiu lalo Awawaloa Ulukiu		3 *lo'i*, 2 *lo'i*, house lot	1 (2 acres, 2 rods, 27 rods)
8843	Kapa`a	Kiau	Apopo	Kalolo Village	6 (5) *lo'i* and *kula*, house lot	2 (2.75 acres 3 rods)
10564	Kapa`a	Oleloa Daniel		Hikinui Farm	Fishpond, 10 *lo'i*	

The land claims during this period show that only five individuals were awarded land parcels in the relatively large *ahupua`a* of Kapa`a. The five awardees were Kiau (#08843), Kamapaa (#08837), Mane Honolii (#03971) Hulili (#03638) and Ehu (#08247). All four had lo`i or irrigated *kalo* fields on the *mauka* side of the lowland swampy area, sometimes extending a short distance up into small, shallow gulches and valleys. Many of these *lo`i* parcels name *pali* or hills/cliffs as boundaries. Each LCA also had a separate house lot located on the *makai* side of the swamp, near the beach. Three of the land claims name ponds on their lands, including Puhi Pond (LCA #03554), and fishponds in Kupanihi 'Ili (LCA #03971) and Hahanui 'Ili (LCA #10564). *Loko* Kihapai may be the same as the fishpond in the same land claim. The other two *loko* are associated with house lots, situated on the *makai* edge of the Kapa'a swamplands suggesting modification of the natural swamplands.

Other natural and cultural resources mentioned in the LCAs include freshwater springs, pig pens, *hau* bushes, *hala* clumps, streams, `*auwai*, and *kula* or pasturelands.

Interestingly, the residential "village" of Kapa'a did not exist as a single entity, but was likely a series of small settlements or compounds, perhaps even individual house lots which stretched along the shoreline of the *ahupua`a* and included (south to north) Kupanihi (Makahaikupanihi), Kalolo (Kaulolo), Puhi, and Uluki.

The fifth individual, Ehu (LCA #08247), was the only person to be awarded a single parcel in the upland area of Kapa`a, Moalepe Valley, approximately five miles one mile southwest of the project area. In 1848, when Ehu made his claim, he was the only one living there. A few years later, according to Honolii's testimony to support Ehu's claim, "There are no houses and no people now living on the land. Ehu found himself lonely there, all his neighbors having either died or left the land. Ehu now lives in Wailua." Evidently Ehu may have been the last person to live at and cultivate in the traditional way, the far *mauka* region of Kapa`a (Van Ryzin and Hammat 2004).

Early Historic Accounts of Kapaa (1830s-1900s)

Although most of the historic record documents for Kaua`i in this period revolve around missionary activities and the missions themselves, there was indication that the Kapaa area was being considered for new sugar cane experiments, similar to those occurring in Kōloa In 1835 Ladd and Company received a 50 year lease on land in Kōloa from Kamehameha III and Kaua`i Governor Kaikio`ewa of Kaua`i. The terms of the lease allowed the new sugar company "the right of someone other than a chief to control land" and had profound effects on "traditional notions of land tenure dominated by the chiefly hierarchy" (Donohugh, 2001: 88). In 1837, a very similar lease with similar terms was granted to Wilama Ferani, a merchant and U.S. citizen based in Honolulu (Hawai`i State Archives, Interior Dept., Letters, Aug. 1837). The lease was granted by Kauikeaouli for the lands of Kapaa, Kealia and Waipouli for twenty years for the following purpose:

> ...for the cultivation of sugar cane and anything else that may grow on said land, with all of the right for some place to graze animals, and the forest land above to the top of the mountains and the people who are living on said lands, it is to them whether they stay or not, and if they stay, it shall be as follows: They may cultivate the land according to the instructions of Wilama Ferani and his heirs and those he may designate under him... (Hawai`i State Archives, Interior Dept. Letters, Aug. 1837).

Unlike Ladd & Company which eventually became the Kōloa Sugar Company, there is no further reference to Wilama Ferani and his lease for lands in Kapaa, Kealia and Waipouli. In a brief search for information on Honolulu merchant, Wilama Ferani, nothing was found. It is thought that perhaps Wilama Ferani may be another name for William French, a well-known Honolulu merchant who is documented as having experimented with grinding sugar cane in Waimea, Kaua`i at about the same time the 1837 lease for lands in Kapaa, Kealia and Waipouli was signed (Joesting 1984: 152).

In 1849, son of Wai`oli missionary, William P. Alexander, recorded a trip he took around Kaua`i. Although, he focuses on the larger mission settlements like Kōloa and Hanalei, he does mention Kapa`a.

> A few miles from Wailua, near Kapaa we passed the wreck of a schooner on the beach, which once belonged to Capt. Bernard. It was driven in a gale over the reef, and up on the beach, where it now lies. A few miles further we arrived at Kealia. We had some difficulty crossing the river at this place, owing to the restiveness of our horses. The country here near the shore was rather uninviting, except the valley which always contained streams of water (Alexander 1991: 123).

In later years, the notorious Kapaa reef was to become the location of many shipwrecks once a landing was built there in the 1880s.

The first large scale agricultural enterprise was begun in Kapaa in 1877 by the Makee Sugar Plantation and the *Hui* Kawaihau (Dole 1916: 8). Originally a choral society begun in Honolulu its membership consisted of many prominent names, both Hawaiian and *haole*. It was Kalakau'a's thought that the *Hui* members could join forces with Makee, who had previous sugar plantation experience on Maui, to establish a successful sugar corporation on the east side of Kaua`i. Captain Makee was given land in Kapaa to build a mill and he agreed to grind cane grown by *Hui* members. Kalakau'a declared the land between Wailua and Moloaa, the Kawaihau District, a fifth district and for four years the *Hui* attempted to grow sugar cane at Kapahi, on the plateau lands above Kapaa town. After a fire destroyed almost half of the *Hui*'s second crop and after the untimely death of one of their principal advocates, Captain James Makee, the *Hui* began to disperse and property and leasehold rights passed on to Makee's son-in-law and new Makee Plantation owner, Colonel Z.S. Spalding (Dole 1916: 14).

As part of the infrastructure of the new plantation, a sugar mill was erected and the Makee Landing was built in Kapaa during the early years of operation of the Makee Sugar Plantation. Following Captain Makee's death, Colonel Spalding took control of the plantation and in 1885 moved the mill to Kealia (Cook 1999: 51). The deteriorating stone smokestack and landing were still there well into the 1900s (Damon 1931:359). Conde´ and Best (1973:180) suggest that railroad construction for the Makee Plantation began just prior to the mid-1890s. There is one reference to a railroad line leading from the Kapaa landing to Kealia in 1891. During Queen Lili`uokalani's visit to Kaua`i in the summer of 1891, the royal party was treated to music by a band, probably shipped in from O`ahu. "The band came by ship to Kapaa and then by train to Kealia" (Joesting 1984:252). This railroad line is depicted on a 1910 USGS map which shows the line heading south from Kealia Mill and splitting near the present Coral Reef Hotel, another line going to the old Kapaa Landing (Makee Landing) and another line heading *mauka*, crossing the present Moikeha Canal, traveling southwest up Lehua Street and through what is now goat pasture, along a plateau and into the *mauka* area behind Kapaa swamplands. This railroad line was part of a twenty mile network of plantation railroad with some portable track and included a portion of Kealia Valley and in the *mauka* regions of the plateau lands north of Kealia (Conde´ and Best 1973:180).

By the late 1800s hundreds of Portuguese and Japanese immigrants found work on Makee Plantation and the new influx of immigrants required more infrastructure (Cook 1999:51). In 1883, a lease for a school lot was signed between Makee Sugar Company and the Board of Education (Kapaa School 1983: 9). Stipulations in the Portuguese immigrant contracts with Makee Sugar Company stated that "children shall be properly instructed in the public schools" (Garden Island April 1, 1983). The original Kapaa School was constructed in 1883 on a rocky point adjacent to the Makee Sugar Company railroad. Traditionally, this point was known as Kaahiahi (Kapaa School 1983: 10). In 1908, Kapaa School was moved to its present site directly *mauka* and up the hill at Mailehune.

Narrow wagon roads gave way to macadamized roads in the early part of the 20th century. One of these new roads was called the Kaua`i Belt Road and parts of it are thought to have followed along the "Old Government Road" (Cook, 1999). In Kapaa, the present day Kuhio Highway likely follows the same route as the original Government Road and subsequent Kaua`i Belt Road. In fact, the locations of the *kuleana* awards in Kapaa indicate that the majority of the house lots were situated along the Government Road. LCA 3243 names a "road" as one of its boundaries.

In the latter half of the 1800s, following Makee's death, Chinese rice farmers began cultivating the lowlands of Kapaa with increasing success. Several Hawaiian *kuleana* owners leased or sold their parcels *mauka* of the swamp land to Chinese rice cultivators. Other Chinese rice cultivators appealed to the government for swamplands, first leasing and later buying the land. The economic activity displaced the house lot *kuleana* on the *maka*i side of the marsh for increasing commercial and residential development (Lai 1985:148-161).

20th Century History of Kapa`a (1900 - Present)

In the early 1900s, to help with the burgeoning plantation population, government lands were auctioned off as town lots in Kapaa. One *kama`aina* mentioned that in the 1930s and 1940s, the area north of Moikeha Canal in Kapaa was mostly settled by Portuguese families (Bushnell et al 2002). The Japanese were also very prominent in the 1920s and 1930s largely replacing the Chinese merchants in the Kapaa business sector (Bushnell et al. 2002). Starting in 1926, the territorial Board of Health ran a dispensary in Kapaa, which was located at the *makai* edge of Niu Street, near the extant Kapaa Beach Park parking lot and bike path. The location of the former dispensary currently is a vacant lot. Elsewhere in the vicinity, a fire station occupies the location of the former Coral Reef Hotel, and a courthouse and a jail once stood where the present Kapaa Neighborhood Center is located. It is not known when these structures were abandoned or removed.

In 1913, Hawaiian Canneries opened in Kapaa at the site now occupied by Pono Kai Resort (Cook, 1999: 56). Through the Hawaiian Organic Act, Hawaiian Canneries Company, Ltd. purchased land they were leasing, approximately 8.75 acres, in 1923 (Bureau of Land Conveyances, Grant 8248). A 1923 sketch of the cannery shows only four structures, one very large structure assumed to be the actual cannery and three small structures *makai* of the cannery. By 1956, the cannery was producing 1.5 million cases of pineapple. By 1960, 3400 acres were in pineapple and there were 250 full time employees and 1000 seasonal employees (Honolulu Advertiser, March 20, 1960). In 1962, Hawaiian Canneries went out of business due to competition from third world countries.

The Ahukini Terminal & Railway Company was formed in 1920 to establish a railroad to connect Anahola, Kealia, Kapaa to Ahukini Landing and "provide relatively cheap freight rates for the carriage of plantation sugar to a terminal outlet" (Conde´ and Best, 1973: 185). This company was responsible for extending the railroad line from the Makee Landing, which was no longer in use, to Ahukini Landing, and for constructing the original Waikaea Railroad Bridge and the Moikeha Makai Railroad Bridge.

In 1934, the Lihue Plantation Company absorbed the Ahukini Terminal & Railway Company and Makee Sugar Company (Conde´ and Best, 1973: 167). The railway and rolling stock owned by Makee Sugar Company became the Makee Division of the Lihue Plantation. At this time, besides hauling sugar cane, the railroad was used to haul plantation freight including "fertilizer, etc... canned pineapple from Hawaiian Canneries to Ahukini and Nawiliwili, pineapple refuse from Hawaiian Canneries to a dump near Anahola and fuel oil from Ahukini to Hawaiian Canneries Co., Ltd." (Hawaiian Territorial Planning Board, 1940: 11). Former plantation workers and *kama`aina* growing up in Kapaa remember when the cannery would send their waste to the pineapple dump, a concrete pier just north of Kumukumu Stream (State Site No. 50- 30-08-789) by railroad. The structure is built over the water where the rail cars would dump the pineapple waste. The current would carry the waste to Kapaa which would attract fish and sharks (Bushnell et al. 2002).

Lihue Plantation was the last plantation in Hawaii to convert from railroad transport to trucking (Conde´ and Best, 1973: 167). "By 1957 the company salvaged a part of their plantation railroad, which was being supplanted by roads laid out for on or close to the old rail bed" (Ibid: 167). By 1959, the plantation had completely converted over to trucking. The Cane Haul Road which begins near the intersection of Haua`ala Road and Kuhio Highway is thought to date to the late 1950s and follows the alignment of the old railroad until just before or near `Alibi Point.

Severe floods in Kapaa in 1940 led to the dredging and construction of the Waikaea and Mokeha Canals sometime during that decade. (Hawaii Territorial Planning Board, 1940: 7). Although the Waikaea Canal, bordering the Kapaa Pineapple Cannery, had been proposed as early as 1923, nothing was constructed until after the floods (Bureau of Land Conveyances, Grant 8248). A Master Plan for Kapaa, published in 1940, asks the Territorial Legislature for funds to be set aside for the completion of a drainage canal and for filling *makai* and *mauka* of the canal (Hawaii Territorial Planning Board, 1940:7). In 1955, the local newspaper reported the dredging of coral from the reef fronting Kapaa Beach Park for the building of plantation roads (Garden Island Newspaper, September 21, 1955). This dredging was later blamed for accelerated erosion along Kapaa Beach (Garden Island Newspaper, October 30, 1963). Today, there are several sea walls along the Kapaa Beach Park to check erosion. Old time residents claim the sandy beach in Kapaa was once much more extensive than it is now (Bushnell et al. 2002).

In the 1930s after the incorporation of Makee Sugar Company into Lihue Plantation, Kealia Town was slowly abandoned. Many of the plantation workers bought property of their own and moved out of the plantation camps. The camps which bordered Kuhio Highway were disbanded in the 1980s. In the last part of the 20th century the Lihue Plantation began to phase out and Kapaa Town suffered after the closing of the Kapaa Cannery; however the growing tourist industry helped to ease the economic effects of the Cannery's closing.

PREVIOUS ARCHAEOLOGICAL RESEARCH

Archaeological Studies and Sites in Kapa`a *Ahupua`a*

The following table outlines the archaeological research (Table 3) and historic properties (Table 4) identified in Kapa`a *Ahupua`a*. These tables are followed by discussion of the research and historic properties. Table 3 provides a list of archaeological research conducted within Kapa`a *Ahupua`a*, including columns for source, location, nature of study, and findings. The locations of these archaeological studies are shown in Figure 4. Table 4 is a list of known historic properties within the *ahupua`a* and includes columns for state site numbers, site type, location and reference. The locations of identified sites within Kapa`a *Ahupua`a* are shown in Figure 5. All site numbers are numbered 50-30-08-SHIP site number. Here only the SHIP sit number designation will be used

Table 3. Previous Archaeological Studies in coastal Kapa`a.

EXPLORATION ASSOCIATES LTD

Source	Location	Nature of Study	Findings
Bennett 1931	Island wide: identifies 2 sites: Site 110 Taro terraces and bowl and Site 111 A large simple dirt Hawaiian ditch	Archaeological Reconnaissance	Identifies 2 sites: Site 110 Taro terraces and bowl and Site 111 A large simple dirt Hawaiian ditch
Handy and Handy 1972	Archipelago-wide	Native Planter study	Discusses "highly developed irrigation system"
Ching 1976	Just south of the Waikaea Drainage Canal	Archaeological Reconnaissance	No significant findings
Hammatt 1981	Upland Kapaa	Archaeological Reconnaissance	No significant findings
Hammatt 1986	Upper reaches of the Makaleha stream valley.	Archaeological Reconnaissance	No significant findings
Hammatt 1991	Along Kuhio Highway	Subsurface Testing	Identifies two sub-surface cultural layer sites
Kikuchi and Remoaldo 1992	Around Kapaa Town	Cemeteries of Kauai	Identifies six cemeteries
Spear 1992	South side Waikaea Canal, *mauka* of Kuhio Highway. (TMK: 4-5-05:04, 09)	Monitoring Report	Designated subsurface Site 547

Source	Location	Nature of Study	Findings
Chaffee, Burgett & Spear 1994a	A house lot near the corner of Kukui and Ulu Streets in *mauka* Kapaa Town. [TMK: 4-5-09:10]	Archaeological Inventory Survey	No significant findings
Chaffee, Burgett & Spear 1994b	Mamane Street Kapaa Town. [TMK: 4-5-09:51]	Archaeological Inventory Survey	No significant findings
Hammatt, Ida & Chiogioji 1994	Proposed bypass routes *mauka* of Kapaa Town	Archaeological Assessment	No new field work, literature review only
Hammatt, Ida & Folk 1994	South side Waikaea Canal, *mauka* of Kuhio Highway [TMK: 4-5-05:06]	Archaeological Inventory Survey	Weak cultural layer designated Site 748
Kawachi 1994	Inia Street (Jasper) [TMK 4-5-08:33]	Burial Report	Designated Site 871
McMahon 1994	"behind the armory in Kapa`a near the god stones" The location is uncertain, and at "Buzz's near the Coconut Marketplace"	Documents a report of two burials	16 sets of human remains. Site numbers unknown
Creed, Hammatt, Ida, Masterson & Winieski 1995	Kapa`a Sewer line project, Kuhio Highway, south and central Kapaa Town	Archaeological Monitoring Report	Documents cultural layer of Site - 1848 and (an enlarged) Site - 1849 & recovery of thirty burials at Sites —867, -868, -871, and - 1894
Jourdane 1995	1382-A Inia Street, *makai* of Kuhio Highway, central Kapaa Town	Burial Report	Site 626
McMahon 1996	South side Waikaea Canal, *mauka* of Kuhio Highway [TMK: 4-5-05:08]	Archaeological Inventory Survey	No significant cultural material
Hammatt, Chiogioji, Ida & Creed 1997	Test excavations focused inland of Kapaa Town	Archaeological Inventory Survey	Four test trenches were excavated inland of Kapaa Town
Borthwick and Hammatt 1999	Kapaa Seventh-Day Adventist Church at 1132 Kuhio Highway	Archaeological Monitoring and Burial Treatment Plan	Monitoring was indicated as this parcel lay within designated Site 1848.

Figure 6. Map showing previous archaeological studies in Kapa'a.

Table 4. Historic Properties in Kapa`a **Ahupua'a**

Site #	Ahupua'a	Site Type/ Name (if any)	Location	Site Constraints	Reference
B001	Kapa'a	Historic Cemetery	South of bend of Kapa`a Stream, a kilometer *mauka* from Kuhio Hwy	Appears to be a discrete historic cemetery	Kikuchi and Remoaldo 1992
B002	Kapa'a	Historic Cemetery	Just *mauka* from Kuhio Highway, south of Kapa`a Stream	Appears to be a discrete historic cemetery	Kikuchi and Remoaldo 1992
B003	Kapa'a	Kapa'a Public Cemetery	South of Kanaele Road, one kilometer inland of Kuhio Highway	Appears to be a discrete historic cemetery	Kikuchi and Remoaldo 1992
B004	Kapa'a	Historic Cemetery	North of Apopo Road, one kilometer inland of Kuhio Highway	Appears to be a discrete historic cemetery	Kikuchi and Remoaldo 1992
B013	Kapa'a	Historic Cemetery	Just *mauka* from Kuhio Highway, north of the Waikaea Canal	Appears to be a discrete historic cemetery	Kikuchi and Remoaldo 1992
B014	Kapa'a	All Saints Episcopal Church Cemetery	Just *mauka* from Kuhio Highway, south of the Waikaea Canal	Appears to be a discrete historic cemetery	Kikuchi and Remoaldo. 1992:62-65
547	Kapa'a	Sub-surface features including a firepit and a possible house foundation	South of bend of Waikaea Canal, *mauka* of Kuhio Highway	Archaeological monitoring in the vicinity recommended	Spear 1992:3
626	Kapa'a	Burial	Inia Street, *makai* of Kuhio Highway,	Consultation and monitoring in vicinity indicated	Jourdane 1995
748	Kapa'a	Minimal findings, a weak cultural layer (buried A-horizon)	South of the bend of the Waikaea Canal, *mauka* of Kuhio Highway	Considered no longer significant within project area	Hammatt et al. 1994
789	Kapa'a/Kealia	Historic Road	Coastal Cane Haul Road near Kawaihau Road turn off	Unknown	Perzinski et. al. 2000

Site # 50-30-08-	Ahupua'a	Site Type/ Name (if any)	Location	Site Constraints	Reference
867	Kapa`a	1 set of human remains	Kukui Street, just *mauka* of Kuhio Highway, Kapa`a Town	Consultation and monitoring in vicinity indicated	Creed et al. 1995:50
868	Kapa`a	1 set of human remains	Lehua Street *mauka* of Kuhio Highway, Kapa`a Town	Consultation and monitoring in vicinity indicated	Creed et al. 1995:50
871	Kapa`a	13 sets of human remains (Creed et al. 1995:50)	Inia Street, *makai* of hio Highway	Consultation and monitoring in vicinity indicated	Kawachi 1994; Creed et al. 1995:50
1848	Kapa`a	Cultural layer and sub-surface features	Along Kuhio Highway between Wana Road and the Waikaea Drainage Canal	Archaeological monitoring in the vicinity recommended	Hammatt 1991; Creed et al. 1995
1849	Kapa`a	Cultural layer and sub-surface features; Creed et al. 1995:53 expands boundaries to incl. burial sites 626, -867, -868 - 871, and -1894	Along Kuhio Highway between Inia Street and Kauwila Street extending to the coast	Consultation and monitoring in vicinity indicated	Hammatt 1991; Creed et al. 1995
1894	Kapa`a	11 sets of human remains	Ulu Street, just north of Kuhiö Highway, Kapaa Town	Consultation and monitoring in vicinity indicated	Creed et al. 1995:50
2075	Kapa`a/Kealia	Highway Bridge Foundation (old Kaua'i Belt Road)	Kuhio Highway at Kapa`a/ Kealia River	Unknown	Bushnell et al. 2002:55
2076	Kapa`a	Petroglyph	Rocky coast below former cane haul road (Site -789)	Preservation	Bushnell et al. 2002:55
2077	Kapa`a	Concrete steps (related to historic beach pavilion)	Near present Kapaa Beach Park Pavilion	Unknown	Bushnell et al. 2002:55

Site #	Ahupua'a	Site Type/ Name (if any)	Location	Site Constraints	Reference
2078	Kapa'a	Historic Railway Alignment (2 Railroad Bridges, & RR Culvert Foundation)	Both railroad bridges span the Moikeha Canal; the RR culvert foundation is located north of the Kapaa Swimming Pool.	Unknown	Bushnell et al. 2002:55

Figure 7. Map showing previously documented archaeological sites in Kapa`a

The majority of study areas are located within urban Kapa'a along the shoreline and away from the mountain areas.

Pattern of Archaeological Sites in Kapa`a

The pattern of archaeological studies in Kapa`a *Ahupua`a* is somewhat skewed with a dozen projects in urban Kapaa Town and very little work along the coast (Figure 4). Major archaeological sites have been found in area include extensive cultural layers with burials and other cultural features underlying Kuhio Highway near All Saints Gym, and near the older part of Kapaa Town between Waikaea Canal and Kapaa Beach Park, *makai* of Kuhio Highway (Hammatt 1991; Kawachi 1994; Creed et al. 1995; Jourdane 1995; Callis 2000). The *mauka-makai* extent of these

cultural layers has not been clearly defined. The five *kuleana* awarded during the *Mahele* are located adjacent to the present coastal highway. The areas directly *mauka* of Kapaa Town are marshy though much of it has been filled in recent decades for the ByPass Road and shopping centers and housing. These cultural deposits associated with pre-historic and early historic habitation are known to exist in a relatively narrow sand berm that makes up the physiogeography of Kapa`a. The more *mauka* studies but still lower coastal areas, suggest they are located towards the *mauka* fringe of the sand berm, approaching more marshy conditions and have generally reported no significant or minimal findings (Spear 1992; Chaffee et al. 1994a & 1994b; Hammatt et al. 1994, 1997; McMahon 1996). Less than 1.5 km to the south of Waikaea Canal at the southern boundary of Waipouli adjacent to Uhalekawa`a Stream (Waipouli Stream) and the ocean is another extensive subsurface cultural deposit which is associated with a pre-contact fishing encampment located (Hammatt et al. 2000).

Anticipated sites based on historic and archaeological studies in *mauka* Kapa`a are the remains of cane cultivation infrastructure such as ditches and pre-contact too historic period Native Hawaiian terracing for *lo`i* cultivation with nearby habitation sites in the gulches, however the gulches lay outside the current project area.

RESULTS OF FIELD WORK

Pedestrian Survey

On January 3 and April 25, 2012 Exploration Associates Ltd. archaeologist Nancy McMahon, M.A. made field inspections on proposed Kapa`a Highlands project area. Access was made via Olohena Road (two gates). North-south oriented transects were utilized to 100% survey the project area. Because of known historic cane cultivation in this area of Kapa`a, predicted sites might be historic plantation related infrastructure such as ditches, flumes, roads, temporary cane-haul railroad berms and reservoirs. None were observed during the survey. The shallow ravine the project area were surveyed and tested, however no pre-Contact or historic era terraces or habitation sites were revealed. The parcel contains no surface archaeological sites. The access road is related to access for construction of the buildings already present on the Phase I parcel.

Subsurface Testing

On November 11, 2012, three trenches were excavated with a backhoe with a 24 in. width bucket (Figure). Trench 1 was excavated to a depth of 183 cm with a length of 10 meters. Trench 2 was excavated to a depth of 160 cm and a length of 3 m. Trench 3 was excavated to a depth of 260 cm and a length of 2.5 m. Each evinced the same soil composition. A description of the soils representing all three trenches is presented here.

A representative profile description evinced the same stratigraphy consisting in all three trenches, consisting of three soil layers with only a single clear boundary delineating the topsoil from the underlying soils. Soil differences could only be determined utilizing the Munsell Color Chart. The topsoil in each trench 5 YR 4/3 *reddish brown organic*. The other two layers are classified as 5 YR 5/6 *yellowish red* [20 cmbs] and 5 YR 4/6 *yellowish red* [20cmbs to base of excavation]. Characteristics are dry to very dry, crumbly, medium firm, clayey silt. It is pretty much cultivated soils. A local informant, Mr. Vasquez, who worked for the Lihue plantation most of his life Informant stated the plantation chain and ball dragged this land several time over.

A geologic survey was undertaken on the adjacent Phase I parcel prior to the construction of a solar farm. Soils extracted and examined in test trenches revealed only agricultural soils. No buried cultural layers or plantation infrastructure was present.

Figure 8. Trench locations, facing northeast.

Figure 9. Profile Test Trench 2 on the left and Trench 3 right.

Figure 10. Entrance off Olohena Road looking makai in the distance the Solar Farm part of Phase I

Figure 11. Access Road to Solar Farm with Cattle Grazing in the Distance.

Figure 12. Lower Elevation Outside Project Area from the access road.

Figure 13. View Across the Project Area, Facing Makai and Northeast.

Figure 14. The Roof of Kapaa Middle School on State land

RECOMMENDATIONS

As no archaeological sites are present, there are no historic preservation concerns for this project. We recommend no further historic preservation work. Though highly unlikely, if any human remains or other significant subsurface deposits are encountered during the course of development activities all work in the immediate area should stop and the State Historic Preservation Division promptly notified.

REFERENCES

Akina, Joseph

1913 *"I Ke hou i Ka Lulu-o-Moikeha i ka laula o Kapa `a", Kuokoa.* May 2-9, 1913. Bishop Museum Archives HEN Place Names, Kaua`i.

Alexander, William Patterson

1991 "A Tour of Kaua`i in 1849: Private Journal of William DeWitt Alexander," *The Kaua`i Papers,* Kauai Historical Society, A Kauai Historical Society Publication, Lihue, Kaua`i, HI.

Beckwith, Martha

1970 Hawaiian Mythology, University Press of Hawai`i, Honolulu.

Bennett, Wendell C.

1931 The Archaeology of Kaua' i, Bishop Museum Bulletin 80, Honolulu, HI. Bishop Museum Archives HEN I: 214 "Heiaus of Kealia and Kapa`a" and "Well Known Things [or Places]".
HEN I: 215 "Famous Things mentioned by Two Men".
HEN I: 216 "Heiaus from Kapa`a to Kealia" and "Things for which Kapa'a was Known".

Bushnell, K.W., Melanie Mann, Douglas Borthwick, Tony Bush, Todd Tulchin, David Shideler and Hallett H. Hammatt

2002 Archaeological Inventory Survey for the Proposed Kapa`a/Kealia Bike and Pedestrian Path, Kapa`a and Kealia, Kawaihau Districts, Kaua`i Island, Hawaii (TMK 4-5, 4-6-14, 4-7-03 & 04). Cultural Surveys Hawai`i, Inc. Kailua, HI.

Calis, Irene

2000 *End of Field Work Report: Human Burial Removal and Archaeological Monitoring, Kapa`a Beach Park Public Bathroom Installation, Kapa`a, Kaua`i* Scientific Consultant Services

Chafee, David B., Berdena Burgett and Robert L. Spear

1994a An Inventory Survey of a Kukui Street Houselot, Kapa`a Ahupua'a, Kawaihau District, Puna, Island of Kaua`i (TMK: 4-5-09:10), SCS Inc., Kaneohe, HI.

1994b An Inventory Survey of a Mamane Street Houselot, Kapa`a Ahupua'a, Kawaihau District, Puna, Island of Kaua``i (TMK: 4-5-09:51), SCS Inc., Kaneohe, HI.

Ching, Francis K. W.

1968 Archaeological Surface Survey; Wailua State Park, Kaua`i, State of Hawaii, Dept. of Land and Natural Resources, Honolulu, HI.

1976 Letter Report: Archaeological Reconnaissance Report, Kapa`a "Wastewater Treatment and Disposal System, ARCH 14-96, Letter to R. M Towill Corporation, ARCH, Lawai, Kaua`i, HI.

Conde, Jesse C. and Gerald M. Best

1973 Sugar Trains, Narrow Gauge Rails of Hawaii, Glenwood Publishers, Felton, CA.

Cook, Chris

1999 "Kaua`i, the Garden Island: A Pictorial History of the Commerce and Work of the People", Donning Co., Virginia Beach, VA.

Creed, Victoria, Hallett H. Hammatt, Gerald K. Ida, Ian Masterson and John Winieski

1995 A Summary of the Archaeological Monitoring for the Kapa`a Sewerline Project Waipouli and Kapa`a Ahupua`a, Puna District, Kaua`i (TMK: (4)-3-09 and 4-5-03 to 11), Cultural Surveys Hawai`i, Kailua, HI.

Damon, Ethel M.

1934 The Heiau at Wailua, The Kauai Historical Society by the Garden Island Press, Lihue, Kaua`i, HI.

1931 Koamalu, two vols. privately printed by the Honolulu Star-Bulletin Press, Honolulu, HI.

Dega, Michael F. and James Powell

2003 Archaeological Monitoring During Phase I of the Kaua`i Rural Fiber Optic Duct Lines Project, Kaua`i Island, Hawaii. Scientific Consultant Services.

Dole, Charles S.

1916 "The Hui Kawaihau" pp.8-15. A Paper read at the November meeting of the Kauai Historical Society on November 16, 1916. In Lihue, Kaua`i.

Donohugh, Donald

2001 The Story of Kōloa, A Kaua`i Plantation Town, Mutual Publishing, Honolulu, HI.

Foote, Donald E. E. L. Hill, S. Nakamura and F. Stevens

1972 Soil Survey of the Islands of Kauai, 0ahu, Maui, Molokai and Lanai, State of Hawaii U.S. Department of Agriculture. U.S. Government Printing Office, Washington D.C.

Fomander, Abraham

1916-19 Fomander Collection of Hawaiian Antiquities and Folk-Lore, with translations edited and illustrated with notes by Thomas G. Thrum, Volume 4, First series, 1916 - 1917 notes by Thomas G. Thrum, Memoirs of the Bernice P. Bishop Museum, Vols. 4, 5, 6, Honolulu, HI.

Garden Island Newspaper

1955 "Geologists Says Kapa'a Coral Removal No Threat to Town". September 21, 1955.

1963 "Kapa'a Blames Federal Role As Erosion Continues. Says Barrier on Reef is Required". October 30, 1963.

1983 "Centennial Year, Kapa'a School Wants Pix of its 100 Years". April 1, 1983.

Giambelluca, Thomas W., Michael A. Nullet and Thomas A. Schroeder
1986 Rainfall Atlas of Hawai`i, Department of Land and Natural Resources, Honolulu, HI.

Hammatt, Hallett H.

1981 Archaeological Reconnaissance of 52.56 Acres for a Proposed subdivision, TMK: (4)-6-13-1, Kapa`a, Puna, Kaua`i Island, ARCH Report 14-236, Prepared for Waialeale Partners.

1986 Archaeological Reconnaissance of the Makaleha Springs Water Source Development, Kapa`a, Kaua`i TMK: (4)-6-01:1, Cultural Surveys Hawai`i, Kailua, HI.

1991 Archaeological Subsurface Testing for the Proposed Kapa'a Sewer line, Wailua, Olohena, Waipouli and Kapa`a, Kaua`i, Cultural Surveys Hawai`i, Kailua, HI.

Hammatt, Hallett H., Rodney Chiogioji, Gerald K. Ida and Victoria S. Creed
1996 An Archaeological Inventory Survey for the Kuhio Highway Widening and Bypass Options Within the Ahupua`a of Wailua, South Olohena, North Olohena, Waipouli & Kapa`a, Island of Kaua`i, Cultural Surveys Hawai`i, Inc., Kailua, HI.

Hammatt, Hallett H., Gerald K. Ida and William H. Folk
1994 Archaeological Inventory of a 1.87-Acre Parcel, Kapa`a, Kaua`I (TMK (4)-5-05:6), Rev. August 1994, Cultural Surveys Hawai`i, Kailua, HI.

Handy, E.S. Craighill and Elizabeth G. Handy
1972 Native Planters in Old Hawaii: Their Life, Lore, and Environment, B.P. Bishop Museum Bulletin 233, B.P. Bishop Museum, Honolulu, HI.

Hawaii State Archives
1837 Interior Department, Land, Incoming Letter. August 1837.

1882 Interior Department, Letter book, Vol. 20, p. 426, Letter from Spalding to the Honorable Jacob Hardy, Circuit Judge—Fourth Circuit Kaua`i.

Hawaiian Territorial Planning Board

1940 Master Plan of the Town of Kapa`a, In collaboration with the Kaua`i County Board of Supervisors, Publication No. 8. Advertiser Publishing Co., Honolulu, HI.

Honolulu Advertiser
1997 "Amfac to put more land up for sale: Tracts on Kaua`i, Big Island" by Mike Gordon. July 7, 1997. Section BI.

1960 "Kaua`i Tries to See into Future. March 20, 1960.

Joesting, Edward
1984 Kaua`i, The Separate Kingdom, University of Hawaii Press and Kaua`i Museum Association, Ltd., Honolulu.

Jourdane, Elaine
1995 Inadvertent Discovery of Human Remains at 1382-A Inia Street, Kapa`a, Kaua`i (Kapa`a Sewerline Project Laterals) Site 626, SHPD, Honolulu, HI.

Kalakau'a, David
1888 The Legends and Myths of Hawaii, Edited by R.M. Dagget, Charles L. Webster and Co., New York.

Kamakau, Samuel Manaiakalani
1976 The Works of the People of Old, Na Ham a ka Po' e Kahiko, Bishop Museum Special Publication, No. 61, Honolulu, HI.

Kapa`a Elementary School
1982 Kapaa School 1883-1983: A "Century of Knowledge". Kapa`a Elementary, Kapa'a, Kaua`i

Kawachi, Carol T.

1994 Inadvertent Burial at 1316 Inia Street (Jasper) TMK 4-5-08:33, Kapa`a, Kawaihau, Kaua`i 50-30-08-871, State Historic Preservation Division, Honolulu, HI.

Kikuchi, William K. and Susan Remoaldo
1992 Cemeteries of Kaua'i, Volume 1, Kaua'i Community College and University of Hawaii, Puhi, Kaua`i, HI.

King, Robert D.
1935 "Districts in the Hawaiian Islands" In Coulter, John Wesley (compiler) A Gazetteer of the Territory of Hawaii, University of Hawaii Research Publications, No. 11, University of Hawaii, Honolulu, Hi.

Lai, Violet L. assisted by Kum Pui Lai

1985 He Was a Ram, Wong Aloiau of Hawaii, Published for the Hawaii Chinese History Cemetery and the Wong Aloiau Association by University of Hawaii Press, Honolulu.

McMahon, Nancy A.
1994 Inadvertent Burial Find, Kapa` a, Kawaihau, Kaua`i, SHPD, Honolulu, HI.

1996 Archaeological Inventory Survey for 5 Unit Apartment, (TMK:(4)-5-05:8), Kapa`a, Kawaihau, Kaua`i, Exploration Associates, LTD., Kōloa, Kaua`i, HI.

Nakuina, Moses K.
1990 The Wind Gourd of La' amaoma, Translated by Esther T. Mookini and Sarah Nakoa, Kalamaku Press, Honolulu.

Office of the Commissioner of Public Lands
1929 Indices of Awards, Made by the Board of Commissioners to Quiet Land Title in the Hawaiian Islands.

Pukui, Mary Kawena
1983 (Melo No'eau: Hawaiian Proverbs and Poetical Sayings, Bishop Museum Special Publication No.71, Bishop Museum Press, Honolulu, HI.

1986 Hawaiian Dictionary, 2nd Edition, University of Hawaii Press, Honolulu, HI.

1974 Place Names of Hawaii, University of Hawaii Press, Honolulu, HI.

Rice, William Hyde

1974 Hawaiian Legends, Bernice P. Bishop Museum Bulletin 3, Honolulu, HI; originally published 1923, Kraus Reprint, Millwood, New York, N.Y.

1923 Hawaiian Legends, Bernice P. Bishop Museum Bulletin 3, Honolulu.

Spear, Robert L.

1992 Letter Report Concerning Monitoring for the Cost-U-Less Project Kapa'a, Kaua`i, HI (TMK: (4)-5-5:4&9), Scientific Consultant Services Inc., Honolulu, HI.

Thrum, Thomas G.

1906 "Heiaus and Heiau Sites Throughout the Hawaiian Islands, Kaua`i, in: Hawaiian Almanac and Annual 1907, pp. 36-48, Honolulu, HI.

1923 More Hawaiian Folk Tales, A.C. McClurg & Co., Chicago, IL.

Van Ryzin, Karl and Hallett H. Hammatt

2004 An Archaeological Assessment for The Proposed Water Reservoir, Kapa `a Ahupua `a, Kaua`i (TMK (4)-6-03:10 Cultural Surveys Hawai`i, Kailua, HI.

Wickman, Frederick B.

1998 Kaua`i Ancient Place Names and Their Stories. University of Hawaii Press: Honolulu

APPENDIX A

Photos of the Area Surveyed

Figure 1. View of Project Area from the gate at the top of Olohena Road.

Figure 2. Solar Farm on Phase I Property view to north

Figure 3. Cattle Grazing in the Project Area.

Figure 4. Fence in the left side of photo indicating property boundary.

Figure 5. Goats Grazing in the Project Area.

APPENDIX B

State Historic Preservation Letter (June 2010) Requesting Survey

State Historic Preservation Letter (December 1999) Subdivision
"No Effect"

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES

June 28, 2010

LOG NO: 2010.2441
DOC NO: 1006MV50

Greg Allen, Kapaa Highlands Inc.
161 Wailua Road
Kapaa, HI 96746

SUBJECT: **Historic Preservation Review-**
Consultation Letter on TMK (4)-4-3-002:001, Kaua'i Kauai

Thank you for the opportunity to provide a current determination letter on the property with TMK# (4)-4-3-002:001. According to our records, there has not been an Archaeological Inventory Survey (AIS) of this property. In addition, Archaeological Inventory Surveys of nearby properties (TMK (4)-4-3-003:004 and TMK (4)-4-3-003:005) recorded multiple historic properties (SHPD Log No. 2008.1916). However, aerial photos indicate that this property was previously cultivated with sugar cane, which may have destructive implications for pre and post contact Native Hawaiian sites within the project area. However, current aerial photos indicate the presence of potentially historic irrigation features as well as terrain that may not have been subject to intensive cultivation.

The historic preservation requirements for any proposed action within this project area would vary depending on the extent of the action's impact on the parcel. If the action were to take place on previously cultivated land the only historic preservation requirement would be to document the irrigation features. However, if the action takes place in a part of the property that was not cultivated an Archaeological Inventory of that area may be required. It would be highly beneficial for all proposed actions to have an Archeological Inventory Survey for the entire property in order to document the presence or absence of historic sites in this parcel.

Please call Mike Vitousek at (808) 692-8024 if you have any questions or concerns regarding this letter.

Aloha,

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

2-16-2010 8:54AM FROM MUSSHAKU/BRUNSTEIN 808 245 8929 P.2

DEC-19-99 12:40P GREG KAMM 1 808 7421751 P.02

STATE OF HAWAII

DEPARTMENT OF LAND AND NATURAL RESOURCES

HISTORIC PRESERVATION DIVISION

December 14, 1999

Mr. Greg Kamm
P.O. Box 1200
Kalaa, HI 96756

LOG NO: 24572
DOC NO: 9912NM02

Dear Mr. Kamm:

SUBJECT: **Chapter 6E-42, Historic Preservation Review --**
Subdivision Permit Application 5-99-45 (Silagi Family Trust and Hillside Corp. Center L.L.C.)
TMK: 4-3-03: 01 por
Kapaa, Kawaihau, Kaua'i

Thank you for submitting the 1975 air photo of the above subject parcels. We agree that the land has been extensively altered by cane cultivation and filling. Therefore, we now believe that this project will have "no effect" on significant historic sites.

If you have any questions, please call Nancy McMahon at 742-7033.

Aloha,

DON HIBBARD, Administrator
State Historic Preservation Division

NM:lm

c: D. Crowell, Planning Department County of Kauai

APPENDIX C

Report of Geotechnical Evaluation Kapaa Solar Field

d. a. evans inc.

REPORT OF
GEOTECHNICAL EVALUATION-
KAPAA SOLAR FIELD
KAPAA, KAUAI

PREPARED FOR
WAGNER ENGINEERING SERVICES, INC.

PREPARED BY:

D.A.Evans, Inc.
P.O. Box 745
Kilauea, HI., 96754

d. a. evans inc.

REPORT OF
GEOTECHNICAL EVALUATION-
KAPAA SOLAR FIELD
KAPAA, KAUAI

PREPARED FOR
WAGNER ENGINEERING SERVICES, INC.

PREPARED BY:

D.A.Evans, Inc.
P.O. Box 745
Kilauea, HI., 96754

d. a. evans inc.

TABLE OF CONTENTS

	Page
INTRODUCTION	1
Purpose	1
Scope	1
Location	1
REFERENCES	2
PROPOSED DEVELOPMENT	3
GEOLOGIC CONDITIONS	3
TSUNAMIS	4
SURFACE AND SUBSURFACE WATER	4
SOIL MATERIAL PROPERTIES	4
EARTHQUAKES	5
CONCLUSIONS	5
Feasibility	5
Site Preparation	5
Foundation Design	5
Pavement Design	5
PLATE 1- LOCATION MAP	6
PLATE 2- GEOTECHNICAL MAP	7
APPENDIX	A-1

d. a. evans inc.

INTRODUCTION

This report summarizes the results of our evaluation of the geotechnical feasibility of construction of a solar farm west of the town of Kapaa, Kauai. We understand the installation will be used to supply electric power to the Kauai Island Utility Cooperative.

PURPOSE

This report is for the exclusive use of our client, Wagner Engineering Services, Inc. Its purpose is to satisfy the terms of the contract between our two firms. The report summarizes the findings, conclusions and recommendations which were generated by the evaluation. The intent of the report has been to present conclusions and recommendations of a geotechnical nature in such a way as to assist the owner and their design team in preparing plans and specifications for construction.

SCOPE

As outlined in our contract dated August 22, 2010, the following work elements were performed.

- Review of available geologic data and stereographic aerial photographs.
- Subsurface exploration using a rubber-tired "Extendahoe" backhoe.
- Laboratory testing of selected samples of soil collected during subsurface exploration.
- Preparation of a formal report summarizing our findings, conclusions and recommendations.

LOCATION

The site is located slightly less than three miles west of the town of Kapaa. It is accessed by an unpaved road exiting from Olohena Road. The site is shown on Plate 1- Location Map.

REFERENCES

The following references were used in preparing our proposal, conducting our evaluation and preparing this report.

d. a. evans inc.

- "Roadside Geology of Hawaii", Richard W. Hazlett and Donald W. Hyndman, Mountain Press Publishing Company, 1966.
- "Volcanoes in the Sea The Geology of Hawaii", Second Edition, Gordon A. MacDonald, Agatin T. Abbott and Frank L. Peterson, University of Hawaii Press, 1983.
- "Tsunami!", Second Edition, Walter C. Dudley and Min Lee, University of Hawaii Press, 1998.
- "Atlas of Natural Hazards in the Hawaiian Coastal Zone", USGS, Geologic Investigations, Series I-2761, 2002.
- "Reconnaissance Following the October 15th, 2006 Earthquakes on the Island of Hawaii, University Of Hawaii, College Of Engineering, Research Report UHM/CEE/06-07, October 26, 2006.

SITE CONDITIONS AND PROPOSED DEVELOPMENT

The site, as evidenced by preliminary topography and USGS mapping, is located on an elevated stream terrace on the south side of Olohena Road, 2.8 miles west of old Kapaa town and about 4000 feet northeast of the Nonou Forest Reserve. At the time of our exploration, vegetation was sparse due to the ongoing drought. Topography slopes toward the ancestral channel with the steepest portion immediately below Olohena Road.

Detailed plans of the proposed development were not available at the time of our exploration although, because of the nature of the development, the knowledge that it is a solar field is sufficient for our purposes. Drawings which have been provided by your office indicate that the project will consist of six solar panel arrays of varying size mounted on a shallow foundation system.

GEOLOGIC CONDITIONS

The Lihue Depression is the dominant geologic feature which has influenced thesite. The Lihue Depression is apparently the remains of the caldera of the ancestral Wai'ali'ali shield volcano. The caldera was displaced during the massive landsliding which caused the collapse of the portion of the island now occupied by Kapaa and Waipouli. The site is on the northern edge of the depression

Although there is evidence to suggest that the island is still undergoing some settlement associated with the collapse of the volcano, the amount of movement is apparently so small as to be undetectable without instrumentation and there is no longer volcanic activity on the island.

d. a. evans inc.

Our subsurface exploration indicates that the site is an erosion terrace formed by previous stream action. Subsequent erosion has produced a residual soil profile which grades from a fully developed, moderately firm, surface soil to very stiff weathered rock at a depth of about six feet. In this area, as is the case on the majority of the eastern side of the island, the underlying rock is part of the Koloa series of volcanic flow material.

TSUNAMIS

The island of Kauai is susceptible to damage from tsunamis. Although there is a comparatively sophisticated early warning system in place world-wide, the ability of the system to predict the size of any particular event is limited. The general consensus is that tsunamis are certain to occur but their frequency is uncertain. Published data suggest that the site is not vulnerable to damage from tsunami run-up of the magnitude experienced in the Hawaiian Islands historically.

SURFACE AND SUBSURFACE WATER

Drainage on the property occurs as southwesterly sheet flow from the slope below Olohena Road toward the established stream. At the time of our exploration, drought conditions existed on the island and surface was non-existent.

We found no subsurface water to the depth of exploration. Because of the existing drought conditions, the near-surface soil was dry and brittle.

CONCLUSIONS

Based on the results of our geotechnical evaluation, we can offer the following conclusions.

FEASIBILITY

In our opinion, it is geotechnically feasible to develop the site essentially as proposed provided the improvements are properly designed and constructed.

SITE PREPARATION

We have assumed that little or no grading, other than that required for the creation of an access road and support facilities will be needed. Moreover, it is our understanding that the arrays will be supported by some form of pipe piles. As a result, it is likely that site preparation will be minimal.

d. a. evans inc.

EARTHQUAKES

The island of Kauai is in Uniform Building Code seismic zone 1, a designation indicative of a low level of seismic activity. Published data indicate that, during the period 1962 to 1980, for example, there were no recorded earthquakes with a Richter Magnitude greater than 3.0 with an epicenter on or near Kauai. Within the last two years, however, earthquakes in the Richter Magnitude 3 to 4 range have occurred offshore of Maui and Oahu as well as the Loihi seamount east of the Big Island and magma production from Kilauea has altered perceptibly. Of particular importance was the October 15, 2006, M=6.7 and the November 23, 2006, M=5.0 events off the Kona Coast .This may be indicative of shifts in the Pacific tectonic plate which could generate an increase in seismic activity for the near future .As part of our evaluation, we have provided below the numeric parameters necessary to perform the site characterization analysis required by the 1997 Uniform Building Code.

Soil Profile- S_b
$z = 0.075$
$c_a = 0.12$
$c_v = 0.18$
$N_a = 1.0$
$N_v = 1.0$

In our opinion, it is likely that the site will experience low-level ground shaking due to volcanic activity on or near the Big Island, but the magnitude and number of these events will not be larger than those in the historic record.

TSUNAMI

Tsunami run-up of historic proportions has been in the 10 to 40 foot range and, historically, has been concentrated on the north shore of the island. Although the pre-historic "monster" tsunami is still a theoretical possibility, the design practice in coastal areas of the island has apparently been to consider the run-up of historic proportion. The site of the proposed solar field is well above the elevation of historic run-up.

FOUNDATION DESIGN

The upper two feet of the surface soil in the area of the arrays is poorly consolidated and should not relied for either foundation support or uplift resistance. Below two feet, the soil is stiff and capable of generating more than 2500 pounds per square foot for bearing. Uplift resistance can be determined using the relationship (1100)d + Wl where "d" is outside shaft diameter, "W" is unit weight of the shaft and "l" is shaft length below two feet. This assumes that the shaft consists of a

d. a. evans inc.

protected metal shaft encased in concrete. A passive pressure of 300 pounds per cubic foot (equivalent fluid) is reasonable for the soil below a depth of two feet.

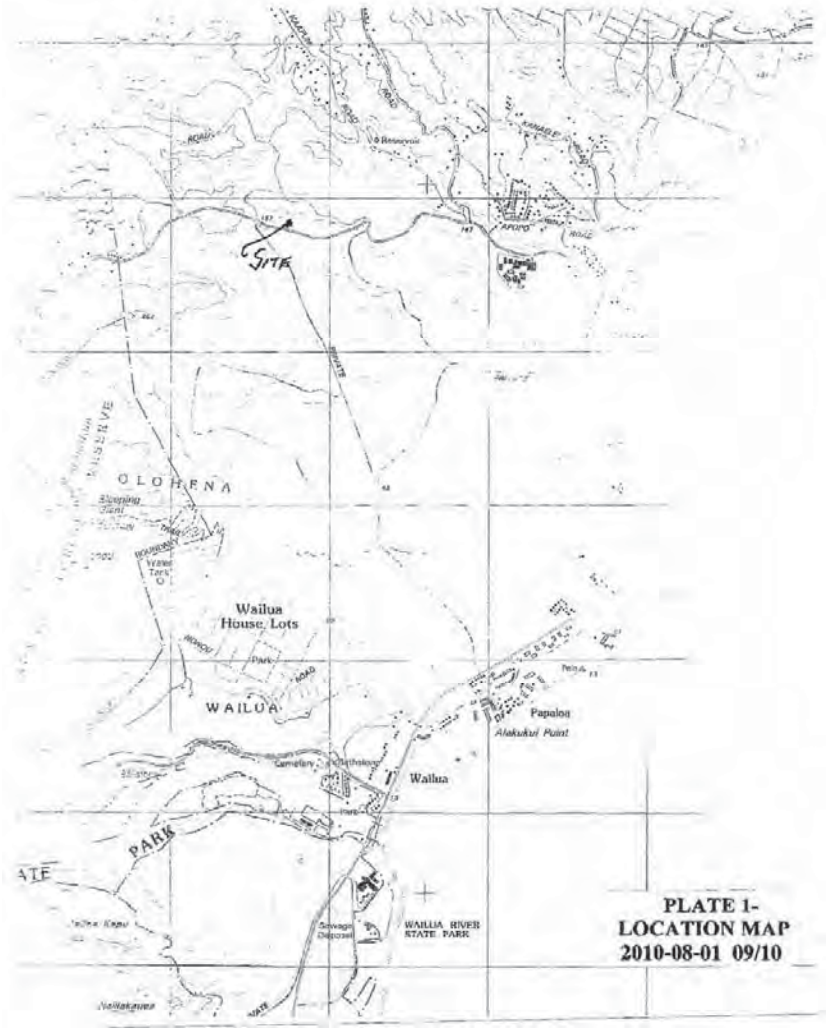
Laboratory tests to determine the relative corrosivity of the soil are currently being performed and the results will be reported under separate cover. However, our work on the island has shown, as the result of a number of tests, that the soil derived from the Koloa volcanic material is highly to severally corrosive to both concrete and metal. The results of the on-site tests will be submitted under separate cover.

SURFACE DRAINAGE

Runoff from rainfall and irrigation should be directed away from the proposed structures to an approved drainage device.

The Plates which are attached and complete this report are listed in the Table of Contents.

oOo



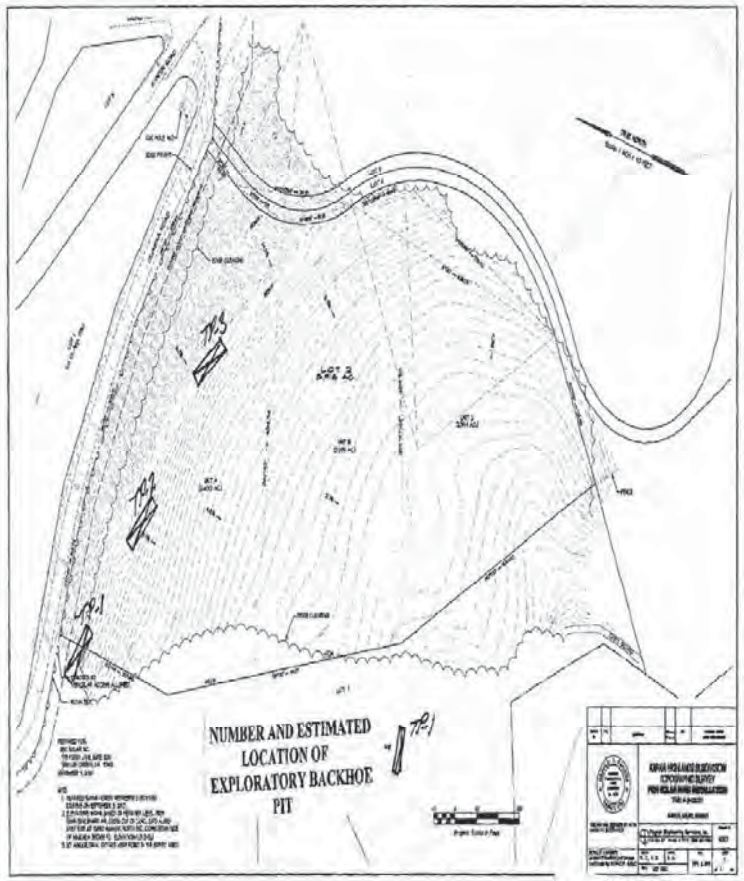


PLATE 2-
GEOTECHNIC L MAP
2010-08-01 09/10

d. a. evans inc.

Our Job 2010-08-01 Page A-1

APPENDIX
SUPPORTING DATA AND PROCEDURES

SURFACE GEOLOGIC MAPPING

A limited amount of surface geologic mapping was performed as part of our evaluation. This mapping was performed both physically and with the aid of topographic maps before and during the subsurface exploration. The results of this work were assimilated with the subsurface exploration.

SUBSURFACE EXPLORATION

Subsurface exploration at the site consisted of the excavation of three trenches using a rubber-tired backhoe with a three-foot-wide bucket. The trenches were located to (a) aid in establishing a "picture" of probable subsurface conditions at the site, and (b) provide access to the subsurface for possible sampling of soil and/or rock. To that extent, both the geomorphology of the site and the type and location of proposed improvements have a bearing on the location of subsurface exploration points. Our estimate of the location of each backhoe trench is shown on Plate-2 Geotechnical Map. Graphic logs, using standard United States Geological Survey, United States Corps of Engineers and United States Bureau of Reclamation nomenclature are included as Plates A-1.1 through A-1.3- Log of Test Pit. Upon completion, all pits were backfilled, tamped and wheel-rolled. The location of each test pits was also marked with a stake and flagging.

LABORATORY TESTING

Moisture/Density. Field moisture content and in-place dry density were determined for each "undisturbed" sleeve sample obtained during exploration. The field moisture content was determined according to ASTM Test Method D2216-66 by obtaining one-half of the moisture sample from each end of the sleeve. The in-place wet and dry density was determined by using the wet weight of the entire sleeve.

At the same time the field moisture content and in-place dry density were determined, the soil material at each end of the sleeve was classified according to the Unified Soil Classification System and pocket penetrometer readings were taken in the cohesive samples. The results of the field moisture content and in-place dry density tests are presented on Plates- A.1 and A-1.2-Log of Test Pit.

Index Tests. For purposes of this report, we have grouped grain-size distribution and Atterberg Limits under "index tests". The bulk sample taken from test pit TP-1 at a depth of two to

d. a. evans inc.

Our Job No. 2010-08-01 Page A-2

three feet was also subjected to an analysis of its distribution of grain size and its Liquid Limit, Plastic Limit, and Plasticity Index were determined. The distribution of grain size was determined according to ASTM Test Method D422-63. Relative plasticity was determined according to ASTM Test Methods D423-66 and D424-59. Using these data, the soil can, among other things, be provided a positive Unified Soil Classification System group name. The tests indicate that the soil has no gravel-sized particles, 18 percent sand-sized particles, 80 percent silt-sized particles, two percent clay-sized particles, a Liquid Limit of 59, a Plastic Limit of 46 and a Plasticity Index of 13. The soil has been given a Unified Soil Classification System group name and symbol of Sandy Silt (MH). The results are summarized on Plate A-2- Relative Plasticity Data and Plate A-3- Grain Size Distribution Data.

Direct Shear Tests. Undisturbed samples taken from test pits TP-1 and Test Pit TP-2 at two feet were subjected to consolidated, drained direct shear tests to determine the shearing resistance of the soil. In each case, samples were allowed to stabilize in a suitable loading frame under the normal stress for the test (in this case, 500, 750 and 1000 pounds per square foot). The samples were then flooded, allowed to stabilize and then sheared at a constant rate of 0.008 inches per minute to failure. The applied normal and induced shear stresses were monitored with electronic load cells and the displacement in the normal and shear directions monitored with linear variable displacement transducers (LVDT's). The force and displacement in the direction of shear were plotted electronically. The results of the tests are summarized graphically on Plates A-4 - Shear Strength Data.

Corrosion Tests. Tests to determine the relative corrosivity of the on-site soil are currently being completed and will be submitted under separate cover.

With the exception of the corrosion tests, all laboratory testing was performed for us by Evans, Colbaugh & Associates, Inc. in San Marcos, California.

Log of Test Pit No. TP- 1

Date: 09/11/10 Elevation: +60 (Map Datum)

Logged By: DAE Hole Size/ Type: 2'x 6'x 6' Backhoe

Depth (feet)	Sample Type	Blow count	Dry Density	Moisture Content	Other Tests	USCS	Graphic Log	Description
1								SOIL (Residual), Clayey Silt (ML), medium-brown, moderately firm, dry, to very dry
2	[redacted] D,SS		72	30	DS,ALL GS	MH		stiff at two feet
3								
4								very stiff, at 4 feet, mottled light brown and yellow grading to highly weathered Koloa volcanic rock at six feet.
5								
6								
7								
8								
9								
10								Bottom at 6 feet. No water. No caving. Hole backfilled, tamped and wheel-rolled
11								

Water level shown is at time of measurement and may be different at different times.
Blow counts are per foot; dry density is in pounds per square foot; moisture content is percent of dry weight.

d. a. evans inc.

Date: 09/12/10 Project No.: 2010-08-01

SOLAR PANEL FIELD
LOG OF TEST PIT TP-1

PLATE A-1.1

Log of Test Pit No. TP- 2

Date: 09/11/10 Elevation: +60 (Map Datum)

Logged By: DAE Hole Size/ Type: 2'x 6'x 6' Backhoe

Depth (feet)	Sample Type	Blow count	Dry Density	Moisture Content	Other Tests	USCS	Graphic Log	Description
1								SOIL (Residual), Clayey Silt (ML), medium-brown, moderately firm, dry, to very dry
2	[redacted] D		70	28	DS	MH		stiff at two feet
3								
4								very stiff, at 4 feet, mottled light brown and yellow grading to highly weathered Koloa volcanic rock at six feet.
5								
6								
7								
8								
9								
10								Bottom at 6 feet. No water. No caving. Hole backfilled, tamped and wheel-rolled
11								

Water level shown is at time of measurement and may be different at different times.
Blow counts are per foot; dry density is in pounds per square foot; moisture content is percent of dry weight.

d. a. evans inc.

Date: 09/12/10 Project No.: 2010-08-01

SOLAR PANEL FIELD
LOG OF TEST PIT TP-2

PLATE A-1.2

Log of Test Pit No. TP- 3

Date: 09/11/10 Elevation: +60 (Map Datum)

Logged By: DAE Hole Size/ Type: 2'x 6'x 6' Backhoe

Depth (feet)	Sample Type	Blow count	Dry Density	Moisture Content	Other Tests	USCS	Graphic Log	Description
1								SOIL (Residual), Clayey Silt (ML), medium-brown, moderately firm, dry, to very dry.
2								four inch dia. "bomb" at three feet.
3								
4								
5								
6								stiff at six feet.
7								
8								
9								
10								Bottom at 6 feet. No water. No caving. Hole backfilled, tamped and wheel-rolled
11								

Water level shown is at time of measurement and may be different at different times.
Blow counts are per foot; dry density is in pounds per square foot; moisture content is percent of dry weight.

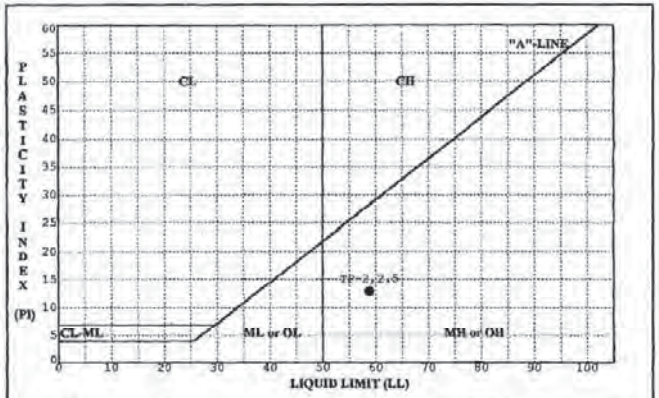
d. a. evans inc.

Date: 09/12/10 Project No.: 2010-08-01

SOLAR PANEL FIELD
LOG OF TEST PIT TP-3

PLATE A-1.3

EXPLORATION ASSOCIATES LTD



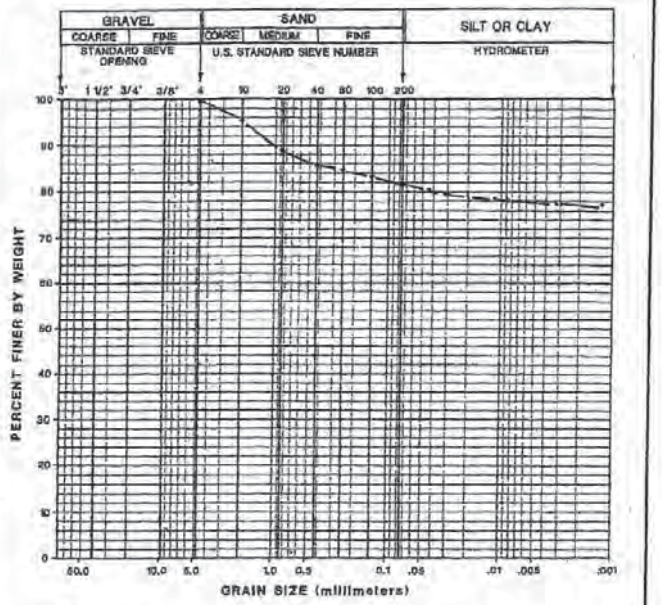
Symbol Type	Sample Location	Sample Depth (ft)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	USCS Group Symbol and Name
●	TP-2	2.5	59	46	13	ML

evans, colbaugh & assoc. inc.

2010-08-01

Relative Plasticity
D A Evans

A-2
1 of 1



SYMBOL	SAMPLE NUMBER	SAMPLE DEPTH (feet)	SOIL DESCRIPTION
— · —		TP-1 @ 2'	SILT (MH)

d.a. evans inc.

GRAIN SIZE DISTRIBUTION DATA

Job Number 2010-08-01 Plate A-3

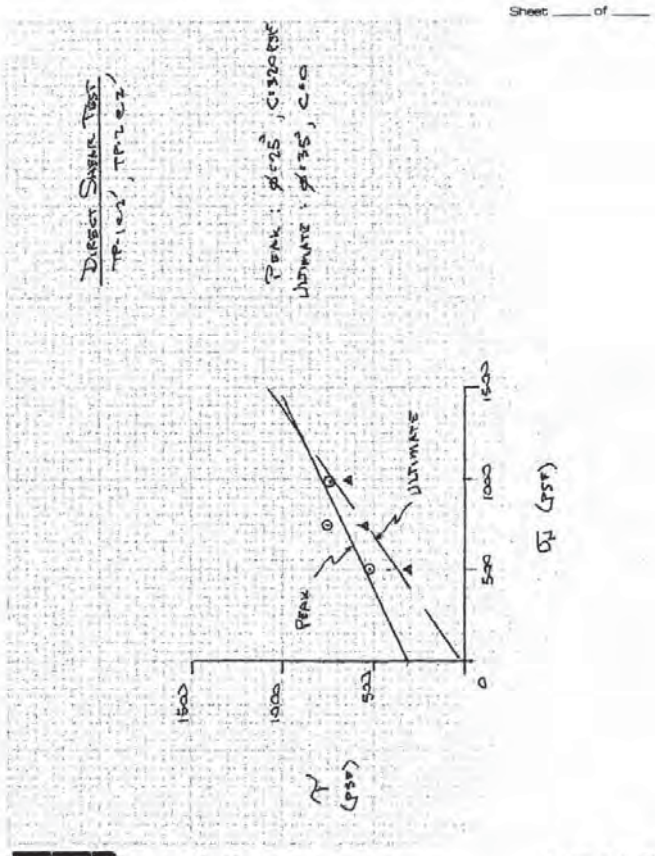


Exhibit M

A Cultural Impact Assessment for the Proposed Kapa‘a Highlands Phase II
Kapa‘a Ahupua‘a, Kawaihau District, Kaua‘i

Exploration Associates Ltd.

A Cultural Impact Assessment for the Proposed Kapa`a Highlands Phase II, Kapa`a Ahupua`a, Kawaihau District, Kaua`i

TMK (4) 4-3-03:01

by

Nancy McMahon, M.A.

Prepared for
Three Stooges LLC

By
Exploration Associates, Ltd.
May 2012

EAL 3-2600 Kaumualii Hwy 1300-306 **T** 808 639 6695 poipunan@me.com

TABLE OF CONTENTS

INTRODUCTION 2

- Scope of Work 2
- Methods 2

KAPA'A 6

- Natural Setting 9
- Mo'olelo of Kapa'a 10
- Place Names and Wahi Pana of Kapa'a 18
- Summary of the Mythological and Traditional Accounts of Kapa'a 22
- Early Post-Contact Period The Mahele Period 26
- The Late 1800s 20th Century History of Kapa'a 29
- Previous Archaeological and Cultural Studies of Kapa'a 33

RESULTS OF COMMUNITY CONSULTATION 39

TRADITIONAL RESOURCES/CULTURAL PRACTICES 42

SUMMARY AND CONCLUSION 46

BIBLIOGRAPHY 48

APPENDIX 58

LIST OF FIGURES

Figure 1. Tax Map Showing the Kapa'a Highlands Phase II 7

Figure 2. Aerial View of the Project Area Looking North 8

Figure 3. Portion of 1872 Survey Map by James Gay, Showing Swamp Land in Puna 23

Figure 4. Aerial View of Kapa'a, Kaua'i, looking west, circa 1933 (Bishop Museum Archives) 31

Figure 5. Hawai'i Territory Survey Map (Iao 1914) of Kapa'a Section Showing Roads, Railroads and Camps 32

Figure 6. Historic Properties in Kapa'a Ahupua'a 37

Figure 7. Cattle Grazing 40

Figure 8. Goats (in the Distance) Grazing 40

Figure 9. Solar Farm and Equipment Buildings 41

Figure 10. Road Remnant with Cattle in Background 45

LIST OF TABLES

Table 1. Place Names of Kapa'a 10

Table 2. Mahele Land Claims and Land Use of Kapa'a 25

Table 3. Heiau of Kapa'a 33

Table 4. Historic Properties in Kapa'a Ahupua'a 34

INTRODUCTION

Scope of Work

The following scope of work was agreed upon to fulfill the requirements of a cultural impact assessment, as outlined by the Office of Environmental Quality Control guidelines:

1) Further background research with the goal of identifying traditional Hawaiian activities including gathering of plant, animal and other resources or agricultural pursuits as may be indicated in the historic record.
2) Examination of historical documents, Land Commission Awards, and historic maps, with the specific purpose of identifying traditional Hawaiian activities including gathering of plant, animal and other resources or agricultural pursuits as may be indicated in the historic record to develop a Cultural landscape background study,
3) A review of the existing archaeological information pertaining to the sites in the study area as they may allow us to reconstruct traditional land use activities and identify and describe the cultural resources, practices and beliefs associated with the parcel and identify present uses, if appropriate.
4) Conduct oral interviews with persons and agencies knowledgeable about the historic and traditional practices in the project area and region. This includes eight formal interviews and more informal interviews plus coordination with relevant community groups.
5) Preparation of a report on items 1-3 summarizing the information gathered related to traditional practices and land use. The report will assess the impact of the proposed action on the cultural practices and features identified.

Methods

1. Historic Research

Research was conducted to find historic maps at the Hawai'i State Survey Office, the State Historic Preservation Division library and the Kaua'i Historical Society. Historical research was conducted at the State Historic Preservation Division Library, the Hawai'i State Archives and the Bishop Museum where information on historic land use and past cultural traditions was sought. The Bishop Museum also provided historic photographs for

the report. In an attempt to obtain more regional or local sources, historic documents were sought at the Kaua'i Historical Society, Kaua'i Museum and the Kapa'a Public Library.

2. Archaeological Review

The library at the Department of Land and Natural Resources, State Historic Preservation Division were used to obtain information regarding previous archaeological and cultural studies in the Kapa'a area. Previously identified archaeological sites are presented for each section separately and are discussed in the context of associated cultural traditions. A complete review of archaeological sites, including descriptions, *ahupua'a*, settlement patterns and archaeological constraints is available in a separate archaeological assessment document (McMahon 2012).

3. Identification of Knowledgeable Informants

Hawaiian organizations, community members and cultural and lineal descendants with lineal ties to the greater Kapa'a area were contacted to: (1) identify potential knowledgeable individuals with cultural expertise and knowledge of the project area and surrounding vicinity, and (2) identify cultural concerns and potential impacts relative to the project. An effort was made to locate informants who either grew up in the project area or who, in the past, used the area for cultural purposes. These included lifetime residents of Kapa'a Town, families with ties to the historic rice industries of Kapa'a and former employees of Lihue Plantation who may have lived in one of the residential camps near the study area. Other potential user groups were residents in the Kapa'a who have their roots in Kapa'a, and continue to utilize the *makai* areas for cultural reasons. In addition, informal talk-story with community members familiar with the study area is ongoing. The organizations consulted were the State Historic Preservation Division (SHPD), The Office of Hawaiian Affairs (OHA), the Kaua'i/Ni'ihau Islands Burial Council, the Royal Order of Kamehameha, Kaumuali'i Chapter, Kaua'i County Council, Kaua'i County Mayor, Kaua'i Health Heritage Coastal Corridor Committee, Kaua'i Historical Society, Kaua'i Historic Preservation Commission.

4. Interviews

Interviews were conducted for this assessment. Once the participant was identified, she/he was contacted and interviewed. Excerpts from the interview are used throughout this report, wherever applicable.

5. Report

This study documents relevant information on traditions and practices from the historic record as well as from contemporary oral sources. The report includes cultural and historic documentation of Kapa'a, a summary of archaeological studies, the results of

community consultation, and an assessment of traditional resources/traditional practices. The report is organized in such a way that reflects the effort of data and information gathering. This is the information used in the final assessment of Traditional Resources/ Cultural Practices reported in the Conclusions Section IV and V.

KAPA'A

The Kapa'a Highlands Phase II is located in Kapa'a, above the Kapa'a Bypass Road and adjacent to Kapa'a Middle School. The property is further identified by Kaua'i Tax Map Key No. (4) 4-3-03:01. The total acreage of the area is 163.125. (Figure 1 and 2).

The project area lies in the traditional *ahupua'a* of Kapa'a belongs' to the ancient district of Puna (now the district is more commonly called "Kawaihau"), one of five ancient districts on Kaua'i (King 1935: 228). Puna was the second largest district on Kaua'i, behind Kona, and extended from Kipu south of Lihu'e to Kamalomalo'o, just north of Kealia. For taxation, educational and judicial reasons, new districts were created in the 1840's. The Puna District, with the same boundaries became the Lihu'e District, named for an important town in that district. In 1878, by the act of King Kalakaua in securing a future name for the new Hui Kawaihau, created the new district of Kawaihau. This new district encompassed the *ahupua'a* ranging from Olohena on the south to Kilauea on the north. Subsequent alterations to district boundaries in the 1920's left Kawaihau with Olohena as its southernmost boundary and Moloa'a as its northernmost boundary (King 1935:222).

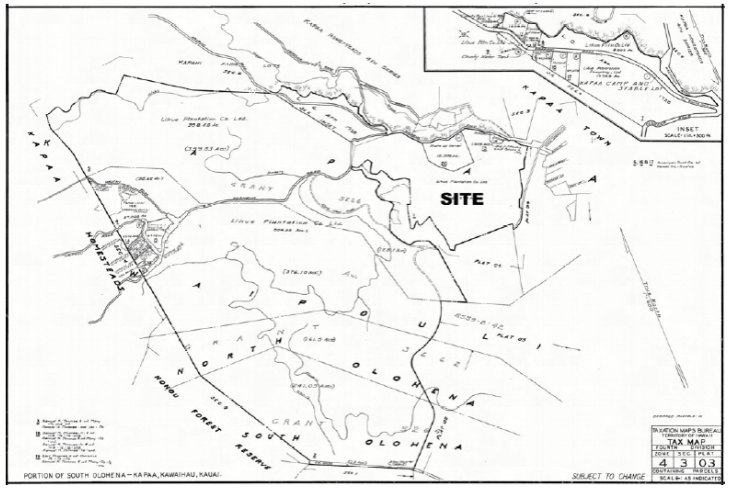


Figure 1. Tax Map Showing the Project Area for Kapaa Highlands Phase II.

Figure 2. Aerial View of Project Area Looking North

Natural Setting

The *ahupua'a* of Kapa'a, is located on the eastern side of the island of Kaua'i, in the old district or *moku* of Puna. Adjacent and to the north is the *ahupua'a of* Keālia, and to the south, Waipouli. Like other *ahupua'a* in Puna, Kapa'a is exposed to the northeast tradewinds and receives 40 to 50 inches of rain a year at the shore and considerably more precipitation inland. The area of the *ahupua'a* of Kapa'a, is approximately 6,394 acres (Gay 1872 R.M. 159, Commission of Boundaries Record, Kaua'i, vol.1, 1873:23; Commission of Boundaries Record, Kauai, vol. 1, 1872:109). Wichman (1998:84) notes the paradox that Kapa'a "is one of the largest *ahupua'a* of the Puna District [of Kaua'i] and the most bereft of legends."

Alluvium, colluvium and terrigenous sediments resulting from the erosion of the primary island building events in Kaua'i history, the Waimea Canyon Volcanic Series and the Koloa Volcanic Series, are the major sources of sediment for the formation of Kaua'i's non-mountainous region, including Kapa'a (MacDonald and Abbott 1970:382-384). Kapa'a is located within the physiographic division known as the Līhu'e Plain (Armstrong 1973:30). During higher sea levels, terrigenous sediment accumulated further inland as streams released their sediment loads further inland from where the shoreline had encroached. Also, reefs grew with the rising sea level, and, as the sea receded, marine sediments were created and deposited on shore by the erosion of these reefs. Both of these processes were part of the formation of the Līhu'e Plain.

The soils of the project area reflect the original geologic sediments deposited and the erosional processes induced by climatic agents. Backshore of the sand berm in Kapa'a, are found sandy loams associated with the Mokuleia soil series (Foote et al. 1972:95). These soils consist of mostly recent alluvium deposited over coral sand and are typical of the eastern and northern coastal plains of Kaua'i. Behind Kapa'a Town and north of Moikeha Canal is found mixed fill. South of Moikeha Canal are Mokuleia clay loams, similar to the sandy loams fronting them. The soils found in the sand berm in Waipouli and Olohena are of the Lihue Series, which are characterized as well-drained soils derived from igneous material originating in Kapa'a's uplands (Foote et al. 1972:82).

Historically, these *ahupua'a* contained two prominent landscape features, a coastal plain with sand dunes and a large marsh. An 1872 map (Figure 2) by James Gay delineating the boundaries of Kapa'a and adjacent lands shows that much of the *makai* region was a "swamp" that extended from Waipouli into Kapa'a. This "swamp" appears to be the most prominent natural feature of the seaward end of Waipouli and Kapa'a. The *makai* areas of the *ahupua'a* can be characterized as fairly flat. Kapa'a has an irregularly-

shaped gulches and small valleys in the uplands, through which small tributary streams run, including the Kapahi, Makaleha, Moalepe and Konohiki Streams. While some of these streams combine with other tributaries in neighboring Keālia to form Kapa'a Stream, which empties into the ocean at the northern border of the *ahupua'a*, others flow directly into the marsh areas of Kapa'a and Waipouli (Handy and Handy 1972:394,423; Territorial Planning Board 1940:9).

Kapa'a Town areas is built on a sand berm with ocean on the *makai* side and marsh on the *mauka* side. The sand berm was probably slightly wider here than in other localities, but dry land was probably always at a premium.

Mo'olelo of Kapa'a

A brief overview of some of the better documented mythological and traditional accounts of Kapa'a is presented below and is followed by a brief summation of their import.

The Puna district of Kaua'i is well known for two legendary chiefs, Kawelo and Mō'īkeha. Kawelo is more closely associated with Wailua and Hanamā'ulu and Mō'īkeha is linked to Kapa'a. Mō'īkeha is understood to be the grandchild of Maweke, one of the principal genealogical lines from which Hawaiians today trace their ancestry (Beckwith 1970:352). Sometime between the eleventh and twelfth centuries marks the arrival of Maweke to the Hawaiian Islands. Mō'īkeha succeeds his older brother Kumuhonua as ruling chief during the time of Mailikūkahi. Kapa'a is mentioned in traditions concerning Kawelo (Kaweloleimākua), the *mo'o* Kalamainu'u and the origins of the *hina'i hinālea* fish, and the story of Lonoikamakahiki (Fornander 1917:IV:318, 704-705; Rice 1923: 106-108; Thrum 1923: 123-135; Kamakau 1976:80).

1. Mō'īkeha

Kapa'a was the final home of the legendary chief Mō'īkeha. Born at Waipi'o on the island of Hawai'i, Mō'īkeha sailed to Kahiki (Tahiti), the home of his grandfather, Maweke, after a disastrous flood. On his return to Hawai'i, he settled at Kapa'a, Kaua'i. Kila, Mō'īkeha's favorite of three sons by the Kaua'i chiefess Ho'oipoikamalani, was born at Kapa'a and was considered the most handsome man on the island. It was Kila who was sent by his father back to Kahiki to slay his old enemies and retrieve a foster son, the high chief La'amaikahiki (Handy and Handy 1972:424; Beckwith 1970:352-358; Kalākaua 1888:130-135; Fornander 1917:IV:160). Mō'īkeha's love for Kapa'a is recalled in the *'olelo no'eau*: *Ka lulu o Mo'ikeha i ka laulā o Kapa'a* "The calm of Mō'īkeha in the breadth of Kapa'a " (Pukui 1983: 157).

The place "Lulu-o-Mō'īkeha" is described as being situated "near the landing and the school of Waimahanalua" (Akina 1913: 5). The landing in Kapa'a was known as the Makee Landing and was probably constructed in the late 1870s, along with the Makee sugar mill. Today, in place of the old Makee Landing is part of a

breakwater located on the north side of Moikeha Canal, near the present day Coral Reef Hotel (Bushnell et al. 2002:7).

In the Hawaiian newspaper *Ku'oko'a* published at the turn of the century, Akina (1913: 6) also tells the story of how Mō'īkeha's son, Kila stocks the Hawaiian Islands with the *akule*, *kawakawa* and *'opelu* fish. When Kila travels to Kahiki, he seeks out his grandfather Maweke and explains that he is the child of Mō'īkeha. When Maweke asks Kila if Mō'īkeha is enjoying himself, Kila answers with the following chant of Puna, Kaua'i:

My father enjoys the billowing clouds	*I walea no ku'u makuakāne i ke ao*
over Pōhaku-pili,	*ho'okanunu, iluna o Pōhakupili*
The sticky and delicious poi,	*I ka poi uouo ono ae no a,*
With the fish brought from Puna,	*Me ka i'a i na mai o ka Puna,*
The broad-backed shrimp of Kapalua,	*Ka opae hoainahanaha o Kapalua;*
The dark-backed shrimp of Pohakuhapai,	*Na opae kua hauli o Pohakuhapai,*
The potent awa root of Maiakii,	*Na puawa ona mai no o Maiakii,*
The breadfruit laid in the embers at Makialo	*Me ka ulu moelehu mai no o Makialo,*
The large heavy taros of Keahapana	*Me na kalo pehi hua o Keahapana,*
The crooked surf of Makaiwa too	*A i kekee nalu ae no hoi o Makaiwa,*
The bending hither and thither of the reed and rush blossoms,	*A i ke kahuli aku kahuli mai o ka pua uku me ka pua neki,*
The swaying of the kalukalu Puna,	*A i ka nu'a ae no o ke kalukalu o Puna,* grasses of
The large, plump, private of my mothers,	*A i na mea nui nepunepu no a ku'u mau* parts *makuahine*
Of Ho'oipoikamalanai and Hinau-u,	*O Ho'oipoikamalanai me Hinau-u,*
The sun that rises and sets,	*A i ka la hiki ae no a napoo aku,*
He enjoys himself on Kaua'i,	*Walea ai no ka nohona ia Kaua'i,*
All of Kaua'i is Mō'ikeha's	*Ua puni a puni Kaua'i ia Mō'ikeha*

Maweke was delighted and when the boy is questioned as to his purpose, Kila tells his great grandfather he is seeking fish for his family. Maweke tells Kila to lead the fish back to his homeland. This is how Kila led the *akule*, *kawakawa* and *'opelu* to Hawai'i (Fornander 1917:IV:162-163).

In another legend of Kila, Mō'ikeha sends his son to Tahiti to slay his enemies. Upon reaching Tahiti, Kila meets his father's aunt, Kanepohihi, in the form of a blind, supernatural rat. He introduces himself, sending his father Mō'ikeha's greetings. Kanepohihi asks of Mō'ikeha, and Kila responds:

He is indulging in ease in Kaua'i	*I walea ia Kaua'i*
Where the sun rises and sets again,	*I ka lā hiki ae a pō iho*
Where the surf of Makaiwa curves and	*I ke kee a ka nalu o Makaiwa* bends,
Where the sun comes up over	*I ka hiki mai a ka la maluna*
The kalukalu of Kewa;	*O ke kalukalu o Kewa*
The stretched out waters of Wailua,	*O ka wai halau o Wailua*
And the entrancing favors of my mother	*O ka lealea o ka mai o kuu makuahine*
Ho'oipoikamalanai	*O Ho'oipoikamalanai*
He will live and die in Kaua'i	*O kahi noho no o Kaua'i a make*

(Fornander 1916:IV:162-163)

2. Ka'ililauokekoa the Chiefess of Kapa'a and the Lute Kanikawi

Waipouli and Kapa'a are mentioned in the legend of Ka'ililauokekoa, a chiefess of Kapa'a and granddaughter or daughter of Mō'ikeha. Thomas Thrum (1907: 83-84) relates that:

> [Kaililauokekoa's] greatest desire was to play konane, a game somewhat resembling checkers, and to ride the curving surf of Makaiwa (*ke'eke'e nalu o Makaiwa*), a surf which breaks directly outside of Waipouli, Kapa'a. She passed the larger part of her time in this matter every day, and because of the continual kissing of her cheeks by the fine spray of the sea of Makaiwa, the bloom of her youth became attractive 'as a torch on high,' so unsurpassed was her personal charm.

In the Thrum (1923:123-135) version, Ka'ililauokekoa is seduced by the nose flute of Kauakahiali'i who is at the time residing in Wailua uka at a place called Pihanakalani. She travels up to Pihanakalani with her companion where she joins Kauakahiali'i as his wife. They are found by Mō'ikeha's people and taken down to Kapa'a where Kauakahiali'i is imprisoned. A boy named Kalukaluokewa takes pity on Kauakahiali'i and sneaks

through the *kalukalu* grass and the *ahuawa* rushes to bring the prisoner food and water. Meanwhile, Ka´ililauokekoa tells her parents of her calling by Kanikawi to the home of Kahalelehua at Pihanakalani and her encounter with Kauakahiali'i.

3. Kalukalu grass of Kapa'a

"*Kūmoena kalukalu Kapa'a*" or "Kapa'a is like the *kalukalu* mats" is a line from a chant recited by Lonoikamakahiki. *Kalukalu* is a sedge grass, apparently used for weaving mats (Fornander 1917:IV:318-319). Pukui (1983:187) associates the *kalukalu* with lovers in "*ke kalukalu moe ipo o Kapa'a*"; "the *kalukalu* of Kapa'a that sleeps with the lover." According to Wichman (1998:84), "a *kalukalu* mat was laid on the ground under a tree, covered with a thick pile of grass, and a second mat was thrown over that for a comfortable bed," thus the association with lovers. Kaua'i was famous for this peculiar grass, and it probably grew around the marshlands of Kapa'a. It is thought to be extinct now, but an old-time resident of the area recalled that it had edible roots, "somewhat like peanuts." Perhaps it was a famine food source (Kapa'a Elementary School 1933: VI).

4. Pāka'a and the wind gourd of La'amaomao (Keahiahi)

Kapa'a also figures prominently in the famous story of Pāka'a and the wind gourd of La'amaomao. Pāka'a was the son of Kuanu'uanu, a high-ranking retainer of the Big Island ruling chief Keawenuia'umi (the son and heir to the legendary chief 'Umi), and La'amaomao, the most beautiful woman of Kapa'a and member of a family of high status *kahuna*. Kuanu'uanu left the island of Hawai'i, traveled throughout the other islands and finally settled on Kaua'i, at Kapa'a. It was there that he met and married La'amaomao, although he never revealed his background or high rank to her until the day a messenger arrived, calling Kuanu'uanu back to the court of Keawenuia'umi. By that time, La'amaomao was with child but Kuanu'uanu could not take her with him. He instructed her to name the child, if it turned out to be a boy, Pāka'a. Pāka'a was raised on the beach at Kapa'a by La'amaomao and her brother Ma'ilou, a bird snarer. He grew to be an intelligent young man and it is said he was the first to adapt the use of a sail to small fishing canoes. Although Pāka'a was told by his mother from a very young age that his father was Ma'ilou, he suspected otherwise. After constant questioning by Paka'a, La'amaomao told her son the truth about Kuanu'uanu.

Intent on seeking out his real father, Pāka'a prepared for the journey to Hawai'i Island. His mother presented him with a tightly covered gourd containing the bones of her grandmother, also named La'amaomao, the goddess of the winds. With the gourd and chants taught to him by his mother, Pāka'a could command the forces of all the winds in Hawai'i. While this story continues on at length about Pāka'a and his exploits on Hawai'i and later

on Moloka'i, it will not be dwelt upon further here. It is important to note that several versions of this story do include the chants which give the traditional names of all the winds at all the districts on all the islands, preserving them for this and future generations (Nakuina 1990; Rice 1923:69-89; Beckwith 1970:86-87; Thrum 1923:53-67; Fornander 1918:V: 78-128).

Frederick Wichman (1998:84) writes that Pāka'a grew up on a headland named Keahiahi just south of Kapa'a River. Here, Pāka`a learned to catch *mālolo*, his favorite fish. After studying the ocean and devising his plan to fabricate a sail, Pāka'a wove a sail in the shape of a crab claw and tried it out on his uncle's canoe. One day, after going out to catch *mālolo*, he challenged the other fishermen to race to shore. He convinced them to fill his canoe with fish suggesting it was the only way he could truly claim the prize if he won:

> The fishermen began paddling toward shore. They watched as Pāka'a paddled farther out to sea and began to fumble with a pole that had a mat tied to it. It looked so funny that they began to laugh, and soon they lost the rhythm of their own paddling. Suddenly Pāka'a's mast was up and the sail filled with wind. Pāka'a turned toward shore and shot past the astonished fishermen, landing on the beach far ahead of them. That night, Pāka'a, his mother, and his uncle had all the mālolo they could eat [Wichman 1998:85].

5. Kaweloleimakua

Kapa'a is also mentioned in traditions concerning Kawelo (Kaweloleimakua), Keililauokekoa (Moikeha's daughter, or granddaughter, dependent on differing versions of the tale), the *mo'o* or reptile Kalamainu'u and the origins of the *hina'i hinalea* or the fish trap used to catch the *hinalea* fish, and the story of Lonoikamakahiki (Fornander 1917, vol.4 pt.2:318, vol.4 pt.3:704-705; Rice 1923:106-108; Thrum 1923:123-135; Kamakau 1976:80).

6. Kanaka-Nunui-Moe-The Sleeping Giant

Frederick B. Wichman relates an account of Kaua'i's Sleeping Giant:

> A long time ago, there was a giant living in Kawaihau among the low hills behind Kapa'a town. He was so tall he could see above the coconut trees. If he sat very still, it was easy to mistake him for one of the hills. Anyone who did not know him was afraid of his great size, fearing

the damage he might cause. However the people of Kawaihau loved him, for he was very friendly and went out of his way to be useful.

This giant was always careful where he stepped so that he would not injure anyone and he never destroyed taro patches or houses with a careless foot. When he wished to rest, he sat on one of the small hills above Kapa'a. The villagers were glad when this happened for his weight flattened the hilltop, making another plot of ground fit for cultivation.

"He is very helpful," the Kapa'a people said to astonished stranger who came to their land. "He does many things for us quickly that otherwise we could not do in many months."Wherever this giant stepped he left keep footprints and in these deep holes the people planted banana trees. The villagers threw leaves, taro peelings, and other vegetable rubbish into these holes. When compost had been formed, they planted banana sprouts. In this way, the people of Kapa'a always had ripe bananas to give to the giant, for banana was his favorite food.

The giant yawned very often, for he was always sleepy. The gust of wind from his mouth often knocked down houses and blew the grass thatch into the sea. The giant was always very apologetic whenever this happened and he quickly brought logs from the uplands to rebuild the fallen houses and gathered *pili* for the thatching.

He found it difficult to stay awake more than a hundred years at a time. When he could no longer fight against the drowsiness overpowering him, he would sleep using a small hill for a pillow. Because of this, the people called him Kanakanunui-moe, the sleeping giant.

When he slept, Nunui slept for hundreds of years while the winds blew dirt over him and seeds were dropped there by the birds. The gently showers sent by *Kahale-lehua,* goddess of the gentle rains, fed these seeds and forest grew up over the giant. When Nunui awoke and stretched, the people of Kapa'a fled in great fear, for what they had thought to be a hill had come alive.

One time, while Nunui was still awake, the high chief of Kawaihau wanted to build a large *heiau* to honor one of his gods. This was to be no ordinary temple. The chief wanted water-polished rocks for the walls and hard *koa* wood from Kokee for the framework of the god's house.

So the chief told the Kawaihau people what he wanted them to do. They must gather rocks from the golden brown waters of the Koke`e streams and

cut *koa* trees on the edges of Waimea canyon, and gather *pili* grass that grew at Mana. "All this must be done in the turn of one moon," he ordered.

The unhappy people left their chief and silently returned to their village. The giant Nunui, stepping carefully among them, saw the long faces of the people.

"What is wrong?" he asked.

The Kapa'a villagers told him what they must do within the impossibly short time. "This cannot be done," the people said in low, sad voices. "How can we go to Kokee and bring back stones enough to build the walls in that time? And cut down the *koa* trees and bring the logs here and build the sacred house? And even if we do these things, who will cultivate our fields?"

Nunui smiled gently. "Tend to your fields," he said. "This work is nothing for me, and I'll gladly help you. Besides, it will give me something to do."

The giant went to Kokee and scooped up smooth, round boulders from the golden brown waters and brought them to Kapa'a. "Chief," he called to the astonished ruler, "show me where you wish to build this *heiau."*

The amazed chief pointed out the place set aside for the temple. Nunui placed the rocks to form a wall, fitting them so closely together that not even a mouse could squeeze between the cracks. Within a week, he had built a strong, thick, handsome wall around the sacred place.

Nunui returned to the edge of Waimea Canyon and cut down *koa* trees and trimmed them into the shaped he needed. He carried these back and made the framework of the house. He gathered *pili* grass form Wild and wrapped the stems into bundles, tied these bundles to the framework, and within half the time the chief had set, the *heiau* was finished.

Everyone was happy. The farmers had been able to keep up with their chores, the chief had his *heiau,* and Nunui had something to do. There was even time enough a celebration. The chief ordered all his people to gather bananas and to pound sweet potatoes and taro into poi. Some people hurried to slaughter pigs and dogs to be cooked in the *imu,* while other paddled out to sea to fill their canoes with fish and sent their wives to gather seaweed and *opihi* from the reef. At last, enough food for everyone was ready, and the chief, the villagers, and Nunui sat down before the overflowing bowls and platters.

"Eat," said the chief to Nunui. "After the work you have done, you must be hungry."

> The giant ate all the food that had been put before him. When he was through, his stomach bulged and he was very sleepy. He chose a comfortable hill just a short distance above Kapa'a town. Nunui stretched a last time, lay down along the top of the hill, and soon was sound asleep.
>
> As he slept through the years, the winds blew dirt over him and the birds brought seeds. Ka-hale-lehua, goddess of the gentle rains, sent showers to water the plants that now covered the giant.
>
> So Kanaka-nunui-moe sleeps and sleeps and has come to resemble a long hill with a lump at one end where his nose is and lumps at the other ends where his feet are. He no long looks like a living being, but one day, perhaps soon, his eyes will open, he'll yawn and stretch his arms, and sit up. [Wichman 1985:13-16]

7. Lepeamoa

In the Legend of "Lepeamoa (The Chicken Girl of Palama)"(Thrum 1923:177) is a reference to a fantastic battle at Kapa'a between Lepeamoa's brother, the hero Kauilani and a supernatural kupua called Akuapehuale ("god of swollen billows"):

> Kauilani struck him a heavy blow and the spear leaped again and again upon him, till he rolled into a mountain stream at a place called Kapa‘a, out of which he crawled, almost drowned. Then he was driven along even to the image houses, where a fierce battle took place, in which the wooden images took part, many of them being torn to pieces by the teeth of Akuapehuale.

8. Palila and Ka`ea

High in the *mauka* region of Kapa‘a in the Makaleha mountains at a place called Ka`ea, is reported to be the supernatural banana grove of the Kaua`i *kupua* or demigod Palila, grandson of Hina (Handy and Handy 1972:424). Joseph Akina for *Kieoko ’a* Newspaper in 1913 describes Palila's banana grove:

> The stalk could hardly be surrounded by two men, and was about 35 feet high from the soil to the lowest petiole. The length of the cluster from stem to lowest end of the bunch of bananas was about 1 3/4 fathoms long (one *anana* and one *muku).* There were only two bananas on each about 4 '/2 inches around the middle. There were just two bananas, one on the east side and one on the west, each about a foot or more in length. The one on the east side was tartish, like a *waiawi* (Spanish guava) in taste and the one on the west was practically tasteless. The diameter of the end of the fruit stem of this banana seemed to be about 11/2 feet. This kind of banana plant and its fruit seemed almost supernatural... (Akina, 1913:5).

9. Winds

The winds of Kapa‘a and Waipouli are named in the *mo‘olelo* of Kuapaka‘a and these include the *kehau* for Kapa‘a, the *ho‘olua* for Makaiwa and the *inuwai* for Waipouli (Fornander 1917:IV:96). A *kama‘āina* interviewed for the 50th anniversary book of Kapa‘a School in 1933 (p. 28) identified the winds of Kapa‘a:

> ...Some persons call the wind MAKANI LIHUE: That is, those who live here in Kapa‘a, because the wind comes from Lihue. The wind we had on Jan. 30 was really, MAKANI LIHUE. The wind that comes from Hanalei is called MAKANI KIU which means, a very cold wind. The wind that comes from the northeast—(tradewind) is called MAKANI HOOLUA. This is the plant destroying wind...

Place Names and Wahi Pana of Kapa‘a

Place names and *wahi pana* (“legendary place”) (Pukui and Elbert 1986:377) are an integral part of Hawaiian culture. “In Hawaiian culture, if a particular spot is given a name, it is because an event occurred there which has meaning for the people of that time” (McGuire 2000:17). The *wahi pana* were then passed on through language and the oral tradition, thus preserving the unique significance of the place. Hawaiians named all sorts of objects and places, points of interest that may have gone unnoticed by persons of other cultural backgrounds.

Hawaiians named taro patches, rocks and trees that represented deities and ancestors, sites of houses and *heiau* (places of worship), canoe landings, fishing stations in the sea, resting places in the forests, and the tiniest spots where miraculous or interesting events are believed to have taken place. (Pukui et al. 1974:x)

The following is a list of place names for Kapa‘a, mentioned in this report. This list should by no means be considered complete. Place names were gathered from traditional literature (*mo‘olelo*, chants), historical sources, maps and the Māhele records. Almost all of the *‘ili* names were taken from Land Commision Award records. Sadly, none of these *‘ili* names were documented on historic maps researched for this project, and their meanings and cultural associations appear to be lost and forgotten.

Place Names of Hawai‘i (Pukui et al. 1974) was used as the primary source for all place name translations. Where there were no known translations, a literal translation of the place name was sometimes made using the *Hawaiian Dictionary* (Pukui and Elbert 1986). The intent of the author is merely to present the available information and let the reader come to his/her own conclusions.

An attempt was made to include the proper diacritical marks for all known and generally accepted translations of place names. Making incorrect assumptions about the pronunciation and where to place the diacritical marks in a name can entirely change the meaning of a name, (e.g. *pū'ā'ā*: "scattered; to flee in disorder and fright"; *pua'a*: "pig, pork"). Therefore, in cases where the pronunciation of a name was uncertain, diacritical marks were not used and no attempt was made to translate the name. In some cases, cultural relationships were made based on the literal translation of the root word.

One of the beauties of the Hawaiian language is the dualism in names and the double meanings—the literal meaning and the *kaona* or hidden meaning. It should be remembered that the true significance of a place name lies only with the people who use them and know their history.

The following abbreviations are used throughout the Place Names section for ease and efficiency. (Refer to the References section for complete citations.)

LCA=Land Commission Award

PE=Hawaiian Dictionary by Pukui and Elbert, 1986

PEM=Place Names of Hawai´i by Pukui, Elbert and Mookini, 1974

Table 1 Place Names of Kapa'a.

Name	Meaning	Reference
Apopo	Land division, possibly 'ili in Kapa'a, pali, Literally "tomorrow"?	(LCA #10907/#8343) Soehren (2002:265)
Awawaloa	The name of a land division, possibly an 'ili in Kapa'a in which lo'i were cultivated meaning - long valley, gulch, ravine.	(LCA #8843/#8837), (Soehren, 2002:265)
Hahanui /Kahanui	The name of an 'ili in Kapa'a where lo'i were claimed pali, stream, Lobelia plant?	(LCA #10564/#3554/#3599), (Soehren, 2002:265)
Hoa	Pali, Literally "Friend"?	(LCA#3638:1) (Soehren, 2002:265)
Ho'opi'i	Wailele, Literally "To cause to rise?"	(Soehren, 2002:265)
Humu'ula	Pu'u, Literally "Jasper stone?"	(LCA #8247) (Soehren, 2002:265)
Kahana	The name of a land, possibly an 'ili in Kapa'a where uncultivated lo'i were claimed Literally, "cutting"	(LCA 3971). (PEM: 63), (Soehren, 2002:265)

Name	Meaning	Reference
Kaiakea/Kaikea	Name of area encompassing Kuahiahi Point. "Kaikea: White sea foam, especially as washed up on a beach: ka'ike'a: Station of the cross (Catholic); procession of the cross"	(PE:116).
Kalolo/Kaloko	The name of a village or houselot in Kapa'a Ahupua'a Kauhale, kula, Literally, "the pond", " liquor"	(LCA#3638, #8843), (Soehren, 2002:265)
Kaloloku	Name of swamp in back of Kapa'a and Waipouli	
Kamahuna	Pu'u	(Soehren, 2002:265)
Kamali'i	Ridge, Literally "Children"	(Soehren, 2002:265)
Kapa'a	Ahupua'a name, Literally "solid" or "the closing"	(Wichman, 1988:84 and Soehren, 2002:265)
Kapahi	Village, stream, Literally "the Knife"	(Soehren, 2002:265)
Kapeku	Lo'i, Literally "the Kick"	LCA# 8837, (Soehren, 2002:265)
Kaulolo	Kauhale	LCA# 3638, (Soehren, 2002:265)
Kehau	Name of wind of Kapa'a	(Fornander, 1918:V:96, 97)
Keiwa	Ridge, boundary point, Literally "The ninth"	(Soehren, 2002:265)
Koalua	Surf, Literally "Two coral heads",	Finney 1959, (Soehren, 2002:265)
Kolehaka	Pali,	LCA#3971/#3243 (Soehren, 2002:265)
Kolokolo	Name of deep fresh water pond, Literally "Soap Plant"	Wichman (1988:84)
Kolouna	Pali,	LCA# 8247, (Soehren, 2002:265)
Kuahiahi/Kaahiahi	Name of rocky headland at north end of Kapa'a Ahupua'a;	
Kuahiahi/Keahiahi	Location of first Kapa'a School (1883-1908); location of former heiau called Kuahiahi, place where the legendary figure Paka'a, keeper of the wind gourd of La'amaomao, grew up and fished Literally "twilight"	(PEM 211 :216) ; (Wichman 1998 : 85)
Kupali'i	Name of a pond in Puna district famed in chant for the rustling of the manienie grass	(PEM: 211-216)

Name	Meaning	Reference
Kupanihi	The name of a pond in the Puna district associated with Kaeo, Kaumuali'i's older brother, ili, kauhale, Name of fishpond and land in Kapa'a claimed	(PEM:216); in LCA #3971/#3243, (Soehren, 2002:265)
Maeleele	The name of a land division, possibly an 'ili in Kapa'a in which lo'i Literally "Numb" were cultivated,	(LCA #3638), (Soehren, 2002:265)
Makaleha	Pu'u, boundary point, Eyes looking about as in wonder and admiration,	Boundary Commission, (Soehren, 2002:265)
Makanalimu	Place, heiau, Literally "Gift of seaweed"	PEM:141
Makea	'Auwai, Literally "fallow land"	LCA# 3599/#3554 (Soehren, 2002:265)
Moalepe/Moalepi	Hill in the mauka region of Keālia (HAS, Interior Dept., Land, June 23, 1862); land division, stream possibly an 'ili in mauka region of Kapa'a	LCA #8247 (Soehren, 2002:265)
Moikeha Canal	Canal which is traversed by two plantation era railroads near the present day Kapa'a Public Library and the Coral Reef Hotel	
Naele	Pali, Literally "swamp, big"	LCA #8837, (Soehren, 2002:265)
Paikahawai	'ili,	(Soehren, 2002:265)
Pohakiikii	Pu'u, Tilted stone,	(Soehren, 2002:265)
Pohakupili	Pu'u, boundary point, Literally " joined stone",	(Soehren, 2002:265)
Poo	Surf, Literally "Head"	Finney 1959, (Soehren, 2002:265)
Pueo	Pali, Literally "owl",	LCA# 8843, (Soehren, 2002:265)
Puhi	The name of a village or household in Kapa'a Ahupua'a, Kauhale, pond, Literally "eel",	LCA #3554/#3599, (Soehren, 2002:265)
Puohomaka	Pali,	LCA# 8837, (Soehren, 2002:265)
Pupukai	Pali,	LCA# 3638, (Soehren, 2002:265)
Puu Ekeeke	Pali,	LCA# 8837, (Soehren, 2002:265)
Puu Lauii	Pu'u, boundary point, Laui'i fern hill,	Boundary Commission,(Soehren, 2002:265)
Ulakiu	Ku,	LCA# 8837, (Soehren, 2002:265)
Ulukiu	Name of a houselot or village in Kapa'a	(LCA #8837

Name	Meaning	Reference
Waika'ea	Canal and boat ramp in Kapa'a adjacent to the present day Pono Kai Resort, ditch,	(Clark 2002:374), (Soehren, 2002:265)
Waikaeee	A place described as being located in the uplands near Nounou	(PEM Placenames, Ku'oko'a, May 2, 1913)
Waileia	Rock, boundary point, Literally "Abundant Water"	Boundary Commission, (Soehren, 2002:265)
Waimahanalua	Name of a stream and school located near the old Makee The name mahanalua suggests the stream was forked and fed by multiple streams which could well be the case since the backlands of Kapa'a were swamplands fed by many streams. near the present day Moikeha Canal.	(PEM Placenames, Ku'oko'a May 9, 1913).
Waitala	"local" name used to refer to Waika´ea Canal	(T. Sokei, July 28, 2003 in Bushnell et.al. 2004)

Summary of the Mythological and Traditional accounts of Kapa'a

A survey of traditional mythological literature shows Kapa'a prominently associated with some of the most famous legendary and historical figures including Maui, Kawelo, Mo'ikeha, Maweke, Palila, Paka'a and Kanaka Nunui Moe. What few specific references there are suggest that high status habitation was focused near the coast with less intensive utilization of the uplands which were regarded as wild places. The most notable feature of the traditional accounts are the references to grasses and sedges (*Kalukalu* grass and *Ahuawa* rushes) which undoubtedly reflects in part the natural marsh lands near the coast but may also reflect transformation of the landscape through a denudation of trees by the activities of a relatively dense population harvesting slow growing trees for firewood and construction materials over many centuries.

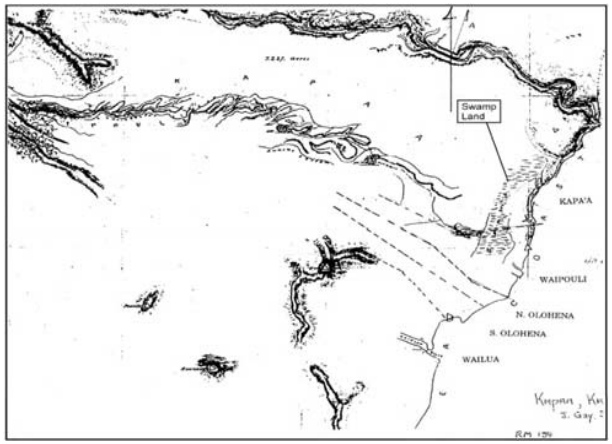


Figure 3. Portion of 1872 Survey Map by James Gay, Showing Swamp Land in Puna.

Early Post-Contact Period

Very few recorded observations exist for this period in Kapa'a's history. George Vancouver (1798:2:221-223) examined the east coast of the island from his ship in 1793 and stated that it was the "most fertile and pleasant district of the island..." However, he did not anchor nor go ashore there due to inhospitable ocean conditions.

Kiaimakani stands out as a particularly interesting Hawaiian chief in the early post-contact history of Waipouli. In 1824, the brig, "Pride of Hawaii," owned by Liholiho (Kamehameha II), ran aground in Hanalei Bay. Hiram Bingham (1847:221-222) recorded the efforts of a great crowd of Hawaiians to pull the vessel to shore for salvage:

> Kiaimakani passed up and down through the different ranks, and from place to place, repeatedly sung out with prolonged notes, and trumpet tongue... 'be quiet - shut up the voice.' To which the people responded...'say nothing,' as a continuance of the prohibition to which they were ready to assent when they should come to the tug. Between the trumpet notes, the old chieftain, with

> the natural tones and inflections, instructed them to grasp the ropes firmly, rise together at the signal, and leaning inland, to look and draw straight forward, without looking backwards toward the vessel. They being thus marshalled and instructed, remained quiet for some minutes, upon their hams.

The salvage efforts ultimately failed and the brig was lost. Bingham's account vividly suggests the force of personality of the chief and further betokens an authority and stature that may have been founded upon the traditional prestige of his domain, Waipouli.

Kiaimakani appears in Samuel Kamakau's account (1961:267) of the 1824 rebellion of the chiefs of Kaua'i upon the death of Kaumuali'i. Kalanimoku, representative of Kamehameha II, had called a council of the Kaua'i chiefs at Waimea during which he announced

> "The lands shall continue as they now stand. Our son, Kahala-i'a, shall be ruler over you." A blind chief of Waipouli in Puna, named Ki'ai-makani, said, "That is not right; the land should be put together and re-divided because we have a new rule," but Ka-lani-moku would not consent to this.

After some Kaua'i chiefs, including Kiaimakani, rebelled against the imposed decrees:

> On August 8 [1824] the battle of Wahiawa was fought close to Hanapepe. The Hawaii men were at Hanapepe, the Kauai forces at Wahiawa, where a fort had been hastily erected and a single cannon (named Humehume) mounted as a feeble attempt to hold back the enemy...Large numbers of Kauai soldiers had gathered on the battleground, but they were unarmed save with wooden spears, digging sticks, and javelins...No one was killed on the field, but as they took to flight they were pursued and slain. So Kia'imakani, Na-ke'u, and their followers met death [Kamakau 1961: 268].

Kamakau´s singling out of Kiaimakani for special mention reinforces the impression that the chief and his *ahupua'a* may have shared a traditional prestige.

In 1840, Peale and Rich, with Charles Wilkes' United States Exploring Expedition, traversed the coastline there on horseback heading north from Wailua:

> The country on the way is of the same character as that already seen. They passed the small villages of Kuapau, Keālia, Anehola, Mowaa, and Kauharaki, situated at the mouths of the mountain streams, which were closed with similar sand-bars to those already described. These bars afforded places to cross at, though requiring great precaution when on horseback. The streams above the bars were in most cases deep, wide, and navigable a few miles for canoes. Besides the sugarcane, taro, &c., some good fields of rice were seen. The country may be called open; it is covered

> with grass forming excellent pasture-grounds, and abounds in plover and turnstones, scattered in small flocks [Wilkes 1845:69].

James Jarves (1844:157), who tracked much of the same route as Peale and Rich, noted "nothing of particular interest is met with on the road, until arriving at Anahola."

The Mahele Period

The Organic Acts of 1845 and 1846 initiated the process of the Mahele, which introduced private property into Hawaiian society. It is through information garnered from records for Land Commission Awards (LCAs) generated during the Mahele that specific documentation of traditional life in Kapa‘a come to light.

Table 2. Mahele Land Claims and Land Use of Kapa‘a.

LCA Number	Ahupua‘a	Claimant	‘Ili of the Ahupua‘a	Land Use	Number of ‘Āpana
3243 (See 3971)	Kapa‘a	Honolii, Ioane	Kahana, Kupanihi Village	6 *lo‘i* (uncult), house lot	2 (2 acres, 1 rood, 1 ord)
3554	Kapa‘a	Keo	Kahanui Puhi Village	15 *lo‘i*, house lot	2 (7 acres, 1 rood, 17 rods)
3638	Kapa‘a	Huluili	Maeleele Kaloko Village	12-15 *lo‘i*, house lot	2 (5 acres, 1 rood, 19 rods)
8247	Kapa‘a	Ehu	Moalepe / Noalepe	20 *lo‘i*,	1 (3 roods)
8837	Kapa‘a	Kamapaa	Ulukiu lalo Awawaloa Ulukiu	3 *lo‘i*, 2 *lo‘i*, house lot	1 (2 acres, 2 roods, 27 rods)
8843	Kapa‘a	Kiau	Apopo Kalolo Village	6 (5) *lo‘i* and *kula*, house lot	2 (2.75 acres, 3 rods)
10564	Kapa‘a	Oleloa, Daniel	Hikinui farm	fishpond, 10 *lo‘i*	

Kapa’a Land Commission Awards

Documents relating to Land Commission Awards (*kuleana*) during this period show, surprisingly, that only six individuals were awarded *kuleana* parcels in the relatively large *ahupua‘a* of Kapa‘a. Five of the six received multiple parcels and show characteristic similarities. They are Keo (LCA #3554, 3599), Kiau (#8843), Kamapaa (#8837), Ioane Honolii (#3971), and Huluili (#3638) (See Table 1). All five had *lo‘i* on the *mauka* side of the lowland swamp area, sometimes extending a short distance up into small, shallow gulches and valleys. Each also had a separate house lot located on the *makai* side of the swamp, adjacent to the beach.

Interestingly, the residential "village" of Kapa‘a did not exist as a single entity, but was a series of small settlements or compounds that stretched along the shoreline of the *ahupua‘a* and included (south to north) Kupanihi (Makahaikupanihi), Kalolo (Kaulolo), Puhi, and Ulukiu. The sixth individual, Ehu (#8247), was the only person to be awarded a single parcel in the upland area of Kapa‘a at Moalepe valley, approximately five miles from the shore. In 1848, when Ehu made his claim, he was the only one living there. A few years later, according to Honoli‘i’s testimony to support Ehu’s claim, "There are no houses and no people now living on the land. Ehu found himself lonely there, all his neighbors having either died or left the land. Ehu now lives in Wailua." Ehu may have been the last person to live at and cultivate in the traditional way the far *mauka* region of Kapa‘a.

A check of the Foreign Testimony (F.T) for *Kuleana* Claims to Quiet Land Titles in the Hawaiian Islands (1848-50) reveals the names of three *‘auwai* in Kapa‘a. Cross-referencing this information with various maps gives a general indication of their location: Makahaikupanihi, along the southern border near the shore and the settlement in Waipouli; Makea, near the current Kapa‘a Public Library on the *mauka* side of Kūhiō Highway; and Kapa‘a, probably along the current Kanaele Road.

There were no *kuleana* claims found within the project area.

The Late 1800s

In 1849, a son of Wai‘oli missionaries, William P. Alexander, recorded a trip he took around Kaua‘i. Although, he focuses on the larger mission settlements like Koloa and Hanalei, he does mention Kapa‘a:

> A few miles from Wailua, near Kapa‘a, we passed the wreck of a schooner on the beach, which once belonged to Capt. Bernard. It was driven in a gale over

> the reef, and up on the beach, where it now lies. A few miles further we arrived at Kealia. We had some difficulty crossing the river at this place, owing to the restiveness of our horses. The country here near the shore was rather uninviting, except the valley which always contained streams of water (Alexander, 1991: 123).

In later years, the notorious Kapa'a reef was to become the location of many shipwrecks particularly once a landing was built there in the 1880s.

Although most of the historic record documents for Kaua'i in this period revolve around missionary activities and the missions themselves, there was indication that the Kapa'a area was being considered for new sugar cane experiments, similar to those occurring in Koloa. In a historic move, Ladd and Company received a 50 year lease on land in Koloa from Kamehameha III and Kaua'i Governor Kaikio'ewa of Kaua'i. The terms of the lease allowed the new sugar company "the right of someone other than a chief to control land" and had profound effects on "traditional notions of land tenure dominated by the chiefly hierarchy" (Donohugh, 2001: 88). In 1837, a very similar lease with similar terms was granted to Wilama Ferani, a merchant and U.S. citizen based in Honolulu (Hawai`i State Archives, Interior Dept., Letters, Aug. 1837). The lease was granted by Kauikeaouli or Kamehameha III for the lands of Kapa'a, Kealia and Waipouli for twenty years for the following purpose:

> ...for the cultivation of sugar cane and anything else that may grow on said land, with all of the right for some place to graze animals, and the forest land above to the top of the mountains and the people who are living on said lands, it is to them whether they stay or not, and if they stay, it shall be as follows: They may cultivate the land according to the instructions of Wilama Ferani and his heirs and those he may designate under him... (Hawai`i State Archives, Interior Dept., Letters, Aug. 1837).

Unlike Ladd & Company which eventually became the Koloa Sugar Company, there is no further reference to Wilama Ferani and his lease for lands in Kapa'a, Kealia and Waipouli. In a brief search for information on Honolulu merchant, Wilama Ferani, nothing was found. It is thought that perhaps Wilama Ferani may be another name for William French, a well known Honolulu merchant who is documented as having experimented with grinding sugar cane in Waimea, Kaua'i at about the same time the 1837 lease for lands in Kapa'a, Kealia and Waipouli was signed (Joesting, 1984: 152).

The sugar industry came to the Kapa'a region in 1877 with the establishment of the Makee Sugar Company and subsequent construction of a mill near the north end of the present town. Cane was cultivated mainly in the upland areas on former *kula* lands. The first crop was planted by the *Hui* Kawaihau, a group composed of associates of King

David Kalākaua. The king threw much of his political and economic power behind the project to ensure its success (Dole 1929:8-15). The *Hui* Kawaihau was originally a choral society begun in Honolulu whose membership consisted of many prominent names, both Hawaiian and *haole*. It was Kalakaua's thought that the *Hui* members could join forces with Makee, who had previous sugar plantation experience on Maui, to establish a successful sugar corporation on the east side of Kaua'i. Captain Makee was given land in Kapa'a to build a mill and he agreed to grind cane grown by *Hui* members. Kalakaua declared the land between Wailua and Moloa'a, the Kawaihau District, a fifth district and for four years the *Hui* attempted to grow sugar cane at Kapahi, on the plateau lands above Kapa'a. After a fire destroyed almost one half of the *Hui's* second crop of cane and the untimely death of one of their principal advocates, Captain James Makee, the *Hui* began to disperse and property and leasehold rights passed on to Makee's son-in-law and new Makee Plantation owner, Colonel Z. S. Spalding (Dole, 1916: 14). As part of the infrastructure of the new plantation, a sugar mill was erected and the Makee Landing was built in Kapa'a during the early years of the Makee Sugar Plantation. Following Captain Makee's death, Colonel Spalding took control of the Plantation and in 1885 moved the mill to Kealia (Cook, 1999: 51). The deteriorating stone smokestack and landing were still there well into the 1900s (Damon, 1931:359).

A train line went inland from Kapa'a Town from the coast along the present Lehua Street alignment heading south behind Kapa'a Town. This railroad line skirts the rice lands behind Kapa'a Town. Another branch ran between Hauaala and Hundley Roads and the branch from behind Kapa'a Town joined the Hauaala/Hundley railroad alignment where the proposed corridors for this project join the present Kūhiō Highway. The train line continued north to the Keālia (Kapa'a) River. Chinese rice farmers had begun to cultivate the lowlands of Kapa'a with increasing success about this same time. Several Hawaiian *kuleana* owners leased or sold outright their parcels *mauka* of the swampland to rice cultivators. Concurrently, the economic activity as a result of the rice and sugar cultivation sparked interest in the house lot *kuleana* on the *makai* side of the marsh for increasing commercial and residential development (Lai 1985:148-161). This land was drained and used for cane in the early 20th century before more recent urbanization of the area.

Narrow wagon roads gave way to macadamized roads in the early part of the 20th century. This new road was called the Kaua'i Belt Road and parts of it are thought to have followed the "Old Government Road" (Cook, 1999). In Kapa'a, the present day Kuhio Highway probably follows the same route as the original Government Road and subsequent Kaua'i Belt Road. The location of the *kuleana* awards in Kapa'a indicates that the majority of the house lots were situated along the Government Road. LCA 3243 names a "road" as one of its boundaries.

20th Century History of Kapaʻa

In the early 1900s, government lands were auctioned off as town lots in Kapaʻa Town to help with the burgeoning plantation population. Many of these lots were purchased by Portuguese and Japanese laborers who had fulfilled their contract duties with Makee Plantation. One *kamaʻāina* interviewed for a previous project in Kapaʻa mentioned that in the 1930s and 1940s, the area north of Moʻikeha Canal in Kapaʻa was mostly settled by Portuguese families (W. Kaneakua in Bushnell et al. 2002:28). The Japanese were also very prominent in the 1920s and 1930s, largely replacing the Chinese merchants of the turn of the century in the Kapaʻa business sector.

Though most of the large plantation camps were located in neighboring Keālia, there were a few in Kapaʻa. Many people consulted had clear memories of the plantation camps in Kapaʻa: a fairly large camp located just behind Kapaʻa Town and three smaller camps located in the hills above Kapaʻa. The large camp, Pueo Camp (Figure 6), was located adjacent to the intersection where the current Kapaʻa Bypass Road turns off of Olohena Road (Interview w/ A. Paik, 5/14/03 in Bushnell et. al. 2004). One Kapaʻa resident who grew up in Pueo Camp remembers the camp being quite large with between 75 and 100 people, mostly single Filipino and Chinese men with some Japanese families and a few Hawaiian and Portuguese families Pueo Camp is thought to be a fairly early Makee Plantation Sugar Camp built strategically adjacent to the railroad tracks which accessed the sugar fields in the upland areas of Kapaʻa. Though no one consulted knew the date Pueo Camp was established, the oldest of our informants, Mrs. Alice Paik, born in 1912, knew the camp was there before she was born (Interview w/ A. Paik, 5/14/03 in Bushnell et. al. 2004). Pueo camp was destroyed sometime in the 1950s. The other three camps located in the hills adjacent to or just off of Olohena Road were considerably smaller than Pueo Camp. These consisted of Stable Camp, 35 Camp and 18 Camp (See Figure 6). Two other camps in the Kapaʻa/Waipouli area were also mentioned. Aguiar camp was a residential camp for employees of the pineapple industry, and Mundon Camp was thought to be a residential camp for Lihue Plantation workers (Interview w/ G. Hiyane, 5/14/03 in Bushnell et. al. 2004).

Pineapple became the next largest commercial enterprise in the region. In 1913, Hawaiian Canneries opened in Kapaʻa at the site now occupied by Pono Kai Resort (Cook 1999:56; Figure 6). The Kapaʻa Cannery provided employment for many Kapaʻa residents and many of the informants for this project mentioned having worked in the cannery during some time of their lives. By 1960, 3400 acres were in pineapple and there were 250 full time employees and 1000 seasonal employees for the Kapaʻa Cannery. However, in 1962, Hawaiian Canneries went out of business due to competition from third world countries.

The Ahukini Terminal & Railway Company was formed in 1920 to establish a railroad to connect Anahola, Keālia and Kapaʻa to Ahukini Landing at Hanamāʻulu and to "provide relatively cheap freight rates for the carriage of plantation sugar to a terminal outlet" (Condé and Best 1973:185). This company was responsible for extending the Makee Sugar Company railroad line from the Makee Landing [formerly located near the present day Coral Reef Hotel] to the Ahukini Landing at Hanamāʻulu Bay. This railroad line traversed near much of the study area (Figures 4 & 5) and was in use from 1921, through the take-over by Lihue Plantation Company in 1934 and until Lihue Plantation converted from railroad transport to trucking in the late 1950s.

Lihue Plantation was the last plantation in Hawaiʻi to convert from railroad transport to trucking (Condé and Best 1973: 167). In 1955, reports came out on the dredging for coral proposed for the reef fronting Kapaʻa Beach Park (*Garden Island Newspaper*, September 21, 1955). This coral was to be used for building plantation roads. The dredging was later blamed for accelerated erosion along Kapaʻa Beach (*Garden Island Newspaper*, October 30, 1963). Today, there are several sea walls along the Kapaʻa Beach Park to check erosion. Old time residents claim the sandy beach at Kapaʻa was once much more extensive than it is now. "By 1957 the company was salvaging a part of their plantation road, which was being supplanted by roads laid out for the most part on or close to the old rail bed" (Condé and Best 1973: 167). By 1959, the plantation had completely converted over to trucking.

Severe floods in Kapaʻa in 1940 led to the dredging and construction of the Waikaea and Moikeha Canals sometime in the 1940s (Territorial Planning Board 1940:7). Although the Waikaea Canal, bordering the Kapaʻa Pineapple Cannery, had been proposed as early as 1923, nothing was constructed until after the floods (Bureau of Land Conveyances, Grant 8248). A Master Plan for Kapaʻa, published in 1940, asks the Territorial Legislature for funds to be set aside for the completion of a drainage canal and for filling *makai* and *mauka* of the canal (Territorial Planning Board 1940:7). In 1955, reports came out on the dredging for coral proposed for the reef fronting Kapa'a Beach Park *(Garden Island Newspaper,* September 21, 1955). The coral was to be used for building plantation roads. This dredging was later blamed for accelerated erosion along Kapa'a Beach (Garden Island Newspaper, October 30, 1963).

Today, there are several sea walls along the Kapa'a Beach Park to check erosion. Old time residents claim the sandy beach in Kapa'a was once much more extensive than it is now (Bushnell et al. 2002).

Many of the plantation workers bought property of their own and moved out of plantation camps. The plantation camps which bordered Kahio Highway were disbanded in the 1980s. The Lihue Plantation began to phase out in the last part of the 20th century. Kapa'a Town suffered after the closing of the Kapa'a Cannery, however the growing tourist industry helped to ease the economic affects of the Cannery's closing.

Figure 4. Aerial View of Kapa'a, Kaua'i, looking west, circa 1933 (Bishop Museum Archives)

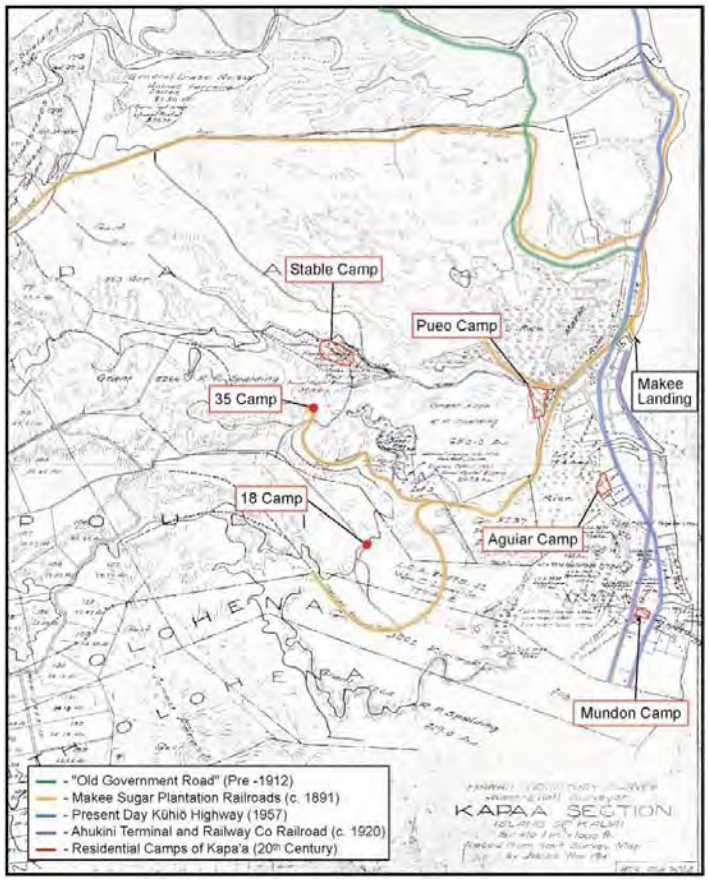


Figure 5. Hawai'i Territory Survey Map (Iao 1914) of Kapa'a Section Showing Roads, Railroads and Camps

Previous Archaeological and Cultural Studies of Kapa‘a

During their expeditions around Hawai‘i in the 1880s collecting stories from *ka pō‘e kahiko*, Lahainaluna students stopped in Kapa‘a and Kealia and gathered information regarding *heiau* of the region (Bishop Musuem Archives (HEN I:214). Fourteen *heiau* were named, suggesting that these two *ahupua‘a* were probably more socially/politically/religiously significant in ancient times and a testament to the substantial population of these *ahupua ‘a*.

Unfortunately, the locations for most *heiau* were given as Kapa‘a/Kealia, indicating that the exact location of the *heiau* was not identified. Of the fourteen *heiau*, five are definitely located in Kapa‘a. These include the locations of *wahi pana* or sacred places, Mailehuna (in the area of the present day Kapa‘a School), Pueo, Kuahiahi ((also spelled Kaahiahi and Keahiahi) the site of the first Government School in Kapa‘a—adjacent to the Kuhiö Highway near the northern boundary of Kapa‘a Ahupua‘a), Makanalimu (in upland of Kawaihau) and Kaluluomoikeha. Kaluluomolkeha is thought to be the general area near the Mo`ikeha Canal and the present day Coral Reef Hotel.

There are no known remains of these *heiau* today. The exact locations of these *heiau* are unknown.

Table 3. Heiau of Kapa‘a

Name	Location	Type	Associated
Mailehuna	Kapa‘a (Mailehuna is the area of the present day Kapa‘a School)	unknown	Kiha, Kaumuali‘i/ Lukahakona
Pueo	Kapa‘a	unknown	Kiha, Kaumuali‘i/ Lukahakona
Pahua	Kapa‘a/Kealia	unknown	Kiha/ Lukahakona
Kumalae	Kapa‘a/Kealia	unknown	Kiha/ Lukahakona
Waiehumalama	Kapa‘a/Keilia	unknown	Kiha/ Lukahakona
Napu‘upa‘akai	Kapa‘a/Kealia	unknown	Kiha/ Lukahakona
Noeamakali`i	Kapa‘a/Kedlia	"heiau for birth of Kaua‘i Chiefs, like Holoholoku"	Unknown
Pu'ukoa	Kapa‘a/Kealia	"unu type heiau"	Unknown
Piouka	Kapa‘a/Kealia	"unu type heiau"	Unknown
Una	Kapa‘a/Kealia	Unknown	Kiha/ Lukahakona
Mano	Kapa‘a/Kealia	Unknown	Kiha/ Lukahakona

Name	Location	Type	Associated
Kuahiahi	Kapa‘a (govn't school stands on site now)	Unknown	Kaumuali‘i/ Lukahakona
Makanalimu	Upland of Kawaihau	Unknown	Kaumuali‘i
Kaluluomoikeha	Kapa‘a	Unknown	Mo‘ikeha

4. Historic Properties in Kapa‘a Ahupua‘a (see Figure 6)

Site # 50-30-08-	Ahupua‘a	Site Type/ Name (if any)	Location	Site Constraints	Reference
B001	Kapa‘a	Historic Cemetery	South of bend of Kapa‘a Stream, a kilometer mauka from Kuhiö Hwy	Appears to be a discrete historic cemetery	Kikuchi and Remoaldo 1992
B002	Kapa‘a	Historic Cemetery	Just mauka from Kuhiö Highway, south of Kapa‘a Stream	Appears to be a discrete historic cemetery	Kikuchi and Remoaldo 1992
B003	Kapa‘a	Kapa‘a Public Cemetery	South of Kanaele Road, one kilometer inland of Kuhiö Highway	Appears to be a discrete historic cemetery	Kikuchi and Remoaldo 1992
B004	Kapa‘a	Historic Cemetery	North of Apopo Road, one kilometer inland of Kuhiö Highway	Appears to be a discrete historic cemetery	Kikuchi and Remoaldo 1992
B013	Kapa‘a	Historic Cemetery	Just mauka from Kuhiö Highway, north of the Waikaea Canal	Appears to be a discrete historic cemetery	Kikuchi and Remoaldo 1992
B014	Kapa‘a	All Saints Episcopal Church Cemetery	Just mauka from Kuhiö Highway, south of the Waikaea Canal	Appears to be a discrete historic cemetery	Kikuchi and Remoaldo 1992:62-65
547	Kapa‘a	sub-surface features including a firepit and a possible house foundation	South of bend of Waikaea Canal, mauka of Kuhiö Highway	Archaeological monitoring in the vicinity is recommended	Spear 1992:3

Site # 50-30-08-	Ahupua'a	Site Type/ Name (if any)	Location	Site Constraints	Reference
626	Kapa'a	Burial	'Inia Street, makai of Kuhiö Highway, central Kapa'a	Consultation and monitoring in vicinity indicated	Jourdane 1995
748	Kapa'a	Minimal findings, a weak cultural layer (buried A-horizon)	South of the bend of the Waikaea Canal, mauka of Kuhiö Highway	Considered no longer significant within project area	Hammatt et al. 1994
789	Kapa'a/ Kealia	Historic Road	Coastal Cane Haul Road near Kawaihau Road turn off		Perzinski et al. 2000
867	Kapa'a	1 set of human remains	Kukui Street, just mauka of Kuhiö Highway, Kapa'a Town	Consultation and monitoring in vicinity indicated	Creed et al. 1995:50
868	Kapa'a	1 set of human remains	Lehua Street mauka of Kuhiö Highway, Kapa'a Town	Consultation and monitoring in vicinity indicated	Creed et al. 1995:50
871	Kapa'a	13 sets of human remains (Creed et al. 1995:50)	Inia Street, makai of Kuhiö Highway	Consultation and monitoring in vicinity indicated	Kawachi 1994; Creed et al. 1995:50
1848	Kapa'a	Cultural layer and sub-surface features	Along Kuhiö Highway between Wana Road and the Waikaea Drainage Canal	Archaeological monitoring in the vicinity is recommended	Hammatt 1991; Creed et al. 1995
1849	Kapa'a	Cultural layer and sub-surface features; Creed et al. 1995:53 expands boundaries to incl. burial sites, -626, -867, -868 -871, and -1894	Along Kuhiö Highway between Inia Street and Kauwila Street extending to the coast	Consultation and monitoring in vicinity indicated	Hammatt 1991; Creed et al. 1995
1894	Kapa'a	11 sets of human remains	Ulu Street, just north of Kuhiö Highway, Kapa'a Town	Consultation and monitoring in vicinity indicated	Creed et al. 1995:50

Site # 50-30-08-	Ahupua'a	Site Type/ Name (if any)	Location	Site Constraints	Reference
2075	Kapa'a/Ke ālia	Highway Bridge Foundation (old Kaua'i Belt Road)	Kuhiö Highway at Kapa'a/ Keālia River		Bushnell et al. 2002:55
2076	Kapa'a	Petroglyph	Rocky coast below former cane haul road (Site -789)	Preservation	Bushnell et al. 2002:55
2077	Kapa'a	Concrete steps (related to historic beach pavilion)	Near present Kapa'a Beach Park Pavilion		Bushnell et al. 2002:55
2078	Kapa'a	Historic Railway Alignment (2 Railroad Bridges, & RR Culvert Foundation)	Both railroad bridges span the Moikeha Canal; the RR culvert foundation is located north of the Kapa'a Swimming Pool.		Bushnell et al. 2002:55

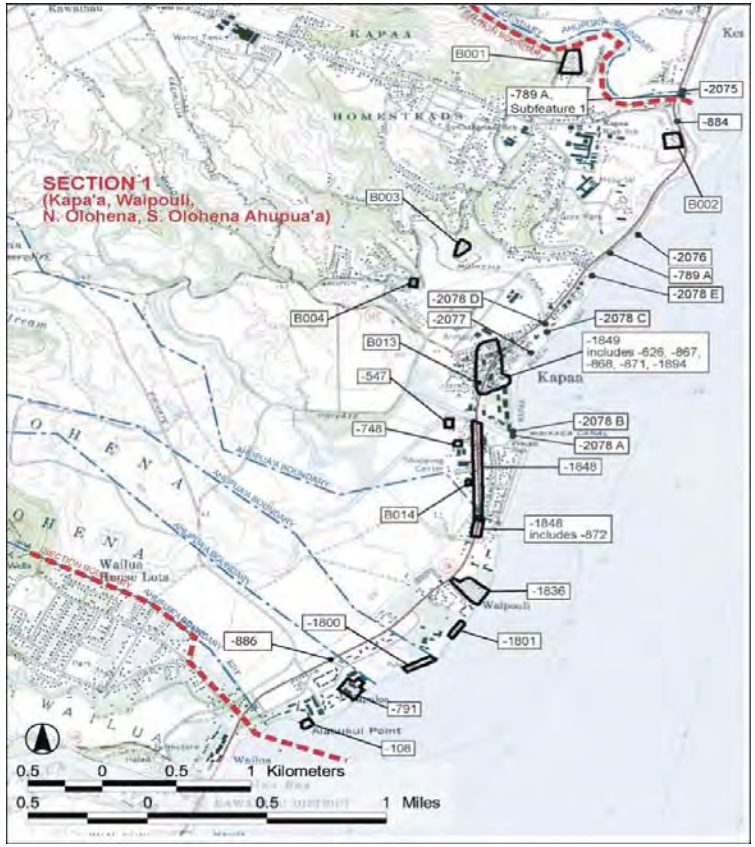


Figure 6. Historic Properties in Kapa'a, Waipouli and Olohena Ahupua'a.

In summary, the archaeological research of the Kapa'a, area has been somewhat skewed to development which has mostly occurred along the coast. Early 20th century archaeological studies attested to the existence of upland terraces, however subsequent studies in the 1980s found no record of upland sites. Although there is little in the way of surface archaeology of Kapa'a that has been able to withstand the test of time (with the exception of Kukui Heiau), archaeological studies have illustrated the vast potential for intact subsurface cultural layers. These cultural deposits extend throughout modern day Kapa'a Town, on the shorelines between the Waipouli Town Center and the Coconut Plantation Resort and along the coast in Olohena *makai* of the old Coconut Plantation Cinema. These cultural deposits suggest a long occupation of the area over many centuries beginning by the late 15th or early 16th centuries.

RESULTS OF COMMUNITY CONSULTATION

As partial fulfillment of the Scope of Work, consultation with organizations and the community was conducted to identify knowledgeable *kūpuna* and participants to be interviewed, as well as others who could inform on the history of the subject area and previous land use. The organizations consulted were the State Historic Preservation Division, the Department of Land and Natural Resources (DLNR), the Office of Hawaiian Affairs, the Kaua'i/Ni'ihau Islands Burial Council, the Kaua'i Historical Society, and the Kaua'i Historic Preservation Review Committee (KHPRC).

A substantial effort was made to locate knowledgeable informants for the area of Kapa'a. An attempt was made to contact as many individuals as possible. These led us to the 5 knowledgeable parties that were interviewed for this project. A cultural impact assessment conducted for the Kapa'a-Kealia Bike and Pedestrian Path included a narrow corridor from the Waikaea Drainage Canal to Hōmaikawa'a, a small inlet beyond Kealia (Bushnell et al. 2002). In addition cultural impact assessment was also conducted for the Kapa'a Relief Route (Bushnell et. al. 2004). Only one cultural impact assessment has been conducted for the uplands of Kapa'a for the proposed Water Reservoir *Mauka* Locale in Kapa'a, Kaua'i Island (Mitchell et. al. 2004). These CIA and historic research of the project area, community consultation and informant interviews were combined to provide an assessment of cultural traditions, both past and present.

Traditions were also collected in connection to the streams, canals and marsh areas where *'ōpae* and *'o'opu* were once found in abundance. Fishing for *'oama* in Kapa'a's canals continues to be a lively family tradition during the summers.

Consultation Process

Through the consultation process, five individuals were identified as potential informants. Three had written letters of their knowledge of the area (Stanley Vasques,

Willie Sanchez, and Albert Fukashima) [see Appendix]. Two others informants gave a verbal interviews. One of these the Martin family spoke about the use of the lands for pasture when the Plantation ceased using the land for cane. The other informant was from the East Kauai Soil and Water District (Les Milnes) and had no knowledge any plantation ditches that were still intact within the project area. The old maps he had, showed the ditch system around Twin Reservoir which is located directly across Olohena Road from this property but the maps stop before this project area. This indicates that there were no permanent plantation ditch lines on this parcel.

Mr. Fukashima drew a map of his recollection of the land uses of the project area, which matched some of the historic maps for Kapa'a.

Figure 7 and 8 Showing Cattle and Goats (in the Distance) Grazing.

No Native Hawaiian informants came forward to discuss any traditional gather associated with this project area. The Office of Hawaiian Affairs gave a list of possible indiviuals with extensive knowledge of traditional cultural practices and resources but none knew of any for this project area.

Figure 9. KIUC's Solar Farm and Equipment Buildings.

TRADITIONAL CULTURAL PRACTICES OF KAPA' A

Burials

The coastline in Kapa'a once contained extensive sand dunes that were documented in travels throughout the nineteenth century (Knudsen 1991; Alexander 1991). Most of the sand dunes were modified or destroyed at the onset of the twentieth century. This was due to the extensive use of the coastal areas for ranching, settlement, and new transportation routes like trains and roads. Archaeological studies in the Kapa'a area demonstrate the widespread prehistoric use of sand as a medium for burials. Burials have been idenfied along the coast and extending well *mauka* of the coastline into present day Kapa'a Town. Cultural deposits found associated with burials in the Kapa'a area shed light on the Hawaiian tradition of burying members of the *'ohana* in the *kulaiwi*, or birth land.

For Hawaiians, "man's immortality was manifest in his bones...Even the bones of the living became symbols of the link between man's progenitors and his own eventual immortality" (Pukui et al. 1972:106). Thus, the discovery of *iwi* (bones) is a very sensitive issue for the Hawaiian community requiring much mediation and protocol.

No burials are believed to be present within the project area and none are known in the vicinity.

Marshlands of Kapa'a

The areas inland of Kapa'a and Waipouli Towns were formerly the marshlands of Kapa'a. During the 20th century, portions of the marshlands of Kapa'a and Waipouli were filled, drained and designated as marginal agricultural lands. Traditionally, however, these marshlands were once much more significant. Westerners may call them "swamps," but Hawaiians who grew up in the Kapa'a and Waipouli area knew they were fishponds (Bushnell et. al. 2004). Many *kama'aina* recall fishing for freshwater shrimp and

gobies, the *'opae* and *'o'opu*. For the Kaneakua brothers, their childhood memories of *'opae* are tied to the old Chinese vendors who once traversed the neighborhood selling the shrimps.

> I can remember Chinese, they used to catch shrimp, fresh water shrimp in big five gallon can. They put it in there, both side and they have their stick across, walking through the little village that we were over there and used to come out and say, "'*Opae, 'Opae*" and families who want buy the *'Opae* and they used to dig it out in a big a scoop, bowl, and was so much you know. Yeah, those were the days. Our streams used to be loaded with shrimp (Interview with J. & W. Kaneakua 8/1/02 in Bushnell et al. 2002).

One informant said that his experience catching *'opae* centered on the irrigation ditches that drained the marshlands behind Kapa'a. "My first lessons in swimming were in the drain ditches the sugar people created to dry out their cane lands. Also in the ditches were the *'opae* or river shrimp. I caught *'opae* and cooked them with soy sauce in recycled oil sardine cans." (Interview with G. Hiyane, 5/14/03 in Bushnell et. al. 2004). One individual who grew up in Pueo Camp adjacent to the marsh recalls frequenting the irrigation ditches in Waipouli for *'ōpae, 'o'opu*, and *pantat* (catfish) that were then sold to the old Chinese men in the camp for 10¢ (Personal communication with G. Mukai, 8/5/03 in Bushnell et. al. 2004).

Mr. Sokei who grew up in a rice growing family in the back of what is known as All Saints Church in Kapa'a shared some memories of his home in the 1930s that may reflect the landscape a hundred years prior. Mr. Sokei remembers the family home located on high ground above the marsh. "Back then, the land was natural, full of mounds. Rice was cultivated in fields all the way to the hills. The water level in the marsh would go up and down with the tide and when there was lots of water, one could find *'o'opu*, *'ōpae*, catfish, frogs and mud turtles for eating" (Personal communication with T. Sokei, 7/28/03 in Bushnell et. al. 2004). Likewise, the *kuleana* awards of the 1840s and 1850s present a picture of homes scattered on the edges of the marsh and on islands of high ground within the marsh. Numerous *'auwai* were constructed to irrigate *lo'i kalo*. *Hau* bush was shaped into fences to separate *kuleana* or physical features and fishponds were built to stock fish. For Hawaiians living the marsh was an extremely productive area constituting the basis of their existence.

The notion that the marshlands were quite significant traditionally is also evident in the Hawaiian place names, particularly the *wahi pana* (storied places) associated with the Kapa'a/Waipouli marsh. Mākaha-o-Kupānihi was a pond, a "deep pool set aside for *ali'i* to bathe in" located at the border of Kapa'a and Waipouli Ahupua'a presumably within the marsh (Lahainaluna Students Compositions, No. 15). It was here that Kaumuali'i's half-brother Keawe was shot to death forever defiling the waters of Kupānihi. Another *wahi pana* in this district was Kēwā. The proverb *'ke kalukalu o Kēwā'* refers to a certain type

of grass, *kalukalu* (used in making a very soft gauze or *kapa*) found growing in the marshlands of Kapa'a and Waipouli (Fornander 1916:IV:162).

Gathering for Plant Resources

Hawaiians utilized upland resources for a multitude of purposes. Forest resources were gathered, for not only the basic needs of food and clothing, but for tools, weapons, canoe building, house construction, dyes, adornments, hula, medicinal and religious purposes. The present project area is dominated by alien vegetation (albezia, ginger, California grass) although some traditional cultigens (banana, bamboo, *kid* and historically introduced food plants (papaya) are present as well. Within the project area itself no specific documentation was found regarding gathering of plants during traditional Hawaiian times. During this assessment there were no ongoing practices related to traditional gathering of plant resources identified in the present project area. None of the individuals contacted for this assessment identified any native plant gathering practices within the project area.

Historic Properties

No historic properties were identified within the project area or in the vicinity. The density of identified historic properties is far greater near the coast of Kapa'a Ahupua'a. For a listing of the historic properties of Kapa'a, Kaua'i, see Table 4.

Trails

Based on nineteenth and twentieth century maps the primary transportation routes *mauka/makai* correlated closely to the existing major roadways. During this assessment there were no trail systems identified in the proposed project area.

Planation Ditch System or 'Auwai

Based on the archaeological assessment (McMahon, 2012), field checks, documentation from land records, plantations records and maps, and informants information, no remnants of these historic properties exist. Several pieces presumed to be rem-

nant of the metal flumes (transportable irrigation) were found. It is also thought that the existing roads on the property might be filled.

Figure 10. Remnant Road and Cattle Grazing in the Project Area.

SUMMARY AND CONCLUSIONS

A cultural impact assessment was conducted for the proposed Kapa'a Highlands Phase II. Historic research of the project area was carried out to identify any cultural resources or traditional cultural practices associated with the area encompassing the proposed Kapa'a Highlands Phase II. In addition, community consultation was conducted. An attempt was made to contact parties regarding cultural knowledge, land use history, cultural sites and traditional Hawaiian or other cultural practices in the vicinity of the project area. Five individuals came forward as knowledgeable informants. In addition to the informants, other community members shared valuable information regarding traditional land use, attitudes and practices associated with the project area.

The marshlands of Kapa'a were once a significant resource prior to Western contact. The fringes of the marsh were utilized for *lo'i kalo*, and other resources including the gathering of *kalukalu*, a type of grass utilized for *kapa*. Places in the marshes also served as fishponds. Vestiges of the cultural significance of the marshlands are retained in the *mo'olelo* and *'olelo no'eau* particular to this area. With the establishment of the sugar plantations in the late nineteenth century, the marshlands were significantly altered. Marsh areas were drained and filled to create more dryland for commercial agriculture and pasture land. Several individuals consulted and interviewed grew up fishing for *'ōpae* and *'o'opu* in the irrigation ditches which once drained the swamps. They expressed sadness at the changing of the landscape and the passing of their childhood traditions with the final draining and filling of the swamps. No further concerns regarding the marshlands were expressed other than the presumed low potential of possibly encountering habitation deposits and burials related to former LCA parcels.

This report documents the use of the *'auwai* or plantation ditches for irrigation and water use by the residents up until the 1960s. The *'auwai* were also utilized for a variety of activities beyond their primary irrigation purpose. The bulk of the *'auwai* have been lost through modern pasturage, disuse and adjacent road improvements.

In general the community emphasized the importance of communicating with the *'ohana* of Kapa'a regarding changes to the land. This includes asking permission of the *'ohana*, including *'uhane* (immortal spirits) for opening up the land to proposed new

uses. It was stressed that this and other protocols are necessary to "open the path" for change, thus avoiding accidents and potential obstacles of a cultural nature.

In summary, there are no known traditional resources or cultural practices associated with the Kapaa Highlands Project Area.

BIBLIOGRAPHY

Akina, Joseph
1913 "I Ke hou I Ka Lulu-o-Moikeha I ka laula o kapaa", Ku'oko'a. May 2-9, 1913. Bishop Museum Archives HEN Place Names, Kauai.

Alexander, William Patterson
1991 "A Tour of Kauai in 1849: Private Journal of William DeWitt Alexander," *The Kauai Papers,* Kauai Historical Society, A Kauai Historical Society Publication, Lihue, Kauai, HI.

Armitage, George T.and H.P. Judd
1944 Ghost Dog and Other Hawaiian Legends; Advertiser Publishing Co., Ltd., Honolulu.

Armstrong, Warwick, Ed.
1973 Atlas of Hawai'i, University of Hawaii Press, Honolulu.

Barrère, Dorothy, compiler
1994 The King's Māhele: The Awardees and Their Lands, Honolulu, HI.

Beckwith, Martha W.
1970 Hawaiian Mythology, University of Hawaii Press, Honolulu, HI.

Bennett, Wendell C.
1931 The Archaeology of Kaua`i, Bishop Museum Bulletin 80, Honolulu.

Bingham, Hiram
1847 A Residence of Twenty-One Years in the Sandwich Islands, Huntington, Hartford.Conn., Convers, New York

Bishop Museum Archives
HEN I: 214 "Heiaus of Kealia and Kapa`a" and "Well Known Things [or Places]".

HEN I: 215 "Famous Things mentioned by Two Men".

HEN I: 216 "Heiaus from Kapa'a to Kealia" and "Things for which Kapa'a was Known".

Borthwick, Douglas F. and Hallett H. Hammatt

1999 Archaeological Monitoring and Burial Treatment Plans for the Proposed Improvements to the Kapa'a Seventh-day Adventist Church, Kapa`a Ahupua`a, Puna District, Kaua`i Island (TMK 4-5-03: 19), Cultural Surveys Hawai'i, Kailua, HI.

Boundary Commission see Commission of Boundaries

Buck, Peter H. (see also Te Rangi Hiroa)
1964 Arts and Crafts of Hawaii, Bishop Museum Special Publication 45, Vol. I, Honolulu.

Bureau of Land Conveyances
Grant 8248

Bushnell, K.W., D.W. Shideler, and H. H. Hammatt
2002 Cultural Impact Assessment for the Proposed Kapa'a -Kealia Bike and Pedestrian Path, Kapa'a and Kealia, Kawaihau District, Kaua'i Island, Hawai'i (TMK: 4-5, 4-6-14, 4-7-03 & 04), Vols. I & II; Cultural Surveys Hawai'i, Inc., Kailua, HI

2004 Cultural Impact Assessment for Kapa'aRelief Route: Kapa'a Waipouli, Olena and Hanamaulu, Kaua'i Island, Hawai'i Cultural Surveys Hawai'i, Kailua, HI

Bushnell, Kristina and Hallett H. Hammatt
2000 An Archaeological Monitoring Report for Improvements to the Kapa'a Seventh-Day Adventist Church, 1132 KuhiO Highway, Kapa'a Ahupua'a, District of Puna, Island of Kauai (TMK 4-5-03:19), Cultural Surveys Hawaii, Kailua, HI.

Bushnell, K.W., Melanie Mann, Douglas Borthwick, Tony Bush, Todd Tulchin, David Shideler and Hallett H. Hammatt
2003 *Archaeological Inventory Survey for the Proposed Kapa'a/Kealia Bike and Pedestrian Path, Kapa 'a and Kealia, Kawaihau District, Kaua `i Island, Hawai (TMK 4-5, 4-6-14, 4-7-03 & 04).* Cultural Surveys Hawaii, Inc. Kailua, HI.

Calis, Irene
2000 End of Field Work Report: Human Burial Removal and Archaeological Monitoring, Kapa'a Beach Park Public Bathroom Installation, Kapa'a, Kaua'i Scientific Consultant Services.

Chafee, David B., Berdena Burgett and Robert L. Spear
1994a An Inventory Survey of a Mamane Street Houselot, Kapa'a Ahupua'a, Kawaihau District, Puna, Island of Kaua'i (TMK: 4-5-09:51), SCS Inc., Kane'ohe, HI.

1994b An Inventory Survey of a Kukui Street Houselot, Kapa'a Ahupua'a, Kawaihau District, Puna, Island of Kaua'i (TMK: 4-5-09:10), SCS Inc., Kane'ohe, HI.

Chaffee, David B. and Robert L. Spear
1995 A Reconnaissance Survey Letter Report, Earl & Maggie Arruda Property, Kapa'a, Kaua'i, Hawai'i, TMK 4-4-02:100 Scientific Consultant Services, Inc. Kane'ohe, HI.

Ching, Francis K. W.
1976 *Letter Report: Archaeological Reconnaissance - Report, Kapa 'a "Wastewater Treatment and Disposal System,* ARCH 14-96, Letter to R. M Towill Corporation, ARCH, Lawa`i, Kaua`i, HI.

Clark, John R.K.
2002 Hawai'i Place Names, Shores, Beaches and Surf Sites, University of Hawaii Press, Honolulu, HI.

Commission of Boundaries
1864-1905 Record of Commission of Boundaries for the Island of Kaua'i, vol. 1, Honolulu, HI.

Condé, Jesse C. and Gerald M. Best
1973 Sugar Trains, Narrow Gauge Rails of Hawaii, Glenwood Publishers, Felton, CA.

Cook, Chris
1999 "Kaua'i, the Garden Island: A Pictorial History of the Commerce and Work of the People", Donning Co., Virginia Beach, VA.

Cooper, George and Gavan Daws
1990 Land and Power in Hawaii, The Democratic Years; University of Hawaii Press, Honolulu.

Coulter, John Wesley
1931 Population and Utilization of Land and Sea in Hawaii, 1853 Bernice P. Bishop Museum Bulletin 88, Honolulu, Hawaii.

Coulter, John Wesley and Chee Kwon Chun
1937 Chinese Rice Farmers in Hawaii, University of Hawai'i, Honolulu.

Creed, Victoria, Hallett H. Hammatt, Gerald K. Ida, Ian Masterson and John Winieski
1995 A Summary of the Archaeological Monitoring for the Kapa'a SewerlineProject Waipouli and Kapa'a Ahupua'a, Puna District, Kaua'i (TMK: 4-3-09 and 4-5-03 to 11), Cultural Surveys Hawaii, Kailua, HI.

Damon, Ethel M.
1931 Koamalu, Privately printed at the Honolulu Star-Bulletin Press, Honolulu, (2 Volumes).

Dega, Michael F. and James Powell
2003 Archaeological Monitoring During Phase I of the Kaua'i Rural Fiber Optic Duct Lines Project, Kaua'i Island, Hawai'i. Scientific Consultant Services

Dole, Charles S.
1929 The Hui Kawaihau" in Papers of the Hawaiian Historical Society, Number 16, Honolulu.

Donohugh, Donald
2001 *The Story of Koloa, A Kaua `i Plantation Town,* Mutual Publishing, Honolulu, HI.

Elmore, Michelle and Joseph Kennedy
2003 *An Archaeological Monitoring Report for the Proposed Kiihio Drainage Improvements Kapa'a and Anahola (Project # 56AC-01-01) Located in Kawaihau District, Island of Kaua* ACPI.

Foote, Donald E., Elmer L. Hill, Sakuichi Nakamura, and Floyd Stephens
1972 Soil Survey of the Islands of Kauai, Oahu, Maui, Molokai, and Lanai, State of Hawaii. Soil Conservation Service, U.S. Department of Agriculture.

Fornander, Abraham
1878-85 An Account of the Polynesian Race, Its Origin and Migrations and the Ancient History of the Hawaiian People to the Time of Kamehameha I, 3 vols., Trubner & Co., London.

Fornander, Abraham
1917-1918 Collection of Hawaiian Antiquities and Folklore, T.G. Thrum edit., Memoirs of the Bernice Pauahi Bishop Museum (Vol. IV & V), Bishop Museum Press, Honolulu.

Fornander, Abraham
1996 Ancient History of the Hawaiian People to the Times of Kamehameha I, with an Introduction by Glen Grant, Mutual Publishing, Honolulu, HI.

Garden Island Newspaper
1955 "Geologists Says Kapaa Coral Removal No Threat to Town". September 21, 1955.

1963 "Kapaa Blames Feceral Role As Erosion Continues. Says Barrier on Reef is Required". October 30, 1963.

1983 "Centennial Year, Kapa'a School Wants Pix of its 100 Years". April 1, 1983.

Giambelluca, Thomas W., Michael A. Nullet and Thomas A. Schroeder
1986 *Rainfall Atlas of Hawaii*, Department of Land and Natural Resources, Honolulu, HI.

Glick, Clarence E.
1980 Sojourners and Settlers: Chinese Migrants in Hawaii. Hawaii Chinese History Center and The University Press of Hawaii, Honolulu.

Hammatt, Hallett H.
1981 Archaeological Reconnaissance of 52.56 Acres for a Proposed Subdivision, TMK:4-8(?)-13-1, Kapa'a, Puna, Kaua'i Island, ARCH Report 140298, Prepared for Waialeale Partners.

1986 Archaeological Reconnaissance of the Makaleha Springs Water Source Development, Kapa'a, Kaua'i TMK: 4-6-01:1, Cultural Surveys Hawaii, Kailua, HI.

1987 Letter Reports on Kapa'a Sewerline Project

1991a *Archaeological Subsurface Testing for the Proposed Kapa 'a Sewer line, Wailua, Olohena, Waipouli and Kapa 'a, Kaua `i,* Cultural Surveys Hawai`i, Kailua, HI.

1991b Archaeological Subsurface Testing for the Proposed Kapa'a Sewerline, Wailua, Olohena, Waipouli and Kapa'a, Kaua'i, Cultural Surveys Hawai'i, Kailua, O'ahu.

Hammatt, Hallett H., Rodney Chiogioji, Gerald K. Ida, and Victoria S. Creed
1997 An Archaeological Inventory Survey for the Kuhio Highway Widening and Bypass Options within the Ahupua'a of Wailua, South Olohena, North Olohena, Waipouli & Kapa'a, Island of Kaua'i , with Appendix on Palynology by Jerome Ward, Ph.D., Cultural Surveys Hawaii, Kailua, HI.

Hammatt, Hallett H., Gerald K. Ida, and Rodney Chiogioji
1994 Archaeological Document Review and Assessment of Three Alternative Widening and Bypass Options for the Kuhio Highway Within the Ahupua'a of Hanamaulu, Wailua, South Olohena, North Olohena, Waipouli & Kapa'a, Lihu'e and Kawaihau Districts, Island of Kaua'i, Revised 1994, Cultural Surveys Hawaii, Kailua, HI.

Hammatt, Hallett H., Gerald K. Ida and William H. Folk
1994 Archaeological Inventory of a 1.87-Acre Parcel, Kapa'a, Kaua'i (TMK 4-5-05:6), Rev. August 1994, Cultural Surveys Hawaii, Kailua, HI.

Hammatt, Hallett H. and David W. Shideler
2004 Archaeological Assessment of Alternative Routes Proposed for the Lydgate to Kapa'a Bike and Pedestrian Pathway Project Within the Ahupua'a of Wailua, South Olohena, North Olohena, Waipouli and Kapa'a, Cultural Surveys Hawai`i, Kailua, HI.

Hammatt, Hallett H., David W. Shideler and William H. Folk
2002 Archaeological Study in Support of Proposed Kuhio Highway Improvements (Kapa'a By-Pass) Hanama'ulu to Kapa'a Ahupua'a, Kaua'i, Cultural Surveys Hawai'i, Kailua, HI.

Handy, E.S. Craighill
1940 The Hawaiian Planter, Volume 1, Bishop Museum, Bulletin No. 161., Honolulu, HI.

Handy, E.S. Craighill, and Elizabeth G. Handy
1972 Native Planters in Old Hawaii, Bishop Museum Press, Honolulu, HI.

Hawaii State Archives
1837 Interior Department, Land, Incoming Letter. August 1837.

1882 Interior Department, Letter book, Vol. 20, p. 426, Letter from Spalding to the Honorable Jacob Hardy, Circuit Judge—Fourth Circuit Kauai

Hawaii Territorial Planning Board
1940 Master Plan of the Town of Kapa'a, In collaboration with the Kaua'i County Board of Supervisors, Publication No. 8. Advertiser Publishing Co., Honolulu, HI.

Honolulu Advertiser
1997 "Amfac to put more land up for sale: Tracts on Kaua'i, Big Island" by Mike Gordon. July 7, 1997. Section Bl.

1960 "Kaua'i Tries to See into Future. March 20, 1960.

Jarves, James Jackson
1844 Scenes and Scenery in the Sandwich Islands and a Trip through Central America 1837-42, J. Munroe and Co., Boston.

Joesting, Edward
1984 Kaua'i, The Separate Kingdom, University of Hawaii Press and Kaua'i Museum Association, Ltd., Honolulu

Jourdane, Elaine
1995 Inadvertent Discovery of Human Remains at 1382-A Inia Street, Kapa'a , Kaua'i (Kapa'a Sewerline Project Laterals) Site 626, SHPD, Honolulu, HI..

Kalākaua, David
1888 The Legends and Myths of Hawaii, Charles L. Webster, (Reprint of three volumes published in 1877-85), New York.

Kamakau, Samuel Manaiakalani
1961 Ruling Chiefs of Hawaii, The Kamehameha Schools Press, Honolulu, HI.

Kamakau, Samuel Manaiakalani
1976 The Works of the People of Old, Bishop Museum Special Publication, No. 61, Honolulu.

Kapa`a Elementary School
1933 Kapaa Elementary School, Kula O Kapa'a, 1883-1933, Published by the school on its fiftieth anniversary, Kapa'a , Kaua'i .
1983 Kapa 'a School 1883 1983: A "Century of Knowledge". Kapa'a Elementary, Kapa`a, Kaua` i.

Kawachi, Carol T.
1994 Inadvertent Burial at 1316 Inia Street (Jasper) TMK 4-5-08:33, Kapa 'a, Kawaihau, Kauai 50-30-08-871, State Historic Preservation Division, Honolulu, HI.

Keaweamahi, D.
1876 "Huakai makaikai ia Kauai." Ka Lahui Hawai'i, 10 & 17 August 1876. "Tour of Kauai." English Translation by M.K. Pukui. BMA: HEN Thrum #227.

Kikuchi, William K. and Susan Remoaldo
1992 Cemeteries of Kaua'i, Vol. 1, Kaua'i Community College and University of Hawai'i, Puhi, Kaua'i .

King, Robert D.
1935 "Districts in the Hawaiian Islands" In Coulter, John Wesley (compiler) *A* Gazetteer of the Territory of Hawaii, University of Hawaii Research Publications, No. 11, University of Hawaii, Honolulu, Hi.

King, Robert D., compiler
1942 Real Property, Appraisers Manual, Honolulu, HI.

Klass, Tim
1970 World War II on Kauai: Historical Research, Prepared for the Kauai Historical Society by The Westland Foundation, Portland, Oregon.

KRD (Kaua'i Renovation and Development - Kaipo Akana)
1994 Archaeological Monitoring of the Rock Wall Revetment for Burial Site - 746

Lai, Violet L. assisted by Kum Pui Lai
1985 He Was a Ram, Wong Aloiau of Hawaii, Published for the Hawaii Chinese History Center and the Wong Aloiau Association by University Press of Hawai'i, Honolulu.

Lydgate, J.M.
1917 Kaumuali'i, The Last King of Kaua'i, Hawaiian Historical Society, Annual Report No. 24, Honolulu.

Lydgate, John M.
1916 "The Pictured Rocks", The Garden Island, 22 February: 5.

MacDonald, G.A. and Abbott, A.T.
1970 Volcanoes in the Sea. University of Hawaii Press, Honolulu.

McMahon, Nancy A.
1996 Archaeological Inventory Survey for 5 Unit Apartment, TMK: 4-5-05:8, Kapa'a, Kawaihau, Kaua'i, Exploration Associates, Ltd., Koloa, Kauai, HI.

1994 Inadvertent Burial Find, Kapa 'a, Kawaihau, Kaua `i, SHPD, Honolulu, HI
1993a Inadvertent Burial Discovery and Disinterment, Site 50-30-09-6011, State Preservation Division, DLNR, Honolulu, HI.
1992a Field Inspection Report for Site 50-30-04-1880, on file at State Historic Preservation Division.
1992b Field Inspection Report for Site 50-30-04-1881, on file at State Historic Preservation Division.
2012 An Archaeological Assessment for the Kapaa Highlands Phase II, TMK: (4) 4-3-03:01, Exploration Associates Ltd, Lihue, Kauai

Mitchell, Auli'i and Hallett Hammatt
2004 A Cultural Impact Assessment For A Proposed Water Reservoir, Kapa'a Ahupua'a, Kawaihau District, Kaua'i, TMKS 4-6-11:, 4-6-8:24, 4-6-03: 30, Cultural Surveys Hawaii, Kailua HI

Malo, David
1951 Hawaiian Antiquities, Bishop Museum Press: Honolulu.

Nakuina, Moses K.
1990 The Wind Gourd of La'amaomao, Translated by Esther T. Mookini and Sarah Nakoa, Kalamaku Press, Honolulu.

Office of the Commissioner of Public Lands
1929 Indices of Awards, Made by the Board of Commissioners to Quiet Land Title in the Hawaiian Islands.

Pacific Planning & Engineering, Inc.
1992 Environmental Assessment and Environmental Impact Statement Preparation Notice Kuhio Highway, Hanamaulu to Kapaa Project Number 56A-07-90, Kapa'a, Kaua'i, Hawai'i, For U.S. Department of Transportation Federal Highways Administration and State of Hawai'i, Department of Transportation Highways Division.

Perzinski, Mary and Hallett H. Hammatt
2001 A Summary of Archaeological Monitoring for the Kuhio Highway, Waikaea Bridge Widening Project Kapa'a Ahupua'a, Kawaihau District,

Kaua'i Island (TMK: 4-3-06 to 4-3-08), Cultural Surveys Hawaii, Kailua, HI.

Porteus, Stanley B.
1962 A Century of Social Thinking in Hawaii, Pacific Books Publication, Palo Alto, CA.

Pukui, Mary Kawena
1983 Olelo No'eau: Hawaiian Proverbs and Poetical Sayings, Bishop Museum Special Publication No.71, Bishop Museum Press, Honolulu.
1986 Hawaiian Dictionary, 2nd Edition, University of Hawaii Press, Honolulu, HI.

Pukui, Mary K., Samuel H. Elbert and Esther Mookini
1974 Place Names of Hawai'i, University of Hawai'i Press, Honolulu.

Rice, William Hyde
1923 Hawaiian Legends, Bernice P. Bishop Museum Bulletin 3, Honolulu..

Spear, Robert L.
1992c Letter Report Concerning Monitoring for the Cost-U-Less Project Kapa'a, Kaua'i , Hawai'i (TMK: 4-5-5:4&9), Scientific Consultant Services Inc.

Territorial Planning Board, Territory of Hawaii in collaboration with the County Board of Supervisors, County of Kaua'i
1940 Master Plan of the Town of Kapaa, County of Kauai, Hawaii, Publication No. 8, Advertiser Publishing Co., Ltd., Honolulu.

Thrum, Thomas G.
1906 "Heiaus and Heiau Sites Throughout the Hawaiian Islands, Kauai, in: Hawaiian Almanac and Annual 1907, pp. 36-48, Honolulu, HI.
1923 More Hawaiian Folk Tales, A.C. McClurg & Co., Chicago.
1998 Hawaiian Folk Tales: A Collection of Native Legends, Mutual Publishing, Honolulu.

Vancouver, George
1798 A Voyage of Discovery to the North Pacific Ocean and Round the World Performed in the Years 1790-95, 6 vols., John Stockdale, London.

Van Ryzin, Karl and Hallett H. Hammatt
2004 An Archaeological Assessment For The Proposed Water Reservoir, Kapa 'aAhupua 'a, Kaua `i TMK 4-6-03:10 Cultural Surveys Hawai`i, Kailua, HI.

Wichman, Frederick B.
1998 Kaua'i Ancient Place Names and Their Stories. University of Hawaii Press: Honolulu.
1985 Kauai Tales, Bamboo Ridge Press, Honolulu, HI

Wilkes, Charles
1845? Narrative of the United States Exploring Expedition, During the Years 1838, 1839, 1840, 1841, 1842, 5 Vols. Lea and Blanchard, Philadelphia, Pa.

APPENDIX

Letters from Informants

I worked for Lihue Plantation from 1965 - 1988 in various jobs I worked in Kapaa so, approximately 80-100 acres, of which TMK (4) 4-3-03-1 is a portion of this field. my father and uncles, also, worked in these fields in the 1930's - 1970's I worked in Kapaa so many other year as a bulldozer driver pushing cane as a crane operator and with the plows department plowing this field at no time did we ever see or heard of anyone finding any human remains or graves sites in this field If you have questions or require additional information, please call me at 651-8978

Stanley Vasquez
1737 Kuhio Rd
Kapaa HI 96746

December 30, 2011

To Whom It May Concern,

I Willie Sanchez was the first person to work in the area of TMK (4) 4-3-03-1 after Amfac Sugar sold the property. I started mowing the property in about 1999. The agricultural water system was abandoned and the interior ditches have become almost flat from non-use. I have never seen any historical or cultural items on this property. I mowed the property for about 5 years. The property is now overgrown with guinea grass and hale koa.

Willie Sanchez

Greg Allen

The sugar cane land that you asked me about was first used by the Makee Sugar Company which was located in Kekaha. After it closed the Lihue Plantation Comany took over the lands from Anahola to Lihue

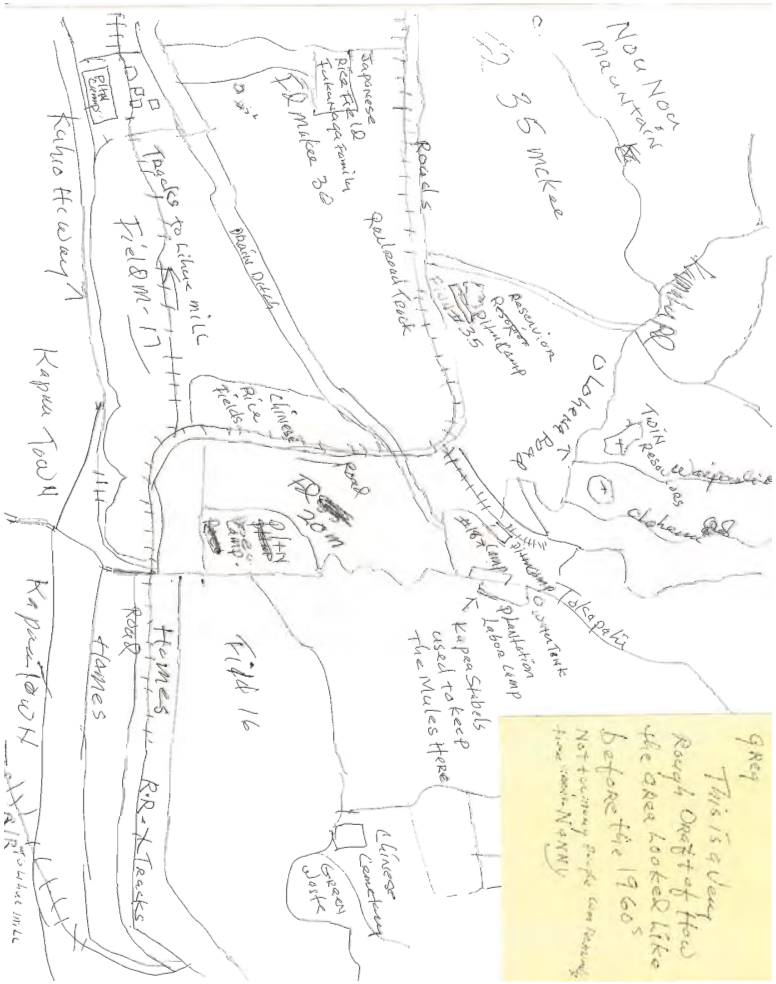
I Dont know when these land were used in sugar cane, I belive it was in the early 1800' the agriculture practice changed over the years to have better yeilds to produce sugar.

For my part the company that I worked for was called Hawaiian Sugar Planters ASSN, which we did the propergation of New varieties over all the years that I worked and other types of Experiments.

Looking back for the 44 years that I worked for our company there has been a number of years we worked in these fields that covers the Waipoli Waihua areas where sugar cane was raised.

To my knowledge for the number of years that we worked in these fields, we never did come across any Heiau or burial grounds in these areas that I know of. If it did exist it most likely is far beyond my time —

Sincerely
Albert Fukashima
ALBERT FUKASHIMA
5-9-10



Greg
This is a very Rough Draft of How the area looked like before the 1960s
Not to many Photo can Remember from 1960's Nanny

Exhibit N

Comment Letters, Scoping Letters and Letters of Support

Bernard P. Carvalho, Jr.
Mayor

Gary K. Heu
Managing Director

Larry Dill, P.E.
County Engineer

Lyle Tabata
Deputy County Engineer

DEPARTMENT OF PUBLIC WORKS
County of Kaua'i, State of Hawai'i
4444 Rice Street, Suite 275, Lihu'e, Hawai'i 96766
TEL (808) 241-4992 FAX (808) 241-6604

January 4, 2012

Vladmir P. Devens, Chairperson
Land Use Commission
Department of Business, Economic Development, and Tourism
State of Hawai'i
P.O. Box 2359
Honolulu, Hawai'i 96804-2359

Subject: Petition to amend the Land Use Boundary of certain lands situated at Kapa'a, Island of Kaua'i, State of Hawai'i, consisting of 97 acres from the Agriculture and Rural District, to the Urban District, Tax Map Key No. (4) 4-3-003:001, Kapa'a Highlands, Three Stooges, LLC

Dear Chairperson Devens:

This letter is to inform you of the County of Kaua'i, Department of Public Work's (County) general support of the Kapa'a Highlands petition to amend 97 acres in Kapa'a to the Urban District. The proposed amendment is for the development of 231 affordable housing units. The County is generally supportive of petitions that will provide affordable housing units in a manner consistent with the Kaua'i County General Plan.

We have met with the Petitioners, Three Stooges LLC, and we will work with them to ensure that any impacts from the project are analyzed and effectively mitigated.

Please call me at (808) 241-4996 if you have any questions.

Very truly yours,

Larry Dill, P.E.
County Engineer

bc: Greg Allen
Mayor Carvalho

An Equal Opportunity Employer

I worked for Lihue Plantation from 1963 - 1985 in various Jobs I worked in Kapaa zo, approximately 80 - 100 acres, of which TMK (4) 4-3-03-1 is a portion of this field. my father and uncles, also, worked in these fields in the 1930's - 1970's I worked in Kapaa zo every other year as a bulldozer driver pushing cane as a crane operator and with the Plow department plowing this field at no time did we ever see or heard of anyone finding any human remains or gravesites in this field If you have questions or require additional information, please call me at 651-8978

Stanley Vasquez
1737 Huia Rd
Kapaa HI 96746

December 30, 2011

To Whom It May Concern,

I Willie Sanchez was the first person to work in the area of TMK (4) 4-3-03-1 after Amfac Sugar sold the property. I started mowing the property in about 1999. The agricultural water system was abandoned and the interior ditches have become almost flat from non-use. I have never seen any historical or cultural items on this property. I mowed the property for about 5 years. The property is now overgrown with guinea grass and hale koa.

Willie Sanchez

NEIL ABERCROMBIE
GOVERNOR

KATHRYN S. MATAYOSHI
SUPERINTENDENT

STATE OF HAWAII
DEPARTMENT OF EDUCATION
OFFICE OF THE COMPLEX AREA SUPERINTENDENT
KAUAI SCHOOLS
3060 Eiwa Street, Room 305
Lihue, Hawaii 96766

October 28, 2011

Mr. Greg Allen
Kapaa Highlands Phase II Project
Harbor Mall

Dear Mr. Allen:

This is a letter of support for the relocation of the County of Kauai, Kapaa Swimming Pool to the subdivision area of the Kapaa Highlands Phase II Project.

The project will provide an opportunity to have a recreational facility in an area away from the tsunami inundation zone due to the current location. The relocation of the Kapaa Swimming Pool will provide accessibility to swimming and recreational activities for the general population in the Kapaa area.

The proposed new location of the pool will be in close proximity to Kapaa Middle School for students, teachers and staff usage for educational purposes such as physical education, sports events, and water safety training.

The Kauai Complex Area supports your effort to relocate the pool. It will serve as an added resource to reach our educational and healthy Hawaii initiatives for our students in the Kapaa complex school area.

We look forward to reviewing your environmental studies to better understand the full impact of your proposed Kapaa Highlands Phase II Project.

Please feel free to call me at 274-3502 should you have any questions.

Aloha,

William N. Arakaki

William N. Arakaki
Kauai Complex Area Superintendent

cc: Mayor Bernard P. Carvalho, Jr.

AN AFFIRMATIVE ACTION AND EQUAL OPPORTUNITY EMPLOYER

KAUAI PATH

P. O. Box 81 :: Lihue, HI 96766
phone 808.822.9447 :: fax 808.822.5075
www.KauaiPath.org
Pres@KauaiPath.org

registered 501(C)(3)

October 17, 2011

Commissioner Normand R. Lezy, Chairperson
Land Use Commission
Department of Business, Economic Development, and Tourism
State of Hawaii
PO Box 2359
Honolulu, HI. 96804-2359

RE: Petition to amend the Land Use Boundary of certain lands situated at Kapa'a, Island of Kaua'i, State of Hawaii, consisting of 97 acres from the Agriculture and Rural District to the Urban District, Tax Map Key No. (4)4-3-03:001. Kapa'a Highlands, Three Stooges, LLC

Dear Commissioner Lezy,

Thank you for the opportunity for the Kauai Path, Inc. Board of Directors to offer our support for Kapa'a Highlands subdivision.

This proposed development as described to us by the developer appears to be consistent with smart, responsible growth. The planned development has the potential to serve the best interests of our communities. Preliminary plans we have been shown integrate community parks, green spaces, residential housing, and commercial areas. These elements promote a healthy and livable community.

Accordingly, it is our recommendation that if the Commission approves the applicants' request to change the property's zoning, such an approval should include conditions requiring the project to incorporate active transportation facilities. We recommend that these accommodations be designed with all users in mind. Such facilities should be described in a well-conceived circulation plan with provisions for safe bicycling and access to public transportation serving riders and pedestrians of all ages and abilities in compliance with Americans with Disabilities Act ("ADA") guidelines. The final plan

should include appropriate traffic calming features like roundabouts, back-in diagonal parking, sidewalks, bike lanes and/or multi-use paths, public transportation stop(s), safe crossing opportunities, and median islands. These concepts encompass a Complete Streets approach to urban development.

As a feature conducive to smart growth and urban in-fill projects, we further recommend the inclusion of a modest community center providing sundries, sanitary facilities, and preferably some type of commercial food service for neighbors, visitors to the public swimming pool, the project's residents, and the nearby Kapa'a Middle School campus.

Creating attractive multimodal transportation connections—not only within the project, but most importantly to the surrounding multimodal infrastructure as well—will help create a community where families can live, work, and play with less dependence on automobiles and enhanced opportunities for improved health.

Respectfully,

Sally Jo Manea

Sally Jo Manea, President Board of Directors,
Kauai Path Inc.

Tommy A Noyes

Tommy A Noyes
Member of Board of Directors
Kauai Path Inc.

Dear Land Use Commission, 10/14/11

This letter is to show my support for the Kapa'a Highlands subdivision. It has been many years since the Kapa'a Ahupua'a has had a new planned subdivision. Planned communities are superior to random growth because they integrate community parks, green spaces, commercial areas and housing in an organized, smart layout that benefits everyone. The Kapa'a Highlands subdivision will be a planned community. It promises a healthy and livable community that will provide some work force housing which is sorely needed.
I ask that you give the Three Stooges LLC and Kapa'a Highlands your approval.

Thank you,

David Vickers

Island Truss

October 14, 2011

Land Use Commission
Department of Business, Economic Development, and Tourism
State of Hawai'i
P.O. Box 2359
Honolulu Hawai'i 96804-2359

Re: Petition to amend the Land Use Boundary of certain lands situated at Kapa'a, Island of Kaua'i, State of Hawai'i, consisting of 97 acres from the Agriculture and Rural District to the Urban District, Tax Map Key No. (4)4-3-03:001. Kapa'a Highlands, Three Stooges, LLC.

Dear Land Use Commissioners,

I am writing in support of the Kapaa Highlands project. As a person who has a degree in Urban Planning I believe this project has many of the features of a true smart growth community and will be a welcomed and vital addition to the Kapaa community. The project is close to town center making it a walkable community. It is also near a public transportation site. The plans are also asking for some limited mixed use within the community which could provide shopping and jobs within walking distance for residents. The project will allow the middle school to in effect expand into the park area and provide them with use of a pool (a needed addition since the nearby Kapaa pool is in need of repair.

The community will have a good density with single family homes duplexes and apartments. The plan is to make this community affordable for the average person which is most needed. The so called "gap housing" is often neglected on Kauai. They are incorporating parks and green space and the community is across the street from the Kapaa Park which will be a great addition for the kids of the community. The community will be walkable and bike able and they are looking to extend a spoke of the eastside bike path to the community. All streets are planned to be complete and therefore safe for all modes of transportation. The developers will be dedicating the bypass road to the state which is necessary for the development of Kapaa. The current circle at the bypass is a very safe feature for pedestrians and bicycles.

There are so many good and thoughtful smart growth considerations in this community that it should be approved and built. In addition this is one of the best uses for this land that is so near to central Kapaa.

Thank you for your consideration of this project, which I feel should be approved overwhelming.

Sincerely,

Neil J Clendeninn, MD, PhD, MS-arch
PO Box 1005, Hanalei, HI 96714
cybermad@msn.com
808-294-0660

KURT R. BOSSHARD
ATTORNEY AT LAW
3144 ELUA STREET
LIHUE, HAWAII 96766
TELEPHONE 808-245-5302
FAX 808-245-8929

October 6, 2011

Re: TMK 4-3-03-001

To Whom It May Concern:

I am the President of Kapaa Solar LLC. In 2010, Kapaa Solar LLC entered into with its owners who are the applicants herein, a lease/purchase and option to purchase portions of TMK 4-3-03-001. Construction of Kapaa Solar LLC's approximately 1.2 megawatt facility which will feed the Kauai Island Utility Cooperative's grid was successfully completed in December 2010. Construction was completed without placing any encumbrances upon the real property. And, in fact should the owner/applicant successfully complete the subdivision of the property, Kapaa Solar hopes to purchase several of the agriculturally zoned condominium units where the solar farm is located. The Kurt Bosshard Trust, of which I am the Trustee, has been the first mortgage holder as to the property since 2001.

I presently engage in other agricultural pursuits on approximately 30 additional acres of this property. Presently, the property is used for pasturage but my intention is to engage in more intensive farming activities should I be able to obtain subdivided lots/units where I am now farming. These activities would include aquaculture and fish farming, as I own an adjacent kuleana which has access to water. In these regards, I have had the Kauai Community College Chancellor and faculty members at the site who have shown interest in working with me to move such a project forward. KCC has a "sustainability" curriculum and it would like to place its graduates into such projects.

I have been a resident of Kauai's east side since 1976 and believe I have significant knowledge of this property, development in this area, and the communities' needs and concerns. Kapaa Solar LLC and the Bosshard Trust believe that the development of the property as proposed by the owners is in the communities' best interests as outlined in the application presently pending your approval. It is unfortunate that this land was not available in the year 2000 and thereafter when growth in the Kapaa area was forced to spread out away from the Kapaa urban area. It would be a shame should the same pressures for growth again emerge and the land not be available for reasonable urban expansion to meet the needs of Kauai's east and north sides. Timely approval of the

To Whom It May Concern
October 6, 2011

owners' application would be a significant step towards proper planning for the area and the communities' benefit.

I am available to respond to any questions you may have as to any of the foregoing and appreciate your attention to these matters.

Sincerely,

KURT BOSSHARD
President, Kapaa Solar LLC
Trustee, Kurt Bosshard Trust

KB:tes

Records

COUNTY COUNCIL
JAY FURFARO, CHAIR
JOANN A. YUKIMURA, VICE CHAIR
TIM BYNUM
DICKIE CHANG
KIPUKAI KUALI'I
NADINE K. NAKAMURA
MEL RAPOZO

4396 RICE STREET, SUITE 209
LĪHU'E, KAUA'I, HAWAI'I 96766
E-mail: cokcouncil@kauai.gov

OFFICE OF THE COUNTY CLERK
Council Services Division
Elections Division

PETER A. NAKAMURA, County Clerk
EDUARDO TOPENIO, JR., Deputy County Clerk

Telephone: (808) 241-4188
Facsimile: (808) 241-6349

October 5, 2011

Normand R. Lezy, Chairperson
Land Use Commission
State of Hawaii
Department of Business, Economic Development, and Tourism
P.O. Box 2359
Honolulu, Hawai'i 96804-2359

Dear Chairperson Lezy:

RE: Petition To Amend The Land Use Boundary Of Certain Lands Situated At Kapa'a. Island of Kaua'i, State of Hawai'i, Consisting Of 97 Acres From The Agriculture And Rural District To The Urban District, Tax Map Key No. (4)4-3-03:001. Kapa'a Highlands, Three Stooges, LLC.

Thank you for the opportunity to offer my support in my individual capacity as a member of the Kaua'i County Council for the amendment of 97 acres in the Urban State Land Use District.

I have been assured that the Petitioners, Three Stooges, LLC, continues to work directly with various County departments in order to follow all County ordinance requirements.

The proposed amendment is expected to provide 231 affordable housing units, both single family and multi-family types of structures.

The Petitioners are dedicated to creating a multi-use development that serves the best interest of its surrounding community and is consistent with smart, responsible growth.

Thank you for allowing me this opportunity to provide my support as an individual member of the Kaua'i County Council.

U:2011 memos & letters/CMBynumSupportLTRtoLUCChairperson/JT.lmpw

AN EQUAL OPPORTUNITY EMPLOYER

Test Leg

Should you have any questions, please feel free to contact me at (808) 241-4188.

Sincerely,

TIM BYNUM
Councilmember
Kaua'i County Council

U:2011 memos & letters/CMBynumSupportLTRtoLUCChairperson/IT:lmpw

NEIL ABERCROMBIE
GOVERNOR OF HAWAI'I

GARY L HOOSER
DIRECTOR

STATE OF HAWAI'I
OFFICE OF ENVIRONMENTAL QUALITY CONTROL
235 SOUTH BERETANIA STREET, SUITE 702
HONOLULU, HAWAI'I 96813

In reply, please refer to:
File:

October 3, 2011

Patrick J. Childs
Suite 104
4365 Kukui Grove Street
Lihue, Hawaii 96766

Dear Mr. Childs:

Subject: Kapaa Highlands Phase II, Petition for District Boundary Amendment, TMK: 4-4-02-01 por. Kauai

Am in receipt of your letter requesting the Office of Environmental Quality Control (OEQC) to "...confirm through your office that there is no specific requirement for an EA at this time."

Based on the information presented in your letter, it appears that this action involves an application before the Land Use Commission requesting the redistricting of 97 acres of agricultural land into urban. In this case, the determination as to whether or not this application triggers HRS Chapter 343 would be made by the LUC. It is my understanding that changing the land use designation as described does not by itself trigger HRS Chapter 343, however depending on the extent and nature of the planned development, a permitting agency may determine otherwise. Furthermore, depending on the developments ultimate impact on adjacent State highways, the Department of Transportation should also be consulted. I would be pleased to meet and discuss this project or any issues of concern or questions that you might have, should you believe that would be helpful.

NOTE: The OEQC is not authorized to determine or enforce compliance with HRS Chapter 343, nor does it have legal authority to approve or disapprove exemptions, EA's or EIS documents. The OEQC policy on such requests is to consult and offer general guidance based on our understanding of HRS Chapter 343 and past practice with regards to its implementation, but to refrain from issuing specific opinions on specific projects, except that the OEQC may make a recommendation as to the acceptability of a final statement upon request. Not only does the OEQC not have the legal authority to direct compliance or make determinations, the office also lacks the resources to effectively analyze specific projects, conduct site visits and in general conduct the due diligence needed to properly evaluate a projects impacts and potential Chapter 343 compliance issues. The responsibility for such analysis and determinations rests solely on the permitting and approving or accepting agency.

Sincerely,

Gary Hooser, Director
Office of Environmental Quality Control

Bernard P. Carvalho, Jr.
Mayor

Gary K. Heu
Managing Director

Michael A. Dahilig
Interim Director of Planning

Dee M. Crowell
Deputy Director of Planning

PLANNING DEPARTMENT
County of Kaua'i, State of Hawai'i
4444 Rice Street, Suite A-473, Līhu'e, Hawai'i 96766
TEL (808) 241-4050 FAX (808) 241-6699

August 31, 2011

RECEIVED
SEP -6 2011
BELLES GRAHAM PROUDFOOT WILSON & CHUN, LLP

Max W. J. Graham, Jr.
BELLES GRAHAM PROUDFOOT WILSON & CHUN, LLP.
Watumull Plaza
4334 Rice Street, Suite 202
Līhu'e, Hawai'i 96766-1388

Subject: KAPA'A HIGHLANDS SUBDIVISION – Subdivision of Parcel 1, Being a Portion of Grant 5266 to Rufus P. Spalding Into Lots 1 to 13, Inclusive, Kapa'a and Waipōuli, Kaua'i, Hawai'i. (**S-99-45**, Allen Family LLC/Moloa'a Bay Ventures, LLC/Three Stooges, LLC)

An extension until **AUGUST 31, 2012** to file final subdivision maps has been approved by the Planning Commission at their meeting held on August 30, 2011. The Applicant shall submit an updated status report on the subdivision that includes a detailed time chronology on the progress of the tentative approval requirements and it shall be submitted to the Planning Department no later than six (6) months from that date of the extension approval.

MICHAEL A. DAHILIG
Interim Director of Planning

xc: CoK – Public Works Dept.
CoK – Water Dept.
CoK – Real Property Div. – Assessment
State Health Dept.

An Equal Opportunity Employer

Department of Water County of Kaua'i

Water has no substitute.....Conserve it

August 22, 2011

Mr. Gregg Allen
161 Wailua Road
Kapaa, HI 96746

Dear Mr. Allen:

Subject: Water Master Plan for the Kapa'a Highlands Project on TMK: 4-3-03:001

At the Department of Water, Water Board July 28th 2011 meeting, via Managers Report 12-10, in response to your letters of April 22, 2011 and May 11, 2011, accepted the proposed exchange of source for storage on a dollar for dollar basis. This acceptance is based on your commitment to proceed with zoning changes in your development to match the county zoning. That zoning change requires affordable housing in certain portions of your proposed development.

This acceptance is based on building permits and County water meter service not being issued if the source and storage requirements have not been completed as of the date of requested building permit approval. We ask that you submit a proposed draft of an agreement to memorialize this action. We would expect that this agreement runs with the land.

If you have any questions, please contact Mr. Gregg Fujikawa at (808) 245-5416.

Sincerely,

David R. Craddick, P.E.
Manager and Chief Engineer

GF/WE:bdm
Bill/Gregg Allen Response Letter/July Board Mtg.

4398 Pua Loke St., P.O. Box 1706, Lihue, HI 96766 Phone: 808-245-5400
Engineering and Fiscal Fax: 808-245-5813, Operations Fax: 808-245-5402, Administration Fax: 808-246-8628

Bernard P. Carvalho, Jr.
Mayor

Gary K. Heu
Managing Director

Michael A. Dahilig
Director of Planning

Dee M. Crowell
Deputy Director of Planning

PLANNING DEPARTMENT
County of Kaua'i, State of Hawai'i
4444 Rice Street, Suite A-473, Līhu'e, Hawai'i 96766
TEL (808) 241-4050 FAX (808) 241-6699

4 March 2011

Agor Architecture, LLC
424 Ena Road, Suite 206A
Honolulu, HI 96815

Re: **Kapa'a Highlands Phase II**
Petition for District Boundary Amendment
TMK: 4-4-03: 01 Por.

Dear Mr. Agor:

Mahalo, for providing information to us on your proposed project. In reviewing your Draft EA and Petition, we note that you propose to apply to the State Land Use Commission to redesignate approximately 97 acres of land, from the Agriculture State Land Use District to the Urban State Land Use District. The proposed area is located adjacent to, and south and east of the existing Kapa'a Middle School.

The area is located in the Agriculture Zoning District. From a map and text review of the 2000 General Plan, we note that the area was redesignated from Agricultural to Urban Center and Residential Community. It appears that the 97 acres is located totally within the General Plan Urban Center area. Because of the conceptual nature of your submittal, we cannot locate the exact area of your project on our General Plan Map. However, General Plan designations do allow for some flexibility in interpretation and we may be able to make minor adjustments. Be aware that the Land Use Commission will require a metes and bounds description of the area you propose to redesignate.

Therefore, because your proposed project appears to be in conformance with the General Plan of the County of Kaua'i, and HRS Ch. 343 is not triggered by any requirements of the Planning Department. We have no comments to offer on the particulars of your project at this time.

Also, please be advised that recent court decisions and legislation have had an impact on HRS Ch. 343 triggers. You may want to consult other state and county agencies that deal with land development to discuss any change in their particular requirements.

If you have any questions, please feel free to call me, or Deputy Director Dee Crowell at (808)241-4050, or email dcrowell@kauai.gov.

MICHAEL A. DAHILIG
Planning Director

Bernard P. Carvalho, Jr.
Mayor

Gary K. Heu
Managing Director

OFFICE OF THE MAYOR
County of Kaua'i, State of Hawai'i
4444 Rice Street, Suite 235, Lihu'e, Hawai'i 96766
TEL (808) 241-4900 FAX (808) 241-6877

March 1, 2011

Mr. Greg Allen
161 Wailua Road
Kapa'a, Hawai'i 96746

Dear Greg:

Allow me to extend my deepest Mahalo and congratulations for the recent dedication of the Kapa'a solar project. This is such a huge accomplishment and will benefit Kaua'i for many years to come. I know you played a significant role in its development and hope that you know we are very grateful for your efforts.

I'm also hopeful your plans for additional housing for Kapa'a will move forward expeditiously, as this project could also provide many benefits such as affordable housing and community facility assets – especially for the nearby schools.

Best wishes, Greg, for continued success and Mahalo again for your contribution to Kaua'i's renewable energy future!

Sincerely,

Bernard P. Carvalho, Jr.
Mayor

An Equal Opportunity Employer

Bernard P. Carvalho, Jr.
Mayor

Gary K. Heu
Managing Director

OFFICE OF THE MAYOR
County of Kaua'i, State of Hawai'i
4444 Rice Street, Suite 235, Lihu'e, Hawai'i 96766
TEL (808) 241-4900 FAX (808) 241-6877

December 9, 2010

Vladimir P. Devens, Chairperson
Land Use Commission
Department of Business, Economic Development, and Tourism
State of Hawai'i
P.O. Box 2359
Honolulu, Hawai'i 96804-2359

Re: Petition to amend the Land Use Boundary of certain lands situated at Kapa'a, Island of Kaua'i, State of Hawai'i, consisting of 97 acres from the Agriculture and Rural District to the Urban District, Tax Map Key No. (4) 4-3-03: 001. Kapa'a Highlands, Three Stooges, LLC.

Dear Chairperson Devens:

Thank you for the opportunity to offer my support for the amendment of 97 acres in the Urban State Land Use District.

The Petitioners, Three Stooges, LLC, have continued to work directly with various County departments to ensure this development project follows all County ordinance requirements and mitigates any adverse impacts during construction.

The proposed amendment will provide 231 affordable housing units in a manner consistent with the County of Kaua'i's General Plan. The development will provide single and multi-family housing as well as various public facilities to support its close proximity to Kapa'a Middle School and the urban areas of Kapa'a town.

Furthermore, Petitioners are dedicated to creating a multi-use development that serves the best interest of its surrounding community. This is consistent with the smart, responsible growth that I envision for the island of Kaua'i, to create communities where families can live, work and play.

For these aforementioned reasons, I support the petition to amend the land of 97 acres to the Urban District.

Mahalo nui loa,

BERNARD P. CARVALHO, JR.
Mayor, County of Kauai

LINDA LINGLE
GOVERNOR

MICHAEL D. FORMBY
INTERIM DIRECTOR

Deputy Directors
FRANCIS PAUL KEENO
JIRO A. SUMADA

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
KAUAI DISTRICT
1720 HALEUKANA STREET
LIHUE, HAWAII 96766

IN REPLY REFER TO

HWY-K 4.100528

November 3, 2010

Vladimir P. Devens, Chairperson
Land Use Commission
Department of Business, Economic Development, and Tourism
State of Hawaii
P.O. Box 2359
Honolulu, Hawaii 96804-2359

Dear Chairperson Devens:

Subject: Petition to amend the Land Use Boundary of certain lands situated at Kapaa, Island of Kauai, State of Hawaii, consisting of 97 acres from the Agriculture and Rural District, to the Urban District, Tax Map Key No. (4) 4-3-03: 001
Kapaa Highlands
Three Stooges, LLC

We are writing in general support of the Kapaa Highlands petition to amend 97 acres in Kapaa to the Urban District. The proposed amendment is for the development of 231 affordable housing units. The Department of Transportation is generally supportive of petitions that will provide affordable housing units in a manner consistent with the Kauai County General Plan.

We have met with the Petitioners, Three Stooges LLC, and we will work with them to ensure that any traffic impacts from the project are analyzed and effectively mitigated

If you have any questions, please call me at 241-3006.

Sincerely,

for RAYMOND J. MC CORMICK, P.E.
District Engineer

SMI:JI
cc: Ron Agor

LINDA LINGLE
GOVERNOR OF HAWAII

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES

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

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

RUSSELL Y. TSUJI
FIRST DEPUTY

KEN C. KAWAHARA
DEPUTY DIRECTOR - WATER

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

June 28, 2010

LOG NO: 2010.2441
DOC NO: 1006MV50

Greg Allen, Kapaa Highlands Inc.
161 Wailua Road
Kapaa, HI 96746

SUBJECT: Historic Preservation Review-
Consultation Letter on TMK [4]-4-3-003:001, Kapa`a Kauai

Thank you for the opportunity to provide a current determination letter on the property with TMK# [4]-4-3-003:001. According to our records, there has not been an Archaeological Inventory Survey (AIS) of this property. In addition, Archaeological Inventory Surveys of nearby properties (TMK [4]-4-3-003:004 and TMK [4]-4-3-003:005) recorded multiple historic properties (SHPD Log No. 2008.1916). However, aerial photos indicate that this property was previously cultivated with sugar cane, which may have destructive implications for pre and post-contact Native Hawaiian sites within the project area. However, current aerial photos indicate the presence of potentially historic irrigation features as well as terrain that may not have been subject to intensive cultivation.

The historic preservation requirements for any proposed action within this project area would vary depending on the extent of the action's impact on the parcel. If the action were to take place on previously cultivated land the only historic preservation requirement would be to document the irrigation features. However, if the action takes place in a part of the property that was not cultivated an Archaeological Inventory of that area may be required. It would be highly beneficial for all proposed actions to have an Archeological Inventory Survey for the entire property in order to document the presence or absence of historic sites in this parcel.

Please call Mike Vitousek at (808) 692-8024 if you have any questions or concerns regarding this letter.

Aloha,

Nancy A. McMahon

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

Bernard P. Carvalho, Jr.
Mayor

Gary K. Heu
Administrative Assistant

KAUAI COUNTY HOUSING AGENCY
Pi'ikoi Building 4444 Rice Street Suite 330
Lihue Hawaii 96766

Eugene K. Jimenez
Housing Director

COPY

March 2, 2010

Mr. Greg Allen
161 Wailua Road
Kapa'a, HI 96746

SUBJECT: In the Matter of the Petition of KAPA'A HIGHLANDS, THREE STOOGES, LLC, to Amend the Land Use District Boundary of Certain Lands Situated at Kapa'a, Island of Kaua'i, State of Hawai'i, Consisting of 97 Acres from the Agriculture and Rural District, To the Urban District, TAX MAP KEY NO. (4) 4-3-03: 01 (por.)

Dear Mr. Allen,

Thank you for the opportunity to review your preliminary Petition for District Boundary Amendment of 97 acres into the Urban State Land Use District. We are aware that a portion of TMK (4) 4-3-03:01 has been designated Urban Center by the Kaua'i County General Plan since the 1980's. The property is contiguous to and in close proximity to the coastal urban areas of Kapa'a Town, yet sits at a higher elevation and abuts the Kapa'a Middle School. The Petitioner proposes to develop single and multi-family housing as well as public facilities on the redistricted land. For the foregoing reasons, we support the petition to amend the land into the Urban District.

Please be advised that under current law, at the time of zoning amendment, the project area will be subject to Ordinance No. 860, the Housing Policy for the County of Kaua'i. The Ordinance requires the development of workforce housing targeted to Kaua'i residents earning from up to 80% to 140% of the Kaua'i Median Household Income. Ordinance No. 860 requires the fee-simple sale of workforce housing equivalent to thirty (30%) of the market units, which may be reduced to a minimum of fifteen percent (15%) through the use of incentives. We anticipate that the subject project would comply with all County ordinance requirements, and that our comments will be sought in the Land Use Commission's formal petition review.

Sincerely,

Eugene K. Jimenez

EUGENE K. JIMENEZ
Housing Director

cc: Ron Agor, AIA; Imai Aiu, Planning

Development Section (808) 241 4444 FAX (808) 241 5118
TDD (808) 241 4411

EQUAL HOUSING OPPORTUNITY

Section 8 (HUD) (808) 241 4440 FAX (808) 241 5119

COPY

BERNARD P. CARVALHO JR.
MAYOR

GARY K. HEU
ADMINISTRATIVE ASSISTANT

IAN K. COSTA
DIRECTOR OF PLANNING

IMAIKALANI P. AIU
DEPUTY DIRECTOR OF PLANNING

COUNTY OF KAUA'I
PLANNING DEPARTMENT
4444 RICE STREET
KAPULE BUILDING, SUITE A473
LIHU'E, KAUA'I, HAWAI'I 96766-1326

TELEPHONE: (808) 241-4050 FAX: (808) 241-6699

January 5, 2010

To: Ransom A.K. Piltz, Chairperson
Department of Business, Economic Development & Tourism
State of Hawaii
P.O. Box 2359
Honolulu, Hawaii 96804-2359

Subject: Petition to amend the Land Use District boundary of certain lands situated at Kapa'a, Island of Kaua'i, State of Hawai'i, consisting of 97 acres from the Agriculture and Rural District, to the Urban District, Tax Map Key no. (4)4-3-03:01. Kapa'a Highlands, Three Stooges LLC

Aloha Chair Piltz,

We are writing in general support of Three stooges LLC's petition to amend 97 acres in Kapa'a to the Urban district. The proposed amendment is in conformance with the County of Kaua'i's General Plan and will provide 231 units of affordable housing. Affordable housing remains an acute need on Kaua'i, even with a falling real estate market and as such the County is generally supportive of any petition that proposes additional affordable housing, particularly when contiguous to developed urban areas, infrastructure and consistent with our General Plan.

Sincerely,

IAN K. COSTA
Planning Director, County of Kaua'i

CC: Ron Agor

BERNARD P. CARVALHO, JR.
MAYOR

GARY K. HEU
ADMINISTRATIVE ASSISTANT

DONALD M. FUJIMOTO
COUNTY ENGINEER
TELEPHONE 241-4992

EDMOND P.K. RENAUD
DEPUTY COUNTY ENGINEER
TELEPHONE 241-4992

AN EQUAL OPPORTUNITY EMPLOYER
COUNTY OF KAUA'I
DEPARTMENT OF PUBLIC WORKS
4444 RICE STREET
MO'IKEHA BUILDING, SUITE 275
LIHU'E, KAUA'I, HAWAI'I 96766-1340

December 22, 2009

Mr. Greg Allen
161 Wailua Road
Kapa'a, Hawai'i 96746

SUBJECT: PROPOSED KAPA'A HIGHLANDS RESIDENTIAL DEVELOPMENT

Dear Mr. Allen:

We acknowledge receipt of your email dated September 24, 2009 for the proposed project and offer the following comments:

1. The proposed project will be connected to the Wailua Wastewater Treatment Plant (WWTP) via a connection to the County's Wailua-Kapa'a sewer system in the vicinity of Olohena Road. The on-site and any necessary off-site extension of a sewer collection system will need to be designed and constructed as part of the development, and may either be a privately owned and operated collection system, or may be designed and constructed with the intent to convey the new collection system to the County. In either case, the system should be designed and constructed pursuant to County standards.

2. The concept plan map submitted does not show proposed sewer utility lines. All appurtenant sewer collection system improvements necessary to serve the development will be designed and installed by the developer. As such, sewer connection charges (SCC) will be waived as provided by the County's sewer ordinance.

3. Based on the proposed 769 single-family and multi-family residential units to be developed, at the current rate of $3,900.00 per unit, the Wastewater Treatment Capacity Assessment (WTCA) is in the amount of $2,999,100.00. The WTCA shall be paid prior to any final subdivision or building permit approvals.

4. Please note that a preliminary engineering report (PER) is required to evaluate the adequacy of the existing and proposed sewer collection system and treatment plant capacity. The PER shall be submitted for our review and approval. The PER should include sufficient detail to allow the County to verify that the proposed sewer system will comply with County Standards, identify the anticipated flow to the County's

sewer system, and to evaluate whether improvements to the existing County sewer system will be needed to serve the development. In the event the project will be developed in phases, please indicate the approximate schedule for phasing of the project, to allow the County to identify impacts from the project on the County's wastewater system, including the flow projections for the Wailua WWTP.

5. Prior to start of any sewer system construction, plans need to be submitted for our review for compliance with sewer design standards.

6. Depending on the extent of necessary improvements to the County's wastewater system, applications for sewer service by others, and project phasing and build-out flows to the Wailua WWTP, there may need to be improvements at the WWTP prior to the County having adequate capacity for the full build-out of the project.

Should you have questions, please contact Valentino Reyna at (808) 241-4083.

Very truly yours,

EDWARD TSCHUPP
Chief, Wastewater Management Division

CONCUR:

DONALD M. FUJIMOTO
County Engineer

VR

cc: Engineering Division
Planning Department

GAllen

From: Tadani, Curtis [ctadani@kiuc.coop]
Sent: Thursday, September 06, 2007 9:44 AM
To: gallen@harbormall.net
Cc: Pascual, Ferdinand
Subject: Kapaa Highlands

Hi Greg,

I got your message and the plans that you brought in were already approved and signed off by us on June 27, 2005 so as far as we're concerned, it should be okay. But if you need to do anything different that will affect the electrical plans, than you should revise them and resubmit them to us for further review. Let me know if anything happens after your Planning Commission meeting next week that will affect the design of the subdivision and more so the electrical portion.

Thanks,

Curt K. Tadani
Eastside Distribution Planner
Kauai Island Utility Cooperative
Ph: 246-4356
Fax: 246-4332
Email: ctadani@kiuc.coop

Elec Plans ok

BRYAN J. BAPTISTE
MAYOR

IAN K. COSTA
DIRECTOR OF PLANNING

GARY K. HEU
ADMINISTRATIVE ASSISTANT

IMAIKALANI P. AIU
DEPUTY DIRECTOR OF PLANNING

COUNTY OF KAUA'I
PLANNING DEPARTMENT
4444 RICE STREET
KAPULE BUILDING, SUITE A473
LIHU'E, KAUA'I, HAWAII 96766-1326
TEL (808) 241-6677 FAX (808) 241-6699

May 29, 2007

Max Graham, Jr.
Belles Graham
Proudfoot & Wilson
4334 Rice Street, Suite 202
Lihue, Kauai HI 96766

SUBJECT: TMK: 4-3-003:001
Kapa'a and Waipouli, Kauai

In response to your letter dated April 16, 2007 concerning the Kapa'a and Waipouli property Tax Map Key (TMK) 4-3-003:001, the subject property is approximately 163.125 acres in size. The State Land Use Commission (SLUC) designates the entire 163.125 acres of the subject property as Agriculture. The County General Plan designates approximately 97.654 acres Urban-Center, 33.685 acres Open, and 31.787 Agriculture. The Comprehensive Zoning Ordinance has the property zoned approximately 127.305 acres Agriculture (A) and 35.820 acres Open (O).

Please understand that the contents of this letter reflect the regulations and/or requirements that are currently in effect and being administered by this Department. These regulations are subject to change. Additionally, we recommend that you also check with other governmental agencies which may administer regulations and requirements that relate to development on this property and/or the proposed use

Attached is a copy of a map showing the SLUC District boundaries on the subject property.

Should you have any questions, please contact Ka'aina Hull of my staff at 241-6677.

Sincerely,

IAN K. COSTA
Director of Planning

Attached.

AN EQUAL OPPORTUNITY EMPLOYER

2-16-2010 8:54AM FROM BUSSHARD/BRUNSTEIN 808 245 8929 P.2

Dec-19-99 12:40P GREG KAMM 1 808 7421751 P.02

12 18-99

SEN. JAMES J. GAYETANO
GOVERNOR OF HAWAII

TIMOTHY E. JOHNS, CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

DEPUTIES
JANET E. KAWELO
LANEL NISHIOKA

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
HISTORIC PRESERVATION DIVISION
Kakuhihewa Building, Room 555
601 Kamokila Boulevard
Kapolei, Hawaii 96707

AQUATIC RESOURCES
BOATING AND OCEAN RECREATION
CONSERVATION AND RESOURCE ENFORCEMENT
CONVEYANCES
FORESTRY AND WILDLIFE
HISTORIC PRESERVATION
LAND
STATE PARKS
WATER RESOURCE MANAGEMENT

December 14, 1999

Mr. Greg Kamm
P.O. Box 1200
Koloa, HI 96756

LOG NO: 24572
DOC NO: 9912NM02

Dear Mr. Kamm:

SUBJECT: **Chapter 6E-42, Historic Preservation Review --**
Subdivision Permit Application S-99-45 (Silagi Family Trust and Hillside Corp. Center L.L.C.)
TMK: 4-3-03: 01 por
Kapaa, Kawaihau, Kaua'i

Thank you for submitting the 1975 air photo of the above subject parcels. We agree that the land has been extensively altered by cane cultivation and filling. Therefore, we now believe that this project will have "no effect" on significant historic sites.

If you have any questions, please call Nancy McMahon at 742-7033.

Aloha,

DON HIBBARD, Administrator
State Historic Preservation Division

NM:lm

c: D. Crowell, Planning Department County of Kauai

From: Heidi_Meeker/FacilDev/HIDOE@notes.k12.hi.us
[mailto:Heidi_Meeker/FacilDev/HIDOE@notes.k12.hi.us]
Sent: Wednesday, April 25, 2012 11:24 AM
To: PeterYoung@Hookuleana.com
Subject: Kapaa Highlands II - Draft Language in EA

Heidi Meeker/FacilDev/HIDOE

04/25/2012 10:40 AM

To Jeremy Kwock/FacilDev/HIDOE@HIDOE,
cc
Subject Kapaa Highlands II - Draft Language in EA Link

Hello Peter,

I appreciate the opportunity to review the education section of the DEA for Kapaa Highlands.

1. Publication of our worksheet
We didn't have a problem with responding to your specific request for a hypothetical impact worksheet, but the sheet itself was marked for discussion purposes only. We have a real problem with the publication of an impact fee work sheet for an impact fee district that doesn't exist, with no current plans to proposed one. The sheet doesn't serve any real purpose for Kapaa Highlands and could be grossly misinterpreted if it was applied to other proposed projects.

2. There's no impact district
Your narrative never states in plain language that there is no school impact fee district in Kapaa, or any where else on the island. The conclusion seems to be buried: we will not be asking the Kapaa Highlands project for any contributions or fees at this point in time. We do not have any current plans to propose an impact district in Kapaa. However, it is possible that a future impact district may cover Kapaa. In that event, Kapaa Highlands may be required to pay impact fees, based on the fee schedule established for the district.

3. Capacity figure
We would prefer that the capacity figures you use be labeled "Classroom Utilization Report 2007-2008" and "CUR 07-08". The annual Classroom Utilization Report was not strictly an inventory of classroom space, it relied on other data such as faculty and staff counts.

We don't have a problem with your estimated student count, but would like the Student Generation Rate to be identified as an estimated Kapaa-area-only SGR.

We don't have a problem with your general assessment that there is sufficient capacity in the Kapaa schools at this point in time to accommodate the students who will reside in the Highlands project.

Please get back to me if you have questions.

Heidi Meeker - heidi_meeker@notes.k12.hi.us
Planning Section
Department of Education/Facilities Development Branch
Kalani High School TB1B
4680 Kalanianaole Highway
Honolulu, 96821
Ph.808-377-8301

Exhibit O

Kaua'i County Planning Commission
Tentative Subdivision Approval for HoKua Farm Lots
June 19, 2014

Jan Kimura
Chair

Angela Anderson
Vice-Chair

Hartwell Blake
John Isobe
Wayne Katayama
Sean Mahoney
Amy Mendonca
Members

PLANNING COMMISSION
County of Kaua'i, State of Hawai'i
4444 Rice Street
Kapule Building, Suite A-473
Lihu'e, Hawai'i 96766-1326
TEL (808) 241-4050 FAX (808) 241-6699

Michael A. Dahilig
Clerk of the Commission

JUN 19 2014

Mr. Brian M. Hennessy
HONUA ENGINEERING, INC.
Ching Young Center, Suite C7
P.O. Box 851
Hanalei, Hawai'i 96714

Subject: Hokua Farm Lots, being the Subdivision of Parcel 1 into Lots 1 to 6 inclusive and designating Easements "AU-1", "AU-2", "D-1", and "W-1", being a portion of Grant 5226 to Rufus P. Spalding at Kapa'a, Kaua'i, Hawai'i.
(**S-2014-02**, HG Kauai Joint Ventures LLC)

Dear Mr. Hennessy,

This letter memorializes the action taken by the Kaua'i Planning Commission effective JUNE 10, 2014 concerning **TENTATIVE APPROVAL** of the above subject application. Final subdivision map approval, per your consent, is subject to the following conditions:

1. Requirements of the Planning Department:

   a. An updated preliminary title report for the existing lot shall be submitted to the Planning Department for review.

   b. All existing and proposed easements shall be identified in the deed descriptions of affected lots and shown on the final subdivision map. Draft copies of the deed descriptions shall be submitted to the Planning Department for review and approval.

   c. Pursuant to section 9-3.8(b) of the Subdivision Ordinance, Kaua'i County Code (1987), the applicant shall submit to the Planning Department an electronic record (digitized format) of the final subdivision map(s) on disk for record keeping purposes prior to final subdivision approval.

rcd 6/21/1
Job#5117

d. The following fees shall be paid to the County of Kaua'i:

1) Park Dedication fee: $900.00

2) Environmental Impact Assessment fee: $1,250.00

e. A future road widening reserve shall be established along the frontage of Olohena Road and Kapa'a By-Pass Road which shall be subject to the specifications of the Public Works Department for a major street. There shall be no new structures permitted within the reserve, and any new structures should be setback from the reserve. The reserve along with its restrictions shall be incorporated into the deed descriptions of the affected lots, draft copies of which shall be submitted to the Planning Department for review and approval.

f. Prior to final subdivision approval, the subdivider shall delineate the Class "B" classified lands on the final subdivision map. In addition and pursuant to Act 199, Session Laws of Hawai'i, 1976, the applicant shall enter into an agreement with the County to incorporate agricultural restrictions into the instruments of conveyance for those lots which contain the Class "A" and/or "B" soils.

g. The Applicant is advised that uses on the newly-created lots shall be limited to those listed as permissible uses within the "A" Agricultural District in the State Land Use Commission Rules and Regulations. Dwellings on the lot shall mean a single-family dwelling located on and used in connection with a farm where agriculture activity provides income to the family occupying the dwelling. These restrictions shall be included in the covenants for the proposed lots, draft copies of which shall be submitted to the Planning Department for review and approval.

h. Prior to final subdivision approval, the Applicant shall submit to the Planning Department a density breakdown for each lot which will be subject to review and approval by the Department. These restrictions shall be included in the covenants and deed descriptions of the proposed lots, draft copies of which shall be submitted to the Planning Department for review and approval. The Planning Department reserves the right to impose additional conditions relating to this matter while in the process of resolving this condition.

i. The pole sections of the double flag lots shall be designated as common access/utility easements in favor of each other and shall be incorporated into the deed descriptions of the affected lots (Lot 4 and Lot 5), draft copies of which shall be submitted to the Planning Department for review and approval.

j. The subdivider shall resolve with the Planning and Public Works Departments the following:

1) Participation in the upgrading of the intersection of 'Olohena Road, Ka'apuni and Kaehulua Roads by providing necessary lands to accommodate the future improvements.

2) Limiting vehicular access points onto 'Olohena Road.

3) Establishing a road reserve within the project area in order to accommodate future construction of interior roadway system that would allow a connection for 'Olohena Road to the Kapa'a By-Pass Road and relieve traffic off 'Olohena Road.

The Planning Department reserves the right to impose additional conditions relating to this matter while in the process of resolving this condition.

k. The Applicant shall prepare and obtain construction plan approvals for necessary road, water, drainage, electrical and telephone utilities and facilities, and either construct the same or post a surety bond for completion.

l. In order to ensure that the subdivision and development of property complies with the land use requirements contained in Chapter 205 of the Hawai'i Revised Statutes ("HRS"), the following matter shall be resolved prior to final subdivision approval:

(1) The Applicant shall provide the following documents to the Subdivision Committee of the Planning Commission ("Subdivision Committee") for its review and approval:

(A) An Agriculture Master Plan shall describe the proposed agricultural uses of the property, the marketing and business plans associated with such activities, and the manner in which the agricultural and related uses on the property will comply with HRS Chapter 205.

(B) A map of the property showing the proposed location of: Agricultural Activities; Building Areas; and Agricultural Easements.

(C) A Declaration of Conditions, Covenants and Restrictions ("Restrictive Covenants") which will be recorded in the Bureau of Conveyances of the State of Hawai'i ("Bureau"), which will encumber and run with the property, and which will provide and require: that the owners of the lots in the subdivision ("Subdivision Lots") shall comply with the Agricultural Plan and the provisions of HRS Chapter 205; that the owners of all of the Subdivision Lots shall be members in an association ("Association") which will have the power and duty to enforce the Restrictive Covenants; that the Association shall file periodic reports (as determined by the Planning Department) with the Planning Department verifying compliance with the Agricultural Master Plan; and that the Agricultural Master Plan shall not be amended without prior approval of the Planning Department.

(D) An Agricultural Subdivision Agreement which will be recorded in the Bureau, run with and encumber the property, and which will provide and require: that each Subdivision Lot owner shall indemnify, defend and hold the County harmless from any claims arising out of the failure of the Subdivision Lot owner to comply with the Agricultural Master Plan and/or HRS Chapter 205; and that in the

event of a Subdivision Lot owner's noncompliance with the Agricultural Master Plan and/or HRS Chapter 205 as determined by the Planning Department, the County and the State of Hawai'i shall have the right to refuse to grant any permits or approvals for uses or development on any Subdivision Lot affected by such noncompliance unless and until the noncompliance is cured, as determined by the Planning Department.

m. The subdivider shall resolve with the Planning Department the provision of public access within the subdivision. The applicant shall propose an access plan for the review and approval of the Planning and Public Works Departments. Additionally, due to the farming activities, the subdivider shall work with the Planning Department on establishing a public access control system.

Proper documents shall be prepared and ready for execution prior to final subdivision approval. The Planning Department reserves the right to impose additional conditions relating to this matter while in the process of resolving this condition.

2. Requirements of the Department of Public Works:

DRAINAGE

a. The subject subdivision abuts a natural unnamed drainage way on the West for which a detailed flood study has not been incorporated with the Flood Insurance Rate Maps (FIRM). Several natural drainage valleys or drainage swales traverses through and along the property. The natural drainage water courses will collect and concentrate storm flows through the site. A drainage study and provisions need to be established to prevent structures from being built in flood prone areas and to preserve the function and capacity of the natural water courses.

The subdivision and subsequent development of residences and other impermeable surfacing will increase storm water flowage. A drainage study needs to be made to evaluate the impacts of the increased storm runoffs. Measures to keep flow rates to predevelopment conditions is required.

b. Flood studies need to include the existing bridge at the Kapa'a By Pass Road whether the bridge is adequate to convey storm flows without overtopping the Kapaa By Pass Road.

c. The flood zoning, FIRM panel no. 204F and the date of the FIRM November 26, 2010 needs to be labeled on the final maps as well as the determined flood prone areas with base flood elevations. The applicant and future owners shall be advised that construction of new structures in flood prone areas presents flood risks and associated flood problems.

ROAD

d. The street name labeling for *Opala Road* needs to be amended to **"Malu Road"**. The Kapa'a By Pass Road traverses through the proposed Lot 6. We recommend that the Kapa'a By Pass Road be named to facilitate house addressing assignment.

e. The subject subdivision abuts the Olohena Road on the North. Olohena Road has a right of way width of 40 feet and an average pavement width of 20 feet. The pavement width is adequate for two way passenger vehicular type traffic. The right of way width is inadequate for a major collector street classification (60 feet right of way). We recommend a road reserve be established along Olohena Road or lands be dedicated to the County as well as improvements to Olohena Road to facilitate Safe Route to School and Complete Streets facilities.

f. Access along Olohena Road **must** be restricted. Access for Lots 1, 2 and 3 **shall** be restricted to the pole section for Lots 4 and 5. Easement "AU-1" for roadway and utility purposes shall be restricted to the pole section for Lots 4 and 5. Comments should be solicited from the State Department of Transportation whether access would be allowed for Lot 6 from the Kapa'a By Pass Road.

OTHERS

g. Complete Streets and Safe Route to School design principles needs to be incorporated with the subdivision improvements to Olohena Road. Complete Streets and Safe Route to School features include interconnected sustainable transportation networks providing opportunities for all modes of travel to and from neighborhood destination points for users of all ages and abilities. Comments should be solicited from the County's Transportation Planner.

3. Requirements of the Department of Water:

a. The subdivider shall pay the Department of Water, a Facilities Reserve Charge of $23,000 (5 lots at $4,600 per lot). The subdivider shall pay any rate increase and/or applicable charges in effect at the time of receipt.

b. The subdivider shall prepare and get Department of Water's approval on construction drawings for necessary water system facilities and either construct said facilities or post a performance bond for construction. These facilities shall also include:

1) Additional source facilities. The Applicant may wait until others (including the Department of Water) to construct additional source for this area.

2) The domestic service connection.

c. Locate and show all existing water meter/s (with appropriate water meter number) on the tentative subdivision map for the Department of Water's review and approval. Also identify the proposed subdivision lot that the existing water meter/s will be assigned to. The DOW comments may change depending on the approved tentative map.

4. Requirements of the State Health Department:

   a. The existing individual wastewater system can continue to serve the existing building. However, wastewater generated from any additional dwelling units and other buildings shall be disposed of in wastewater systems that meet the wastewater rules in effect at the time of building permit application.

   b. Noise will be generated when construction occurs after Lots 1 through 6 are subdivided, shall not exceed the applicable maximum permissible sound levels as stated in Title 11, Hawaii Administrative Rules (HAR), Chapter 11-46, entitled "Community Noise Control" unless a noise permit is obtained from the State Department of Health (DOH).

   c. Temporary fugitive dust emissions could be emitted when/if construction activities occur after Lots 1 through 6 are subdivided. At that time, in accordance with Title 11, HAR, Chapter 11-60.1, entitled "Air Pollution Control", effective measures for air pollution control shall be provided to minimize or prevent any fugitive dust emissions caused by the construction work from impacting the surrounding areas. This includes the off-site roadways used to enter / exit the project. The control measures include but are not limited the use of water wagons, sprinkler systems, dust fences, etc.

   d. In accordance with Title 11, HAR, Chapter 11-58.1, entitled "Solid Waste Management Control", the construction waste that is generated when/if the subdivided lots are developed shall be either recycled or disposed of at a solid waste disposal facility that complies with the DOH. The open burning of any of these wastes on or off site is prohibited.

   e. Any project and its potential impacts to State waters must meet the following criteria:

      1) Anti-degradation policy (HAR, Section 11-54-1.1), which requires that the existing uses and the level of water quality necessary to protect the existing uses of the receiving State water be maintained and protected.

      2) Designated uses (HAR, Section 11-54-3), as determined by the classification of the receiving State waters.

      3) Water quality criteria (HAR, Sections 11-54-4 through 11-54-8).

   f. Please call the Army Corps of Engineers at (808) 438-9258 to see if this project requires a Department of the Army (DA) permit. Permits may be required for work performed in, over, and under navigable waters of the United States. Projects requiring a DA permit also require a Section 401 Water Quality Certification (WQC) from our office.

   g. You are required to obtain a National Pollutant Discharge Elimination System (NPDES) permit for discharges of wastewater, including storm water runoff, into State surface waters

(HAR, Chapter 11-55). For the following types of discharges into Class A or Class 2 State waters, you may apply for NPDES general permit coverage by submitting a Notice of Intent (NOI) form:

1) Storm water associated with industrial activities, as defined in Title 40, Code of Federal Regulations, Sections 122.26(b)(14)(i) through 122.26(b)(14)(ix) and 122.26(b)(14)(xi).

2) Storm water associated with construction activities, including clearing, grading, and excavation, that result in the disturbance of equal to or greater than one (1) acre of total land area. The total land area includes a contiguous area where multiple separate and distinct construction activities may be taking place at different times on different schedules under a larger common plan of development or sale. **An NPDES permit is required before the start of the construction activities.**

3) Treated effluent from leaking underground storage tank remedial activities.

4) Once through cooling water less than one (1) million gallons per day.

5) Hydro-testing water.

6) Construction dewatering effluent.

7) Treated effluent from petroleum bulk stations and terminals.

8) Treated effluent from well drilling activities.

9) Treated effluent from recycled water distribution systems.

10) Storm water from a small municipal separate storm sewer system.

11) Circulation water from decorative ponds or tanks.

   h. You must submit a separate NOI form for each type of discharge at least 30 days prior to the start of the discharge activity, except when applying for coverage for discharges of storm water associated with construction activity. For this type of discharge, the NOI must be submitted 30 before to the start of construction activities.

   i. For types of wastewater not listed in Item 3 above or wastewater discharging into Class 1 or Class AA waters, you must obtain an NPDES individual permit. An application for an NPDES individual permit must be submitted at least 180 days before the commencement of the discharge.

   j. You must also submit a copy of the NOI or NPDES permit application to the State Department of Land and Natural Resources, State Historic Preservation Division (SHPD), or

demonstrate to the satisfaction of the CWB that SHPD has or is in the process of evaluating your project. Please submit a copy of your request for review by SHPD or SHPD's determination letter for the project along with your NOI or NPDES permit application, as applicable.

k. Please note that all discharges related to the project construction or operation activities, whether or not NPDES permit coverage and/or Section 401 WQC are required, must comply with the State's Water Quality Standards. Noncompliance with the water quality requirements contained in HAR, Chapter 11-54 and/or permitting requirements, specified in HAR Chapter 11-55 may be subject to penalties of $25,000 per day per violation.

5. Requirements of the Housing Agency:

a. Chapter 7A of the Kaua'i County Code, 1987, as amended, is applicable to the proposed subdivision, pursuant to Section 7A-1.4(c)(1).

Prior to final subdivision approval, the Applicant shall resolve the workforce housing assessment and shall execute a Workforce Housing Agreement with the Kaua'i County Housing Agency, as to the method of meeting the workforce housing requirement pursuant to Chapter 7A. The executed agreement shall be recorded on the deed of the project properties concurrent with final subdivision approval.

The Kaua'i County Housing Agency reserves the right to change this determination if the petition or application changes from the above, or if the project incorporates or becomes part of a larger residential or resort project, such that provisions of Kaua'i County Code, Section 7A-1.4 become applicable.

6. Requirements of the Department of Wastewater:

a. The proposed subdivision is near the County's sewer service area. If sewer service is needed, the Applicant shall apply for County sewer service and shall be responsible for design and construction of all infrastructure necessary to connect to the County sewer and shall be responsible for payment of all applicable fees.

7. Requirements of the State Historic Preservation Division (SHPD):

a. Pursuant to Hawaii Administrative Rules §13-284 we request an **archaeological inventory survey** be conducted by a qualified archaeologist in order to adequately determine the potential impacts of this subdivision on both surface and subsurface historic properties. We look forward to the opportunity to review the archaeological report prior to commencing further on the subdivision application. We recommend the final subdivision approval be deferred until the archaeological inventory survey report has been completed and appropriate mitigation measures/plans are in place.

b. As recommended by the State Historic Preservation Division (SHPD) of the Department of Land and Natural Resources (DLNR), in the event that historic resources, including human skeletal remains are identified during routine construction activities, all work needs to cease in the immediate vicinity of the find, and the finds need to be protected from additional disturbance, and the State Historic Preservation Division, Kaua'i section, needs to be contacted immediately at (808)692-8015.

8. The Applicant is advised that prior to and/or during construction and use additional conditions may be imposed by government agencies. Should this occur, the Applicant shall resolve these conditions with the respective agency(ies).

Sincerely Yours,

MICHAEL A. DAHILIG
Clerk, Kaua'i Planning Commission

xc: COK Public Works Dept.
COK Water Dept.
COK Real Property – Assessment Div.
State Dept. of Health
State Historic Preservation Dept.