

**GROVE FARM PROPERTIES'**  
**LIHUE PUHI LAND USE MASTER PLAN**  
**Planning and Engineering Report**

## **INTRODUCTION**

This planning and engineering report presents a land use master plan for the development of about 608 acres of land owned by Grove Farm and located at the outskirts of Lihue and in Puhi. This plan is a revision of the plan detailed in an earlier Final Environmental Impact Statement (FEIS). This plan is a concept plan which will change as conditions change.

## **PLAN DESCRIPTION**

### **EXISTING LAND USE**

#### **1. Commercial Use:**

- a. Kukui Grove Commercial: The main commercial areas within the project are the Kukui Grove Shopping Center and the Kukui Grove Commercial Village. Grove Farm is presently developing a new commercial area, Kukui Grove Commercial Village West, to the west of the existing Shopping Center. Uses within this area includes retail sales, banking, fast food restaurants, health clubs and other commercial uses providing services to all of Kauai.
- b. Puhi Neighborhood Commercial: This secondary commercial area exists within Puhi along Kaumualii Highway. This is a neighborhood commercial area and as such contains gas service station and markets. The offices of Grove Farm Properties are also located here.

#### **2. Light Industrial:**

- a. Puhi Light Industrial: This area is an existing industrial area south of the Puhi Neighborhood Commercial area. The area is partially developed and includes warehousing and dairy operations.
- b. Puhi Industrial Park: This area is presently being developed by Grove Farm Properties. The development is about 60 acres in size and will have a mix of 15,000 to 30,000 sq. ft. lots.

#### **3. Residential:**

- a. Komohana Residential Subdivision: This is a recently developed affordable subdivision by Grove Farm Properties. The subdivision includes 96 single family lots and three multifamily sites.
- b. Puhi Residential Subdivision: This subdivision along Kaumualii Highway was developed by Grove Farm in the late 1960's. The subdivision consists of 148 single family lots and includes a highway buffer and a 4.0 acre neighborhood park.

- c. Ulu Ko Residential Subdivision: This is a recently developed affordable subdivision by Grove Farm Properties. This subdivision was recently developed by Grove Farm and is located south of Kukui Grove Shopping Center along Nawiliwili Road. The subdivision include 164 lots and a 4.0 acre park site.

#### 4. Park/Recreation:

- a. Puhi Neighborhood Park: This is a 4.4 acre park site which is located within the Puhi residential subdivision and overlooks Halehaka Stream gulch.
- b. Puhi Passive Park: This is a 2.9 acre grassed open area between Kamualii Highway and the Puhi residential subdivision.
- c. Ulu Ko Neighborhood Park: This is a 4.0 acre park site on the north side of the newly developed Ulu Ko Subdivision.
- d. New Park at Kukui Grove Village West: This is a 5.8 acre private park proposed within the new Kukui Grove village West. The park is intended to provide for regional community events such as the County farm fair.

#### LAND USE CONCEPT

The master plan for the property is an outgrowth of twenty years of past planning efforts by Grove Farm and the existing uses which Grove Farm has developed to date. This plan proposes the following concepts:

1. Provide new commercial as natural expansions from existing commercial areas and take advantage of high visibility and convenient access from Kaumualii Highway and Nawiliwili Road.
2. Provide affordable and market residential uses as part of this project.
  - a. Locate affordable residential near existing Puhi residential areas and west of the Kukui Grove commercial areas.
  - b. Locate market residential in and around a new golf course makai of the existing and proposed commercial areas. These residential developments should take advantage of the golf course, valley, and makai ocean views.
3. Develop an internal roadway system that distributes traffic throughout the project.
  - a. Provide an internal collector road (realigned Nohou Road) that provides movement through the project.
  - b. Provide a secondary road that connects the Lihue side of the project with the Puhi side.
  - c. Use cul-de-sac streets to discourage through traffic and encourage neighborhood enclaves.

## LAND USE PLAN

### 1. Shopping Center Commercial:

- a. Overview. The Kukui Grove Shopping Center provides retail and office services to residents of Kauai. The shopping center's major tenants are Liberty House, Long's Drug Stores, Sears Roebuck & Co., Woolworth, J.C. Penney and Star Super Market.
- b. Shopping Center Expansion (Lot 18-17 acres). This area is proposed as an expansion area for the existing shopping center facility which is nearly fully occupied. The proposed area would allow a logical extension of the existing shopping center mall and parking.

### 2. General Commercial:

- a. Overview. General commercial activities now occur around the shopping center commercial core. The Kukui Grove Commercial Village to the east of the shopping center has been in operation for some time and provides restaurant, entertainment, banking and professional services. The Kukui Grove Village West has just been completed. A new bowling alley facility has recently been announced for this area.
- b. General Commercial Areas West. (Lots 19-8.5 acres, 20-7.5 acres, 21-6.0 acres). These commercial areas are located west of the shopping center and the new Kukui Grove Village West. These areas should have high visibility and easy access from Kaumualii Highway. Uses in these areas might include retail sales, business offices, and other commercial services.

### 3. Residential:

- a. Overview. There are a total of 2,361 units or lots in Grove Farm's Lihue project. These include both affordable and market lots or units and single family and multi-family ntype units. The Puhi, Komohana and Ulu Ko subdivisions are affordable projects included in the total count that have already been constructed by Grove Farm.
- b. Affordable Units. Grove Farm believes that their experience at providing affordable residential projects at Ulu Ko, Komohana and Puhi will allow them to continue providing affordable housing units that satisfy the resident needs.
  - i. Single Family (Lots 2, 3, 4, 5 and 13). Lots 2 and 3 are the Komohana and Puhi Subdivision are 96 lot and 148 lot affordable projects developed by Grove Farm. Lot 13 is the Ulu Ko Subdivision, a 164 lot project, developed by Grove Farm along Nawiliwili Road.

Lots 4 and 5 located on the Puhi side would provide about 264 affordable units at a density of about 6 units per acre. These projects might consist of traditional single family detached or zero lotline subdivisions.
  - ii. Multifamily (Lots 6 and 7). These residential areas located on the west of the Kukui Grove commercial areas would provide about 596 units at a density of 10-12 units per acre. These projects might consist of zero lotline subdivisions, single family attached, townhouse and garden apartment units.

- iii. Rental Multifamily (Lot 1). This 5 acre multifamily area located across the highway from the Komohana Subdivision and west of the Kauai Community College is intended to provide 200 rental units for individuals working in Lihue or attending the college. This project is located on the former plantation residential area at Puhi.
- c.. Market Units. The market units are intended to satisfy the demands as demonstrated by the market projections for the project. The market projects are expected to provide the profits needed to carry the affordable projects. The market units are located makai of the Kukui Grove commercial area and will take advantage of the golf course, makai and valley view amenities. The proximity to the proposed golf course will also provide a recreational amenity for these projects. The projects are as follows:
  - i. Single Family (Lots 9, 10, 11, 14, 15, 16 and 17). These residential areas, totaling 164.5 acres, would provide about 658 residential units at densities of about 4 units per acre. These projects are generally expected to be traditional single family detached subdivisions.
  - ii. Multi-family (Lot 8 and 12). These two multi family projects are located next to the proposed golf course. These areas, totalling about 19.5 acres, would provide about 225 market type units. The projects are expected to have densities of 10-12 units per acre and would probably be townhouse units looking into golf course and open areas.

#### 4. Golf Course Facility:

- a. Golf Course (Lots 22, 23, 24, 25 and 26). An 18-hole golf course on about 236.5 acres of the project area would provide recreation, open space and visual amenities. The golf course would also provide ponding areas for irrigation and drainage purposes.
- b. Golf Clubhouse, Maintenance and Town Club Facilities (portion of Lot 24). A golf clubhouse would be developed as part of the proposed golf course. It would be located on the southside of the existing manager's house. The maintenance area would be located next to the proposed driving range. The existing manager's house would be converted to a town club.
- c. Sewage Treatment Plant: Limited expansion area for Sewage Treatment Plant expansion is provided for on the makai side of the existing plant. Further studies need to be done, however, to determine if the plant needs to be expanded at the present site, relocated to a new site or replaced by an improved Lihue STP facilities.

#### DEVELOPMENT SCHEDULE

A real estate market analysis indicated there is a pent up demand for residential lots and multi-family units over the initial phase (1990-1994) of the project and beyond. Construction of houses on these lots by owners is expected to occur over a ten-year period.

The same analysis indicated that most of the Shopping Center Expansion and General Commercial uses could occur during the initial phase.

## **INFRASTRUCTURE**

### **ROADWAYS**

#### **Existing Circulation**

The two major roadways which border the Lihue-Puhi Project District area are the Kaumualii Highway and Nawiliwili Road.

Kaumualii Highway is a State facility which connects Lihue and Waimea. It has two 12 foot lanes with 4-foot paved and 10-foot unpaved shoulders on each side. Major intersections to Kaumualii Highway occur with Nawiliwili Road, Puhi Road, at the Puhi light industrial site, at Komohana and Puhi residential subdivisions and at the Kukui Grove Shopping Center. The intersections of Kaumualii Highway with Puhi Road and the Kukui Grove Shopping Center have separate left turn lanes and acceleration and deceleration lanes to Kaumualii Highway.

Nawiliwili Road is a two lane road which connects the harbor area with Kaumualii Highway. It has two 12-foot lanes with 4 foot stabilized and 10 foot unpaved shoulders on each side. Intersections to Nawiliwili Road occur at Ulu Ko Subdivision, Haleko Road, Halehaka Road, Lala Road, Waapa Road and Kaumualii Highway. The Kukui Grove Center and Commercial Village also have access to Nawiliwili Road. The Nawiliwili Road intersection with Kaumualii Highway is a "T" intersection.

#### **Proposed Improvements**

The Lihue-Puhi Project District Plan proposes single family, multi-family, light industrial, commercial and golf course uses. These new uses would be served by the existing roadway network plus a system of roads that will be developed as part of the project district.

The roadway system within the subject property will consist of collector, minor and dead end streets. Nuhou Street will be the collector street for the project and will connect to Nawiliwili Road west of Waapa Road and to Kaumualii Highway east of Puhi Road. It is intended for internal use to keep traffic from the new development off of existing Kaumualii Highway and Nawiliwili Road. Provisions for bicycle and jogging paths on improved Nuhou Street would be made.

Nawiliwili Road is expected to be realigned to run between the Kukui Grove Center and the Kukui Grove Commercial Village by the Highways Division. With the realignment, the Highways Division expects to construct turning lanes and signalize the intersection with Kaumualii Highway. The portion of Halehaka Road within the project will be rerouted.

#### **Traffic Impacts**

Preliminary traffic forecast indicate that afternoon peak hour traffic along Kaumualii Highway will reach the capacity of a two lane highway by the year 2000 even without the project. The forecasts further indicate that due to the high traffic volumes the unsignalized intersections along Kaumualii Highway at Nawiliwili Road, Nuhou Road and Puhi Road operate at levels-of-service (LOS) F. All other intersections along Kaumualii Highway and Nawiliwili Road from the Lihue-Puhi Project District will still operate below capacity as unsignalized intersections.

The Nawiliwili Highway will be about 530 trips both ways near the intersection with Kaumualii Highway, and will decrease towards the harbor, reducing to about one-half the volume at Waapa Road.

The forecasted traffic growth on Kaumualii Highway indicate that widening to four lanes would likely be required by the year 2000 whether or not the proposed project is developed. Furthermore, the heavy volume of traffic on Kaumualii Highway will cause long delays for motorist attempting to enter or exit the proposed development, therefore requiring signalization for the major intersections. Preliminary analyses indicate that by widening Kaumualii Highway to four lanes and including additional exclusive turn lanes the signalized intersections at Nawiliwili Road, Nuhou Road and Puhi Road will be able to operate at acceptable levels-of-service. The signalization of these major intersections will also benefit motorist at other, unsignalized intersections, by creating breaks in the traffic flow for turning movements.

### **Water Supply**

The project district is served by Kauai County Department of Water Supply's Lihue and Puhi water systems. Sources for these systems incorporate well complexes mauka of Lihue town and a well mauka of the Kauai Community College in Puhi.

These wells feed a system of storage tanks at Lihue, Puhi and Hanamaulu. Two 1 million gallon tanks above the German Hill area serves the Lihue, Kukui Grove Center, Kapaia, and Hanamaulu areas. Two low pressure tanks near the Kauai Nursery serves Pua Loke, Ulu Mahi and Ulu Kukui residential subdivisions located along Nawiliwili Road. A storage tank is located mauka of the Kauai Community College serves the Puhi area. An additional storage tank is to be constructed at Hanamaulu.

Transmission from these storage facilities are by lines ranging in size from 10-18". Grove Farm Properties recently installed a 16" line from the German Hill tanks to service its Kukui Grove Center development and the rest of the project district.

The proposed development will generate a need for an estimated .934 mgd. This is based on Department of Water Supply's factors of 500 gallons per day per housing unit and 4,000 gallons per day per acre of industrial use.

The Department of Water indicated that the present source and storage capacity is adequate. The department, however, does not commit the adequacy of its source and storage until a development is at the subdivision approval process.

The transmission and distribution system would be constructed by the petitioner and, when completed, turned over to Department of Water Supply's Lihue and Puhi water systems for ownership, operation and maintenance. All distribution lines will be located in common areas, public spaces and road rights-of-way, where maintenance operations can be easily conducted.

### **Solid Waste**

The disposal site is expected to be the County's Halehaka landfill site and/or Kekaha landfill site. The Halehaka landfill site, according to the County, has a life through 1990. The County plans to construct a transfer station in Lihue as part of a County wide solid waste disposal plan.

Domestic solid waste is expected to be disposed of by private services for commercial and industrial uses and by the County for residential lots. The amount of domestic solid waste generated by light industrial users and residents is estimated at 44,000 lbs. per day.

### **Sewage System**

At present, the Kukui Grove Shopping Center and Commercial Village are served by an existing 0.16 mgd private wastewater facility located south of the shopping center on Halekaha Road. The Kukui Grove Village West Subdivision which is presently being designed will be connecting to this existing treatment facility. Ulu Ko subdivision has a dry sewerage system and presently utilizes cesspools. All remaining adjacent areas utilizes cesspools for handling the sewage.

The proposed development would generate an estimated 0.84 mgd of sewage. This waste would be collected via a system of gravity sewer lines, sewage pumping station and force mains and conveyed to the existing treatment plant site. The facility could be expanded to accommodate the increased volume of wastewater. The treated sewage effluent would be utilized to irrigate the proposed golf course. If expanded, the treatment facility would provide adequate sludge treatment and dewatering facilities.

The proposed collection and treatment system can be either private or dedicated to the County of Kauai. These alternatives require more detailed analysis and communications with the County before a selection can be made. An additional alternative would be to replace the existing treatment plant with a sewage pump station which would convey the sewage to the County's Lihue Wastewater treatment plant. Improvement to the Lihue Plant would also be required. Regardless of which alternative is ultimately selected, the sewage generated will be properly treated and disposed.

### **DRAINAGE**

The drainage system within the proposed development will revolve around the existing drainage systems. Roadway drainage systems will also be designed with the existing drainage patterns in mind.

The roadway drainage system will collect the runoff from the developed areas by means of concrete gutters, ditches, and underground pipes. This flow will be ultimately directed to a natural drainage system. All drainage systems will be designed to County standards.

The natural drainage pattern directs a majority of the surface runoff to the Puali Stream Basin. This drainage pattern will be maintained. In addition measures shall be taken to mitigate both the volume of runoff and the amount of sediment disposed into existing stream basins. The proposed golf course provides open space that will serve to reduce surface runoff by allowing more water to be absorbed into the ground. Gentle slopes, depressions and sediment basins will also be provided.

### **ELECTRICITY AND TELEPHONE**

Primarily, the proposed development will be provided with underground electric and telephone distribution systems. Undergrounding in affordable housing areas may need further study because of cost considerations. Both systems will be constructed in conformance with the

requirements of Kauai Electric and Hawaiian Telephone Companies. The source of power is Port Allen power plant with back-up from Lihue, McBryde and Kekaha Sugar Mills and various hydro-electric installations.

#### **ESTIMATED DEVELOPMENT COST**

The estimated order of magnitude cost for the on-site and off-site improvements is between 65 and 75 million dollars. This estimate is in 1989 dollars and includes the cost of the golf course and other site improvements. Roadway, water, drainage, sewer and underground electric/telephone systems costs are also included in this estimate. This estimate does not include the cost of the golf clubhouse, town house, commercial buildings and residential units. This order of magnitude is subject to more detailed analysis and coordination with the appropriate governmental agencies.



# LIHUE-PUHI REVISED LAND USE SUMMARY

LOT	USE	ACREAGE	DENSITY	UNITS	MARKET	AFFORD.
1	MF Rental	5	40	200		200
2	Komohana Subdivision	--	--	96		96
3	Puhi Subdivision	--	--	148		148
4	SF Residential	5	6	30		30
5	SF Residential	39	6	234		234
6	MF Residential	26	10	260		260
7	MF Residential	28	12	336		336
8	MF Residential	15	12	180	180	
9	SF Residential	8.5	4	34	34	
10	SF Residential	49	4	196	196	
11	SF Residential	40	4	160	160	
12	MF Residential	4.5	10	45	45	
13	Ulu Ko Subdivision	--	--	164		164
14	SF Residential	3.5	4	14	14	
15	SF Residential	7.5	4	30	30	
16	SF Residential	38	4	152	152	
17	SF Residential	18	4	72	72	
18	Shopping Center Expansion	17	0	0		
19	General Commercial	8.5	0	0		
20	General Commercial	7.5	0	0		
21	General Commercial	6	0	0		
22	Golf/Open	25	0	0		
23	Golf/Open	50	0	0		
24	Golf/Open	79	0	0		
25	Golf/Open	57	0	0		
26	Golf/Open	25	0	0		
	Roads & Miscellaneous	46	0	0		
	TOTAL	608	124	2,351	883 37.56%	1,468 62.44% 100.00%



