

MAUI ISLAND PLAN



Prepared for:
The State of Hawai'i
Department of Hawaiian Home Lands

Prepared by:



September 2004

MAUI ISLAND PLAN

State of Hawai'i
Department of Hawaiian Home Lands



Hawaiian Homes Commission

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EXECUTIVE SUMMARY

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EXECUTIVE SUMMARY

A. PURPOSE OF THE MAUI ISLAND PLAN

The mission of the Department of Hawaiian Home Lands (DHHL) is to effectively manage the Hawaiian Home Lands trust and to develop and deliver land to native Hawaiians. DHHL landholdings on the island of Maui total more than 31,000 acres. The *Maui Island Plan* serves as a comprehensive resource for planning and managing these lands and establishes land use designations to encourage orderly social, physical, and economic development.

The plan examines infrastructure needs and opportunities from an island wide perspective, gauges beneficiary needs and demands, proposes plans for both homesteading and non-homesteading uses, estimates costs for both on- and off-site infrastructure, and based on these findings, identifies priority areas for homestead development.

Information provided by the *Maui Island Plan* will enable the Department of Hawaiian Home Lands to better coordinate its developments with State, County, and private sector plans and activities. This will help DHHL to potentially align major infrastructure needs, such as roads and highways, sewage treatment and water development and use with existing and/or planned services for other development projects on Maui.

B. CONTEXT OF THE MAUI ISLAND PLAN WITH DHHL PROGRAM ACTIVITIES

The *Maui Island Plan* is part of a three-tier planning system developed by DHHL to guide the development and use of Hawaiian home lands statewide. Island plans are the primary policy document that guides land uses for Hawaiian home lands on each island.

C. RESIDENTIAL GOALS FOR THE MAUI ISLAND PLAN

On February 26, 2002, the Hawaiian Homes Commission adopted a *General Plan*, which established goals and objectives that serve as the guidance for the island plans. A key objective of the *General Plan* is to:

“Deliver an average of 500 new residential housing opportunities per year in proportion to the number of applicants on the residential waiting list for each island.”

In the second quarter of 2002, there were 16,870 residential applications statewide. The Maui residential waitlist accounted for 2,749 applications, or 16 percent of the overall list. According to the quoted *General Plan* objective, a minimum of 1,600 lots needs to be developed on Maui over 20 years.

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D. PLANNING PROCESS

A series of planning studies to assess existing land inventories, beneficiary demand and resources were prepared and formed the basis of the Maui Island Plan.

In March 2003, SMS Marketing & Research Services, Inc., surveyed current Maui Island lessees and applicants to better understand their needs and desires. In addition to demographic information, the survey asked respondents to indicate their preferences for type of award, lot size, and location. A major finding from the survey was a list of area preferences that defined demand for residential homesteads by regional area. Findings are listed, by region, below:

Location	Total Residential Preferences		
	Total	Percent	Projected
West	317	14.5%	411
Central	866	39.7%	1,122
Upcountry	854	39.2%	1,107
East	121	5.6%	157
South	23	1.1%	30
Total	2,181	100.0%	2,827

Carl Takumi Engineering, Inc. assessed off-site water requirements for Hawaiian home lands properties. Rider, Hunt, Levett, & Bailey provided development cost estimates for needed infrastructure improvements.

A key component of the *Maui Island Plan* was to establish relationships with public agencies, private companies, community groups, and other stakeholders in order to coordinate activities related to the development and use of land on Maui. This was first initiated through a series of working group meetings that involved State and County agencies, adjacent large land owners, non-profit service providers, and representatives of both lessee and applicant groups on Maui. Three meetings were conducted on March 27, April 17, and November 13, 2003.

In addition to working group meetings, two rounds of community meetings, open to the general public, were conducted in each of the five planning regions to provide information regarding proposed land use opportunities and to receive input relating to the development and use of Hawaiian home lands. The first round of regional meetings was held in May and June. This series of meetings also included half-day site visits. The site visits were followed by focus group discussions sponsored by Hui Kako'o 'Aina Ho'opulapula, an advocacy group for DHHL applicants. Written comments were received pursuant to the focus group discussions and were considered in the formulation of the *Maui Island Plan*. A second round of regional community meetings was held in November of 2003.

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E. HAWAIIAN HOME LANDS ON MAUI

Hawaiian home lands account for over 31,000 acres in five regions on the island of Maui. Central Maui (Waiehu, Paukūkalo, and Pu‘unēnē) contains over 850 acres, West Maui (Honokōwai) has over 750 acres, Upcountry Maui (Kēōkea/Waiohuli, ‘Ulupalakua, Kualapa) has over 6,000 acres, South Maui (Kahikinui, Kalihi/Kanahena, ‘Āhihi) has over 23,000 acres, and East Maui (Ke‘anae, Wailua, Wākiu) has almost 900 acres (Figure A).

F. LAND USE DESIGNATIONS

The Department of Hawaiian Home Land planning system uses “land use designations” (LUD) to classify its land uses within island plans. LUD classification separates the lands into use districts, each having its own set of general permitted uses and development standards. The land use designations used in the *Maui Island Plan* are separated into homesteading and non-homesteading categories and include the following:

Homestead Uses

Residential
Subsistence Agriculture
Supplemental Agriculture
Pastoral

Non-Homestead Uses

General Agriculture
Commercial
Industrial
Conservation
Community Use
Special District

G. IMPLEMENTATION OF THE MAUI ISLAND PLAN

As each island plan is developed and approved, priority tracts identified in the plan are budgeted for development in either the near or long term. Once monies are allocated, DHHL formulates detailed development plans for each priority tract. The development plan provides information that enables DHHL to move into the design and construction phase for the tract.

H. SUMMARY OF FINDINGS AND PROPOSED LAND USE RECOMMENDATIONS

1. Upcountry Maui

Kēōkea/Waiohuli – Priority Tract

DHHL has a major land interest in the Kula area of Upcountry Maui. With over 6,000 acres located below Kula Highway on the slopes of Haleakalā, the Kēōkea/Waiohuli tract provides tremendous homesteading opportunities for Maui Applicants (Figure B). Although the tract is large, it has very few existing major infrastructure improvements. It is far from Maui’s economic centers and its terrain makes development more expensive. At

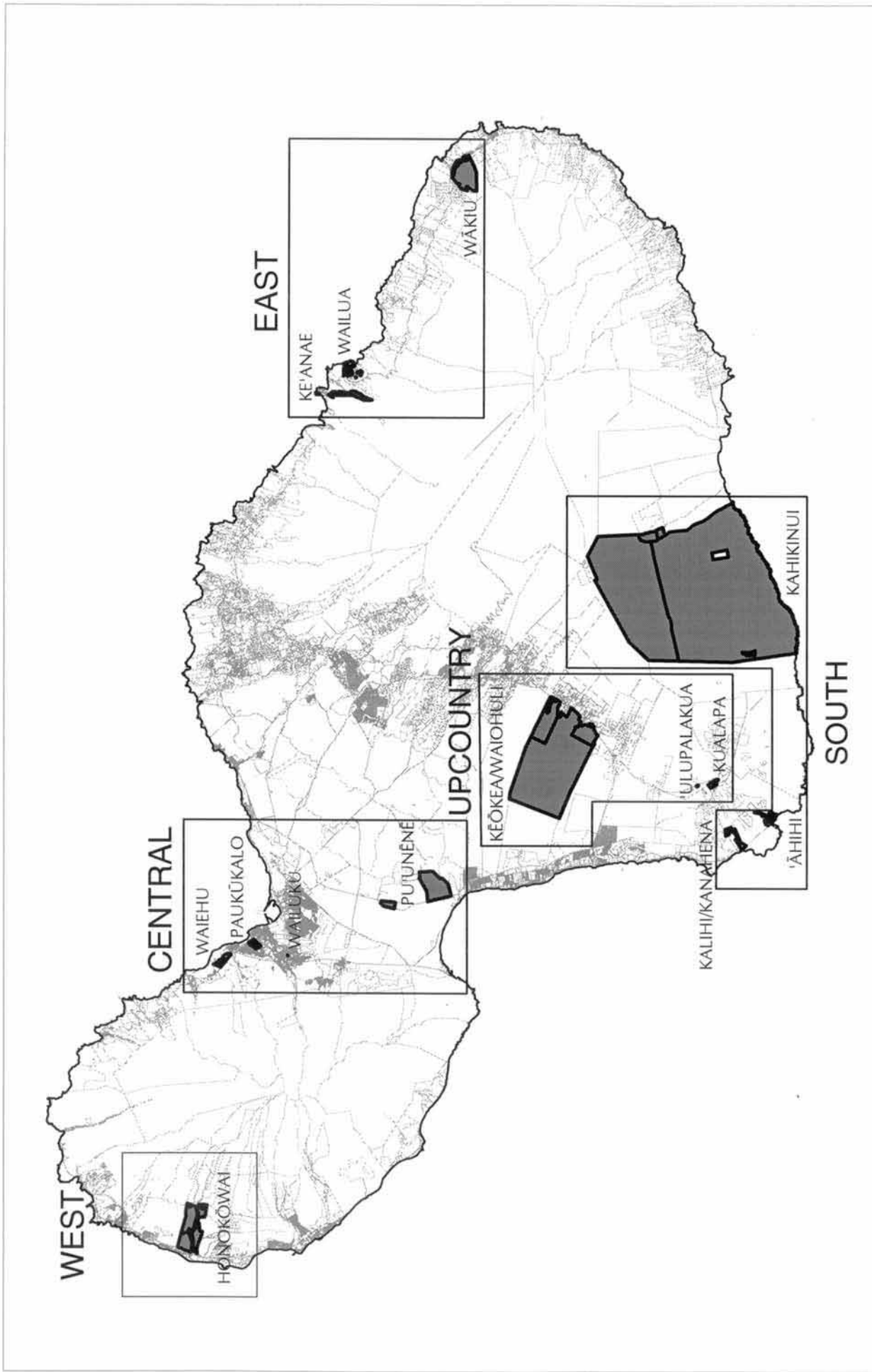


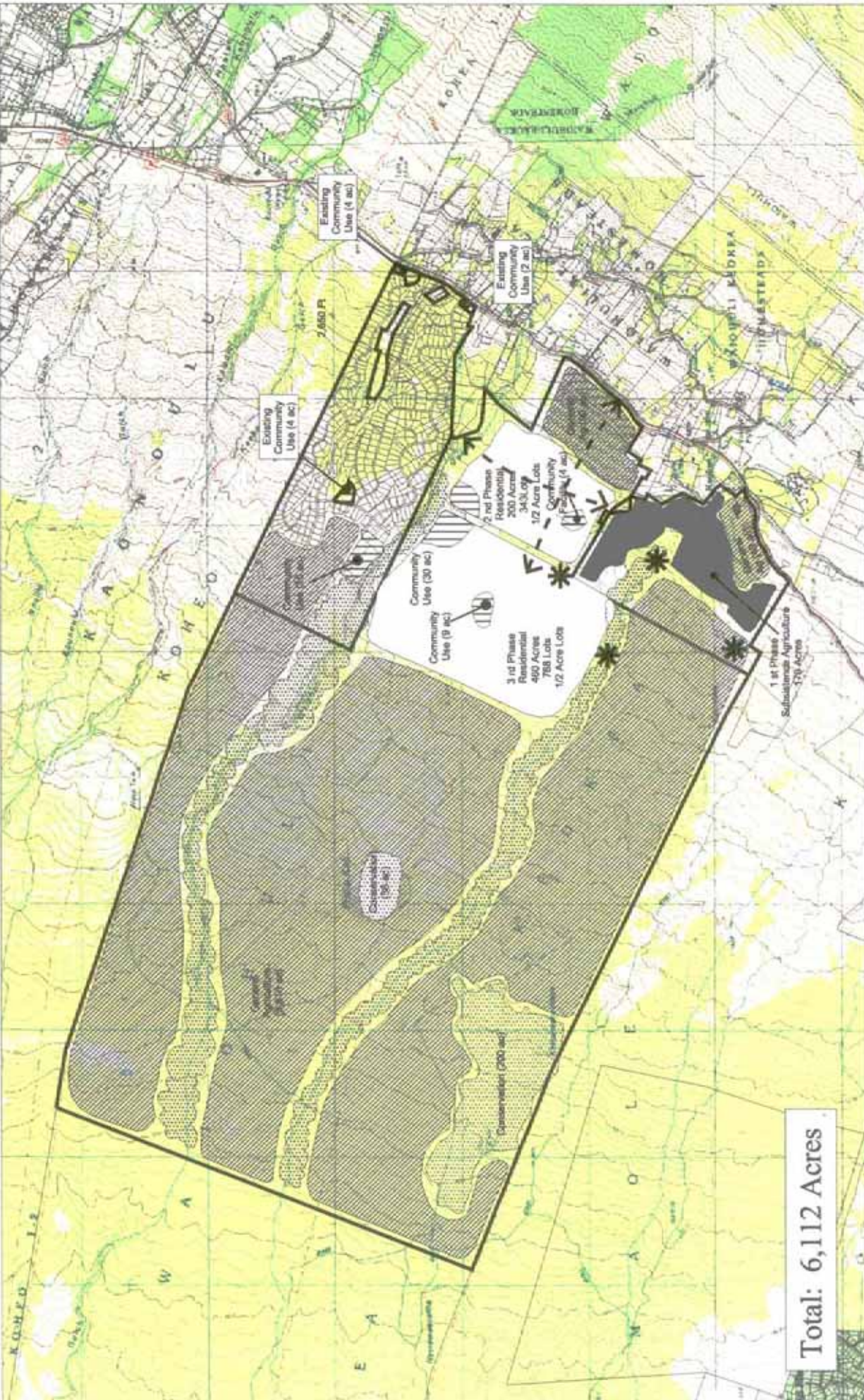
Figure A
DHHL Maui Regions
MAUI LAND INVENTORY

DEPARTMENT OF HAWAIIAN HOME LANDS
NORTH



Legend

 DHHL Properties



Total: 6,112 Acres

Legend

- DHHL Land Boundary
- Heiau

Land Use Summary

Land Use	Lot Size	Number of Lots	Approx. Acres
Residential	1/2	1,111	660 ac
Community Use			69 ac
General Agriculture			3,940 ac
Conservation			773 ac
Subsistence Agriculture	2	70	170 ac
Existing Residential			500 ac
Total		1,181	6,112 ac

Figure B
KŌKEAWAIOHULI
Land Use Plan
MAUI LAND INVENTORY



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this time, water commitments from the Department of Water Supply are a crucial factor in the next phase of development planning for Kēōkea/Waiohuli. A 70-unit farm lot subdivision at Kēōkea was planned prior to the *Maui Island Plan*. A second phase of 343 residential lots can be implemented using allocations from the existing water system if planned in the mid-section of the tract between existing residential lots and the Kēōkea farm lots. An additional 768 residential lots are proposed for future residential homesteads at Waiohuli pursuant to the development of an on-site production well.

Recommended Land Uses and Development Cost Estimates

Use	Lot Size	No. of Lots	Acreage	Total Cost \$	Cost Per Lot \$
Residential – Phase 2	0.5 acre	343	200	23,046,566	67,191
Residential – Phase 2 (Existing)			500		
Residential – Phase 3	0.5 acre	768	460	63,543,098	82,738
Subsistence Agriculture	2 acres	70	170		
Community Use			69		
General Agriculture			3,940		
Conservation			773		
Total		1,181	6,112	86,589,664	77,939

‘Ulupalakua

Situated along Kula Highway, DHHL has title to a small two-acre parcel in close proximity to the store and offices of ‘Ulupalakua Ranch. This parcel’s location provides tremendous opportunities for some form of community economic development use (Figure C).

Recommended Land Use

Community Uses – 2 acres

Kualapa

Located along Kula Highway south of ‘Ulupalakua near Kanaio, this tract does not have immediate development potential due to infrastructure constraints (Figure D). The water system is old and undersized and is not able to accommodate any further growth; extensive off-site improvements would be needed to support residential development. On-site constraints include extensive lava tubes and steep slopes, which limits access and use of the site for residential purposes.

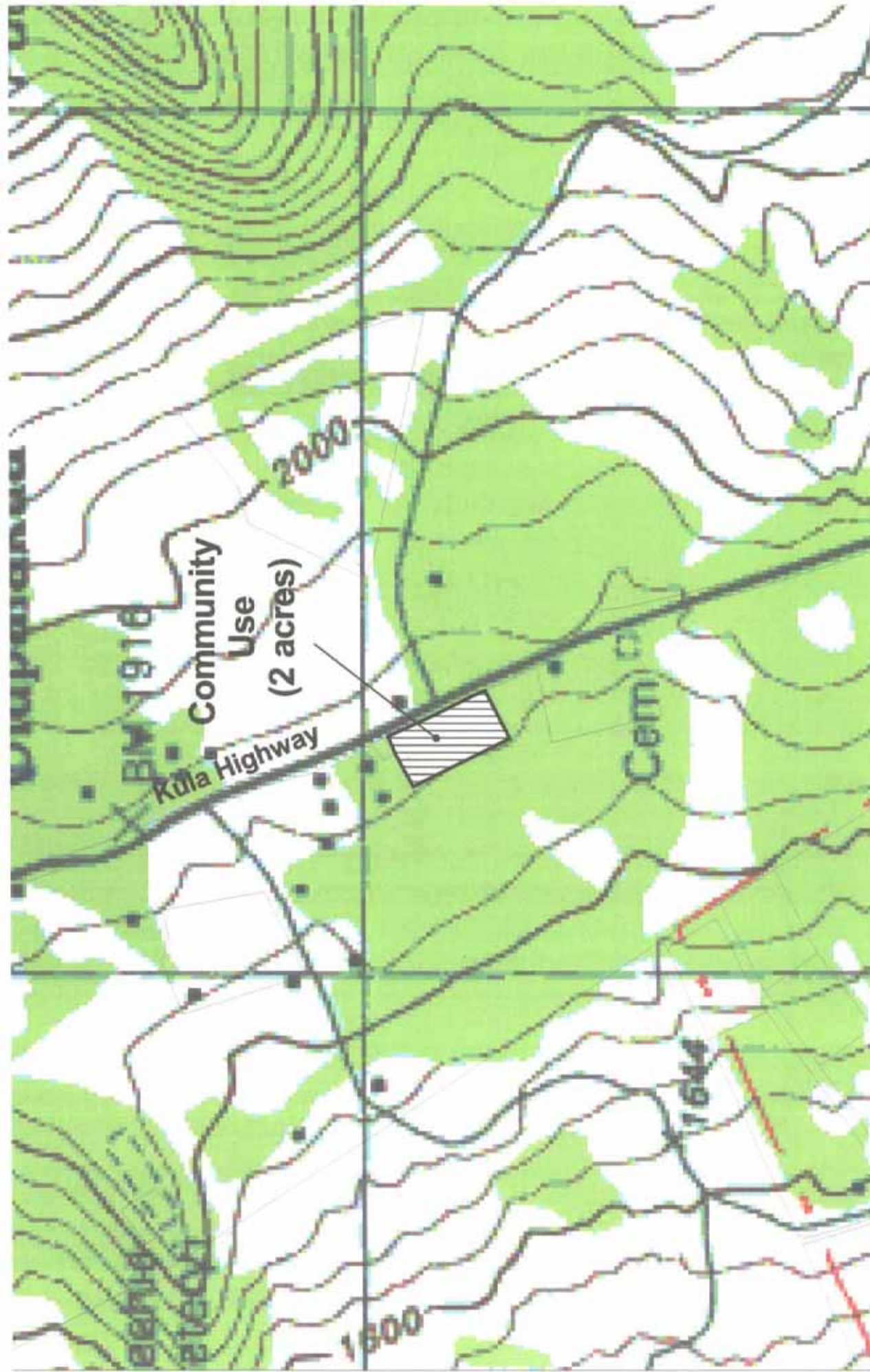


Figure C
ULUPALAKUA
Land Use Plan
MAUI LAND INVENTORY

DEPARTMENT OF HAWAIIAN HOME LANDS

 NORTH

 0 250 500 (FEET)

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7/03/03

Land Use Summary		Approx Acres
	Community Use	2
	Total	2

Legend

 DHHL Land Boundary

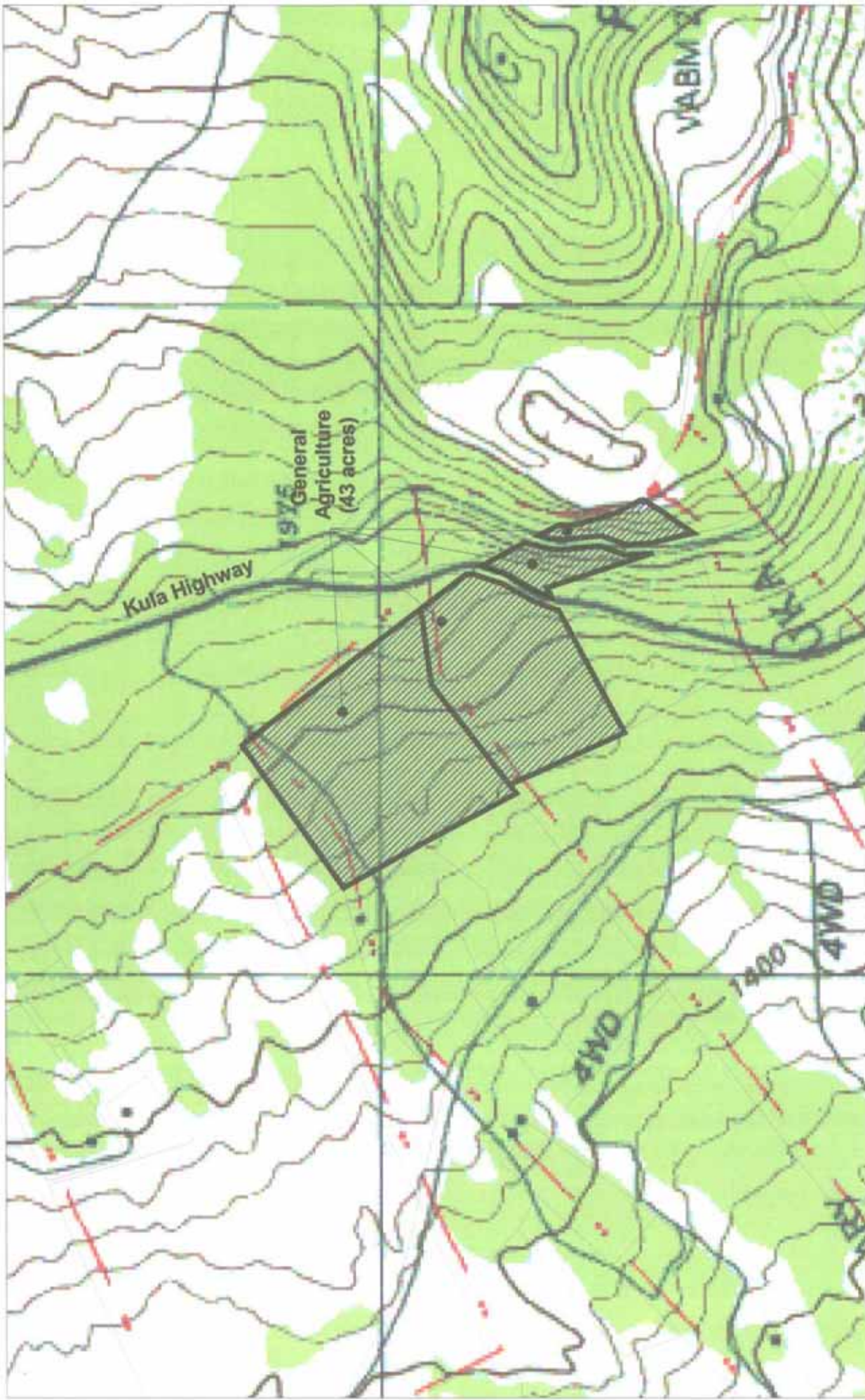


Figure D
 KUALAPA
 Land Use Plan
 MAUI LAND INVENTORY

Legend	Land Use Summary	Approx. Acres
	General Agriculture	43
	Total	43

DEPARTMENT OF HAWAIIAN HOME LANDS

NORTH

0 250 500 (FEET)

PBR

700303

MAUI ISLAND PLAN

Recommended Land Use

General Agriculture: 43 acres

2. Central Maui

Pu'unēnē

With over 700 acres situated on the central plains between Kahului and Kīhei, Pu'unēnē offers tremendous commercial and industrial opportunities for DHHL (Figure E). The site is adjacent to Mokulele Highway, a major transportation corridor through central Maui. Analysis of the lands at Pu'unēnē indicates that the area is not suitable for residential uses due to noise impacts from the nearby Maui Raceway Park. Additional development constraints include the lack of water resources in Central Maui and the distance from the existing wastewater treatment facility in Kahului.

Although the beneficiary survey indicates the highest demand for residential use in the Central Maui region, lands at Pu'unēnē are not suitable for residential uses. As a result, additional lands are needed in Central Maui to meet the beneficiary demand for residential homesteads. There are opportunities for land exchanges or acquisitions in Central Maui.

Recommended Land Uses

Industrial: 180 acres

General Agriculture: 546 acres

Paukūkalo

Paukūkalo is Maui's first and oldest homestead area. It is an aging residential homestead and contains no vacant lands for future homestead uses (Figure F). The area is a prime candidate for utilization of federal funds to rehabilitate homes in need of repair.

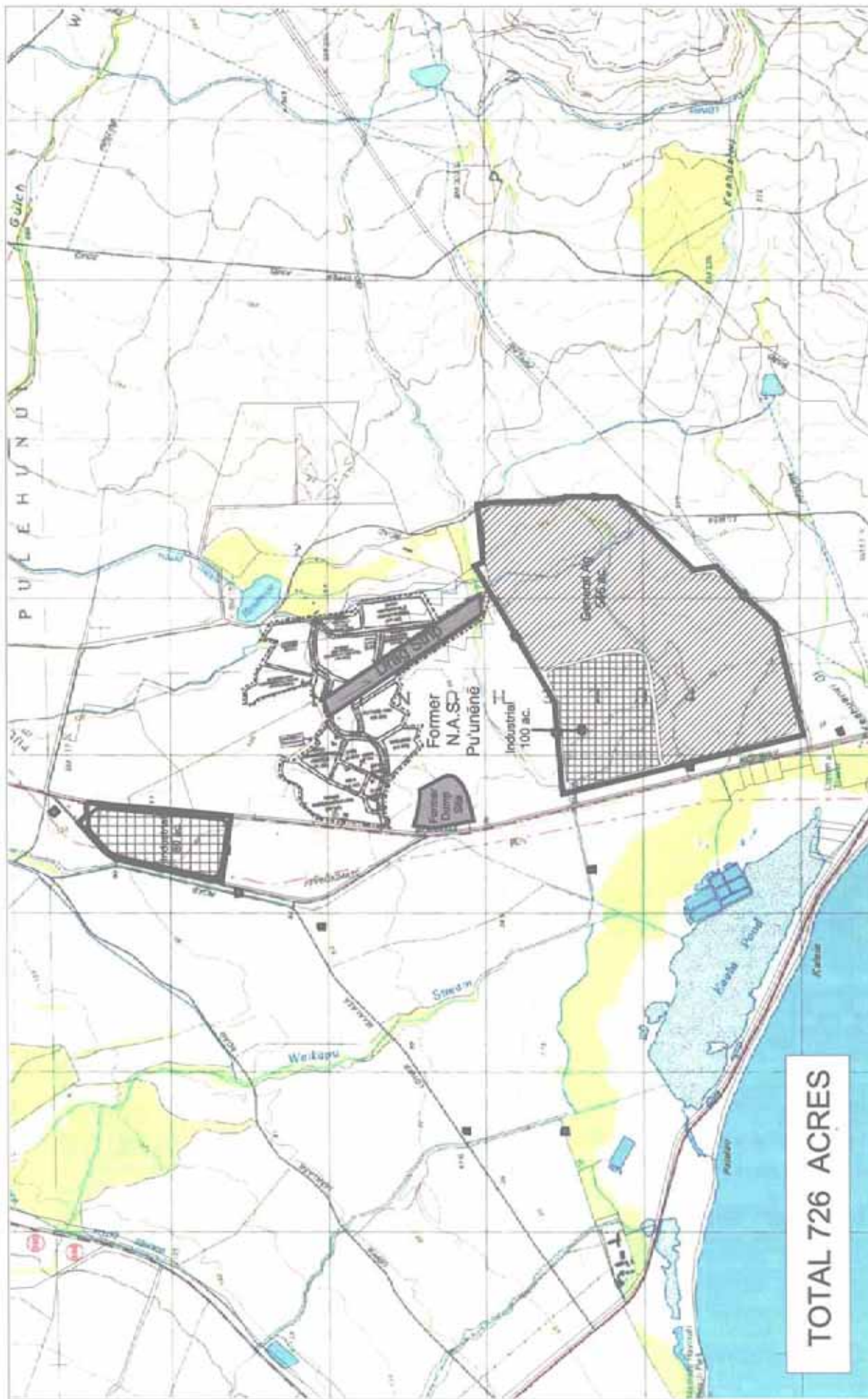
Recommended Land Uses

Existing Residential: 58 acres

Community Uses: 6 acres

Waiehu

Waiehu is one of Maui's newest homestead subdivisions. The area was developed in three phases and contains 250 residential homesteads that were constructed using either the turn-key or owner-builder construction methods (Figure G). Waiehu contains no vacant land for future homestead uses; however, DHHL is considering the purchase of adjacent properties to allow for more residential development. According to the SMS survey, the Wailuku to Waihe'e areas are highly desired in terms of residential uses for Maui applicants.



Legend

 DHLH Land Boundary

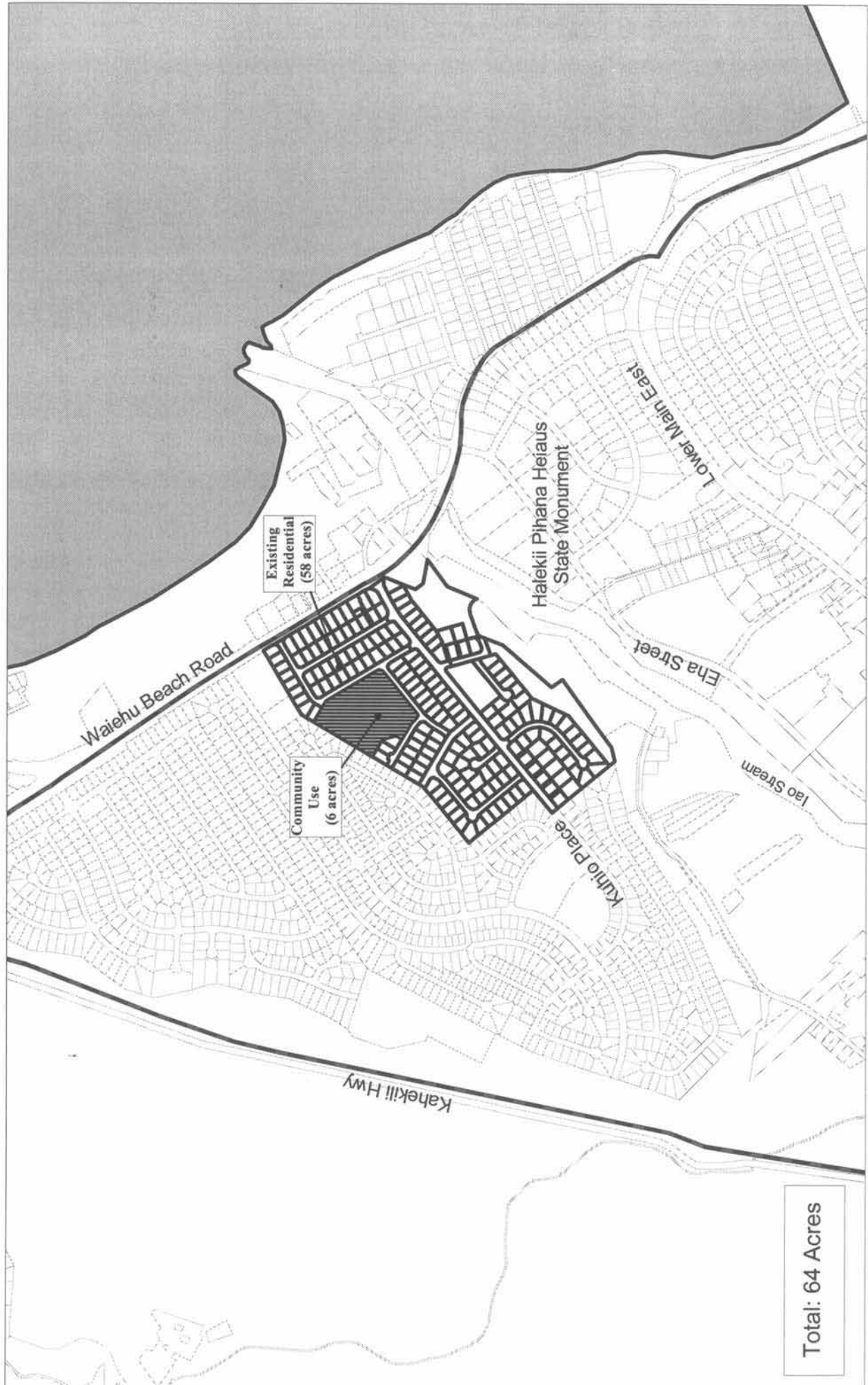
Land Use Summary		Approx. Acres
	General Agriculture	546
	Industrial	180
	Total	726

Figure E
PU'UNĒNĒ
Land Use Plan

MAUI LAND INVENTORY

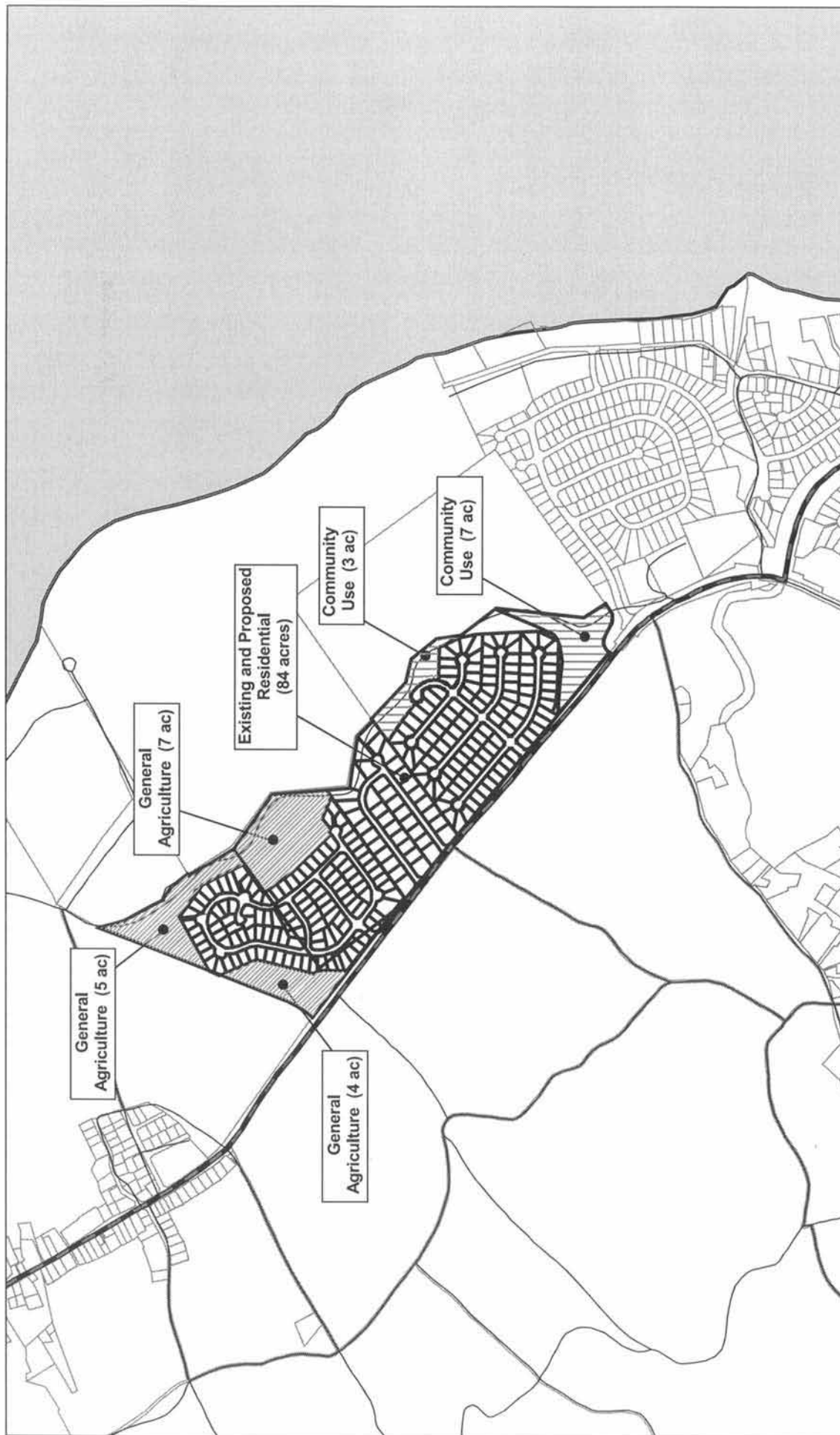
DEPARTMENT OF HAWAIIAN HOME LANDS





Land Use Summary

	Number of Lots	Approx Acres
Existing Residential	167	58
Community Use		6
Total		64



Legend

W DHHHL Land Boundary

Land Use Summary		Approx Acres
	Existing Residential	84
	Community Facility	7
	Total	91

Figure G

WAI'EHU

Land Use Plan

MAUI LAND INVENTORY

DEPARTMENT OF HAWAIIAN HOME LANDS



PBR
HAWAII

7/21/03

MAUI ISLAND PLAN

Recommended Land Uses

Existing Residential: 84 acres

Community Uses: 7 acres

Wailuku

Situated along Wells Street in downtown Wailuku, DHHL has title to a small (0.19 acre) triangular shaped parcel adjacent to the Wailuku fire station. The close proximity of this parcel to area businesses and recreational uses may facilitate some form of commercial opportunity (Figure H).

Recommended Land Use

Commercial = 0.19 acre

3. West Maui

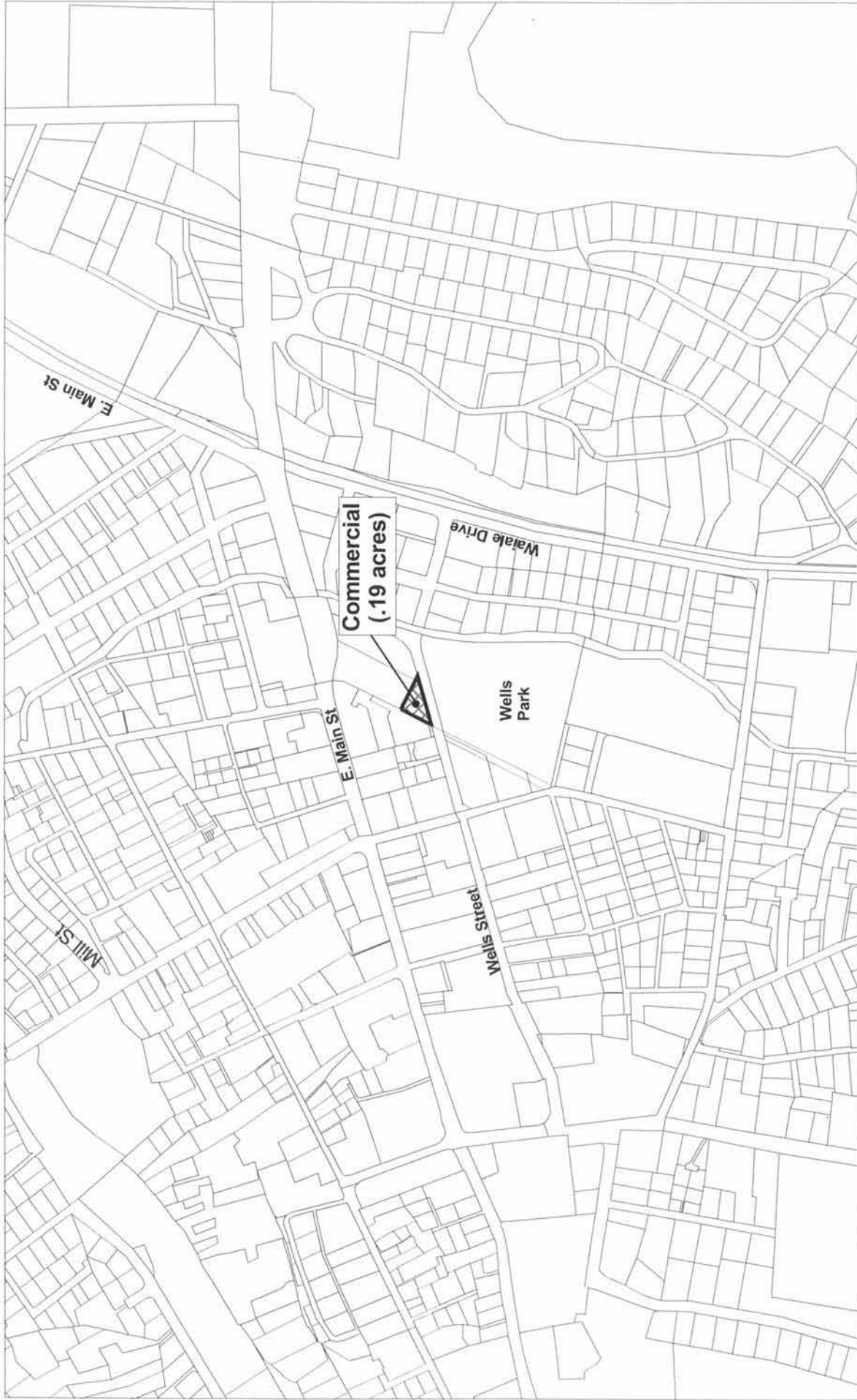
Honokōwai – Priority Tract

This tract consists of 777 acres of former sugar cane and pineapple fields situated along Honoapiʻilani Highway in the district of Lahaina. The tract is bisected by Honokōwai Stream. Two major off-site infrastructure facilities exist adjacent to the tract – the Lahaina Wastewater Reclamation Facility and the Māhinahina Water Treatment Facility. The site offers panoramic views, has moderate slopes, and is in close proximity to the economic centers of West Maui that offer job opportunities. Constraints to development include a lack of existing potable water resources and regional traffic congestion.

Recommended Land Uses and Development Cost Estimates

Use	Lot Size	No. of Lots	Acreage	Total Cost \$	Cost Per Lot \$
Residential – Phase 1	0.25 acre	337	91	34,761,802	103,151
Residential – Phase 2	0.25 acre	74	20	5,598,350	75,653
Community			19		
Supplemental Agriculture	5 acres	15	205	174,854	11,657
Commercial			30		
Industrial			5		
General Agriculture			407		
Total		426	777	40,535,006	190,461

Honokōwai offers major residential, agriculture and commercial/industrial opportunities (Figure I). Additional space is provided for proposed community uses, which include parks and a school site. The lands designated for residential use will accommodate 411 new homestead lots at 10,000 square feet in size. These lots will satisfy the estimated



Legend	Land Use Summary	
	Approx Acres	
	Commercial	.19

Figure H
WAILUKU
Land Use Plan

MAUI LAND INVENTORY

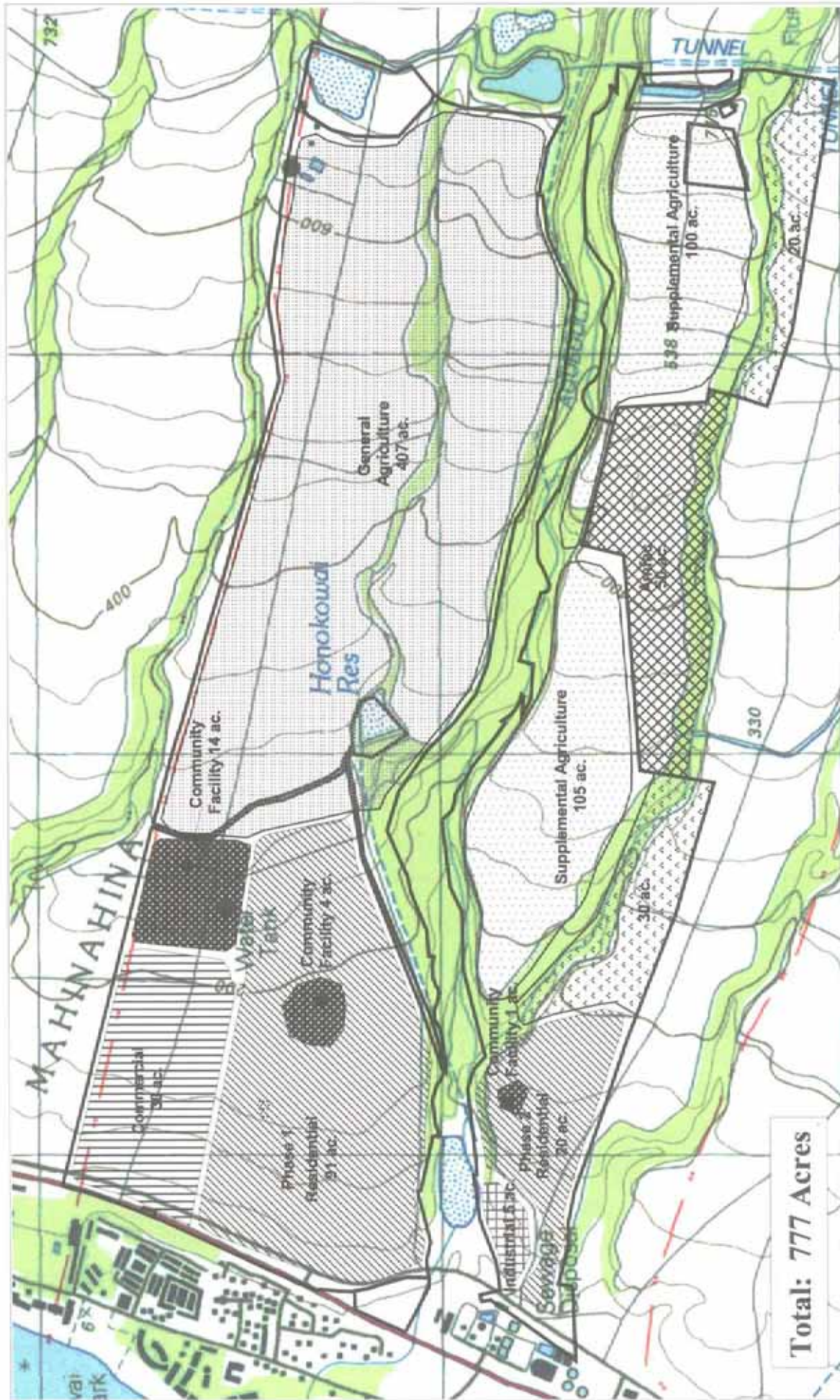
DEPARTMENT OF HAWAIIAN HOMELANDS

NORTH

250 0 500 (FEET)

PBR HAWAII

7/03/03



Total: 777 Acres

Legend

- DHHL Land Boundary
- Proposed Land Exchange
- Kaanapali Development Corporation
- DHHL

Land Use Summary

Land Use	Lot Size	Number of Lots	Approx Acres
Residential (ph.1)	10,000 sf	337	91
Residential (ph.2)	10,000 sf	74	20
General Agriculture			407
Community Use			19
Industrial			5
Commercial Use			30
Supplemental Agriculture 5 ac		15	205
Total		426	777

Figure 1
HONOKŌWAI
Land Use Plan

MAUI LAND INVENTORY

DEPARTMENT OF HAWAIIAN HOME LANDS



MAUI ISLAND PLAN

regional demand for West Maui homesteads. Over 400 acres *mauka* of the proposed residential uses are allocated for general agricultural use to allow for future residential expansion and to maintain ongoing agriculture uses.

Two hundred and five acres of land south of Honokōwai stream are designated for supplemental agriculture. Fifteen new supplemental agriculture homestead lots of five acres in size are proposed. DHHL is also in the process of working with Kā'anapali Development Corporation (KDC) to exchange respective properties that are currently land-locked and bisected by a gulch.

4. East Maui

Wākiu – Priority Tract

All properties in the East Maui planning region provide the opportunity to develop “rural” type residential and subsistence agricultural homesteads that require modest infrastructure improvements. The intent is to significantly reduce development costs in order to provide homesteading opportunities in a more cost efficient and timely manner.

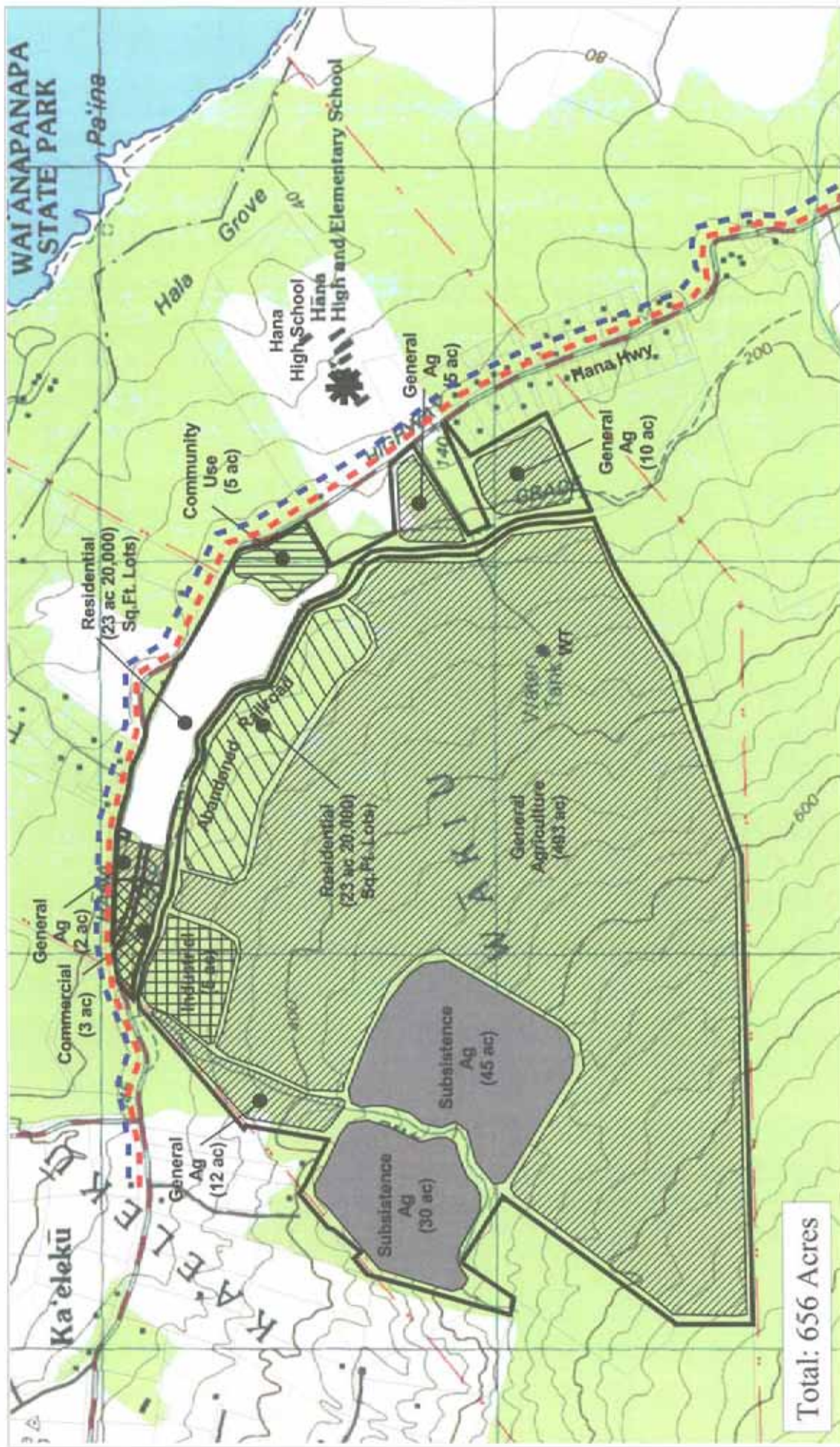
Recommended Land Uses and Development Cost Estimates

Use	Lot Size	No. of Lots	Acreage	Total Cost \$	Cost Per Lot \$
Residential – Phase 1	0.5 acre	40	23	3,791,300	94,783
Residential – Phase 2	0.5 acre	40	23	3,793,368	94,834
Community	5 acres		5		
Subsistence Agriculture	3 acres	22	75	814,330	37,015
Commercial			3		
Industrial			5		
General Agriculture			522		
Total		102	656	8,398,998	226,632

In Wākiu, the *Maui Island Plan* proposes homestead residential, subsistence agricultural, community, commercial, and industrial uses (Figure J). The commercial/industrial use will provide needed space for economic development opportunities for native Hawaiians in East Maui. The close proximity of Wākiu to Hāna town and its location along Hāna Highway across from Hāna High School makes Wākiu the preferred location for a new homestead project in East Maui.

Ke'anae

The Ke'anae tract contains two separate parcels – a two-acre parcel along the shoreline on Ke'anae Peninsula and a 149-acre parcel along Palauhulu Stream *mauka* of Hāna



Land Use Summary			
Land Use	Lot Size	Number of Lots	Approx Acres
Commercial		3	3
Community Use		5	5
General Agriculture		522	522
Industrial		5	5
Residential	20,000 SF	40	23
Residential	20,000 SF	40	23
Subsistence Agriculture	3 ac	22	75
Total		102	656

Legend

DHHL Land Boundary

Water Line

Electrical Line

Figure J
WĀKIU
 Land Use Plan
MAUI LAND INVENTORY
 DEPARTMENT OF HAWAIIAN HOME LANDS
 NORTH

PBR
 7/02/03

Source: United States Geologic Survey and Department of Hawaiian Home Lands

MAUI ISLAND PLAN

Highway. The smaller parcel offers opportunities for community use, while the larger piece is appropriate for agricultural homesteads given its gentle slopes, high rainfall, easy access, and rural character (Figure K).

Recommended Land Uses and Development Cost Estimates

Use	Lot Size	No. of Lots	Acreage	Total Cost \$	Cost Per Lot \$
Subsistence Agriculture	+/-3 acres	32	57	692,915	21,654
Community			2		
General Agriculture			92		
Total		32	151	692,915	21,654

Wailua

Wailua is an existing community with a long history of taro cultivation. The proposed uses for Wailua aim to replicate the traditional land use pattern established within the valley (Figure L). In the past, house lots were distributed with detached lots for taro cultivation. DHHL would like to develop a similar program that utilizes existing lots for residential purposes and have them adjoining existing lots for taro cultivation. Given the unique character of the area, DHHL would require that lots be given to agriculture homestead applicants that can demonstrate experience in taro cultivation.

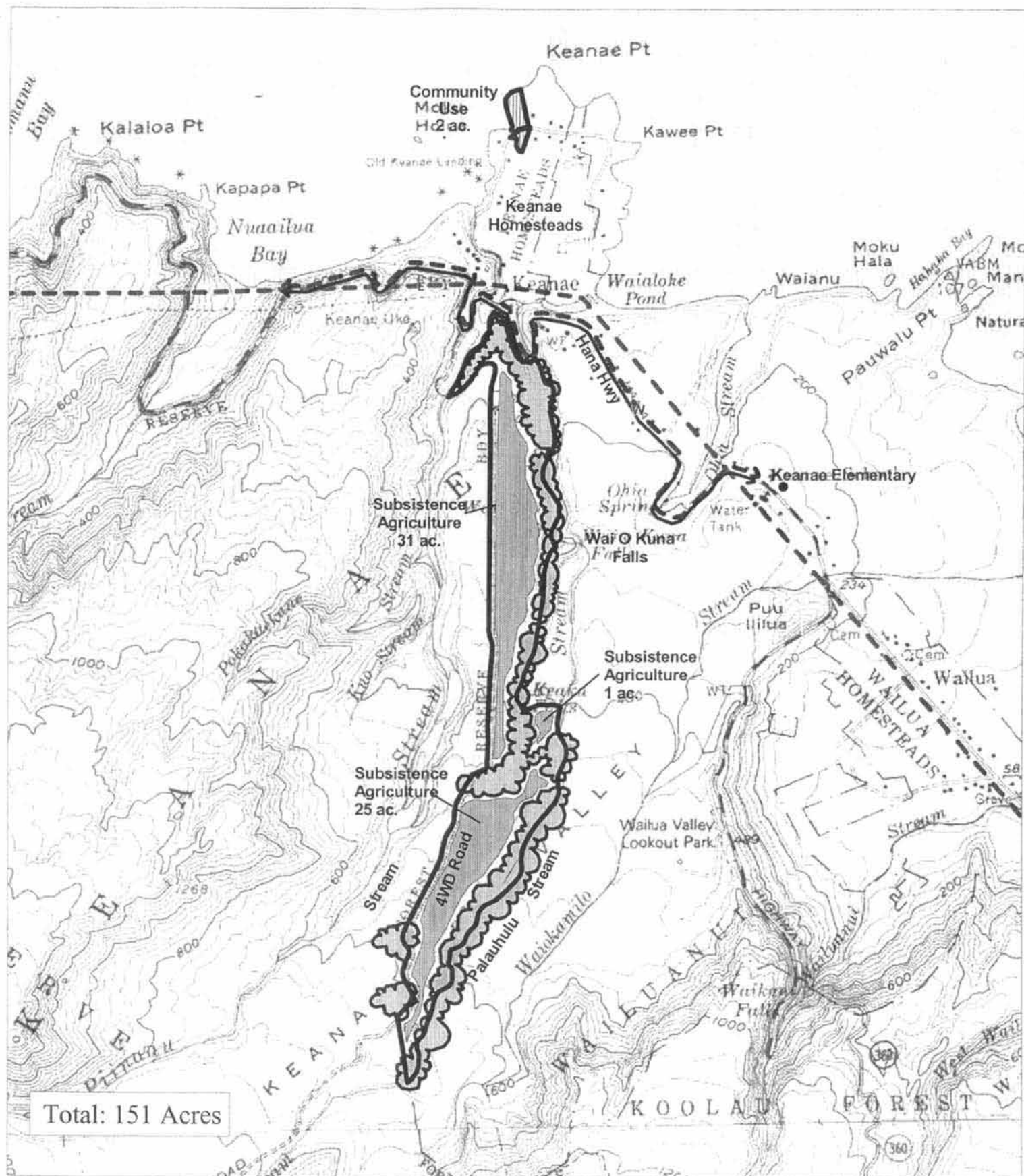
Recommended Land Uses and Development Cost Estimates

Use	Lot Size	No. of Lots	Acreage	Total Cost \$	Cost Per Lot \$
Subsistence Agriculture	+/- 3 acres	11	28	249,004	22,637
Conservation			10		
General Agriculture			52		
Total		11	90	249,004	22,637

5. South Maui

Kahikinui

Kahikinui is the largest tract within the DHHL land inventory on Maui. However, given its distance from urban infrastructure and the uniqueness of the area, Kahikinui is being designated both Special District and Conservation to allow for flexibility in the use of the area (Figure M).



- Legend
- DHHL Land Boundary
 - Water Line
 - Electrical Line

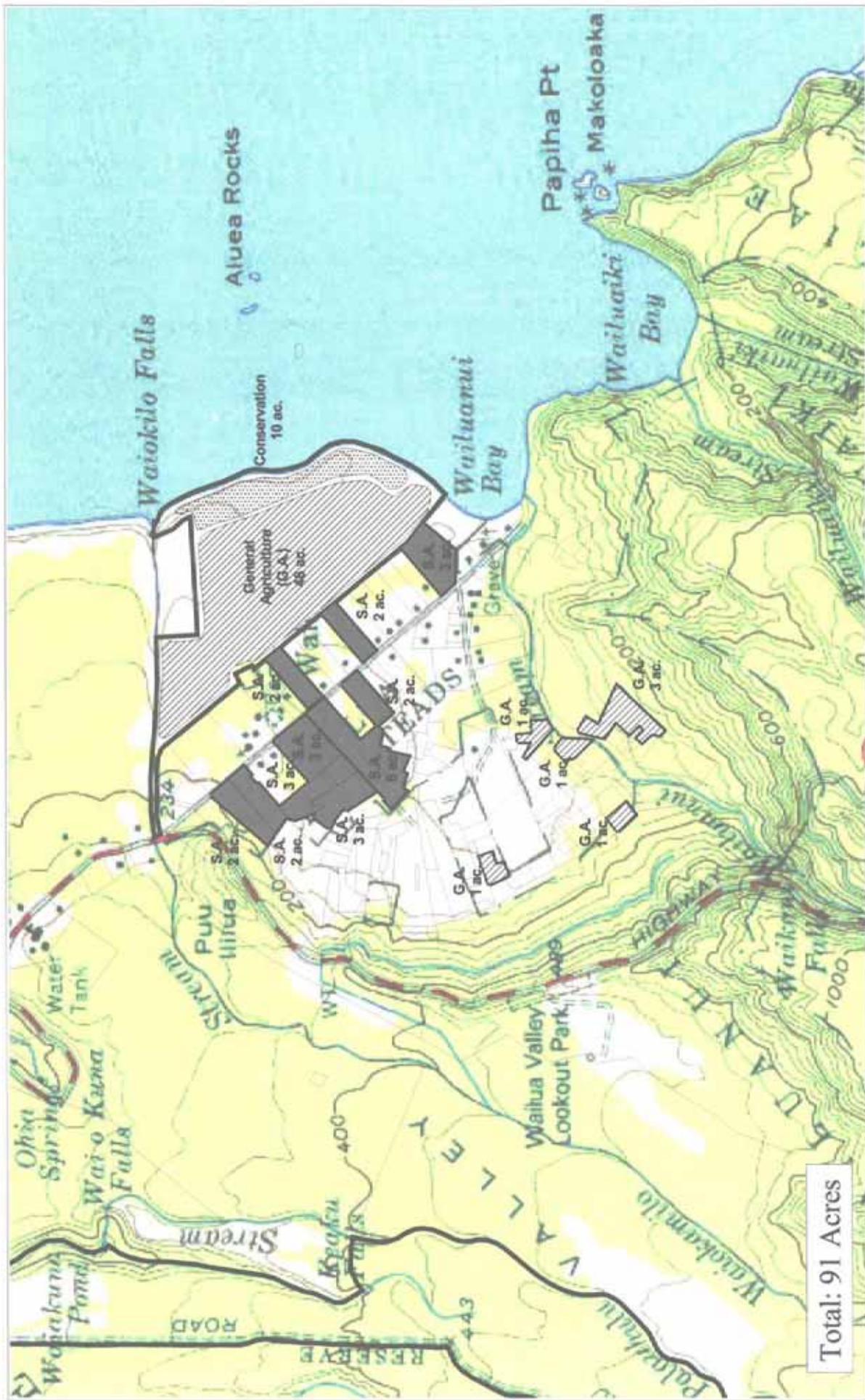
Land Use Categories	Lot Size	Number of Lots	Approx Acres
Subsistence Agriculture	3 ac	32	57
Community Use			2
General Agriculture			92
Total		32	151

Figure K
KE'ANAE
Land Use Plan
MAUI LAND INVENTORY

DEPARTMENT OF HAWAIIAN HOME LANDS

NORTH

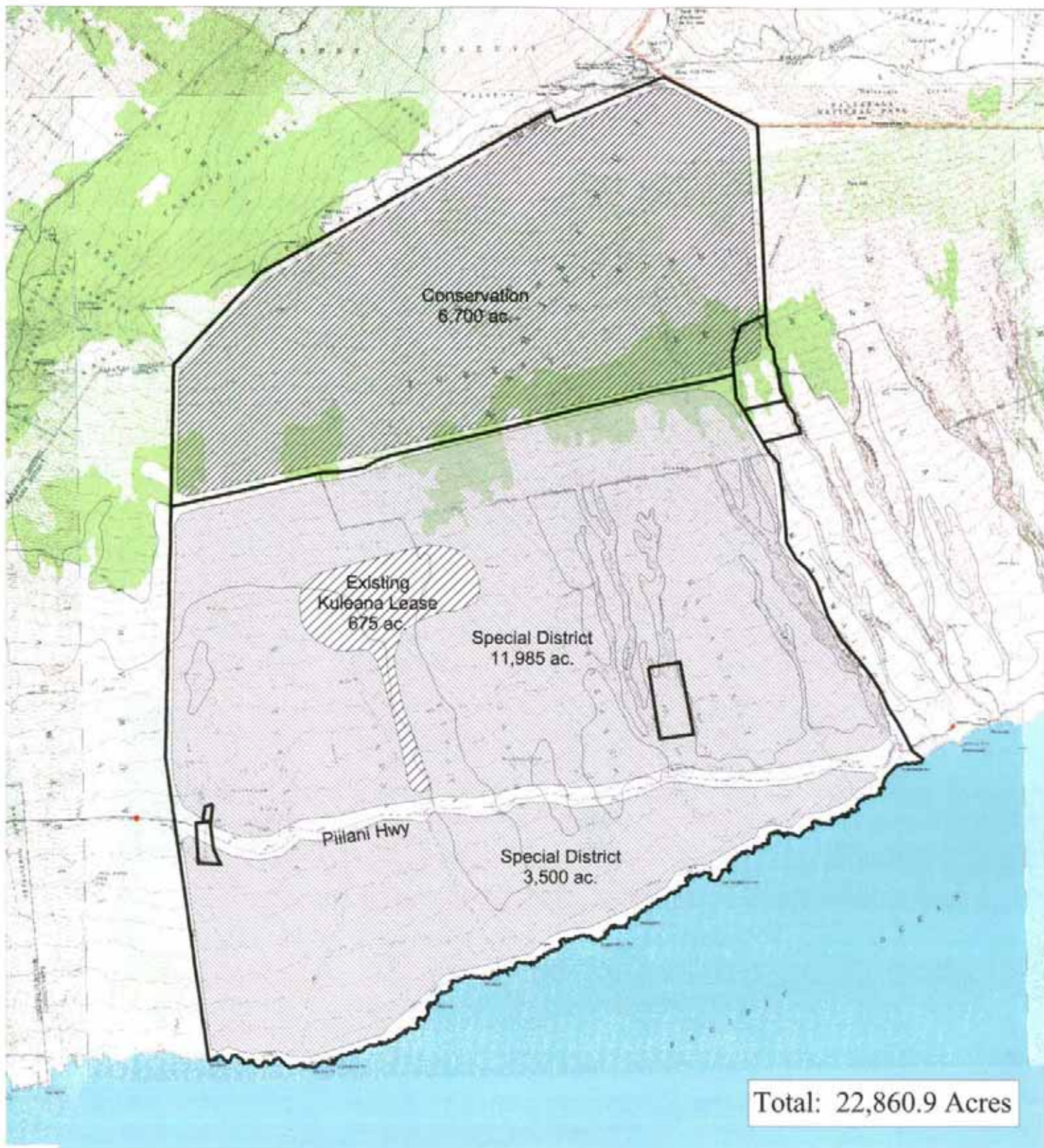




Land Use Summary	Lot Size	Number of Lots	Approx. Acres
Conservation			10 ac
General Agriculture			53 ac
Subsistence Agriculture	2-3 ac	11	28 ac
		11	91 ac

Legend

W DHHL Land Boundary



Legend
DHHL Land Boundary

Land Use Summary		Approx Acres
Land Use Categories		
	Conservation	6,700
	Special District	15,485
	Kuleana Lease	675
	Total	22,860

Figure M
KAHIKINUI
Land Use Plan
MAUI LAND INVENTORY

DEPARTMENT OF HAWAIIAN HOME LANDS



8/25/03

MAUI ISLAND PLAN

Recommended Land Uses

Existing *kuleana*: 675 acres

Special District: 15,485 acres

Conservation: 6,700 acres

Kalihi/Kanahena and 'Āhihi

These properties are situated on the south shore along old Mākena Road. The lack of infrastructure severely constrains the parcels in terms of potential homestead development. The area is not targeted for homestead development at this time (Figures N and O).

Recommended Land Use

General Agriculture: 173 acres

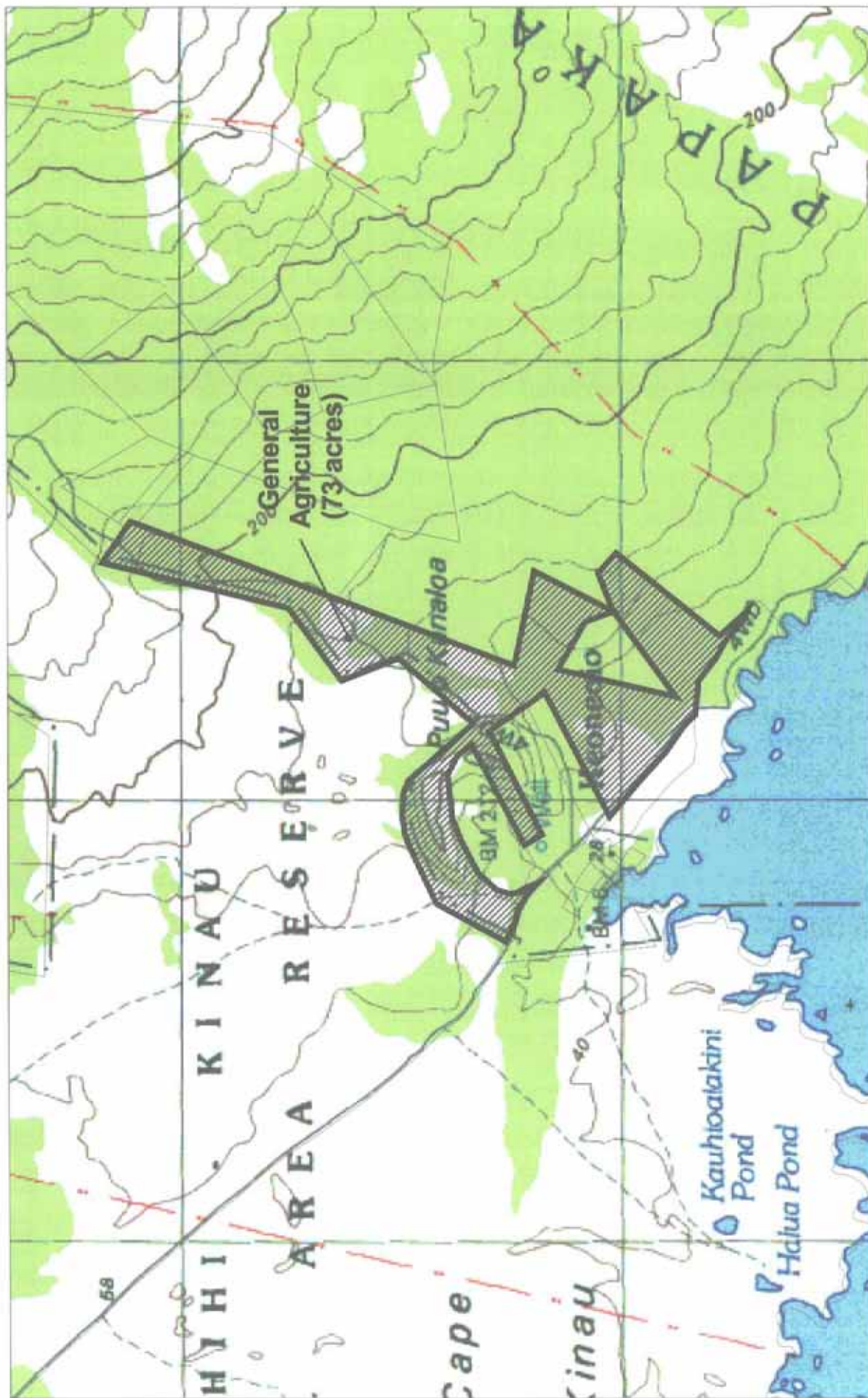


Figure O

‘ĀHIHI
Land Use Plan

MAUI LAND INVENTORY

DEPARTMENT OF HAWAIIAN HOME LANDS



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1.0 INTRODUCTION

MAUI ISLAND PLAN

1.0 INTRODUCTION

A. PURPOSE

The purpose of the *Maui Island Plan* is to provide the Department of Hawaiian Homelands (DHHL) with an evaluation of, and systematic plan for, its land holdings on Maui. The plan is a comprehensive resource for planning and managing DHHL's Maui lands and includes an assessment of social, economic, and environmental conditions related to potential future use of homestead lands; an analysis of DHHL's Maui land inventory and preferred land uses; and priority development of overall land use plans.

The *Maui Island Plan* was undertaken under Section 213(e) of the Hawaiian Homes Commission Act (HHCA), authorizing planning studies to provide a basis for identifying preferred land uses and appropriate management strategies for those lands.

B. APPROACH

The *Maui Island Plan* is one component of a planning system developed by DHHL to guide the use of Hawaiian home lands statewide (Figure 1-1). Island plans are the primary policy documents that guide land uses for Hawaiian home lands.

The *Maui Island Plan* provides baseline physical and demographic information; establishes land use designations to encourage orderly social, physical, and economic development; identifies priority areas for homestead development over a 20-year timeframe; and estimates the costs for both on- and off-site infrastructure needed to advance the goals and objectives of the homesteading program on Maui.

C. METHODOLOGY

The methods used to assess the development potential of DHHL land holdings on Maui are described in the following sections.

1. BASELINE DATA

Each tract is described in terms of natural and man-made features, applicable regulations, and existing land use(s).

Physical and Environmental Conditions

The analysis of physical and environmental conditions examines climate, elevation, soil types, topography, and other physical/environmental factors that affect potential land use. U.S. Geological Survey (USGS) quad base maps were used to conduct a slope analysis for each subject parcel using three ranges of slope: zero to ten percent, 11 to 20 percent, and greater than 20 percent. Development on areas with slopes greater than 20 percent is constrained by access limitations, erosion potential, and stability.

DHHL Planning System

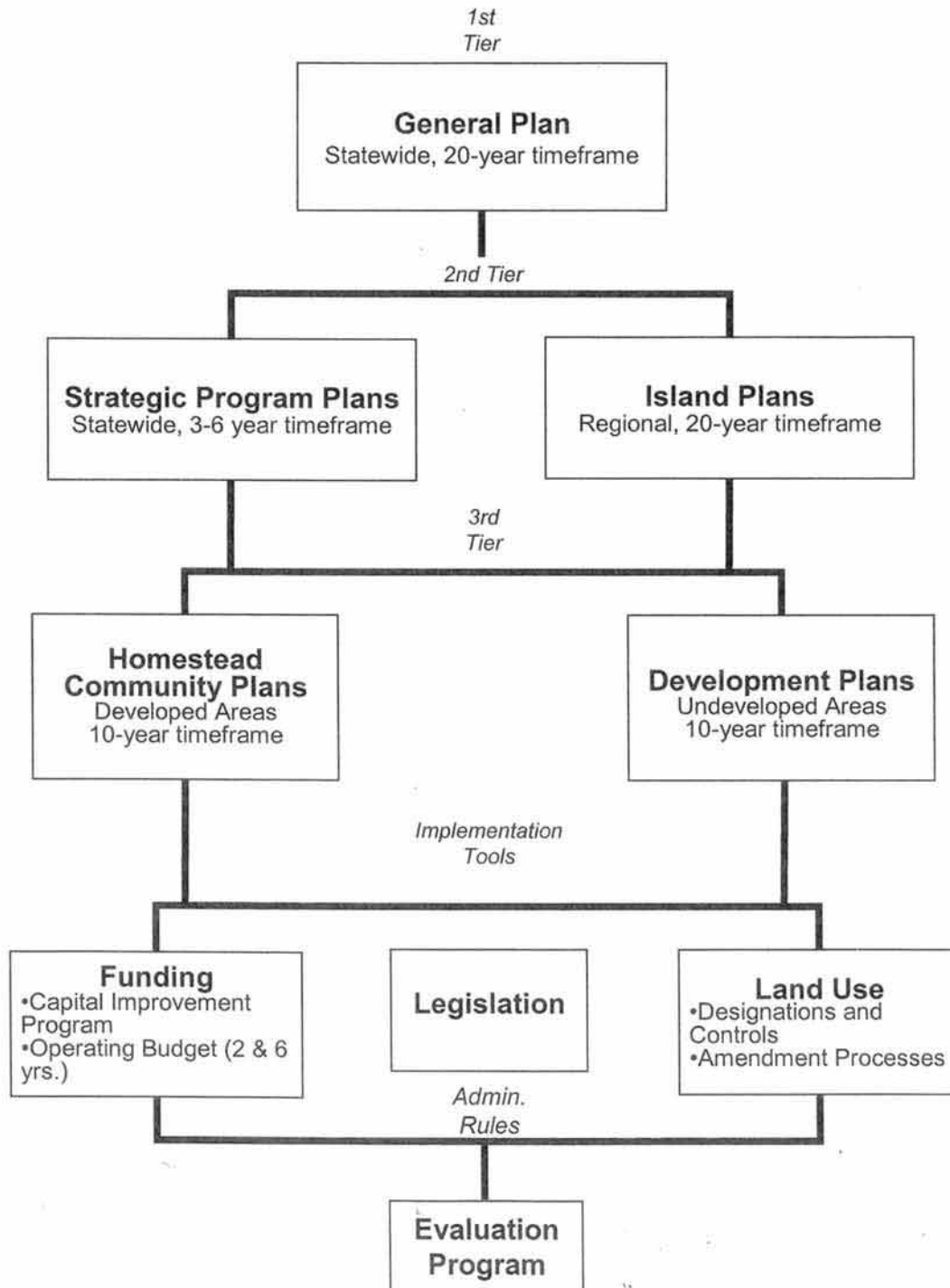


Figure 1-1

MAUI ISLAND PLAN

Existing uses and/or encumbrances are analyzed to determine whether uses/encumbrances might affect or even prevent development or other uses.

Elevation is considered in terms of residential viewshed potential and suitability for agriculture and development of infrastructure (e.g., water storage and pressure).

Soil Assessment of the tracts is based on the U.S. Department of Agriculture Soil Conservation Service digital database. This digitized data is a composite inventory of soils and non-soil (e.g. lava) areas on Maui.

Drainage is analyzed in terms of the existing and natural drainage patterns of each tract.

Tsunami flooding is a potential hazard for Maui's shoreline and may affect the DHHL parcels located in near shore areas. Those lands (and some inland floodways) are covered below under "FEMA Flood Insurance Rate Maps."

Streams and their watersheds have influenced agricultural and settlement patterns on Maui since ancient times. Such patterns are expected to continue to influence development, especially where water availability and quality are limiting factors and management issues. Hence, any major streams along or within DHHL parcels are shown on the site analysis maps. Watersheds are shown in cases where they are part of special ecosystems, such as wetlands or very steep slopes, and where development could potentially impact water quality.

Endangered species and protection of their habitats often present significant constraints on land development in Hawai'i. This is particularly important in less developed (i.e. rural) areas, which characterizes the majority of the DHHL lands (except Central Maui), because those regions are more likely to be undisturbed and therefore may have endangered species (and/or archaeological sites).

The Hawaii Natural Heritage Program (HNHP)'s *Biological Conservation Datasystem (BCD) for Department of Hawaiian Home Land* provides endangered species data in the form of spatial distribution maps showing Hawai'i's endangered/rare plants and animals and their habitats. The presence of rare and/or endangered species impacts development plans because these species are federally protected and/or subject to specific use policies for surrounding lands.

Archaeological sites and associated cultural practices are significant for most Native Hawaiians. Archival research and reference to Department of Land and Natural Resources (DLNR), State Historic Preservation Division (SHPD) data provides identification and mapping of known archaeological sites (although cultural resource data provided in this report do not supplant archaeological fieldwork required in advance of future development).

MAUI ISLAND PLAN

Rainfall is the source of all water in Hawai'i. Without water, land is of little or no use. Areas with adequate rainfall allow a variety of uses without the high costs of developing wells, pumping systems, storage, and transmission lines. Generally speaking, household catchment systems are practical in areas with annual rainfall of 60 inches or more.

The State of Hawai'i GIS Database, sources rainfall data from the 1986 Hawaii Ra Atlas. Water availability and rainfall and are closely associated planning considerations for all potential land uses on DHHL parcels. The former is needed for all uses, and the latter is, of course, a key to successful agriculture and the use of household catchment systems.

Infrastructure/Other Services

Existing or adjacent infrastructure and/or services that can support future land uses are an important consideration in analyzing the potential use of DHHL's Maui lands. Each tract is analyzed regarding availability of roads and electrical, sewer, and water service.

Water is a limiting factor for any development. Maui County, especially Maui Island, is uniquely sensitive to the supply and development of water resources relative to demand. The *County of Maui Infrastructure Assessment Update* (Wilson Okamoto, 2003) provides data regarding water source, capacity, and distribution. In addition, Carl Takumi Engineering prepared an up-to-date investigation of water resources for Kēōkea/Waiohuli, Honokōwai, and Wākiu.

No other engineering studies were conducted to specifically assess capacities of existing infrastructure (although indications of capacity were often assessed based on existing environmental assessments or studies). Once specific plans are finalized, additional engineering studies may be needed.

Another important factor is the cost related to development of potable water sources compared to derived benefits and opportunities. If water development costs are prohibitive, as is the case for the majority of parcels located at higher elevations, alternative land uses or water treatment or pumping technologies should be evaluated.

Existing County-operated wastewater systems are analyzed to determine whether the systems will be able to service the DHHL Maui projects. For lands located outside of the County wastewater system; project density, Department of Health (DOH) rules and regulations, and site features determine the feasibility of using on-site wastewater treatment and/or disposal systems.

Existing electric and telecommunication service are assessed for each tract. Telecommunications and power capacities are studied to determine the level of service.

Access routes and types of access for each parcel are mapped. Regional transportation routes are also incorporated into the assessment process.

MAUI ISLAND PLAN

Governmental Regulations

State Land Use Designations and Regulations

State land use designations are provided for each tract. Surrounding uses are a significant factor for comprehensive analysis and planning.

Special Management Areas

Counties in Hawai'i may designate Special Management Areas (SMA) for intensive management near coastlines. Development can only occur in an SMA with a County permit.

Underground Injection Control (UIC)

The State's Underground Injection Control (UIC) program establishes regulations to protect the quality of the State's underground sources of drinking water (USDW) from pollution by subsurface disposal of fluids. Conditions are specified to govern the location, construction and operation of injection wells so that injected fluids do not migrate and pollute USDW.

Maui County General Plan

The *Maui County General Plan* sets forth policies, goals, and objectives for development and use of land. In Maui County, community plans and zoning ordinances are used to implement County land use policies.

Community Plans

Maui County has nine community plans to guide growth within specific districts on the County's three islands – Maui, Lāna'i, and Kaho'olawe. These plans enact the policies, goals, and objectives set forth by the *Maui County General Plan*. Community plan designations are provided for each tract.

County Zoning

The County Zoning Code sets additional provisions for land use and development. Zoning may restrict land use, building density, and construction type. Historically, DHHL has honored County zoning and subdivision regulations. County Zoning designations are provided for each tract.

FEMA Flood Insurance Rate Maps

Flood hazards are shown on Flood Insurance Rate Maps (FIRM) prepared by the Federal Emergency Management Agency (FEMA), National Flood Insurance Program. The maps indicate flood risks for coastal and inland areas within 100- and 500-year flood zones. Development of lands located within FIRM flood zones must meet state, federal, and county regulations for building and engineering design. As such, FIRM flood zones are included in the baseline data and analysis sections of this report. Risk for each DHHL site is noted in reference tables for each tract.

MAUI ISLAND PLAN

Flood Zone Explanations (from Flood Insurance Rate Maps):

- A Areas of 100-year flood; base elevations and flood hazard factors not determined.
- AO Areas of 100-year shallow flooding where depths are between one (1) and three (3) feet; average depths of inundation are shown, but no flood hazard factors are determined.
- AH Areas of 100-year shallow flooding where depths are between one (1) and three (3) feet; base flood elevations are shown, but no flood hazard factors are determined.
- A1-A30 Areas of 100-year flood; base flood elevations and flood hazard factors are determined.
- A99 Areas of 100-year flood to be protected by flood protection system under construction; base flood elevations and flood hazard factors are not determined.
- B Areas between limits of the 100-year flood and 500-year flood; or certain areas subject to 100-year flooding with average depths less than one (1) foot or where the contributing drainage area is less than one square mile; or areas protected by levees from the base flood.
- C Areas of minimal flooding.
- D Areas of undetermined, but possible, flood hazards.
- V Areas of 100-year coastal flood with velocity (wave action); base flood elevations and flood hazard factors not determined.
- V1-V30 Areas of 100-year coastal flood with velocity (wave action); base flood elevations and flood hazard factors are determined.

Agricultural Lands of Importance to the State of Hawai'i (ALISH)

The State of Hawai'i Department of Agriculture *Agricultural Lands of Importance to the State of Hawai'i (ALISH)* system classifies land according to its agricultural suitability. A brief description of the categories under this system are as follows:

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

Unique Agricultural Land is land used for the production of specific high-value food crops. The land has the special combination of soil quality, growing season, temperature, humidity, sunlight, air drainage, elevation, aspect, moisture supply, or other conditions, such as nearness to market, that favor the production of a specific crop of high quality and/or high yield when the land is treated and managed according to modern farming methods.

Other Agriculture Land is land other than Prime or Unique Agricultural Land that is also of statewide or local importance for the production of food, feed, fiber, and forage crops. The lands in this classification are important to agriculture in Hawai'i yet they exhibit

MAUI ISLAND PLAN

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

U.S Fish and Wildlife Service (USFWS) Critical Habitats

The U.S Fish and Wildlife Service defines critical habitats as geographic areas that are essential for conservation of a threatened or endangered species and that may require special management and protection. A critical habitat designation does not necessarily restrict all development; it is a reminder, however, to federal agencies that they must make special efforts to protect the important characteristics of the area. Although a critical habitat designation does not limit all activities within a designated area, activities requiring a federal permit, license, or funding, and those that are likely to destroy or adversely modify the area of critical habitat are affected.

Social and Economic Opportunities

A description of social and economic opportunities, particularly commercial and industrial potential, is crucial in assessing current and future use of DHHL land holdings. Economic opportunities have been considered in site evaluations.

Beneficiary Surveys

Surveys were conducted to assess beneficiaries' preferences of locations and types of Maui Island awards to promote a greater awareness in planning for their needs and desires.

Specific survey objectives were to: (1) determine preferred regions for Maui awards; (2) identify applicant needs and preferences for land use and lot size; and (3) quantify opinions regarding land use and distribution.

Two surveys were conducted. The first gathered need, preference, and other data from current applicants; the second gathered similar data from current lessees of DHHL Maui homesteads.

Applicants were asked to rate seven land regions on Maui by preference for location and award type (i.e. residential, agricultural, pastoral), expressed as follows:

1. Central 1: Paukūkalo, Wailuku, Waiehu
2. Central 2: Pu'unēnē
3. Upcountry: Kēōkea/Waiohuli, 'Ulupalakua/Kualapa
4. East 1: Ke'anae, Wailua
5. East 2: Wākiu
6. South: Kahikinui, 'Āhihi, Kalihi/Kanahena
7. West: Honokōwai

MAUI ISLAND PLAN

A small number of applicants for each type of award noted no area preference. Other respondents reported a willingness to take any award offered as long as it fit their needs at the time. Such “no preference” responses were factored using the same distribution as other applicants.

Preferences by type of farming operation were based on DHHL definitions of subsistence¹, supplemental², or commercial³ agricultural farming. All applicants were asked to rate each Maui Island region for agricultural applications.

Applicants were also asked about the lot size necessary for their chosen land uses, as agricultural lot sizes may be related to type of crops or livestock raised and/or the size of intended operations.

An effort was made to gauge applicants’ willingness to accept alternative awards, such as land with no infrastructure. The study also surveyed household income and size, as well as other demographic data.

Beneficiary, Public Agency, Community, DHHL Staff, and Other Stakeholder Input

Working Group Meetings

The working group, comprised of participants from State, County, and non-profit agencies, private sector businesses, and beneficiary organizations, met a total of three times over the course of 2003. The intent of the working group meetings was to provide participants an understanding of the Hawaiian home lands program(s) and related Maui resources and constraints; to explain and discuss what DHHL and stakeholders hope to accomplish; and identify how participants might benefit from the process. Facilitators recorded feedback from participants for later use in the planning process.

Public Agency Meetings

Planners met separately with staff of the Maui Planning Department, Maui County Departments of Water Supply (DWS) and Public Works (DPW), and the State Department of Transportation (DOT). Meetings were held to give agency staff an opportunity to closely examine and discuss planning issues, identify how constituents of those agencies will benefit from the process, and note feedback from those agencies for later use in the planning process.

Regional Meetings

Two sets of regional workshops and one set of regional site visits were conducted in each of the five planning regions. The goal of the regional meetings was to give interested

¹ *Subsistence Farming/Ranching*: grow crops/raise animals to supply minimal needs of the immediate family, living in the household.

² *Supplemental Farming/Ranching*: crops grown/excess of animal products will supply some, but not all of the income/goods/services needed by the family.

³ *Commercial Farming/Ranching*: crops grown/excess of animal products will provide all of the income/goods/services needed by the family without other employment.

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participants and beneficiaries a hands-on opportunity to closely examine and discuss the planning issues facing the program on an island wide scale and to record feedback from participants for later use in the planning process.

The first set of regional meetings were held in April and May of 2003 in Central Maui, West Maui, Hāna, Kula, and South Maui. The workshops provided a detailed review of planning issues within each region and reviewed the conceptual land use proposals for each region. Site visits were conducted with the first set of regional workshops; participants were given opportunities to visit each tract within regions during half-day site visits. Feedback from the workshops and site visits were recorded for later use in the planning process.

A second set of regional meetings were held in November 2003 in Central Maui, Upcountry/South Maui, West Maui, and Hāna. These meetings were conducted to review planning issues and land use designations within each region. The intent of the second set of meetings was to allow the general public the opportunity to review and make recommendations regarding the preferred land use designations.

Site Visits

The aim of the mandated site visits was to provide interested working group participants and beneficiaries further hands-on opportunities to examine and discuss planning issues of the program from an island wide perspective. Department of Hawaiian Home Lands planners scheduled, arranged, and facilitated half-day site visits to Hawaiian home land tracts.

Planning Workshop with Hui Kako'o 'Aina Ho'opulapula

Planning staff met with members of Hui Kako'o 'Aina Ho'opulapula (Hui Kako'o), a group representing native Hawaiians on the waitlist for DHHL leases. The goals of the planning workshop were to discuss what DHHL and stakeholders hope to accomplish on Maui; to give members a chance to examine and discuss Maui planning issues; to identify how Hui Kako'o members can gain from the process; and to note members' feedback for later use. Hui Kako'o members made recommendations for many of the sites, including residential, agricultural, commercial, and community uses. Members also noted "cultural concerns" regarding development; general comments addressed road engineering, water, safety issues, etc.

DHHL Staff Review

Project planners met with DHHL staff to develop a mutual understanding of the home lands programs, resources on Maui, and to determine what DHHL and stakeholders hope to accomplish on Maui.

2. ANALYSIS

An analysis of the baseline data, including physical and environmental conditions, infrastructure, and government regulations, identifies planning opportunities and

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constraints for each of the DHHL parcels. The results of the baseline analysis and the beneficiary survey, as well as review of the input from beneficiary, public agency, community, and other stakeholder input are used to assess the development potential for each tract. An “Analysis” section, as well as composite Site Analysis Maps, presents the results of this analysis and the key features of priority DHHL parcels.

3. ALTERNATIVES AND DEVELOPMENT COSTS

Alternative land use plans were developed for each tract through a synthesis of the baseline information, beneficiary survey, and comments from agencies, beneficiaries, community groups, and DHHL staff.

Development costs were prepared for each of the alternative land use plans that proposed homestead uses. Given that the *Maui Island Plan* will serve primarily as a planning document that will guide future development plans, the costs presented in this document are order-of-magnitude projections rather than detailed estimates. More specific development costs will be generated through the various development plans required prior to actual development.

Development cost estimates are based on net acreage and density. Additional conditions factored into the estimates include, but are not limited to, standards, slope, site preparation, proximity of existing roadways and utilities, and existing infrastructure. Both on- and off-site costs are provided and categorized by total and per lot costs.

4. PRIORITIZING TRACTS

An objective of the *Maui Island Plan* is to identify priority tracts that are suitable for priority planning and development. Tracts were prioritized by systematically and subjectively weighing factors presented in the “Baseline Data,” “Analysis,” and “Alternatives” sections of this report; incorporating beneficiary demand and regional preferences; and estimating development costs.

5. SELECTED ALTERNATIVE – FINAL LAND USE PLAN, PHASING, AND COST ESTIMATES

The goal of the final land use plans is to illustrate the highest and best use for each tract. Upon approval, DHHL will budget monies and use the final land use plans to guide the preparation of more detailed development plans.

Selection of the final land use plan involves analyzing the alternatives to determine best and highest uses for each tract. The analysis includes assessing beneficiary demand and area preference; considering opportunities and constraints from the baseline data; examining infrastructure availability, capacity, and improvement requirements; evaluating development cost estimates for each alternative; incorporating input from beneficiaries,

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public agencies, community, stakeholders and DHHL staff; and integrating DHHL goals and objectives.

Phasing plans ensure the viability of each component of the final land use plans. Beneficiary demand and preference, infrastructure availability and capacities, and costs are factored into each phasing plan.

Development cost estimates are presented by phase for each final land use plan. Similar to the cost estimates for the alternatives, these costs weigh a number of different factors, which result in total and per lot costs.

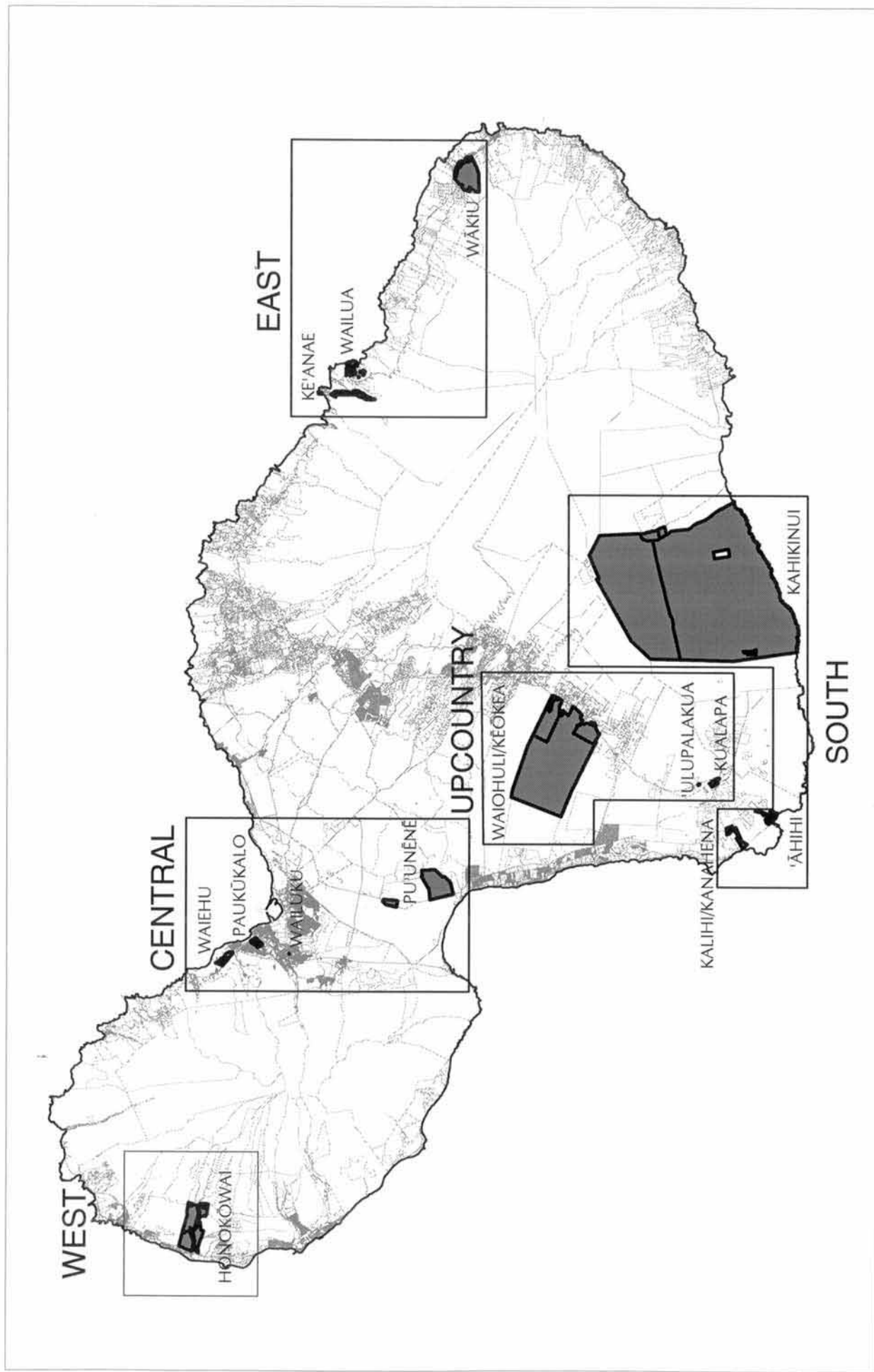
D. HAWAIIAN HOME LANDS ON MAUI

1. INVENTORY

Hawaiian home lands account for more than 31,000 acres on 14 major tracts on the island of Maui (see Table 1-1).

Table 1-1: Maui Hawaiian Home Lands Inventory

TRACT	ACREAGE
West Maui	
Honokōwai	776.5
Central Maui	
Wailuku	0.2
Pu'unēnē	726.0
Waiehu	91.1
Paukūkalo	61.0
Upcountry Maui	
Kēōkea/Waiohuli	6,112.0
ʻUlupalakua	2.0
Kualapa	40.9
East Maui	
Wākiu	743.0
Wailua	91.4
Keʻanae	150.9
South Maui	
Kahikinui	22,860.9
Kalihi/Kanahena	100.0
ʻĀhihi	75.0
Total	31,830.9



Legend

 DHHL Properties

Figure 1-2
DHHL Maui Regions

MAUI LAND INVENTORY

DEPARTMENT OF HAWAIIAN HOME LANDS



0 20,000 40,000
(FEET)



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2. PLANNING REGIONS

The fourteen tracts are divided into five separate regions (Figure 1-2). Central Maui (Waiehu, Paukūkalo, Pu‘unēnē) contains over 850 acres; West Maui (Honokōwai) contains over 750 acres; Upcountry Maui (Kēōkea/Waiohuli, ‘Ulupalakua, Kualapa) contains over 6,000 acres; South Maui (Kahikinui, Kalihi/Kanahena, ‘Āhihi) contains over 23,000 acres; and East Maui (Ke‘anae, Wailua, Wākiu) contains nearly 1,000 acres.

An objective of the *Maui Island Plan* is to coordinate DHHL’s developments with Maui County. Maui County has developed a general plan setting forth policies, goals, and objectives for development and/or use of land. Nine community plans implement the policies from the general plan and guide growth on the County’s three islands, directing investment in infrastructure and other development. Figure 1-3 illustrates the relationship between the *Maui Island Plan’s* five regions and Maui County’s nine community plan regions.

E. LAND USE DESIGNATIONS

The Department of Hawaiian Home Land planning system uses “land use designations” (LUD) to classify its land uses within island plans (Table 1-2). LUD classification separates the lands into use districts, each having its own set of general permitted uses and development standards. The land use designations used in the *Maui Island Plan* are separated into homesteading and non-homesteading categories.

Table 1-2: Land Use Designations

	Setting/Intent/Purpose	Lot Size	Minimum Infrastructure
HOMESTEADING USES			
Residential	Residential subdivision built to County or rural standards in areas close to existing infrastructure.	1 acre or less	County or rural standards
Subsistence Agriculture	Small lot agriculture. Lifestyle areas intended to allow for home consumption of agricultural products.	5 acres or less	Water (catchment surface); Road access
Supplemental Agriculture	Large lot agriculture. Intended to provide opportunities for agricultural production for supplemental income and home use. Occupancy optional. Farm plan and 2/3 lot cultivation required.	40 acres or less	Water (catchment or surface); Road access
Pastoral	Large lot agriculture specifically for pastoral uses. Occupancy optional. Ranch plan and fencing required.	1,000 acres or less	Road access and stockwater

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Table 1-2: Land Use Designations (continued)

	Setting/Intent/Purpose	Lot Size	Minimum Infrastructure
NON-HOMESTEADING USES			
General Agriculture	Intensive or extensive farming or ranching allowed. Uses subject to HRS Chapter 205. May serve as an interim use until opportunities for higher and better uses become available.	To be determined	N/A
Special District	Areas requiring special attention because of unusual opportunities and/or constraints. E.g. natural hazard areas, open spaces, raw lands far from infrastructure, mixed use areas, and greenways.	To be determined	To be determined
Community Use	Common areas for community uses. Includes space for parks and recreation, cultural activities, CBED, and other public amenities.	County standards	County standards
Conservation	Watersheds, critical habitats, sensitive historic and cultural sites	To be determined	N/A
Commercial	Retail, business, and commercial activities	To be determined	County standards
Industrial	Processing, construction, manufacturing, transportation, wholesale, and warehousing	To be determined	County standards



2.0 MAUI ISLANDWIDE INFORMATION

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2.0 MAUI ISLANDWIDE INFORMATION

A. DEMOGRAPHICS

1. BENEFICIARY SURVEY

In May 2003, SMS Marketing & Research Statistics, Inc. (SMS) conducted a survey to assess the preferences of DHHL's beneficiaries on Maui. The full results and analysis are included in a separate report entitled, *Beneficiaries Surveys 2003 – Island of Maui*. The following provides a summary of beneficiary preferences and current socio-economic conditions experienced by those beneficiaries.

Background and Objectives

Data from the beneficiary survey provides DHHL with information for developing plans that will address beneficiary needs. It also provides a better understanding of the beneficiaries themselves, allowing planning to proceed with greater sensitivity to the conditions experienced by this specific group of people.

Specific survey objectives were: (1) collect profile information on Maui applicants; (2) identify applicant preferences for award type and lot size; (3) determine regional preferences among Maui applicants; and (4) quantify opinions regarding land use and distribution. Survey methods and select findings are discussed below.

Study Methods

Two separate surveys were conducted. The first gathered need, preference, and opinion data from current applicants on the waiting list for Maui Island homesteads. The second survey gathered similar data from current lessees on DHHL homestead land on Maui. Self-administered mail-back surveys were used for both surveys.

The applicant survey was mailed to 3,820 applicants seeking land awards on Maui; 927 usable surveys (24.3%) were returned. The results were statistically significant with a sampling error of plus or minus 2.8 percentage points at the 95 percent confidence level.

Lessee surveys were mailed to 699 current Maui leaseholders; 230 surveys (32.9%) were returned for analysis. The results of this survey were also statistically significant with a sample error of plus or minus 5.3 percentage points at the 95 percent confidence level.

Selected Findings

The following findings are based on both of the above surveys. Sample design eliminated duplicate entries. Applicants are allowed to apply for more than one land award, therefore the total number of applications is greater than the number of applicants. The 927 responses to the applicant survey account for 433 residential, 453 agricultural, and 222 pastoral awards. Data from these surveys were weighted according to the number of applications waiting for each type of parcel to extrapolate the full DHHL waiting list of

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3,820 applicants (as of May 2003), who represent 6,404 applications applying for 2,891 residential, 3,148 agricultural, and 365 pastoral awards.

Distinct patterns are noted across each type of award application. Most applicants for all types of awards are between 36 and 55 years of age and a majority of applicants are married. Very few applicants are under 25 years of age, and relatively few can be considered elderly.

Residential

Residential Applicant Profile

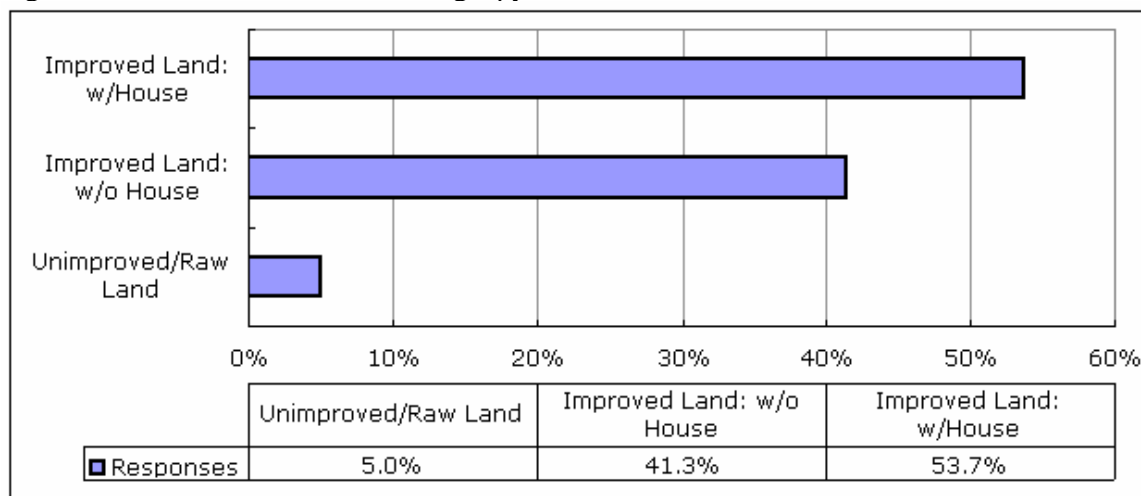
A typical current residential applicant is part of a two- to three- person household with one to two children under the age of 18. Two employed adults earn a total household income between \$40,000 and \$49,999. Approximately three-quarters (74 percent) live in “single-family” home with 54 percent owning and about 20 percent renting. Another 13 percent live in apartments. Over three-quarters (77 percent) of the applicants are satisfied with their present homes but would prefer an improved award with a DHHL provided home (54 percent). Slightly less than half (46 percent) would prefer a developed single-family home, with 35 percent choosing owner-built single-family homes.

The three most important factors in choosing a home are cost (70 percent), home size (38 percent), and neighborhood safety (32 percent).

Residential Housing Type and Lot Size Preferences

Most residential applicants prefer an award of improved land with a single-family home on a 5,000- to 10,000-square foot lot. Figure 2-1 shows data for residential housing types preferred by residential applicants in the year 2003.

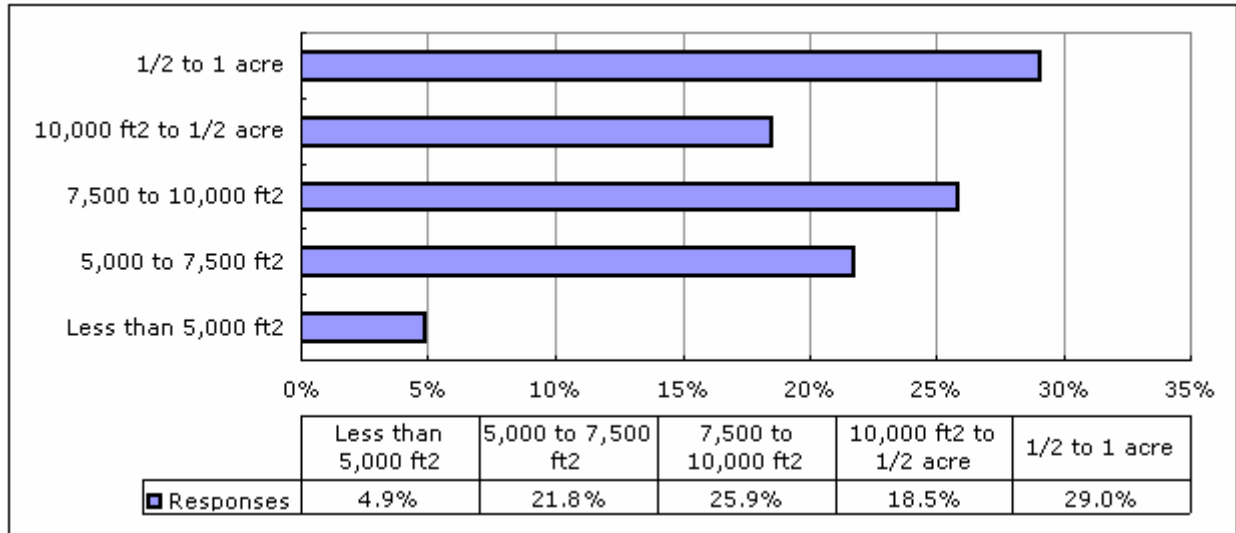
Figure 2-1: Residential Housing Type



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Figure 2-2 presents data on lot size preferences. Applicants have varied opinions regarding lot sizes; 29 percent would accept lots that are a minimum of one-half to one acre in size; 26 percent would accept a lot that is 7,500 to 10,000 square feet; 22 percent would accept a lot that is 5,000 to 7,500 square feet; and 19 percent would accept a lot that is between 10,000 square feet to one-half acre in size.

Figure 2-2: Minimum Acceptable Lot Size – Residential



Residential Area Preference

All applicants surveyed were asked to rate each of seven land regions on Maui in terms of preference of award location (Table 2-1). The land areas were as follows:

1. Central 1: Paukūkalo, Wailuku, Waiehu
2. Central 2: Pu'unēnē
3. Upcountry: Kēōkea, 'Ulupalakua, Waiohuli,
4. East 1: Ke'anae, Wailua
5. East 2: Wākiu
6. South: Kahikinui, 'Āhihi, Kalihi/Kanahena,
7. West: Honokōwai
8. No Preference

Approximately five to seven percent of applicants noted no area preference. Other respondents reported being willing to take any award offered, as long as it fit their needs at the time of award. This group is included in the analysis using an assumption that their eventual choices would reflect preference distributions of other applicants.

Many applicants rated fewer than five areas, noting they were not at all interested in some areas. Figure 2-3 shows the popularity of each area as raw percentages. For planning purposes, applicants claiming "no preference" and those not responding were factored into the general applicant pool.

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Figure 2-3: Area Preference for Residential Awards

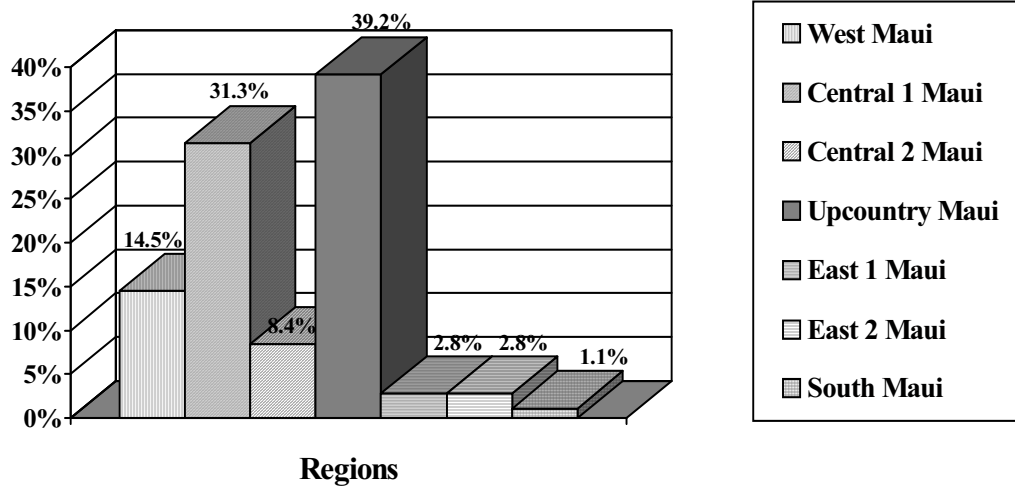


Table 2-1 shows the projected number of housing units needed to satisfy the demand in each region.

Table 2-1: Area Demand – Residential

Regions	Number of Units
West	411
Central 1	885
Central 2	237
East 1	78
East 2	79
Upcountry	1,107
South	30
Total	2,827

As noted in Table 2-1, the projected residential demand is 2,827 units. The projected demand is lower than the 2,891 residential applications filed. Adjustments were made for those who were listed as deceased and for those who gave an applicant profile that does not occur.

Figure 2-3 and Table 2-1 also show where residential applicants would most like to live. Upcountry is the most popular region at 39.2 percent and 1,107 units. The Central 1 region is second with 31.3 percent and 885 units. West Maui ranks third at 14.5 percent and 411 units. The remaining regions, ranked by preference, are Central 2, East 2, East 1, and South.

Although the Upcountry region is the most popular location, combining Central 1 and 2 into one region yields a higher percentage of preference and unit demand than

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Upcountry. When combined, the entire Central region is preferred by 39.7 percent of applicants with a demand for 1,122 units compared to 39.2 percent and 1,107 units in Upcountry.

Summary

Applicants prefer improved lots with moderately priced developer built homes in safe neighborhoods. The homes should be built on lots ranging from 7,500 square feet to one acre in size.

Upcountry is the most popular region followed by Central 1 and West Maui. Island wide, a total of 2,827 units are needed, with approximately 2,308 units or 80 percent of those units preferred in the Upcountry and Central regions.

The next step is determining the feasibility of meeting this demand given the current availability of developable land in each area.

Agricultural

Agricultural Applicant Profile

Only 23 percent of agricultural applicants are currently engaged in farming activities of any kind. Of these, 73 percent do so on a subsistence level; less than six percent report commercial-level growing. However, 10 percent of all agricultural applicants responded that they intend to undertake commercial-level farming as soon as a lease award is secured. The data suggests that as more amateur farmers move onto parcels, they will increase demand for agricultural training. Nearly two-thirds (62%) intend to live and grow crops on their award.

Agricultural Type and Lot Size Preference

Figure 2-4 shows level of farming preferences by farming type. Farming types are based on DHHL definitions of subsistence¹, supplemental², or commercial³ farming. Most of the applicants (89%) are interested in either subsistence or supplemental operations. Of the 23 percent of agricultural applicants currently involved in farming, fairly few applicants (11%) are interested in commercial farming.

Analyzing the levels of farming preferred correlates to the sizes of lots proposed. Subsistence and supplemental farming require less acreage than a commercial farm. In addition, programmatically the amount of training or experience required to produce successful operations on subsistence and supplemental farms is not as critical as compared to commercial farms.

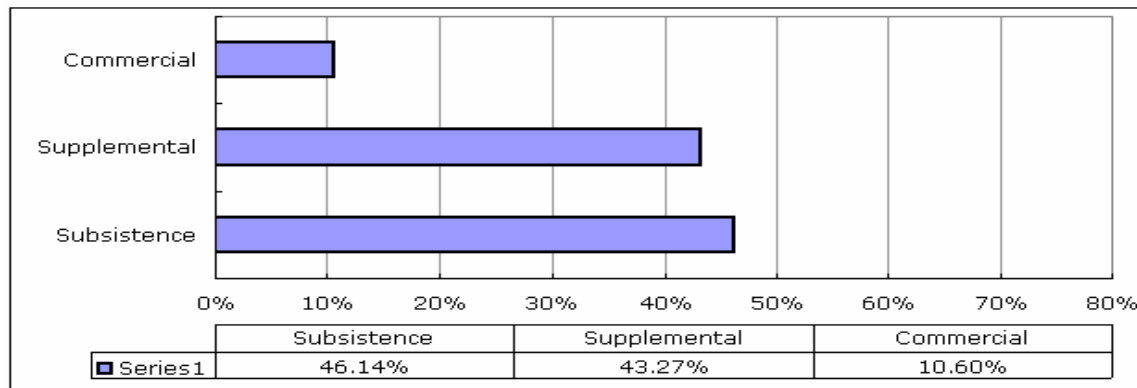
¹ *Subsistence Farming/Ranching*: grow crops/raise animals to supply minimal needs of the immediate family, living in the household.

² *Supplemental Farming/Ranching*: crops grown/excess of animal products will supply some, but not all of the income/goods/services needed by the family.

³ *Commercial Farming/Ranching*: crops grown/excess of animal products will provide all of the income/goods/services needed by the family without other employment.

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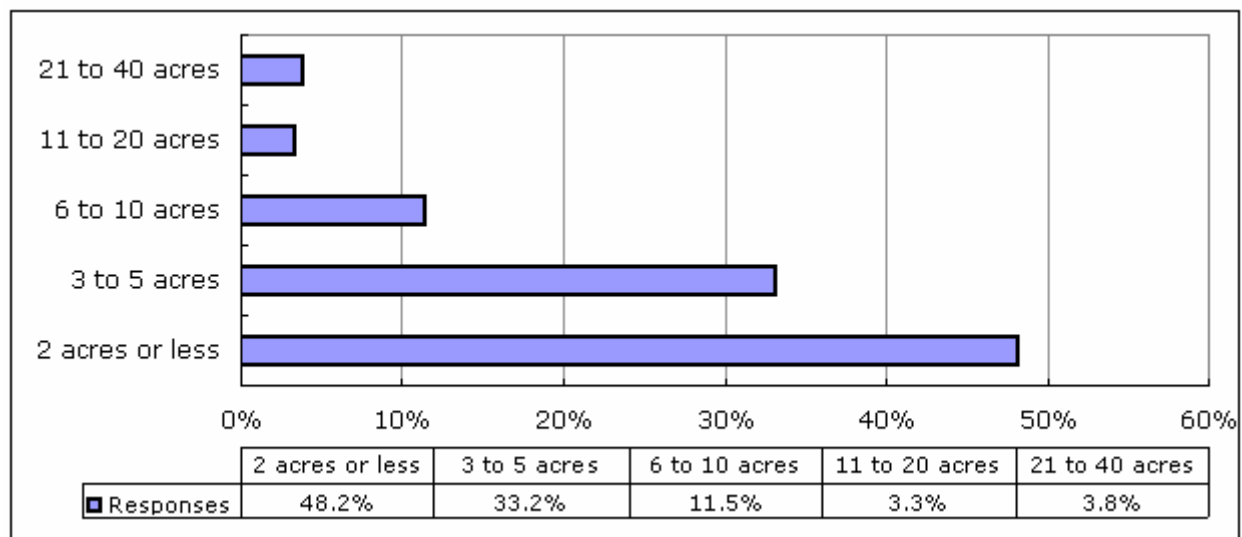
Figure 2-4: Agricultural Type



Agricultural lot size may be directly related to type of crops or livestock and to the type of operations planned (e.g. supplemental or commercial). Figure 2-5 shows data for lot sizes wanted by agricultural applicants.

Minimum lot sizes for applicants planning to undertake agricultural activities will obviously be larger than those for residential uses. However, survey data showed that half (48%) of agricultural applicants reported being willing to accept lots of two acres or less, followed by 33 percent willing to accept three to five acres, and 19 reported the need for a lot between a six and 40 acres.

Figure 2-5: Minimum Acceptable Lot Size – Agricultural



Agricultural Area Preferences

Planning for the development of agricultural lots must take unique factors into consideration. Like residential planning, agricultural development must take costs, feasibility, access, and infrastructure into consideration. However, applicants' preferences

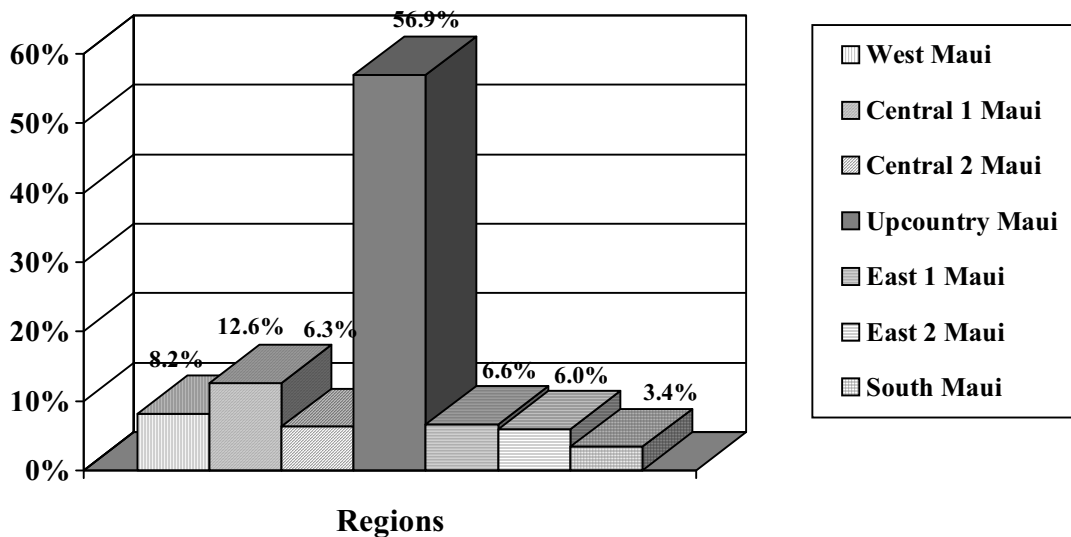
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for land location and lot size are particularly important when planning for agricultural development the majority of applicants will live and farm on the same land.

Applicants surveyed considered the same seven regions for agricultural applications as were identified for residential use. The percentage of agricultural applicants choosing each region is shown in Figure 2-6. Table 2-2 shows the popularity of Maui regions as projected numbers of lots needed to satisfy demand.

Approximately six percent of applicants for agricultural awards said report “no preference” for land areas, as long as they receive an award of adequate size. Those responses are included in the analysis by assuming that their eventual choices will have the same distribution as choices made by the other 94 percent of applicants. Many agricultural applicants also rated fewer than seven regions, noting that they were not interested in some. For planning purposes, applicants claiming “no preference” or not responding are placed into the general applicant pool.

Figure 2-6: Area Preferences for Agricultural Awards



As shown in Table 2-2, the total island wide demand for agricultural lots is 3,071. The Upcountry region is the most preferred location for farming at 57 percent or 1,747 lots, followed by Central 1 at 13 percent or 388 lots, and West Maui at 8 percent or 252 lots.

Combining split regions into a single location changes the order of preferred areas; although Upcountry and Central (1 and 2) are still the most popular two regions for farming, the East region (1 and 2) surpasses the West as the third most favored region.

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Table 2-2: Area Demand – Agricultural

Regions	Number of Units
West	252
Central 1	388
Central 2	193
East 1	204
East 2	183
Upcountry	1,747
South	104
Total⁴	3,071

Summary

Eighty-seven percent of the applicants prefer two- to three-acre subsistence or supplemental agricultural awards. The Upcountry region is the overwhelming preferred location, followed by Central Maui (Central 1 and 2). West Maui was third in comparison to the individual East 1 and East 2 regions; however the combined East region surpassed the West in overall demand. A total of 3,071 agricultural lots are needed to meet the overall demand on Maui.

Pastoral

Pastoral Applicant Profile

Most applicants for pastoral awards (84%) are not currently involved in ranching or animal husbandry activities. Of the 16 percent of the applicants that are engaged in ranching activities, 75 percent do so on a subsistence level, with less than three percent reporting commercial level activities. Sixty-eight percent of the pastoral applicants intend to live and raise animals on the awarded parcel.

Pastoral Type and Lot Size Preference

Figure 2-7 shows pastoral preference by type based on DHHL definitions of subsistence⁵, supplemental⁶, or commercial⁷. Most (55%) of the applicants are interested in subsistence ranching. Nineteen percent intend to use their pastoral awards for residential use only, while 63 percent indicate that they will live and raise livestock on the award.

⁴ Note: “No preference” respondents redistributed based on percentage of applicants who actually indicated each area as their first choice. The projected demand is lower than the 3,148 agricultural applications filed. Adjustments were made for those who were listed as deceased, or gave an applicant profile that does not occur.

⁵ *Subsistence Farming/Ranching*: grow crops/raise animals to supply minimal needs of the immediate family, living in the household.

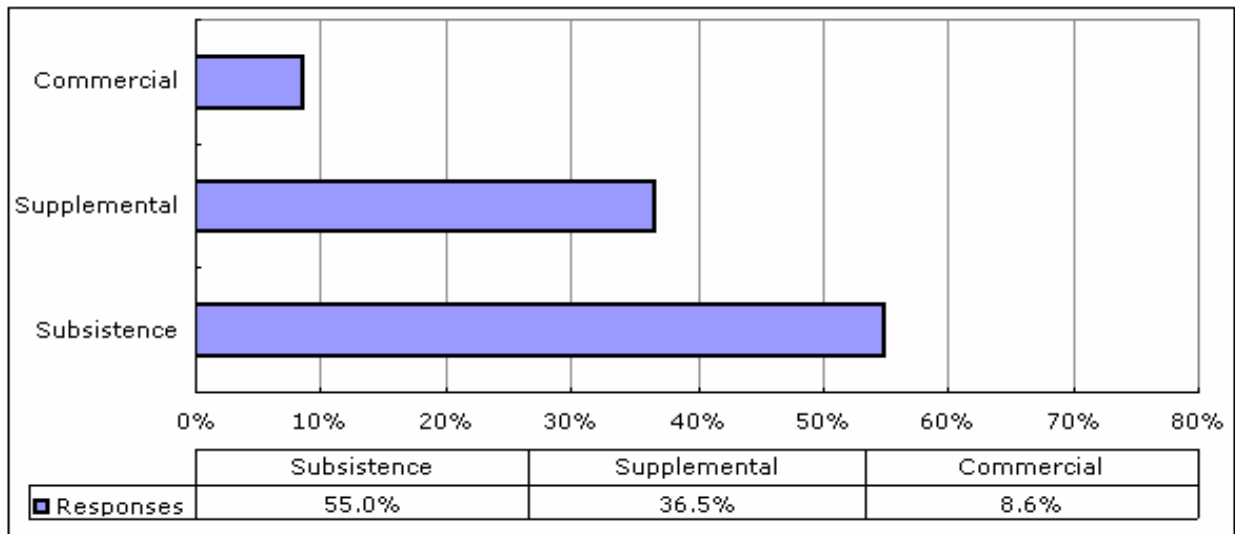
⁶ *Supplemental Farming/Ranching*: crops grown/excess of animal products will supply some, but not all of the income/goods/services needed by the family.

⁷ *Commercial Farming/Ranching*: crops grown/excess of animal products will provide all of the income/goods/services needed by the family without other employment.

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In order to meet beneficiary needs, DHHL must pursue the most efficient land uses. With respect to pastoral awards, this means addressing housing needs by focusing on providing pastoral opportunities to those applicants who intend to use their awards for residential purposes. In addition, providing smaller subsistence agriculture awards as an alternative for applicants seeking to live and raise personal livestock also utilizes land more effectively.

Figure 2-7: Pastoral Type

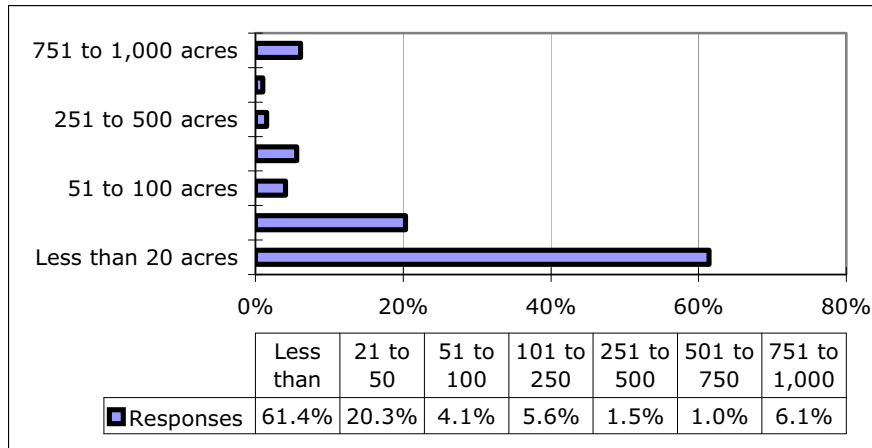


Pastoral lot size may be directly related to the type of livestock to be raised and to the type of operations planned. Figure 2-8 shows data for preferred lot sizes.

Minimum lot sizes for applicants planning to undertake pastoral activities will be larger than those for residential and agricultural uses. Survey data shows that the majority (61 percent) of pastoral applicants are willing to accept lots of twenty acres or less, followed by 20 percent willing to accept 21 to 50 acres, and approximately 18 percent requesting a lot in between 51 and 1,000 acres.

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Figure 2-8: Minimum acceptable lot size – Pastoral



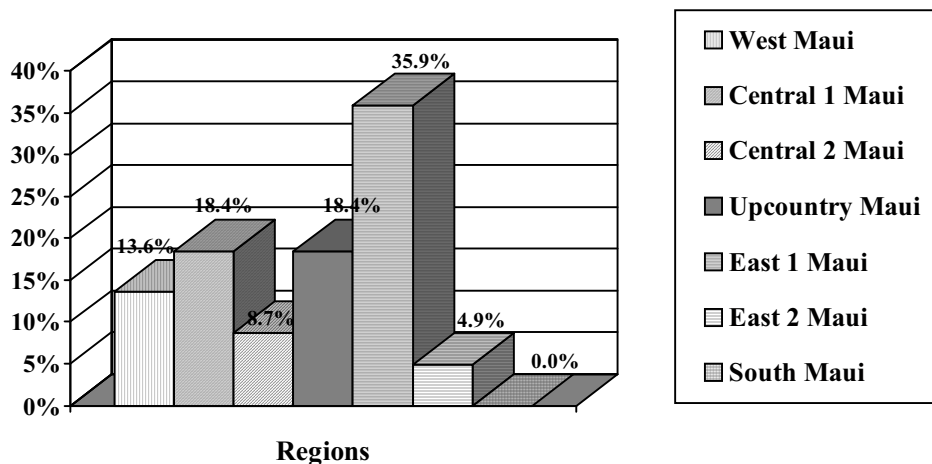
Pastoral Area Preferences

Pastoral applicants surveyed rated the same seven Maui regions as did residential and agricultural applicants.

The percentage of pastoral applicants choosing each location is shown in Figure 2-9. Table 2-3 shows the popularity of Maui regions as projected numbers of lots needed to satisfy demand. Some respondents report “no preference” for land areas, as long as they receive an award of adequate size. Those responses are included in the analysis by assuming that their eventual choices will have the same distribution as choices made by the other applicants.

Many applicants also rated fewer than seven regions, noting they were not interested in some. For planning purposes, applicants claiming “no preference” or not responding are placed in the general applicant pool.

Figure 2-9: Area Preferences – Pastoral



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Table 2-3: Area Demand – Pastoral

Regions	Number of Units
West	48
Central 1	66
Central 2	31
East 1	128
East 2	17
Upcountry	66
South	0
Total⁸	356

As shown in Figure 2-9 and Table 2-3, East 1 (Ke’anae, Wailua) is the most preferred area for ranching at 36 percent or 128 projects lots. Central 1 (Waiehu, Paukūkalo) and Upcountry are equally preferred at 18 percent or 66 lots each, followed by West Maui at 14 percent or 48 lots, Central 2 at nine percent or 31 lots, and East 2 at five percent or 17 lots. The South region was not selected by any of the respondents.

Combining split regions into a single location changes the preference order. East 1 (Ke’anae, Wailua) is still the favored region; however, the Central region (Central 1 and 2) surpass Upcountry as the second most favored region.

Summary

The majority of the applicants pastoral awards are not currently involved in ranching. Eighty-nine percent are seeking subsistence or supplemental awards. Upon receiving the awards, 68 percent would live and raise livestock on the same land. Applicants for pastoral awards report a preference for the East 1 region. A total of 356 pastoral lots are needed to meet the overall pastoral demand on Maui.

2. 2000 UNITED STATES CENSUS

The Research and Statistics Unit of Alu Like Inc., summarized demographic, social, economic and housing data from the 2000 U.S. Census for 12 Hawaiian home lands areas with populations greater than 500. Paukūkalo is the only area on Maui included in this study. The following discussion focuses on the Paukūkalo findings and compares this data with similar figures for Maui County.

Demographic

According to the 2000 U.S. Census, there were 753 persons in Paukūkalo in 2000, of which 67 percent were between 18 and 65 years old. The median age in Paukūkalo was 31 years. There were slightly fewer females (49.4 percent) than males in Paukūkalo in

⁸ “No preference” respondents redistributed based on percentage of applicants who actually indicated each area as their first choice. The projected demand is lower than the 365 pastoral applications filed. Adjustments were made for those who were listed as deceased, or gave an applicant profile that does not occur.

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2000. These figures are relatively consistent in comparison to countywide census data. In 2000, 63 percent of all Maui County residents were between the ages of 18 and 65. The median age for the County was somewhat higher at 36.8 years. The number of males and females was almost equal with female residents representing 49.8 percent of the total population in Maui County.

Social

In Paukūkalo, 60 percent of persons in the community were married, of which two percent were separated or divorced. Fifty-two percent of all Maui County residents were married, of which 18 percent were separated or divorced.

The majority of Paukūkalo residents were originally from Hawai'i, with 92 percent born in Hawai'i, five percent born in another state, and two percent born outside of the United States. In contrast, only 54 percent of Maui County residents were born in Hawai'i. Twenty-eight percent were born in another state and one percent was born outside of the United States.

Twenty-eight percent of Paukūkalo residents indicated not graduating from high school. Only seven percent have received a bachelor's degree or higher form of education. For all of Maui County, 17 percent of residents reported not graduating from high school and 22 percent have sought higher education.

Economic

In Paukūkalo, 48 percent of residents were employed, seven percent were unemployed, and 45 percent were not in the labor force. Countywide data indicates that 64 percent of residents were employed, three percent were unemployed, and 33 percent were not in the labor force.

Those that worked in Paukūkalo indicated that approximately half (55 percent) drove to work alone. The balance of the workers carpooled, used other means of transportation, or walked. None of the workers from Paukūkalo used public transportation. The average travel time between work and home was 30 minutes. Seventy-two percent of Maui County workers drove to work and the average travel time to work was 21.7 minutes.

The majority of the workers in Paukūkalo held jobs in either the private or government sectors, with the most common occupations categorized as service oriented, production, or sales. The top three occupational categories for all of Maui County were service, management and professional, and sales and office.

According to U.S. Census figures, workers in Paukūkalo earn far less than countywide averages. The median income for households in Paukūkalo was \$48,043, compared to County median income of \$55,277. The average per capita income for Paukūkalo was \$12,369, compared to Maui County per capita income of \$22,033. The median earnings for Paukūkalo males were \$35,278, which were significantly higher than earnings for females, recorded at just \$28,182.

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Housing

Data from the 2000 Census also provides important information about housing trends in Paukūkalo in comparison with Maui County as a whole. The average household size in Paukūkalo was 4.5 persons compared to just 2.9 persons per household countywide. The majority of the Paukūkalo households were family oriented (i.e., all persons were related by birth, marriage or adoption), which was consistent with island wide housing trends.

The Census indicated that there were 167 housing units in Paukūkalo in 2000, of which 95 percent were owner occupied and 5 percent were renter occupied. In contrast, Maui County averaged 58 percent owner occupied and 42 percent renter occupied housing units.

The majority of the homes in Paukūkalo were single detached units built between 1940 and 1995. All of the homes have three or more rooms with an average of 5.3 rooms per unit. Twenty-eight percent of the households indicated that there were more people than there were rooms.

Of the total housing units in Maui County, a little over half (56%) were single detached units. Similar to data for Paukūkalo, the majority of the homes were built between 1940 and 1995. There was an average of four rooms per household, which is lower than for Paukūkalo alone. However, only 17 percent of households countywide indicated that there were more people than there were rooms in the homes.

The median value of the Paukūkalo homes was \$119,700, with mortgages averaging \$721 a month, compared to the Maui County median value of \$249,900 and an average mortgage of \$1,572.

B. INFRASTRUCTURE

1. ELECTRICITY

Electrical power on Maui is supplied by Maui Electric Company (MECO). The installed generating capacity currently owned and operated by MECO is 212.90 Megawatts (MW). This capacity is divided between the Mā'alaea Generating Station with a reserve capacity of 175.30 MW and the Kahului Generating Station with a reserve capacity of 37.60 MW. Additional power from Hawaiian Commercial & Sugar Company (HC&S), a subsidiary of Alexander & Baldwin, Inc. (A&B), supplements the total installed generating capacity of MECO. Power from HC&S is generated at the Pu'unēnē Mill located in Pu'unēnē. The mill produces 44 MW of power.

The current transmission grid on Maui consists primarily of seven 69-kV lines from the Mā'alaea Power Plant and four 23-kV lines from the Kahului Power Plant. Two 69-kV lines service the Wailuku/Kahului area and another 69-kV line services Kīhei/Wailea and continues up-country to Kula, Pukalani, and Kahului.

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Four 23-kV lines from the Kahului Power Plant service the Wailuku/Kahului area, the Ha'ikū/Makawao area, and East Maui. In Kahului, the 23-kV and 69-kV lines link at the Kanahā Substation and in Wailuku, the 23-kV and 69-kV lines link at the Walinu Substation.

Currently, there are 68 operating substations in the system and four substations in the planning stage. Areas in which the transmission lines do not currently reach include the area from Waiehu, around the northern West Maui Mountains, to approximately Honolulu and from Hāna, around the eastern base of Haleakalā, to 'Ulupalakua.

Recommended additions to generating capacity differ based on linear and non-linear projections. If the population of Maui increases linearly for the next 20 years, a minimum of 65 MW should supplement the current generating capacity by the year 2020. If the yearly rate of electrical demand increases exponentially, as much as 130 MW may be needed. According to the *County of Maui Infrastructure Assessment Update Electrical Systems* (Morikawa & Associates, March 2003), the projected peak electric power demand in 2020 is 275.5 MW.

To meet past demands from population growth on Maui between 1990 and 2000, MECO installed a total of 100 MW of additional generating capacity. The implementation of both supply-side and demand-side technologies will determine the distribution of units in the future. As electrical demand increases, so will the need for a new generating station. Both the Kahului and Mā'alaea Generating Stations have limited space for additional generating units. Land has been appropriated to create a new generating site along Pūlehu and Waiko Roads in Central Maui. After a steam turbine generator is installed at the Mā'alaea Generating Station in 2007, all subsequent units will be installed at the new Waena Generating Station. This land is limited to producing 66 MW of fossil fuel burning energy production. The remaining land will be used for alternative energy and ancillary facilities.

2. SOLID WASTE

Solid waste is taken to the Central Maui and Hāna Landfills.

According to the *Public Facilities Assessment Update* (R. M. Towill, July 2002), the Central Maui and Hāna Landfills will have adequate capacities to accommodate commercial and residential waste through the year 2020, with a surplus of approximately one million cubic yards of landfill space for Central Maui and 110,000 cubic yards for Hāna.

3. COMMUNICATIONS AND TELEPHONE

Telephone service is provided by Verizon Hawaii and other private companies and is regulated by the State Public Utilities Commission. The existing telephone system on Maui consists of a network of telecommunication links made by wire, fiber-optic lines,

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and microwave transmission. Major switching nodes are located within nine central offices on the island and the toll office in Wailuku. Radio stations provide microwave links off of the island, including the link that connects Hāna with the rest of Maui via Hu‘ehu‘e on the island of Hawai‘i and Haleakalā.

Sandwich Isles Communications, Inc. (SIC), a native Hawaiian company, also provides telecommunications services to beneficiaries and lessees on Hawaiian Home Lands. SIC provides telecommunications infrastructure at no cost to DHHL and assists the agency the installation costs.

C. SOCIO-ECONOMIC

1. SOCIO-ECONOMIC FORECAST

Maui County commissioned the *Maui County Community Plan Update Program: Socio-Economic Forecast, Phase II Report* (SEF) in February 2003. The SEF reports Maui’s most current socio-economic data used as the basis for the *Maui County General Plan* and nine community plans. The SEF projections draw on 1990 and 2000 U.S. Census data, including population, distribution by age and sex, occupied housing units, and average household size. Other sources used to estimate future trends include State Department of Labor and Industrial Relations data regarding wages and salaries by industry and State Health Survey data for 2000 to estimate incomes by county, island, and community plan area.

The SEF generated three versions of projected data based on assumptions concerning economic growth:

- Baseline Projection: the Department of Business, Economic Development and Tourism’s (DBEDT) current “best guess” for Maui County based on a long-term forecast that estimates future numbers of residents, visitors, jobs, and housing at five-year intervals, incorporating year 2000 Census data where possible;
- Low Projection: Maui County variables projected with a visitor growth rate for the County increasing at half the rate specified in baseline projections; and
- High Projection: Maui County variables when the visitor growth rate increases at one and a half times the rate specified in baseline projections.

Barring extreme changes in policy or external factors, Maui’s future population growth and trends are likely to fall within this range. Therefore, the projections of the SEF serve as an appropriate context for DHHL goals, objectives, and this plan.

The SEF projects Maui’s growth in five primary regions; DHHL has land in all of these anticipated growth areas. DHHL’s determination of the most appropriate locations for accommodating growth will be primarily based on its mission, goals, and objectives; beneficiary preferences; and fiscal and other constraints and opportunities. A primary

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purpose of the *Maui Island Plan* is to support DHHL and the beneficiaries in participating in Maui County's planning for the future.

Summary of Projections

Using growth scenarios in a context of low to high ranges, the SEF projected Maui's 2000 population of 117,644 to increase to a total between 156,863 and 163,822 by 2020. Total households on Maui are projected to increase from 40,041 in 2000 to between 57,748 and 60,324 in 2020.

A follow-up SEF report, entitled *Socio-Economic Impacts of the Maui Community Plan Long-Term Forecast, 2002*, describes Maui's long-term forecast as one of "slow growth." As defined in the SEF, even that slow growth forecast calls for a continuation of current growth in numbers of residents and households, but slower growth in jobs, and even slower growth in the number of visitors.

The SEF also forecasts that during its 20-year timeframe, most of Maui's visitor industry growth will occur in the Lahaina Community Plan region, where DHHL has land at Honokōwai.

Relevance

Although Maui's long-term forecast calls for "slow growth," it is important to designate land uses that will allow for the creation of new jobs. Furthermore, an increase in population will create demand for expanded or new school and community facilities.

This socio-economic forecast directly relates to DHHL land use planning goals and objectives, including:

- Using Hawaiian home lands for uses most appropriate to meet the needs and desires of the beneficiary population; and
- Directing urban growth to priority development areas based on infrastructure availability, feasible site conditions, beneficiary preferences, and job opportunities.

2. HEALTH

The 2003 *Maui County Data Book*, a comprehensive collection of statistical information prepared by the Hawaii Small Business Development Network Center and Hawaii Business Research Library, provided the following information on Maui's health care system.

Maui Memorial Medical Center (MMMC) is the only major health care facility on Maui and provides medical, surgical, critical, obstetric and psychiatric care. In 2000, the hospital had 196 licensed beds and admitted 10,270 patients for an average of 5.4 days.

In addition to MMMC, several adult residential care homes, health clinics, and other smaller-scale health facilities service various Maui communities.

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There are approximately 261 physicians on Maui, compared to 2,627 physicians on O'ahu.

3. HOUSING

The following data on housing trends on Maui was gathered from *The Hawaii Housing Policy Study Update, 2003* (HHPS) prepared by SMS Research & Marketing Services, Inc.

Housing Inventory

According to the 2000 Census, there were 56,549 housing units in the Maui Housing Market Area (HMA). This represents 34 percent overall growth since 1990 when there were 42,261 housing units were counted in the Maui HMA.

Vacancy Rates

The last decade began with a very tight for-sale housing market in the County of Maui. The owner vacancy was only 0.2 percent in 1990 and grew to 1.3 percent in 2000. For rental units, the 1990 vacancy rate was 11 percent in 1990 and eight percent in 2000.

Market Conditions

Home Ownership

Three factors have fueled a major increase in housing activity and prices in recent years. First, rapidly falling interest rates have spurred potential buyers to quickly enter or move up in the housing market. Second, housing construction rates have not kept pace with short-term demand. Third, sales of new units on Maui to non-residents have increased. The convergence of these trends has sparked a level of real estate activity that is well above what normal demand would support.

Rental Market Conditions

Overall, the number of available rental units is dropping. With increasing numbers of visitor arrivals more units are being absorbed for visitor use. Single-family rentals have also entered the home-ownership market as owners sell to the quickly growing number of buyers wishing to take advantage of low interest rates. The same factors that caused higher activity in the home ownership market have contributed to re-sales of multifamily rental projects, often resulting in higher rents. As a result, rents have skyrocketed in the Maui market.

Housing Demand Forecast

Forecasts project that household growth in the Maui HMA between 2003 and 2010 will be about 3,966, or approximately 567 households per year. Production is not expected to match demand; the forecast shows that the deficit in units will range from 4,516 in 2003 to 4,183 in 2010. This assumes that population growth will remain steady at approximately 1.5 percent per year, and that production –stimulated by continuing low interest rates and external demand – will remain around 1.2 to 1.6 percent per year. A

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deficit will be created if demand runs ahead of total production minus units sold outside the state or transferred to the visitor industry. Total production is expected to be nearly all ownership units. Although it is arguable that the very high rents experienced in the HMA in 2003 might prompt some owners to enter the rental market, new production is not likely to include any units for the rental market. Demand, on the other hand, will be substantial for both owned and rented units.

4. EMPLOYMENT

According to statistics for the Department of Labor and Industrial Relations (DLIR), the leading job sectors on Maui in March 2004 were: (1) "Service-Providing" (approximately 57,000 jobs); (2) "Leisure and Hospitality" (20,000 jobs); (3) "Trade, Transportation and Utility" (12,750 jobs); and (4) "Government" (8,700 jobs). The "Agriculture" sector was eleventh out of twelve sectors with approximately 1,750 jobs.

The results show that Maui County's job market is predominately service oriented, presumably connected to Maui's visitor industry. These results are consistent with the data from the 2000 Census for Paukūkalo where workers held jobs in either the private or government sectors, with the majority of the jobs being in the service oriented, production, and sales occupational categories.

During 2003, Maui County showed a 2.3 percent growth in its labor force and employment sectors. According to the Department of Business, Economic Development and Tourism, Maui gained approximately 1,450 jobs, with growth occurring in the entertainment and recreation and Federal Government sectors.

5. AGRICULTURE

Approximately 48 percent of land in Maui County is devoted to agriculture. In 1997, the market value of Maui's agricultural products sold totaled almost \$130 million. Historically, Maui's agricultural industry was dominated by sugar and pineapple production. In recent years this, however, as sugar and pineapple production have continued to decline, diversified agriculture has increased. The closing of Pioneer Mill in West Maui and operation reductions in sugar reflects this shift. Although there is ample land available for new agricultural operations, the conversion to diversified agriculture has been slow due to the challenges posed by unsuitable climates, market demands, market competition, high labor costs, and transportation costs.

Maui's largest agricultural operation is Alexander and Baldwin, Inc. (A&B), whose HC&S grows sugar on over 37,000 acres in Central Maui. The HC&S plantation is the last remaining large sugar plantation. An announced cutback in U.S. sugar subsidies might alter the existing precarious balance of land use on Maui. If Maui sugar operations became unsustainable, large amounts of both land and water would potentially be available. Given this uncertain future for the viability of large-scale agricultural operations on Maui, A&B will most likely weigh potential impacts to their HC&S plantation (and

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smaller agricultural operations) in planning for future development of their own lands and those leased from others (such as DHHL's Pu'unēnē lands). Reports indicate that A&B's total inventory of lands will be sufficient to meet their needs for existing agricultural markets, while maintaining the bulk of its non-urban in reserve for more profitable uses in the future (such as commercial/industrial and residential developments at Kahului and Wailuku).

6. REGULATORY

The planning process is designed to be consistent with the General Plan. The table below describes proposed land use categories under the General Plan.

Proposed Land Use Designations

Proposed Use	Setting/ Intent/ Purpose	Lot Size	Minimum Infrastructure
Residential	Residential subdivisions built to County standards where close to existing infrastructure. Residential waiting list.	≤ 1 ac.	Potable water, all utilities, paved access
Subsistence Agriculture	Agriculture / aquaculture lots. Marginal to good lands; "lifestyle" lands mainly to allow for home consumption of products grown on-site; lessee occupancy required. Takes advantage of nearby existing infrastructure. Benefits those applicants on agriculture list.	≤ 5 ac.	Water catchment or system and <u>paved</u> access
Supplemental Agriculture	Agriculture/ aquaculture lots; marginal to good land; independent of off-site infrastructure; allow commercial farms & agricultural production to supplement income & for home use. Occupancy optional. Farm plan and 2/3 cultivation required. Agriculture waiting list.	≤ 40 ac.	Water catchment or system and <u>unpaved</u> access
Pastoral	Large lot agriculture specifically for pastoral uses; marginal lands; some commercial pastoral activity allowed. Ranch plan & fencing required. Pastoral waiting list.	≤ 1,000 ac.	Water (Catchment or system) and road access (unpaved)
General Agriculture	Marginal to prime lands. Commercial farming or ranching. Opportunities for General Leases. Land Reserve or land bank for future use.	TBD	N/A
Special District	Areas requiring special attention because of unusual constraints and/ or opportunities; natural hazard areas; open space, raw lands far from infrastructure (difficult to improve); mixed uses, green-ways.	TBD	To be determined
Community Use	Community common areas. Includes space for parks and recreation, cultural activities, cemeteries, & other public amenities.	TBD	County Standards

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Proposed Land Use Designations (continued)

Proposed Use	Setting/ Intent/ Purpose	Lot Size	Minimum Infrastructure
Conservation	Watershed, environmental, cultural/ historic sites.	TBD	N/A
Commercial	Commercial/ offices and retail business.	TBD	County Standards
Industrial	Processing, construction, manufacturing, wholesale and warehousing.	TBD	County Standards

The background of the page features a lush tropical forest scene with various palm trees and dense foliage. On the left side, there is a vertical bar composed of four distinct shades of pink, ranging from a very light, almost white tone to a deeper magenta.

3.0 UPCOUNTRY MAUI

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3.0 UPCOUNTRY MAUI

A. REGIONAL OVERVIEW

The Upcountry planning region encompasses three DHHL holdings totaling 6,154.9 acres: Waiohuli/Kēōkea, 'Ulupalakua, and Kualapa (Figure 3-1). Located on the westerly slopes of Haleakalā, the region is within the County's Makawao-Pukalani-Kula Community Plan region (Figure 1-3).

The Upcountry planning region has extensive open space and rolling green hills with the summit of Haleakalā rising above the region to the east. To the west are views of the ocean and the West Maui Mountains. Coastal and ocean views are also visible to the north and south. Strong *paniolo* and farming traditions are evident and have affected architecture, patterns of development, and a uniquely Upcountry lifestyle.

Major population centers in the Makawao-Pukalani-Kula Community Plan region include Makawao and Pukalani. Both of these towns are characterized by a mixture of small-town urban and outlying rural land uses. Although Makawao has grown as a tourist destination, it retains its *paniolo* character.

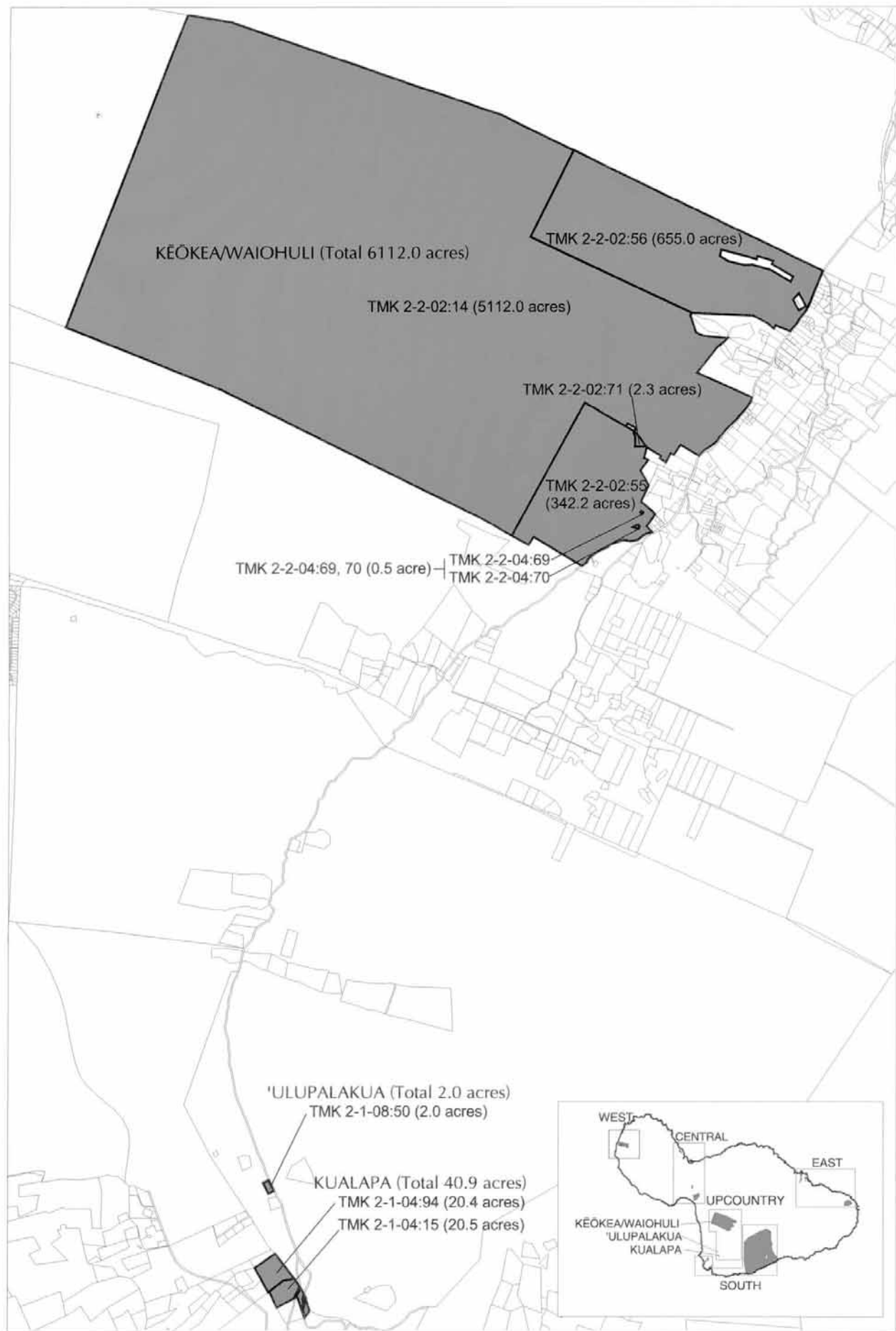
Within the DHHL Upcountry planning region, elevations range from approximately 640 feet above sea level in westerly (*maka'i*) areas of the Waiohuli/Kēōkea tract to approximately 3,000 feet above sea level in the east (*mauka*). Annual rainfall varies greatly, from just 15 inches in westerly dryland forest areas to 30 inches in northerly rainforest areas. The rolling topography and rich soils are favorable for cattle ranching, pineapple cultivation, and diversified agriculture.

1. REGIONAL INFRASTRUCTURE

Roadways

Haleakalā Highway, a three-lane road (currently being widened to four lanes) serves as the primary access between Central and Upcountry Maui. Ōma'opio Road and Pūlehu Road provide secondary access into the DHHL Upcountry region. Kula Highway and Kekaulike Avenue provide access within Upcountry.

A Kīhei-Upcountry connector road is being proposed to link the Kīhei region to the Upcountry area. As proposed by the State Department of Transportation, the preferred alternative would intersect with Pi'ilani Highway in Kīhei and connect with Haleakalā Highway at the current intersection of Haleakalā Highway and Hāli'imaile Road.



Legend

 DHHL Properties

Figure 3-1

Upcountry Region

MAUI LAND INVENTORY

DEPARTMENT OF HAWAIIAN HOMELANDS



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Water System

According to the *County of Maui Infrastructure Assessment Update*, the Makawao-Pukalani-Kula Community Plan region, which includes the DHHL Upcountry region, is primarily supplied by surface water sources. The municipal systems include the Makawao and Kula systems.

Supply

The major source for the Makawao system is the intake at the end of the Wailoa Ditch system at an elevation of approximately 1,100 feet. The Kamole Water Treatment Plant is located at this site and has a capacity of approximately eight million gallons per day (mgd).

The Makawao system supplements the Kula system during dry periods. Although there is some additional water treatment capacity, there is inadequate surface water supply. Present agreements with East Maui Irrigation (EMI) allow the Department of Water Supply to take up to 12 mgd without prior notice. Although the Wailoa Ditch capacity is 190 mgd, the base flow (exceeded 90 percent of the time) is 34 mgd and flow has gone as low as two mgd.

The Kula system consists of an upper and lower system. The upper system, along an elevation of 4,200 feet, collects surface water from Haipua'ena, Puohakamoa, and Waiakamoi Streams. The water treatment plant at Olinda has a capacity of 1.7 mgd. Major storage reservoirs for the upper system include the 100-million gallon (MG) Kahakapao reservoir, the 10-MG Upper Waiakamoi dam/reservoir, the lower Waiakamoi dam, and the 3-MG Olinda tank.

The lower Kula system serves the Ōma'opio, Olinda, and Lower Kula communities. The system begins at an elevation of 3,000 feet and diverts water from Haipua'ena, Puohakamoa, Waiakamoi, and Honomanū Streams. It consists of over 13 miles of water lines, seven pump stations, and the 50-MG Pi'iholo reservoir.

Existing Demand

In the Makawao-Pukalani-Kula Community Plan region, the municipal water demand was 6.40 mgd in the year ending June 2001 for the communities of Makawao, Pukalani, Hāli'imaile, Kula, and 'Ulupalakua.

Agricultural Water System

The County also has an Upcountry Maui Watershed Plan for upper Kula. The plan includes a separate agriculture water distribution system that supplies untreated water for agricultural irrigation purposes to farmers in upper Kula. This plan will relieve some demand on potable supplies and reduce non-potable costs by eliminating the need to treat water to be used for irrigation.

The Kahakapao Reservoir is the water source for the planned separate agricultural water distribution system. When completed, the main distribution pipeline will extend from

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Olinda to Kēōkea with nine lateral systems serving the areas of Olinda, Crater Road, Kimo Road, Pūlehuiki/Kamehameiki, Kealahou, Waiakoa, Ka'ono'ulu, Waiohuli, and Kēōkea/DHHL. The system will provide 473 acres of cropland with agricultural water supply at 91 percent reliability.

This separate water distribution system, when completed, will include 9.4 miles of eight-to 18-inch diameter high density polyethylene main distribution pipeline, 14.8 miles of lateral and sublateral pipelines, 9.2 miles of access roads, gulches and roadway crossings, and 16 acres acquired as easements and right-of-ways.

Total cost for the project is estimated to be \$8.2 million. Half of the cost is federally funded and half is State funded.

The first phase of the Agricultural Water Distribution System has been constructed through lands currently owned by Haleakalā Ranch. The line extends from the Kahakapao Reservoir to just before Kimo Drive in Upper Kula.

House Bill HB660, introduced in the State Legislature in 2003, would authorize six million dollars in general obligation bonds for the second phase of the water distribution system. HB660 was carried over from 2003 to the 2004 legislative session. If not passed during the 2004 session, the bill will die. Should this happen, the bill will have to be reintroduced in the 2005 session in order for the second phase to receive funding from general obligation bonds.

It is not known how much will be drawn by the agricultural areas served by the system and whether there will be enough to meet the needs of agricultural uses on the Kēōkea tract. In addition, the actual schedule of the water system reaching DHHL's Kēōkea landholdings has not been determined, nor has the cost of the water for farmers.

Projected Demand

The projected demand for water in the Makawao-Pukalani-Kula region is based on projections supplied by the *County of Maui Socio-Economic Forecast Study Update* (SMS, May 2002). The projections include population growth projections to the year 2020, as well as household, employment, and visitor growth for each island and community plan region. Total water demand is projected to increase from 6.40 mgd in 2001 to 11.05 mgd by the year 2020, an overall increase of 4.65 mgd or approximately 72 percent of present consumption. Single-family residential uses and agriculture will create the greatest demand for water resources. Anticipated future plans for DHHL's properties in the region are not included in the above demand projections.

Analysis

The Upcountry area has long faced with problems of inadequate water supply, pumping, storage, and treatment. Inadequate supply is most evident during prolonged dry periods. Improvements are required to provide reliable water to existing Upcountry areas, as well as to meet projected demands.

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The Po'okela Well development will help improve supply. A portion of the water supply from the Hāmākuapoko and proposed Ha'ikū wells may also be pumped to the Makawao system. The high cost of pumping water to the higher elevations renders it unlikely that the DWS would rely on this source other than to supplement Upcountry supplies during prolonged periods of low rainfall.

As mentioned above, most of the service area is at too high an elevation to be economically supplied by water pumped from lower elevations where ground and surface water sources are more easily developed. Higher-level sources are needed to avoid pumping.

Another problem is the inadequate storage capacity of the existing reservoirs, which needs to be expanded to stabilize the water supply. However, reservoirs are costly to develop.

Lastly, Upcountry is served primarily by surface water sources. Surface water must be treated to meet increasingly stringent standards of the Safe Drinking Water Act administered by the Environmental Protection Agency. Water treatment is costly and the amount of available water is dependent on the capacities of the treatment facilities. Developing ground water sources would alleviate the region's dependency on treated surface water.

Wastewater Treatment and Disposal

The Makawao-Pukalani-Kula region is not served by County wastewater facilities. For smaller developments, wastewater is generally handled by on-site septic systems. For developments of 50 or more residential lots, State Department of Health rules require a wastewater treatment facility to service the subdivision (HAR, Title 11, Subchapter 3, Section 11-62-31.1(1)(B)). However, individual septic systems may be allowed with a variance from the State Department of Health.

Proposed revisions to the DOH rules would allow septic systems for developments with 50 or more lots provided the development consists of one dwelling unit per acre or greater. As of March 8, 2004, the proposed revised rules are currently under review by the Governor and will become effective if signed by the Governor.

Analysis

Since the Makawao-Pukalani-Kula region is not served by County wastewater facilities, private wastewater facilities would have to be constructed for any new residential development. For subdivisions with fewer than 50 lots, individual on-site septic systems can be used. For subdivisions of 50 or more lots, a private wastewater treatment facility would have to be built unless DHHL seeks and receives a variance from the DOH.

Solid Waste Disposal

The County provides weekly garbage pick-up for a fee. The Central Maui Landfill, which is located in the Wailuku-Kahului Community Plan region, receives solid waste from the area.

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Analysis

According to the *Public Facilities Assessment Update*, the Central Maui Landfill will have adequate capacity to accommodate commercial and residential waste through the year 2020, with a surplus of approximately one million cubic yards of landfill space.

Electrical Service

A 69-kV line from the Mā'alaea Power Plant services Kīhei/Wailea and continues upcountry to Kula and Pukalani. At the Kula substation, a 23-kV line breaks from the 69-kV line to service Haleakalā customers. Another 69-kV line from Mā'alaea Power Plant services Kula and intersects the 69-kV line running from the plant through Kīhei/Wailea, Kula, Pukalani, and to Kahului. The Kīhei/Wailea/Kula 69-kV line links with the Ha'ikū/Makawao 23-kV line from the Kahului Power Plant at the Pukalani Substation in Pukalani, where the 23-kV line extends to Makawao and then to Ha'ikū.

Analysis

According to the *County of Maui Infrastructure Assessment Update Electrical Systems*, the projected peak electric power demand in 2020 is 275.5 MW. Both the Kahului and Mā'alaea Generating Stations have limited space for additional generating units. Land has been appropriated to create a new generating site along Pūlehu and Waiko Roads in Central Maui. After a steam turbine generator is installed at the Mā'alaea Generating Station in 2007, all subsequent units will be installed at the new Waena Generating Station. This land is limited to producing 66 MW of fossil fuel burning energy production. The remaining land will be used for alternative energy and ancillary facilities.

2. SOCIO ECONOMIC INFRASTRUCTURE

Police

According to the *Public Facilities Assessment Update*, this region falls within the Maui Police Department's (MPD) District 1 – Wailuku (Central). This police district is served by the Wailuku Station, which houses the MPD Headquarters for the entire County. The Wailuku Station is currently staffed with 111 budgeted uniformed patrol officers and an estimated share of 38 investigative officers. Approximately 32 uniformed officers and 10 investigative officers are on call to service the policing needs of the Makawao-Pukalani-Kula Community Plan region.

Analysis

According to the *Public Facilities Assessment Update*, the main problem facing this region is the distance from Wailuku Station and the limited number of motorized beats serving the area. This community plan region encompasses a large area with varied topography and a limited road network. This can result in lengthy response times to incidents in outlying areas, leaving Upcountry communities with less than ideal levels of service.

By 2020, police service needs in this region will increase by approximately 30 percent from the current allocation of 42 officers to 57. The 14 new officers will require a further addition of four new support positions (technical, clerical, and administrative) to be staffed

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at the existing Wailuku Station. In addition, total need in District 1 is projected to increase. To accommodate this growth, an expansion of the existing Wailuku Station may be required. Other alternatives include:

- Transferring patrol responsibilities for the Makawao-Pukalani-Kula Community Plan region out of the Wailuku Station to new police substations in those areas; and/or
- Expanding the service area of the planned Kihei-Mākena Station to include the Makawao-Pukalani-Kula Community Plan region.

An additional consideration for planning future police services is the number and distribution of patrol beats. Response times and service quality would be improved with the introduction of an additional patrol beat or new substation closer to the Makawao-Pukalani-Kula Community Plan region service population.

Fire

According to the *Public Facilities Assessment Update*, this region falls within the coverage area of the Kula Fire Station. The Kula Fire Station serves portions of Pukalani, upper Kula, and the area towards Kēōkea.

Analysis

According to the *Public Facilities Assessment Update*, all major business and commercial areas in the community appear to be adequately protected within the two road-mile radius of the Kula Fire Station. However, at the maximum radius of five road-miles, parts of eastern Ha'ikū and portions of southern Haleakalā are not covered. The Kula area is covered with the exception of the Kēōkea and 'Ulupalakua areas. The narrow winding roads common in many parts of the areas worsen the situation by further slowing emergency vehicle response times.

Emergency Services

According to the *Public Facilities Assessment Update*, there is one 12-hour ambulance based in Kula that services the Makawao-Pukalani-Kula and Pā'ia-Ha'ikū Community Plan regions.

Analysis

According to the *Public Facilities Assessment Update*, converting the 12-hour ambulance to a 24-hour service is a high priority (ranked seventh of the 10 highest priority areas statewide). Judging by population projections through 2020, one ambulance will continue to be sufficient to serve this area.

Health Care Services

According to the *Public Facilities Assessment Update*, Maui Memorial Medical Center, located in Wailuku, is the County of Maui's only critical care facility. The Kula Hospital is a smaller scale facility that provides limited acute care (two beds), inpatient skilled nursing and intermediate care, developmentally disabled inpatient services, Alzheimer's and

MAUI ISLAND PLAN

dementia care, family practice clinic services, physical and occupational therapy, outpatient services, and a pharmacy.

Analysis

According to the *Public Facilities Assessment Update*, based on the estimated total demand, 20 additional acute care (inpatient services provided to patients whose average length of stay is usually less than 30 days) beds and 164 long term care beds, 34 of which would be allocated to Kula Hospital, will be needed by 2020.

Schools

The 2002 *Public Facilities Assessment Update*, lists the following schools for this region¹:

Public

Kula Elementary (4 miles)
Pukalani Elementary (11 miles)
Makawao Elementary (12 miles)
Kalama Intermediate (12 miles)
King Kekaulike High School (9 miles)

Private

Clearview Christian Girl's School (Grades 6-8) (10 miles)
Haleakalā Waldorf (Grades K-8) (5 miles)
Kamehameha Schools- Maui (Grades K-12) (9 miles)
Montessori School of Maui (Grades K-5) (13 miles)
Seabury Hall (Grades 6-12) (11 miles)
Carden Academy- Upcountry (Grades K-5) (9 miles)
St. Joseph (Grades K-5) (12 miles)

Analysis

The *Public Facilities Assessment Update*, projected the enrollment for schools in this region to 2020 and made the following assessment:

Elementary Schools

Taken as a region, the elementary schools of Makawao-Pukalani-Kula appear to be adequate to meet demand throughout the planning period. This is consistent with current enrollment data for Makawao and Pukalani Elementary Schools, which range from 72 to 89 percent of capacity. It also is consistent with the high proportion of private school students in this region (35% of 2001 elementary-aged population).

Intermediate Schools

Using the Maui County forecast, demand for a second school increases in later years. However, Kalama Intermediate, with 2001 current enrollment of 1,179 students, is already operating at 118 percent of its rated capacity of 998 students. Thus, the Maui County

¹Distances (approximate) given are from the Waiohuli/Kēōkea tract to the listed school.

MAUI ISLAND PLAN

population forecast appears to underestimate the demand for this age group and there may, in fact, be an existing demand for a second intermediate school in the Upcountry region.

High Schools

Using the Board of Education design guideline of 1,000 students per high school, the high school facilities appear adequate through 2020 according to population forecasts, although overcrowding will intensify at the existing facilities. However, similar to the conditions at the intermediate school, the current high school has a rated capacity of 1,335 and an enrollment of 1,459 or 109 percent of capacity. At a rate of 1,000 students per high school, this region is already over capacity.

Recreation

There are a number of quality park facilities in the Makawao-Pukalani-Kula Community Plan region, despite a lack of an extensive park system in terms of acreage. This area has three neighborhood parks, five district parks, six tennis courts, 21 sports fields, two sports courts, five community centers, and three gyms.

Analysis

According to the *Public Facilities Assessment Update*, based on a standard of 10 acres of sub-regional park space per 1,000 persons, by 2020 this region will need to increase its aggregate park acreage by 180.1 acres to a total of 285.7 acres of sub-regional park space. In addition, the existing community park facilities will need to be supplemented by 13 tennis courts and two sports courts.

B. KĒŌKEA/WAIOHULI TRACT BASELINE INFORMATION



The Kēōkea/Waiohuli tract is DHHL's second largest Maui land holding. The West Maui Mountains and Central Maui plain dominate views; coastal views include Mā'alaea Bay and Keālia Pond.

Kula Highway forms the eastern boundary of the Kēōkea/Waiohuli tract. Existing *kuleana* parcels interrupt the tract's street frontage in two areas along Kula Highway.

1. INVENTORY

TMK and Acreage

The Kēōkea/Waiohuli tract is 6,112.0 acres and is identified by TMK 2-2-02:14, 55, 56, 71, and 2-2-04:69, 70 (Figure 3-1).

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Existing Uses

Waiohuli Subdivision (also referred to as “Kula Residential Lots, Unit 1”) is located in the northwestern corner of the tract and contains 321 completed lots that were built in 2000 and are either ready for occupancy or are already occupied. These lots are developed to Rural Residential 0.5 standards. An additional 99 in-fill lots (referred to as “Kula Residential Lots, Unit 2”) are planned for development, bringing the total lot count to 420.

DHHL is also planning to develop 70 agriculture lots at the southeastern corner of the tract in Kēōkea. The Kēōkea Farm Lot Subdivision project represents the first phase of development on the tract.

DHHL leases roughly 200 acres to the U.S. Fish and Wildlife Service to preserve a large grove of Wiliwili trees in the southwest corner of the tract.

In addition to the above plans, DHHL has granted the following revocable permit, right of entry permits, and leases on land within the Kēōkea/Waiohuli Tract:

Revocable Permit

Sakugawa - Pasture

TMK 2-2-02:14 5,057 acres

Right of Entry Permits

DePonte - access and waterline

TMK 2-2-02:56 (portion) acreage N/A

DePonte - access and waterline

TMK 2-2-01:56 (portion) acreage N/A

Licenses

Maui Electric Company - Poles and Powerlines Easement

TMK 2-2-02:14 (portion) 7.445 acres

Bentley, Arian, and Hiu - Access, Easement A & A-1

TMK 2-2-02:55 (portion) 1.379 acres

Tanji - Access, Easement B & B-1

TMK 2-2-02:55 (portion) 0.209 acres

Rivers - Access, Easement C

TMK 2-2-02:55 (portion) 4.138 acres

Rivers - Waterline, Easement C-1

TMK 2-2-02:14 (portion) 0.606 acres

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Rivers - Utilities, Easement C-2
TMK 2-2-02:14 (portion) 0.622 acres

Time Warner Entertainment - Cable Lines Easement
TMK 2-2-04:36 (portion) acreage N/A

Tri-Isle Resource Conservation Development Council- Preservation/Protection of endangered Wiliwili trees and dryland forest
TMK 2-2-02:14 (portion) 236 acres

Adjacent Uses

The Kēōkea/Waiohuli tract is bounded to the north by Ka'ono'ulu Ranch; to the south and west by Haleakalā Ranch; and to the east by Kula Highway. Corresponding adjacent uses include ranchland.

Proposed Future Surrounding Uses

Haleakalā Ranch has developed a master plan for an upper-income community above Kihei adjacent to Kēōkea/Waiohuli tract to the west (*maka'i*). Preliminary plans show a town center, parks, and residential communities at about the 600-foot elevation. The proposed Kihei mid-level road would provide access to the master planned community.

2. REGULATORY

State Land Use District

The tract is within the State Agricultural District (Figure 3-2).

County Community Plan

The *Makawao-Pukalani-Kula Community Plan* designates the land as Agricultural.

County Zoning

Maui County zoning for Kēōkea/Waiohuli is RU-0.5.

Special Management Area (SMA)

The tract is not within the Special Management Area.

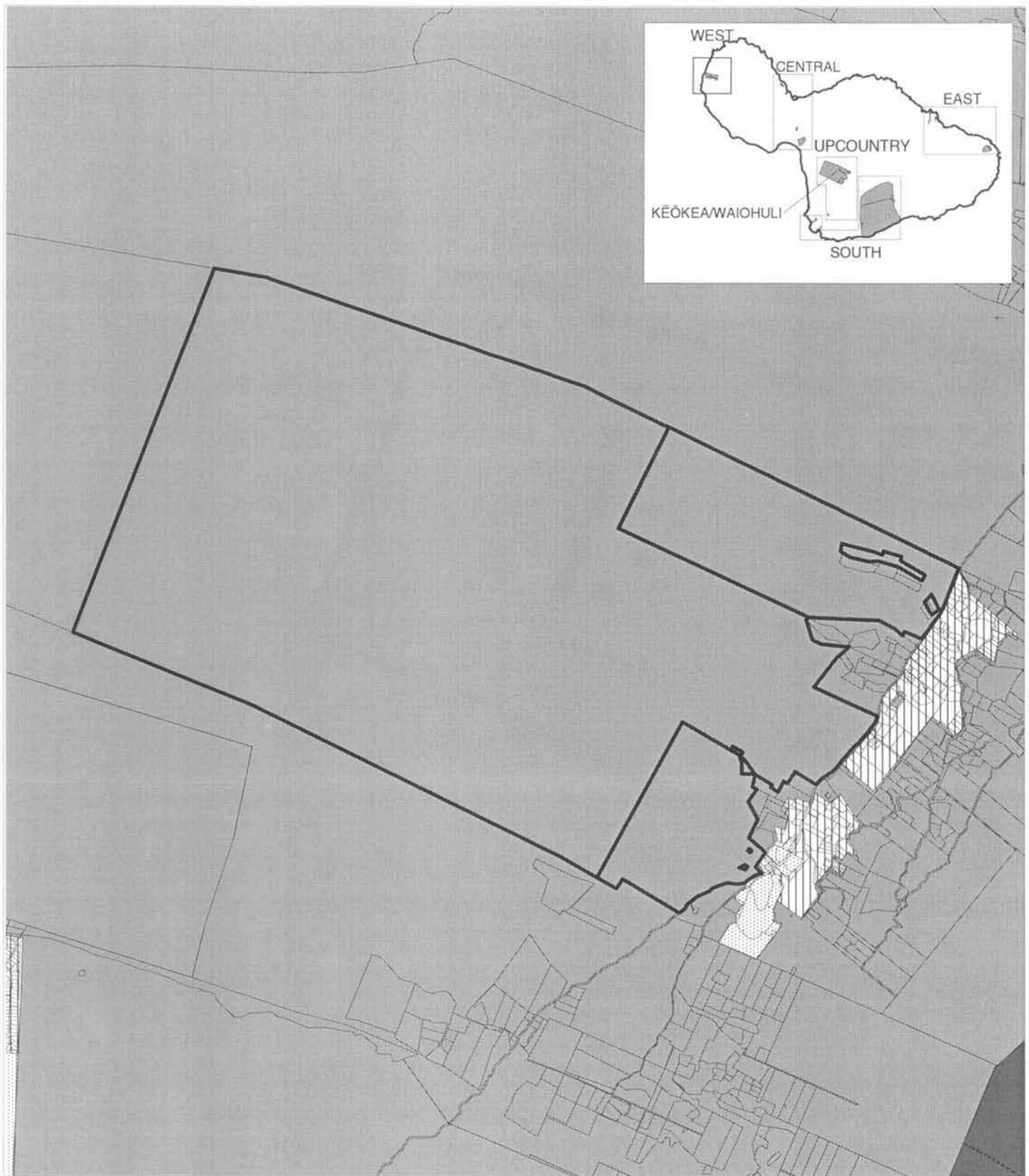
Underground Injection Control (UIC) Line

Kēōkea/Waiohuli is above the UIC line (Figure 3-3).

3. PHYSICAL CHARACTERISTICS

Climate

In general, the climate of the Upcountry region is conducive to farming, with mild and warm days and cool evenings. Daytime temperatures range from the mid 60s (Fahrenheit) during the winter to the upper 80s in the summer.



Legend

- Agricultural District
- Conservation District
- Rural District
- Urban District
- DHHL Land Boundary

Source: State Land Use Commission

Figure 3-2

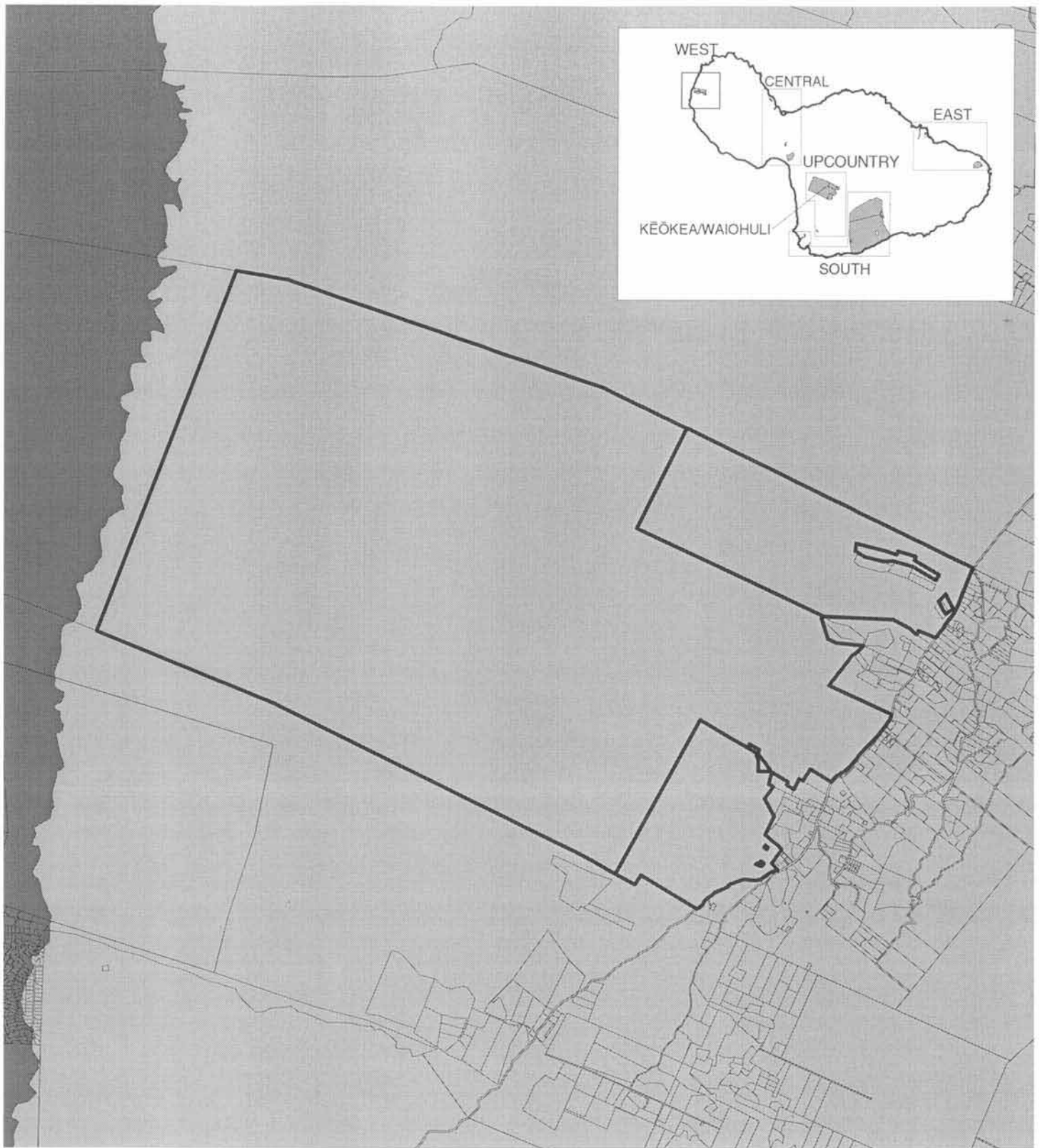
KēōKEA/WAIOHULI
State Land Use

MAUI LAND INVENTORY

DEPARTMENT OF HAWAIIAN HOME LANDS

NORTH





Legend

- Areas Below (Makai) Underground Injection Control Line
- Areas Above (Mauka) Underground Injection Control Line
- DHHL Land Boundary

Figure 3-3

KĒŌKEA/WAIOHULI

Underground Injection Control (UIC) Areas Map

MAUI LAND INVENTORY

DEPARTMENT OF HAWAIIAN HOME LANDS

NORTH



MAUI ISLAND PLAN

Soils

The U.S. Department of Agriculture Soil Conservation Service Survey shows the following soils in Kēōkea/Waiohuli (Figure 3-4):

- Keawakapu Extremely Stony Silty Clay Loam, 3 to 25 percent slopes – This soil is used for pasture and wildlife habitat. Permeability is moderate. Runoff is slow to medium, and the erosion hazard is slight to moderate.
- Kama'ole Very Stony Silt Loam, 3 to 15 percent slopes – This soil is used for pasture and wildlife habitat. Permeability is moderate. Runoff is slow to medium, and the erosion hazard is slight to moderate.
- Kula Cobbly Loam, 12 to 20 percent slopes – This soil is used for pasture. Permeability is moderately rapid. Runoff is medium, and the erosion hazard is moderate.
- Kama'ole Extremely Stony Silt Loam, 3 to 15 percent slopes – This soil is used for pasture and wildlife habitat.
- Waiakoa Extremely Stony Silty Clay Loam, 3 to 25 percent slopes, eroded – This soil is used for pasture and wildlife habitat. In most areas about 50 percent of the surface layer has been removed by erosion. Runoff is medium, and the erosion hazard is severe.
- Kula Loam, 12 to 20 percent slopes – This soil is used for pasture and truck crops.
- Kaimū Extremely Stony Peat, 7 to 25 percent slopes – This soil is used for pasture and wildlife habitat. Permeability is very rapid. Runoff is very slow, and the erosion hazard is no more than slight.
- Kula Very Rocky Loam, 12 to 40 percent slopes – This soil is used for pasture and wildlife habitat. Runoff is medium, and the erosion hazard is moderate.
- Very Stony Land – This land type is used for pasture and wildlife habitat. Pasture improvement is very difficult because of the many stones.
- Kula Loam, 4 to 12 percent slopes – This soil is used for truck crops and pasture.

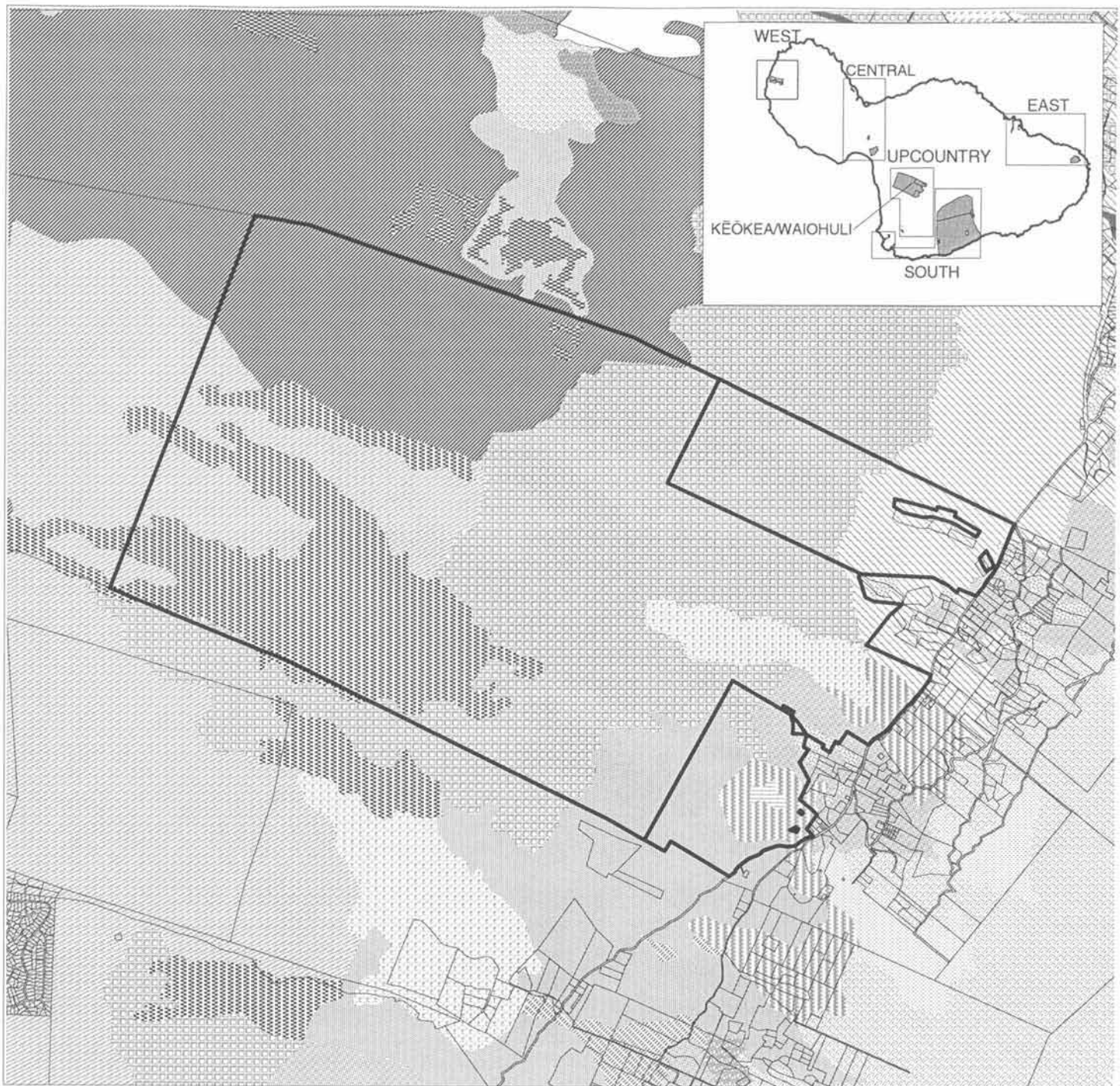
Agricultural Lands of Importance to the State of Hawai'i (ALISH)

The State of Hawai'i Department of Agriculture *Agricultural Lands of Importance to the State of Hawai'i (ALISH)* system of defining agricultural suitability classifies a portion of the soils in Kēōkea/Waiohuli as Other Agricultural Land and the remaining soils are not classified (Figure 3-5).

Ground/Surface Water

The USGS topographic map shows Waiohuli Stream within the Kēōkea/Waiohuli tract. Waiohuli Stream is intermittent.

As discussed in the *Water Development Analysis for the Department of Hawaiian Home Lands Tracts on the Island of Maui* (C. Takumi Engineering, December 2003), an exploratory well (State Well 6-4421-01) located within the Waiohuli/Kēōkea tract penetrates 1,940 feet below the surface (1,864 feet above mean sea level). It has a 7 ⁷/₈-inch diameter hole with a 4-inch steel casing, which is too small for pump testing.



Legend

- Keawakapu Extremely Stony Silty Clay Loam, 3-25% Slopes
- Kamaole Very Stony Silt Loam, 3-15% Slopes
- Kula Cobbly Loam, 12-20% Slopes
- Kamaole Extremely Stony Silt Loam, 3-15% Slopes
- Waiakoa Extremely Stony Silt Clay Loam, 3-25% Slopes, Eroded
- Kula Loam, 12-20% Slopes
- Kaimu Extremely Stony Peat, 7-25% Slopes
- Kula Very Rocky Loam, 12-40% Slopes
- Very Stony Land
- Kula Loam, 4-12% Slopes
- DHHL Land Boundary

Figure 3-4

KĒŌKEAWAIOHULI

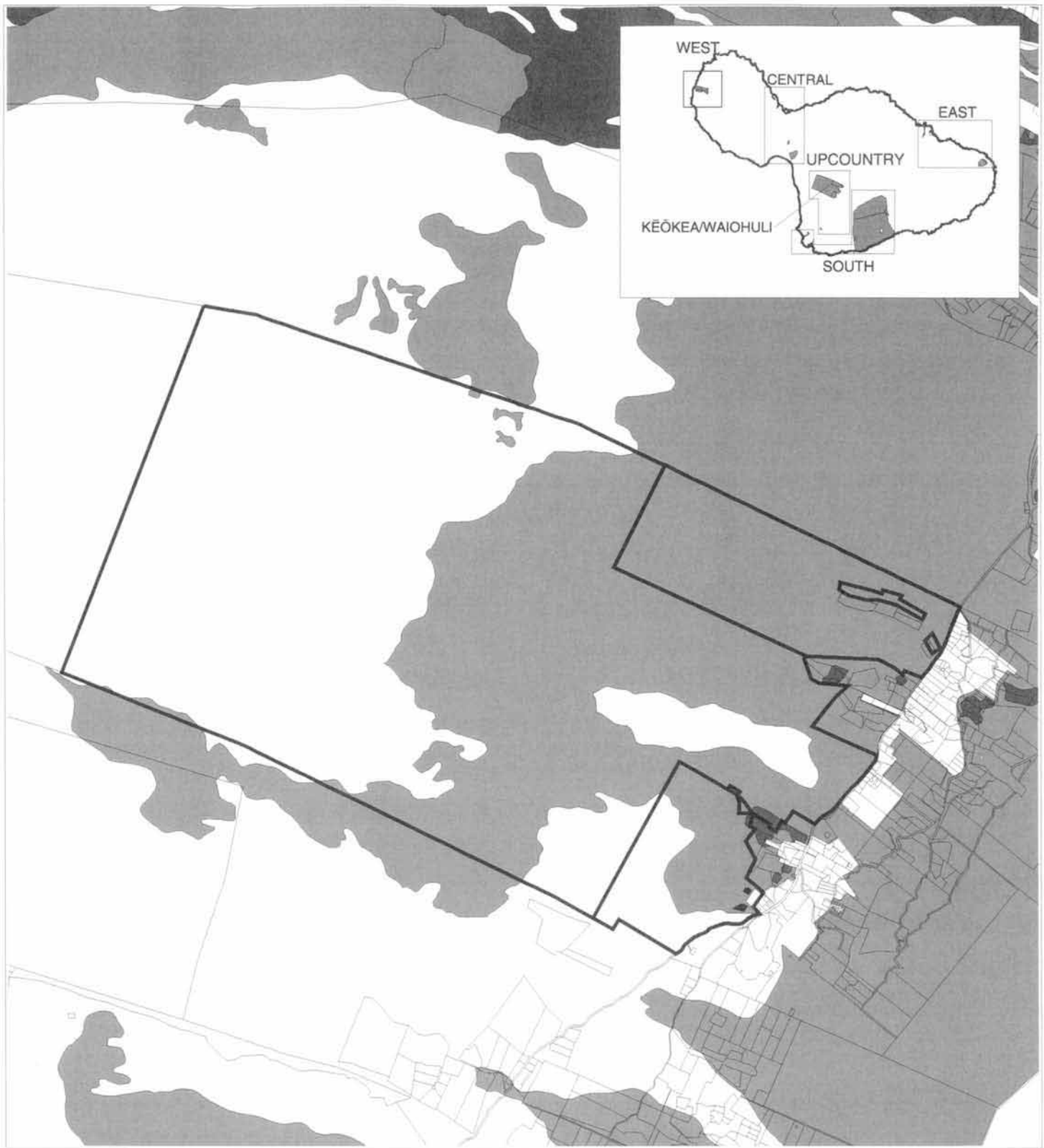
Soil Conservation Service Survey

MAUI LAND INVENTORY

DEPARTMENT OF HAWAIIAN HOME LANDS

NORTH





Legend

- Prime Agricultural Land
- Unique Agricultural Land
- Other Agricultural Land
- Unclassified Land
- DHHL Land Boundary

Source: State of Hawaii Department of Agriculture

Figure 3-5

KĒŌKEA/WAIOHULI

Agricultural Lands of Importance to the State of Hawaii (ALISH)

MAUI LAND INVENTORY

DEPARTMENT OF HAWAIIAN HOME LANDS

NORTH



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Measurements of the exploratory well, between September 2001 and April 2002, found water levels ranging between 5.58 and 6.11 feet above sea level.

Rainfall

Rainfall ranges from 15 inches in the lower elevations to 30 inches in the upper the elevations (Figure 3-6).

Topography/Slope

The topography of Kēōkea/Waiohuli is characterized by rolling hills that grow increasingly steep toward the *mauka* areas. According to the USGS topographic map, elevations range from approximately 640 feet above sea level in the western (*makai*) portion of the tract to approximately 3,000 feet above sea level in the eastern portion (*mauka*). There are several steeply sloping areas that exceed 25 percent slope (Figure 3-6).

Drainage

Because of its largely undeveloped nature, the Kēōkea/Waiohuli area contains limited drainage infrastructure. However, the natural slope and well-draining soils provide adequate drainage for current conditions. When rainfall is heavy enough to produce overland flow, water sheet flows and enters natural drainage ways and gulches. The USGS topographic map shows Waiohuli Gulch as a natural drainage feature within Kēōkea/Waiohuli.

Flood Zone

The Flood Insurance Rate Map indicates that Kēōkea/Waiohuli is located in Zone X, which designates areas determined to be outside the 500-year floodplain (Figure 3-7).

Noise

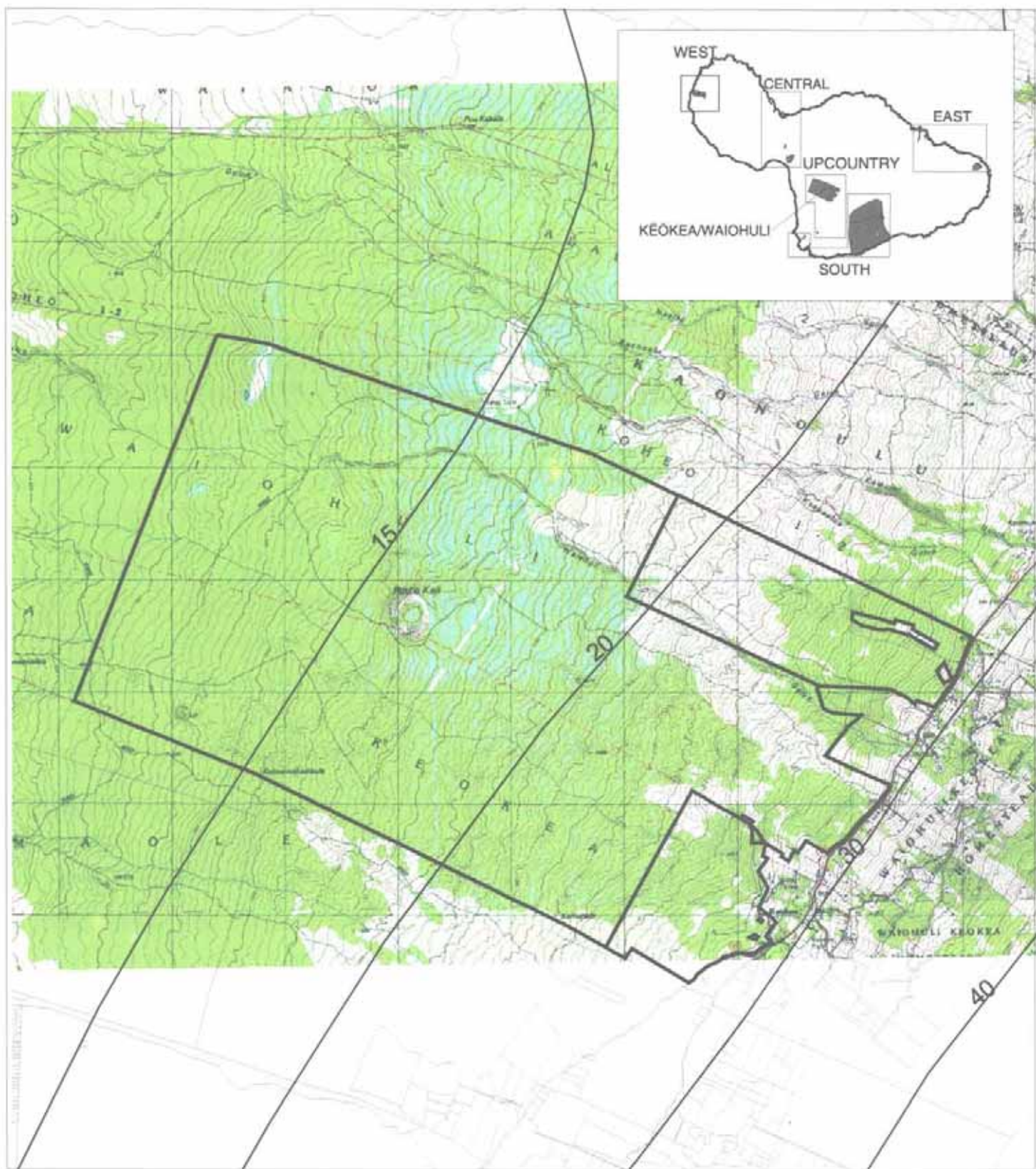
Due to the rural nature of the area, there are no major sources of noise. Ambient noise levels in the area are attributed to wind and wildlife, traffic along Kula Highway, and agricultural equipment such as tractors, sprayers, and trucks.

4. ENVIRONMENTAL CHARACTERISTICS

Historic Sites/Archeology

Kēōkea/Waiohuli is rich in Hawaiian culture and history. Early Hawaiian settlement is evident from the large numbers of archaeological sites in the region; including recorded and unrecorded *heiau*, stone walls, building platforms, and petroglyphs.

In 1989, PHRI conducted an archaeological inventory survey of approximately 1,025 acres in the areas of the Waiohuli and Kēōkea subdivisions (674 acres in Waiohuli and 351 acres in Kēōkea) that surveyed significant resources, including *heiau*, human burials, intact dryland agricultural field systems, and residential complexes. In total, the survey recorded 159 archaeological sites consisting of 274 features.





Legend

-  DHHL Properties
-  Lines of Equal Average Annual Rainfall in inches





Legend

-  **ZONE X:**
Areas Determined To Be Outside 500-Year Floodplain
-  **DHHL Land Boundary**

Source: Federal Emergency Management Agency

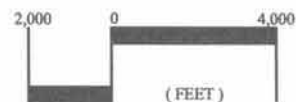
Figure 3-7

KēōKEA/WAIOHULI
Flood Insurance Rate Map

MAUI LAND INVENTORY

DEPARTMENT OF HAWAIIAN HOME LANDS

NORTH



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In addition to the 1989 archaeological inventory survey, the State Historic Preservation Division also conducted an extensive survey of the Kēōkea/Waiohuli area for DHHL in the early 1990s. The survey area was located between the current Waiohuli and Kēōkea homesteads and ran far downslope. The survey found permanent habitation sites running down ridges with a large *heiau* at the end of the ridge, other types of permanent habitations, burials, and samples of agricultural fields.

In reviewing the PHRI survey, and combined with their own archaeological work, SHPD recommended a total of 18 sites for preservation (Figure 3-8). These sites include the Papakea *heiau*, the Molohai *heiau*, burial sites, a large agricultural terrace, two permanent habitation sites, a religious or high-ranking residence, and a habitation site with an enclosed sinkhole and agricultural features.

The State Historic Preservation Division also recommended data recovery for a number of sites for which preservation was deemed unnecessary. They highly recommended that data recovery be conducted prior to infrastructure installation and occupation of the lots.

Cultural Resources

The historic and archaeological context of the Kēōkea/Waiohuli area and the surrounding region indicates a once active community that used the land for agricultural, residential, and religious purposes. Past cultural practices associated with the property relate to gathering, religious, and day-to-day activities. Over the past century, the property has been leased out by DHHL for cattle grazing and agricultural uses.

A cultural impact assessment conducted for the *Kēōkea Agricultural Lots – Unit 1 Environmental Assessment* concludes that given the recent historical use for ranching and agriculture, Native Hawaiian cultural practices are no longer conducted on the property (Munekiyo 2001). The report further concludes that the conversion of the land to agricultural and residential use to replace more recent cattle grazing and other agricultural use is consistent with the area's past use for similar purposes. Moreover, the recommendations for archaeological mitigation, including site preservation, are intended to recognize the significance of past practices in the context of the property's local history. The combination of preservation, along with a land use pattern reflecting past tradition, is deemed to be appropriate in terms of recognizing the cultural practices and beliefs that once took place on the land.

Endangered Species

The following species in Kēōkea/Waiohuli are identified as either candidates or endangered by the Hawai'i Natural Heritage Program *Biological Conservation Datasystem (BCD)* for Department of Hawaiian Home Lands and the U.S. Fish and Wildlife Service.

Candidates

- *Canavalia pubescens*, 'Āwikiwiki

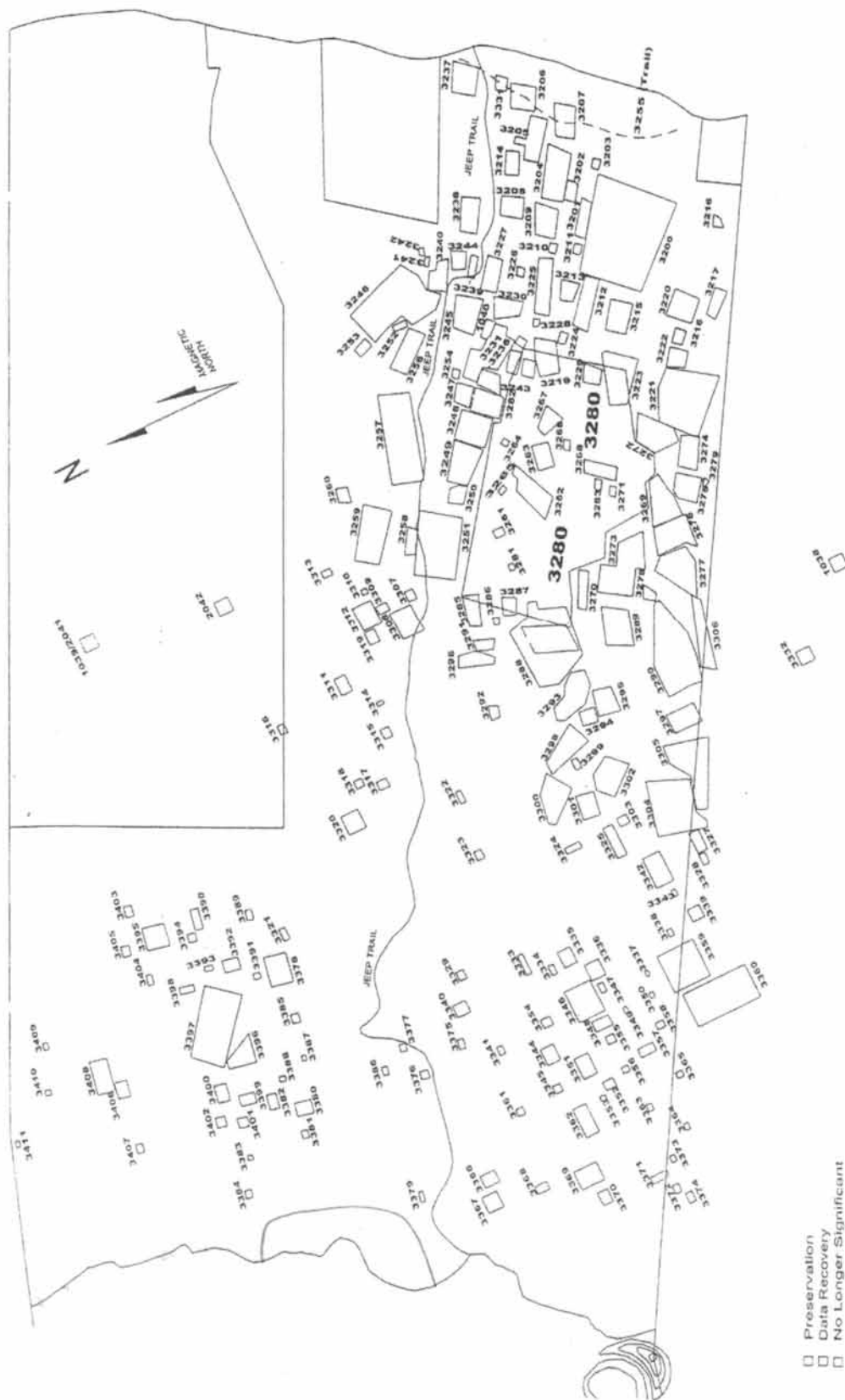


Figure 3-8
Project Area and Site Significance
 Waiohuli, Kula, Maui
 SHPD MAUI ANNEX

MAUI ISLAND PLAN

Endangered

- *Abutilon menziesii*, Ko'olua'ula
- *Bonamia menziesii*
- *Hibiscus brackenridgei*, ssp. *brackenridgei*, Ma'o Hau Hele
- *Lasiurus cinereus semotus*, 'Ōpe'ape'a, Hawaiian Hoary Bat
- *Manduca blackburni*, Blackburn's Sphinx Moth

Critical Habitat

The U.S. Fish and Wildlife Service has not designated any critical habitat areas within the Kēōkea/Waiohuli tract.

While not classified by the USFWS as critical habitat, according to a *Maui News* article (Monson, 2002), the Pu'u-o-kali cinder cone and a surrounding area totaling 236 acres within the tract is home to a diverse native Hawaiian ecosystem. This dryland forest area includes the last intact Wiliwili forest in the islands, lama trees, and other native trees and shrubs.

DHHL licensed the Tri-Isle Resource Conservation Development Council to protect and restore the forest in this area.

5. INFRASTRUCTURE

Access/Roadways

The Waiohuli Subdivision has two existing access points onto the Kula Highway. There is also an internal network of roadways serving the existing subdivision. The roadways are paved right-of-ways without curbs, gutters, or sidewalks, which conforms to County rural standards. Drainage is handled via drains located in the asphalt swells adjacent to the roadways.



Water System (Lines, Wells)

DHHL Water Credits Agreement

DHHL has a Water Credits Agreement with the County of Maui Department of Water Supply, signed on December 9, 1997. This agreement states that DWS shall commit five hundred thousand gallons of potable water per average day to DHHL for the DHHL home sites. The agreement also states that upon completion of the DWS improvements and DHHL improvements pursuant to the Memorandum of Understanding (MOU) dated December 8, 1997, DWS shall maintain the improvements and deliver potable water, except during drought periods affecting lower Kula, as declared by the DWS in accordance with its rules and regulations. According to the agreement, DWS shall not

MAUI ISLAND PLAN

impose any time limitations on DHHL to draw or use such reservation of potable water from the DWS system.

The number of lots that can be developed will be limited by the available water service, which will be determined using water system standards developed by DWS.

The existing 321-unit Kula Residential Unit 1, planned 99-unit Kula Residential Unit 2 in-fill development, and proposed 70-unit Kēōkea farm lots will use approximately 294,000 gallons of the 500,000 gallon Water Credits Agreement, leaving a balance of 206,000 gallons. Using the DWS standard of 600 gallons per unit, there is enough projected capacity to service an additional 343 units.

Existing Waiohuli Water System

Water from Piʻiholo is collected in the Kula Kai Reservoir. A booster station then pumps the water via an 18-inch transmission line from the Kula Kai reservoir to Waiohuli, where it enters the tract at an elevation of 2,615 feet. A booster pump station and three reservoirs at elevations 3,000, 2,750 and 2,355 feet currently serve the Waiohuli Subdivision.

Due to the significant change in elevation across the tract, there are four service zones spanning the property between the 2,150-foot and 3,100-foot elevations. Pressure reducer valves are used throughout the system.

Analysis

The upper service zone does not have available capacity for additional development until a proposed off-site reservoir is constructed. There are no plans to build this reservoir in the near future, thus limiting any development between the 2,900-foot and 3,100-foot elevations.

The 3,000-foot elevation reservoir was originally designed to service the proposed 70 Kēōkea Farm Lots via a 12-inch transmission line along Kula Highway. The available capacity for this reservoir has been allocated and no further development could occur between the 2,650-foot and 2,900-foot elevations without improvements and upgrades to this reservoir.

The reservoirs at the 2,355-foot and 2,750-foot elevations currently serve the mid and lower sections of the Waiohuli Subdivision. These reservoirs have available capacity to service additional residential lots. The additional development would need to occur between the 2,255-foot and 2,650-foot elevations. The installation of pressure reducers could further extend water service down slope.

According to the Water Credits Agreement, 343 additional residential lots could be developed using the existing DWS waster system. Based on the existing water system, the 343 lots need to be developed between the 2,255-foot and 2,650-foot elevations or lower if pressure reducers are used.

MAUI ISLAND PLAN

Wastewater Treatment and Disposal

The existing Kēōkea/Waiohuli community is served entirely by on-site septic systems or cesspools.

Solid Waste Disposal

Solid waste is collected by the County and taken to the Central Maui Landfill.

Telephone Service

Sandwich Isles Communications will provide telephone service to the tract.

Electrical Service

MECO provides electrical service to the Kēōkea/Waiohuli community through a 23-kV line from the Pukalani substation. The Pukalani substation is connected to the Mā'alaea Generating Station by a 69-kV line and the Kahului Generating Station by a 23-kV line.

Cable Television Service

The tract is within the Oceanic Cable service area.

C. KĒŌKEA/WAIOHULI ANALYSIS

A number of factors weighed heavily in the development of the alternatives for the Kēōkea/Waiohuli tract (Figure 3-9).

Beneficiary Demand

The *Maui Island Plan* beneficiary survey indicated that the majority of the beneficiaries (39.2%) preferred the Upcountry region for a residential homestead. Approximately 1,111 units are needed in Upcountry to meet beneficiary demand. Of the Upcountry lands that are in the DHHL inventory, Kēōkea/Waiohuli presents the best opportunity to develop residential homesteads and meet beneficiary demand.

Existing Development

The existing Kula Residential Lots Unit 1, planned Unit 2 in-fill, and proposed Kēōkea Farm Lots subdivisions present an opportunity to share existing and future infrastructure with the additional 1,111 units proposed in this document. The projects could share access points from Kula Highway, the existing network of roads, and water and electric systems, which would help to lower overall development costs.

Infrastructure Availability – Water Service

The number of lots that can be developed will be limited by the available water service, which will be determined using the DWS water system standards for residential development. There are two strategies to provide water to Waiohuli. The first strategy is for DHHL to collaborate with DWS to provide water service to the lots. The second strategy is to develop a new groundwater resource.

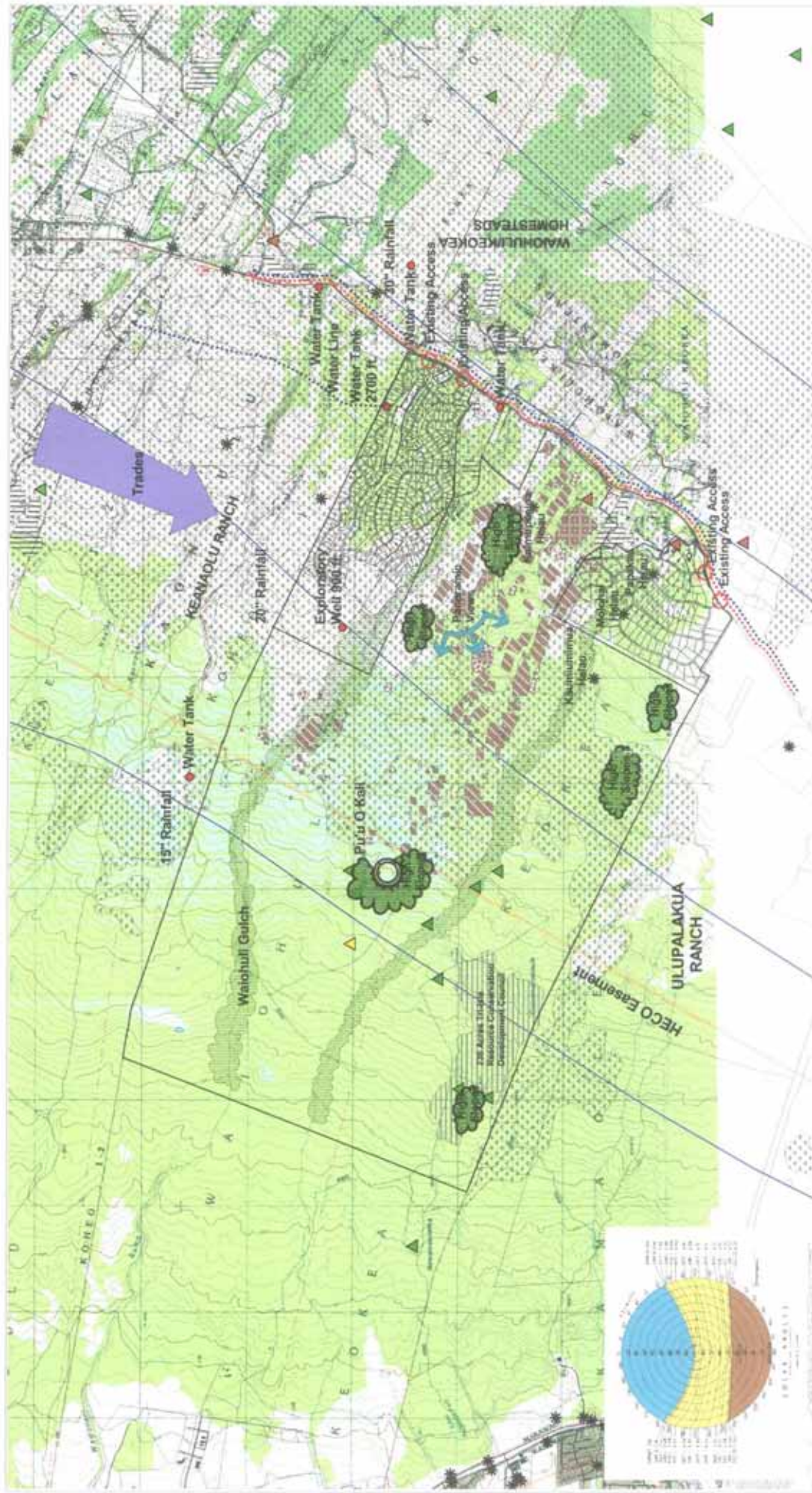


Figure 3-9

KĒOKEA/WAIŌHULI

Site Analysis

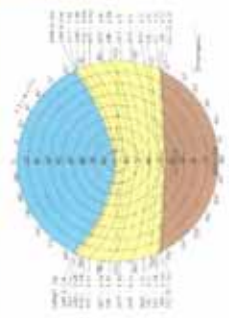
MAUI LAND INVENTORY

DEPARTMENT OF LAND AND NATURAL RESOURCES



Legend

- DHHL Land Boundary
- Lines of Equal Average Annual Rainfall in Inches
- Water Line
- Electrical Line
- Endanger Species (Animal)
- Endanger Species (Invertebrate)
- Endanger Species (Plant)
- Heiau
- ALISH (Other Agricultural Lands)
- Archaeological Site
- Preservation
- Data Recovery
- No Longer Significant



Source: County of Maui, Department of Hawaiian Home Lands; United States Geological Survey; Hawaii Department of Land and Natural Resources; The National Commission on Hawaiian Land and Water Resources.

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The first strategy would include using the balance of the existing 500,000-gallon per day water commitment from the Department of Water Supply through the Water Credits Agreement. As explained on pages 3-15 and -16, there is adequate projected capacity in the existing County Water system to accommodate an additional 343 units in Waiohuli.

The water service elevation – the point where the County water line enters the Kēōkea/Waiohuli tract – is a determining factor in the location of the additional 343 units. The water service elevation is at the 2,750-foot elevation where a 500,000 gallon reservoir is located. The new 343 units need to be located below the 2,650-foot elevation to be served by this existing reservoir, which would mitigate the need for additional storage and transmission facilities.

A second water source is needed for the development of an additional 768 units to meet the beneficiary demand of 1,111 total units in the Upcountry region. An alternative strategy to meet this water need would be to develop an on-site private water system. An exploratory well at the 1,900-foot elevation of the Waiohuli tract located water at approximately six feet above sea level. Further hydrological studies of the aquifer conditions and well capacity, which would include drilling and testing a new well, will be required to determine the quality and quantity of the water. A new 18-inch diameter cased well is assumed to be able to produce 700 GPM or approximately 1.0 MGD. Utilizing the design criteria set forth by DWS, multiple wells will be required to supply the additional 768 units. (From *Water Development Analysis for DHHL Tract at Waiohuli/Kēōkea* by C. Takumi Engineering.)

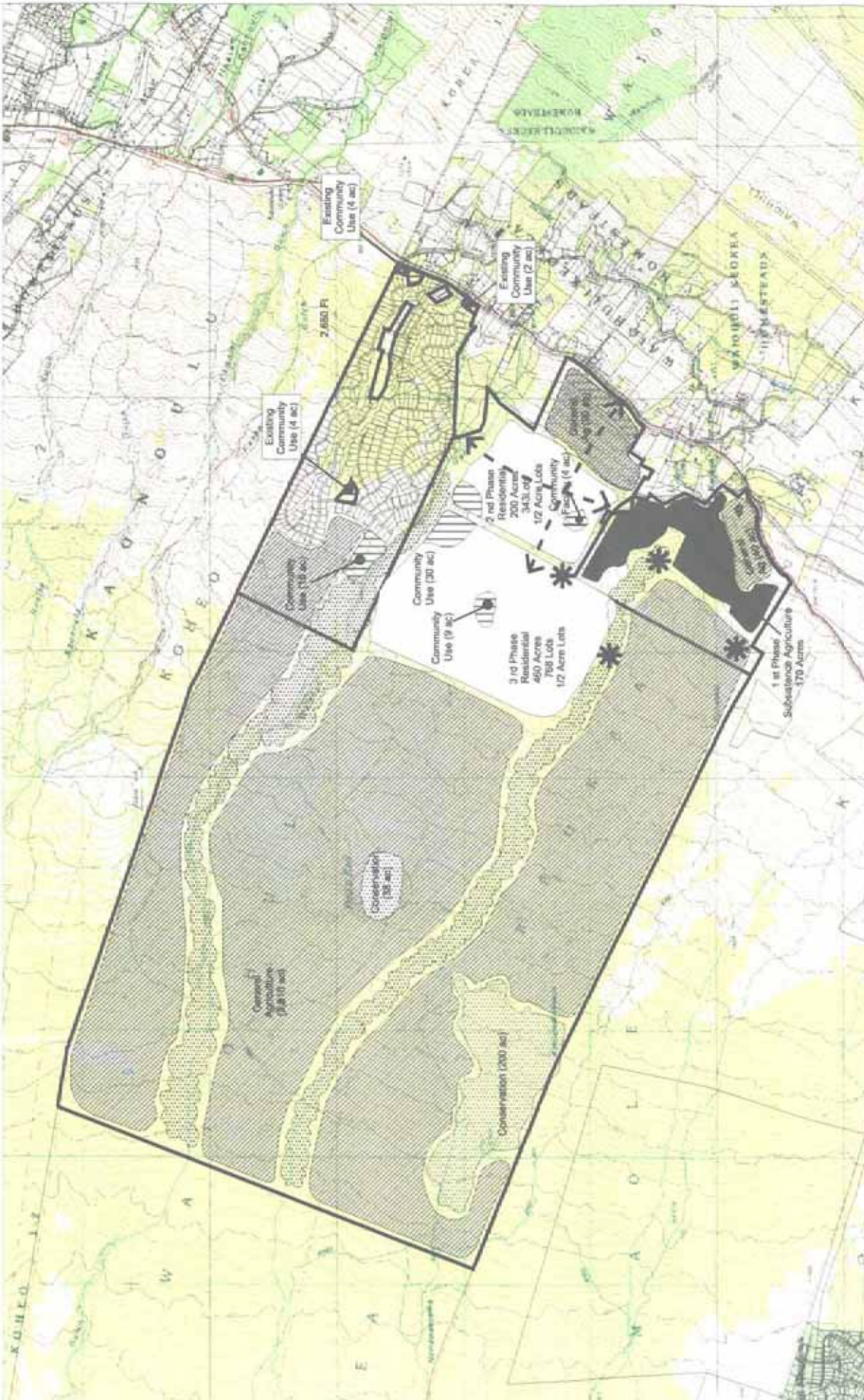
1. ALTERNATIVES

The *Maui Island Plan* proposes two alternatives for the Kēōkea/Waiohuli tract. The major difference between the two alternatives is lot size, which impacts infrastructure improvements and the resulting development costs.

a. Alternative 1 – One-half Acre Scenario

The first alternative proposes 1,111 half-acre residential lots on 660 acres of land between the 1,750-foot and the 2,650-foot elevation (Figure 3-10). Sixty-nine acres are designated for community use, which will include schools, parks, and open space. Seven hundred seventy-three acres of gulches, high-sloped areas, and areas containing critical habitat or endangered species are designated as conservation. The balance of 3,940 acres will be used for general agriculture as an interim use. The land use plan also reflects DHHL's 321-unit Kula Residential Lots, Unit 1 at Waiohuli and the 70-unit farm lot subdivision in Kēōkea. The Kēōkea Farm Lot Subdivision is represented as Phase 1.

Alternative 1 proposes the development of the 1,111 residential units in two increments, known as Phase 2 and Phase 3 (Phase 1 refers to the proposed Kēōkea Farm Lot Subdivision). Phase 2 proposes 343 units between the 2,400-foot and 2,650-foot elevations. Phase 3 proposes 768 units between the 1,750-foot and 2,400-foot elevation.



Legend

DHHL Land Boundary

Heiau

Land Use Summary

Land Use	Lot Size	Number of Lots	Approx. Acres
Residential	1/2	1,111	660 ac
Community Use			69 ac
General Agriculture			3,940 ac
Conservation			773 ac
Subsistence Agriculture	2	70	170 ac
Existing Residential			500 ac
Total		1,181	6,112 ac

Figure 3-10

Kēokea/Waiōhuli
1/2 Acre Alternative 1

MAUI LAND INVENTORY

DEPARTMENT OF HAWAIIAN HOME LANDS



7/01/03

MAUI ISLAND PLAN

Phase 1

The 70-unit Kēōkea Farm Lot Subdivision represents the first phase of the Kēōkea/Waiohuli final land use plan. These lots will average two to three acres in size and will be located in the southeast corner of the tract. The farm lots were proposed and planned prior to the *Maui Island Plan*, and therefore are not included in the following discussion of infrastructure needs and development costs.

Phase 2

The number of units within Phase 2 is directly proportionate to the available water capacity in the DWS water system. According to initial calculations, DHHL's water commitment with DWS has an available capacity to serve an additional 343 residential lots. Water demand for the 343 lots is approximately 205,800 gallons per day.

The lots are located below the 2,650-foot elevation to take advantage of pressure from an existing tank in Waiohuli that is at the 2,750-foot elevation.

Access to Phase 2 will be through the road network within the existing Waiohuli subdivision and proposed Kēōkea Farm Lot Subdivision. A mid-level road that connects Waiohuli and Kēōkea is proposed at roughly the 2,500-foot elevation. This mid-level road will provide multiple access points to the entire 1,111 lots.

Sewage from Phase 2 units will be handled by individual septic systems. DHHL currently has an application for a variance with the Department of Health

Phase 3

In Phase 3, 768 units are proposed. This phase is planned *makai* of Phase 2 in the area between the two major gulches. Water service to the 768 lots will have to come from a private water system composed of wells drilled at approximately the 1,900-foot elevation. Water demand for 768 lots is 460,800 gallons per day.

Access to Phase 3 will be via the mid-level road built in Phase 2 and the existing access points within the Waiohuli and Kēōkea subdivisions. A fourth access point connecting the mid-level road to Kula Highway is also proposed. This access point will provide a direct connection to the highway.

The 768 units will be serviced by individual septic systems

The land *makai* of Phase 3 will be designated for general agriculture as an interim use.

Infrastructure

Access

Road improvements within the existing Kula Residential Lots and the proposed Kēōkea Farm Lots will serve as the primary access to the proposed development. A mid-level road at the 2,500-foot elevation will connect Waiohuli and Kēōkea and provide three access

MAUI ISLAND PLAN

points from Kula Highway to the proposed 343 lot subdivision. During Phase 3 development, a fourth access point from Kula Highway to the mid-level road is proposed.

The development plan stage will include a traffic study to determine the level of service along Kula Highway and the necessary traffic improvements required to maintain an adequate level of service.

Water

Alternative 1 proposes to use the remaining County water commitment for the 343 lots proposed in Phase 2. The 343 lots will be located between the 2,400-foot and 2,650-foot elevations to make use of the available pressure from the existing Waiohuli reservoirs.

The remaining 768 lots in Phase 3 will require a private water system, as discussed above.

Wastewater

The existing Waiohuli community, as well as most of the Upcountry region (with the exception of Pukalani), is served entirely by on-site septic systems. For developments of 50 or more residential lots, State Department of Health rules require a wastewater treatment facility to service the subdivision (HAR, Title 11, Subchapter 3, Section 11-62-31.1(1)(B)). However, for subdivisions with more than 50 lots, individual septic systems may be allowed with a variance from the State Department of Health. DHHL will seek a variance to use individual septic tanks for both phases.

Electrical and Telephone

A 23-kV line from the Pukalani substation currently serves the tract. Waiohuli is also within the cable television service area of Oceanic Cable. Sandwich Isles Communication will provide telephone service.

Costs

This section of the alternatives focuses on costs associated with residential development, and on the primary limiting conditions affecting those costs for each tract. Per-lot costs are also determined by total tract costs and the number of lots feasibly developed within each tract. Estimates are presented as “order of magnitude costs” only. Further, they are limited to costs associated with preparation for and provision of infrastructure, and exclude the cost of the housing itself, which in the case of DHHL lands is the responsibility of the leaseholder.

A total of 70 farm lots and 1,111 residential lots are proposed. However, costs for Phase 1 are not included because the planning and design of the 70 Kēōkea farm lots preceded the *Maui Island Plan*. Projected on- and off-site costs are summarized in the following tables.

Phase 2 – Residential

Total Lots = 343 lots

Lot Size = 20,000 square feet

MAUI ISLAND PLAN

Table 3-1: Projected Costs for One-half Acre Phase 1 Residential Lots at Waiohuli

Improvements	Total Cost \$	Cost Per Lot \$
Off-Site	2,439,553	7,112
On-Site	20,607,013	60,079
Total	23,046,566	67,191

Cost Factors

- Rural development standards
- Cost estimates include the use of individual septic tanks. According to the State Department of Health rules (11-62-31.1(1)(B)), a variance is needed for septic tank use on subdivisions with more than 50 lots.
- 22-foot wide asphalt road pavement and asphalt shoulders
- Overhead electrical lines
- Water supplied by existing DWS system
- Off-site road connections to Kula Residential Lots Unit 1

Phase 3 – Residential

Total Lots = 768 lots

Lot Size = 20,000 square feet

Table 3-2: Projected Costs for Phase 2 One-half Acre Residential Lots at Waiohuli

Improvements	Total Cost \$	Cost Per Lot \$
Off-Site	16,869,487	21,964
On-Site	46,674,610	60,774
Total	63,543,098	82,738

Cost Factors

- Rural development standards
- Cost estimates include the use of individual septic tanks. According to the State Department of Health rules (11-62-31.1(1)(B)), a variance is needed for septic tank use on subdivisions with more than 50 lots.
- 22-foot wide asphalt road pavement and asphalt shoulders
- Overhead electrical lines

MAUI ISLAND PLAN

- On-site water system consisting of three wells, storage, and distribution system to serve the proposed residential lots
- Off-site road connections to Kula Highway.

Alternative 1 Discussion

Alternative 1 proposes the development of 70 farm lots and 1,111 residential lots over three phases. Phase 1 is the 70 Kēōkea farm lots, which was planned prior to the *Maui Island Plan*. Phase 2 proposes 343 lots at a cost of \$67,191 per lot. Phase 3 proposes 768 lots at a cost of \$82,738 per lot. The higher per lot costs in Phase 3 is due to the need to develop a private water system. As mentioned earlier, these costs reflect rural standards.

b. Alternative 2 – One-Acre Scenario

The second alternative proposes 1,111 one-acre residential lots on 1,300 acres of land (Figure 3-11). Seventy acres are designated for community use, which will include schools, parks, and open space. Seven hundred seventy-three acres of gulches, high-sloped areas, and areas containing critical habitat or endangered species are designated as conservation. The balance of 3,289 acres is designated for general agriculture as an interim use. The land use plan also reflects DHHL's 321 unit Kula Residential Lots, Unit 1 at Waiohuli and the 70-unit agriculture lot subdivision in Kēōkea (Phase 1).

The land area required for the 1,111 one-acre lots proposed by Alternative 2 is more double the amount of land needed for Alternative 1. The residential units are located between the 1,500-foot and 2,650-foot elevations. Similar to Alternative 1, development of Alternative 2 is planned in two increments, known as Phase 2 and Phase 3. (Phase 1 refers to the 70-unit Kēōkea Farm Lot Subdivision planned prior to the *Maui Island Plan*.) Phase 2 proposes 343 units located between the 2,200-foot and 2,650-foot elevations. Phase 3 proposes 768 units between the 1,500-foot and 2,200-foot elevations.

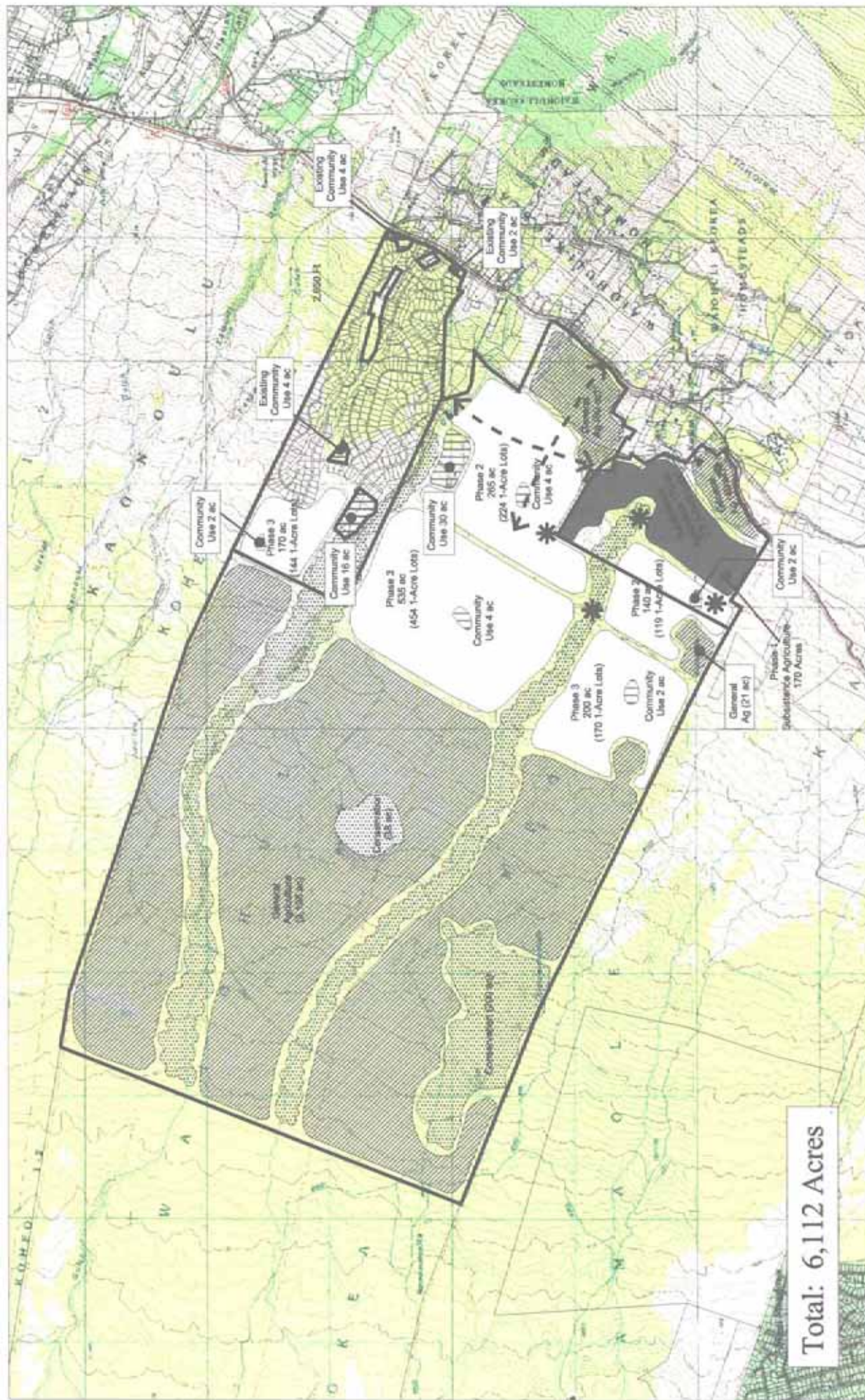
Phase 1

The 70-unit Kēōkea Farm Lot Subdivision represents the first phase of the Kēōkea/Waiohuli final land use plan. These lots will average two to three acres in size and will be located in the southeast corner of the tract. The farm lots were proposed and planned prior to the *Maui Island Plan*, and therefore are not included in the following discussion of infrastructure needs and development costs.

Phase 2

The 343 units within Phase 2 are directly proportionate to the available water capacity of the DWS water system and similar to Alternative 1. Water demand for the 343 units is 262,200 gallons per day.

The lots are located below the 2,650-foot elevation level to take advantage of pressure from an existing tank in Waiohuli that is located at the 2,750-foot elevation.



Legend

DHHL Land Boundary

Heiau

Land Use Summary

Land Use	Number of Lots	Lot Size	Approx Acres
Residential	1,111	1 ac	1,310 ac
Community Use			70 ac
General Agriculture			3,289 ac
Conservation			773 ac
Subsistence Agriculture	70	2-3 ac	170 ac
Existing Residential	321	1/2 ac	500 ac
Total			6,112 ac

Figure 3-11

KŌKEĀWĀIOHULI
1 Acre Alternative 2

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DEPARTMENT OF HAWAIIAN HOME LANDS



PBR

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The mid-level road discussed for Alternative 1 is also proposed for Alternative 2. It provides access to Phase 2 through a connection between Waiohuli and Kēōkea and by utilizing the existing road network to Kula Highway.

Phase 3

A total of 768 units are proposed for Phase 3. This phase is planned *makai* of Phase 2 and extends across the entire width of the tract. Water service for the 674 lots will require development of a private water system composed of wells drilled at approximately the 1,900-foot elevation. Water demand for the 674 units is estimated at 404,400 gallons per day.

The mid-level road built in Phase 2 and the existing Kula Highway access points within the Waiohuli and Kēōkea subdivisions will provide access to Phase 3. A fourth access point connecting the mid-level road to Kula Highway is proposed to provide a direct connection to the highway.

The land *makai* of the Phase 3 will go into general agriculture as an interim use.

Infrastructure

Access

The primary access to the residential lots is similar to the access plan proposed for Alternative 1. A mid-level road connecting Waiohuli and Kēōkea will provide three access points to Kula Highway using existing intersections. During Phase 3, a fourth access point to Kula Highway from the mid-level road is proposed.

The development plan stage will include a traffic study to more accurately determine the level of service along Kula Highway and the necessary traffic improvements.

Water

Alternative 2 proposes to utilize the remaining County water system commitment for the 343 lots proposed in Phase 2. The 343 lots will be located between the 2,400-foot and 2,700-foot elevations to make use of the available pressure from the existing Waiohuli reservoirs. The remaining 768 lots in Phase 3 will require a private water system, as previously discussed.

Wastewater

The existing Waiohuli community, as well as most of the Upcountry region (with the exception of Pukalani), is served entirely by on-site septic systems.

A sewage treatment plant is not planned for either phase. While current DOH rules require a sewage treatment plant for subdivisions over 50 lots, a variance may be requested to allow individual septic systems to be used. It should be noted that proposed revisions to the DOH rules would allow septic systems for developments with 50 or more lots provided the development consists of one dwelling unit per acre or greater. As of

MAUI ISLAND PLAN

March 8, 2004, the proposed revised rules are currently under review by the Governor and will become effective if signed by the Governor.

Electrical and Telephone

A 23-kV line from the Pukalani substation connected to the Mā'alaea Generating Station by a 69-kV line and to the Kahului Generating Station by a 23-kV line provides electric service. Waiohuli is also within the cable television service area of Oceanic Cable. Sandwich Isle Communication will provide telephone service.

Costs

Alternative 2 proposed a total of 1,111 lots averaging one-acre in size. Projected on- and off-site costs are summarized in Table 3-3 below.

Phase 2 – Residential

Total Lots = 343 lots

Lot Size = 1 acre lots

Table 3-3: Projected Costs for Phase 2 – One-Acre Residential Lots at Waiohuli

Improvements	Total Cost \$	Cost Per Lot \$
Off-Site	3,449,600	10,057
On-Site	27,597,663	80,460
Total	31,047,263	90,517

Cost Factors

- Numerous lots require extensive site preparation, such as road grading and utilities installation, thereby increasing overall on-site costs.
- A sewage treatment plant is not planned for either phase. Proposed rule revisions exempting developments with more than 50 lots greater than one acre in size may go into effect. If not, a variance from existing DOH rules will be requested.
- The one-acre lot size diminishes the overall cost savings because more roads are needed to serve the larger lots.
- Costs are further reduced given the proximity of the tract to the existing DHHL Waiohuli homestead and readily available road, electrical, and telephone connections within the subdivision.
- Off-site costs include estimates to construct a private water system consisting of three wells, storage, and distribution system to serve the proposed residential lots in Phase 3.

MAUI ISLAND PLAN

- Existing Waiohuli roads composed of a paved right-of-way with concrete swales and drainage were used as a model to prepare the cost estimates. Full utilities are also reflected in the on-site costs.

Phase 3 – Residential

Total Lots = 768 lots

Lot Size = 20,000 square feet

Table 3-4: Projected Costs for Phase 3 – One-Acre Residential Lots at Waiohuli

Improvements	Total Cost \$	Cost Per Lot \$
Off-Site	14,888,488	19,386
On-Site	65,098,349	84,763
Total	79,986,837	104,150

Cost Factors

- Numerous lots require extensive site preparation and connections, thereby increasing overall on-site costs.
- A sewage treatment plant is not planned for either phase. Proposed rule revisions exempting developments with more than 50 lots greater than one acre in size may go into effect. If not, a variance from existing DOH rules will be requested.
- The one-acre lot size diminishes the overall cost savings because more roads are needed to serve the larger lots.
- Costs are further reduced given the proximity of the tract to the existing DHHL Waiohuli homestead and readily available road, electrical, and telephone connections within the subdivision.
- Off-site costs include estimates to construct a private water system consisting of three wells, storage, and distribution system to serve the proposed residential lots in Phase 3.
- Existing Waiohuli roads composed of a paved right-of-way with concrete swales and drainage were used as a model to prepare the cost estimates. Full utilities are also reflected in the on-site costs.

Alternative 2 Discussion

Alternative 2 proposes the development of 1,111 one-acre lots over two phases. Phase 2 includes 343 lots at a cost of \$106,151 per lot. Phase 3 proposes 768 lots at a cost of \$118,887 per lot.

Per lot costs for Alternative 2 were comparatively higher than those for Alternative 1. This is primarily due to the large lot sizes, which extends the distance of road construction.

MAUI ISLAND PLAN

These costs reflect County development standards. Using lesser standards may result in a reduction of costs.

c. Final Plan

Alternative 1 (one-half acre scenario) is recommended as the final plan based on the lower development costs (Figure 3-12). Although both alternatives propose the development of 1,111 residential lots over two phases, the smaller lot size proposed in Alternative 1 accounts for the main difference in development costs.

The final land use plan, as discussed in Alternative 1, includes:

- 1,111 half-acre residential lots on 660 acres
- 69 acres of community and park use (10 of which are existing)
- 773 acres of gulches, high sloped areas, and areas containing critical habitat or endangered species designated as conservation
- 3,940 acres designated as general agriculture
- 70 previously planned agricultural lots in Kēōkea

This land use summary is included on the Kēōkea/Waiohuli Land Use Plan (Figure 3-12). The 70 farm units will be developed in Phase 1, followed by 343 residential units in Phase 2 and 768 residential units in Phase 3.

Phase 1

The 70-unit Kēōkea Farm Lot subdivision represents the first phase of the Kēōkea/Waiohuli final land use plan. These lots will average two to three acres in size and will be located in the southeast corner of the tract.

Phase 2

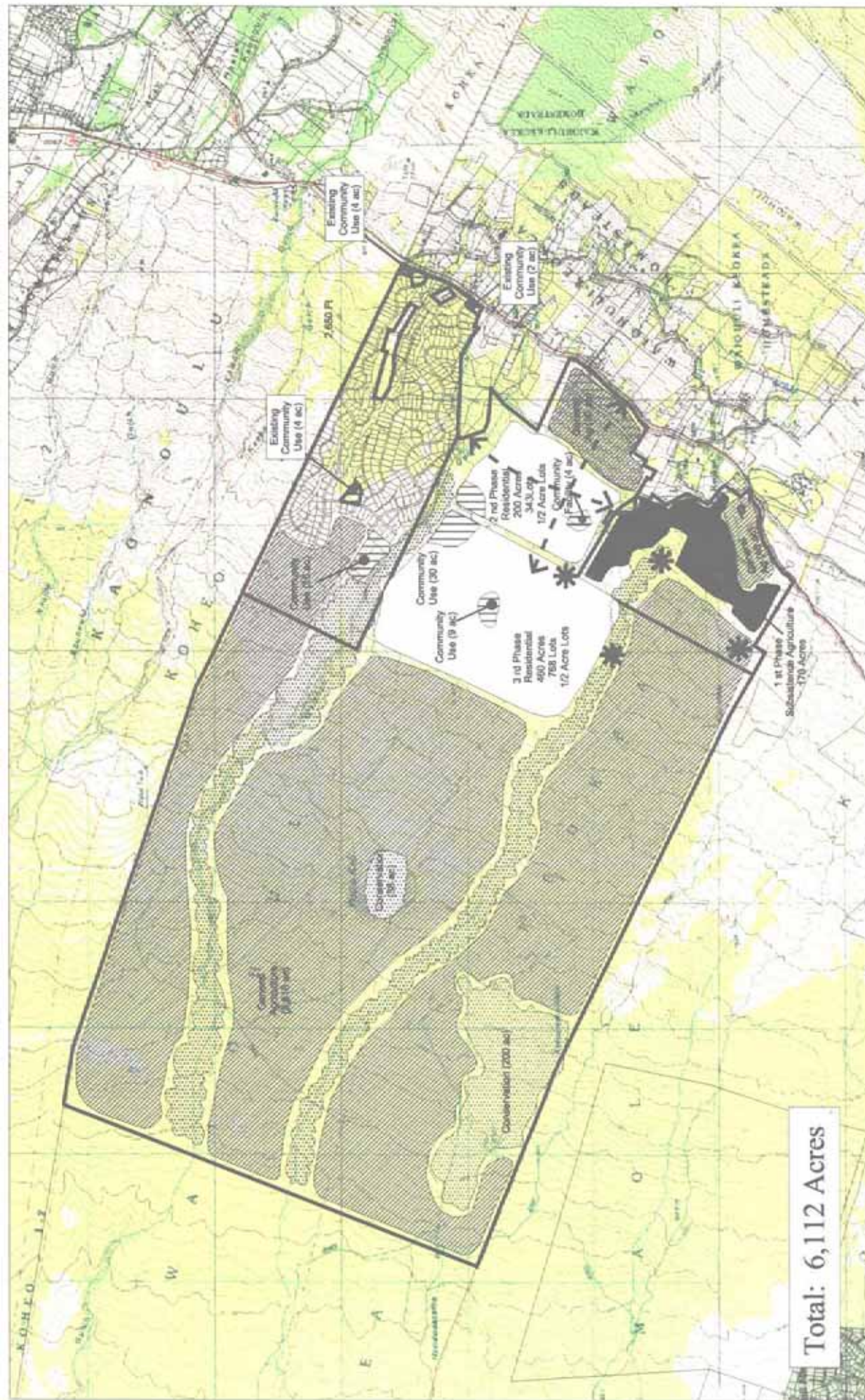
Phase 2 includes 343 one-half acre residential lots. The lots will be located between the 2,400-foot and 2,650-foot elevations, south of the existing Waiohuli Subdivision and between the two gulches shown in Figure 3-9.

Water

Water from the DWS water system will serve the lots developed in Phase 2 in accordance with the previously discussed 500,000-GDP water credits agreement.

Access

The existing road network within the Waiohuli Subdivision and the proposed road network in the Kēōkea Farm Lot Subdivision will serve as the access for Phase 2 residential units. A mid-level road that connects Waiohuli and Kēōkea at roughly the 2,500-foot elevation is also proposed in Phase 2. As mentioned earlier, this mid-level road will serve as the main arterial through the entire 1,111-unit project.



Total: 6,112 Acres

Legend

— DHHL Land Boundary

* Heiau

Land Use Summary

Land Use	Residential	Community Use	General Agriculture	Conservation	Subsistence Agriculture	Existing Residential	Total
	1,111	660 ac	69 ac	3,940 ac	773 ac	170 ac	500 ac
	1,181	6,112 ac					

Lot Size	Number of Lots	Approx Acres
1/2	1,111	660 ac
		69 ac
		3,940 ac
		773 ac
2	70	170 ac
	1,181	6,112 ac

Figure 3-12

KŌKEʻA WAIʻOHULI
Land Use Plan

MAUI LAND INVENTORY

DEPARTMENT OF HAWAIIAN HOME LANDS



PBPR

7/01/03

MAUI ISLAND PLAN

Sewer

Sewage will be handled by on-site septic tanks.

Phase 3

Phase 3 includes 768 residential units. This phase is planned below the 2,400-foot elevation between the two major gulches.

Water

Water service for the 768 lots will come from a private water system composed of wells drilled at the 1,900-foot elevation, as discussed in the alternatives section.

Access

The mid-level road will provide access to Phase 3 at access points within the Waiohuli and Kēōkea Subdivisions. A fourth access point directly connecting the mid-level road to Kula Highway is also proposed for Phase 3.

Sewer

The 768 units will be serviced by on-site septic tanks.

Community Facilities

The final land use plan designates approximately 69 acres for community use. There are already twenty-six existing acres of community areas located within the Waiohuli Subdivision that are planned for parks, community facilities, and open space. An additional thirteen acres for parks and open space are planned for Phase 2 and Phase 3. The amount of acres set aside for parks and open space was determined using the County of Maui Park Standards. The remaining 30 acres is planned for an elementary and/or intermediate school. Discussions with the Department of Education indicated the need for schools given the number of units proposed in Phases 2 and 3.

Remaining Land

According to the final land use plan, approximately 3,940 acres *makai* of the proposed residential development area are proposed for general agriculture use. DHHL may renew the revocable permit with Sakagawa for these lands and generate income in the interim.

Approximately 773 acres are proposed for conservation use. These areas include the two major gulches, Pu'u o Kali, and the 236-acre area licensed to Tri-Isle Resource Conservation Development Council to protect a portion of an existing dryland forest.

Costs

The tables below present the projected costs for the recommended final land use plan. Costs for Phase 1 are not included because the planning and design of the 70 Kēōkea farm lots preceded the *Maui Island Plan*.

MAUI ISLAND PLAN

Phase 2 – Residential

Total Lots = 343 lots

Lot Size = 20,000 square feet

Table 3-5: Projected Costs for One-half Acre Phase 2 Residential Lots at Waiohuli

Improvements	Total Cost \$	Cost Per Lot \$
Off-Site	2,439,553	7,112
On-Site	20,607,013	60,079
Total	23,046,566	67,191

Phase 2 – Residential

Total Lots = 768 lots

Lot Size = 20,000 square feet

Table 3-6: Projected Costs for Phase 3 One-half Acre Residential Lots at Waiohuli

Improvements	Total Cost \$	Cost Per Lot \$
Off-Site	16,869,487	21,964
On-Site	46,674,610	60,774
Total	63,543,098	82,738

D. 'ULUPALAKUA PARCEL BASELINE INFORMATION

DHHL's 'Ulupalakua parcel is approximately one quarter-mile from 'Ulupalakua's town center, along a fairly well known tourist route with traditional ranch-style architecture, winery tours, and a ranch store. Significant coastal views include 'Āhihi Bay and Mākena Bay.

1. INVENTORY

TMK and Acreage

The 'Ulupalakua parcel is 2.0 acres and is identified as TMK 2-1-08:50 (Figure 3-1).

Existing Uses

Although the two-acre site is currently vacant, it is used as a water source by residents of DHHL's Kahikinui *kuleana* lots. A water tap is provided for residents to fill portable containers that they then haul to their lots in Kahikinui.



Adjacent Uses

The parcel is bounded to the north and east by Kula Highway and to the south and west by 'Ulupalakua Ranch.

MAUI ISLAND PLAN

Proposed Future Surrounding Uses

There are no known proposed future surrounding uses.

2. REGULATORY

State Land Use District

The parcel is within the State Agriculture District (Figure 3-13).

County Community Plan

The parcel is designated Agricultural in the *Makawao-Pukalani-Kula Community Plan*.

County Zoning

The parcel is zoned Agricultural on Maui County zoning maps.

Special Management Area

The parcel is not within the Special Management Area.

Underground Injection Control Line

The 'Ulupalakua parcel is above the UIC line (Figure 3-14).

3. PHYSICAL CHARACTERISTICS

Climate

In general, the climate of the Upcountry region is conducive to farming, with mild, warm days and cool evenings. Daytime temperatures range from the mid 60s (Fahrenheit) during the winter to the upper 80s in the summer.

Soils

According to the USDA Soil Conservation Service Survey, 'lo Silt Loam, 7 to 25 percent slopes is the only soil found in the 'Ulupalakua tract (Figure 3-15). This soil is used for pasture, truck crops, and wildlife habitat. Permeability is moderately rapid. Runoff is slow to medium; the erosion hazard is slight to moderate.

Agricultural Lands of Importance to the State of Hawai'i

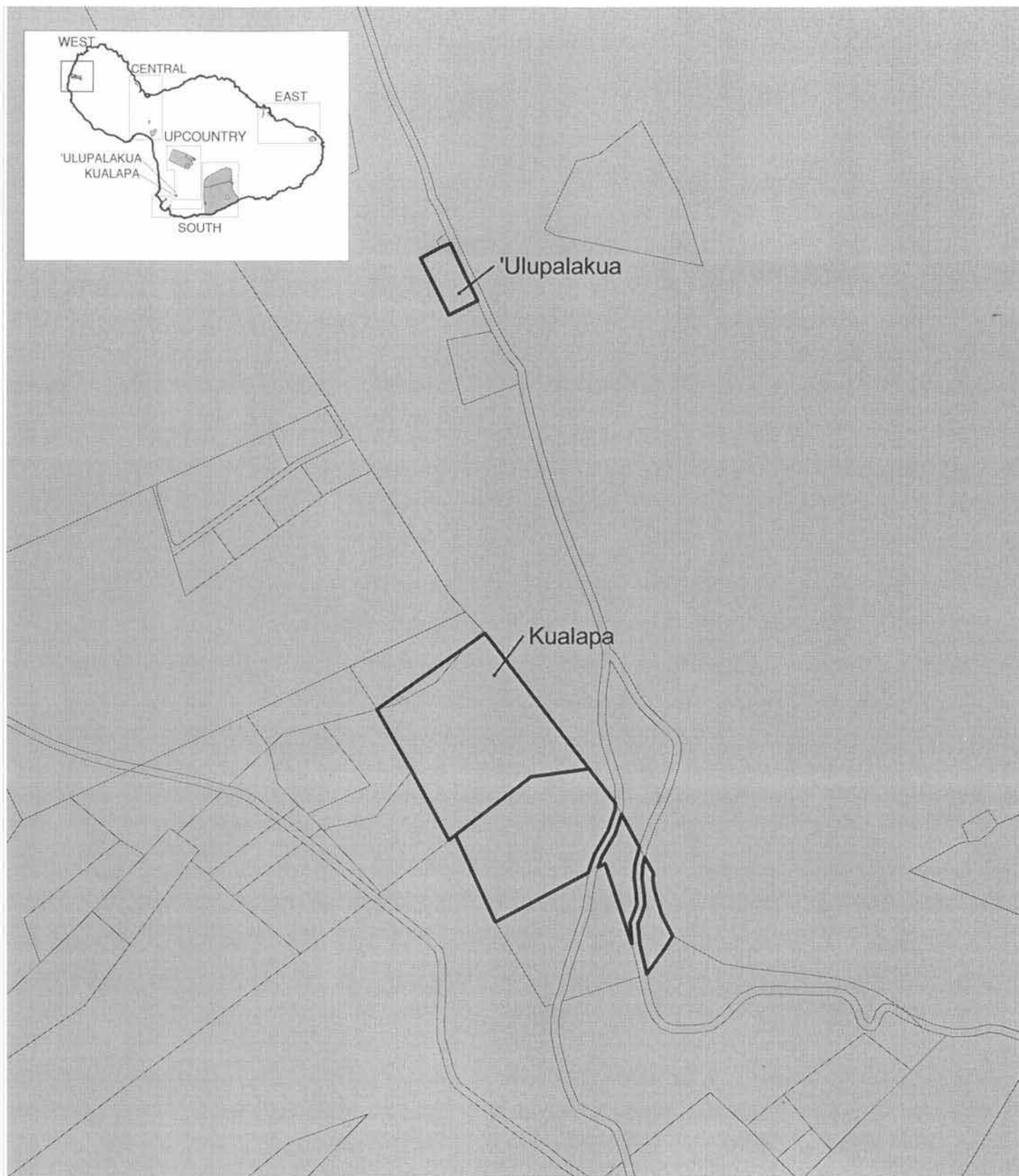
The State of Hawai'i Department of Agriculture *ALISH* system of defining agricultural suitability classifies some of the soils of 'Ulupalakua as "Other Agricultural Land." The remaining lands are not classified (Figure 3-16).

Ground/Surface Water

The USGS topographic map does not show any streams on this tract.

Rainfall

Annual rainfall averages approximately 30-40 inches (Figure 3-17).



Legend

- Agricultural District
- DHHL Land Boundary

Figure 3-13

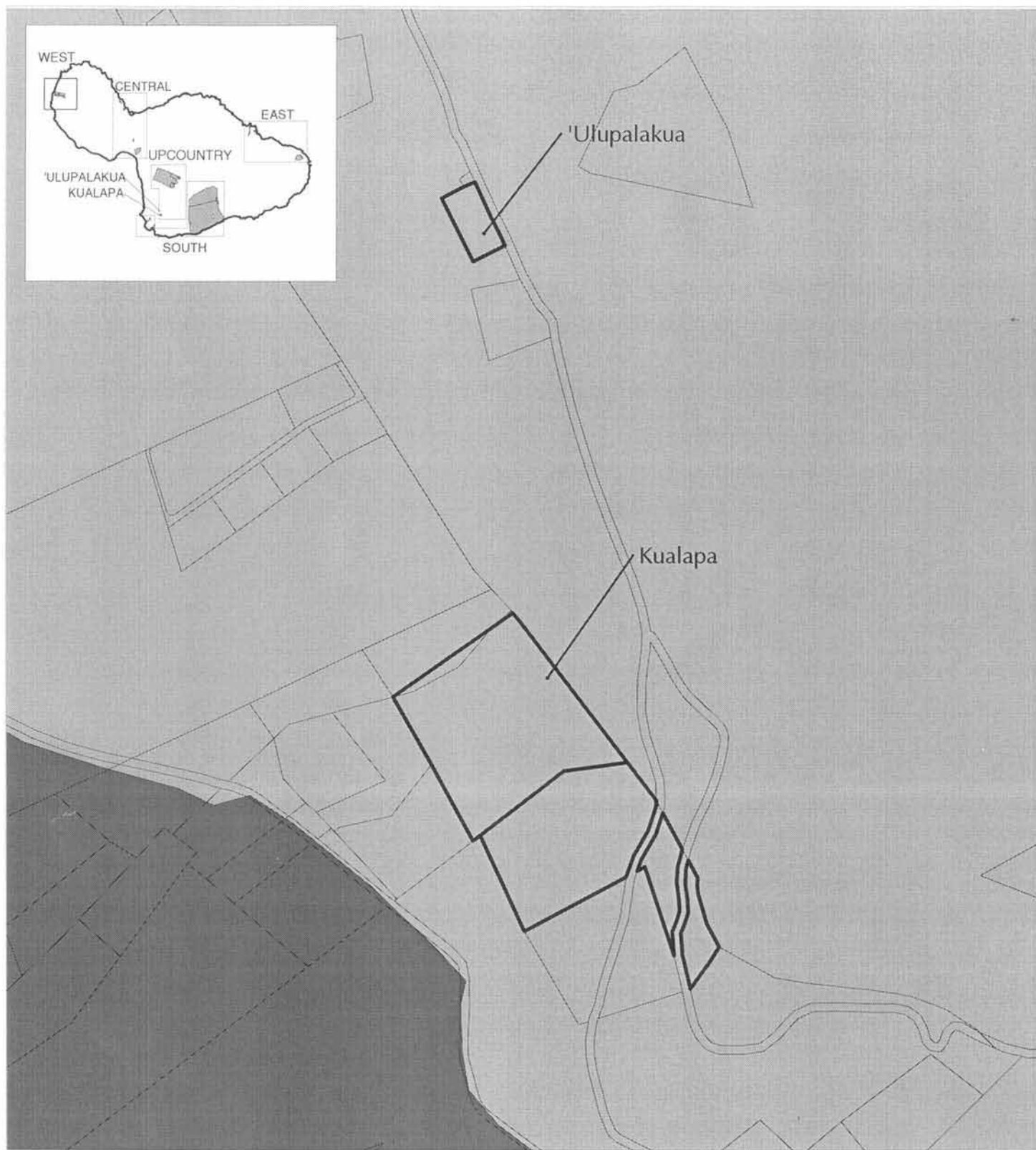
'ULUPALAKUA; KUALAPA
State Land Use

MAUI LAND INVENTORY

DEPARTMENT OF HAWAIIAN HOME LANDS

NORTH





Legend

- Areas Below (Makai) Underground Injection Control Line
- Areas Above (Mauka) Underground Injection Control Line
- DHHL Land Boundary

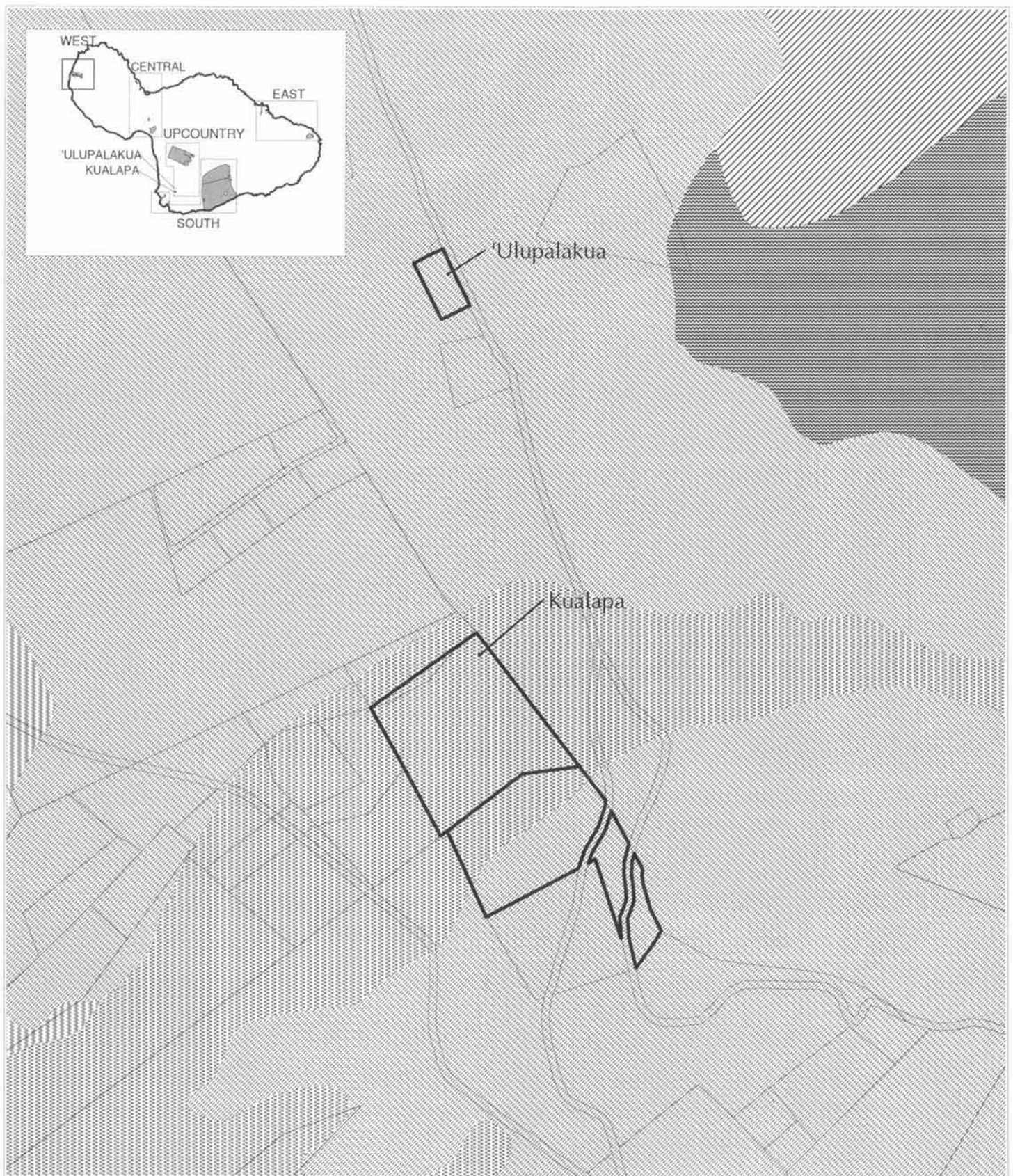
Figure 3-14

'ULUPALAKUA; KUALAPA
Underground Injection Control (UIC) Areas Map

MAUI LAND INVENTORY

DEPARTMENT OF HAWAIIAN HOME LANDS





Legend

-  Io Silt Loam, 7-25% Slopes
-  Very Stony Land
-  DHHL Land Boundary

Figure 3-15

'ULUPALAKUA; KUALAPA
Soil Conservation Service Survey

MAUI LAND INVENTORY

DEPARTMENT OF HAWAIIAN HOME LANDS

NORTH



500

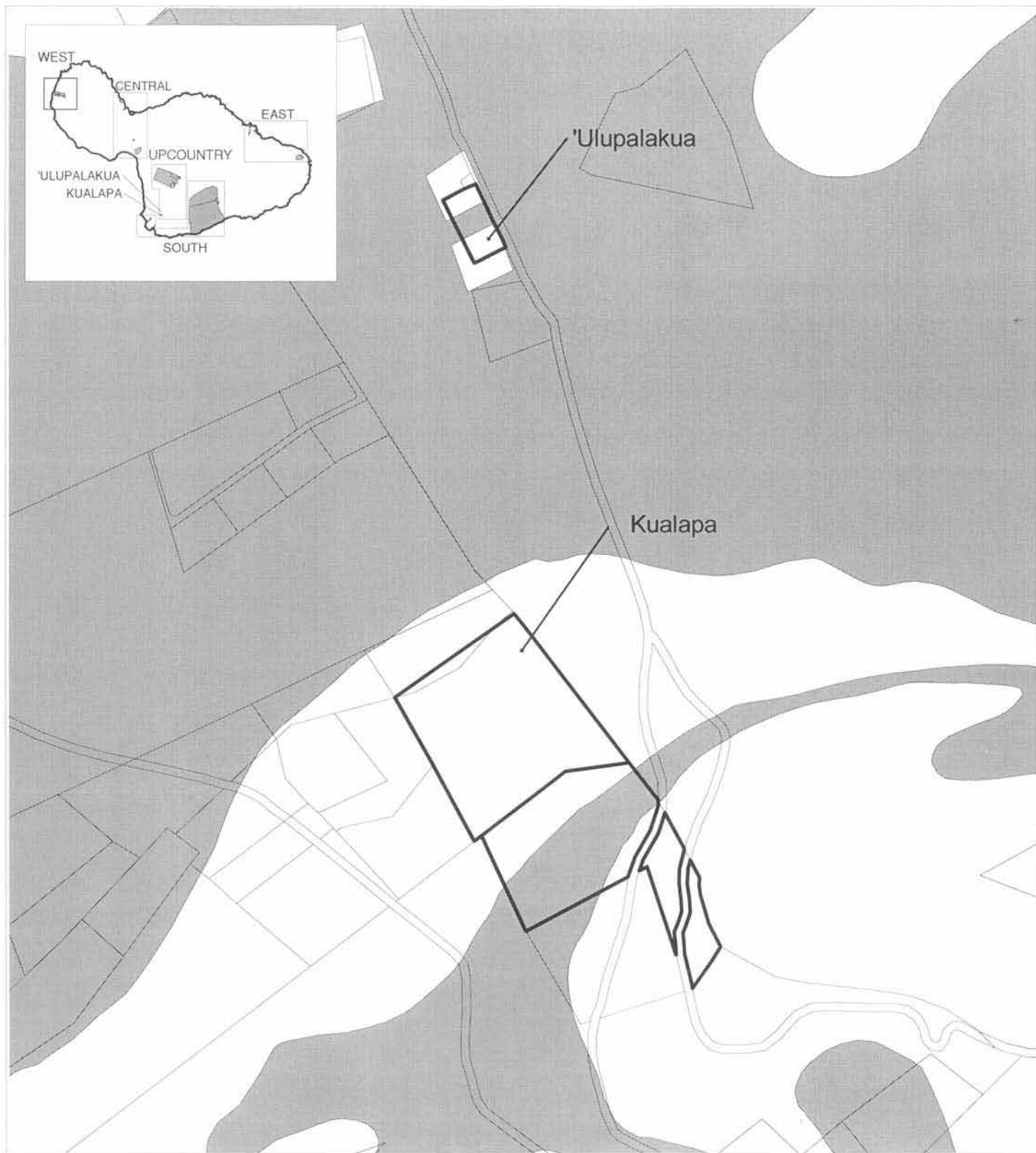
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1,000



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Legend

- Prime Agricultural Land
- Unique Agricultural Land
- Other Agricultural Land
- Unclassified Land
- DHHL Land Boundary

Source: State of Hawaii Department of Agriculture

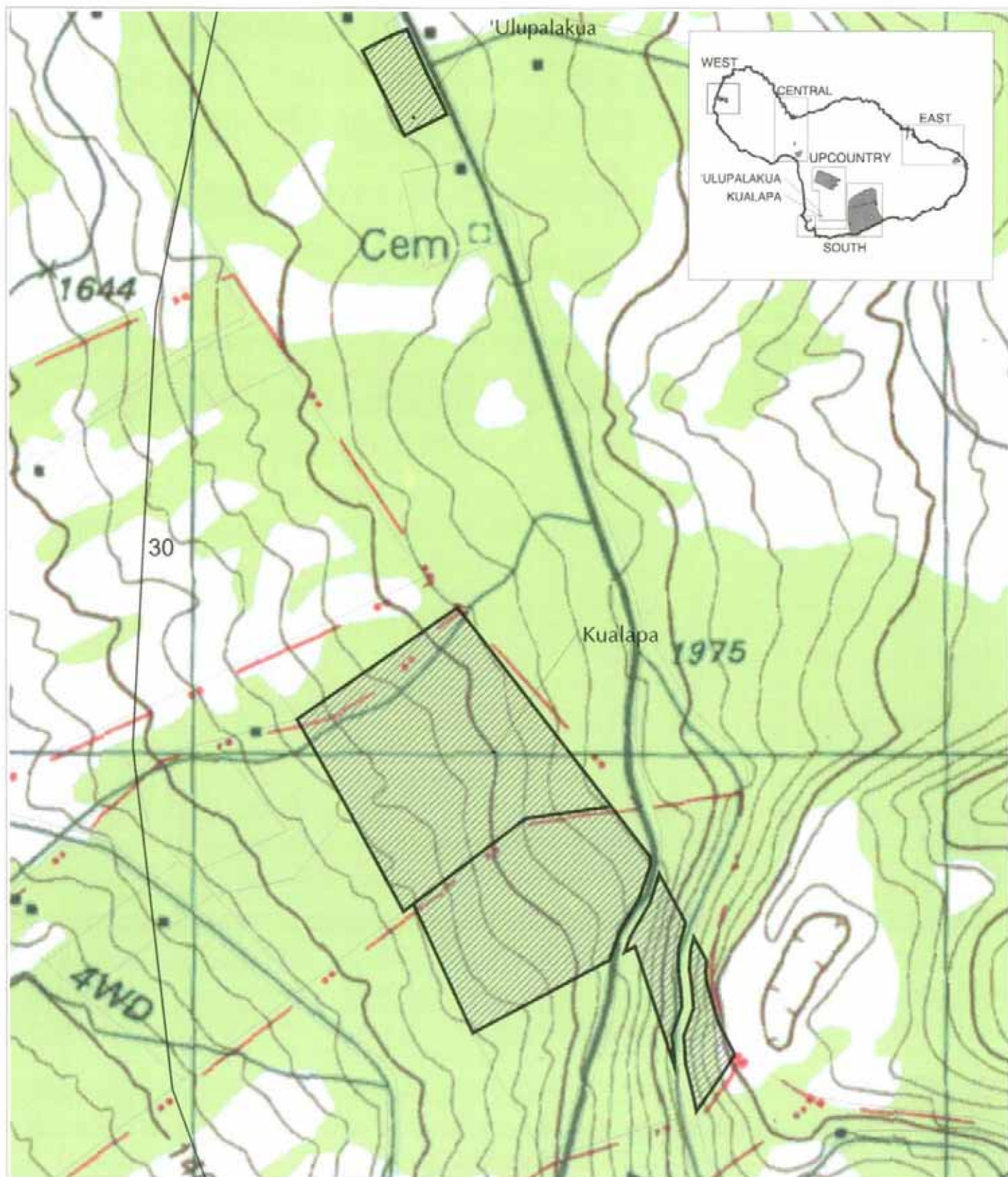
Figure 3-16

'ULUPALAKUA; KUALAPA
Agricultural Lands of Importance to the State of
Hawaii (ALISH)

MAUI LAND INVENTORY

DEPARTMENT OF HAWAIIAN HOME LANDS





Legend

-  DHHL Properties
-  Lines of Equal Average Annual Rainfall in Inches

Figure 3-17
'ULUPALAKUA; KUALAPA
USGS Map and Rainfall Isohyets
MAUI LAND INVENTORY

DEPARTMENT OF HAWAIIAN HOME LANDS

NORTH



400

0

800

(FEET)



MAUI ISLAND PLAN

Topography/Slope

The USGS topographic map shows that the elevation within 'Ulupalakua is approximately 1,900 feet (Figure 3-17).

Drainage

The USGS topographic map does not show any natural drainage features.

Flood Zone

The Flood Insurance Rate Map indicates that 'Ulupalakua is in Zone X, which designates areas determined to be outside the 500-year floodplain (Figure 3-18).

Noise

Due to the rural, undeveloped nature of the area, there are no major sources of noise.

4. ENVIRONMENTAL CHARACTERISTICS

Historic Sites/Archaeology/Cultural Resources

There are no known historic sites, archaeological sites, or cultural resources on this parcel.

Endangered Species

There are no species identified as candidate or endangered by the Hawai'i Natural Heritage Program *Biological Conservation Datasystem (BCD) for Department of Hawaiian Home Land* on this parcel.

Critical Habitat

The U.S. Fish and Wildlife Service has not designated any critical habitat areas within the 'Ulupalakua tract.

5. INFRASTRUCTURE

Access/Roadways

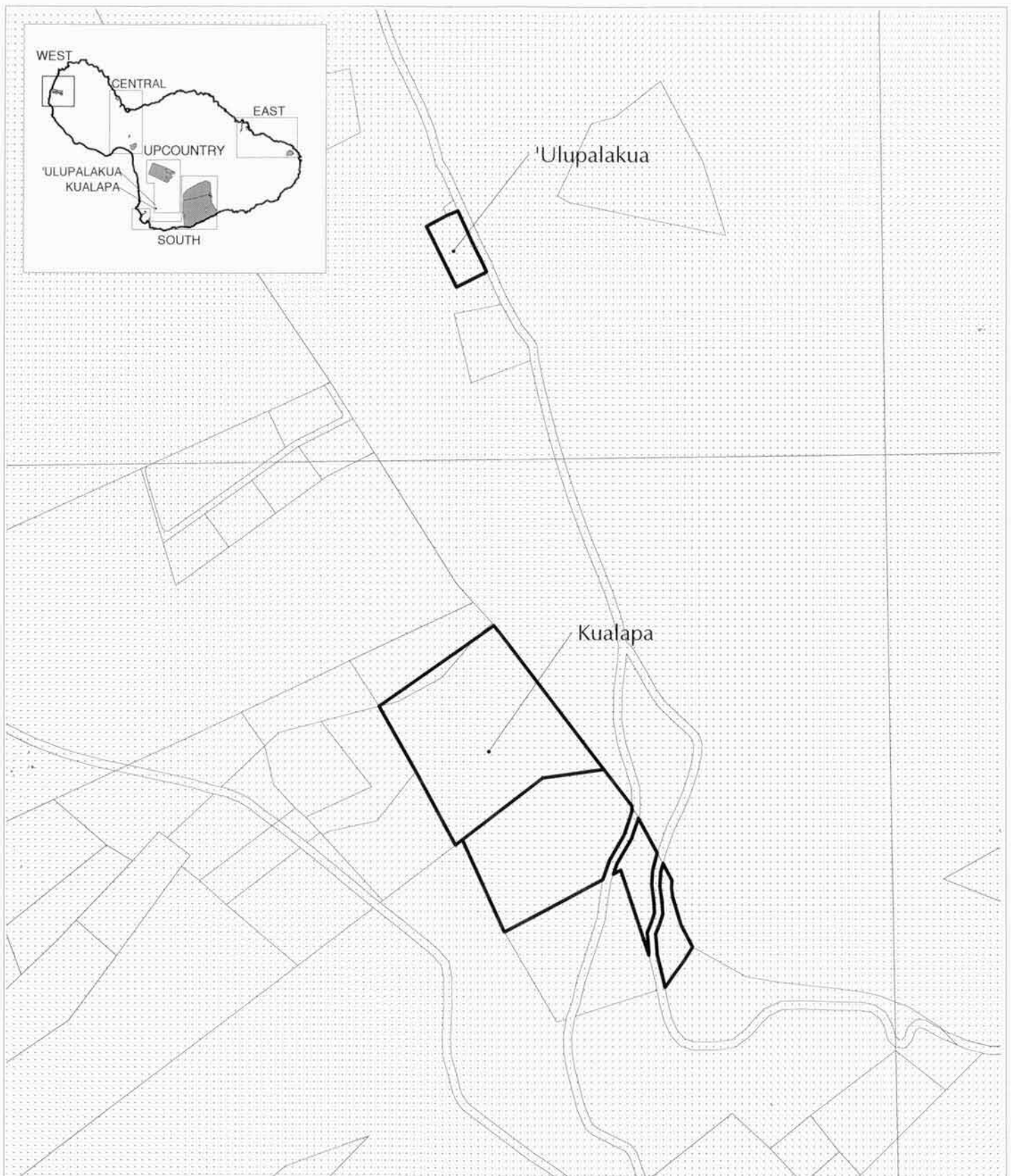
Access to the parcel is from Kula Highway.

Water System (Lines, Wells)

The USGS topographic map shows one water tank within the 'Ulupalakua parcel. A two-inch water line along Kula Highway serves the site.

Wastewater Treatment and Disposal

Currently there are no on-site cesspools. In the future, wastewater can be handled with on-site septic systems.



Legend



-  ZONE X:
Areas Determined To Be Outside 500-Year Floodplain
-  DHHL Land Boundary

Figure 3-18

'ULUPALAKUA; KUALAPA

Flood Insurance Rate Map

MAUI LAND INVENTORY

DEPARTMENT OF HAWAIIAN HOME LANDS

NORTH



500

0

1,000



(FEET)



MAUI ISLAND PLAN

Solid Waste Disposal

Currently, the County does not provide solid waste disposal service to this parcel. However, if solid waste is generated on this parcel it will be collected by the County and taken to the Central Maui Landfill for a fee.

Telephone Service

There is currently no telephone service to this parcel. If needed, Sandwich Isles Communications will provide the telephone service.

Electrical Service

MECO provides electrical service to 'Ulupalakua through a 23-kV transmission line from the Mā'alaea Generating Station. Overhead electric lines serve the site.

Cable Television Service

This parcel is within the service area of Oceanic Cable.

E. 'ULUPALAKUA PARCEL ANALYSIS

The 'Ulupalakua parcel has opportunities for community use by DHHL's beneficiaries living in Kahikinui and the residents of 'Ulupalakua. Although the parcel does not currently have a DHHL land use designation, DHHL beneficiaries already use this parcel for community-oriented activities. As mentioned above, residents of DHHL's Kahikinui *kuleana* lots currently use the two-acre parcel as a water source. The residents fill portable containers with water from taps provided on the parcel. Residents then haul this water to their lots in Kahikinui.

The parcel has good street frontage and is easily accessible from Kula Highway.

A community center and improvements to the water filling facilities would promote and support the current uses of the parcel, and possibly increase its benefits for DHHL beneficiaries.

There are tremendous opportunities for economic development in the form of a general store or farmers market type of use. Beneficiaries and local Upcountry residents could sell local produce, crafts, and other products at this general store/market. The parcel is close to the Tedeshi Winery, which is a major Upcountry tourist destination, as well as other visitor attractions accessed by Kula Highway. Given the parcel's street frontage and easy accessibility from the highway, there is a strong potential for an economic development to capture a portion of this tourist traffic.

In relation to homesteading uses, the parcel's relatively small size (two acres) does not warrant residential, agricultural, or pastoral homesteading because the improvement costs for a few lots far outweigh the benefits of locating homesteads on the parcel.

MAUI ISLAND PLAN

F. 'ULUPALAKUA PARCEL FINAL PLAN

Based on the analysis of the parcel, the final land use plan designates the two-acre 'Ulupalakua parcel for community use (Figure 3-19). Improving the Kahikinui water facilities and providing a community center would serve not only the Kahikinui residents but also the Kēōkea, Kula, 'Ulupalakua, and Waiohuli tracts. The site's small size, minimal rainfall, significant views, frontage along a fairly well-known tourist route, and location near a tourist destination also make it a good place for a general store offering local produce, locally made handicrafts, and information on Hawaiian culture and history. This general store concept could provide DHHL's beneficiaries and Upcountry residents with economic development opportunities.

G. KUALAPA PARCEL BASELINE INFORMATION

The Kualapa tract is located approximately one mile from 'Ulupalakua and is divided into three pieces by Kula Highway and an unpaved road.

1. INVENTORY

TMK and Acreage

The tract is 40.9 acres and is identified as TMK 2-1-04:15 and 94 (Figure 3-1).

Existing Uses

Revocable Permits

'Ulupalakua Ranch- Pasture

TMK 2-1-04:15 20.5 acres

Tedeshi - Waterline Easement

TMK 2-1-04:94 (portion) 0.098 acres

Adjacent Uses

The tract is bounded to the north, south, east, and west by 'Ulupalakua Ranch.

Proposed Future Surrounding Uses

There are no known proposed future surrounding uses.

2. REGULATORY

State Land Use District

The tract is within the State Agriculture Land Use District (Figure 3-13).

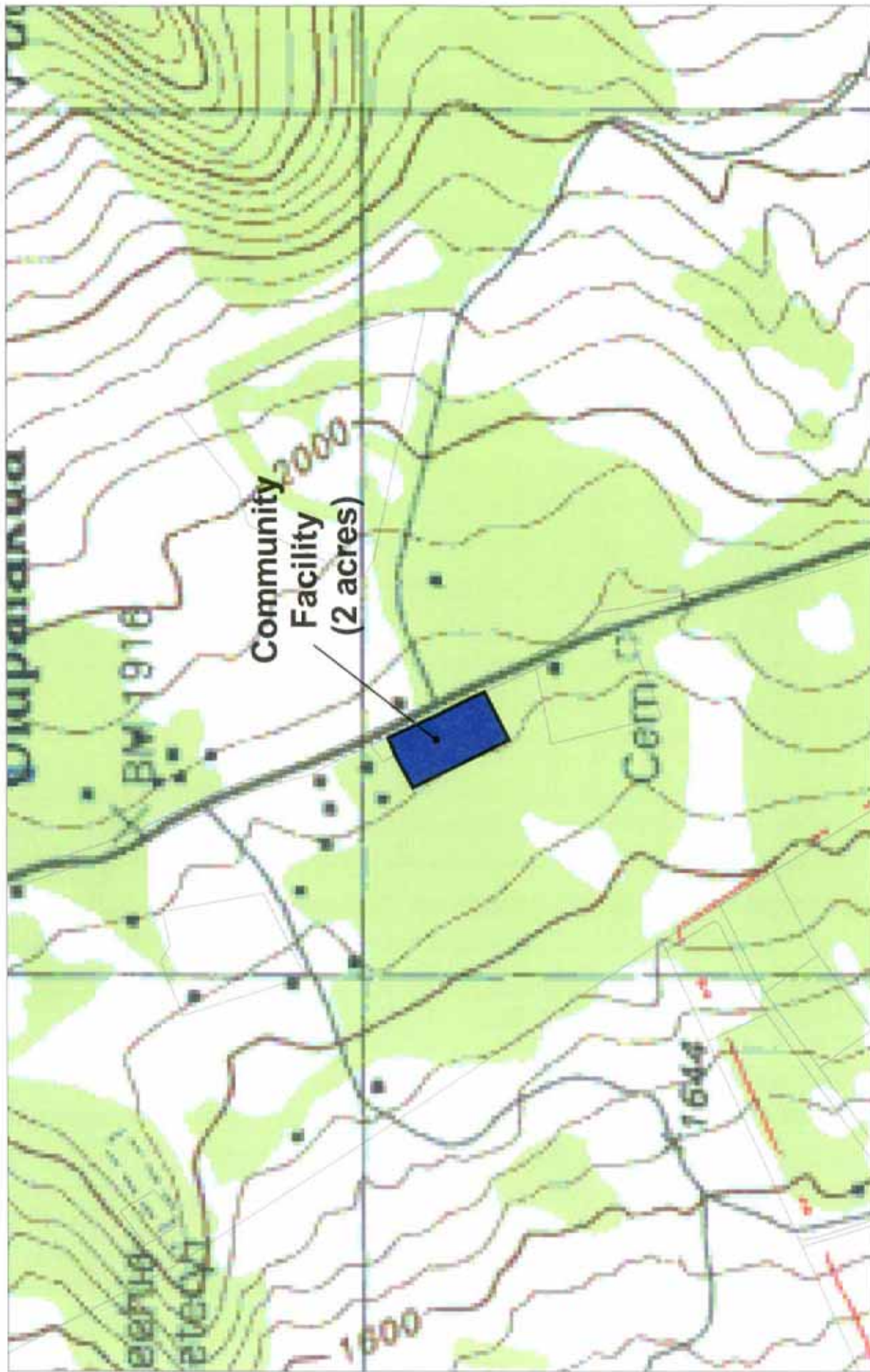


Figure 3-19
'ULUPALAKUA
Land Use Plan

MAUI LAND INVENTORY

DEPARTMENT OF HAWAIIAN HOMELANDS



(FEET)



MAUI ISLAND PLAN

County Community Plan

The *Makawao-Pukalani-Kula Community Plan* designates the tract as Agricultural.

County Zoning

The tract is zoned Agricultural on Maui County zoning maps.

Special Management Area

The tract is not within the Special Management Area.

Underground Injection Control Line

The Kualapa tract is above the UIC line (Figure 3-14).

3. PHYSICAL CHARACTERISTICS

Climate

Temperature averages 75 degrees Fahrenheit throughout the year.

Soils

According to the USDA Soil Conservation Service Survey, the following soils are found on the Kualapa tract (Figure 3-15):

- 'lo Silt Loam, 7 to 25 percent slopes – This soil is used for pasture, truck crops, and wildlife habitat. Permeability is moderately rapid. Runoff is slow to medium, and the erosion hazard is slight to moderate.
- Very Stony Land – This land type is used for pasture and wildlife habitat. Pasture improvement is very difficult because of the many stones.

Agricultural Lands of Importance to the State of Hawai'i

The State of Hawai'i Department of Agriculture *ALISH* system of defining agricultural suitability classifies a portion of the soils of the Kualapa tract as "Other Agricultural Land" and the remaining lands are not classified (Figure 3-16).

Ground/Surface Water

The USGS topographic map shows no natural water sources within the Kualapa tract.

Rainfall

Rainfall averages 30 to 40 inches per year (Figure 3-17).

Topography/Slope

The USGS topographic map shows the elevation within the Kualapa tract ranging from approximately 1,680 feet in the southwestern portion of the tract to 2,080 feet in the eastern portion (Figure 3-17). Slopes generally average 0-15 percent across the entire tract. However, there are areas of steep slope that may prohibit development.

MAUI ISLAND PLAN

Drainage

The USGS topographic survey shows no natural drainage features within the Kualapa tract.

Flood Zone

The Flood Insurance Rate Map indicates that Kualapa is located within Zone X, which designates areas determined to be outside the 500-year floodplain (Figure 3-18).

Noise

Due to the rural, undeveloped nature of the area, there are no major sources of noise.

4. ENVIRONMENTAL CHARACTERISTICS

Historic Sites/Archaeology/Cultural Resources

There are no known historic sites, archaeological sites, or cultural resources on this tract.

Endangered Species

There are no species identified as candidate or endangered by the Hawai'i Natural Heritage Program *Biological Conservation Datasystem (BCD) for Department of Hawaiian Home Land* on this tract.

Critical Habitat

The U.S. Fish and Wildlife Service has not designated any critical habitat areas within the Kualapa tract.

5. INFRASTRUCTURE

Access/Roadways

Access to the tract is from Kula Highway, which bisects the tract.

Water System (Lines, Wells)

The USGS topographic map does not show any constructed water lines, wells, or tanks within the tract.

The Department of Water Supply notes that Kanaio, located one quarter-mile east of the site, is served by a four-inch "Driscoll" (plastic) water line. Kanaio residents occasionally experience low water pressure and interrupted service when the plastic water line breaks.

Wastewater Treatment and Disposal

Currently, there are no on-site cesspools. In the future, wastewater can be handled with on-site septic systems.

MAUI ISLAND PLAN

Solid Waste Disposal

Currently, the County does not provide solid waste disposal service to this parcel. However, if solid waste is generated on this parcel it will be collected by the County and taken to the Central Maui Landfill for a fee.

Telephone Service

There is currently no telephone service to this tract. If needed, Sandwich Isles Communications will provide the telephone service to the tract.

Electrical Service

MECO provides electrical service to 'Ulupalakua through a 23-kV transmission line from the Mā'alaea Generating Station. Overhead electric lines serve the site.

Cable Television Service

This tract is within the service area of Oceanic Cable.

H. KUALAPA PARCEL ANALYSIS

The Kualapa tract is remote and has limited infrastructure service. Extensive off-site improvements would be needed to connect Kualapa to the County water system. On-site constraints include extensive lava tubes and steep slopes. These constraints limit access and use of the tract for residential purposes. In addition, homesteading uses in the Upcountry region will be focused primarily on the Waiohuli tract. Based on these factors, Kualapa is proposed to remain vacant and is designated for general agriculture use over the next 20 years.

I. KUALAPA PARCEL FINAL PLAN

The final land use plan proposes general agriculture for the entire 40.9-acre tract (Figure 3-20). The constraints of supplying adequate water and the cost of improving the existing system and/or developing a new system restrict developing the site for any other use. The "General Agriculture" designation allows DHHL to lease the site to generate income until the water system is improved or DHHL develops a private water system.

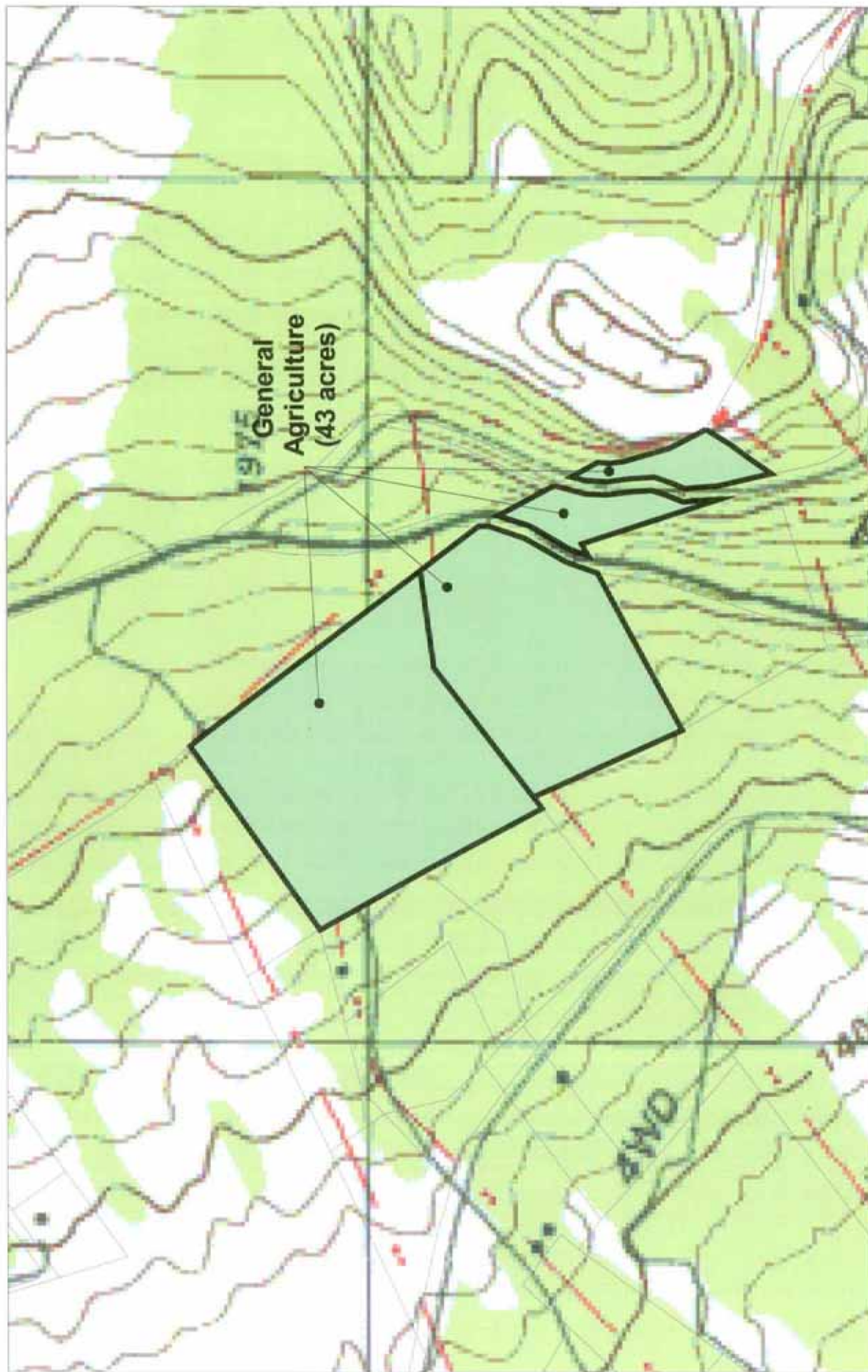


Figure 3-20
KUALAPA
Land Use Plan

MAUI LAND INVENTORY

DEPARTMENT OF HAWAIIAN HOMELANDS



(FEET)





4.0 CENTRAL MAUI

MAUI ISLAND PLAN

4.0 CENTRAL MAUI

A. REGIONAL OVERVIEW

The DHHL Central Maui planning region encompasses five tracts totaling 878.3 acres: Pu'unēnē (two tracts), Waiehu, Paukūkalo, and Wailuku (Figure 4-1). The planning region is within the County's Wailuku-Kahului and Kīhei-Mākena Community Plan areas (Figure 1-3).

The adjoining towns of Wailuku and Kahului are Maui's major population and business centers. Wailuku serves as Maui's civic and financial center, and many of its neighborhoods retain an old-town character. In contrast, Kahului generally follows patterns of post-World War II community development with more master-planned residential subdivisions and mall and strip mall commercial centers. Kahului has also become the County's business, industrial, and commercial center, with Maui's major airport and only deep-draft harbor, as well as the majority of Maui's regional retailers.

Central Maui's agricultural lands are the heart of Hawaiian Commercial & Sugar Company's sugar plantation. HC&S, a division of Alexander & Baldwin, Inc., is Hawai'i's largest producer of raw sugar and one of only two surviving sugar plantations in Hawai'i. The plantation cultivates over 37,000 acres in Central Maui and operates the Pu'unēnē Mill to process the cane.

1. REGIONAL INFRASTRUCTURE

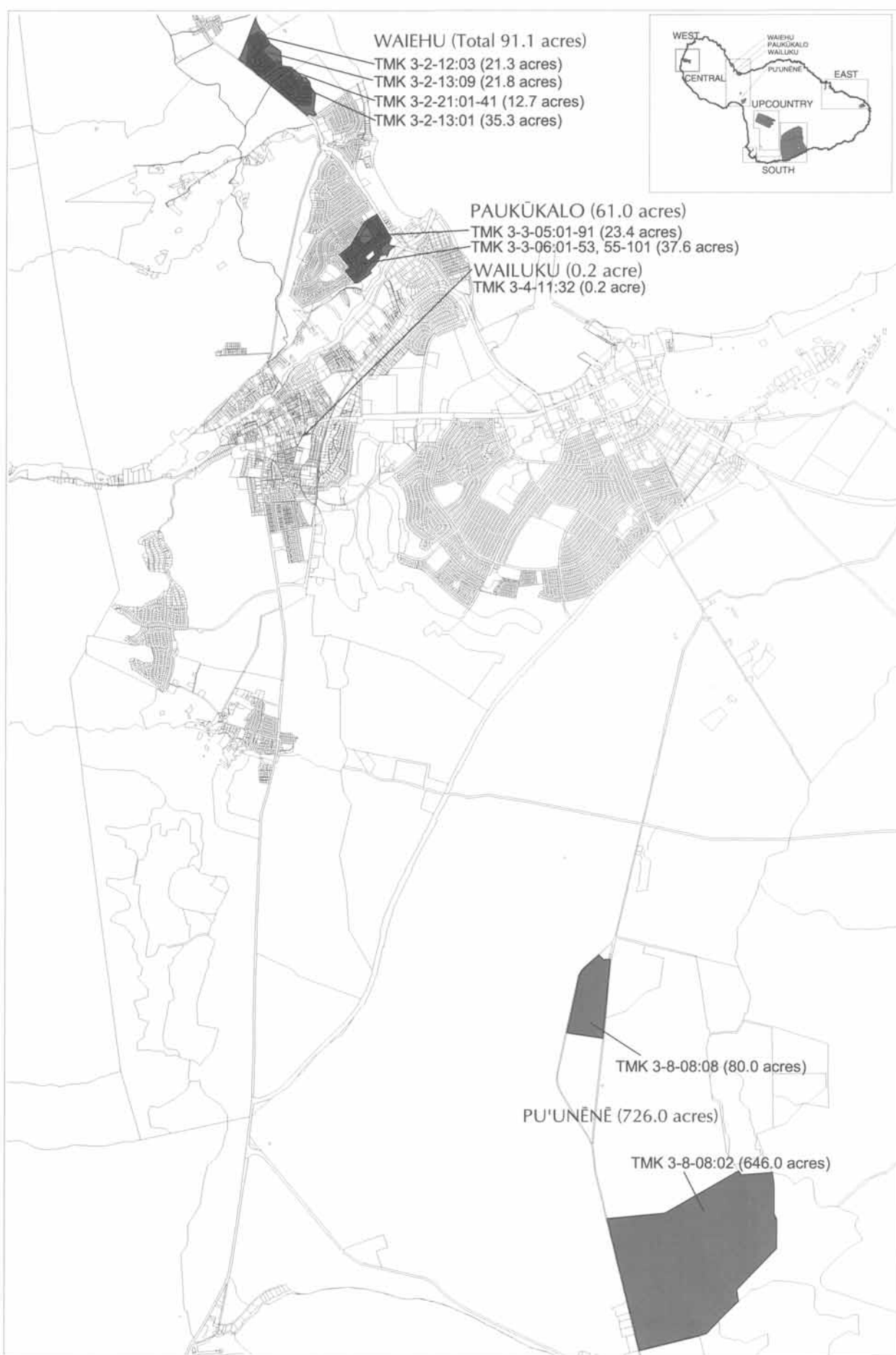
Roads

As home to the island's primary harbor and airport, along with being the retail and business center of the island, Wailuku-Kahului is the roadway hub of Maui. From Kahului, Mokulele Highway serves as the primary route to Kīhei; Kūihelani Highway provides access to West Maui via Honoapi'ilani Highway; and Hāna Highway leads to Upcountry and East Maui.

Analysis

Mokulele Highway is currently in the first phase of expansion that will provide four lanes between Kahului and Kīhei. Recent improvements to the intersection of Kūihelani Highway and Honoapi'ilani Highway have resulted in more efficient traffic movement to and from West Maui.

In spite of these recent improvements, one of Maui's most congested traffic bottlenecks occur along Dairy Road from Hāna Highway to Pu'unēnē Avenue. Proposed signal synchronization may provide a short-term solution. In the long-term, the State is proposing the construction of an Airport Access Road from near the intersection of Pu'unēnē Avenue and Dairy Road to the Airport; A&B is proposing an extension of Ho'okele Street to connect Mokulele Highway with Hāna Highway. Both of these

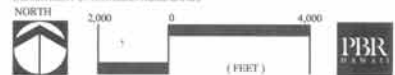


Legend

 DHHL Properties

Figure 4-1 Central Region MAUI LAND INVENTORY

DEPARTMENT OF HAWAIIAN HOMELANDS



MAUI ISLAND PLAN

proposed roads would create routes parallel to Dairy Road, thus providing alternative routes and relieving congestion.

Water

The Central Maui Water System includes the Wailuku-Kahului Community Plan region and the Kihei-Mākena Community Plan region (Wilson Okamoto, March 2003).

Water sources of the Central Maui System are located on the windward slope of the West Maui Mountains. Approximately 75 percent of the water supplying the system is withdrawn from the 'Īao Aquifer in the vicinity of 'Īao Stream and Waiehu Stream. The remaining 25 percent of the water supply is withdrawn from the adjacent Waihe'e Aquifer to the northwest. Beyond the distribution network in Wailuku-Kahului, two major transmission pipelines deliver water to Kihei-Mākena and to Pā'ia.

Analysis

Central Maui does not have available water to support new residential growth until additional water sources are developed. In 2003, the State Commission on Water Resource Management (CWRM) designated the 'Īao aquifer as a State water management area. The designation occurred because average pumping from the 'Īao aquifer exceeded 18 mgd, approximately 90 percent of its sustainable yield as established by CWRM. Sustainable yields represent the estimated maximum amount of groundwater that can be withdrawn without harming the aquifer's ability to replenish itself. The designation requires all users to apply for a State permit to continue to draw water from the aquifer, with CWRM to establish how much water the user can continue to draw.

In recent years the development of wells in the Waihe'e Aquifer, which lies north of the 'Īao Aquifer, has greatly helped to sustain growth in the Central Maui Water System. However, sustainable yield in this aquifer is eight mgd and current pumpage of four to five mgd is approaching the recommended withdrawal limitations. The Waihe'e Aquifer yield can be improved and efforts are ongoing to further develop the aquifer, including the Kūpa'a, Maluhia, and Waiōla'i Wells.

The 'Īao Stream Surface Water Treatment Plant was established in December 2002 to augment potable water supplies. The plant can treat up to two mgd of surface water, depending on ditch flow.

Future water resource development is focused toward East Maui, beyond Pā'ia, where there are undeveloped groundwater sources and moderately high estimates of sustainable yield. However, environmental groups and residents in Ha'ikū oppose this plan, stating that additional pumping of Ha'ikū's water resources would result in lower flows in the local streams. In December of 2003, the County of Maui reached an agreement with the environmental groups that restricts well development in Ha'ikū, but allows the County to develop two wells in Hāmākuapoko. The water would then be piped via a new pipeline from Hāmākuapoko to Pā'ia to supplement the Central Maui Water System.

MAUI ISLAND PLAN

Wastewater

The Wailuku-Kahului Wastewater Reclamation Facility (WWRF) is owned and operated by the County of Maui and services the communities of Kahului, Wailuku, Spreckelsville, Pā'ia, and Kū'au (Wilson Okamoto, March 2003). The Wailuku-Kahului service area is divided into four districts including Wailuku-Kahului, Waihe'e, Spreckelsville-Pā'ia-Kū'au, and Wailuku Heights-Waikapū.

The Wailuku-Kahului WWRF was constructed in 1973 to service Kahului and nearby areas, including Wailuku and Spreckelsville. The WWRF provides secondary sewage treatment. The final effluent is considered to be of excellent quality and is disposed of by eight gravity injection wells. After principal solids treatment and handling processes, the dewatered cake is composted at the Central Maui Landfill.

The majority of the sewer lines in the Wailuku-Kahului region are eight-inch diameter pipes constructed of either PVC or VCP material. However, some of the older areas developed between the 1920s and the 1950s, including central Wailuku, Happy Valley, Sand Hills, and the area around Kahului Shopping Center, have four- and six-inch diameter pipes. Collection systems for newer areas use plastic pipes while most of the areas constructed prior to 1970 use clay pipe.

The WWRF has a design capacity of 7.9 mgd average dry-weather flow, 11.9 mgd peak dry-weather flow, and 15.8 mgd peak wet weather flow. Approximately 6.958 mgd, or 88 percent of its rated average dry-weather flow capacity of 7.9 mgd, has been allocated to affordable housing, long-term residential, public/quasi public, hotel, and commercial uses. Projected wastewater flow at the Wailuku-Kahului WWRF for the year 2005 is 6.43 mgd, including total resident and total visitor flows.

A fiscal year 2003 County of Maui capital improvement project set aside \$500,000 to study the feasibility of constructing a new Central Maui WWRF, which would replace the existing Wailuku-Kahului WWRF. If feasible, the Central Maui WWRF would also enable future expansion to serve growth within Central Maui. Another County capital improvement project (fiscal year 2002) is under construction to improve wastewater treatment process performance and reduce operation and maintenance requirements. This project will also provide modifications to mitigate damage and process disruption in the event of tsunami flooding.

The use of reclaimed water from the Wailuku-Kahului WWRF has thus far been economically unfeasible; however, its use may become viable if recent changes in irrigation practices affect the sustainable yield of the basal aquifers underlying the Wailuku-Kahului region.

Analysis

The WWRF is not expected to reach capacity until some time between 2015 and 2020; however, the WWRF has limited land area for expansion and is located in the 100-year

MAUI ISLAND PLAN

tsunami flood inundation zone. In 2000, flows to the Wailuku-Kahului WWRF averaged 5.34 mgd.

Solid Waste Disposal

Solid waste is taken to the Central Maui Landfill.

Analysis

According to the *Public Facilities Assessment Update*, the Central Maui Landfill will have adequate capacity to accommodate commercial and residential waste through the year 2020, with a surplus of approximately one million cubic yards of landfill space.

Electrical Service

Two 69-kV lines from the Mā'alaea Power Plant service the Wailuku/Kahului area. Another 69-kV line originating at the Mā'alaea Power Plant services Kīhei/Wailea and continues upcountry to Kula, Pukalani, and then to Kahului. In Kahului, a 23-kV line from the Kahului Power Plant and a 69-kV from the Mā'alaea Power Plant link at the Kanahā Substation. In Wailuku, a 23-kV from the Kahului Power Plant and a 69-kV line from the Mā'alaea Power Plant link at the Walinu Substation.

Analysis

According to the *County of Maui Infrastructure Assessment Update Electrical Systems*, the projected peak electric power demand in 2020 is 275.5 MW. Both the Kahului and Mā'alaea Generating Stations have limited space for additional generating units. Land has been appropriated to create a new generating site along Pūlehu and Waiko Roads in Central Maui. After a steam turbine generator is installed at the Mā'alaea Generating Station in 2007, all subsequent units will be installed at the new Waena Generating Station. This land is limited to producing 66 MW of fossil fuel burning energy production. The remaining land will be used for alternative energy and ancillary facilities.

2. SOCIO-ECONOMIC INFRASTRUCTURE

Police

According to the *Public Facilities Assessment Update*, the Central region falls within the Maui Police Department's District I – Wailuku (Central). The Wailuku Police Station also includes the community plan regions of Makawao-Pukalani-Kula and Pā'ia-Ha'ikū. The Wailuku Station is currently staffed with 111 budgeted uniformed patrol officers and an estimated share of 38 investigative officers. Approximately 62 uniformed officers and 22 investigative officers are on-call to service the policing needs of the Wailuku-Kahului region.

Analysis

According to the *Public Facilities Assessment Update*, staffing is sufficient to meet the current policing needs of the region. By 2020, this region's police service needs will increase by approximately 37 percent, requiring a total of 114 officers. These new officers will require a further addition of nine new support positions (technical, clerical, and

MAUI ISLAND PLAN

administrative) to be staffed at the existing Wailuku Station. To accommodate this growth, an expansion of the existing Wailuku Station may be required. Other alternatives include:

- Transferring patrol responsibilities for the Makawao-Pukalani-Kula and/or Ha'ikū Community Plan regions out of the Wailuku Station to new Police Substations in those areas; and/or
- Expanding the service area of the planned Kīhei/Mākena Station to include Makawao-Pukalani-Kula. Thereby freeing up Wailuku Station resources to service the Wailuku-Kahului region.

Fire

According to the *Public Facilities Assessment Update*, three fire stations serve the Wailuku-Kahului region. The Wailuku Fire Station is located on Kinipopo Street and serves the western portion of the Wailuku-Kahului region. The Kahului Fire Station is on Dairy Road and serves the central and southeastern portions of the Wailuku-Kahului region. Lastly, the Pā'ia Fire Station serves Pā'ia and Spreckelsville.

Analysis

According to the *Public Facilities Assessment Update*, areas around Waihe'e, Waiehu, and Waikapū do not have adequate fire protection. Plans call for an additional fire station at Waikapū (Wailuku Heights) that would serve the areas of Maui Lani, Maui Waena, Waikapū, and Wailuku Heights.

Emergency Services

According to the *Public Facilities Assessment Update*, two ambulance stations service this region. To reduce the demand for using emergency vehicles for non-emergency transfers, American Medical Response also operates a 12-hour per day, six-day per week vehicle in Kahului. This vehicle is not part of the State Emergency Medical Services System.

Analysis

According to the *Public Facilities Assessment Update*, given the expected population increases, the ambulance needs of the region will be expanding over the next 20 years. There is a projected need for a third ambulance in 2015.

Health Care Services

The Maui Memorial Medical Center, located in Wailuku, is the County of Maui's only critical care facility.

Analysis

According to the *Public Facilities Assessment Update*, based on the estimated total demand, nine additional acute care (inpatient services provided to patients whose average length of stay is usually less than 30 days) beds will be needed in 2015 and 20 in 2020.

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Schools

The *Public Facilities Assessment Update*, lists the following schools for the Central region¹:

Public

Kahului Elementary School (3 miles)
Lihikai Elementary School (4 miles)
Waihe'e Elementary School (2 miles)
Wailuku Elementary School (3 miles)
Īao Intermediate School (3 miles)
Maui Waena Intermediate School (4 miles)
Baldwin High School (3 miles)
Maui High School (4 miles)

Private

Christ the King (K-5) (3 miles)
Emmanuel Lutheran (K-5) (3 miles)
Ka'ahumanu Hou Christian (K-12) (4 miles)
Maui Adventist (K-5) (3 miles)
St. Anthony (K-12) (2 miles)

Analysis

The *Public Facilities Assessment Update*, projected the enrollment for schools in the Central region to 2020 and made the following assessment:

Elementary Schools

Current statistics indicate the need for at least one additional elementary school to serve the region by 2020. Maui Lani Elementary School is planned to open in 2004 and will absorb some of this demand. The distribution of students between elementary schools in this region will change somewhat after Maui Lani Elementary opens.

Intermediate Schools

Current statistics indicate serious overcrowding in this region's intermediate schools. Enrollment is at 133 to 177 percent of the rated capacity. Three additional intermediate schools will be needed in 2005 and one additional intermediate will be needed in 2020.

High Schools

The two current high schools appear to be sufficient to meet the demands of this region until 2015, when a third high school appears justified. However, the *Public Facilities Assessment Update* notes actual conditions at Maui and Baldwin High Schools indicated an overcapacity situation in 2001.

¹Distances (approximate) given are from the Paukūkalo tract to the listed school.

MAUI ISLAND PLAN

Recreation

According to the *Public Facilities Assessment Update*, the Wailuku-Kahului region is well endowed with parks and recreational facilities. There are 16 neighborhood parks, 14 tennis courts, 12 tot lots, 87 sports fields, 16 sports courts, four gyms, and eight community centers. This area contains more parks in terms of number, size, and facility per capita than any other community plan region. The Maui War Memorial Complex and the Waiehu Golf Course also provide recreational activities within the area.

Analysis

According to the *Public Facilities Assessment Update*, the Wailuku-Kahului region currently needs one additional sport court and 216.8 acres of sub-regional parkland to satisfy the recreational needs of the existing community. In addition, a limitation for the Wailuku-Kahului region is that residents of other communities use many of the parks and recreational facilities in this area, which causes the facilities to be used beyond their capacity.

B. PU'UNĒNĒ TRACT BASELINE INFORMATION

DHHL's Pu'unēnē tract is composed of two parcels – an 80-acre parcel and a 646-acre parcel – totaling 726 acres.



1. INVENTORY

TMK and Acreage

The 80-acre parcel is identified as TMK 3-8-08:08. The 646-acre parcel is identified as TMK 3-8-08:02 (Figure 4-1).

Existing Uses

80-acre parcel

The site is currently leased to HC&S for sugarcane cultivation. DHHL also has a license to Sandwich Isle Communications for one acre near the Humane Society for operation of a transmitting tower that serves DHHL's Upcountry and Kahikinui communities.

646-acre parcel

DHHL currently leases the land to HC&S for sugarcane cultivation. The site was part of a Naval Air Station prior to use for sugar. Since the closure of the base, the land reverted to other uses, primarily sugarcane. There are two sets of reinforced concrete magazine storage bunkers originally used to store live ammunition.

MAUI ISLAND PLAN

Adjacent Uses

80-acre parcel

The 80-acre parcel is bound to the north by the Humane Society, to the west by Mehamaha Loop, to the south by a sugarcane field owned by HC&S, and to the east by Mokulele Highway. The Humane Society facility borders the property to the north. A&B owns the surrounding land to the north, west, and south, and uses the land for sugar cultivation. The 200-acre Pu'unēnē Airport Master Planned Area, owned by Maui County, is southeast of this parcel, across Mokulele Highway.

646-acre parcel

Surrounding land uses include HC&S sugarcane lands to the east (owned by A&B), Trojan Seed Corporation to the south, and smaller private landowners and Keālia Pond and Bird sanctuary to the west. To the north is the proposed 200-acre Maui County Pu'unēnē Airport Master Plan Area, which includes Maui Raceway Park.

Proposed Future Surrounding Uses

Mokulele Highway is a two-lane undivided road that connects Kahului and Kihei and is currently being expanded to four lanes. In anticipation of the highway widening, DHHL provided a 200-foot setback from its site line at the existing highway.

Pu'unēnē Airport Area Master Plan

The County of Maui has developed a master plan for 200 acres adjacent to the DHHL Pu'unēnē tract. The proposed users and uses within the 200-acre Maui County Pu'unēnē Airport Master Plan Area are shown in Figure 4-2 and include:

Government

Hawaii Army National Guard (HIANG) – Armory Facility
Maui Economic Opportunity (MEO) – Transportation Support Facilities
Department of Land and Natural Resources – State Base Yard
Department of Public Works – County Base Yard and Wastewater Facility
Department of Water Supply – Vehicle Maintenance Facility
Maui Police Department/Maui Fire Department – Vehicle Maintenance Facility
Maui County Corrections Center (MCCC) – Correction Facility

Recreational

Maui County Fair Association – County Fairgrounds/Open Space
Maui Motorcycle Association (Moto Cross) – Moto Cross Course and Facilities
Maui Sports Bike Association (Sport Bikes) – Motorcycle Track and Facilities
Maui Go Karters Association (Karts) - Go-Kart Track and Facilities
Valley Isle Timing Association (Drag Racing) – Drag Racing Track and Facilities
Maui RC Modelers/Experimental Aircraft Association (Remote Control Model Aircraft) – Model Aircraft Designated Open Space

PUUNENE AIRPORT AREA MASTER PLAN UPDATE 2002

R T TANAKA ENGINEERS INC.
CHRIS HART AND PARTNERS INC.
COUNTY OF MAUI

**DRAFT
MASTER
PLAN**

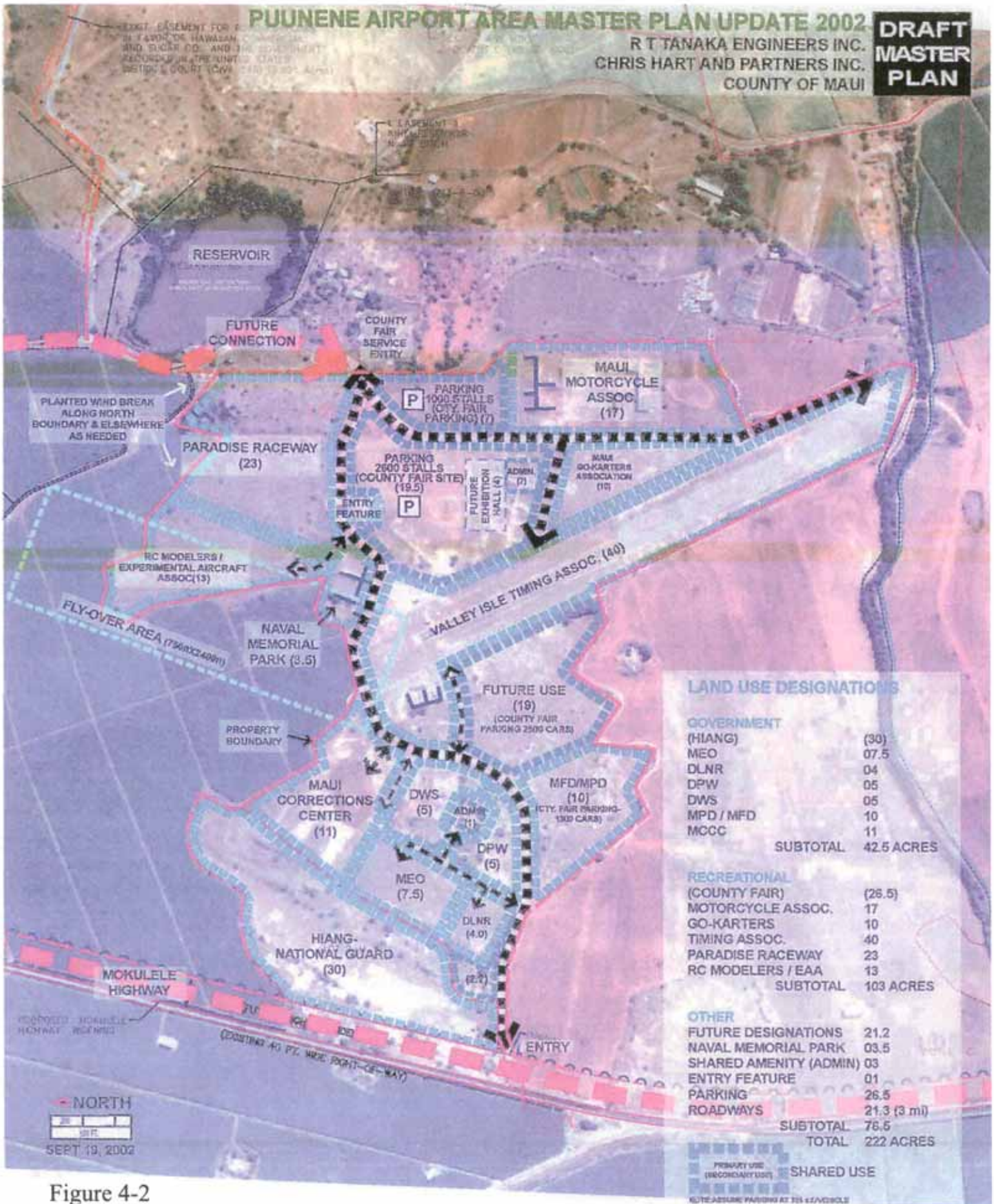


Figure 4-2

MAUI ISLAND PLAN

Other

Naval Memorial Park – Interpretive Center and Park

Administration – Administrative and Business Needs of Recreational Users

Entry Feature

Parking

Roadways

2. REGULATORY

State Land Use District

The tract is within the Agricultural District (Figure 4-3).

County Community Plan

80-acre parcel

The *Kīhei-Mākena Community Plan* designates the 80-acre parcel as Project District 10. According to the Maui County Code (Chapter 19.45), “the intent of a project district development is to provide for a flexible and creative planning approach rather than specific land use designations, for quality development.”

646-acre parcel

The *Kīhei-Mākena Community Plan* designates this parcel as Agricultural.

County Zoning

The entire property is zoned Agricultural.

Special Management Area

The entire property is not within the SMA.

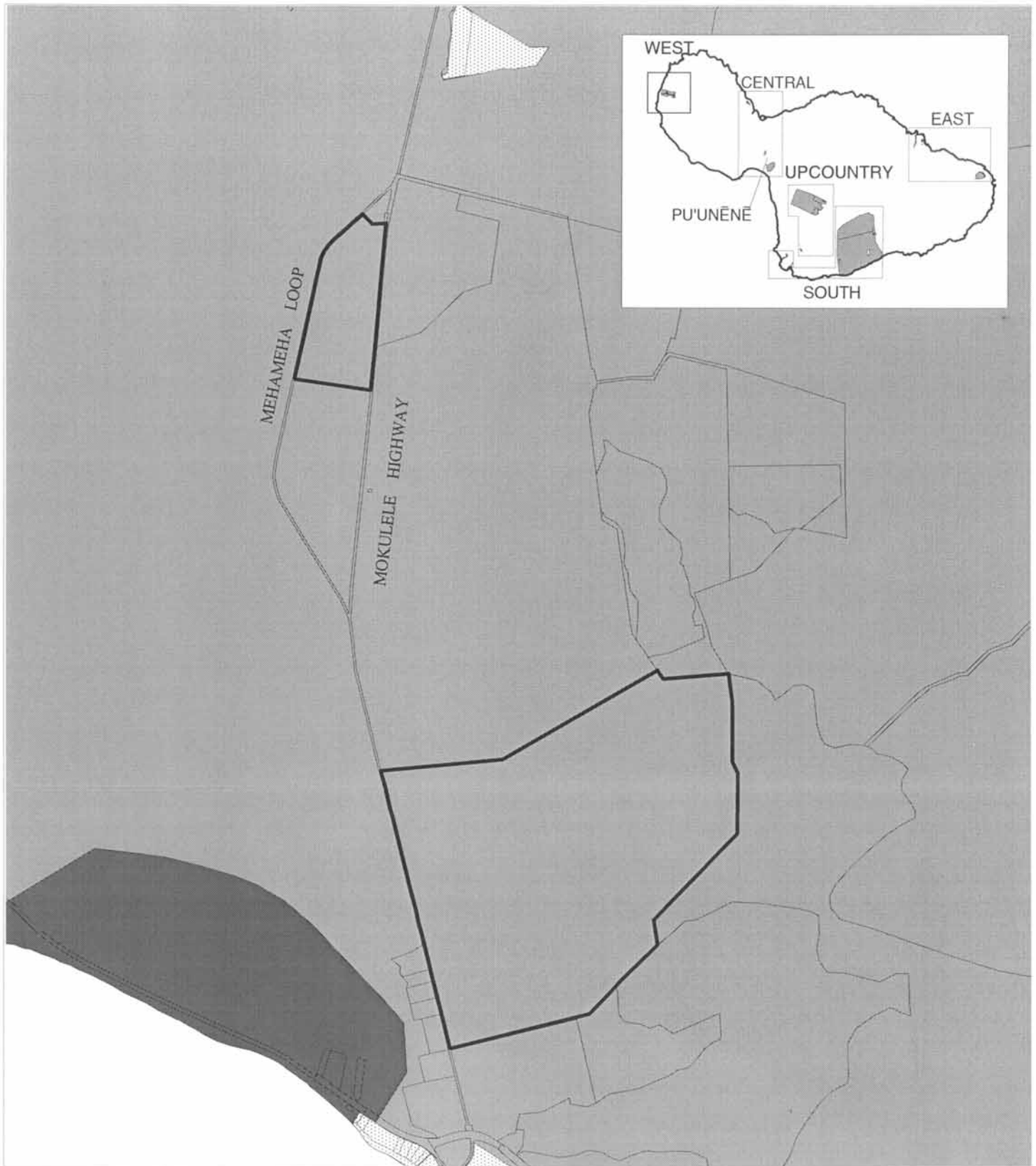
Underground Injection Control Line

The entire property is below the UIC line (Figure 4-4).

3. PHYSICAL CHARACTERISTICS

Climate

The temperature averages 75.6 degrees Fahrenheit during the year. According to the *Pu‘unēnē Airport Area Master Plan MEO Transportation Facility Final Master Plan Report* (Helber Hastert, May 1995), the prevailing winds at the Pu‘unēnē Airport area come from the north-northeast and north direction in speeds ranging from 17 to 21 knots. Frequent northerly winds are caused by the channelization of prevailing trade winds by Haleakalā and the West Maui Mountains. The windstreams for central Maui curve through the central valley, gradually changing from east northeasterly to northerly when traveling south toward Mā‘alaea Bay. Wind direction frequencies vary only slightly between seasons.



Legend

- Agricultural District
- Conservation District
- Urban District
- DHHL Land Boundary

Figure 4-3

PU'UNĒNĒ
State Land Use

MAUI LAND INVENTORY

DEPARTMENT OF HAWAIIAN HOME LANDS

NORTH



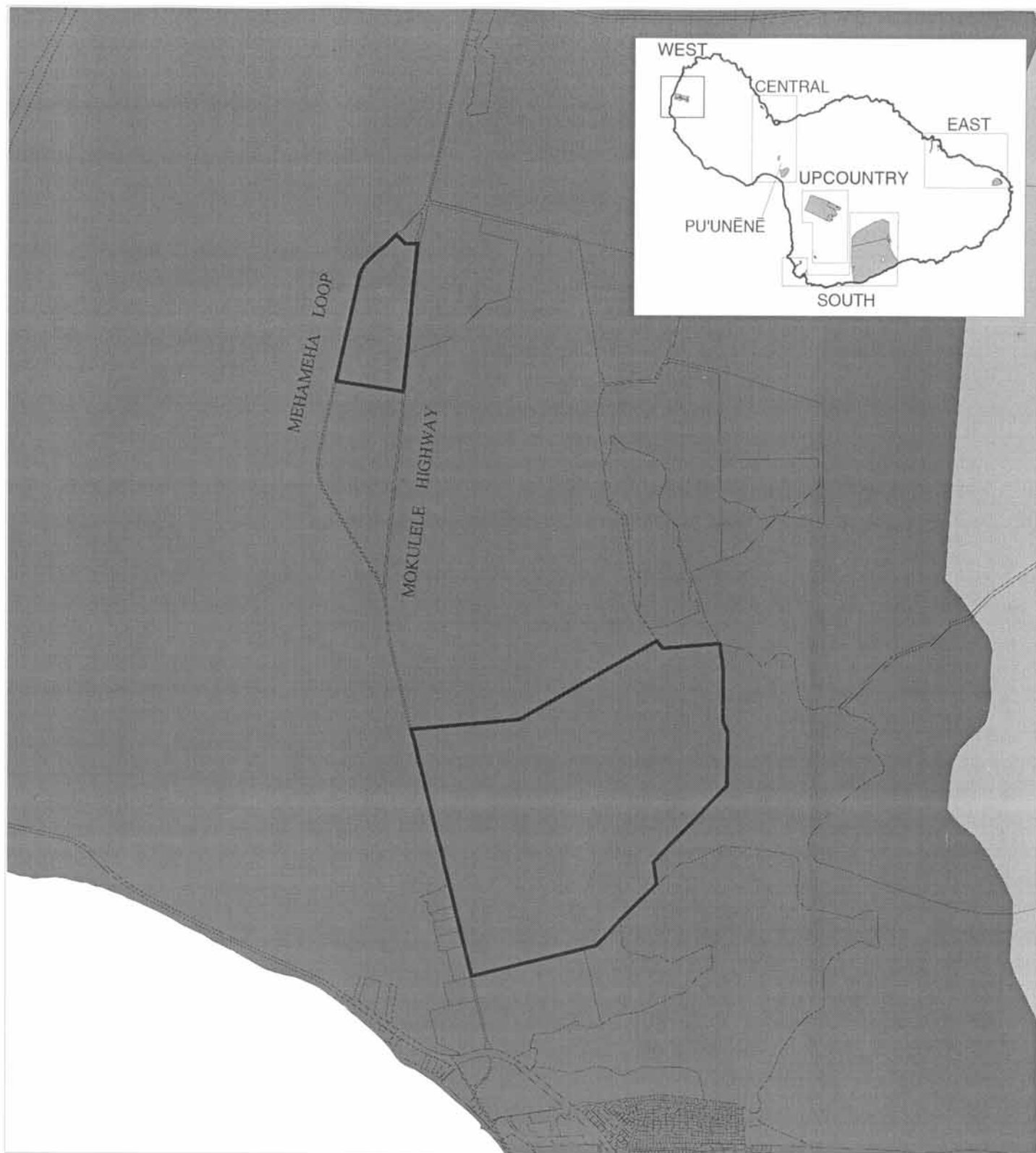
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4,000

(FEET)





Legend

- Areas Below (Makai) Underground Injection Control Line
- Areas Above (Mauka) Underground Injection Control Line
- DHHL Land Boundary

Figure 4-4

P'UUNĒNĒ

Underground Injection Control (UIC) Areas Map

MAUI LAND INVENTORY

DEPARTMENT OF HAWAIIAN HOME LANDS

NORTH



MAUI ISLAND PLAN

Soils

The USDA Soil Conservation Service Survey shows the following soils in the Pu'unēnē parcels (Figure 4-5):

- 'Ewa Silty Clay Loam, 0 to 3 percent slopes – This soil is used for sugarcane and homesites. Runoff is very slow and the erosion hazard is no more than slight.
- Pūlehu Cobbly Silt Loam, 0 to 3 percent slopes – This soil is used for sugarcane and pasture.
- Pūlehu Silt Loam, 0 to 3 percent slopes – This soil is used for sugarcane. Small acreages are used for home sites.
- Waiakoa Extremely Stony Silty Clay Loam, 3 to 7 percent slopes – This soil is used for sugarcane, pasture, and wildlife habitat.
- Alae Sandy Loam, 3 to 7 percent slopes – Most of this soil is used for sugarcane and pasture. It is similar to Alae Cobbly Sandy Loam, 0 to 3 percent slopes, except that there are no cobblestones on the surface. Runoff is slow, and the erosion hazard is slight.
- Waiakoa Extremely Stony Silty Clay Loam, 3 to 25 percent slopes, Eroded – This soil is used for pasture and wildlife habitat. In most areas about 50 percent of the surface layer has been removed by erosion. Runoff is medium, and the erosion hazard is severe.
- Waiakoa Very Stony Silty Clay Loam, 3 to 7 percent slopes – This soil is used for sugarcane, pasture, and wildlife habitat. Permeability is moderate. Runoff is slow, and the erosion hazard is slight.
- Waiakoa Silty Clay Loam, 3 to 7 percent slopes – This soil is used for sugarcane. Small acreages are used for pasture and home sites.

Agricultural Lands of Importance to the State of Hawai'i

The State of Hawai'i Department of Agriculture *ALISH* system of defining agricultural suitability classifies soils of this tract as "Prime Agricultural Land" and "Other Agricultural Land" (Figure 4-6).

Ground/Surface Water

80-acre parcel

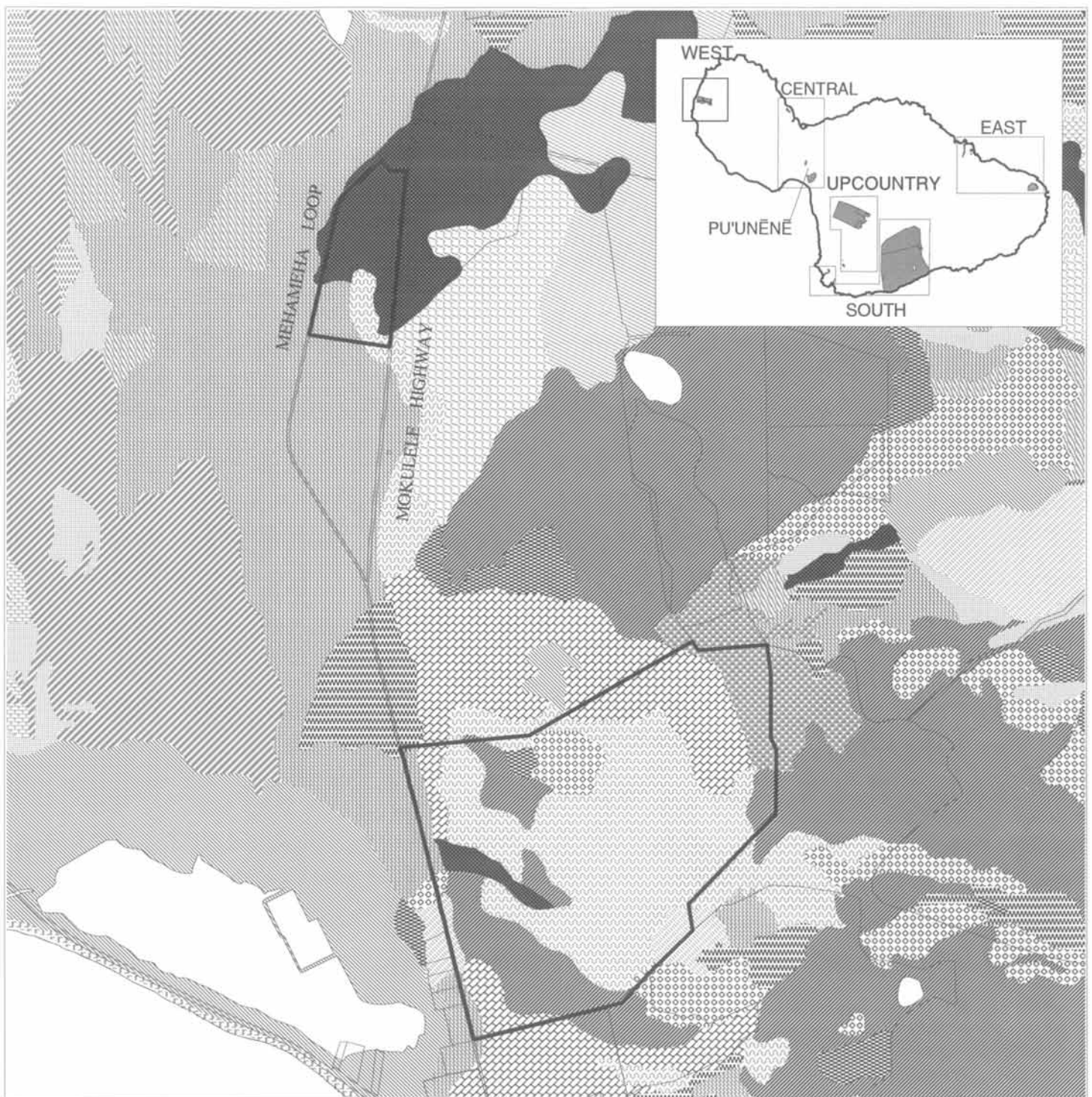
The USGS topographic map shows Pūlehu Stream, an intermittent stream, within this parcel.

646-acre parcel

The USGS topographic map shows Kolaloa Stream within this parcel. Kolaloa Stream is intermittent.

Rainfall

Located in the dry leeward plain of Central Maui, average rainfall in Pu'unēnē is relatively low, with approximately 15 inches per year (Helber Hastert, May 1995) (Figure 4-7).



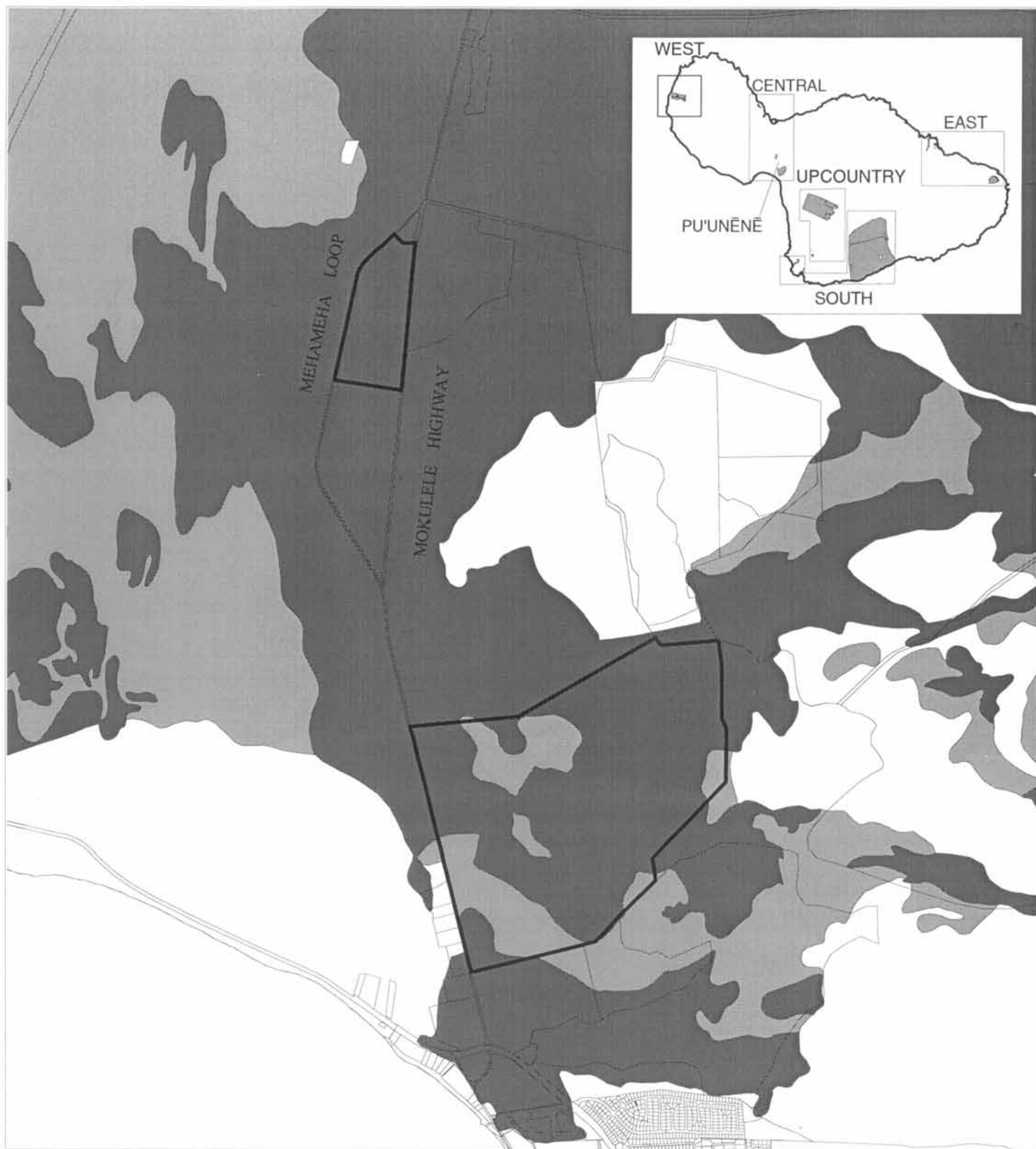
Legend

-  Ewa Silty Clay Loam, 0-3% Slopes
-  Pulehu Cobbly Silt Loam, 0-3% Slopes
-  Pulehu Silt Loam, 0-3% Slopes
-  Waiakoa Extremely Stony Silty Clay Loam, 3-7% Slopes
-  Alae Sandy Loam, 3-7% Slopes
-  Waiakoa Extremely Stony Silt Clay Loam, 3-25% Slopes, Eroded
-  Waiakoa Very Stony Silty Clay Loam, 3-7% Slopes
-  Waiakoa Silty Clay Loam, 3-7% Slopes
-  Alae Cobbly Sandy Loam, 3-7% Slopes
-  Alae Cobbly Sandy Loam, 0-3% Slopes
-  DHHL Land Boundary

Figure 4-5
PU'UNĒNĒ
Soil Conservation Service Survey
MAUI LAND INVENTORY

DEPARTMENT OF HAWAIIAN HOME LANDS





Legend

- Prime Agricultural Land
- Unique Agricultural Land
- Other Agricultural Land
- Unclassified Land
- DHHL Land Boundary

Figure 4-6

PU'UNĒNĒ

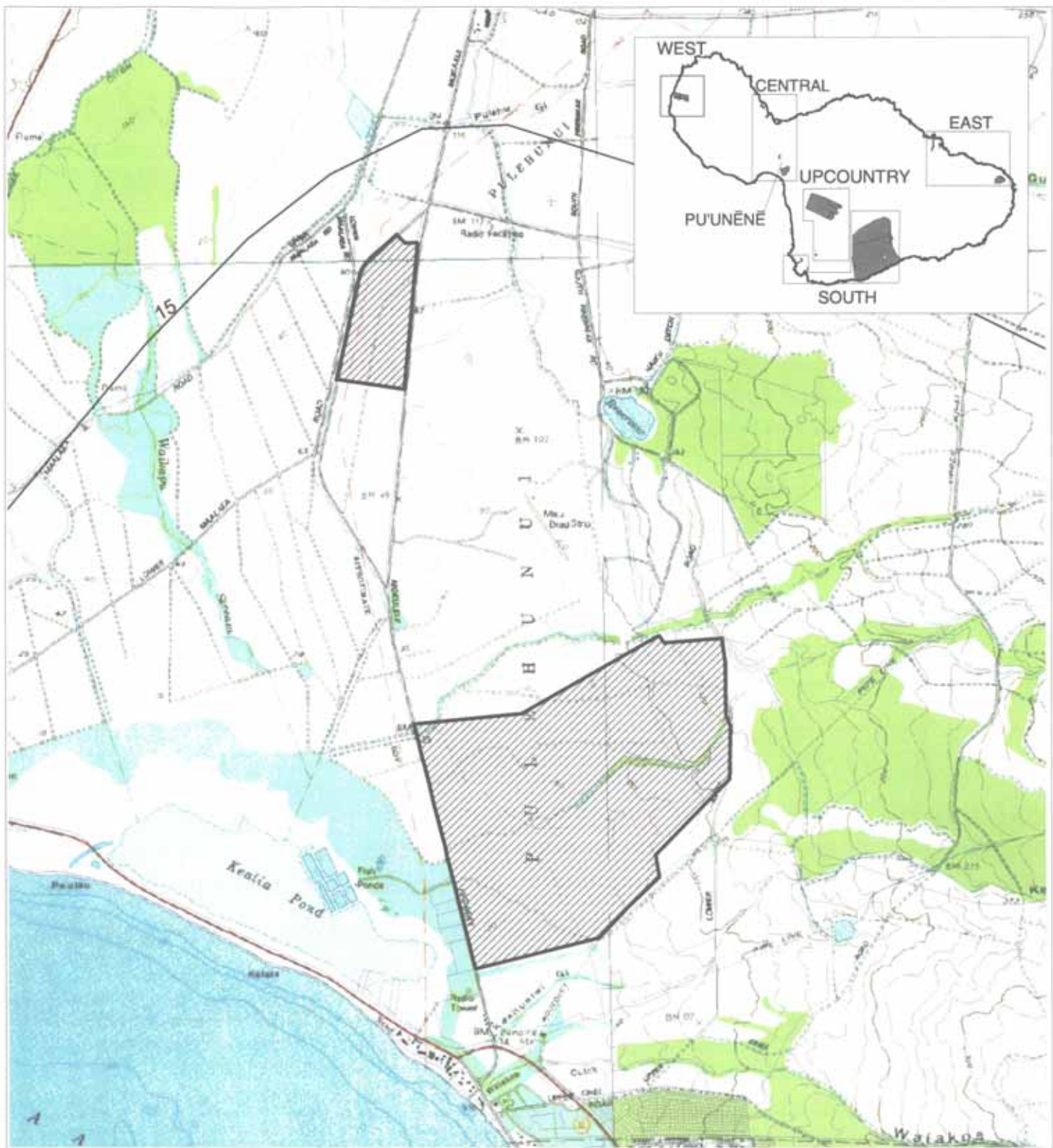
Agricultural Lands of Importance to the State of Hawaii (ALISH)

MAUI LAND INVENTORY

DEPARTMENT OF HAWAIIAN HOME LANDS

NORTH





Legend

-  DHHL Properties
-  Lines of Equal Average Annual Rainfall in Inches

Figure 4-7

PU'UNĒNĒ

USGS Map with Rainfall Isohyets

MAUI LAND INVENTORY

DEPARTMENT OF HAWAIIAN HOME LANDS



MAUI ISLAND PLAN

Topography/Slope

Land within the two parcels is generally gently sloping, with slopes averaging less than ten percent. Elevation ranges from approximately 220 feet above mean sea level (msl) at the northernmost point to 20 feet msl at the far southwest corner nearest to Kihei (Helber Hastert, May 1995) (Figure 4-7). As is common in most undeveloped or formerly developed areas, the tracts have several surface irregularities such as sinkholes and knolls. The southwest portion of the 646-acre parcel is prone to flooding, as runoff from the unnamed drainage course empties into this area. During heavy rainfall, minor depressions in this portion of the parcel may flood.

Drainage

The porous nature of the soils in Pu'unēnē facilitates a high percentage of rainfall recharge into the underlying basal aquifer. However, this recharge occurs only during heavy rainfall, about twice a year, and has been deemed inconsequential by the DLNR, Division of Water Resources Management. Basal water recharge occurs from irrigation water and from rainfall on the Haleakalā slopes, which can average as high as 60 inches per year.

Major drainage features within the two Pu'unēnē parcels consist of a number of gulches traversing the site and adjacent areas in an east to west direction, including the Pūlehu Gulch, Kolaloa Gulch, Keāhuaiwi Gulch, and an unnamed gulch. The USGS topographic map shows Pūlehu Gulch as a natural drainage feature in the 80-acre parcel. Pūlehu Gulch runs north of the tract, intersecting Mokulele Highway where it turns and flows downstream along the highway toward Waikapū Stream and Keālia Pond. The entire Pu'unēnē tract lies within a drainage basin that drains into Keālia Pond and the adjacent coastline in Mā'alaea Bay (Helber Hastert & Fee, May 1995).

Flood Zone

The Flood Insurance Rate Map indicates that a small portion of the 646-acre parcel is in Zone A, which designates areas inundated by the 100-year floodplain for which base flood elevations are not determined (Figure 4-8). The majority of both parcels are in Zone X, which designates areas determined to be outside of the 500-year floodplain.

Noise

The parcels are subject to noise from the Maui Raceway Park drag strip. Although a noise study was not conducted for Pu'unēnē, a noise study was performed for the Pana'ewa Drag Strip adjacent to DHHL's proposed Waiākea Houselots in Hilo, which has conditions very similar to those at Pu'unēnē. The Hilo study noted that when racing is in progress, noise from drag racing greatly impacts the residential areas and that noise from the drag strip when racing was in progress exceeded U.S. Department of Housing and Urban Development (HUD) noise levels standards. This prohibits DHHL from using HUD financing on the project. Based on the Hilo study, similar impacts can be expected for the Pu'unēnē properties.



Legend

- ZONE A:
Special Flood Hazard Areas Inundated by 100-Year Flood
No Base Flood Elevations Determined
- ZONE X:
Areas Determined To Be Outside 500-Year Floodplain
- ZONE X500:
Areas of 500-Year Flood
- DHHL Land Boundary

Source: Federal Emergency Management Agency

Figure 4-8

PU'UNĒNĒ

Flood Insurance Rate Map

MAUI LAND INVENTORY

DEPARTMENT OF HAWAIIAN HOME LANDS

NORTH



2,000

0

4,000



(FEET)



MAUI ISLAND PLAN

4. ENVIRONMENTAL CHARACTERISTICS

Historic Sites/Archeology/Cultural Resources

No known prehistoric sites exist in the Pu'unēnē tract. Given the extensive construction and prolonged cultivation in the area, it is unlikely that any potential archaeological sites would remain intact.



While there are no known pre-contact archeological sites, the area does contain many military bunkers and other former military structures. Under the State's Chapter 6E, HRS regulations, any structure over 50 years old may be considered a historic structure and thus the bunkers and other structures could be considered as historic properties/sites. In addition to their age, because of their WWII significance, compliance with Federal Historic Preservation Section 106 regulations (36 CRF 800) may be required if federal funding is

involved for any projects affecting the bunkers and other structures.

If the structures are to be demolished, further documentation will be required in accordance with the DLNR State Historic Preservation Division's regulations. If construction were to occur on the tract, the State Historic Preservation Officer (SHPO) would recommend an inventory survey of the WWII Naval Air Station structures and proper documentation by qualified personnel, prior to any construction. A report of findings would need to be submitted to the SHPO for review and acceptance, prior to construction. Should sub-surface cultural remains be uncovered during construction activities, work would cease immediately and the SHPO would be notified for further instructions. (Hibbard, 1991 in DLNR 1991b)

Endangered Species

A review of the Nature Conservancy of Hawai'i's Heritage Database indicates that there are no records of any rare or endangered species or ecosystems within either parcel. The entire area has been under intensive plantation agriculture for many years and the central portion was developed first as a civilian airport and later expanded to serve as a Naval Air Station during World War II. These land development activities have likely destroyed the natural habitat. Documentary research indicates that the area appears to contain no native natural communities underlying the parcel. It may be possible for rare plants to be found in the small, undeveloped gulches within the properties.

Several major intermittent gulches/drainage courses pass through the properties and drain into Keālia Pond, a national wildlife refuge located to the southwest. The Nature Conservancy Heritage Database documents sightings of endangered Hawaiian Coot and

MAUI ISLAND PLAN

Hawaiian Stilt at the refuge as recently as 1991. Sightings of rare or endangered birds have also been made at HC&S's Reservoir 90, located adjacent to the properties.

Critical Habitat

The U.S. Fish and Wildlife Service has not designated any critical habitat areas within the Pu'unēnē tract.

5. INFRASTRUCTURE

Access/Roadways

80-acre parcel

Access to this parcel is by a 40-foot right-of-way off of Mokulele Highway.

646-acre parcel

There are four access points that serve the property off of Mokulele Highway.

Water System (Lines, Wells)

The USGS topographic map does not show any wells or tanks within the properties. A 36-inch Central Maui transmission water main runs along the westerly side of the tract. Two abandoned wells exist in the immediate area; however, these wells are no longer in use. Water from both wells would be acceptable for irrigation, but not for drinking without mixing or treatment, assuming that chloride levels for the wells have not changed. According to the *County of Maui Infrastructure Assessment Update*, Pu'unēnē is a water district sub-area within the Wailuku-Kahului Community Plan region, which is part of the Central Maui Water System. For more information on the Central Maui Water System see the regional assessment at the beginning of this chapter.

Wastewater Treatment and Disposal

There are no sewer lines on or adjacent to the tract. Flows would be pumped to the Wailuku-Kahului WWRF for treatment and disposal. The County is planning to construct the Central Maui Wastewater Reclamation Facility adjacent to the Pu'unēnē tract to serve the needs of the Kahului and Kihei areas. Eventually, this facility would provide wastewater treatment for Pu'unēnē.

Solid Waste Disposal

Currently the County does not provide solid waste disposal service to the properties. However, if solid waste is generated it will be collected by the County and taken to the Central Maui Landfill.

Telephone Service

Sandwich Isles Communications will provide telephone service to the properties.

MAUI ISLAND PLAN

Electrical Service

MECO provides electrical service to Pu'unēnē through a 69-kV line from the Mā'alaea Generating Station. The transmission line runs along Mokulele Highway near the southwest corner of the tract.

Cable Television Service

Both parcels are within the service area of Oceanic Cable.

C. PU'UNĒNĒ TRACT ANALYSIS

In developing planning alternatives for Pu'unēnē, a number of factors weighed heavily in determining appropriate uses for these lands (Figure 4-9).

Kīhei-Mākena Community Plan – Project District 10

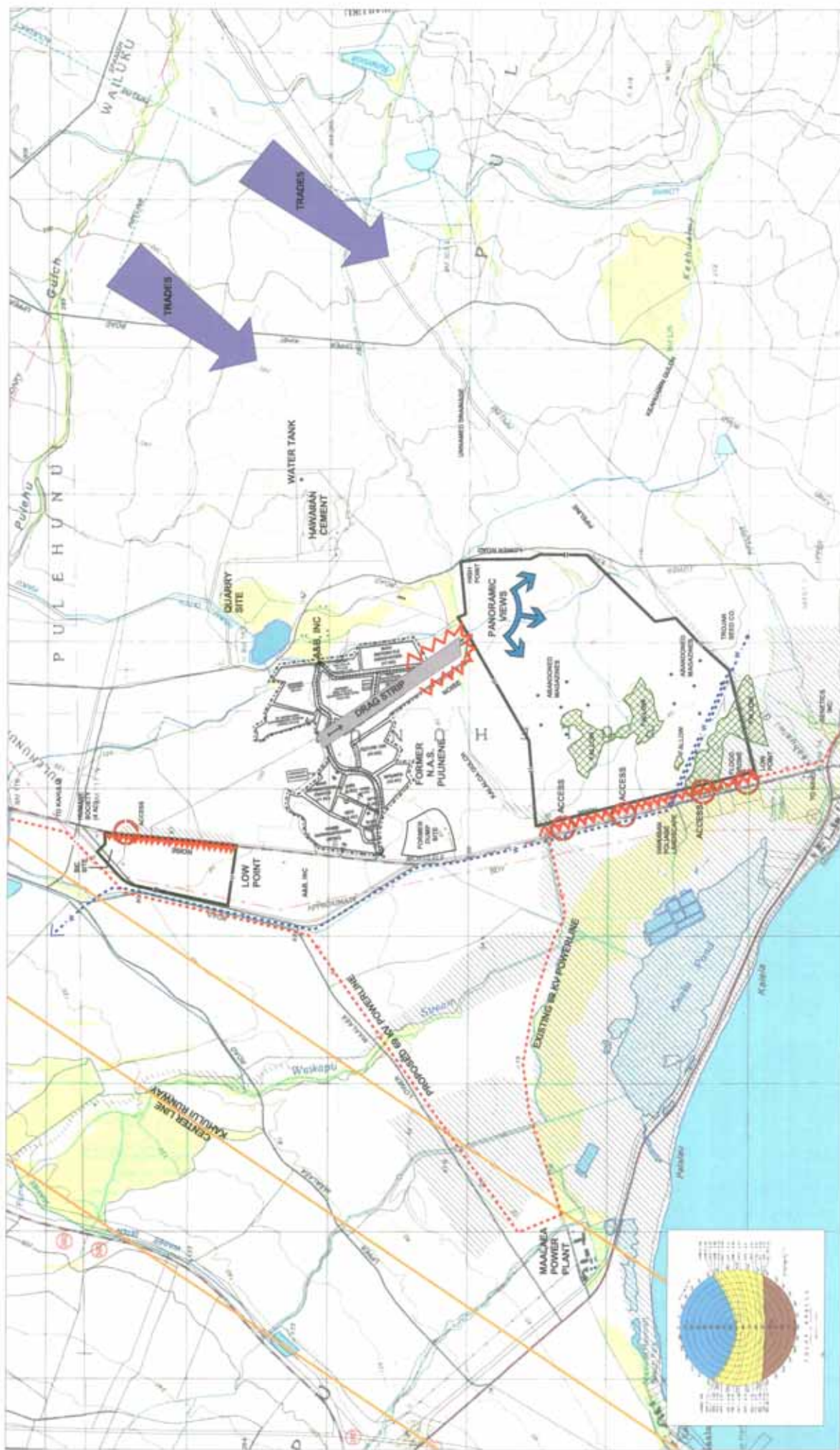
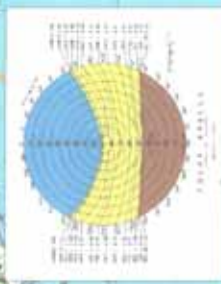
The entire Pu'unēnē tract lies within the Kīhei-Mākena Community Plan district. The *Kīhei-Mākena Community Plan* designates 257 acres of the Pu'unēnē Airport area and 189 acres between Mokulele Highway and Mehamaha Loop as "Project District 10." The 189 acres between Mokulele Highway and Mehamaha Loop includes the 80-acre DHHL Pu'unēnē parcel. This 189-acre area is presently used for sugar cultivation with the exception of the four-acre Maui Humane Society parcel.

According to the *Kīhei-Mākena Community Plan*, the objective of Project District 10 "is to establish a master planned recreational and industrial expansion area to meet future recreation needs and to provide areas for industrial activities, including government facilities, whose locations are better suited away from urban areas." The *Kīhei-Mākena Community Plan* also states, "site planning shall seek to maximize the range of potential user groups while minimizing potential for incompatibilities between recreational, governmental, and industrial activities."

The *Kīhei-Mākena Community Plan* also makes recommendations regarding overall development in the community plan region. Regarding industrial uses along Mokulele Highway, Objective k under Land Use states, in part:

Provide for moderate expansion of light industrial use in the Central Maui Baseyard, along Mokulele Highway. These areas should limit retail business or commercial activities to the extent that they are accessory or provide service to the predominate light industrial use. These actions will place industrial uses near existing and proposed transportation arteries for the efficient movement of goods.

Regarding continued agricultural in the region, Objective p under Land Use states: "Prevent urbanization of important agricultural lands."

Figure 8-6
continued

1

W 1998: East Boundary
2000: East Boundary
2002: East Boundary

Source: United States Census Bureau, Bureau of Economic Analysis, *Survey of Current Business*, 1997, 1998, 1999, 2000, 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022, 2023, 2024, 2025, 2026, 2027, 2028, 2029, 2030, 2031, 2032, 2033, 2034, 2035, 2036, 2037, 2038, 2039, 2040, 2041, 2042, 2043, 2044, 2045, 2046, 2047, 2048, 2049, 2050, 2051, 2052, 2053, 2054, 2055, 2056, 2057, 2058, 2059, 2060, 2061, 2062, 2063, 2064, 2065, 2066, 2067, 2068, 2069, 2070, 2071, 2072, 2073, 2074, 2075, 2076, 2077, 2078, 2079, 2080, 2081, 2082, 2083, 2084, 2085, 2086, 2087, 2088, 2089, 2090, 2091, 2092, 2093, 2094, 2095, 2096, 2097, 2098, 2099, 2100, 2101, 2102, 2103, 2104, 2105, 2106, 2107, 2108, 2109, 2110, 2111, 2112, 2113, 2114, 2115, 2116, 2117, 2118, 2119, 2120, 2121, 2122, 2123, 2124, 2125, 2126, 2127, 2128, 2129, 2130, 2131, 2132, 2133, 2134, 2135, 2136, 2137, 2138, 2139, 2140, 2141, 2142, 2143, 2144, 2145, 2146, 2147, 2148, 2149, 2150, 2151, 2152, 2153, 2154, 2155, 2156, 2157, 2158, 2159, 2160, 2161, 2162, 2163, 2164, 2165, 2166, 2167, 2168, 2169, 2170, 2171, 2172, 2173, 2174, 2175, 2176, 2177, 2178, 2179, 2180, 2181, 2182, 2183, 2184, 2185, 2186, 2187, 2188, 2189, 2190, 2191, 2192, 2193, 2194, 2195, 2196, 2197, 2198, 2199, 2200, 2201, 2202, 2203, 2204, 2205, 2206, 2207, 2208, 2209, 2210, 2211, 2212, 2213, 2214, 2215, 2216, 2217, 2218, 2219, 2220, 2221, 2222, 2223, 2224, 2225, 2226, 2227, 2228, 2229, 2230, 2231, 2232, 2233, 2234, 2235, 2236, 2237, 2238, 2239, 2240, 2241, 2242, 2243, 2244, 2245, 2246, 2247, 2248, 2249, 2250, 2251, 2252, 2253, 2254, 2255, 2256, 2257, 2258, 2259, 2260, 2261, 2262, 2263, 2264, 2265, 2266, 2267, 2268, 2269, 2270, 2271, 2272, 2273, 2274, 2275, 2276, 2277, 2278, 2279, 2280, 2281, 2282, 2283, 2284, 2285, 2286, 2287, 2288, 2289, 2290, 2291, 2292, 2293, 2294, 2295, 2296, 2297, 2298, 2299, 2300, 2301, 2302, 2303, 2304, 2305, 2306, 2307, 2308, 2309, 2310, 2311, 2312, 2313, 2314, 2315, 2316, 2317, 2318, 2319, 2320, 2321, 2322, 2323, 2324, 2325, 2326, 2327, 2328, 2329, 2330, 2331, 2332, 2333, 2334, 2335, 2336, 2337, 2338, 2339, 2340, 2341, 2342, 2343, 2344, 2345, 2346, 2347, 2348, 2349, 2350, 2351, 2352, 2353, 2354, 2355, 2356, 2357, 2358, 2359, 2360, 2361, 2362, 2363, 2364, 2365, 2366, 2367, 2368, 2369, 2370, 2371, 2372, 2373, 2374, 2375, 2376, 2377, 2378, 2379, 2380, 2381, 2382, 2383, 2384, 2385, 2386, 2387, 2388, 2389, 2390, 2391, 2392, 2393, 2394, 2395, 2396, 2397, 2398, 2399, 2400, 2401, 2402, 2403, 2404, 2405, 2406, 2407, 2408, 2409, 2410, 2411, 2412, 2413, 2414, 2415, 2416, 2417, 2418, 2419, 2420, 2421, 2422, 2423, 2424, 2425, 2426, 2427, 2428, 2429, 2430, 2431, 2432, 2433, 2434, 2435, 2436, 2437, 2438, 2439, 2440, 2441, 2442, 2443, 2444, 2445, 2446, 2447, 2448, 2449, 2450, 2451, 2452, 2453, 2454, 2455, 2456, 2457, 2458, 2459, 2460, 2461, 2462, 2463, 2464, 2465, 2466, 2467, 2468, 2469, 2470, 2471, 2472, 2473, 2474, 2475, 2476, 2477, 2478, 2479, 2480, 2481, 2482, 2483, 2484, 2485, 2486, 2487, 2488, 2489, 2490, 2491, 2492, 2493, 2494, 2495, 2496, 2497, 2498, 2499, 2500, 2501, 2502, 2503, 2504, 2505, 2506, 2507, 2508, 2509, 2510, 2511, 2512, 2513, 2514, 2515, 2516, 2517, 2518, 2519, 2520, 2521, 2522, 2523, 2524, 2525, 2526, 2527, 2528, 2529, 2530, 2531, 2532, 2533, 2534, 2535, 2536, 2537, 2538, 2539, 2540, 2541, 2542, 2543, 2544, 2545, 2546, 2547, 2548, 2549, 2550, 2551, 2552, 2553, 2554, 2555, 2556, 2557, 2558, 2559, 2560, 2561, 2562, 2563, 2564, 2565, 2566, 2567, 2568, 2569, 2570, 2571, 2572, 2573, 2574, 2575, 2576, 2577, 2578, 2579, 2580, 2581, 2582, 2583, 2584, 2585, 2586, 2587, 2588, 2589, 2590, 2591, 2592, 2593, 2594, 2595, 2596, 2597, 2598, 2599, 2600, 2601, 2602, 2603, 2604, 2605, 2606, 2607, 2608, 2609, 2610, 2611, 2612, 2613, 2614, 2615, 2616, 2617, 2618, 2619, 2620, 2621, 2622, 2623, 2624, 2625, 2626, 2627, 2628, 2629, 2630, 2631, 2632, 2633, 2634, 2635, 2636, 2637, 2638, 2639, 2640, 2641, 2642, 2643, 2644, 2645, 2646, 2647, 2648, 2649, 2650, 2651, 2652, 2653, 2654, 2655, 2656, 2657, 2658, 2659, 2660, 2661, 2662, 2663, 2664, 2665, 2666, 2667, 2668, 2669, 2670, 2671, 2672, 2673, 2674, 267

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Existing Agricultural Uses

Currently, the properties of the Pu'unēnē tract are leased to HC&S for sugar cane cultivation. Most of the surrounding lands are owned by HC&S Company and are also in sugar cane cultivation. These are the core sugar producing lands of the HC&S Plantation. The Pu'unēnē fields are highly valued by HC&S, as yields from these lands are considered above average for sugar cane production. The Pu'unēnē fields are particularly important because of their proximity to the Pu'unēnē sugar mill. The reduced hauling cost represents substantial savings for HC&S, which is seen as vital to its economic survival.

Prevailing Winds

The prevailing winds are from the north/northeast direction. With the current sugarcane cultivation in the region, windborne smoke and dust during harvesting and replanting will impose significant impacts to any use on DHHL's Pu'unēnē properties. Complaints from nearby users are a serious concern and constraint for HC&S sugar plantation operations.

Adjacent Uses

Maui Raceway Park abuts the northeast boundary of the DHHL 646-acre parcel. The drag strip has a thirty year operating history, covered by a license to occupy and currently holds two to three events a month. Plans have been filed with the County to upgrade the drag strip, issue a long-term lease and perhaps increase the number of events held each month. Drag strip noise presents a major constraint to potential development of the DHHL site. A noise study was prepared for the Pana'ewa Drag Strip in Hilo, which is adjacent to DHHL's proposed Waiākea House Lots, and has conditions notably similar to those at Pu'unēnē. The drag strip in Pana'ewa has seriously constrained the use of DHHL's adjacent land. In addition to the drag strip, the area also contains a dirt bike/motocross track, a sports bike/motorcycle track, a go-cart track, and an open space area for remote control model aircraft. These uses, along with a public address system announcing various events, create a serious noise concern for any neighboring uses.

In addition to Maui Raceway Park, the County of Maui has developed the Pu'unēnē Airport Area Master Plan on approximately 200 acres located to the north and upwind of DHHL's 646-acre parcel (Figure 4-2). Existing and proposed uses include the Hawaii Army National Guard Armory (which is under construction), the Maui Economic Opportunity Transportation Base Yard, a Maui County Corrections Center, the Maui County Public Works Wastewater Treatment Facility, and the Maui County Fairgrounds. In addition, the County Department of Public Works, Department of Water Supply, Police Department, and Fire Department will all have vehicle maintenance and base yard facilities located on the 200 acres. Because trade winds typically blow from the northeasterly direction, the DHHL site will be downwind of these proposed industrial facilities.

Other Existing Site Conditions

The 646-acre parcel was part of a Naval Air Station prior to use for sugar cane cultivation. The site contains two sets of reinforced concrete magazine storage bunkers originally used to store live ammunition. Depending on the site's proposed use, the magazine storage

MAUI ISLAND PLAN

bunkers can either be demolished or reused. If they are to be demolished, a historic study may need to be conducted to determine any historic value of the storage bunkers.

Pu'unēnē Economic Development Potential

The above on- and off-site conditions of the Pu'unēnē properties seriously constrain the feasibility of meeting the DHHL beneficiary homestead residential demand in this area. On the other hand, the opportunity to take advantage of the potential to generate income from the commercial/industrial development is significant.

Commercial and industrial properties provide the DHHL the greatest opportunity for income generation. Regardless of the market for commercial/industrial properties is at this time, DHHL should consider which of their land holdings has the near- or long-term opportunity to produce income for the Department. The Pu'unēnē lands, with their proximity to the primary transportation corridor (Mokulele Highway) between Kahului (Central Maui) and the Kihei-Wailea region (South Maui), afford the optimum exposure to all travel between the airport and South Maui. In addition, with Maui County's Pu'unēnē Airport Master Plan area and the associated proposed County uses, this area has already been targeted as a center for government and industrial enterprises.

The current industrial/commercial market may not warrant moving ahead rapidly on development of the Pu'unēnē lands (See table below). A market study for the proposed Maui Business Park Phase 2 reported demand for roughly 290 acres of new light industrial space in Central Maui. Less than 20 acres of industrial land are currently available with 57 additional acres proposed. If the planned 179-acre Maui Business Park Phase 2 is developed, this would still leave a need for over 30 acres of light industrial land over the next 20 years. This does not preclude the opportunity for DHHL to position the property for future industrial/commercial development should the market opportunity arise.

Project Name	Location	Project Area in Acres	Primary Tenants
<u>Existing (Absorbed)</u>			
Kahului Industrial Area	Near Airport/Pond	197	Light Industrial (LI), Mixed Use (1)
Wailuku Industrial Park	Central Wailuku	55	LI, Mixed-Commercial
Millyard Business Park	Central Wailuku	30	Business, LI
<u>Existing (In-Sales)</u>			
Maui Business Park Phase IB	Mauka Kahului	32	Retail, Business, LI
Maui Business Park Phase IA (Maui Marketplace)	Mauka Kahului	46	Retail, Business, LI
<u>Proposed</u>			
Maui Business Park (Phase II)	Mauka Kahului	179	Retail, Business, LI
Maui Lani Business Park	Mauka Kahului	57	Business, Limited Commercial, LI

MAUI ISLAND PLAN

D. PU'UNĒNĒ TRACT ALTERNATIVES

The *Maui Island Plan* is proposing only one primary use, industrial/commercial, for DHHL's Pu'unēnē tract. No homestead residential or subsistence agriculture uses are being proposed due to the impact from adjacent uses. No homestead pastoral or supplemental agriculture uses are being proposed because; 1) The Beneficiary Survey indicate that Pu'unēnē is not a preferred tract for ranching or farming by the beneficiaries; 2) there may be more profitable uses for Pu'unēnē in the future. The majority of the acreage would be left in general agriculture, retaining the existing HC&S Sugar lease or leasing to other agriculture users.

1. 80-ACRE PU'UNĒNĒ PARCEL

Alternative 1

Alternative 1 proposes roughly 60 acres of light industrial use and 20 acres of general agriculture on the 80-acre Pu'unēnē parcel (Figure 4-10). Given the reported demand for roughly 290 acres of new light industrial space in Central Maui, development of both the proposed 179-acre Maui Business Park Phase 2 and the proposed 57-acre Maui Lani Business Park are built, that would accommodate approximately 80 percent of this demand. The remaining 20 percent (approximately 60 acres) would be accommodated on the 80-acre DHHL parcel. The remaining 20 acres, which will be set aside for general agriculture, can either be moved along with another phase of light industrial use when the market improves or it can remain in the general agriculture designation until the appropriate time to introduce another more intensive use.

Alternative 2

Alternative 2 would offer all 80 acres for industrial use (Figure 4-11). The proposed 80 acres of DHHL's industrial acreage would meet the light industrial shortfall noted above and would more aggressively challenge A&B's preeminence in Maui's commercial industrial market. The County's plans for Pu'unēnē Airport will be conducive to this alternative.

2. 646-ACRE PU'UNĒNĒ PARCEL

Alternative 1

Alternative 1 proposes to leave the entire 646 acres in general agriculture with the opportunity to continue the existing sugar cane lease with HC&S (Figure 4-10). At this time, it is difficult to predict the most beneficial future use of these lands. While HC&S is currently a viable sugar plantation, should the profitability of sugar cultivation decline in the future, there may be more profitable alternative use options for these lands. At this time, leaving the land in general agricultural use provides DHHL with the flexibility to make future decisions according to changing market conditions and/or beneficiary needs.

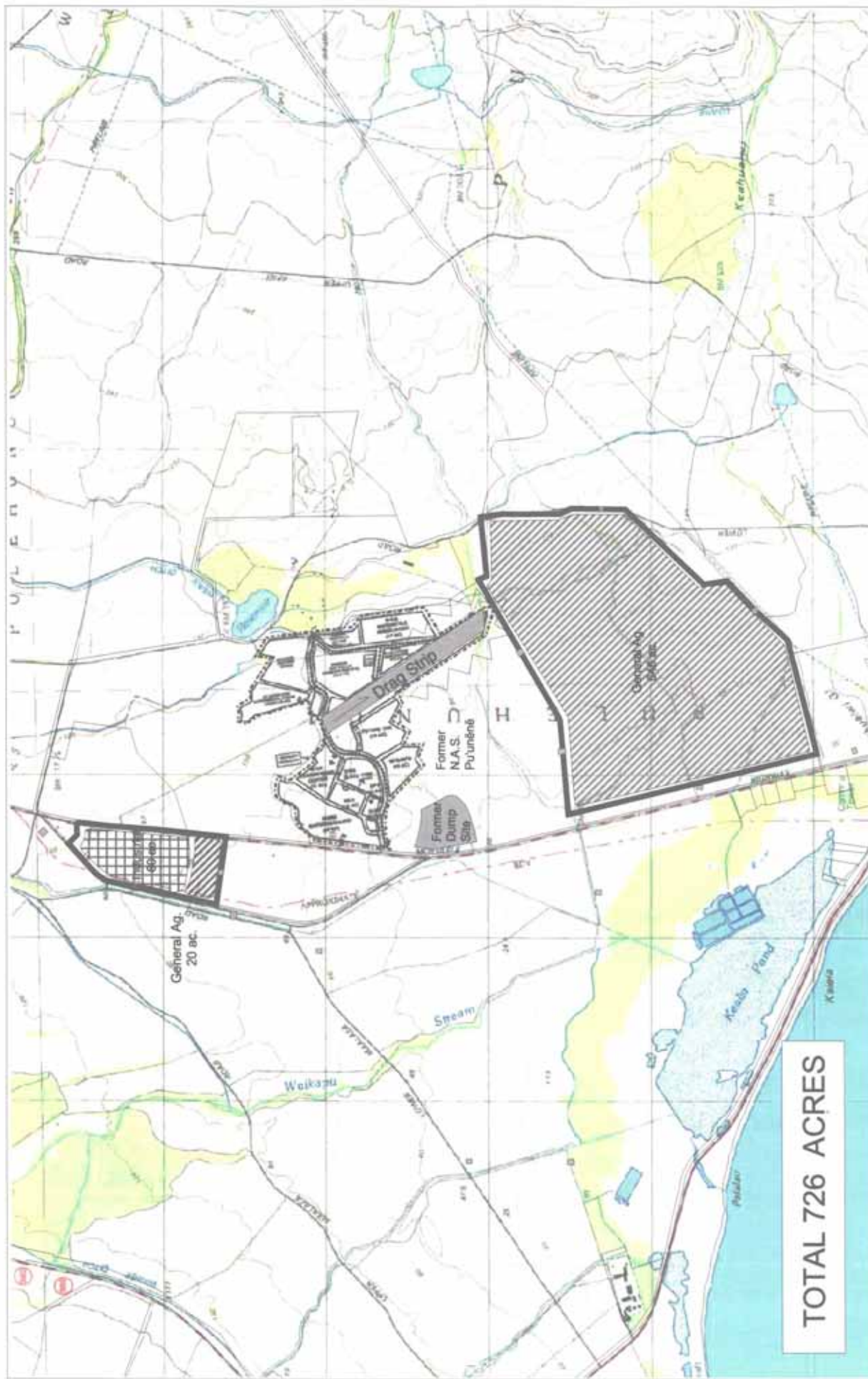


Figure 4-10

PU'UNĒNĒ

Land Use Alternative 1

MAUI LAND INVENTORY

DEPARTMENT OF HAWAIIAN HOME LANDS



193R
7/02/03

Land Use Summary		Approx. Acres
	General Agriculture	666
	Industrial	60
Total		726

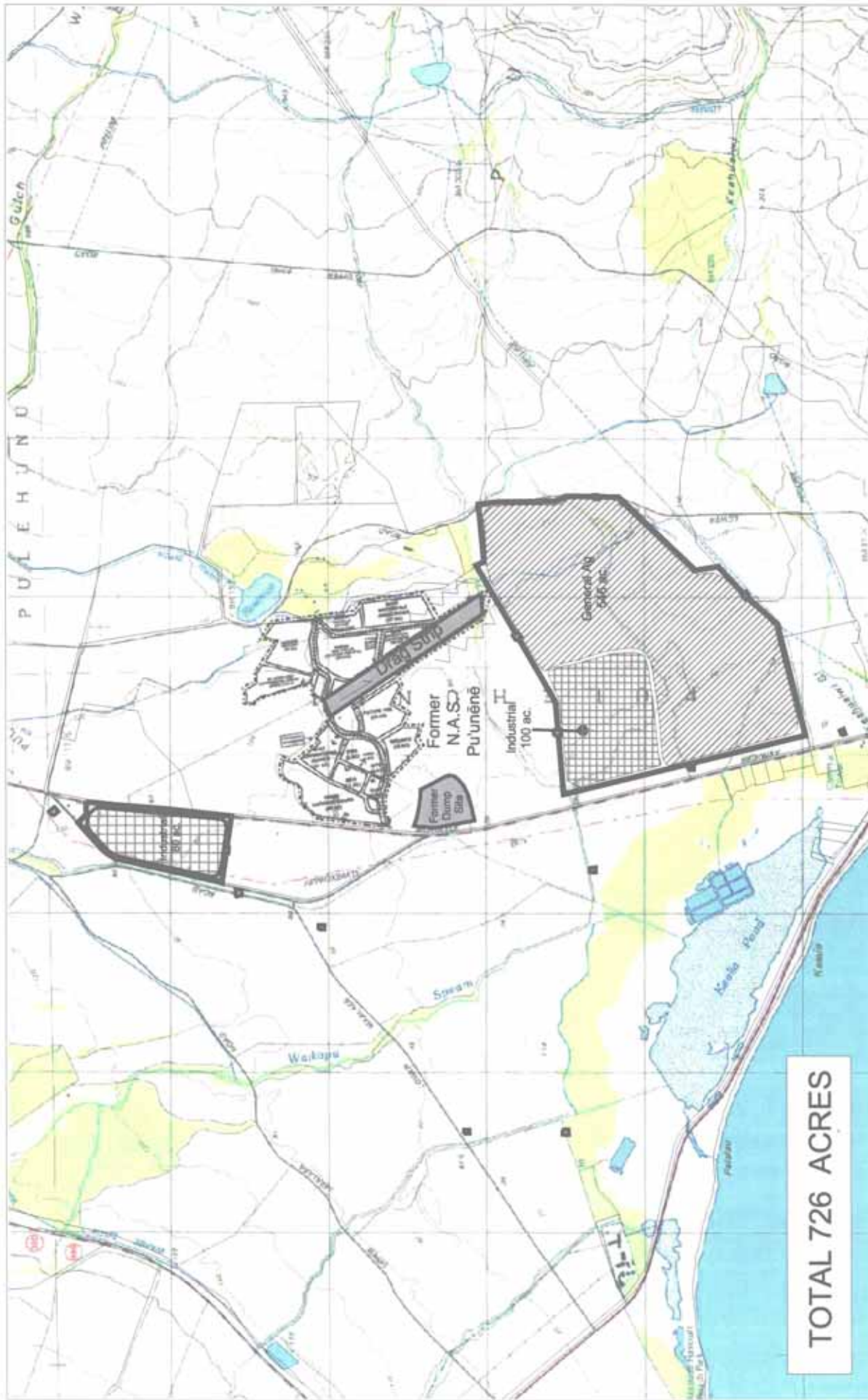
TOTAL 726 ACRES

Legend



DHHHL Land Boundary

Source: United States Geologic Survey and
Department of Hawaiian Homelands



TOTAL 726 ACRES

Land Use Summary		Approx Acres
	General Agriculture	546
	Industrial	180
	Total	726

Legend
 DHHHL Land Boundary

Figure 4-11
 PU'UNĒNĒ
 Land Use Alternative 2

MAUI LAND INVENTORY

DEPARTMENT OF HAWAIIAN HOME LANDS



MAUI ISLAND PLAN

Alternative 2

Alternative 2 proposes to set aside 100 acres adjacent to the County's Pu'unēnē Airport Master Plan Area (Figure 4-11). These lands are set aside for DHHL's long-range needs (over the next 20 years) for income generation purposes. These lands are impacted by the existing and proposed uses of the County's Pu'unēnē Airport Master Plan Area, but will be ideal for industrial uses that would be incompatible with other more urban areas of Maui.

The 546 acres of the parcel would be left in general agricultural use with the opportunity to continue leasing to HC&S or other private agricultural producers.

E. PU'UNĒNĒ TRACT FINAL PLAN

The *Maui Island Plan* does not envision the Pu'unēnē properties as fulfilling the homestead residential objectives of DHHL. Residential uses cannot be situated within the proximity of activities or operations, such as the drag strip, proposed sewage treatment plant, and sugarcane operations, which adversely affect air, noise, and odor conditions. The most appropriate use of these lands would be for industrial and commercial use.

1. 80-ACRE PU'UNĒNĒ PARCEL

The preferred alternative for the 80-acre parcel is to develop the entire parcel into a commercial/light industrial subdivision (Figure 4-12). The 80-acre parcel is designated in the *Kīhei-Mākena Community Plan* as Project District 10. The objective of Project District 10 is to establish industrial expansion areas to meet future needs and to provide areas for industrial activities whose locations are better suited away from urban areas.

By following the County's lead, the 80-acre parcel can be the centerpiece of commercial/light industrial mixed-use development for DHHL. The parcel has road frontage and access off of Mokulele Highway. Access will have to be coordinated with DOT, following the reconfiguration of Mokulele Highway.

This portion of the 80-acre parcel adjacent to the Humane Society must be developed sensitively. All traffic from the airport to the South Maui will view the area, with the West Maui Mountains in the background. Proper design controls will establish a quality project that will provide the optimum economic return to DHHL.

2. 646-ACRE PU'UNĒNĒ PARCEL

The preferred alternative for the 646-acre parcel is to set aside 100 acres for industrial use adjacent to the Pu'unēnē Airport Master Plan Area (Figure 4-12). This would be contiguous to the Kīhei-Mākena Community Plan Project District 10, which sets aside expansion areas for industrial activities (including heavy industrial) that are better suited away from urban areas. The location is away from the highway and downwind of those activities and/or operations producing adverse environmental conditions, including noise

MAUI ISLAND PLAN

from the Maui Raceway Park drag strip, smells from the Maui County Public Works Wastewater Treatment Facility, and air pollution from HC&S harvesting operations. The location of the 100-acre industrial parcel is away from Mokulele Highway so that heavy or noxious industrial uses will not impact the scenic quality of Mokulele Highway. Water demand for the 100 acres of industrial use is approximately 600,000 gallons per day. The amount of sewer effluent for the 100 acres is an estimated 250,000 gallons per day.

The remaining 546 acres would be set aside for general agricultural use with the opportunity to continue the existing sugar cane lease with HC&S. As mentioned in the alternatives discussion, it is difficult to predict what the future will hold for the 546 acres. While retaining the HC&S lease is a viable interim use, should the future prove different, there may be more profitable uses for these lands. At this time, the maintaining the land in general agriculture use provides DHHL with the flexibility to re-designate these lands in the future according to changing conditions.

F. WAIEHU TRACT BASELINE INFORMATION

Waiehu is a suburb located three miles north of Wailuku.

1. INVENTORY

TMK and Acreage

Waiehu contains roughly 91.1 acres, identified as TMK 3-2-12:03, 3-2-13:01, 09 and 3-2-21:01-41 (Figure 4-1).



Existing Uses

Waiehu is comprised of 147 single-family units that were constructed in two phases. Phase 1 was built in 1993 and Phase 2 was completed in 2001. A third phase, Waiehu Kou 3, is in the planning and design phase and is proposed to contain an additional 115 units. Infrastructure for Phase 3 is expected to be completed in 2004. Existing residential lot sizes for the first two Waiehu subdivisions average 10,000 square feet. There is an existing 3-acre park located at the north end of Phase 1.

Licenses

Maui Electric Company & GTE HTCO - Utilities Easement
TMK 3-2-13:08 (portion) 1.960 acres

Department of Water Supply - Waterline Easement
TMK 3-2-13:08 (portion) 1.960 acres

Maui Electric Company- Utilities Phase 2 Easement
TMK 3-12-13:01 (portion) 5.5 acres

MAUI ISLAND PLAN

County of Maui- Sewer Phase 2 Easement
TMK 3-2-22; 3-2-23 acres N/A

County of Maui- Drainage Phase 2 Easement
TMK 3-2-22; 3-2-23 acres N/A

Adjacent Uses

Waiehu is bound to the north and east by the Waiehu Golf Course and to the south and west by Kahekili Highway. Cane fields that once surrounded the area have been converted to diversified agricultural use or remain fallow.

Proposed Future Surrounding Uses

C. Brewer has sold several large lots west of this tract. Future uses on these lots have not yet been determined.

2. REGULATORY

State Land Use District

The majority of Waiehu is in the Agricultural District; a small portion is in the Urban District (Figure 4-13).

County Community Plan

The *Wailuku-Kahului Community Plan* designates the tract as Agricultural use.

County Zoning

The tract is zoned Agriculture.

Special Management Area

This tract is within the Special Management Area (Figure 4-14).

Underground Injection Control Line

Waiehu is below the UIC line (Figure 4-15).

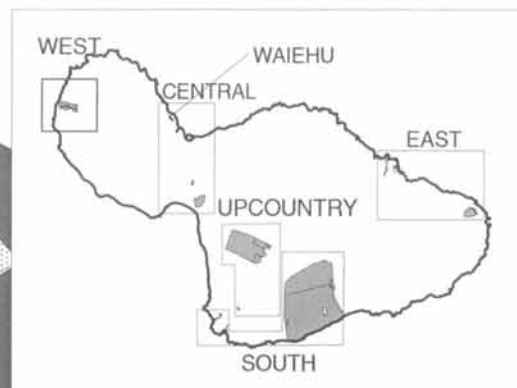
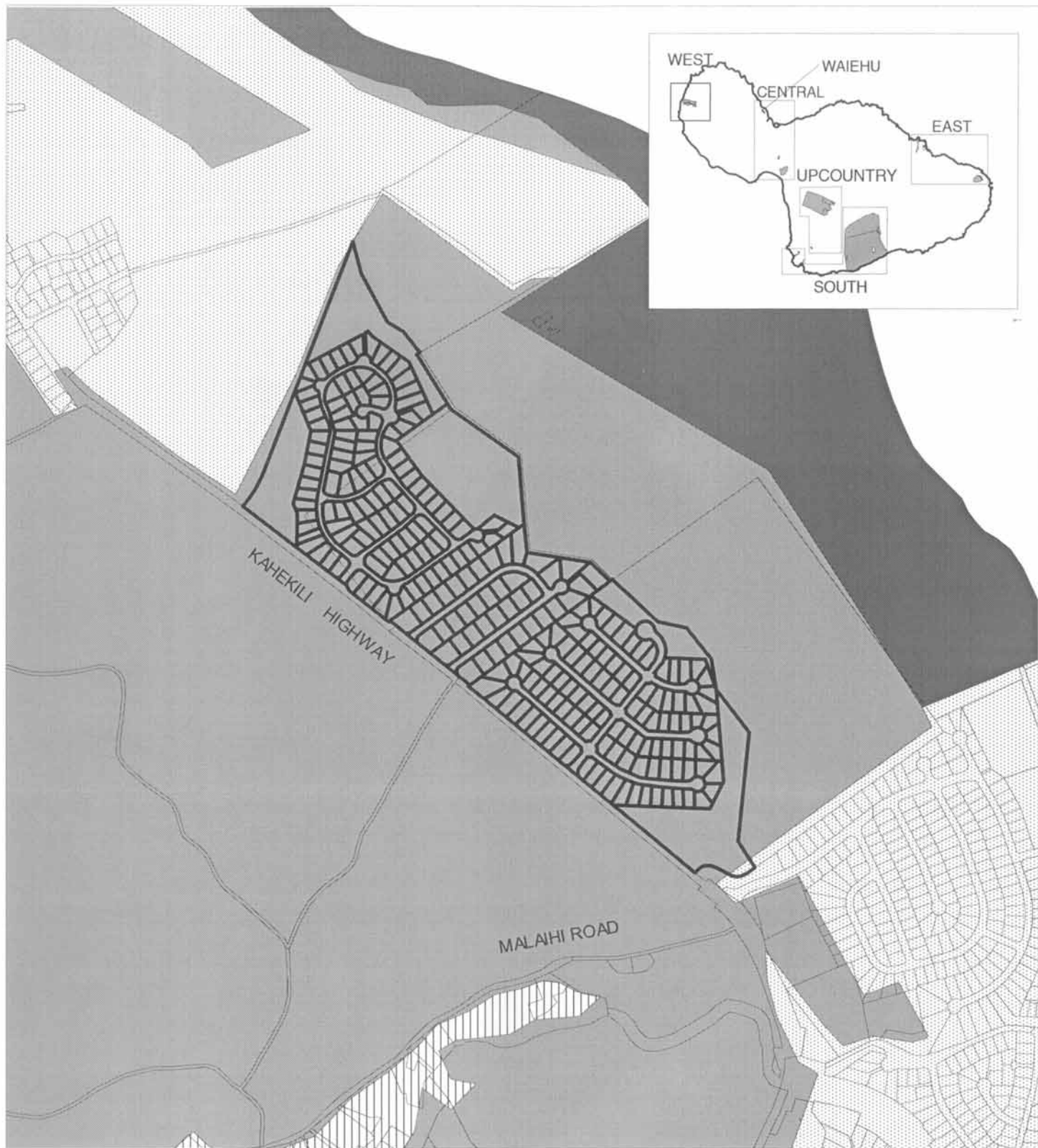
3. PHYSICAL CHARACTERISTICS

Climate

Waiehu's climate is typically warm and humid, with an average annual temperature of 76 degrees Fahrenheit.

Soils

The USDA Soil Conservation Service Survey Map shows the following soils in the Waiehu tract (Figure 4-16).



Legend






-  Agricultural District
-  Conservation District
-  Rural District
-  Urban District
-  DHHL Land Boundary

Figure 4-13

WAIIEHU

State Land Use

MAUI LAND INVENTORY

DEPARTMENT OF HAWAIIAN HOME LANDS

NORTH



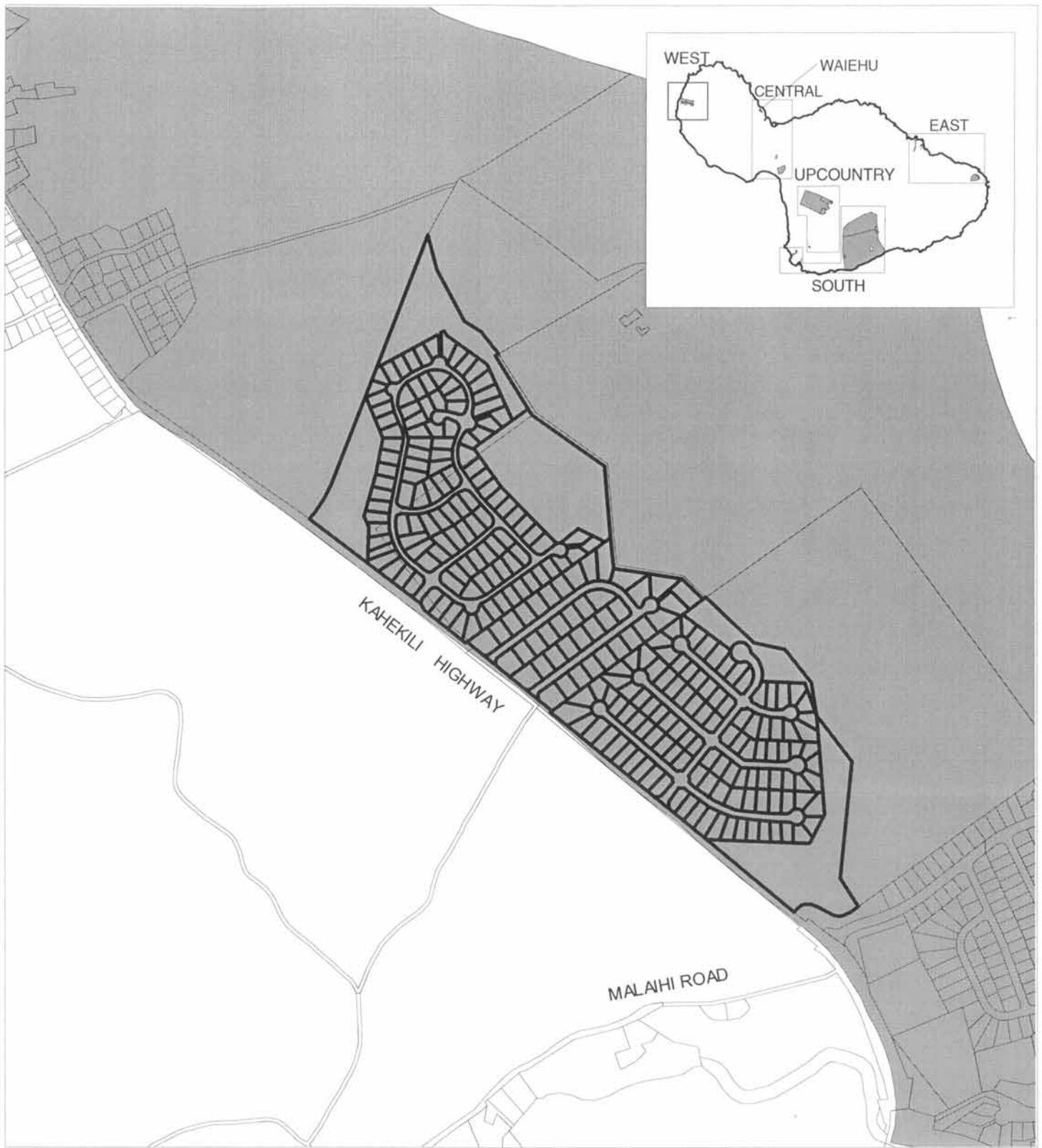
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Legend

- Special Management Area
- DHHL Land Boundary

Figure 4-14

WAIEHU
Special Management Area (SMA)

MAUI LAND INVENTORY

DEPARTMENT OF HAWAIIAN HOME LANDS

NORTH



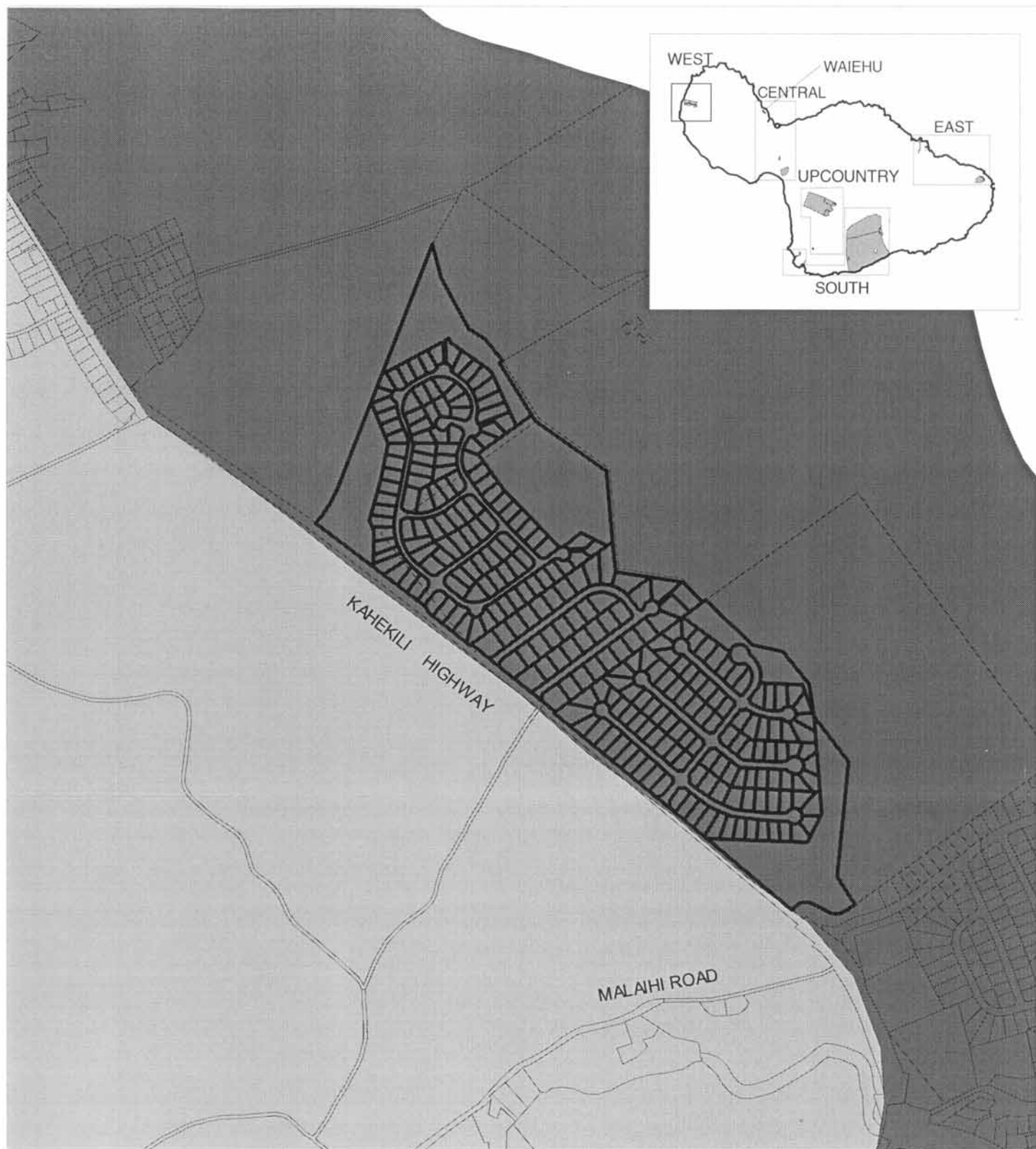
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Legend

- Areas Below (Makai) Underground Injection Control Line
- Areas Above (Mauka) Underground Injection Control Line
- DHHL Land Boundary

Figure 4-15

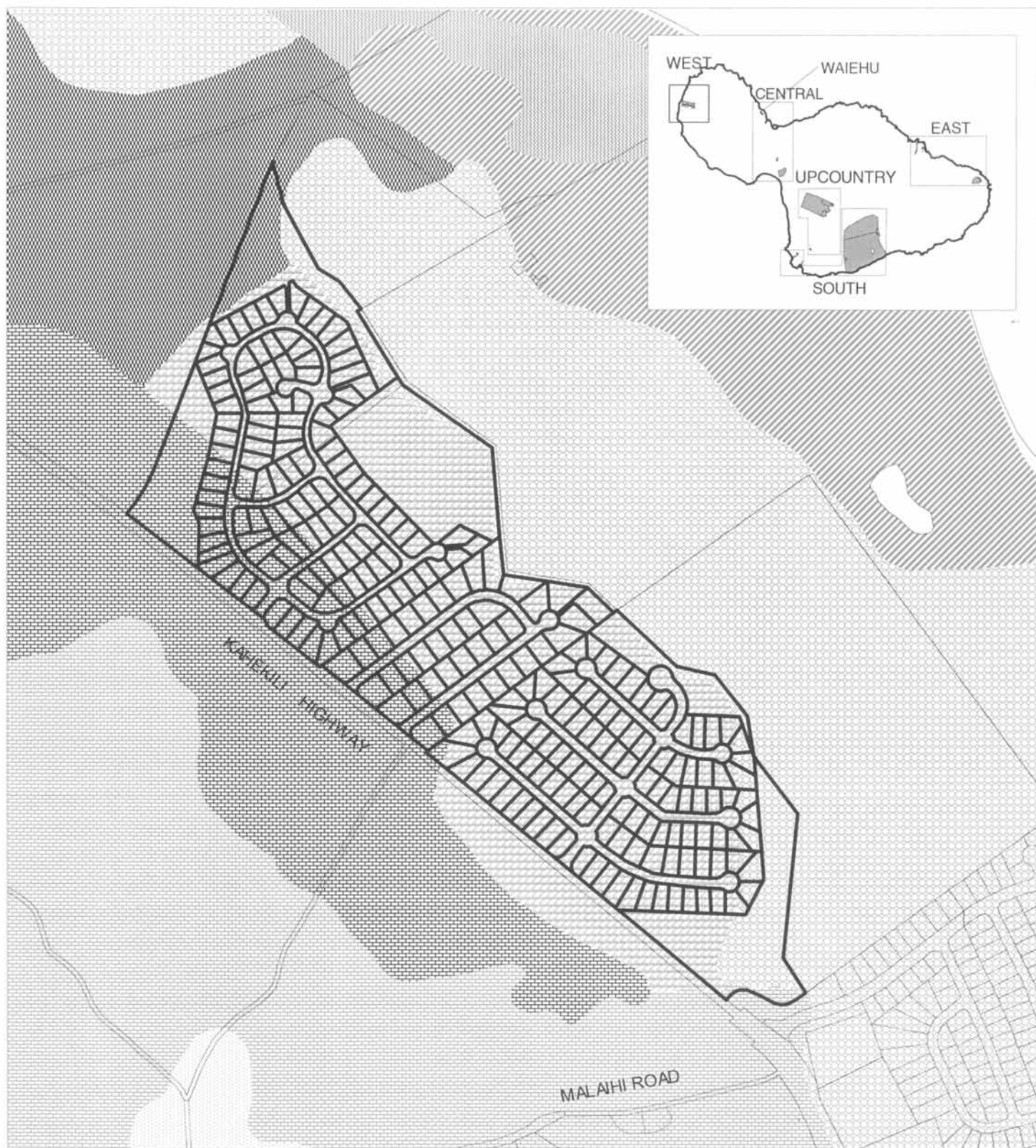
WAIEHU

Underground Injection Control (UIC) Areas Map

MAUI LAND INVENTORY

DEPARTMENT OF HAWAIIAN HOME LANDS





Legend







-  Iao Clay, 3-7% Slopes
-  Puuone Sand, 7-30% Slopes
-  Iao Silty Clay, 0-3% Slopes
-  Wailuku Silty Clay, 3-7% Slopes
-  Wailuku Silty Clay, 7-15% Slopes
-  DHHL Land Boundary

Figure 4-16

WAlIEHU

Soil Conservation Service Survey

MAUI LAND INVENTORY

DEPARTMENT OF HAWAIIAN HOME LANDS

NORTH



500

0

1,000

(FEET)



MAUI ISLAND PLAN

- ʻĪao Clay, 3 to 7 percent slopes – This soil is used for sugarcane and homesites. Permeability is moderately slow. Runoff is medium, and the erosion hazard is slight to moderate.
- Puʻuone Sand, 7 to 30 percent slopes – This soil is used for pasture and home sites. Permeability is rapid, runoff is slow, and the hazard of wind erosion is moderate to severe.
- ʻĪao Silty Clay, 0 to 3 percent slopes – This soil is used for sugarcane. Runoff is slow and the erosion hazard is no more than slight.
- Wailuku Silty Clay, 3 to 7 percent slopes – This soil is used for sugarcane and homesites. Runoff is slow, and the erosion hazard is slight.
- Wailuku Silty Clay, 7 to 15 percent slopes – This soil is used mostly for sugarcane. A small acreage is used for pasture and home sites. Permeability is moderate. Runoff is slow to medium, and the erosion hazard is slight to moderate.

Agricultural Lands of Importance to the State of Hawaiʻi

The State of Hawaiʻi Department of Agriculture *ALISH* system of defining agricultural suitability classifies the majority of the lands of Waiehu as “Prime Agricultural Land.” The remaining lands are not classified by the *ALISH* system (Figure 4-17).

Ground/Surface Water

The USGS topographic map shows no natural water sources.

Rainfall

Annual rainfall for this tract averages 30 inches (Figure 4-18).

Topography/Slope

The USGS topographic map shows an elevation range between 40 to 100 feet (Figure 4-18). The land slopes from one to two percent.

Drainage

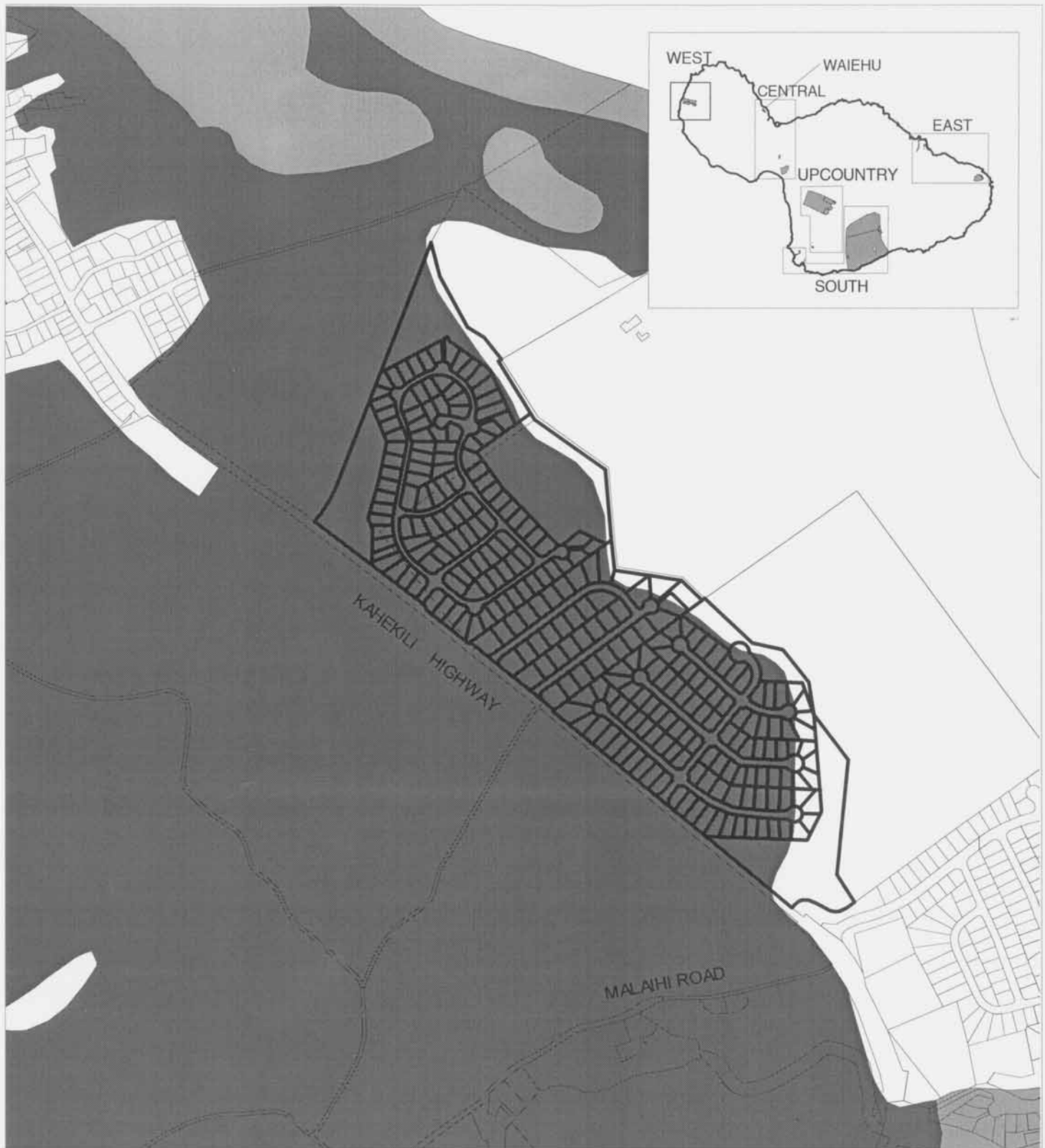
The USGS topographic map shows no natural drainage features.

Flood Zone

The Flood Insurance Rate Map indicates that nearly all of Waiehu falls within Zone X, which designates areas determined to be outside of the 500-year floodplain (Figure 4-19). Small portions of Waiehu are within Zone A, which designates areas inundated by the 100-year flood, for which base flood elevations are not determined, as well as Zone X500, which designates areas inundated by 500-year flood.

Noise

Noise in this area is primarily from Kahekili Highway.



Legend

- Prime Agricultural Land
- Unique Agricultural Land
- Other Agricultural Land
- Unclassified Land
- DHHL Land Boundary

Source: State of Hawaii Department of Agriculture

Figure 4-17

WAIIEHU

Agricultural Lands of Importance to the State of Hawaii (ALISH)

MAUI LAND INVENTORY

DEPARTMENT OF HAWAIIAN HOME LANDS

NORTH



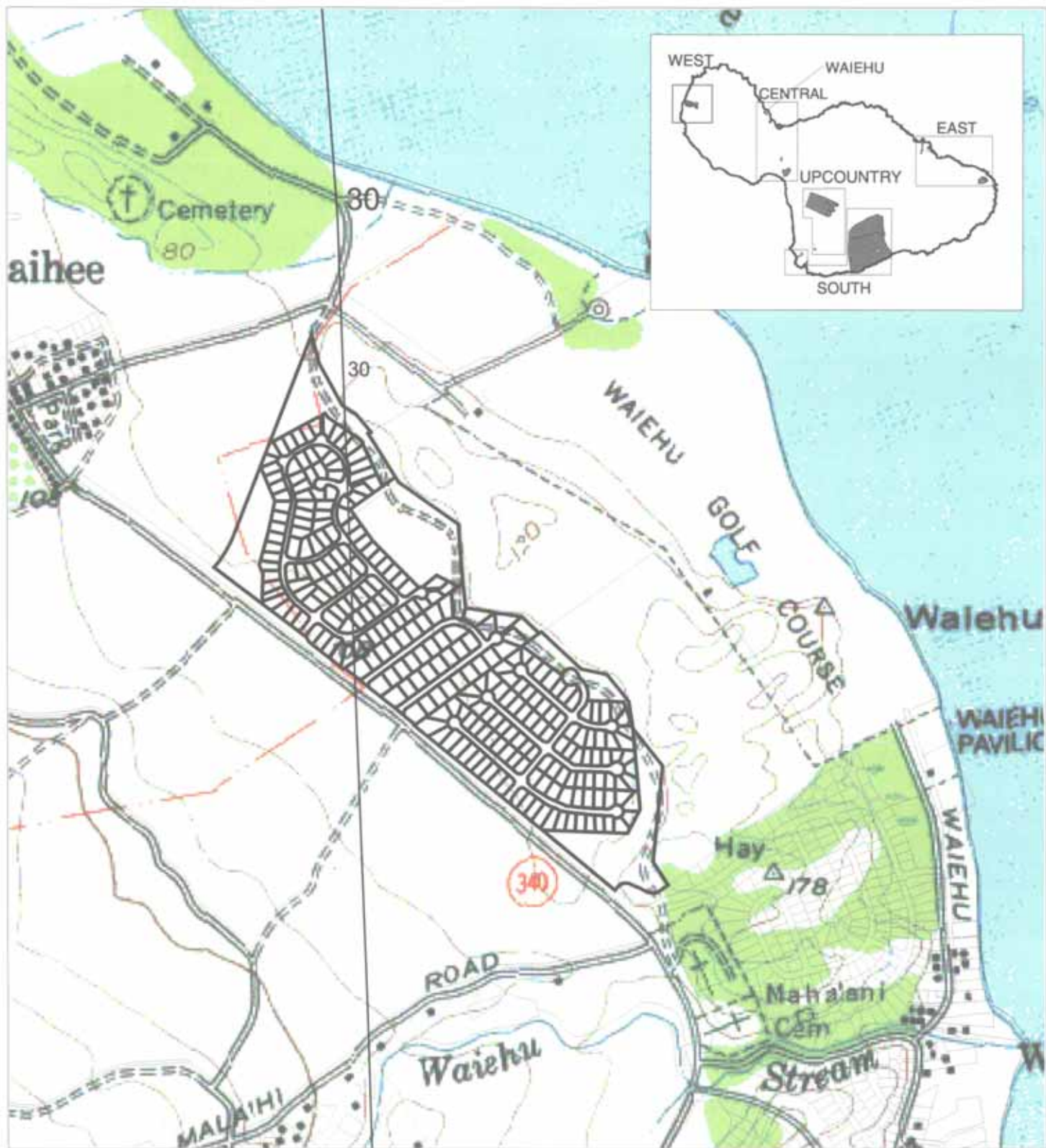
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Legend

-  DHHL Properties
-  Lines of Equal Average Annual Rainfall in Inches

Figure 4-18

WAIIEHU

USGS Map with Rainfall Isohyets

MAUI LAND INVENTORY

DEPARTMENT OF HAWAIIAN HOME LANDS

NORTH



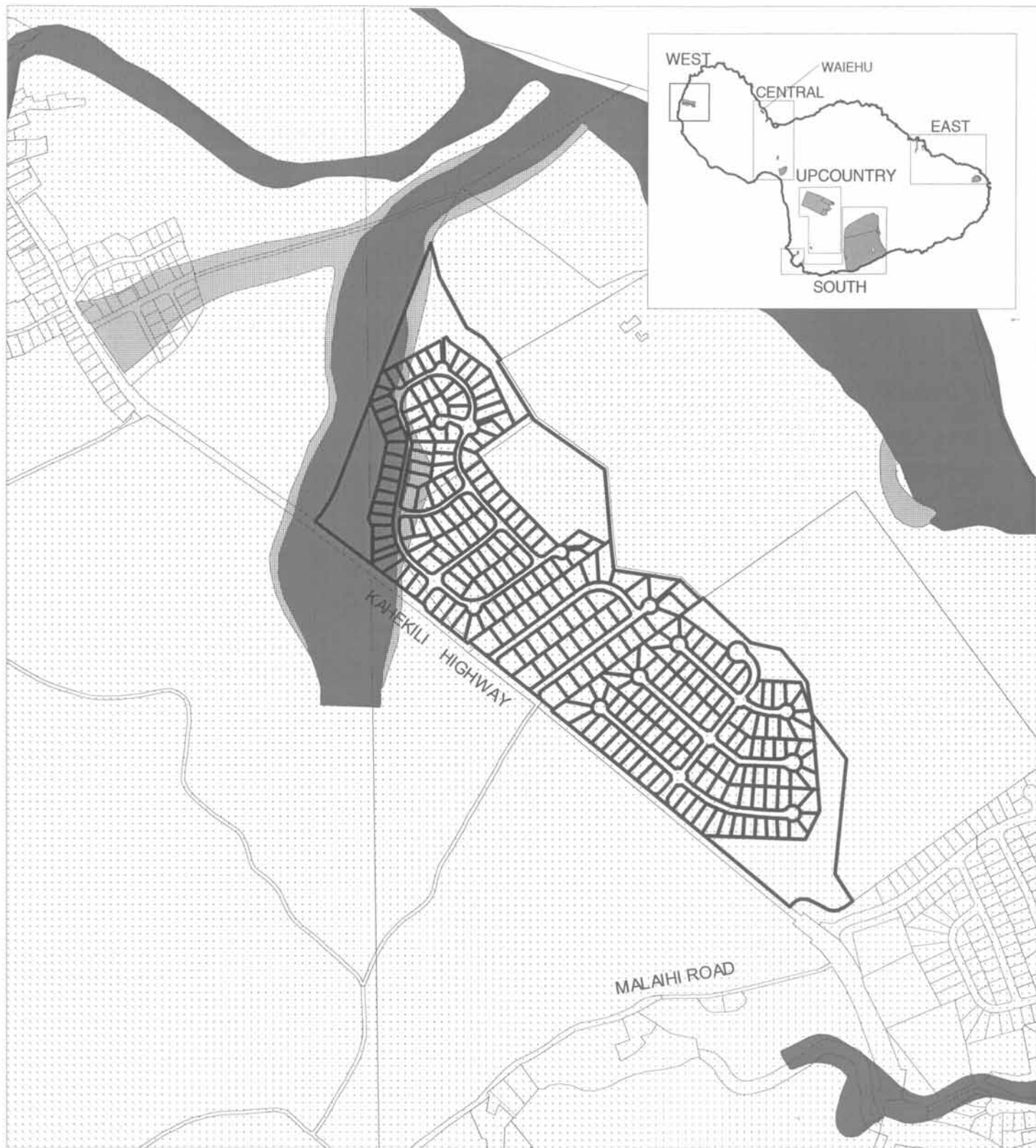
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Legend

- ZONE A:**
Special Flood Hazard Areas Inundated by 100-Year Flood
No Base Flood Elevations Determined
- ZONE X:**
Areas Determined To Be Outside 500-Year Floodplain
- ZONE X500:**
Areas of 500-Year Flood
- DHHL Land Boundary**

Figure 4-19

WAIIEHU

Flood Insurance Rate Map

MAUI LAND INVENTORY

DEPARTMENT OF HAWAIIAN HOME LANDS

NORTH



500

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1,000

(FEET)



MAUI ISLAND PLAN

4. ENVIRONMENTAL CHARACTERISTICS

Historic Sites/Archeology/Cultural Resources

An archeological study has been done for this area and archeological features were uncovered during construction of Waiehu Kou 2. However, now that this tract is nearly built out, the presence of historic sites, archeological sites, or cultural resources is unlikely.

Endangered Species

A review of the Nature Conservancy of Hawai'i's Heritage Database indicates that there are no records of any rare or endangered species or ecosystems within this tract.

Critical Habitat

The U.S. Fish and Wildlife Service has not designated any critical habitat areas within the Waiehu tract.

5. INFRASTRUCTURE

Access/Roadways

Primary access to the site is off the State-owned Kahekili Highway, which is a two-lane, undivided roadway fronting the tract. Kahekili Highway extends north to other northwestern coastal areas and also continues south to Wailuku, where it intersects with Waiehu Beach Road. Waiehu Beach Road extends to Lower Main Street.

A *Traffic Impact Analysis Report* prepared by Julian Ing (December 2001), concludes that traffic generated from Waiehu Kou 3 will have a minor impact on existing traffic conditions and on regional traffic demands. The primary impact of Waiehu Kou 3 will be long delays for vehicles entering onto the highway during the morning peak hours after the construction of a new unsignalized intersection on Kahekili Highway to service the project.

Water Service

Twelve- and six-inch waterlines along Kahekili Highway serve the existing Waiehu 1 and 2 subdivisions and the future Waiehu Kou 3 subdivision. The County of Maui Department of Water Supply has indicated that water is available to the tract and distribution and storage systems are adequate (Townscape 2002).

Wastewater Treatment and Disposal

A pump station at Waiehu pumps the sewage through a six-inch force main along Kahekili Highway to the Wailuku-Kahului WWRF. For further information about wastewater treatment and disposal see the regional assessment at the beginning of this chapter.

Solid Waste Disposal

Solid waste is collected by the County and taken to the Central Maui Landfill.

MAUI ISLAND PLAN

Telephone Service

Sandwich Isles Communications provides telephone service to the tract.

Electrical Service

MECO provides electrical service to Waiehu through a 69-kV line from the Kahului Generating Station.

Cable Television Service

Oceanic Cable services the Waiehu tract.

G. WAIEHU PARCEL ANALYSIS

The Waiehu tract is near full build-out. Two phases have been completed. Planning and design of a third and final phase, Waiehu Kou 3, has begun. The remaining land is within the flood plain and not developable for residential use. The community has requested that a portion of this vacant land on the east corner of Waiehu Kou 2 be designated for community use.

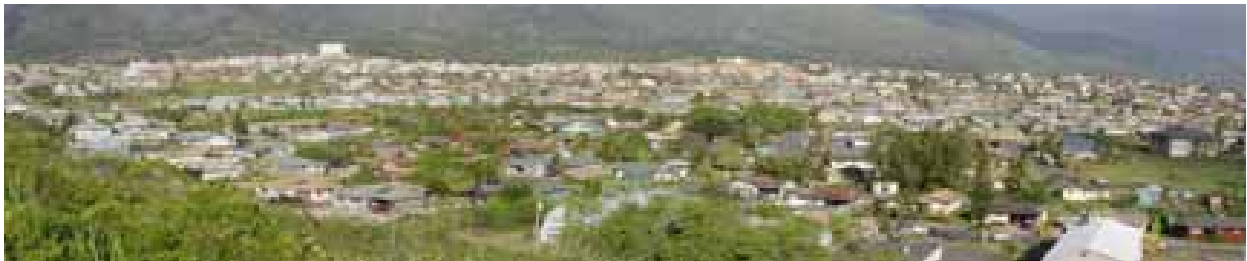
According to the *Maui Island Plan* beneficiary survey, the area from Wailuku to Waihe'e is very desirable in terms of residential use, due to the close proximity to jobs, schools, and other public facilities. DHHL's Waiehu lands do not allow for more residential development; however, there may be opportunities to purchase adjacent properties to develop additional residential properties.

H. WAIEHU PARCEL FINAL PLAN

The final plan for Waiehu designates the entire useable area residential (Figure 4-20). The remaining land in the flood plain is designated for community use or general agriculture.

I. PAUKŪKALO TRACT BASELINE INFORMATION

First built in the 1960's, Paukūkalo is one of DHHL's oldest residential communities on Maui. It is located south of Waiehu, just outside of Wailuku.



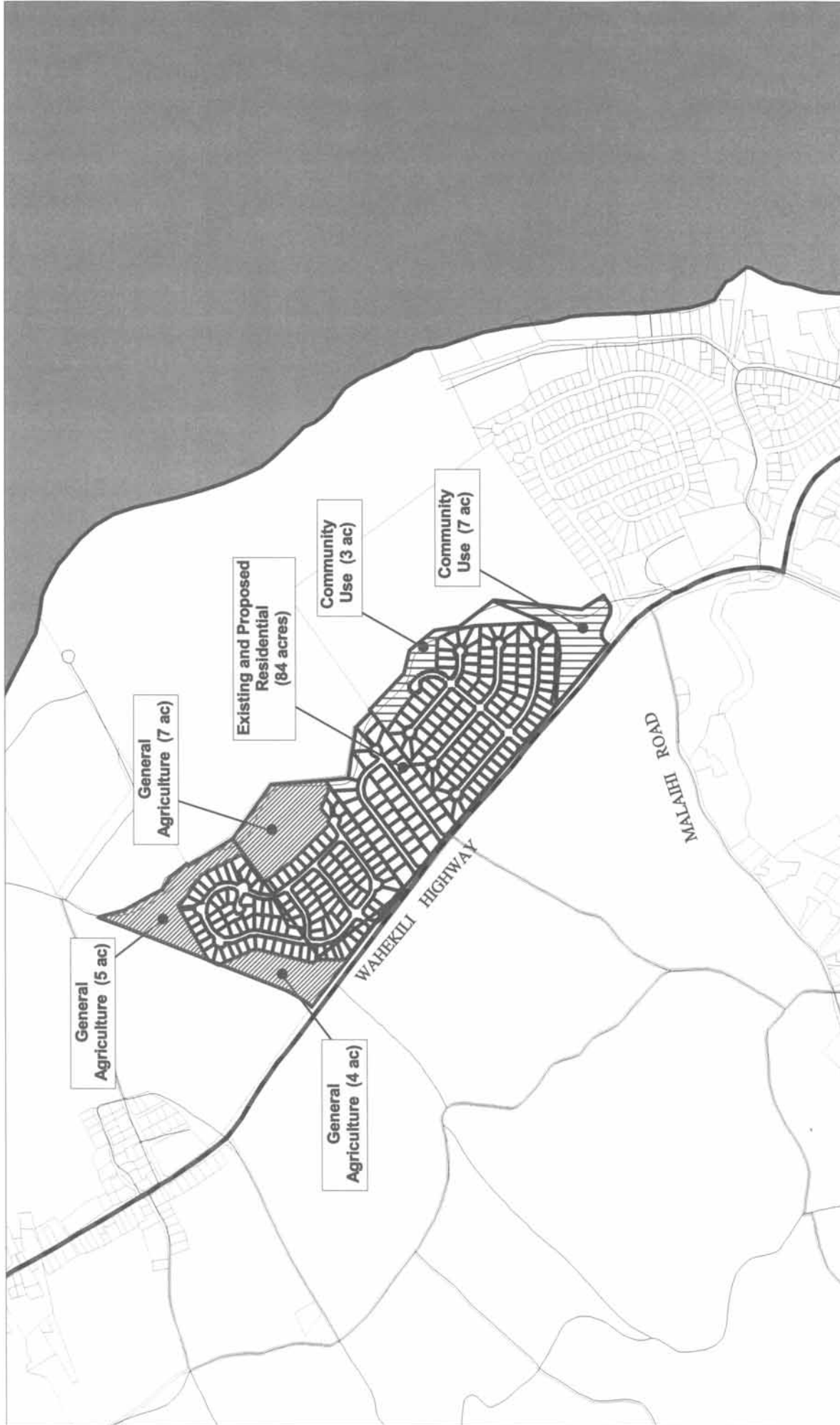


Figure 4-20

WAEIHU

Land Use Plan

MAUI LAND INVENTORY

DEPARTMENT OF HAWAIIAN HOME LANDS



(FEET)



7/21/03

Land Use Summary		Approx Acres
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	Community Facility	7
Total		91

Legend

DHHL Land Boundary

MAUI ISLAND PLAN

1. INVENTORY

TMK and Acreage

Paukūkalo is 61.0 acres and is identified as TMK 3-3-05:01-91, 3-3-06:01-53, and 55-101 (Figure 4-1).

Existing Uses

Paukūkalo is composed of 182 single-family units and is fully developed. Lots average 10,000 square feet.

General Leases

Citizens Utilities Company/The Gas Company - Utility

TMK 3-3-05:03 (portion) 0.072 acres (expiring in 2001)

Trustees of the Estate of Bernice Pauahi Bishop - Preschool

TMK 3-3-05:87 (portion) 2 acres (expiring in 2065)

Licenses

County of Maui-DPW - Sewage Pump Station Easement

TMK 3-3-05:03 0.274 acres

Maui Electric Company & GTE HTCO - Utilities Easement

TMK 3-3-06:53 (portion) Acres N/A

County of Maui-DPW - Drainage Easement

TMK 3-3-01:01 (portion) 0.771 acres

Board of Water Supply - Waterline Easement

TMK 3-3-06:various (portion) 4.455 acres

Board of Water Supply - Waterline Easement for Unit 3, Phase 3

TMK 3-3-06:52 (portion) Acres N/A

County of Maui-DPW - Drainage Easement for Unit 3, Phase 3

TMK 3-3-06:52 (portion) 0.031 acres

Maui Electric Company & GTE HTCO - Utilities Easement

TMK 3-3-06:52 (portion) Acres N/A

Paukūkalo Hawaiian Homes Community Association - Recreation Center

TMK 3-3-05:87 1.630 acres

County of Maui - Community Park

TMK 3-3-05:86 4.743 acres

MAUI ISLAND PLAN

Hawaiian Community Assets - Office Space
TMK 3-3-05:86, 87 (portion) 0.009 acres

Adjacent Uses

The tract is bounded to the west by the Waiehu Heights subdivision, to the south by the Haleki'i-Pihana Heiau State Monument, and to the east by Waiehu Beach Road.

Proposed Future Surrounding Uses

There are no proposed future surrounding uses, as the area is already built out.

2. REGULATORY

State Land Use District

The majority of Paukūkalo is in the Urban District; a small portion is in the Agricultural District (Figure 4-21).

County Community Plan

The *Wailuku-Kahului Community Plan* designates the tract for Single Family Residential use.

County Zoning

The tract is zoned R-2 with a minimum lot size of 7,500 square feet, as delineated in Maui County zoning maps.

Special Management Area

This tract is not within the Special Management Area.

Underground Injection Control Line

This tract is below the UIC line (Figure 4-22).

3. PHYSICAL CHARACTERISTICS

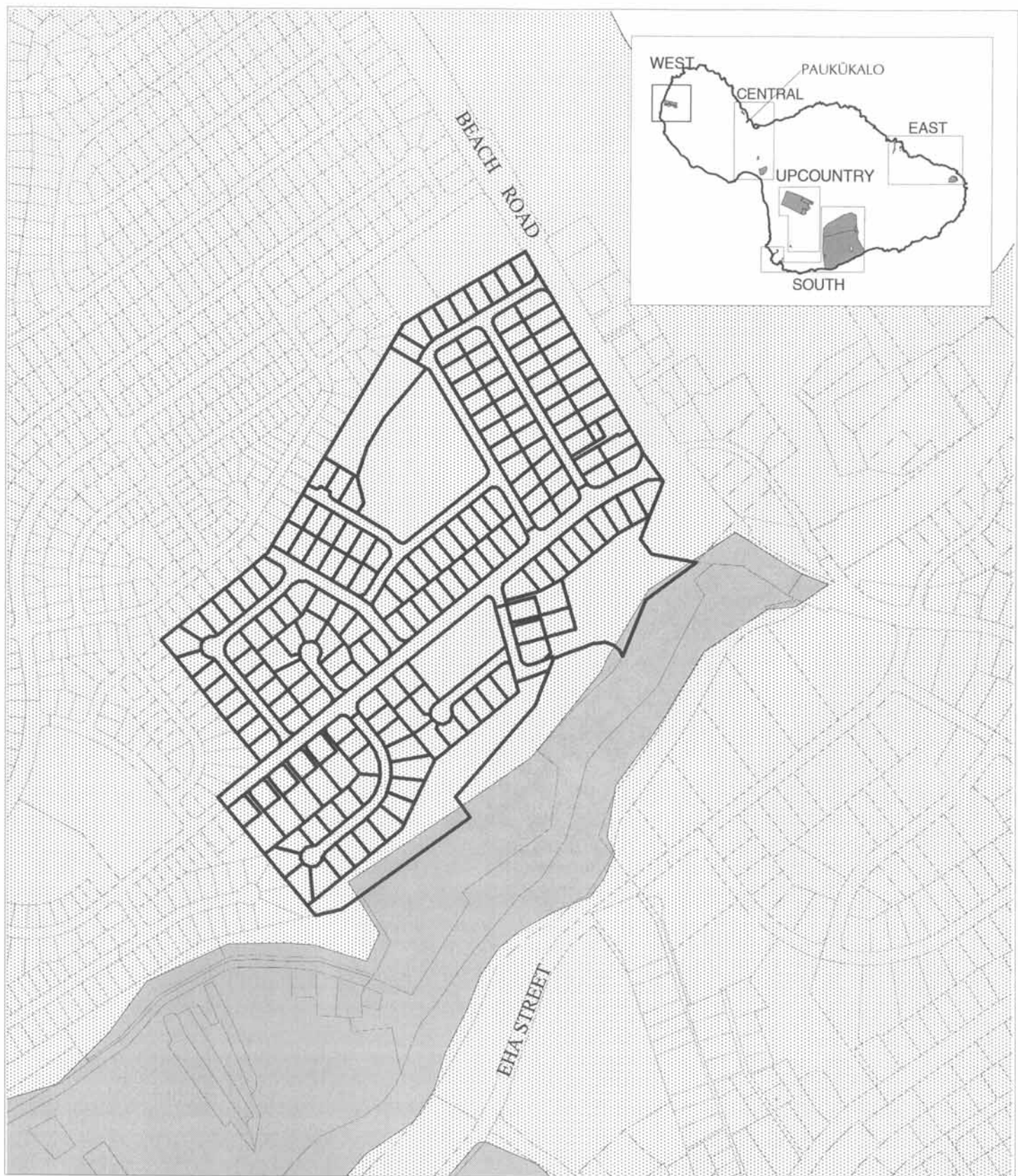
Climate

The climate in Paukūkalo is warm and humid. The average temperature is 76 degrees Fahrenheit.

Soils

The USDA Soil Conservation Service Survey shows the following soils in Paukūkalo (Figure 4-23).

- Jaucas Sand, 0 to 15 percent slopes – This soil is used for pasture, sugarcane, truck crops, and urban development. Permeability is rapid, and runoff is very slow to slow. The hazard of water erosion is slight, but wind erosion is a severe hazard



Legend




-  Agricultural District
-  Urban District
-  DHHL Land Boundary

Figure 4-21

PAUKŪKALO

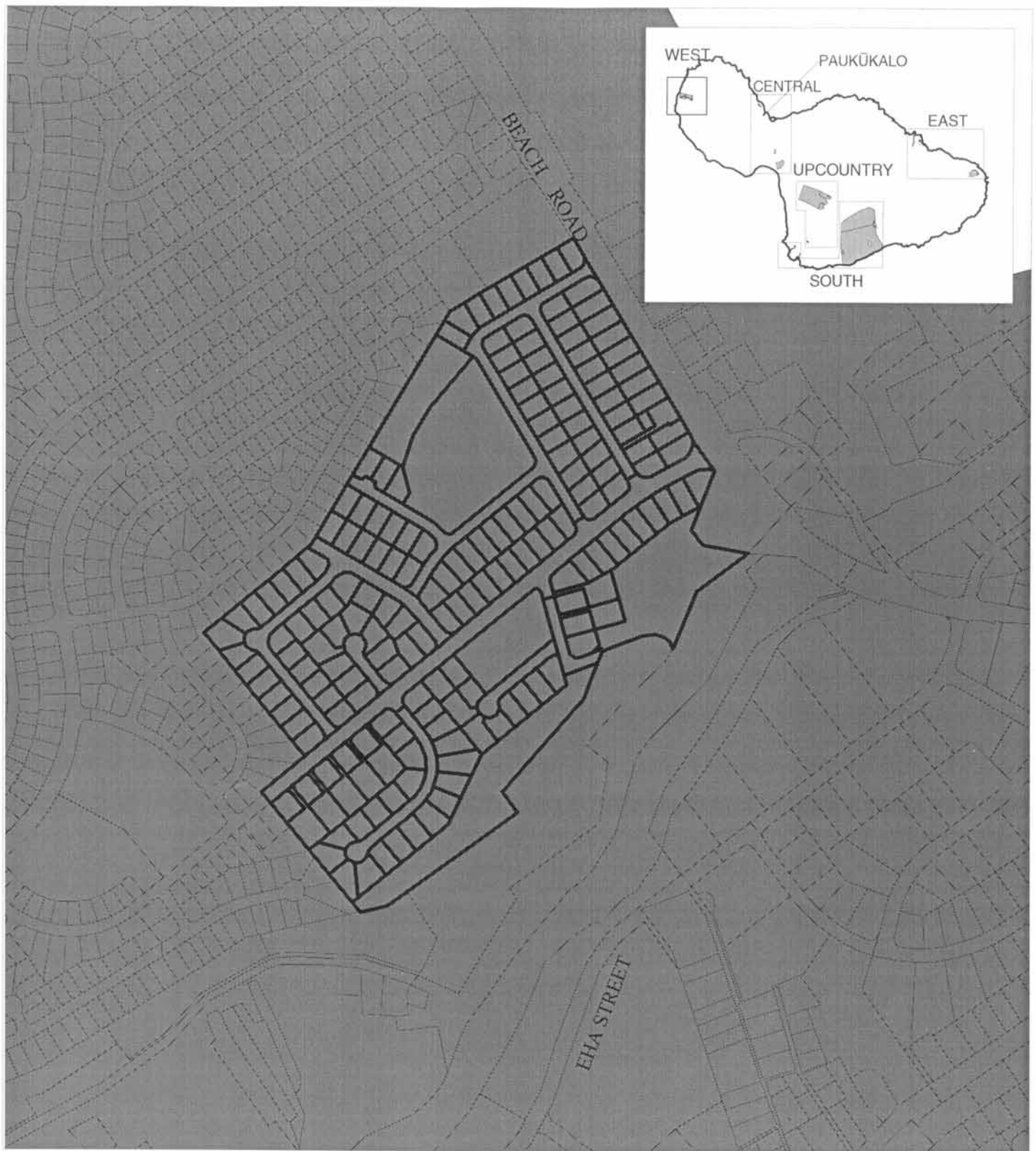
State Land Use

MAUI LAND INVENTORY

DEPARTMENT OF HAWAIIAN HOME LANDS

NORTH





Legend




-  Areas Below (Makai) Underground Injection Control Line
-  Areas Above (Mauka) Underground Injection Control Line
-  DHHL Land Boundary

Figure 4-22

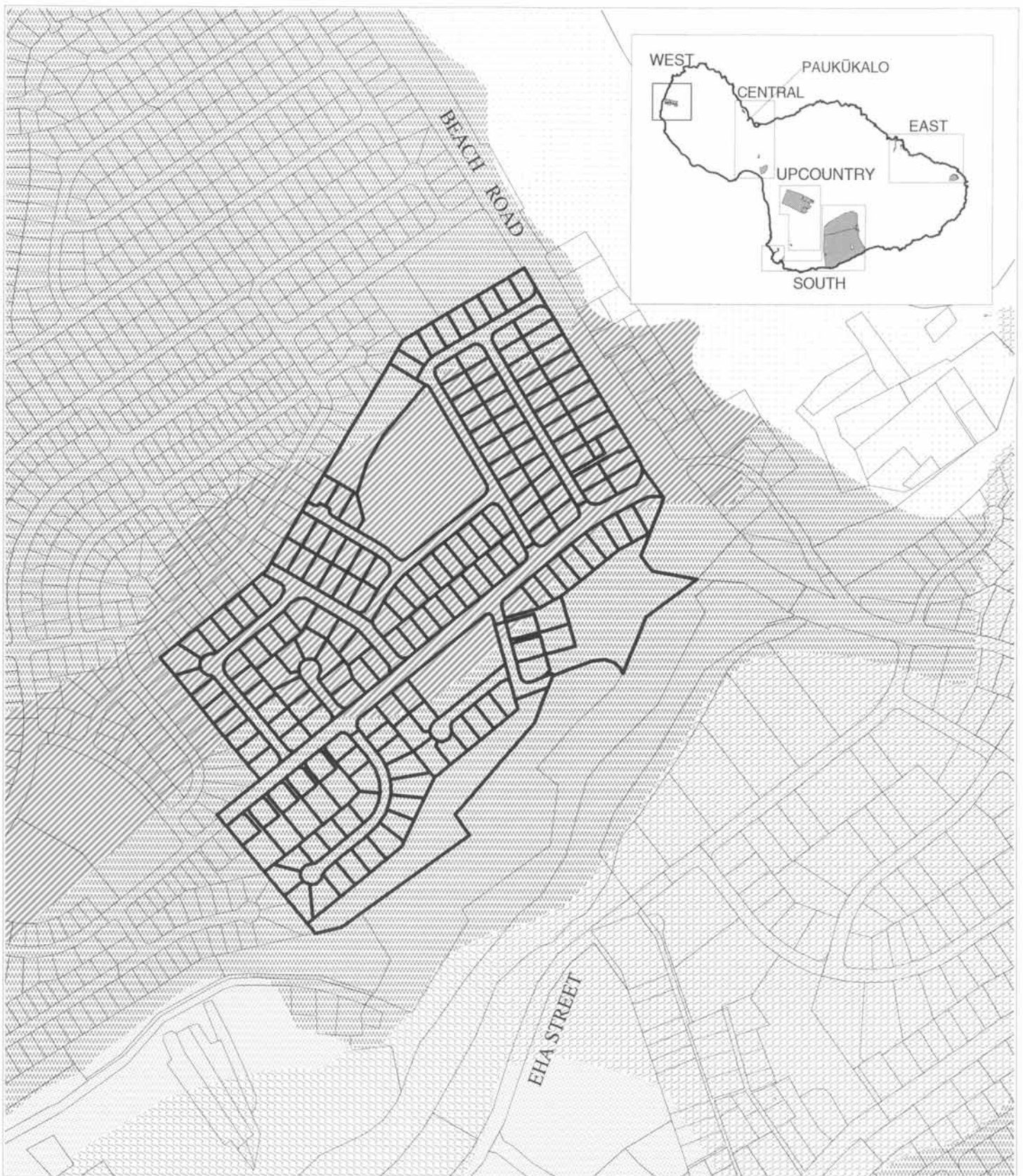
PAUKŪKALO

Underground Injection Control (UIC) Areas Map

MAUI LAND INVENTORY

DEPARTMENT OF HAWAIIAN HOME LANDS





Legend




-  Jaucas Sand, 0-15% Slopes
-  Pauone Sand, 7-30% Slopes
-  DHHL Land Boundary

Figure 4-23

PAUKŪKALO

Soil Conservation Service Survey

MAUI LAND INVENTORY

DEPARTMENT OF HAWAIIAN HOME LANDS

NORTH



MAUI ISLAND PLAN

where vegetation has been removed. Workability is slightly difficult because the soil is loose and lacks stability for use of equipment.

- Pu'uone Sand, 7 to 30 percent slopes – This soil is used for pasture and homesites. Permeability is rapid, runoff is slow, and the hazard of wind erosion is moderate to severe.

Agricultural Lands of Importance to the State of Hawai'i

The State of Hawai'i Department of Agriculture *ALISH* system of defining agricultural suitability does not classify the lands of Paukūkalo (Figure 4-24).

Ground/Surface Water

The USGS topographic map shows no natural water sources within Paukūkalo.

Rainfall

Annual rainfall within Paukūkalo averages 20 to 30 inches (Figure 4-25).

Topography/Slope

The USGS topographic map shows an elevation range between 40 and 160 feet, with slopes ranging from one to two percent (Figure 4-25).

Drainage

The USGS topographic map shows no natural drainage features.

Flood Zone

The Flood Insurance Rate Map shows that Paukūkalo is entirely within Zone X, which designates areas determined to be outside of the 500-year floodplain (Figure 4-26).

Noise

Noise in this tract is low and mainly comes from traffic along Waiehu Beach Road.

4. ENVIRONMENTAL CHARACTERISTICS

Historic Sites/Archeology/Cultural Resources

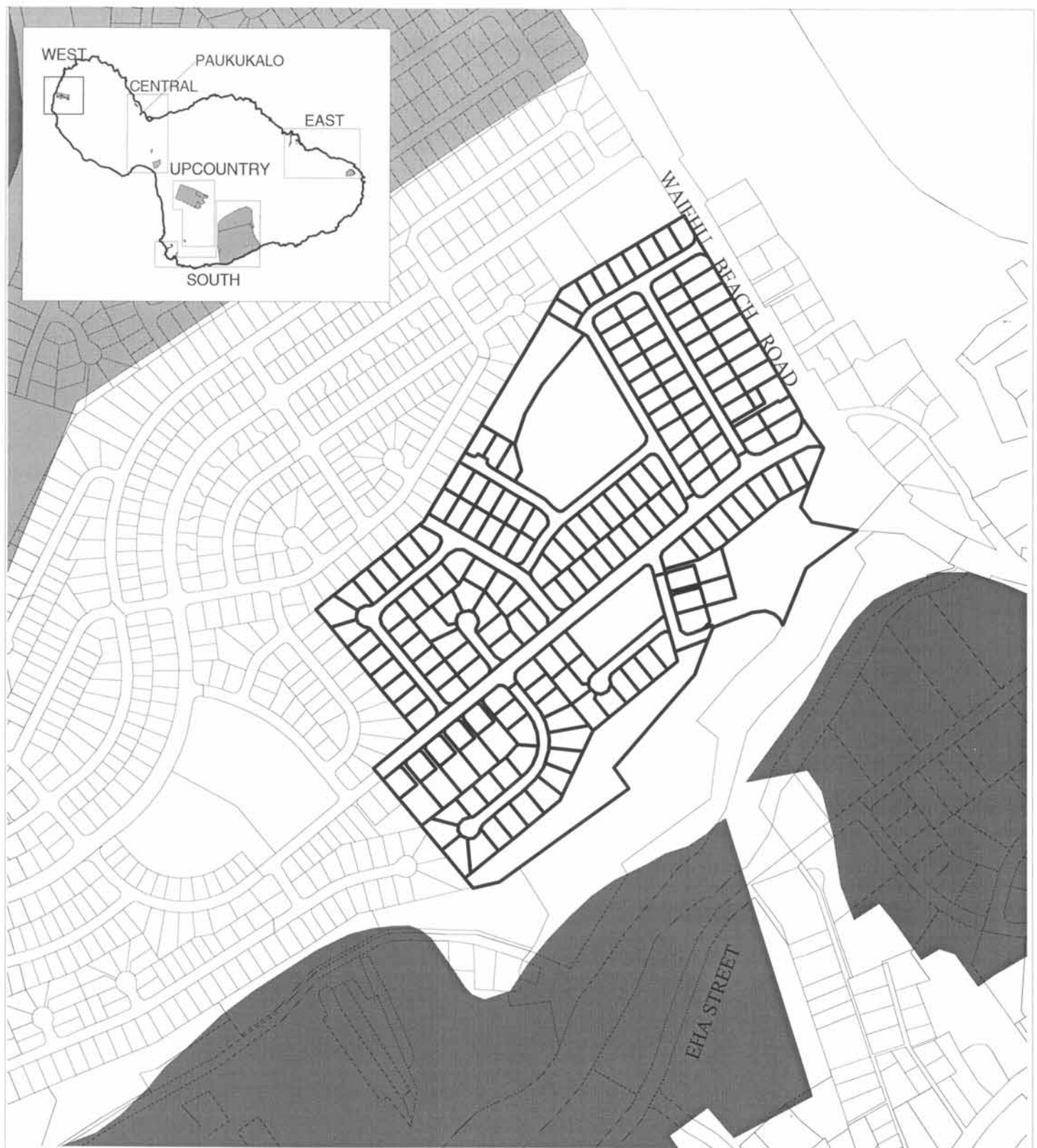
This tract is built out and therefore the presence of historic sites, archeological sites, or cultural resources are unlikely.

Endangered Species

A review of the Nature Conservancy of Hawai'i's Heritage Database indicates that there are no records of any rare or endangered species or ecosystems within this tract.

Critical Habitat

The U.S. Fish and Wildlife Service has not designated any critical habitat areas within the Paukūkalo tract.



Legend

- Prime Agricultural Land
- Unique Agricultural Land
- Other Agricultural Land
- Unclassified Land
- DHHL Land Boundary

Figure 4-24

PAUKUKALO

Agricultural Lands of Importance to the State of Hawaii (ALISH)

MAUI LAND INVENTORY

DEPARTMENT OF HAWAIIAN HOME LANDS

NORTH

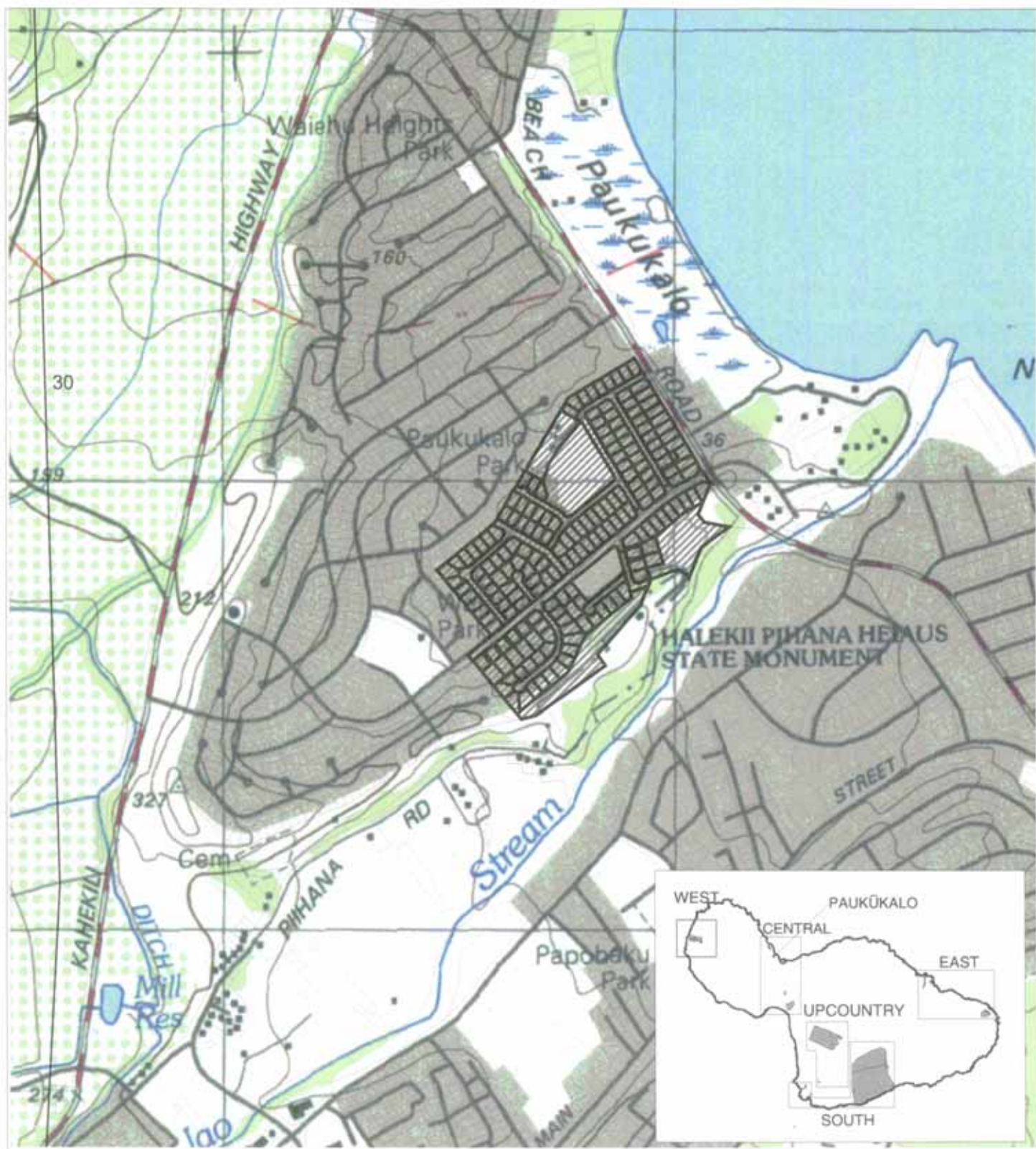


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Legend

-  DHHL Properties
-  Lines of Equal Average Annual Rainfall in Inches

Figure 4-25

PAUKUKALO

USGS Map with Rainfall Isohyets

MAUI LAND INVENTORY

DEPARTMENT OF HAWAIIAN HOME LANDS

NORTH



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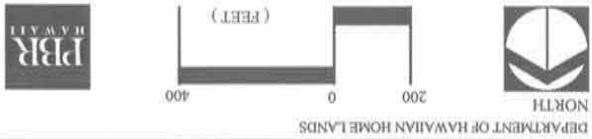
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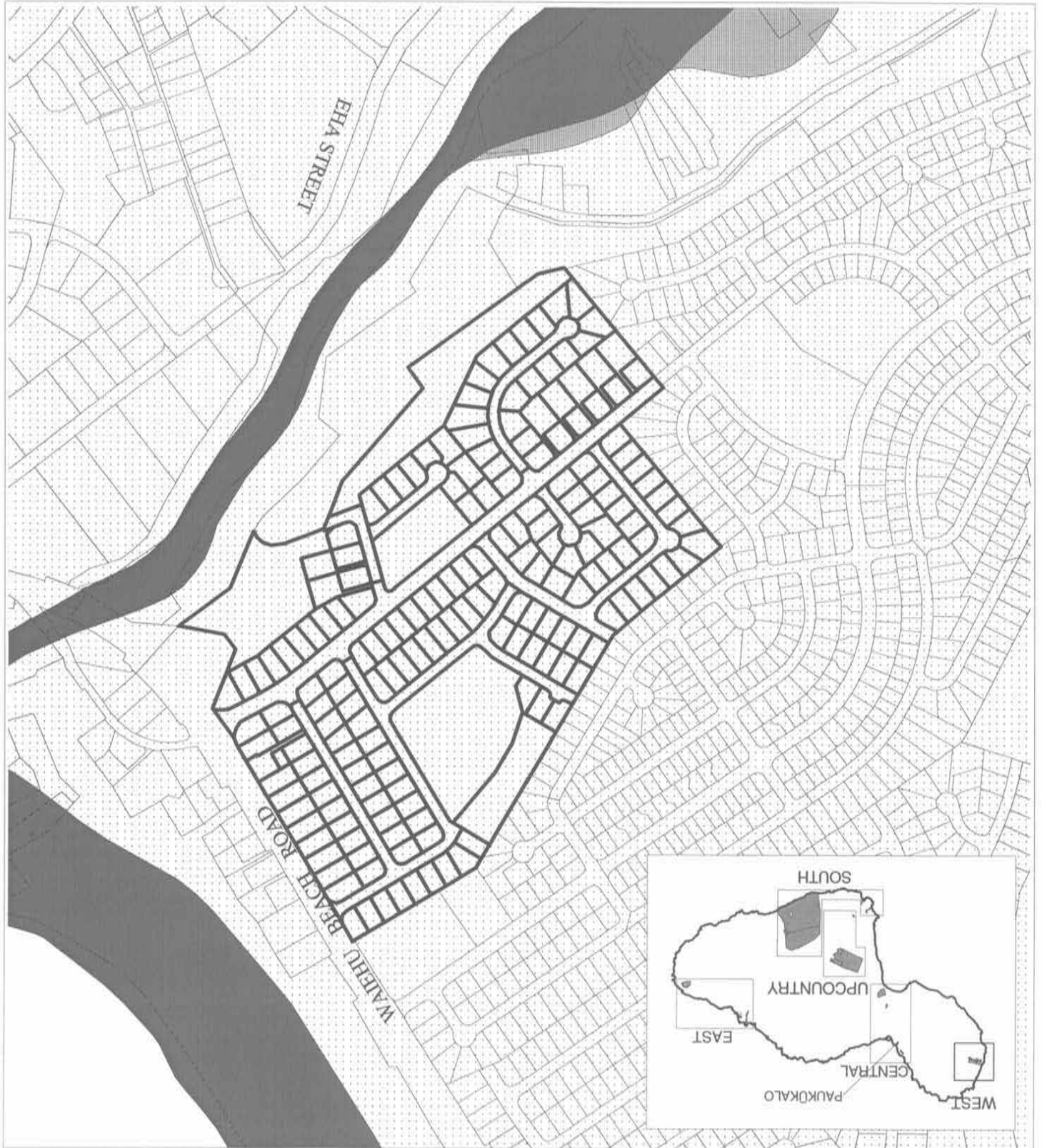
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PAUKŪKALO
Flood Insurance Rate Map
MAUI LAND INVENTORY
Figure 4-26

- Legend**
- ZONE A: Special Flood Hazard Areas Inundated by 100-Year Flood
 - ZONE X: No Base Flood Elevations Determined
 - Areas Determined To Be Outside 500-Year Floodplain
 - DHHL Land Boundary



MAUI ISLAND PLAN

5. INFRASTRUCTURE

Access/Roadways

Access to Paukūkalo is off Waiehu Beach Road.

Water System (Lines, Wells)

A 12-inch water main serves the Paukūkalo tract.

Wastewater Treatment and Disposal

Sewage is pumped via an eight-inch force main to the Wailuku-Kahului WWRF. For further information about wastewater treatment and disposal see the regional assessment at the beginning of this chapter.

Solid Waste Disposal

Solid waste is collected by the County and taken to the Central Maui Landfill.

Telephone Service

Sandwich Isles Communications provides telephone service to the tract.

Electrical Service

MECO provides electrical service to Paukūkalo through a 69-kV line from the Kahului Generating Station.

Cable Television Service

Oceanic Cable services the Paukūkalo tract.

J. PAUKŪKALO TRACT ANALYSIS

Built in the 1960's, Paukūkalo is DHHL's first and oldest homestead community on Maui. There is no available land for additional homesteads in Paukūkalo. With the existing 10,000 square foot size of residential lots at Paukūkalo, existing homes could be expanded to accommodate *ohana* units if the existing infrastructure (water and sewer) were adequate and in a condition to serve additional units. The age of the Paukūkalo subdivision and the environment near the ocean has deteriorated the existing infrastructure. In addition, the eight-inch sewer force main is at capacity and is not able to handle additional flow without increasing the size of the line. The 12-inch water main is near capacity but source is the primary constraint. If all of infrastructure were upgraded, the opportunity to allow additional units at Paukūkalo would be a possibility.

Being the oldest homestead on Maui, Paukūkalo has begun to show its age, making it a prime candidate to utilize funds to rehabilitate homes in need of repair.

MAUI ISLAND PLAN

K. PAUKŪKALO TRACT FINAL PLAN

The final land use plan for Paukūkalo designates the entire tract for residential and community use, reflecting its current uses (Figure 4-27). Based on the baseline data and analysis of Paukūkalo, the entire parcel is fully built out and there is no available land for additional development. A homestead plan should be prepared for Paukūkalo that addresses the use and re-use of existing community facilities.

L. WAILUKU PARCEL BASELINE INFORMATION

Wailuku serves as Maui's civic, financial, and cultural center. Many of Wailuku's neighborhoods retain an old-town character. DHHL acquired the 8,145 square foot (0.187 acres) Wailuku parcel, located on Wells Street across from Wells Park, from the State in a 1994 settlement.

1. INVENTORY

TMK and Acreage

The Wailuku parcel is approximately 0.2 acres and is identified as TMK 3-4-11:32 (Figure 4-1).

Existing Uses

The parcel is currently used for passive recreation.

Revocable Permit

Lōkahi Pacific - Community Park/Garden for passive park use

TMK 3-2-11:31 0.187 acres

Adjacent Uses

This parcel is adjacent to the Wailuku Fire Station, the Weinberg Building and parking lot, and is across Wells Street from Wells Park.

Proposed Future Surrounding Uses

There are no proposed future surrounding uses as the area is already built out.

2. REGULATORY

State Land Use District

The parcel is within the State Urban District (Figure 4-28).

County Community Plan

The *Wailuku-Kahului Community Plan* designates this parcel as Single Family (SF).



Figure 4-27
PAUKŪKALO
 Land Use Plan

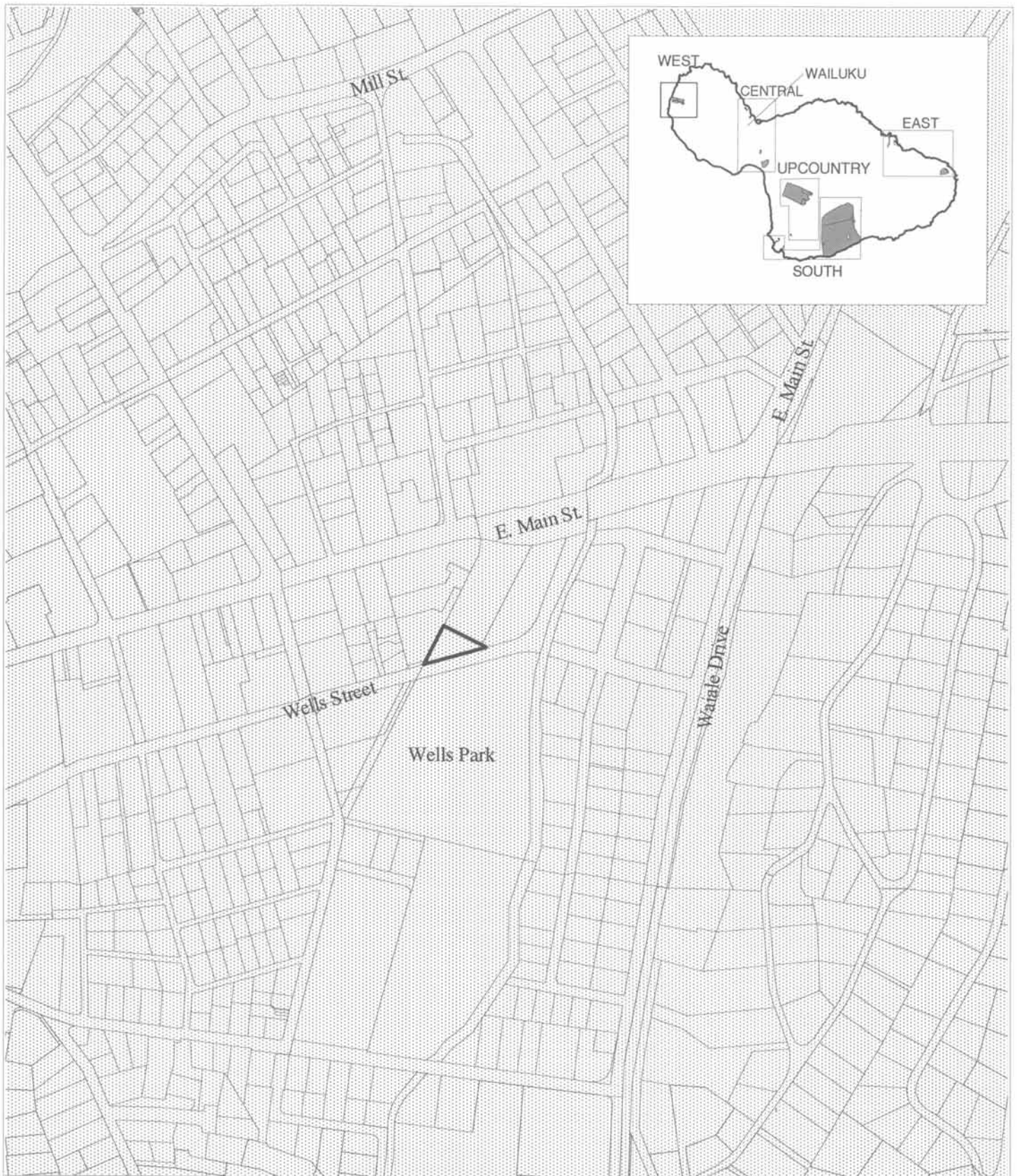
MAUI LAND INVENTORY

DEPARTMENT OF HAWAIIAN HOME LANDS



Land Use Summary		
	Number of Lots	Approx Acres
Existing Residential	167	58
Community Use	6	6
Total		64

Legend
 DHHHL Land Boundary



Legend



-  Urban District
-  DHHL Land Boundary

Figure 4-28
WAILUKU
State Land Use

MAUI LAND INVENTORY

DEPARTMENT OF HAWAIIAN HOME LANDS

NORTH



(FEET)



MAUI ISLAND PLAN

County Zoning

This parcel is zoned Community Business District (B-2).

Special Management Area

This parcel is not within the Special Management Area.

Underground Injection Control Line

This parcel is below the UIC line (Figure 4-29).

3. PHYSICAL CHARACTERISTICS

Climate

The climate in Wailuku is warm and humid. The average temperature is 76 degrees Fahrenheit.

Soils

The USDA Soil Conservation Service Soil Survey shows the following soils on Wailuku parcel (Figure 4-30).

- ʻĀao Clay, 3 to 7 percent slopes – This soil is used for sugarcane and homesites. Permeability is moderately slow. Runoff is medium, and the erosion hazard is slight to moderate.
- Wailuku Silty Clay, 3 to 7 percent slopes – This soil is used for sugarcane and homesites. Runoff is slow, and the erosion hazard is slight.

Agricultural Lands of Importance to the State of Hawaiʻi

The State of Hawaiʻi Department of Agriculture *ALISH* system of defining agricultural suitability does not classify the land of the Wailuku parcel (Figure 4-31).

Ground/Surface Water

The USGS topographic map shows no natural water sources on this parcel.

Rainfall

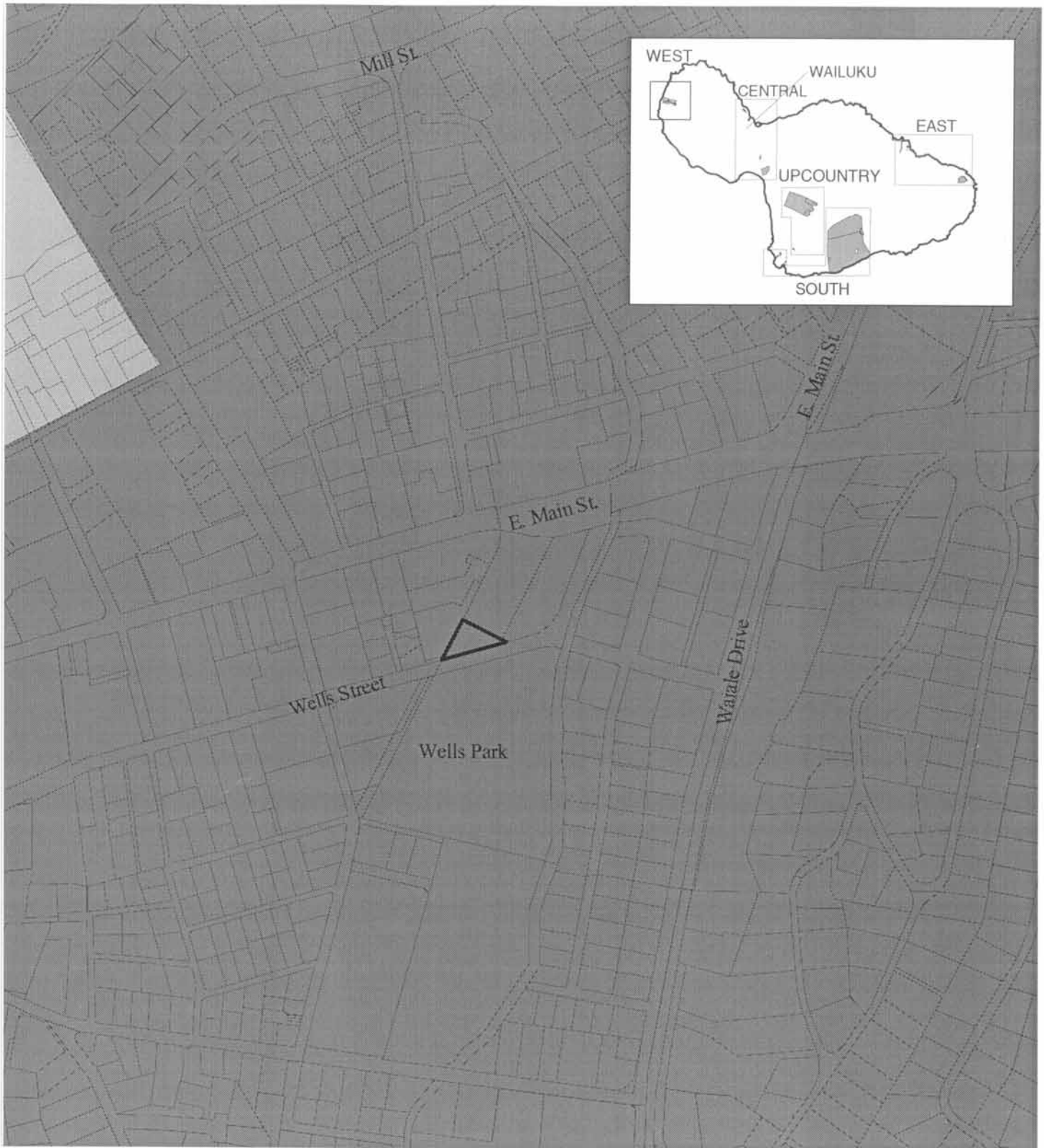
Annual rainfall within Wailuku averages 30 inches (Figure 4-32).

Topography/Slope

The USGS topographic map shows an elevation range between approximately 40 and 160 feet, with slopes of less than five percent (Figure 4-32).

Drainage

The USGS topographic map shows no natural drainage features.



Legend




-  Areas Below (Makai) Underground Injection Control Line
-  Areas Above (Mauka) Underground Injection Control Line
-  DHHL Land Boundary

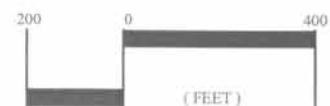
Figure 4-29

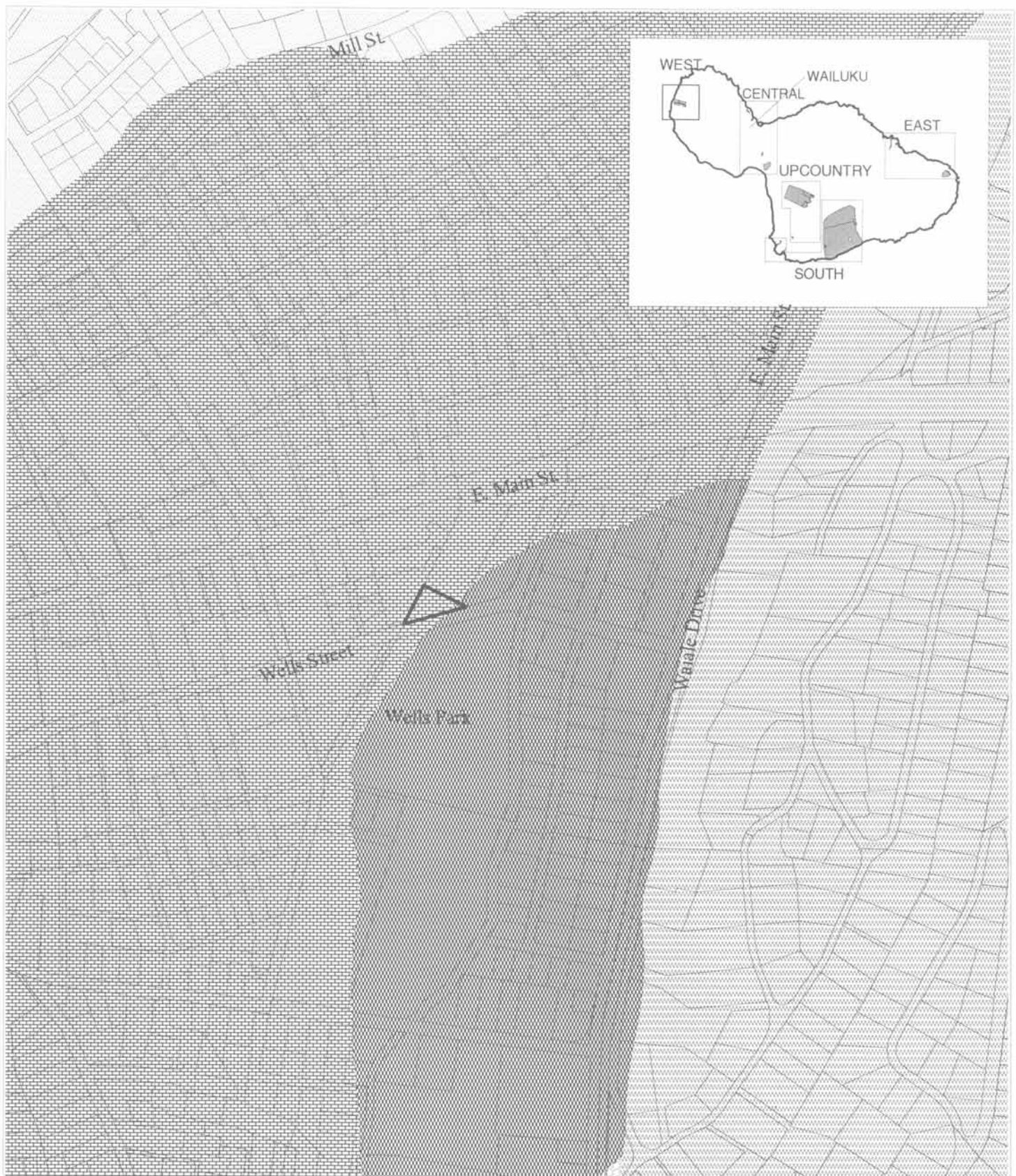
WAILUKU

Underground Injection Control (UIC) Areas Map

MAUI LAND INVENTORY

DEPARTMENT OF HAWAIIAN HOME LANDS





Legend

-  Iao Clay, 3-7% Slopes
-  Wailuku Silty Clay, 3-7% Slopes
-  DHHL Land Boundary

Figure 4-30

WAILUKU

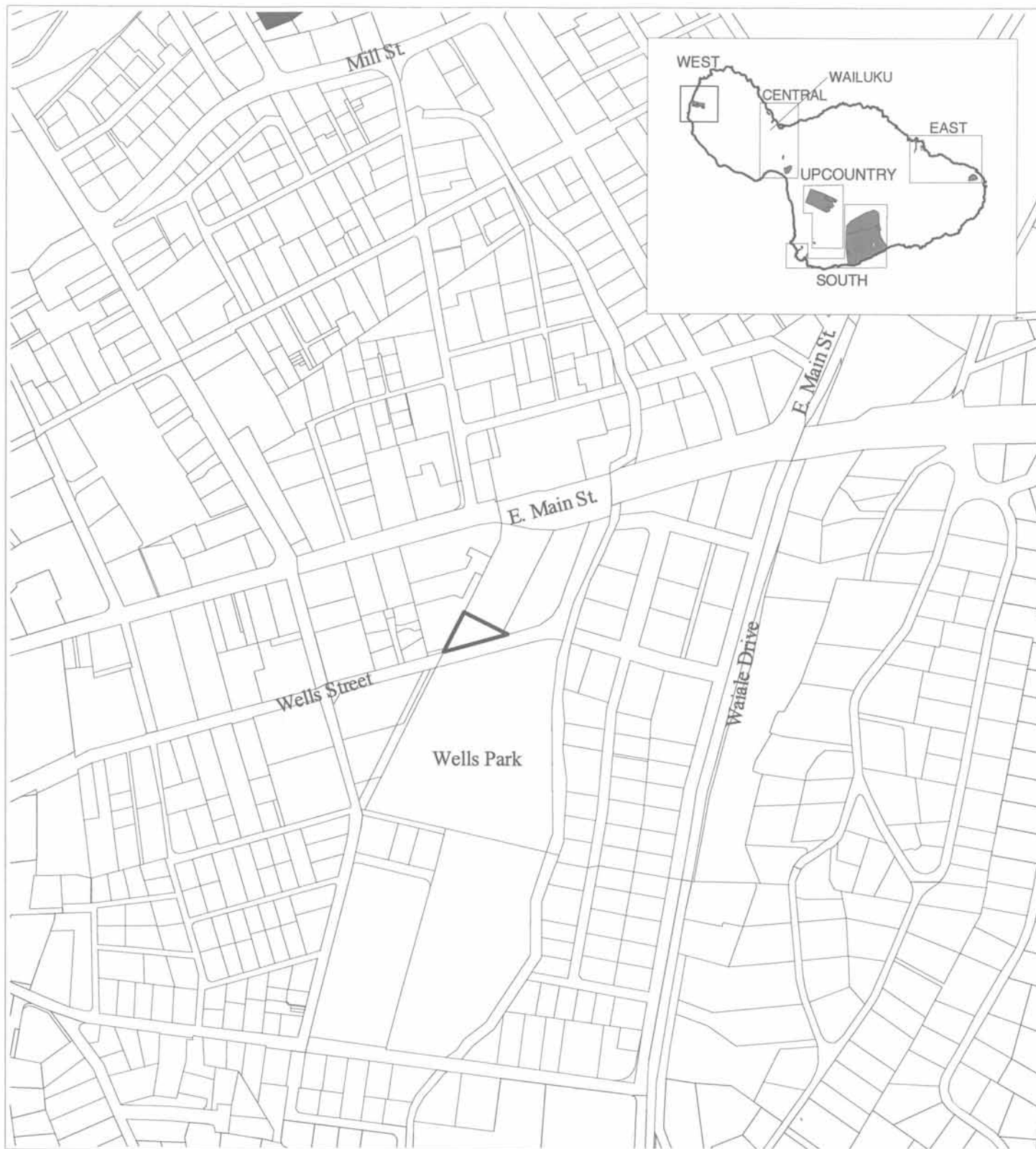
Soil Conservation Service Survey

MAUI LAND INVENTORY

DEPARTMENT OF HAWAIIAN HOME LANDS

NORTH





Legend

-  Prime Agricultural Land
-  Unique Agricultural Land
-  Other Agricultural Land
-  Unclassified Land
-  DHHL Land Boundary

Figure 4-31

WAILUKU

Agricultural Lands of Importance to the State of Hawaii (ALISH)

MAUI LAND INVENTORY

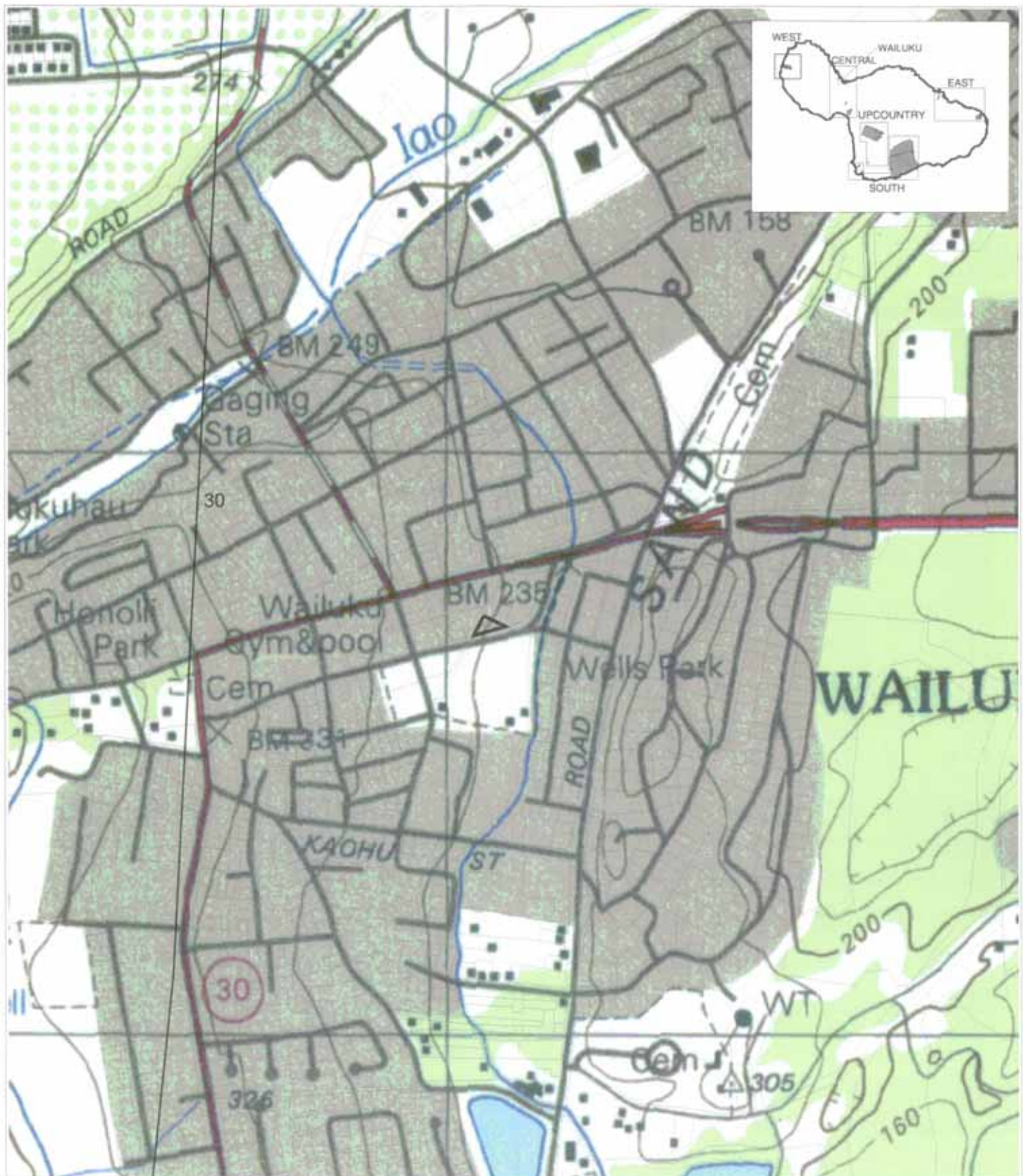
DEPARTMENT OF HAWAIIAN HOME LANDS

NORTH



(FEET)





Legend

-  DHHL Properties
-  Lines of Equal Average Annual Rainfall in Inches

Figure 4-32

WAILUKU

USGS Map with Rainfall isohyets

MAUI LAND INVENTORY

DEPARTMENT OF HAWAIIAN HOME LANDS

NORTH



MAUI ISLAND PLAN

Flood Zone

The Flood Insurance Rate Map indicates that the Wailuku parcel is within Zone X, which designates areas determined to be outside of the 500-year floodplain (Figure 4-33).

Noise

Noise levels at the Wailuku parcel are low and mainly come from traffic in the region and Wells Park across the street.

4. ENVIRONMENTAL CHARACTERISTICS

Historic Sites/Archeology/Cultural Resources

This parcel is within Wailuku and completely surrounded by existing urban development. Therefore, the presence of historic sites, archeological sites, or cultural resources is unlikely.

Endangered Species

A review of the Nature Conservancy of Hawai'i's Heritage Database indicates that there are no records of any rare or endangered species or ecosystems within this parcel.

Critical Habitat

The U.S. Fish and Wildlife Service has not designated any critical habitat areas within the Wailuku tract.

5. INFRASTRUCTURE

Access/Roadways

Access to the Wailuku parcel is from Wells Street. Wells Street is heavily traveled and is one of the two primary access roads within Wailuku.

Water Service

The USGS topographic map shows no wells or tanks on this site. Water service is provided from an existing county water meter that serves the parcel.

Wastewater Treatment and Disposal

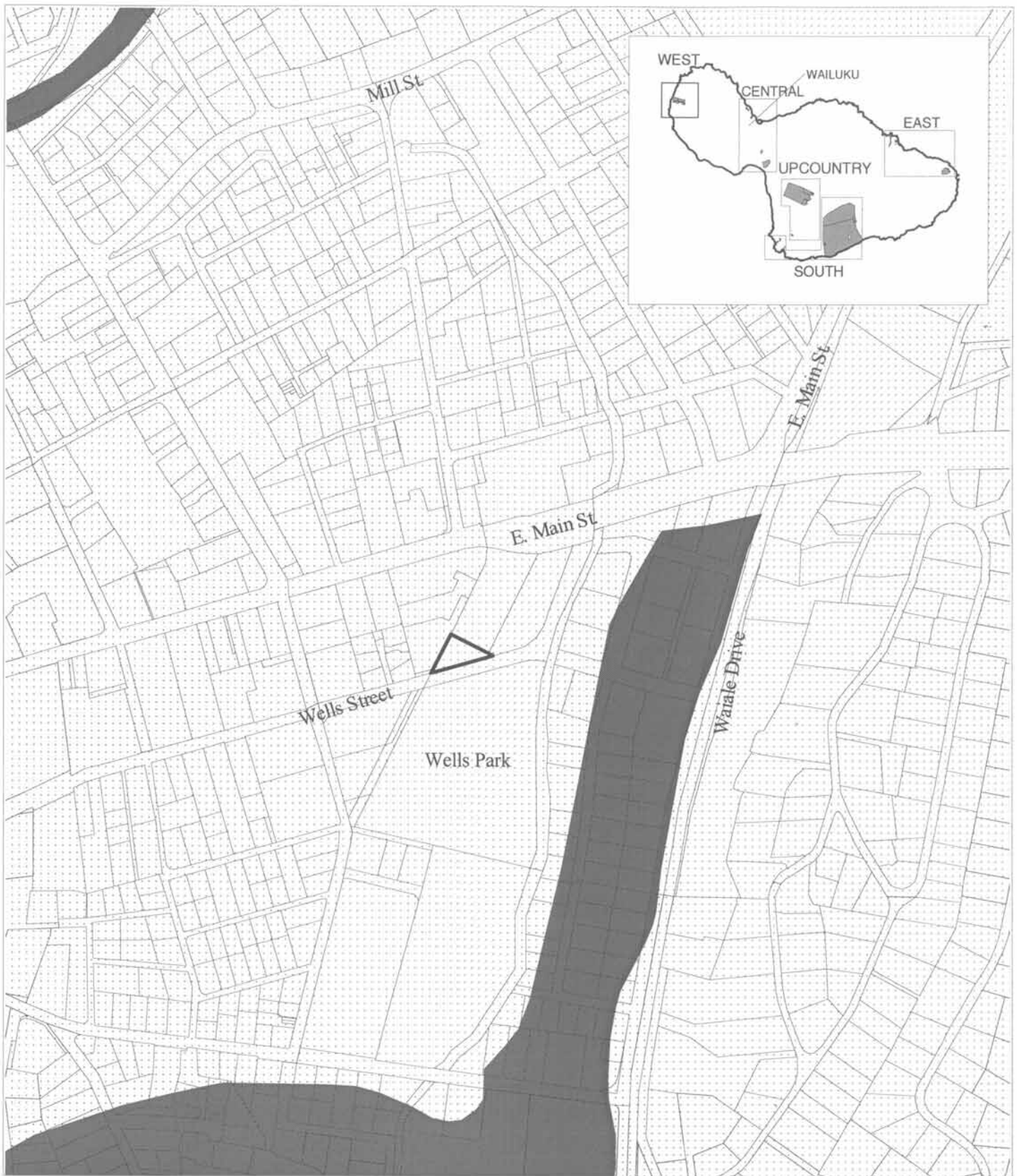
Wastewater service is provided and is readily available. Infrastructure facilities include a sewer distribution line along Wells Street.

Solid Waste Disposal

Solid waste is collected by the County and transported to the Central Maui Landfill.

Telephone Service

Telephone service in this area is readily available.



Legend

- ZONE A:**
Special Flood Hazard Areas Inundated by 100-Year Flood
No Base Flood Elevations Determined
- ZONE X:**
Areas Determined To Be Outside 500-Year Floodplain
- DHHL Land Boundary**

Source: Federal Emergency Management Agency

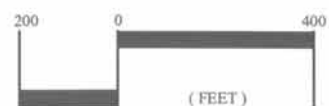
Figure 4-33

WAILUKU

Flood Insurance Rate Map

MAUI LAND INVENTORY

DEPARTMENT OF HAWAIIAN HOME LANDS



(FEET)



MAUI ISLAND PLAN

Electrical Service

MECO provides electrical service to Wailuku through transmission lines from the Kahului Generating Station and the Mā'alaea Generation Station.

Cable Television Service

This parcel is within the service area of Oceanic Cable.

M. WAILUKU PARCEL ANALYSIS

The location, street frontage, access, and proximity to existing infrastructure of the parcel provide an opportunity for immediate commercial use. Wells Street is a major thoroughfare through Wailuku with heavy traffic passing the parcel during peak hours. Commercial uses on the parcel would capture a portion of the traffic. In addition, Wells Park has moderate to heavy use on the weekends, with ball games and park use, which also adds to the commercial viability of the parcel.

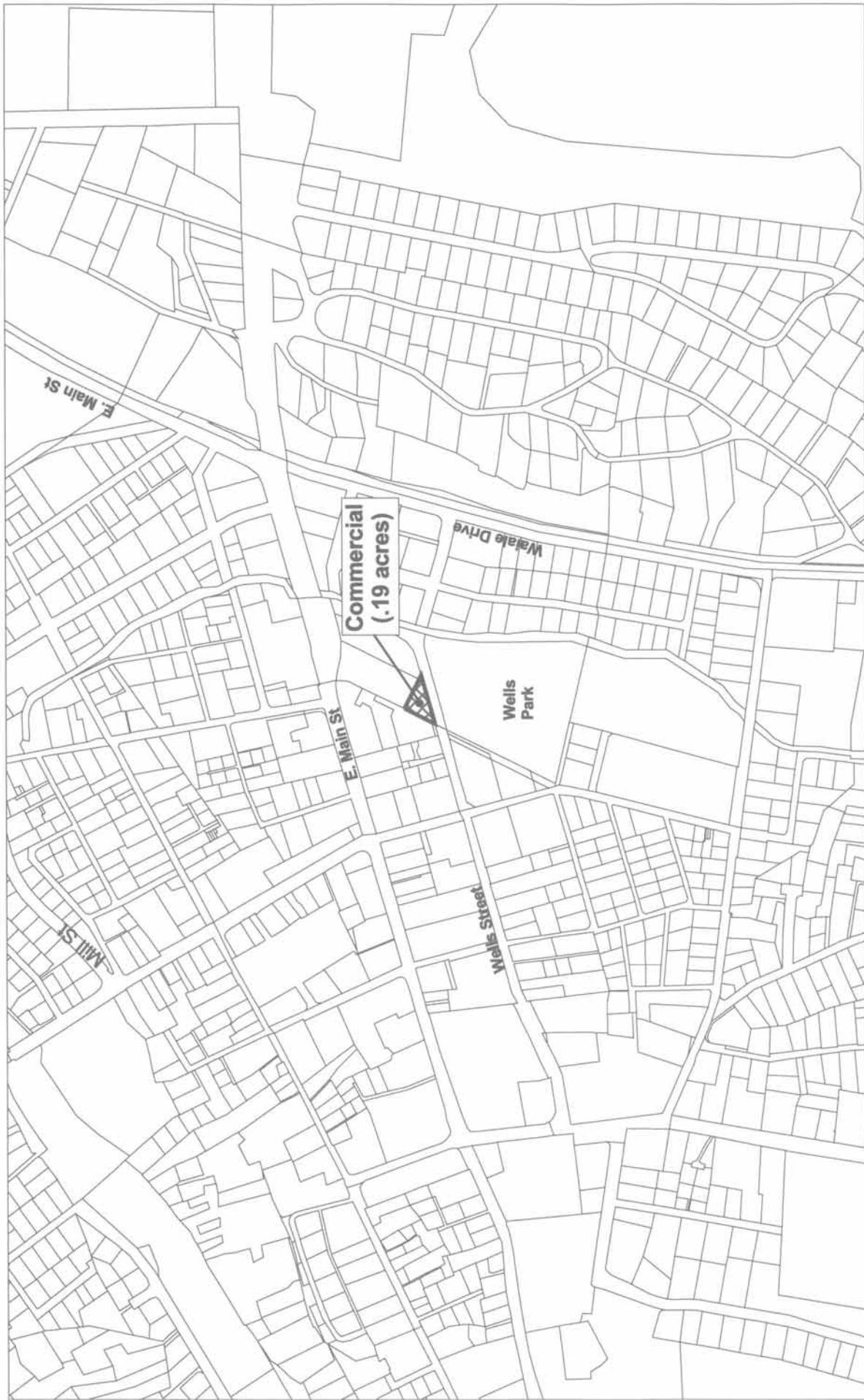
N. WAILUKU PARCEL FINAL PLAN

The final land use plan for the 8,145-square foot parcel is for commercial use (Figure 4-34). The contributing factors for the selection of this use according to the baseline data and analysis are location, street frontage, existing infrastructure and commercial opportunities from adjacent uses. Water demand for the 8,145-square foot parcel is approximately 1,124 gallons per day. The sewage effluent generated from the parcel is approximately 654 gallons per day.

The existing community garden use should be retained as an interim use, for maintenance reasons, until the parcel is either licensed for commercial use or a Request for Proposal is released for commercial development of the parcel.

O. CENTRAL MAUI DISCUSSION

According to the *Maui Island Plan* beneficiary survey, 237 beneficiaries selected Central 2 (Pu'unēnē) as their first choice for residential homestead use. Another 885 beneficiaries selected Central 1 (Waiehu, Paukūalo and Wailuku). Together Central 1 and 2 accounted for 1,122 beneficiaries. The Central 1 and 2 numbers when combined are higher than the 1,107 beneficiaries that chose Upcountry, indicating that Central Maui is a preferred region of DHHL's beneficiaries. However, the DHHL's landholdings in Central Maui are either fully developed or not suitable for homestead development. To meet the shortfall of suitable residential land in Central Maui, it is recommended that DHHL consider a possible land exchange of the Pu'unēnē parcels for suitable residential land in Central Maui. Another alternative is acquiring suitable residential Central Maui land through land purchase.



Legend	Land Use Summary	
	Approx Acres	
	Commercial	.19

Figure 4-34
WAILUKU
Land Use Plan

MAUI LAND INVENTORY



The background of the page is a grayscale photograph of a tropical forest. Numerous palm trees are visible, their fronds creating a dense, layered pattern. On the far left, there is a vertical bar composed of four distinct shades of pink, transitioning from a very light, almost white shade to a medium pink.

5.0 WEST MAUI

MAUI ISLAND PLAN

5.0 WEST MAUI

A. REGIONAL OVERVIEW

Honokōwai, totaling 776.5 acres, is the only landholding DHHL's West Maui planning region (Figure 5-1). The tract is entirely within the area of the County's West Maui Community Plan region (Figure 1-3). The primary urban centers in the area are Lahaina and Kā'anapali, along with a coastal corridor between Kā'anapali and Kapalua. Agricultural lands are located in upland areas. Visitor accommodations are concentrated in Lahaina, Kā'anapali, Honokōwai, Nāpili, and Kapalua.

1. REGIONAL INFRASTRUCTURE

Roads

Primary highway access to and from West Maui is along Honoapi'ilani Highway. A number of *mauka-makai* roads link Honoapi'ilani Highway to urban and residential developments.

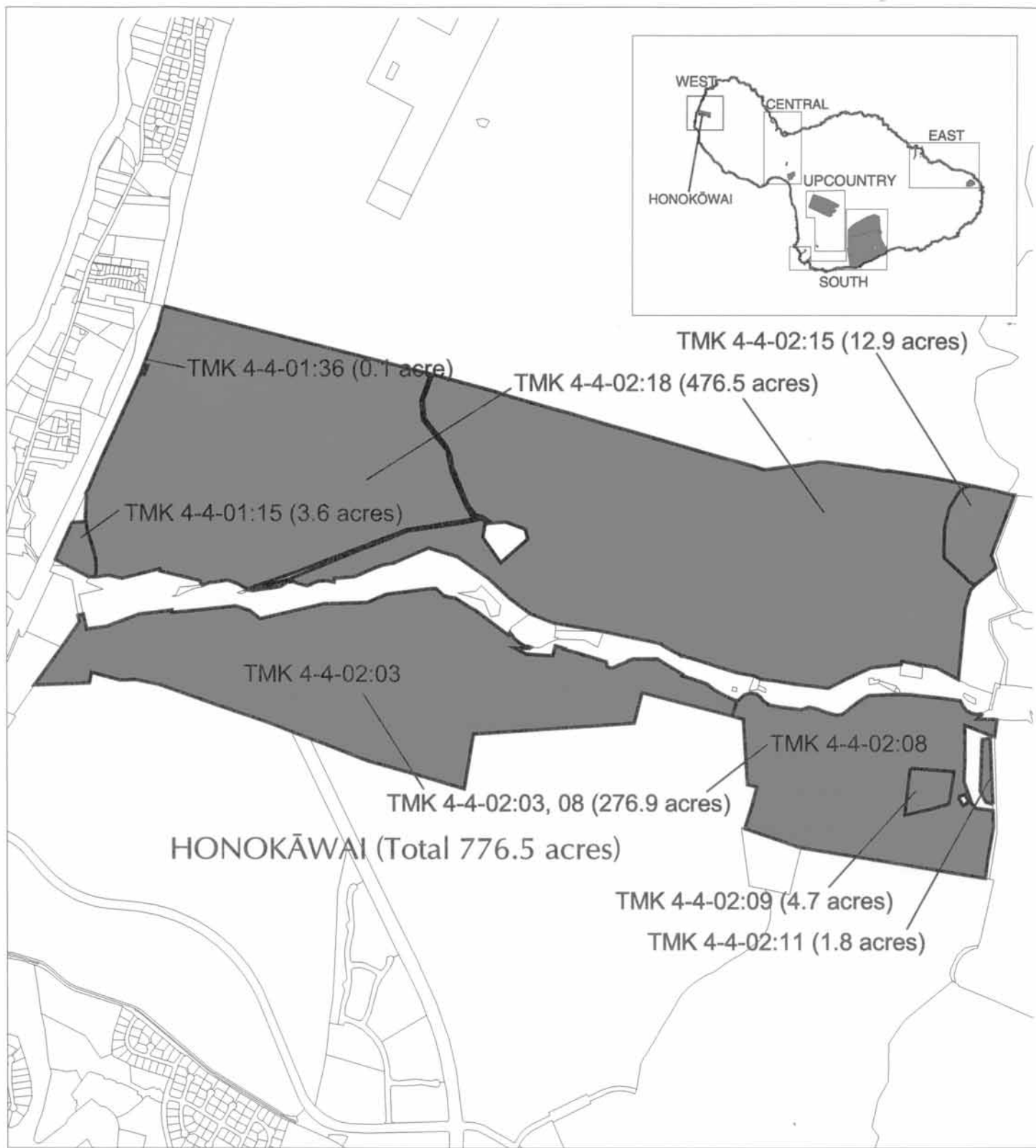
Analysis

Traffic congestion is a major issue in the region, with frequent traffic congestion along Honoapi'ilani Highway, primarily as it passes through Lahaina. According to the *Maui News* (December 11, 2003), Governor Lingle has released funds for a project to widen a portion of Honoapi'ilani Highway from Lahainaluna Road to Aholo Road near Puamana. Construction of the project should begin in fiscal year 2005.

In addition, the State Department of Transportation is proposing a Lahaina Bypass Highway around Lahaina to serve as a new north-south arterial providing an alternative route to Honoapi'ilani Highway. As currently planned, the bypass will originate at Launiupoko, south of Lahaina, and proceed to Ikena Avenue in Lahainaluna. The bypass will continue northwest to Kapunakea Street and further north past the Kā'anapali Resort, and terminate within the DHHL Honokōwai tract, south of the Māhinahina Gulch. The approximately nine-mile route will be a limited access highway with connections to Honoapi'ilani Highway at various points. Currently connections to Honoapi'ilani Highway are proposed in the vicinity of Puamana, Lahainaluna Road, Keawe Street, Kapunakea Street, and Pu'ukoli'i Road. There are no access points onto the bypass from the DHHL Honokōwai parcel.

Water

According to the *County of Maui Infrastructure Assessment Update*, the municipal Lahaina Water System serves most of the West Maui residential population with potable water. The system serves coastal areas from Launiupoko to Kā'anapali and from Honokōwai to Nāpili. The water sources of the system consist of two surface sources from the Honokōhau Ditch and Kanahā Stream and nine groundwater wells in Kanahā, Waipuka, Nāpili, and Honokahua. These wells draw from the Honokōhau, Honolua, Honokōwai,



Legend

 DHHL Properties

Figure 5-1
West Region

MAUI LAND INVENTORY

DEPARTMENT OF HAWAIIAN HOME LANDS

NORTH



MAUI ISLAND PLAN

Launiupoko, Olowalu and Ukumeke aquifers in the Lahaina district. Two County water treatment facilities at Māhinahina and Lahaina have a combined maximum capacity of approximately 6.0 mgd.

The municipal water demand for the West Maui Community Plan region was 5.37 mgd for the year ending June 2001. This amount represents metered consumption and is less than the quantity withdrawn due to leakages and unaccounted water.

With the cessation of sugar cultivation in West Maui and a significant reduction in the irrigation of agricultural fields, groundwater hydrology in the Lahaina area between Honokōwai and Launiupoko has been directly affected. The *County of Maui Infrastructure Assessment Update* states that the net effects of the Pioneer Mill plantation closure on available water yields are uncertain at this time.

Analysis

The projected water demand in the *County of Maui Infrastructure Assessment Update* for the West Maui region is based on projections of the *County of Maui Socio-Economic Forecast Study Update*. Total water demand is projected to increase from 5.37 mgd in 2001 to 8.24 mgd by the year 2020, an overall increase of 2.87 mgd or approximately 53 percent of present consumption. The greatest water demands are for single-family residential and hotel uses.

The Honokōhau, Honolua and Honokahua aquifers have been, or are planned to be, developed to support projected development, including the 1,000-acre State Housing and Community Development Corporation of Hawai'i (HCDCH) Lahaina Master Planned Community in Wahikuli. HCDCH plans to provide potable water include the development of at least eight deep wells *mauka* of the project site and additional reservoirs and transmission lines. HCDCH has proposed to develop the wells and dedicate them to the County. Therefore, the County would not need to fund source development, transmission, and storage for the additional water demand generated by HCDCH's development.

The Kā'anapali area has adequate remaining capacity to support planned development, including the Kā'anapali 2020 Development, which is on its own private water system. Additional deep wells *mauka* of Kā'anapali and Kapalua resorts could be developed to meet future water demands.

The Honokōhau aquifer system has an estimated 10 mgd of sustainable yield with no existing groundwater withdrawals. Extensive transmission systems and additional storage facilities would be required due to the remote location of the aquifer inland of Honokōhau Bay. The Honolua aquifer system, *mauka* of Honokōhau Bay, has a surplus sustainable yield of approximately four mgd that could be developed. Additional wells in Honokōhau and Honolua could be developed to potentially yield 0.8 mgd each. The development of additional wells may be pursued in upper Māhinahina and upper Nāpili areas to yield

MAUI ISLAND PLAN

0.72 mgd each. A well field, including the HCDCH wells, in upper Wahikuli could provide additional municipal source capacity if necessary.

In addition, the Māhinahina Water Treatment Facility, which treats surface water from the Honolulu Ditch has a design capacity of 3.2 mgd and is currently producing an average of 3.0 mgd. There is additional source water available with the expansion of the Māhinahina Water Treatment Facility.

Wastewater

The County Lahaina WWRF services the West Maui region from Puamana to Kapalua. The WWRF is actually two separate wastewater reclamation facilities on one site, with a design capacity of 9.0 mgd average dry-weather flow. Reclaimed water from the Lahaina WWRF is used by the Kā'anapali Resort golf course and roadway landscape irrigation. The WWRF has a fill station that allows contractors to fill water wagons for dust control purposes. The remainder of the effluent is disposed of by gravity injection wells.

Analysis

The Lahaina WWRF is expected to have sufficient capacity beyond 2020, according to the *2003 Maui Infrastructure Assessment Update* report. This is based on projections for resident population and average daily visitors and assumes that all new developments taken into account in the report will be connected to the County sewer system.

Approximately 2.3 mgd of the facility's 9.0 mgd average dry-weather flow has been allocated to Amfac, HCDCH, and Kapalua Land Company, Ltd., who funded upgrades to the facility in 1995. However, by agreement, if HCDCH does not proceed with its Villages of Leiali'i project, its allocation will expire in 2006 and revert back to the County.

Solid Waste

The County provides collection services for solid waste in West Maui, which is received by the Central Maui Landfill. The Olowalu transfer station is located approximately four miles southeast of Lahaina and accepts self-haul waste from residents of Lahaina for transfer to the Central Maui Landfill.

Analysis

According to the *Public Facilities Assessment Update*, the Central Maui Landfill will have adequate capacity to accommodate commercial and residential waste through the year 2020, with a surplus of approximately one million cubic yards of landfill space.

Electrical

Three 69-kV lines from the Mā'alaea Power Plant service the West Maui/Lahaina area.

Analysis

According to the *County of Maui Infrastructure Assessment Update Electrical Systems*, the projected peak electric power demand for Maui in 2020 is 275.5 MW.

MAUI ISLAND PLAN

Recommended additions to generating capacity differ based on linear and nonlinear projections. If the population of Maui increases linearly for the next 20 years, a minimum of 65 MW should supplement the current generating capacity by 2020. If the yearly rate of electrical demand increases exponentially, as much as 130 MW may be needed. Based on the planned additions for generating capacity to MECO's generation facilities, this predicted energy demand will be easily met. MECO plans for 361.2 MW of generating capacity, much above the needed amount.

2. SOCIO-ECONOMIC INFRASTRUCTURE

Police

According to the *Public Facilities Assessment Update*, the DHHL West region falls within the Maui Police Department's District IV – Lahaina. This district has one police station that serves as the headquarters for the West Maui Community Plan region. The Lahaina Station is currently staffed by 56 uniformed patrol officers and an estimated 18 investigative officers.

Analysis

According to the *Public Facilities Assessment Update*, the main problem facing the Lahaina district police is the large area they are required to cover. The extensive area of coverage can cause long lag times between beats in outlying areas as police commute back to the Lahaina Station. For outlying regions, this time lag can be considerable, leaving outlying communities inadequately protected.

By the year 2020, a staff of 106 officers and 33 support staff will be required to service the Lahaina Police District. This represents an increase of approximately 40 percent over the current number of officers assigned to the Lahaina district. Expansion of the existing Lahaina Station will be required to accommodate future personnel and operational requirements and improve the time and effectiveness of service call responses.

Fire

According to the *Public Facilities Assessment Update*, two fire stations cover the Lahaina region, the Lahaina Fire Station and the Nāpili Fire Station. The Lahaina Fire Station is responsible for the Lahaina, Olowalu, and Kā'anapali areas. The Nāpili Fire Station is responsible for the Honokōwai, Kapalua, and Nāpili areas.

Analysis

According to the *Public Facilities Assessment Update*, the addition of an engine and ladder company at the southern end of Lahaina town would provide coverage for Lahainaluna and south Lahaina.

Emergency Services

According to the *Public Facilities Assessment Update*, two ambulances service the region, one in Lahaina and one in Nāpili.

MAUI ISLAND PLAN

Analysis

According to the *Public Facilities Assessment Update*, the service level of two ambulances appears to be adequate until 2015, after which an additional ambulance should be considered.

Health Care Services

Maui Memorial Medical Center, located in Wailuku, is the County of Maui's only critical care facility.

A West Maui 24-hour Acute Care Medical Center is currently planned for an approximately 15-acre site within the Kā'anapali 2020 "Lower Honokōwai" community. Plans to build this facility continue to progress.

Analysis

According to the *Public Facilities Assessment Update*, based on the estimated total demand, nine additional acute care (inpatient services provided to patients whose average length of stay is usually less than 30 days) beds will be needed in 2015 and 20 in 2020.

Schools

The 2002 *Public Facilities Assessment Update*, lists the following schools for this region¹:

Public

Kamehameha III Elementary School (5.5 miles)

Nahienaena Elementary School (6 miles)

Lahaina Intermediate School (6 miles)

Lahainaluna High School (6 miles)

Private

Sacred Hearts (K-8) (5 miles)

Analysis

The 2002 *Public Facilities Assessment Update* projected the enrollment for schools in this region to 2020 and made the following assessment:

Elementary Schools

The elementary schools in Lahaina appear to be adequate throughout the planning period (from 2005 to 2020). However, the forecast may understate the actual demand for classrooms, since actual enrollment at the two elementary schools was above rated capacity in 2001.

¹Distances (approximate) given are from the Honokōwai tract to the listed school.

MAUI ISLAND PLAN

Intermediate Schools

County of Maui population projections indicate demand for a second intermediate school to serve the Lahaina planning region by 2010, with significant crowding at the existing facility anticipated until that time.

High Schools

The high school student projections for Lahaina to 2020 indicate a growing demand. By 2020, Lahainaluna High School will be 25 percent over capacity. However, the projections do not appear to justify the need for a second high school before 2020.

Recreation

According to the *Public Facilities Assessment Update*, Lahaina has a well-developed park system, with over 10.3 acres of sub-regional and special-use parkland per 1,000 residents. The sub-regional park system in the Lahaina area consists of 23 neighborhood parks. The community currently has access to two tennis courts, two sports fields, a gym, and a community center (Lahaina Civic Center), in addition to the many supplemental facilities offered by resorts in the area.

Analysis

According to the *Public Facilities Assessment Update*, the Lahaina region will need an additional 63.7 acres of community oriented park space over the next twenty years, using a standard of 10 acres of sub-regional park space per 1,000 persons. The community cannot rely on its abundance of beach and private park facilities, as the rising numbers of visitors expected in the community will place increasing pressure on these resources.

In addition, based on expected growth of approximately 6,886 residents by 2020, the existing community recreational facilities will need to be supplemented by an additional 15 tennis courts, five tot lots, 10 sports fields, 20 sports courts, and a community center. It may be infeasible to site many of these facilities at the existing regional beach parks due to their limited size or narrow width. However, there are many parks at the regional level where these facilities could be sited.

B. HONOKŌWAI TRACT BASELINE INFORMATION



1. INVENTORY

TMK and Acreage

The Honokōwai tract is 776.5 acres and is identified by TMK 4-4-01:15, 36 and TMK 4-4-02: 03, 08, 09, 11, 15, and 18 (Figure 5-1).

Existing Uses

Maui Land & Pineapple Company, Inc. leases 510 acres (TMK 4-4-02:15 and 18, portion) of the tract, for pineapple farming. This general lease is for 20 years and will expire in 2011.

MAUI ISLAND PLAN

Adjacent Uses

The tract is bounded to the west by Honoapi'ilani Highway, to the south by Amfac's "Kā'anapali 2020" Master Plan area, to the east by pineapple fields, and to the north by Maui Land & Pineapple Company, Inc.'s Māhinahina lands. The Māhinahina Water Treatment facility is located adjacent to the northeast corner and the Lahaina WWRF is adjacent to the southwest corner of the tract. Honokōwai Gulch divides the site *mauka* to *makai* into three separate land sections.

The Kapalua Airport is situated one quarter-mile north of the tract. The flight path for approaching and departing planes crosses the eastern corner of the tract along a north-south axis. However, flights are limited to the daylight hours. Amfac's Kā'anapali Beach Resort is located *makai* and to the south of the tract. This resort development has a mix of hotel, multi-family residential, and commercial uses. Its close proximity to the tract presents employment opportunities.

Proposed Future Surrounding Uses

In total more than 12,000 residential units are proposed from Olowalu to Kapalua as part of several projects throughout West Maui (*Honolulu Advertiser*, February 8, 2004). Kā'anapali 2020, which is adjacent to the tract, is proposing approximately 3,032 units. *Makai*, another 1,000 units are planned in North Beach. Approximately 1,400 units are being proposed further north, between Kahana and Kapalua. This total of approximately 12,000 units also includes the 4,800 units of the Villages of Leiali'i.

Maui Land & Pineapple Company, Inc. has proposed a new affordable housing project called Pulelehua adjacent to and north of the *makai* section of the Honokōwai tract. The project would consist of approximately 270 acres between Honoapi'ilani Highway and the Kapalua West Maui Airport. As of March 2004, no details regarding the number of units or other uses within the project were available.

2. REGULATORY

State Land Use District

Honokōwai is within the State Agricultural District (Figure 5-2).

County Community Plan

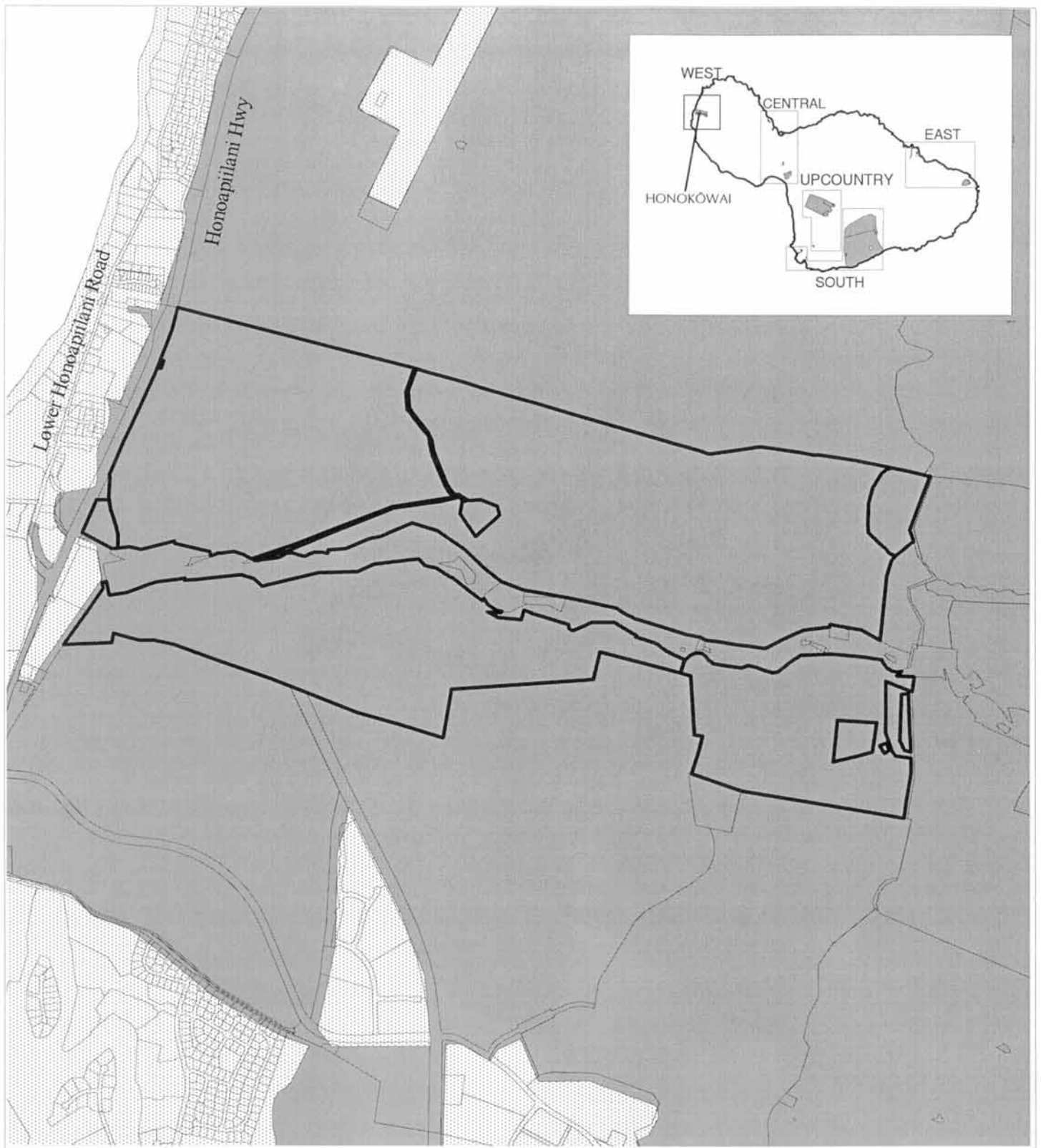
The *West Maui Community Plan* designates the tract as Agricultural.

County Zoning

The tract is within the County Agricultural zone.

Special Management Area

This tract is not within the Special Management Area.



Legend




-  Agricultural District
-  Urban District
-  DHHL Land Boundary

Figure 5-2

HONOKŌWAI

State Land Use

MAUI LAND INVENTORY

DEPARTMENT OF HAWAIIAN HOME LANDS

NORTH



1,000 0 2,000



(FEET)



MAUI ISLAND PLAN

Underground Injection Control Line

The majority of this tract is above the UIC line; however, a part of the lower portion of this tract is below the UIC line (Figure 5-3).

3. PHYSICAL CHARACTERISTICS

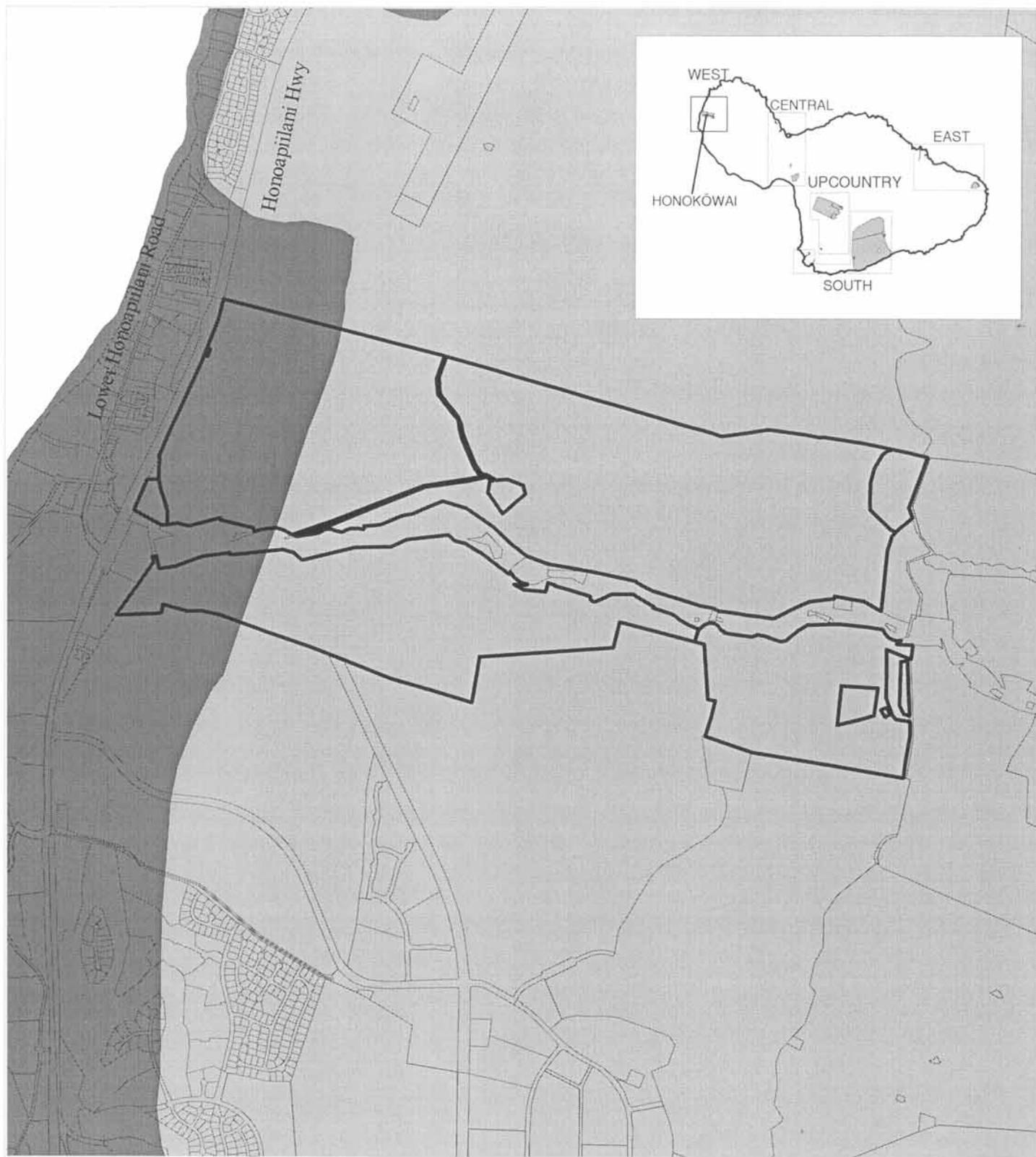
Climate

Temperature averages 75.7 degrees Fahrenheit during the year.

Soils

The USDA Soil Conservation Service Survey shows the following soils on the Honokōwai tract (Figure 5-4).

- Lahaina Silty Clay, 7 to 15 percent slopes – This soil is used for sugarcane and pineapple. Small acreages are used for truck crops, pasture, and wildlife habitat. Runoff is medium and the erosion hazard is moderate.
- Lahaina Silty Clay, 3 to 7 percent slopes – This soil is used for sugarcane and pineapple. Runoff is slow, and the erosion hazard is no more than slight.
- Rough Broken and Stony Land – This land type is used for pasture, wildlife habitat, and watershed. It consists of very steep, stony gulches. Runoff is rapid, and geologic erosion is active.
- Moloka'i Silty Clay Loam, 3 to 7 percent slopes – This soil is used for sugarcane, pineapple, pasture, wildlife habitat, and homesites. Runoff is slow to medium and the erosion hazard is slight to moderate.
- Rough Broken Land – This land type is used primarily for watershed and wildlife habitat. In places it is also used for pasture and woodland. It consists of very steep land broken by numerous intermittent drainage channels. Runoff is rapid, and geologic erosion is active.
- 'Ewa Silty Clay Loam, 0 to 3 percent slopes – This soil is used for sugarcane and homesites. Runoff is very slow and the erosion hazard is no more than slight.
- Kahana Silty Clay, 3 to 7 percent slopes – This soil is used for sugarcane, pineapple, and homesites. Runoff is slow and the erosion hazard is slight.
- Kahana Silty Clay, 7 to 15 percent slopes – This soil is used for sugarcane, pineapple, and homesites. Permeability is moderately rapid. Runoff is slow to medium, and the erosion hazard is slight to moderate.
- Moloka'i Silty Clay Loam, 7 to 15 percent slopes – This soil is used for sugarcane, pineapple, pasture, wildlife habitat, and homesites. This soil occurs on knolls and sharp slope breaks. Runoff is medium, and the erosion hazard is moderate.
- Pūlehu Clay Loam, 0 to 3 percent slopes – This soil is used for sugarcane, truck crops, and pasture. This soil is on alluvial fans and stream terraces and in basins. Runoff is slow, and the erosion hazard is no more than slight.
- Rock Land – This land type is used for pasture, wildlife habitat, and water supply. It is also used for urban development. In many areas, especially on O'ahu, the soil



Legend

- Areas Below (Makai) Underground Injection Control Line
- Areas Above (Mauka) Underground Injection Control Line
- DHHL Land Boundary

Figure 5-3

HONOKŌWAI

Underground Injection Control (UIC) Areas Map

MAUI LAND INVENTORY

DEPARTMENT OF HAWAIIAN HOME LANDS

NORTH

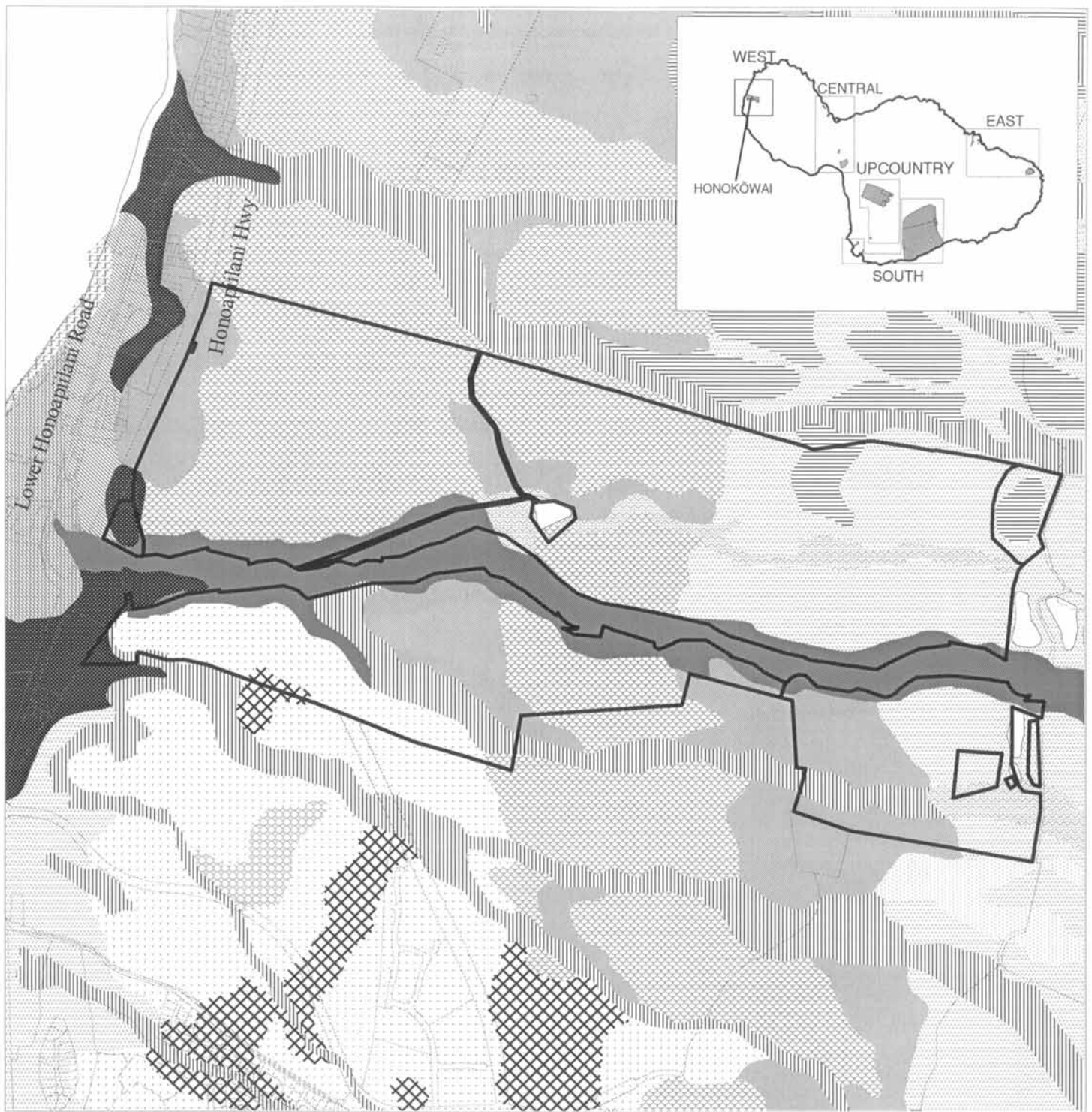


1,000 0 2,000



(FEET)





Legend














-  Lahaina Silty Clay, 7-15% Slopes
-  Lahaina Silty Clay, 3-7% Slopes
-  Rough Broken and Stony Land
-  Molokai Silty Clay Loam, 3-7% Slopes
-  Rough Broken Land
-  Ewa Silty Clay Loam, 0-3% Slopes
-  Kahana Silty Clay, 3-7% Slopes
-  Kahana Silty Clay, 7-15% Slopes
-  Molokai Silty Clay Loam, 7-15% Slopes
-  Pulehu Clay Loam, 0-3% Slopes
-  Rock Land
-  Water
-  DHHL Land Boundary

Figure 5-4

HONOKŌWAI

Soil Conservation Service Survey

MAUI LAND INVENTORY

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MAUI ISLAND PLAN

material associated with the rock outcrops is very sticky and very plastic. It also has high shrink-swell potential. Buildings on the steep slopes are susceptible to sliding when the soil is saturated. Foundations and retaining walls are susceptible to cracking.

Agricultural Lands of Importance to the State of Hawai'i

The State of Hawai'i Department of Agriculture ALISH system of defining agricultural suitability classifies most of the soils in Honokōwai as "Prime Agriculture Land" and the remaining soils are not classified (Figure 5-5).

Ground/Surface Water

The USGS topographic map shows Honokōwai Stream as a natural water source within Honokōwai.

Rainfall

Rainfall ranges from 10 to 40 inches (Figure 5-6).

Topography/Slope

The USGS topographic map shows the elevation of Honokōwai ranging from approximately 50 feet above sea level along the western border of the tract to 750 feet above sea level along the eastern border (Figure 5-6). The average slope across the tract is approximately 10 to 15 percent.

Drainage

The USGS topographic map shows Honokōwai Gulch and a siltation pond as natural drainage features within Honokōwai.

Flood Zone

The Flood Insurance Rate Map indicates that portions of Honokōwai are within the following zones (Figure 5-7):

A	Special flood hazard areas inundated by the 100-year flood (no base flood elevations determined)
X	Areas determined to be outside of the 500-year floodplain
X500	Areas inundated by the 500-year flood

Noise

Planes taking off and landing at the nearby Kapalua West Maui Airport impact ambient noise levels. To minimize the impact, flights are restricted to daytime hours and only small engine aircraft are allowed at the airport.

There will also be noise impacts from the proposed bypass highway. Setbacks, noise barriers, or landscaping should be used to minimize the impacts of the bypass on the surrounding uses.



Legend

-  Prime Agricultural Land
-  Unique Agricultural Land
-  Other Agricultural Land
-  Unclassified Land
-  DHHL Land Boundary

Source: State of Hawaii Department of Agriculture

Figure 5-5

HONOKŌWAI

Agricultural Lands of Importance to the State of Hawaii (ALISH)

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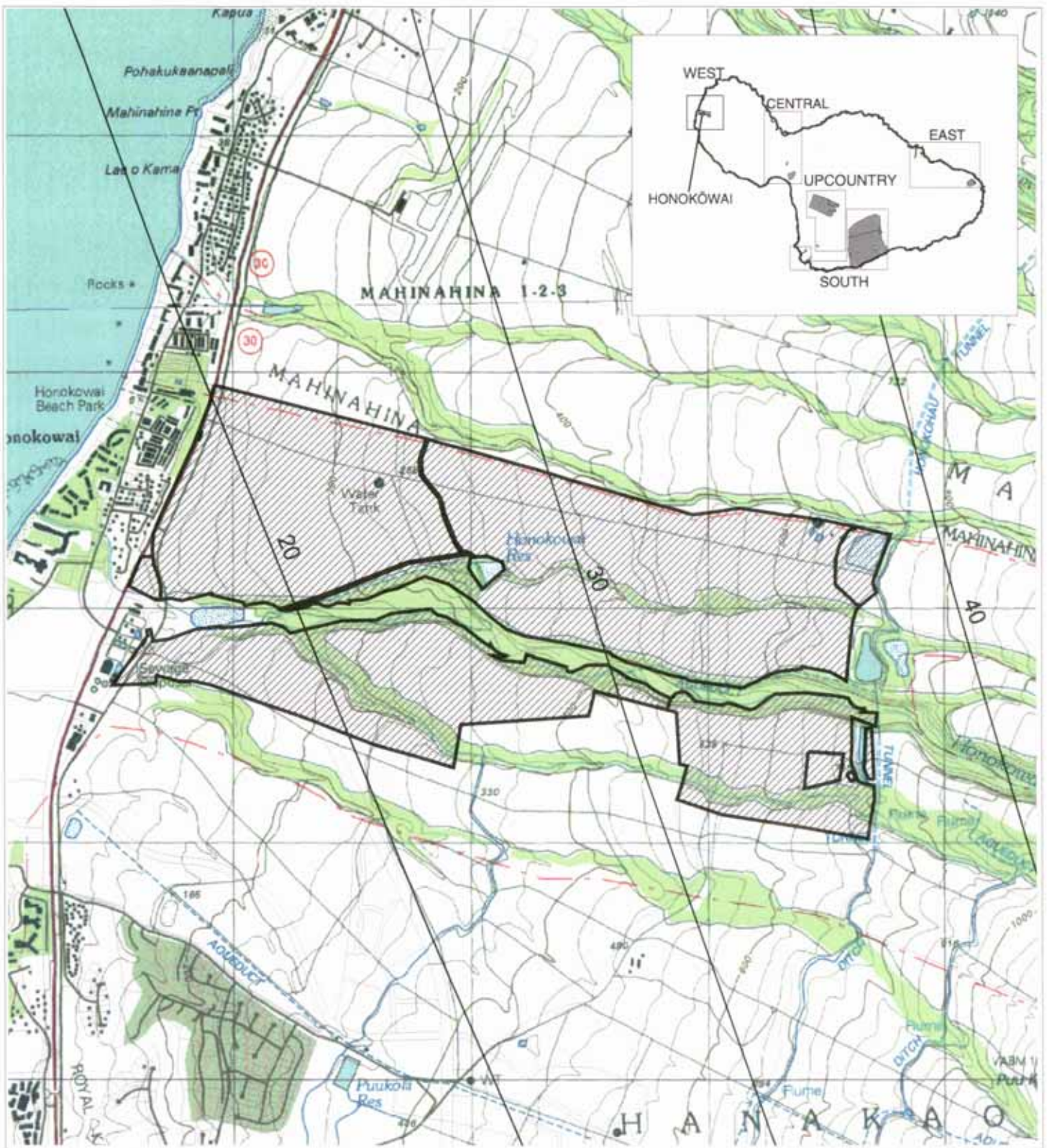
DEPARTMENT OF HAWAIIAN HOME LANDS

NORTH



(FEET)





Legend

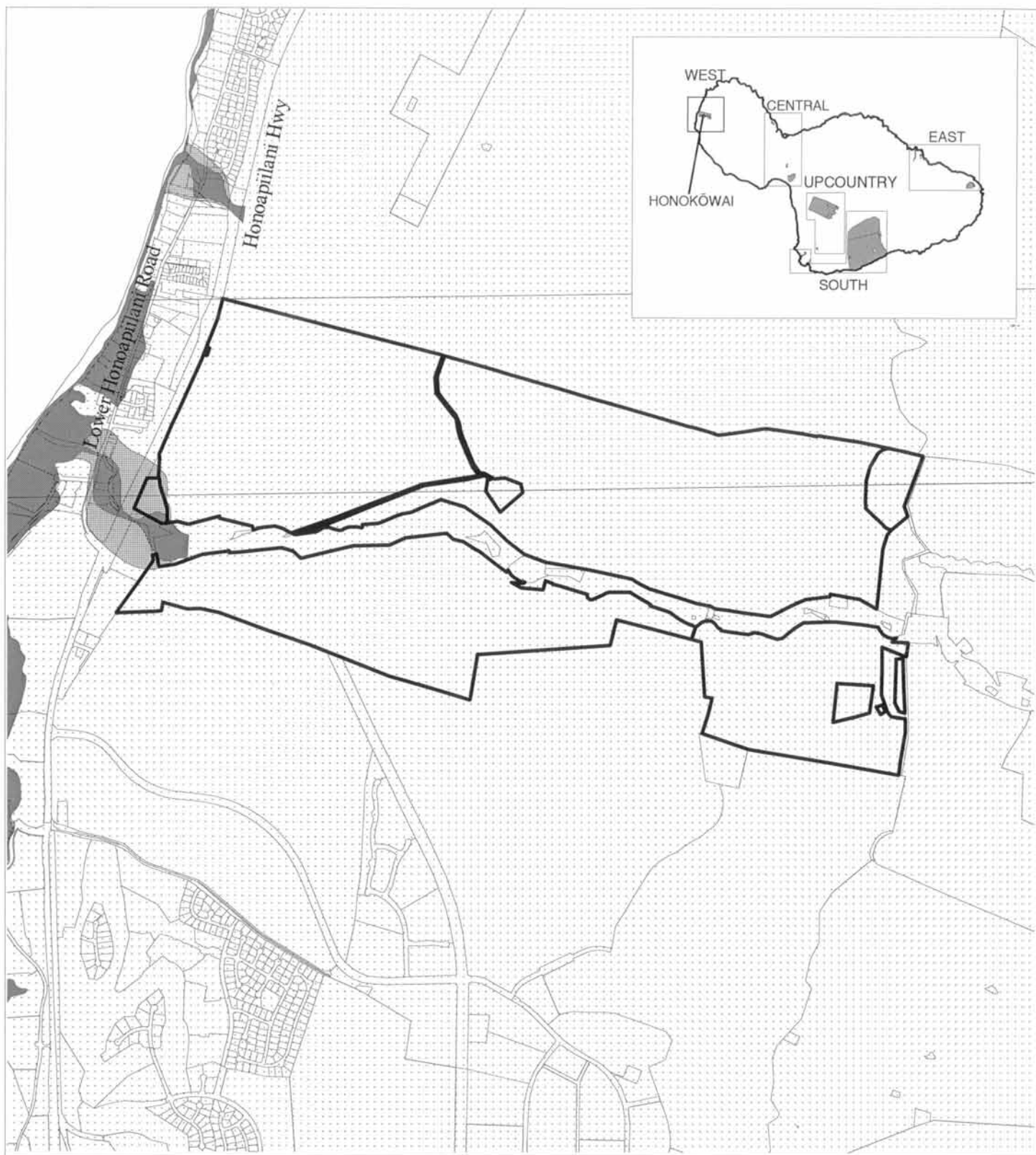
-  DHHL Properties
-  Lines of Equal Average Annual Rainfall in Inches

Figure 5-6
HONOKŌWAI
USGS Map with Rainfall Isohyets
MAUI LAND INVENTORY

DEPARTMENT OF HAWAIIAN HOME LANDS

NORTH





Legend

- ZONE A:
Special Flood Hazard Areas Inundated by 100-Year Flood
No Base Flood Elevations Determined
- ZONE X:
Areas Determined To Be Outside 500-Year Floodplain
- ZONE X500:
Areas of 500-Year Flood
- DHHL Land Boundary

Source: Federal Emergency Management Agency



MAUI ISLAND PLAN

4. ENVIRONMENTAL CHARACTERISTICS

Historic Sites/Archeology/Cultural Resources

There are no known archeological sites on the tract, as a majority of the property has been cultivated for sugar and pineapple production.

Honokōwai Gulch, one of two gulches that transverse the tract from *mauka* to *makai*, is known to contain archeological sites. There is a restoration project underway in the gulch referred to as the Honokōwai Stabilization Project. The objectives of this project include preserving cultural resources and archaeological sites and attempting to reforest the gulch using native Hawaiian plants. The second major gulch that transverses the tract may also contain archaeological sites. Honokōwai Gulch is not owned by DHHL.

Endangered Species

There are no species identified as candidate or endangered by the Hawai'i Natural Heritage Program *Biological Conservation Datasystem (BCD) for Department of Hawaiian Home Land* on the Honokōwai tract.

Critical Habitat

The U.S. Fish and Wildlife Service has not designated any critical habitat areas within the Honokōwai tract.

5. INFRASTRUCTURE

Access/Roadways

The largest contiguous land section within the tract, which is located north of Honokōwai Gulch, has direct access off Honoapi'ilani Highway. The two remaining sections, south of the Honokōwai Gulch, are currently landlocked with no road access. Existing plantation cane roads within the property serve the pineapple fields and create an unimproved road network.

The proposed bypass highway will create opportunities for the Honokōwai tract that include creating prime street frontage for commercial and industrial uses and providing access points to the south portion of the tract, which is currently landlocked. The bypass highway may also create constraints, including limiting *mauka-makai* routes and noise impacts on uses located along the bypass alignment. Four access points are planned along the bypass highway's corridor, none of which are within the Honokōwai tract. DHHL will need to meet with D.O.T. to add an access point into the Honokōwai tract.

DHHL will need to come to an agreement with Amfac for use of Halawai Drive for temporary access onto the south portion of the tract until the bypass highway is built.

Water System (Lines, Wells)

The County of Maui operates a surface water treatment plant (Māhinahina Water Treatment Facility) adjacent to the *mauka* north east corner of the tract. Under agreement,

MAUI ISLAND PLAN

the County can withdraw up to 5.0 MGD from the Honokōhau/Honolua Ditch for processing at the facility. However the facility has a design capacity of 3.2 MGD and is presently producing an average of 3.0 MGD. Therefore, there is available source water that could be treated if the capacity of the treatment plant was expanded.

In addition, the County has a 16-inch waterline from the Māhinahina Water Treatment Facility to a 2.0 MG storage reservoir at an elevation of 250 feet. This 2.0 MG reservoir cannot support development above an elevation of 150 feet. If development occurs above the 150-foot elevation, a higher elevation reservoir will need to be constructed.

A 20-inch waterline runs from the reservoir to Lower Honoapi'ilani Road, where it connects to the DWS distribution system along the highway.

Wastewater Treatment and Disposal

Lahaina WWRF is adjacent to the southwest corner of the tract. According to the *2003 Maui Infrastructure Assessment Update* report, the Lahaina WWRF is expected to have sufficient capacity beyond 2020.

Solid Waste Disposal

The County provides solid waste disposal service, which will be collected and taken to the Central Maui Landfill.

Telephone Service

Sandwich Isles Communications will provide the telephone service to the tract.

Electrical Service

MECO provides electrical service to the West Maui/Lahaina area through three of the seven 69-kV lines from the Mā'alaea Power Plant.

Cable Television Service

This Honokōwai tract is within the Oceanic Cable service area.

C. HONOKŌWAI TRACT ANALYSIS

The tract is divided into three parcels by Honokōwai stream and an unnamed gulch, which creates opportunities for a mix of uses (Figure 5-8).

Two major off-site infrastructure facilities exist adjacent to the tract – the Lahaina WWRF and the Māhinahina Water Treatment Facility. The Māhinahina Water Treatment Facility needs to be upgraded to accommodate development on the tract. However the close proximity of these facilities to the site lowers off-site development costs.



MAUI ISLAND PLAN

The tract has moderate slopes and offers panoramic views of the Lahaina coastline. The tract also has prime agricultural soils that have been farmed in the past and present opportunities for agriculture homestead uses.

The tract is situated along Honoapi'ilani Highway, which is the primary corridor through the region. The frontage along the highway presents tremendous opportunities for income generating uses. The tract is also in close proximity to Kā'anapali, Kapalua and Lahaina, which are the economic centers of West Maui and offer job opportunities.

A major development constraint is the regional traffic congestion. Honoapi'ilani Highway experiences heavy congestion during peak hours. Improvements to Honoapi'ilani Highway and the proposed Lahaina Bypass Highway will help with the congestion. However, improvements to portions of both roadways that will serve the tract are not planned in the immediate future.

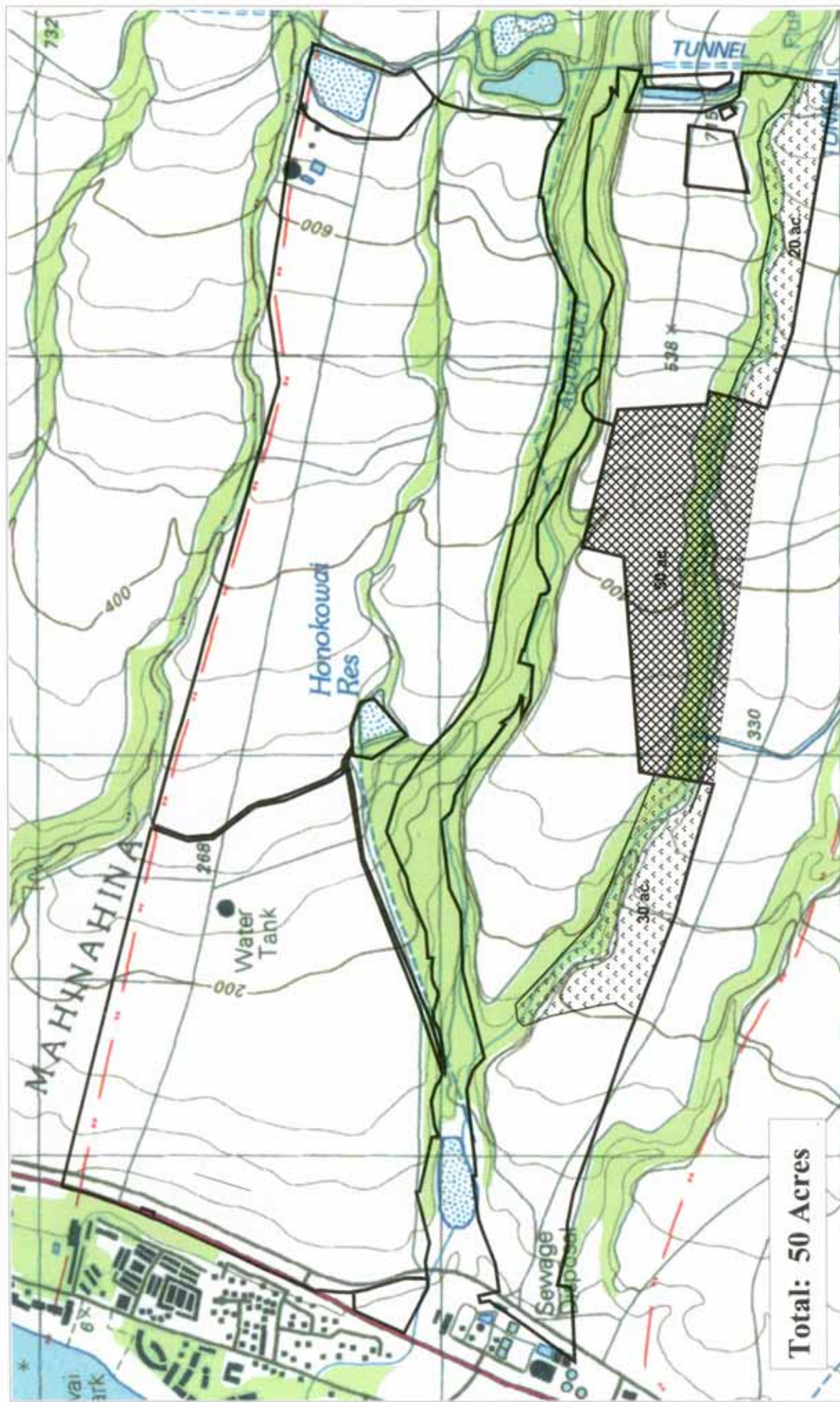
Based on the opportunities and constraints, Honokōwai offers major residential, agriculture, and commercial/industrial opportunities. Infrastructure and traffic constraints need to be addressed in order for development to occur.

Land Exchange

Two major gulches intersect the entire length of the Honokōwai tract. Honokōwai Gulch is the northern gulch; the southern gulch is unnamed. DHHL owns the finger of land between the two gulches, which terminates at the junction of the two gulches at approximately the 160-foot elevation. The southern boundary of this tract has an irregular indentation between the 300-foot and 520-foot elevations. The boundary crosses over the unnamed gulch and into the land between both gulches at the 300-foot elevation. The boundary extends *mauka* and crosses back over the gulch at the 520-foot elevation. The area of the land between the two gulches that is excluded from the tract is approximately 50 acres (Figure 5-9).

The tract also includes 20 acres of land south of the unnamed gulch in the southeast corner of the property and approximately 60 acres of land south of the Honokōwai gulch in the southwest corner. Access to the 20 acres in the southwest corner is limited and landlocked. Access to the 60 acres is also limited to the *makai* portion of the 60 acres off of Honoapi'ilani Highway until the Lahaina Bypass Highway is built.

A land exchange with Kā'anapali Development Corporation (KDC) is proposed. The exchange of 20 acres in the southeast corner and 30 acres in the southwest corner for the 50-acre piece between the 300-foot and 520-foot elevations would consolidate the portion of land between the gulches. Thirty acres would be retained in the southwest corner of the tract for future residential use.



Legend

- DHHL Land Boundary
- Proposed Land Exchange Kaanapali Development Corporation
- DHHL

Figure 5-9
HONOKOWAI
Land Exchange
MAUI LAND INVENTORY

DEPARTMENT OF HAWAIIAN HOME LANDS



MAUI ISLAND PLAN

D. HONOKŌWAI TRACT ALTERNATIVES

1. ALTERNATIVE 1

A preliminary development plan was prepared for the Honokōwai tract during an on-going planning effort done for DHHL by an independent firm. Hui Kako’o (DHHL applicants organization) assisted applicants/beneficiaries to provide public input during the planning process.

The preliminary development plan proposes 279 acres of residential use, 94 acres of subsistence agriculture, 65 acres of supplemental agriculture, 75 acres of parks, 21 acres of industrial, 14 acres of commercial, eight acres of *kupuna* housing (for the elderly), 24 acres for the Lahaina Bypass, eight acres for water facilities, seven acres of community facilities, and 195 acres of roads and open space. The preliminary development plan designates 790 acres of uses, although total acreage according to baseline data for the tract is only 777 acres.

The 279 acres of residential use would offer roughly 969 single-family units. Access to those areas would be from Honoapi’ilani Highway, with connections onto the proposed Lahaina Bypass Highway. The majority of the land between Māhinahina Gulch and Honokōwai Gulch would be designated for residential use, parks, and a private school. *Kupuna* housing would be sited within the residential areas.

DHHL’s Honokōwai site is especially well located to take advantage of its highway location, the existing and planned infrastructure, and the regional commercial market for both community facilities and commercial/industrial uses.

Access and road frontage are the main reasons for developing commercial, community facilities, and industrial lands along the highway. Industrial use is proposed adjacent to the wastewater treatment plant, south of Honokōwai Gulch, to separate the industrial use from residential uses and to create a buffer between the wastewater treatment plant and homes.

Mauka lands above the proposed industrial area are designated for subsistence and supplemental agriculture. Subsistence agricultural lots will average one to two acres in size; supplemental agricultural lots will average three to five acres in size. Both types of proposed agricultural lots would help meet a need for additional agricultural lands on Maui.

Phase I

The preliminary development plan illustrates the full build out of the Honokōwai tract but does not reflect existing beneficiary demand. According to the *Maui Island Beneficiary Survey*, there is a demand for 411 residential units in West Maui. The intent of the *Maui*

MAUI ISLAND PLAN

Island Plan is to meet demand in each region over the next 20 years and avoid oversaturating a region with surplus units exceeding the demand. With this in mind, Alternative 1 proposes an initial phase of development that incorporates elements of the preliminary development plan. Phase 1 includes 111 acres for residential use, 19 acres for community facilities, 20 acres of industrial uses, 12 acres of commercial uses, and 615 acres for general agriculture (Figure 5-10).

Residential

Within the 111 acres proposed for residential use, 411 residential units are proposed at the northwest corner of the tract. This location takes advantage of its proximity to Honoapi'ilani Highway and the proposed Lahaina Bypass Highway. Access from Honoapi'ilani Highway into the 111-acre subdivision will be located at the northwest corner of the tract. The proposed Lahaina Bypass Highway will run along the western boundary of the residential site and may provide additional access points when completed.

The estimated water use is approximately 246,600 gallons per day. The estimated effluent discharge is approximately 131,500 gallons per day.

Community Facilities

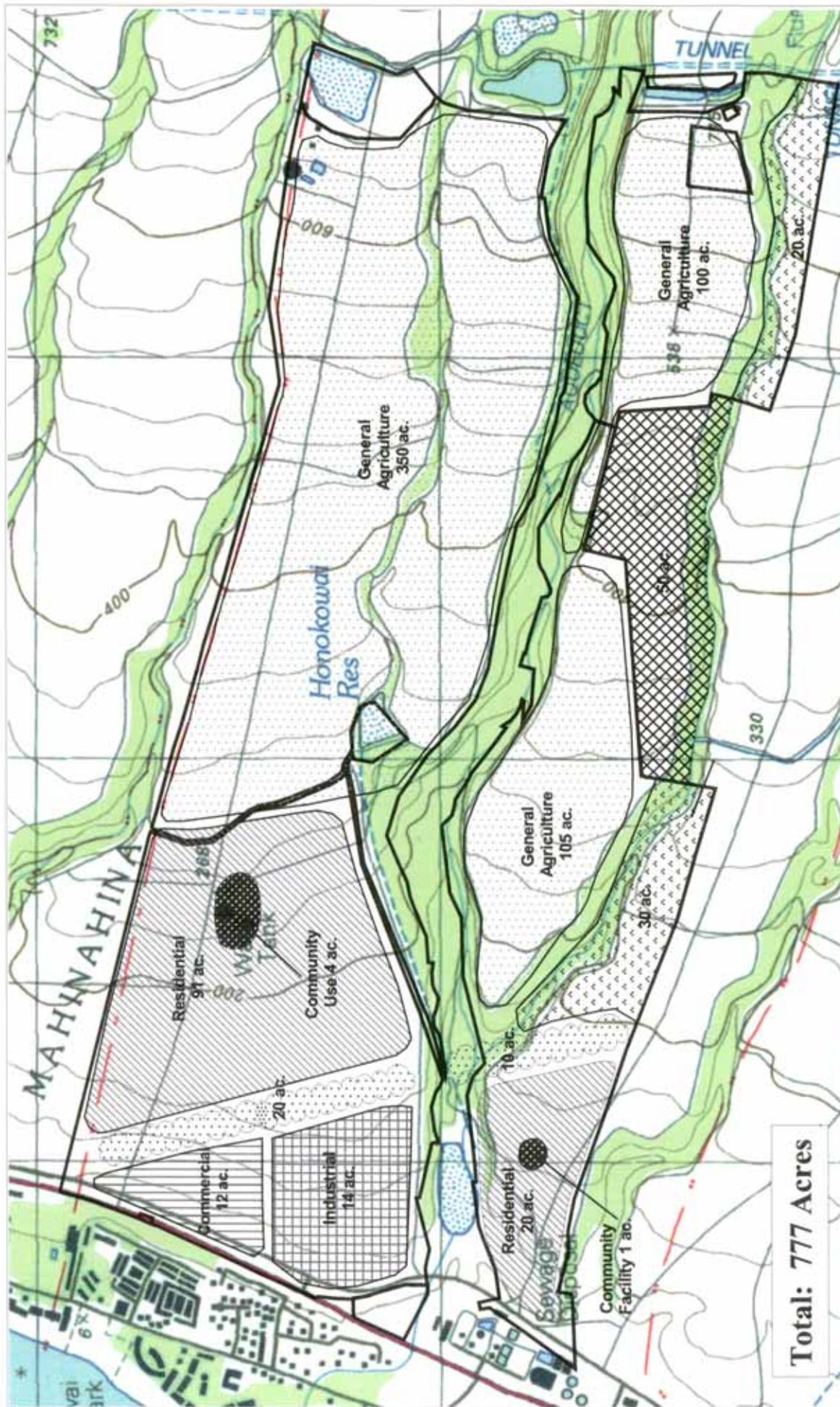
Of the total 19 acres of community facilities, 14 acres are proposed along Honoapi'ilani Highway and five acres are proposed within the residential area. According to County of Maui park standards, five acres of park area are needed for the 411 proposed units. The additional 14 acres along Honoapi'ilani Highway reflects the preliminary development plan proposal. According to the plan, this community use will be a regional facility that will serve the greater Lahaina area rather than just the homesteads on the Honokōwai tract. Uses in the 14-acre parcel may include a community center and potential school site.

The estimated water use is approximately 20,000 gallons per day. The estimated effluent discharge is approximately 2,000 gallons per day.

Commercial

The 12 acres of commercial uses will be located at the site's *makai* end along Honoapi'ilani Highway to take advantage of the beneficial street frontage and access.

According to a market study for the proposed Pulehua Community, there is 625,000 square feet of gross leasable commercial space in Lahaina with an estimated resident Lahaina population of 18,750. The square feet per capita ratio is 33 square feet per capita, compared to the statewide average of 27 square feet per capita. According to the market study commercial development in Lahaina is stable and most importantly not oversupplied. A portion of the viability of the proposed 12 acres of commercial will be a direct function of consumer demand created by the Honokōwai community. As Honokōwai is built out, population levels will increase, and the need for additional services is proportionately created. In addition, given the location of the 12 acres along



Legend

DHHL Land Boundary
 Proposed Land Exchange
 Kaanapali Development Corporation
 DHHL

Land Use Summary

Land Use	Lot Size	Number of Lots	Approx. Acres
Residential	10,000 sf	411	111
General Agriculture			635
Community Use			5
Industrial			14
Commercial Use			12
Total		411	777

Figure 5-10

HONOKŌWAI

Land Use Alternative 1

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10/27/03

MAUI ISLAND PLAN

the highway and its visibility and frontage support reserving this site for future commercial development

The estimated water use is approximately 36,000 gallons per day. Using neighborhood commercial standards, the estimated effluent discharge is approximately 12,000 gallons per day.

Industrial

The proposed 20 acres of industrial use will be situated in an area near the wastewater treatment plant on lands south of Honokōwai Gulch. This location takes into consideration the proximity to existing industrial uses, adequate street frontage, and creating a separation between the industrial and residential components of the plan.

According to a market study for the proposed Pulehua Community, there is 338,500 square feet of gross leasable light industrial space in Lahaina, with an estimated resident Lahaina population of 18,750. The square feet per capita ratio is 18 square feet per capita, compared to the statewide average of 29 square feet per capita. This indicates that light industrial space in Lahaina is strongly undersupplied.

The estimated water use is approximately 42,000 gallons per day. Using light industrial standards, the estimated effluent discharge is approximately 14,000 gallons per day.

General Agriculture

Alternative 1 designates approximately 615 *mauka* of the proposed residential, commercial, industrial, and community facilities, for general agriculture. General agriculture will allow DHHL to retain existing pineapple leases with Maui Land & Pineapple Company, Inc., and give DHHL the flexibility to expand the proposed residential uses or provide subsistence or supplemental agriculture in the future.

Designation of the southern portion of the tract for subsistence or supplemental agriculture use was also considered. However, access is a significant problem because this portion is landlocked by the existing gulches. Although there are unimproved access roads that cross the Honokōwai Gulch, these roads are not within the DHHL land inventory.

A potential solution to address the access problem is developing a bridge across the gulch from the proposed industrial area. However, this would be a costly endeavor and would add to development costs of the agricultural lots. A second solution is to make an agreement with the landowner of the gulches for use of the existing unimproved roads that cross the gulch to the site. A third solution is to postpone development of this portion and leave it in general agricultural use until the Lahaina Bypass Highway is built. The proposed highway would offer access to this portion of land.

Cost Estimate

Alternative 1 proposes a total of 411 lots of 10,000 square feet each. Projected on- and off-site costs are depicted in Table 5-1 below.

MAUI ISLAND PLAN

Table 5-1: Projected Costs for Residential Lots at Honokōwai

Improvements	Total Cost \$	Cost Per Lot \$
Off-Site	11,688,385	68,452
On-Site	28,133,939	28,439
Total	39,822,324	98,891

Cost Factors

- Development of off-site infrastructure at Honokōwai accounts for 39 percent of projected costs. Although the proposed development is in close proximity to existing water and wastewater infrastructure, the Māhinahina Water Treatment Facility would require upgrades to serve the Honokōwai project.
- Off-site costs include estimates to upgrade the Māhinahina Water Treatment plant.
- County standard roads and full utilities are reflected in the on-site costs.
- Extensive site preparation requirements also increase on-site cost estimates for Honokōwai.

2. ALTERNATIVE 2

Alternative 2 proposes 111 acres of residential use, 205 acres of supplemental agriculture, five acres of industrial use, 30 acres of commercial use, 19 acres of community facilities, and 407 acres of general agriculture (Figure 5-11). The total acreage of Alternative 2 is 777 acres.

Residential

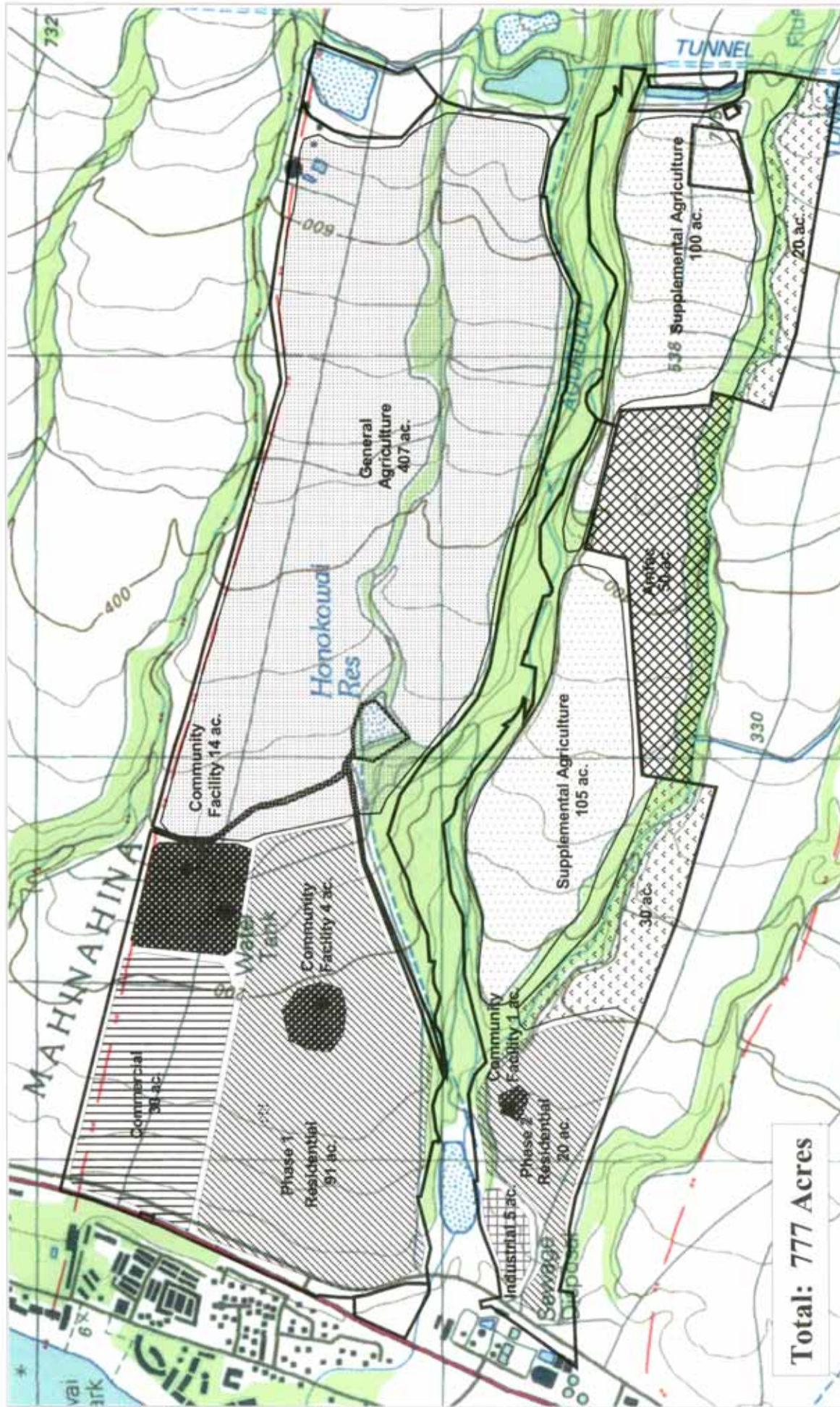
Four hundred eleven single-family units are proposed in two areas separated by Honokōwai Gulch.

91-Acre Residential Subdivision

The 91-acre area will contain 337 residential units between Māhinahina and Honokōwai Gulches. This location takes advantage of the proximity to Honoapiʻilani Highway, the Māhinahina Water Treatment Plant, and the proposed Lahaina Bypass Highway. Access from Honoapiʻilani Highway will be located at the northwest corner of the tract. Highway and intersection improvements would be needed.

The Māhinahina Water Treatment Plant, located in the northeast corner of the tract, is at an optimum location to use gravity flow to service the residential development.

Four acres of community facilities, including parks and open space uses, are proposed for the 91-acre residential site. This acreage was determined using County park standards.



Legend

- DHHL Land Boundary
- Propose Land Acquire
- Propose Land Transfer

Land Use Summary

Land Use	Lot Size	Number of Lots	Approx Acres
Residential	10,000 sf	411	111
General Agriculture			407
Community Use		19	5
Industrial			30
Commercial Use		15	205
Supplemental Agriculture 5 ac			
Total		426	777

Figure 5-11

HONOKŌWAI

Land Use Alternative 2

MAUI LAND INVENTORY

DEPARTMENT OF HAWAIIAN HOME LANDS



9/9/04

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The estimated water use of the 337 residential units is approximately 202,200 gallons per day. The estimated effluent discharge is approximately 108,000 gallons per day.

20-Acre Residential Subdivision

The 20-acre residential area will be located on the southern side of Honokōwai Gulch at the southeast corner of the tract. Approximately 74 units could be built in this location, which takes advantage of a number of different factors. First, the Kā'anapali 2020 development is adjacent to the 20-acre site to the south. Kā'anapali 2020's Master Plan proposes a golf course along the site's boundary. Having an adjacent golf course creates opportunities to develop view lots overlooking the course.

The 20-acre site is located on an upper plateau that overlooks the Kā'anapali North Beach Resort Area just across Honoapi'ilani Highway. Below the bluff, adjacent to the highway, is the wastewater treatment plant, which is low in profile and situated downwind of prevailing trades.

Halawai Drive may provide access to the 20-acre site from Honoapi'ilani Highway, with the potential for future *mauka* connections onto the proposed Lahaina Bypass Highway.

One acre for a community facility/park is proposed to service the 74 units. The acreage was calculated using County of Maui park standards.

Separating the residential development into two separate pieces allows DHHL to develop the land in increments. Although one contiguous piece is usually the norm, developing the 20-acre site and taking advantage of its unique scenic and cultural opportunities and location warrants special consideration.

The estimated water use for the 74 residential units is approximately 44,400 gallons per day. The estimated effluent discharge is approximately 24,000 gallons per day. The estimated water use for the one acre community facility/park is approximately 1,700 gallons per day. The estimated effluent discharge is approximately 400 gallons per day.

Supplemental Agriculture

Fifteen supplemental agricultural lots averaging five acres in size are proposed for the portion of land between the gulches that transverse the site. These supplemental agriculture lots are not intended for residential use, thus improvements are only limited to gravel roads. No water, electric, or sewer will be provided to these lots.

Community Facilities

Like Alternative 1, Alternative 2 designates 19 acres for community use, 14 of which are *mauka* of the commercial use and five of which are located within the residential areas. According to County of Maui park standards, five acres of park area are needed for the 411 proposed units. The additional 14 acres reflects the preliminary development plan proposal. According to the plan, this community use would be a regional facility and serve

MAUI ISLAND PLAN

the greater Lahaina community, rather than just the homesteads on the Honokōwai tract. Uses on the 14-acre parcel may include a community center and school site.

The estimated water use is approximately 32,300 gallons per day. The estimated effluent discharge ranges from approximately 7,600 gallons per day for park use to 67,400 gallons per day for a 13 acre school and 6 acre park .

Industrial/Commercial

The tract is situated along Honoapi'ilani Highway and is located in close proximity to the major economic centers of West Maui. These factors offer tremendous opportunities for income generating uses within the tract. To take advantage of these factors, Alternative 2 proposes five acres of industrial and 30 acres of commercial use.

The five-acre industrial site is located in close proximity to existing industrial uses and has adequate access. The industrial site was limited to five-acres due to the high slope along its eastern boundary. Locating this type of industrial use off the Highway, below the proposed residential development and close to existing industrial uses were factors in selecting this particular site.

The estimated water use for the industrial site is approximately 30,000 gallons per day. Using light industrial standards, the estimated effluent discharge is approximately 5,000 gallons per day.

The 30-acre commercial site is larger than the 12 acres proposed in Alternative 1. This is due to optimal street frontage and high visibility along Honoapi'ilani Highway. Although commercial demand is stable in the Lahaina, these attributes warrant reserving enough acreage for future commercial development. The 30 acres can be phased proportionately as the Honokōwai community is built out and the need for additional services increases.

The estimated water use for the commercial site is approximately 180,000 gallons per day. Using community commercial standards, the estimated effluent discharge is approximately 105,000 gallons per day. Community commercial standards assume a more intensive level of use compared to neighborhood commercial uses. The assumption to use community commercial standards was based on the greater land area compared to the 12-acre scenario.

General Agriculture

Alternative 2 proposed 407 acres of general agricultural use on *mauka* portions of the tract. The existing pineapple leases with Maui Land & Pineapple Company, Inc., should be retained in the interim to generate income. This designation also allows for potential expansion of residential uses or future subsistence or supplemental agricultural use in the future.

MAUI ISLAND PLAN

Cost Estimates

Alternative 2 propose development of a total of 411 10,000-square foot lots over two phases. Projected on- and off-site costs are summarized in the tables below.

Phase 1 – Residential

Total Lots = 337 lots

Lot Size = 10,000 square feet

Table 5-2: Projected Costs for Phase 1 Residential Lots at Honokōwai

Improvements	Total Cost \$	Cost Per Lot \$
Off-Site	11,693,885	34,700
On-Site	23,067,917	68,451
Total	34,761,802	103,151

Cost Factors

- Development of off-site infrastructure at Honokōwai accounts for 40 percent of Phase 1 costs. Although Phase 1 is in close proximity to existing water and wastewater infrastructure, the Māhinahina Water Treatment Facility will require upgrades to serve Honokōwai.
- Off-site access improvements are included in the cost estimates.
- Roads, sidewalks, curbs and gutters, and full underground utilities designed according to County standards are included in cost estimates.
- Extensive site preparation requirements also increase on-site cost estimates for Honokōwai.

Phase 2 – Residential

Total Lots = 74 lots

Lot Size = 10,000 square feet

Table 5-3: Projected Costs for Phase 2 Residential Lots at Honokōwai

Improvements	Total Cost \$	Cost Per Lot \$
Off-Site	532,328	7,194
On-Site	5,066,022	68,460
Total	5,598,350	75,653

Cost Factors

- Required off-site infrastructure for Phase 2 includes extending water service from Phase 1, providing a connection to the wastewater treatment plant, and developing access to the site.

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- Off-site costs do not include costs to upgrade the Māhinahina Water Treatment plant or the Lahaina Reclamation Wastewater Facility, which are addressed in the Phase 1.
- Roads, sidewalks, curbs and gutters, and full underground utilities designed according to County standards are included in cost estimates.

Supplemental Agriculture

Total Lots = 15 lots

Lot Size = 5 acres

Table 5-4: Projected Costs for Phase 2 Residential Lots at Honokōwai

Improvements	Total Cost \$	Cost Per Lot \$
Off-Site	129,071	8,605
On-Site	45,783	3,052
Total	174,854	11,657

Cost Factors

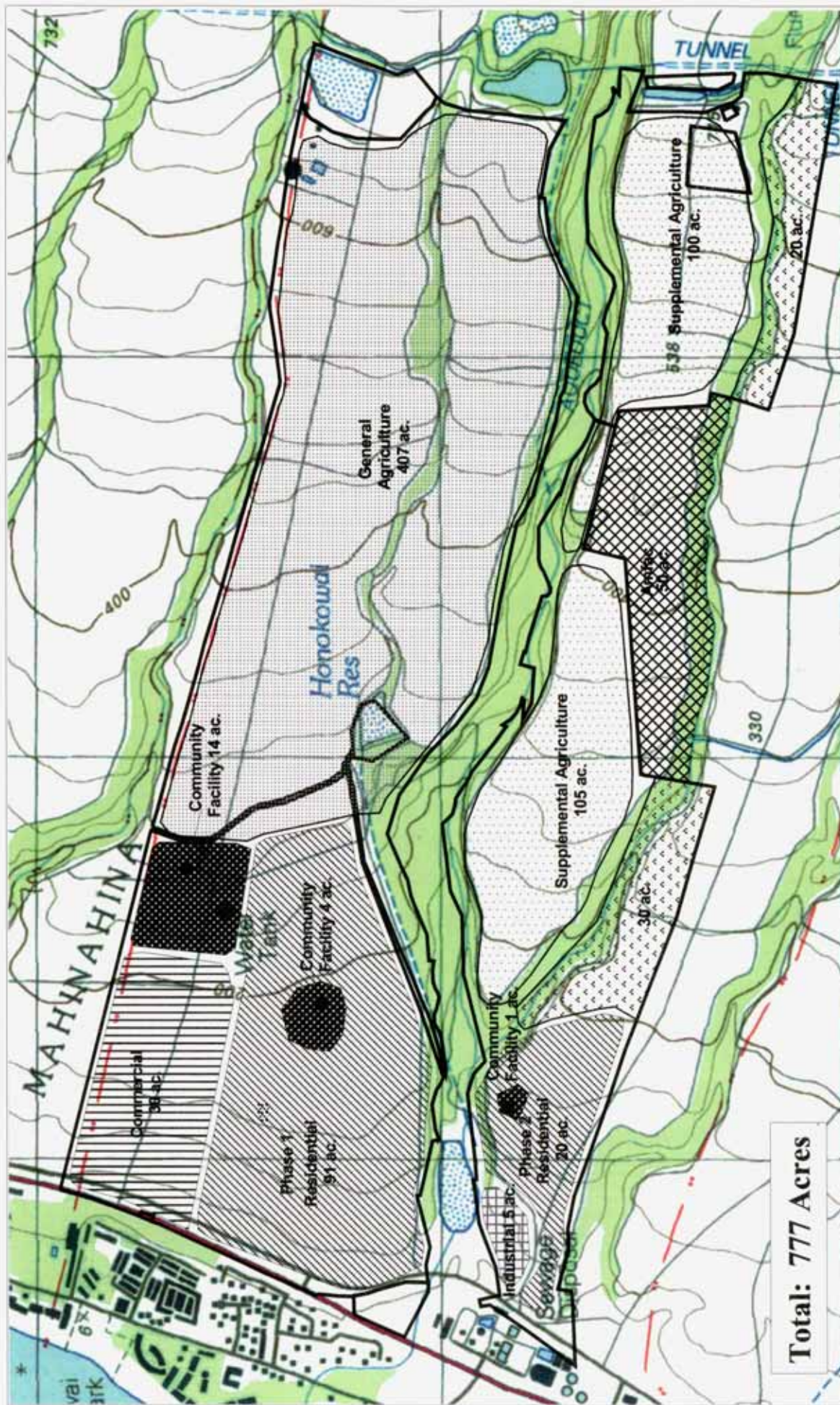
- Off-site improvements include a gravel road with grass shoulders to access the site and design contingency costs.
- On-site costs also include gravel roads with grass shoulders and design contingency costs.
- Water, electricity, and sewer infrastructure are not provided.

E. HONOKŌWAI TRACT FINAL PLAN

Based on beneficiary demand, land suitability and analysis of the alternatives, the final land use plan for Honokōwai reflects Alternative 2, which proposes 111 acres of residential uses, 19 acres for community use, 5 acres of industrial and 30 acres of commercial space (both income generating), and 407 acres in general agriculture (Figure 5-12).

West Maui was the first choice of 411 beneficiaries. Baseline data and analysis indicate that the 777-acre tract has approximately 500 acres of suitable land for homestead development, and could accommodate the 411 residential units. Alternative 2 proposes developing the 411 lots in two phases of 337 and 74 units. The residential lots will average 10,000 square feet and will be provided with power, water, sewer, and telephone service.

According to *Water Development Analysis for Department of Hawaiian Home Lands Tracts on the Island of Maui*, 823,500 gallons of water per day would be required to



Legend

- DHHHL Land Boundary
- Proposed Land Exchange
- Kaanapali Development Corporation
- DHHHL

Land Use Summary

Land Use	Lot Size	Number of Lots	Approx Acres
Residential (ph.1)	10,000 sf	337	91
Residential (ph.2)	10,000 sf	74	20
General Agriculture			407
Community Use			19
Industrial			5
Commercial Use			30
Supplemental Agriculture 5 ac		15	205
Total		426	777

Figure 5-12
HONOKŌWAI
Land Use Plan

MAUI LAND INVENTORY

DEPARTMENT OF HAWAIIAN HOME LANDS



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service the 411 residential units. The off-site infrastructure is able to support development on the tract. The Lahaina WWRF has excess capacity to serve the proposed 411 units. The Māhinahina Water Treatment Plant also has an excess capacity, but improvements may be needed to accommodate all of the 411 proposed units.

Impacts from traffic on Honoapiʻilani Highway are a concern. These impacts could be mitigated by the construction of the Lahaina Bypass Highway.

Fifteen supplemental agricultural lots averaging five acres in size are proposed for the portion of land between the gulches that transverse the site. These supplemental agricultural lots are not intended for residential use, thus improvements are only limited to gravel roads. No water, electric, or sewer service will be provided to these lots.

The 19 acres of community use are proposed *mauka* of the commercial uses adjacent to the first phase of residential lots. The community use areas are planned for parks, recreational areas, and community-oriented uses that will service not only the 411 residential lots, but also the entire west region. It is envisioned that five acres of the community use acreage will be dispersed throughout both phases of the residential community to promote pedestrian nodes within the community.

The 30 acres of proposed commercial use are located at the *makai* end of the site fronting Honoapiʻilani Highway. According to the above alternatives, street frontage and ease of access are the primary determinates for locating the commercial area along Honoapiʻilani Highway.

The remaining 407 acres of the tract are designated for general agriculture. As mentioned in the alternatives section, the existing lease with Maui Land & Pineapple Company, Inc., for pineapple cultivation should be retained in the interim. The general agriculture designation provides opportunities for the expansion of residential use or the development of agricultural use in the *mauka* portions of the tract in the future.

Cost Estimates

The final land use plan proposes a total of 411 residential and 15 supplemental agricultural lots for the Honokōwai tract. Projected on- and off-site costs are depicted in the tables below.

Phase 1 – Residential

Total Lots = 337 lots

Lot Size = 10,000 square feet

MAUI ISLAND PLAN

Table 5-5: Projected Costs for Phase 1 Residential Lots at Honokōwai

Improvements	Total Cost \$	Cost Per Lot \$
Off-Site	11,693,885	34,700
On-Site	23,067,917	68,451
Total	34,761,802	103,151

Cost Factors

- Required off-site infrastructure account for 40 percent of Phase 1 costs. Although Phase 1 is in close proximity to existing water and wastewater infrastructure, the Māhinahina Water Treatment Facility would require upgrades to serve Honokōwai.
- Off-site access improvements are included in cost estimates.
- Roads, sidewalks, curbs and gutters, and full underground utilities designed according to County standards are included in cost estimates.
- Extensive site preparation requirements also increase on-site cost estimates for Honokōwai.

Phase 2 – Residential

Total Lots = 74 lots

Lot Size = 10,000 square feet

Table 5-6: Projected Costs for Phase 2 Residential Lots at Honokōwai

Improvements	Total Cost \$	Cost Per Lot \$
Off-Site	532,328	7,194
On-Site	5,066,022	68,460
Total	5,598,350	75,653

Cost Factors

- Off-site infrastructure needs of Phase 2 include extending water service from Phase 1, providing a connection to the wastewater treatment plant and access onto the site.
- Off-site costs do not include costs to upgrade the Māhinahina Water Treatment plant, and Lahaina Reclamation Wastewater Facility, which have been addressed in the Phase 1.
- Roads, sidewalks, curbs and gutters, and full underground utilities designed according to County standards are included in cost estimates.

MAUI ISLAND PLAN

Supplemental Agriculture

Total Lots = 15 lots

Lot Size = 5 acres

Table 5-7: Projected Costs for Phase 2 Residential Lots at Honokōwai

Improvements	Total Cost \$	Cost Per Lot \$
Off-Site	129,071	8,605
On-Site	45,783	3,052
Total	174,854	11,657

Cost Factors

- Off-site improvement costs are limited to a gravel road with grass shoulders to access the site and design contingency costs.
- On-site costs also include gravel roads with grass shoulders and design contingency costs.
- Water, electricity, and sewer infrastructure are not provided



6.0 EAST MAUI

MAUI ISLAND PLAN

6.0 EAST MAUI

A. REGIONAL OVERVIEW

The DHHL East Maui planning region encompasses three tracts totaling 985.0 acres: Keʻanae, Wākiu, and Wailua (Figure 6-1). All three tracts are within the Hāna Community Plan area (Figure 1-3). The region's rural economy is based on diversified agriculture, government services, subsistence activities, and the visitor industry.

Topography generally consists of steep slopes and rugged coastlines. The eastern slopes of Mount Haleakalā dominate *mauka* view planes. Significant coastal views and resources include Hāna Harbor and Keʻanae Bay. Cultural resources include at least 104 *heiau*, several 100-year-old churches, and the historic bridges of scenic Hāna Highway.

The town of Hāna is the major population center and also serves as the region's civic and governmental hub. In addition to Hāna Highway, Hāna Harbor and Hāna Airport serve the region's transportation needs.

1. REGIONAL INFRASTRUCTURE

Roads

Hāna Highway is a two-lane road and is the main route through the region, connecting Hāna to the rest of Maui.

Analysis

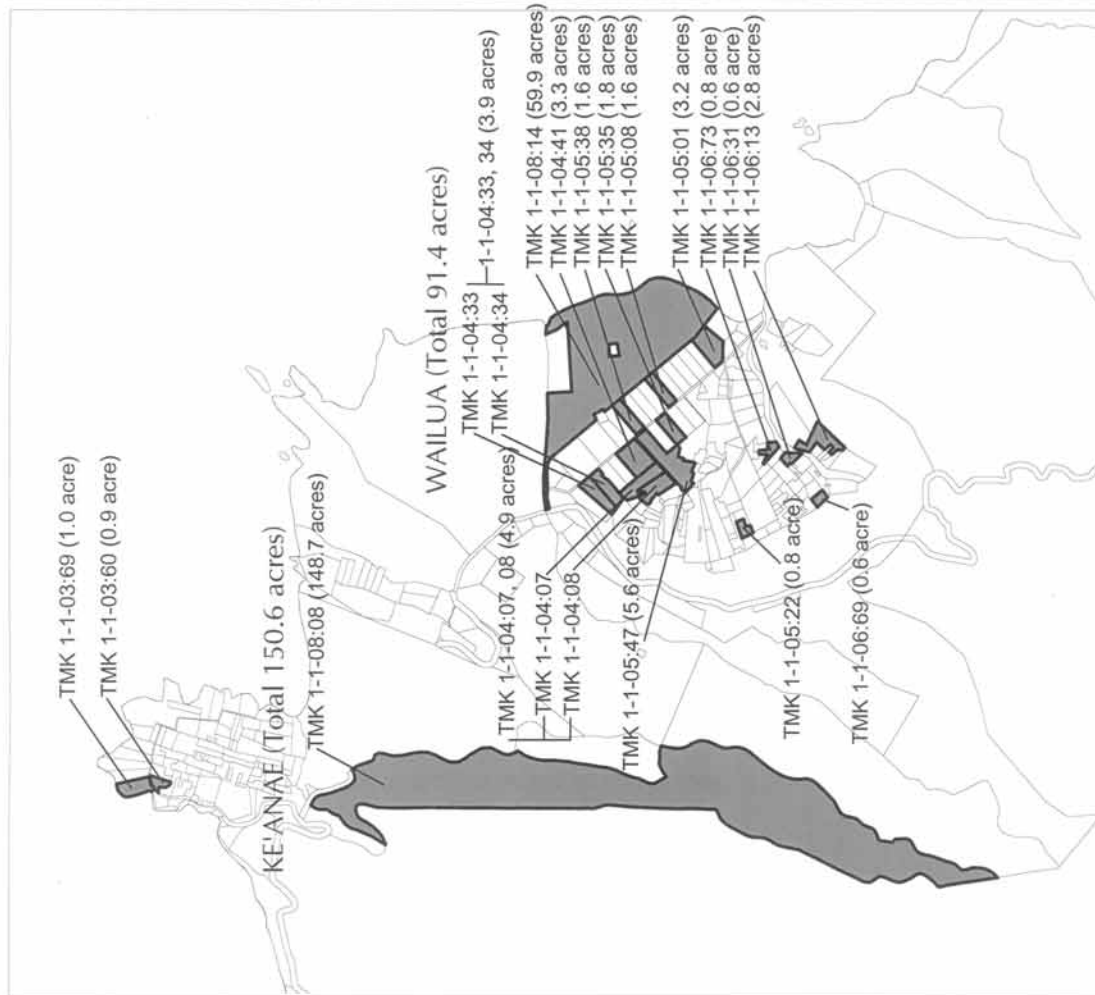
Hāna Highway is the primary transportation route to and from Hāna. Road closures due to repairs, accidents, or weather conditions greatly impact Hāna and the East planning region.

Water

According to the *County of Maui Infrastructure Assessment Update*, the County water system in the region consists of three deep wells (Wākiu Well A, Wākiu Well B, and Hāmoa Well), three storage tanks in Hāmoa and Hāna, and a surface water source on Wailua Stream. Wākiu Well A has been out of service since 1997 and the surface water source at Wailua Stream is not currently being used. The system pumps an average of 168,000 gpd. Back-up at both ends of the system between Wākiu and Hāmoa is necessary. DWS is adding a well at Hāmoa and improving transmission between the Hāmoa and Wākiu wells. Wākiu Well A has been inoperable since 1997 due to a cracked well casing. Many areas served by the County system have inadequate line capacity to provide fire flow.

Analysis

The total water demand in the Hāna region is projected to increase from 0.2 mgd in 2001 to 0.33 mgd by the year 2020, reflecting an overall increase of 0.13 mgd or about 65



Legend

DHHL Properties

Figure 6-1
East Region

MAUI LAND INVENTORY

DEPARTMENT OF HAWAIIAN HOMELANDS



PBR

MAUI ISLAND PLAN

percent of the present consumption. The greatest demand for increased water resources is for single-family residential use.

Wastewater

County wastewater facilities do not serve Hāna; individual wastewater systems are used.

Analysis

It is anticipated that wastewater from new developments will be accommodated by individual wastewater systems.

Solid Waste

Hāna's solid waste is taken to the Hāna Landfill.

Analysis

According to the *Public Facilities Assessment Update*, the Hāna Landfill will have adequate capacity to accommodate solid waste through the year 2020, with a surplus of approximately 110 thousand cubic yards of landfill space.

Electrical Service

MECO provides electrical service to Hāna through the extension of a 23-kV line running from Kahului, around the base of Haleakalā, and through Pā'ia.

Analysis

According to the *County of Maui Infrastructure Assessment Update Electrical Systems*, the projected peak electric power demand in 2020 is 275.5 MW.

Recommended additions to generating capacity differ based on linear and nonlinear projections. If the population of Maui increases linearly for the next 20 years, a minimum of 65 MW should supplement the current generating capacity by 2020. If the yearly rate of electrical demand increases exponentially, as much as 130 MW may be needed.

2. SOCIO-ECONOMIC INFRASTRUCTURE

Police

According to the *Public Facilities Assessment Update*, this region falls within the Maui Police Department's District III – Hāna. One police station with nine uniformed patrol officers and three investigative officers serve this the Hāna region.

Analysis

According to the *Public Facilities Assessment Update*, the Hāna District has a projected need for six officers (combined patrol and investigative) by the year 2020. Given the current staffing of 12 officers, police service in Hāna is determined to be adequate through 2020 and expansion of existing services is not required.

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Fire

The Hāna Station serves this community plan area.

Analysis

According to the *Public Facilities Assessment Update*, projected population growth will increase demands on the community's fire control unit through the year 2020. The addition of a second fire station closer to Ha'ikū would take the pressure off the Hāna Station by reducing its service boundaries.

Emergency Services

According to the *Public Facilities Assessment Update*, the Hāna area maintains one ambulance and one back-up vehicle. The region has two ambulances because of its remote location and longer response times.

Analysis

The Hāna region is in need of an additional ambulance. In all of Maui County, the *Public Facilities Assessment Update* ranked the Hāna region as the second most in need for improved emergency medical services.

Health Care Services

Maui Memorial Medical Center, located in Wailuku, is the County of Maui's only critical care facility.

The Hāna Community Health Center, a nongovernmental organization located in Hāna town, provides limited medical services to residents.

Analysis

According to the *Public Facilities Assessment Update*, based on the estimated total demand, nine additional acute care (inpatient services provided to patients whose average length of stay is usually less than 30 days) beds will be needed in 2015 and 20 in 2020.

Schools

The *Public Facilities Assessment Update* lists the following schools for this region¹:

Public

Ke'ānae Elementary (6 miles)

Hāna Elementary and High School (0 miles)

Private

There are no private schools in the East planning region.

¹Distances (approximate) given are from the Wākiu tract to the listed school.

MAUI ISLAND PLAN

Analysis

The *Public Facilities Assessment Update* projected the enrollment for schools in this region to 2020 and found that in terms of rated capacity, existing Hāna educational facilities are adequate to meet the demand for enrollment to 2020.

Recreation

According to the *Public Facilities Assessment Update*, Hāna has a well-developed park system, with over 20.1 acres of sub-regional parkland. The sub-regional park system in the Hāna area consists of nine parks, most of which are neighborhood parks. The community currently has access to ten tennis courts, four sports fields, and three sports courts, in addition to the many supplemental facilities that are provided by the Hāna School Complex. Due to the linear nature of the community (mainly along the shoreline) most of the parks are within the coastal strip and are quite accessible to the community's residents.

Analysis

According to the *Public Facilities Assessment Update*, given a standard of ten acres of sub-regional park space per 1,000 people, the Hāna region will need an additional 2.6 acres of community oriented park space over the next twenty years. By 2020, an additional sports court will be needed. It may be infeasible to site this facility at any of the existing parks due to their limited size, natural heritage, and narrow width. However, the sports court could be sited at regional-level facilities such as public schools. The community and the Department of Parks and Recreation should jointly plan park development and facility siting to meet the Hāna community's needs.

B. WĀKIU TRACT BASELINE INFORMATION

1. INVENTORY

TMK and Acreage

Wākiu is 743.0 acres and is identified by TMK 1-3-04:12 (Figure 6-1).

Existing Uses



The majority of the Wākiu tract is vacant open space. A 0.5 MG water tank is located on the southeast portion of the tract. There is Miconia infestation in the *mauka* areas.

A revocable permit has been issued to Kukulu Kumu Hāna, a student-based agricultural business, for five acres identified by TMK 1-3-04:12 (portion). The five acres along Hāna Highway that is licensed to Kukulu Kumu Hāna for community and cultural uses has been cleared and a cultural center has been erected. Kukulu Kumu Hāna provides Hāna High and Intermediate School students with vocational agricultural based skills and cultural education.

MAUI ISLAND PLAN

Adjacent Uses

The tract is bound to the north by the Hāna Highway, to the west by the Hāna Agricultural Park, to the east by Hāna Tropical Fruit Plantation, and to the south by forest reserve and a cinder quarry. Hāna High and Elementary School, Wai‘ānapanapa State Park, and the Hala Grove are located across Hāna Highway from the property.

An old railroad right-of-way runs parallel to Hāna Highway along the *makai* portion of the tract. This railroad right-of-way is not within the tract boundaries and divides the tract into separate parcels.

Proposed Future Surrounding Uses

There are no known proposed future surrounding uses.

2. REGULATORY

State Land Use District

Wākiu is in the Agricultural District (Figure 6-2).

County Community Plan

The *Hāna Community Plan* designates the tract for Agricultural use.

County Zoning

The tract is zoned Agricultural.

Special Management Area

Wākiu is not within the Special Management Area.

Underground Injection Control Line

Although the majority of the tract is above the UIC, the portion between Hāna Highway and the old railroad right-of-way is below the UIC line (Figure 6-3).

3. PHYSICAL CHARACTERISTICS

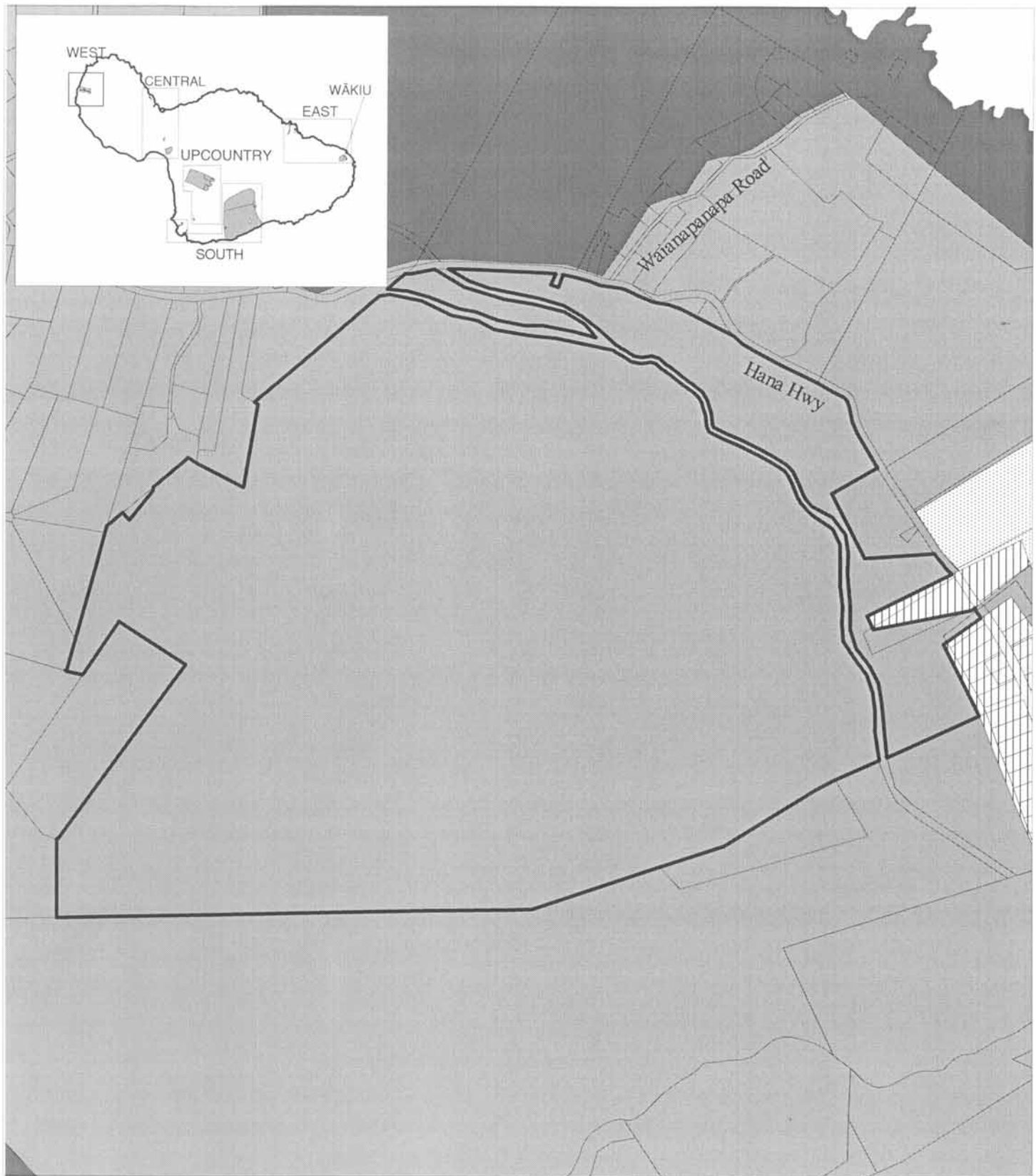
Climate

Temperature averages 74 degrees Fahrenheit during the year.






Soils

The USDA Soil Conservation Service Survey shows the following soils in Wākiu (Figure 6-4):

- Malama Extremely Stony Muck, 3 to 25 percent slopes – This soil is used mostly for water supply with small acreages used for orchard crops and pasture. Runoff is very slow and the erosion hazard is no more than slight.



Legend

-  Agricultural District
-  Conservation District
-  Rural District
-  Urban District
-  DHHL Land Boundary

Source: State Land Use Commission

Figure 6-2

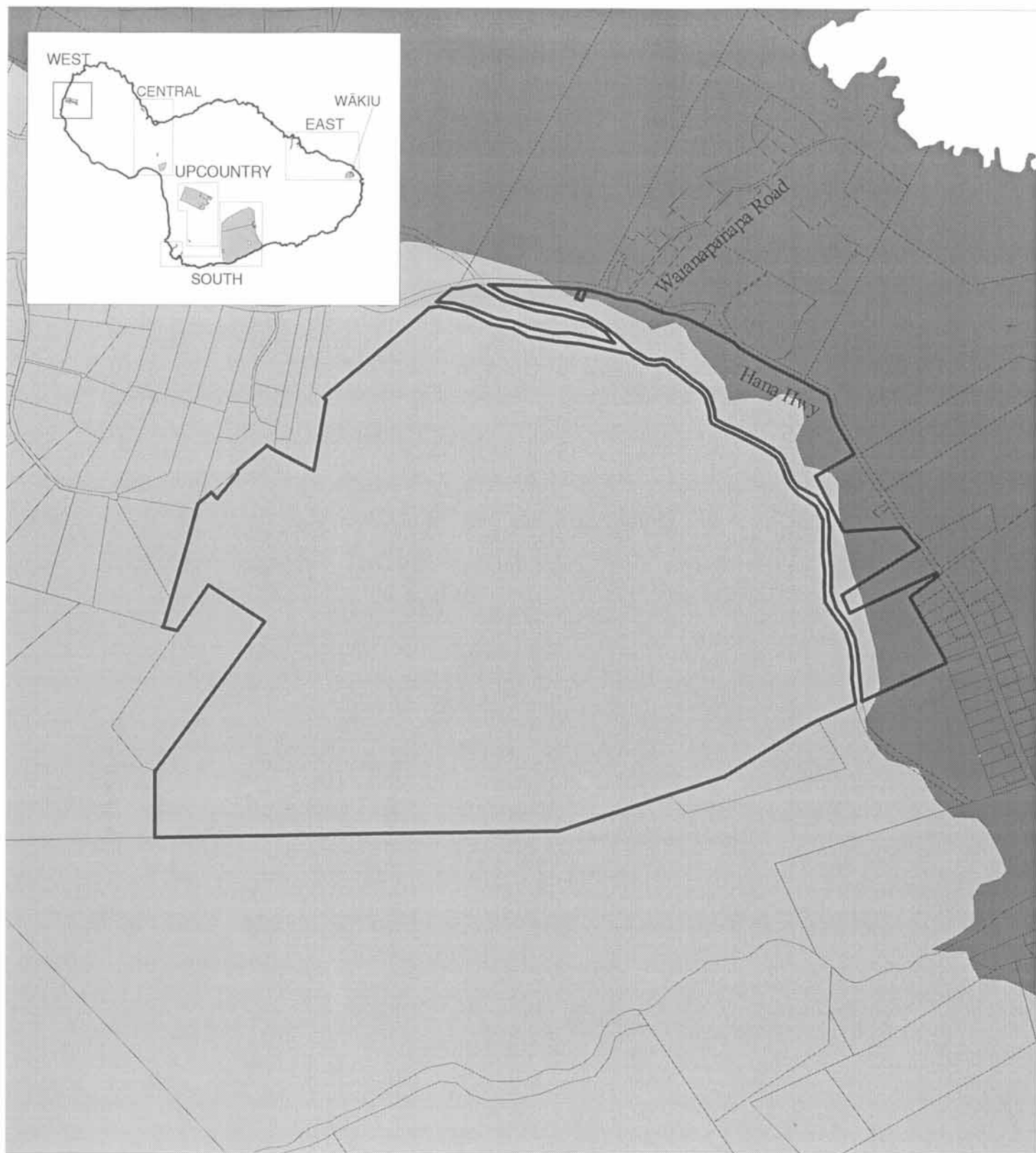
WĀKIU
State Land Use

MAUI LAND INVENTORY

DEPARTMENT OF HAWAIIAN HOME LANDS

NORTH





Legend

- Areas Below (Makai) Underground Injection Control Line
- Areas Above (Mauka) Underground Injection Control Line
- DHHL Land Boundary

Figure 6-3
WĀKIU

Underground Injection Control (UIC) Areas Map

MAUI LAND INVENTORY

DEPARTMENT OF HAWAIIAN HOME LANDS

NORTH





Legend




-  Malama Extremely Stony Muck, 3-25% Slopes
-  Hana Silty Clay Loam, Moderately Deep Variant, 3-15% Slopes
-  Hana Very Stony Silty Clay Loam, 3-25% Slopes
-  DHHL Land Boundary

Figure 6-4

WĀKIU

Soil Conservation Service Survey

MAUI LAND INVENTORY

DEPARTMENT OF HAWAIIAN HOME LANDS

NORTH



MAUI ISLAND PLAN

- Hāna Silty Clay Loam, Moderately Deep Variant, 3 to 15 percent slopes – This soil is used for pasture and home sites. Runoff is slow to medium and the erosion hazard is slight to moderate.
- Hāna Very Stony Silty Clay Loam, 3 to 25 percent slopes – This soil is used for pasture. Runoff is slow to medium and the erosion hazard is slight to moderate.

Agricultural Lands of Importance to the State of Hawai'i

The State of Hawai'i Department of Agriculture *ALISH* system of defining agricultural suitability has not classified the majority of the soils of Wākiu. A small portion of the tract has been classified as "Other Agriculture Land" (Figure 6-5).

Ground/Surface Water

The USGS topographic map shows no streams within Wākiu.

Rainfall

Average annual rainfall ranges from 40 inches during the summer months to 120 inches in the winter (Figure 6-6).

Topography/Slope

The USGS topographic map shows that the elevation in Wākiu ranges from approximately 160 feet in the southwest portion of the tract to 960 feet in the northeast portion.

The topography of the tract is rough, with steep slopes at the higher elevations. There are several areas with slopes in the between 20 and 25 percent in the upper elevations. The slope of the *makai* portion fronting Hāna Highway is approximately five to ten percent (Figure 6-6).

Drainage

The USGS topographic map does not show any natural drainage ways or constructed lines or wells. One water tank is located in the southeast portion of the Wākiu tract.

Flood Zone

The Flood Insurance Rate Map indicates that Wākiu is in Zone X, which designates areas determined to be outside of the 500-year flood plain (Figure 6-7).

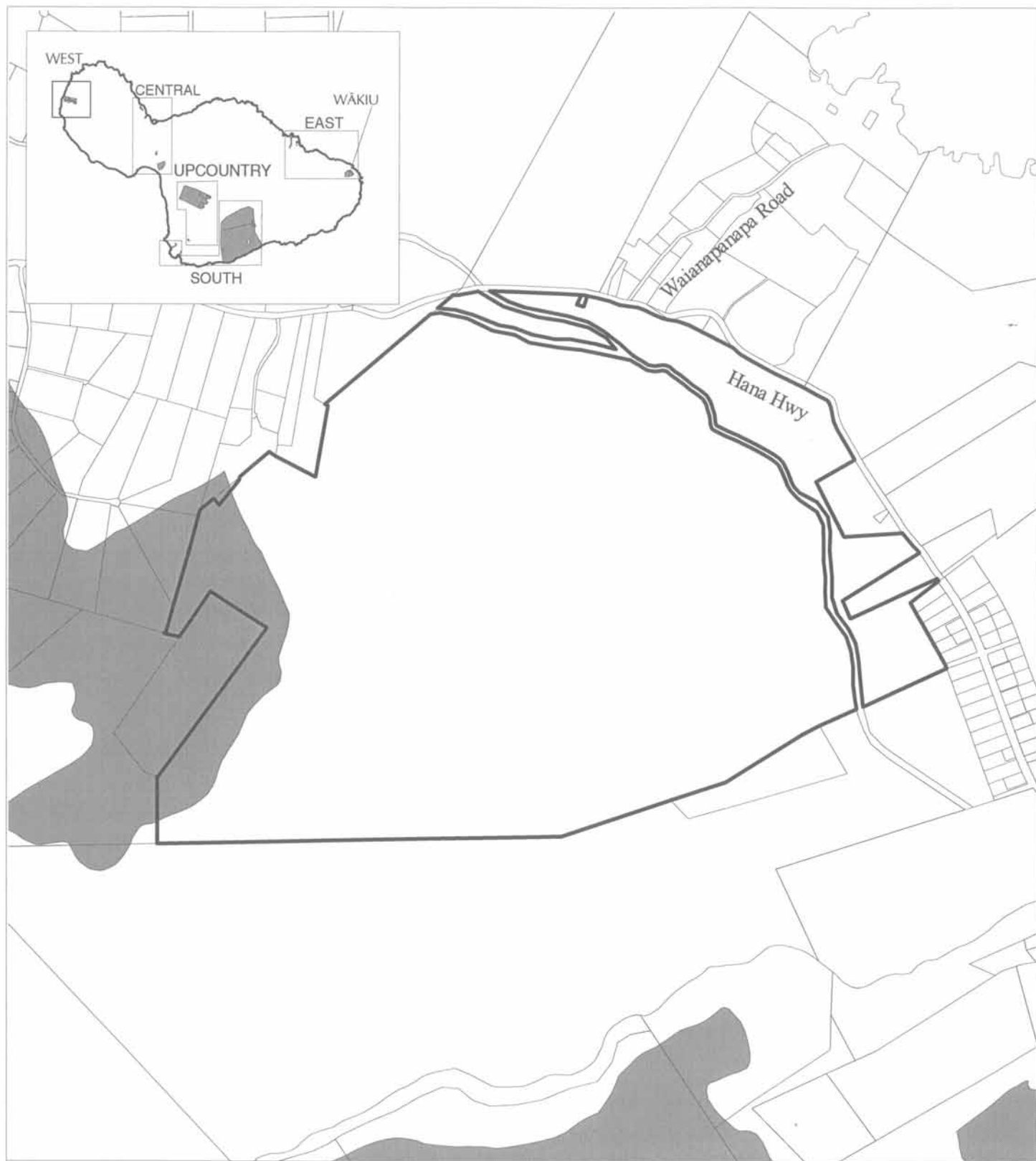
Noise

Due to the rural nature of the area, there are no major sources of noise other than occasional extraction of cinder from the nearby quarry.

4. ENVIRONMENTAL CHARACTERISTICS

Historic Sites/Archaeology/Cultural Resources

There are no known historic sites, archaeological sites, or cultural resources on the Wākiu tract.



Legend

-  Prime Agricultural Land
-  Unique Agricultural Land
-  Other Agricultural Land
-  Unclassified Land
-  DHHL Land Boundary

Figure 6-5

WĀKIU

Agricultural Lands of Importance to the State of Hawaii (ALISH)

MAUI LAND INVENTORY

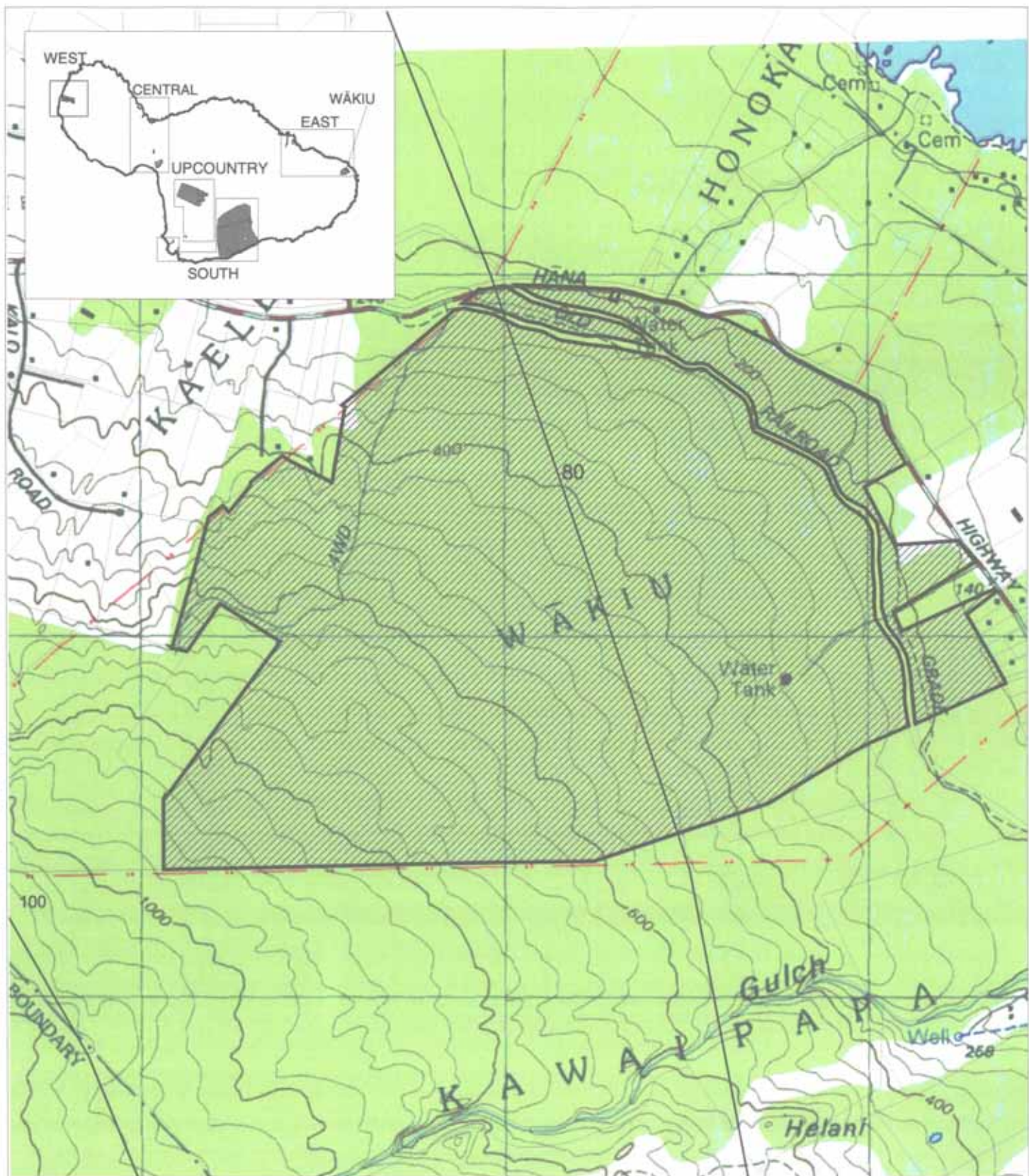
DEPARTMENT OF HAWAIIAN HOME LANDS

NORTH



(FEET)





Legend

-  DHHL Properties
-  Lines of Equal Average Annual Rainfall in Inches

Figure 6-6

WĀKIU

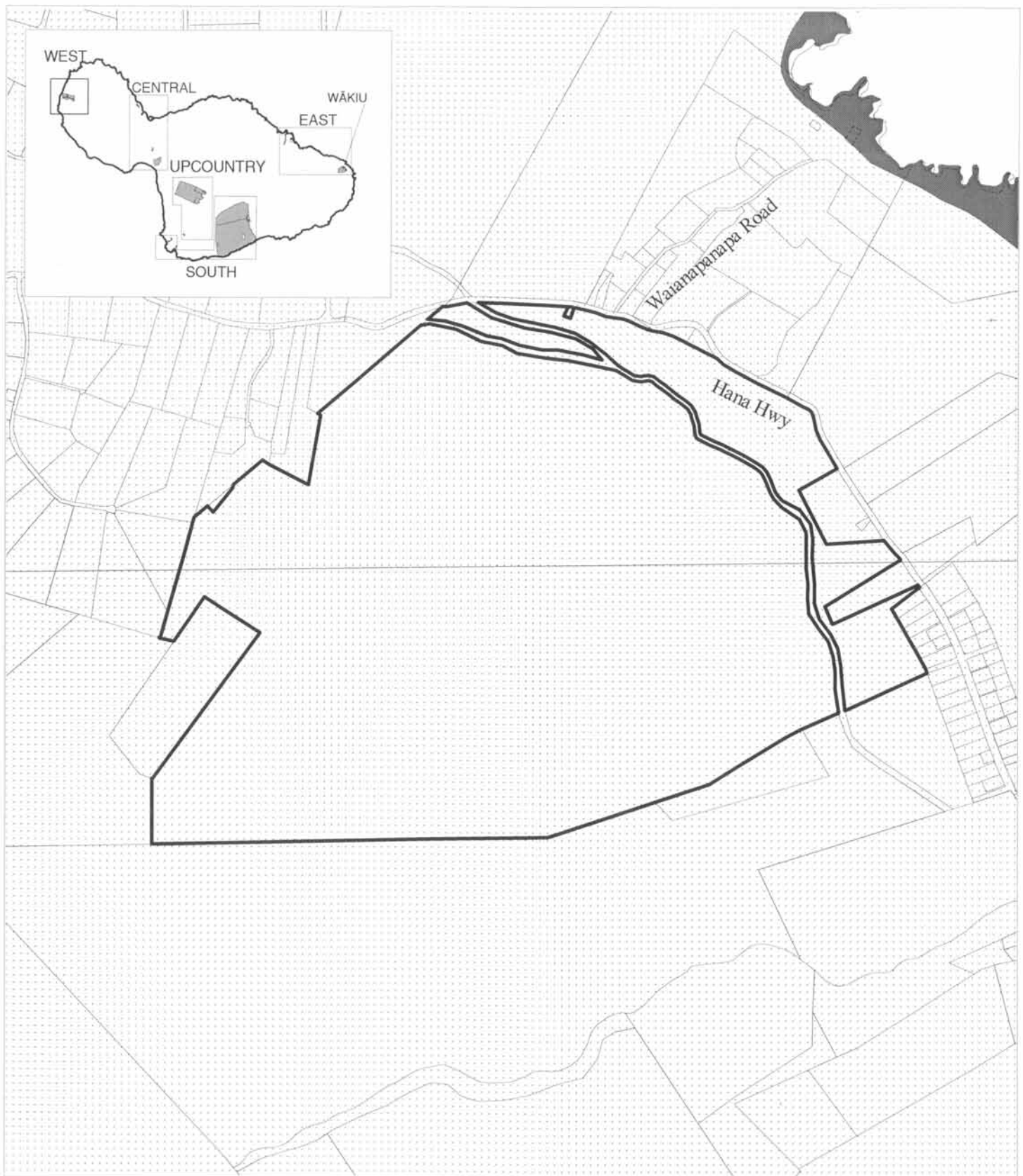
USGS Map with Rainfall Isohyets

MAUI LAND INVENTORY




DEPARTMENT OF HAWAIIAN HOME LANDS

NORTH





Legend

-  **ZONE A:**
Special Flood Hazard Areas Inundated by 100-Year Flood
No Base Flood Elevations Determined
-  **ZONE X:**
Areas Determined To Be Outside 500-Year Floodplain
-  **DHHL Land Boundary**

Source: Federal Emergency Management Agency

Figure 6-7
WĀKIU

Flood Insurance Rate Map

MAUI LAND INVENTORY

DEPARTMENT OF HAWAIIAN HOME LANDS

NORTH



MAUI ISLAND PLAN

Endangered Species

There are no species on this tract identified as candidate or endangered by the Hawai'i Natural Heritage Program *Biological Conservation Datasystem (BCD) for Department of Hawaiian Home Lands*.

Critical Habitat

The U.S. Fish and Wildlife Service has not designated any critical habitat areas within the tract.

5. INFRASTRUCTURE

Access/Roadways

Access to the Wākiu tract is from Hāna Highway, which forms the *makai* boundary of the tract.

There is also an existing gravel access road that leads up to the cinder quarry located above the *mauka* boundary of the tract. This access road intersects with Hāna Highway at the northern corner of the tract.

Another gravel access road leads up to the 0.5 MG water tank located on the south portion of the tract.

A final access point leads from Hāna Highway into the five-acre Kukulu Kumu Hāna licensed area across from Hāna High and Elementary School.

Water System

As discussed by the *Water Development Analysis for the Department of Hawaiian Home Lands Tracts on the Island of Maui*, there is a DWS 0.5-MG concrete storage tank on the Hāna side of the tract at an elevation of 310 feet. The storage tank is fed by two wells and pumps (40 hp) capable of supplying a total of 700 gpm. A 12-inch water line extends from the tank to Hāna Highway and along Hāna Highway towards Hāna Town. A six-inch water line runs north along Hāna Highway to Wai'ānapanapa Road. The existing 0.5 MG water tank can service the area along Hāna Highway from an elevation of approximately 140 feet above msl to 200 feet above msl. Improvements to the water system are needed to service the remaining areas of the tract.

The County plans to connect portions of the Wākiu and Hāmoa systems and construct a back-up well to supplement the Hāna system.

Wastewater Treatment and Disposal

Maui County does not operate a wastewater system in Hāna. The existing Hāna community is served by cesspools or on-site septic systems.

MAUI ISLAND PLAN

Solid Waste Disposal

If solid waste is generated on this parcel, it will be taken to the Hāna Landfill.

Telephone Service

Existing overhead lines along Hāna Highway can provide telephone service to the tract, although the tract currently has no telephone service. If needed, Sandwich Isles Communications will provide telephone service.

Electrical Service

MECO provides electrical service to Wākiu through the extension of a 23-kV line running from Kahului, through Pā'ia, around the base of Haleakalā, and ending in Hāna. The tract would be serviced via the overhead lines along Hāna Highway.

Cable Television Service

This parcel is within the service area of Oceanic Cable. If needed, cable service can be provided from the existing overhead line along Hāna Highway.

C. WĀKIU ANALYSIS

Based on the opportunities and constraints of the tract, there is potential for a mix of uses on the property, including residential, agricultural, and industrial/commercial. According to site analysis, of the 743 acres in Wākiu, approximately 200 acres that are generally located in the lower portion of the tract are readily developable (Figure 6-8). High slopes are the primary development constraint in the upper elevations of the tract.

Demand for residential homesteads in Hāna is evident based on the beneficiary survey conducted for the *Maui Island Plan*, as well as community input. There are opportunities for residential use along Hāna Highway where there is easy access from the highway, readily available infrastructure, and no slope constraints.

Existing commercial and industrial uses are limited in Hāna. According to the *Hāna Community Plan*, there are approximately 19 acres of commercial areas and eight acres of industrial areas in Hāna. The majority of these commercial and industrial uses are located on lands belonging to Hāna Ranch.

The *Hāna Community Plan* recommends additional commercial and industrial space in Hāna. This additional commercial and industrial space could be developed in Wākiu. Commercial uses generally require adequate street frontage, thus a location along Hāna Highway is recommended. The Hāna community voiced support for commercial and industrial uses on Wākiu at *Maui Island Plan* meetings. Therefore, reserving lands for commercial and industrial uses would support recommendations of the *Hāna Community Plan*, as well as community input. It would also create income-generating sources for DHHL in Hāna.

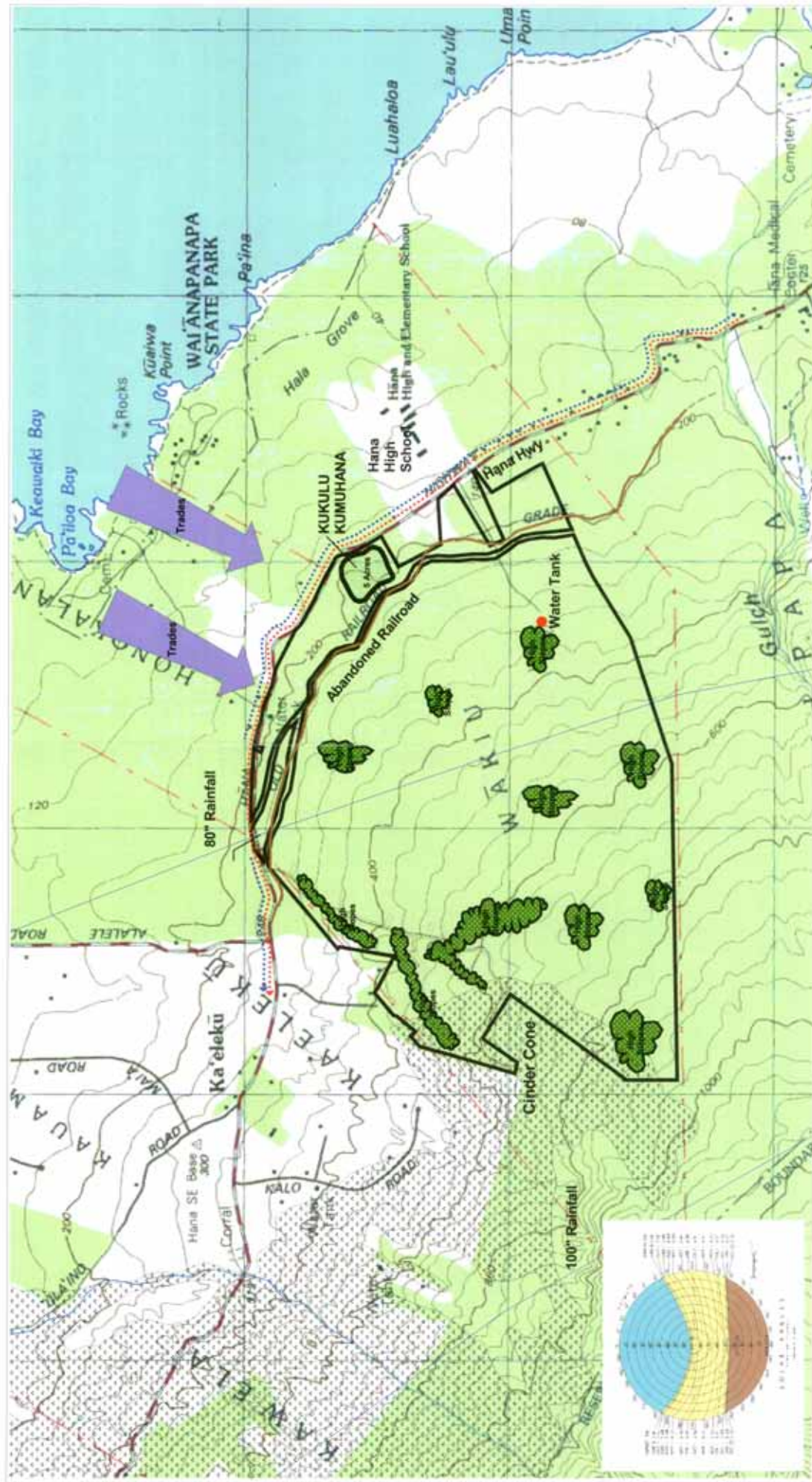


Figure 6-8

WAKIU
Site Analysis

MAUI LAND INVENTORY

DEPARTMENT OF LAND AND NATURAL RESOURCES



MAUI ISLAND PLAN

The baseline data also supports agricultural use on the tract; the *ALISH* map shows that the soils in the west portion of Wākiu are designated “Other Agricultural Land,” which indicates that the land is suitable for the production of food, feed, fiber, and forage crops. There are opportunities for good crop yields, through the use of fertilizer and soil amendments. The area has an existing access road connecting to Hāna Highway. Average annual rainfall is high enough that water catchments could be used for crop irrigation.

Kukulu Kumu Hāna provides Hāna High and Intermediate School students with vocational agricultural based skills and cultural education on five acres of the tract along Hāna Highway. This educational service is invaluable to the Hāna community. Thus the five-acre license should be retained or integrated into development proposals for Wākiu

The tract’s location along Hāna Highway presents numerous options for providing access to the proposed uses. However, access points onto Hāna Highway should be limited in number to decrease the impacts of increased traffic on the highway. One or two intersections connected to a network of internal collector roads serving the uses in the tract are recommended.

The existing access road leading up to the “Other Agricultural Lands” area and the cinder quarry presents opportunities for uses along its right-of-way. In addition, this access road has an improved “T” intersection onto Hāna Highway.

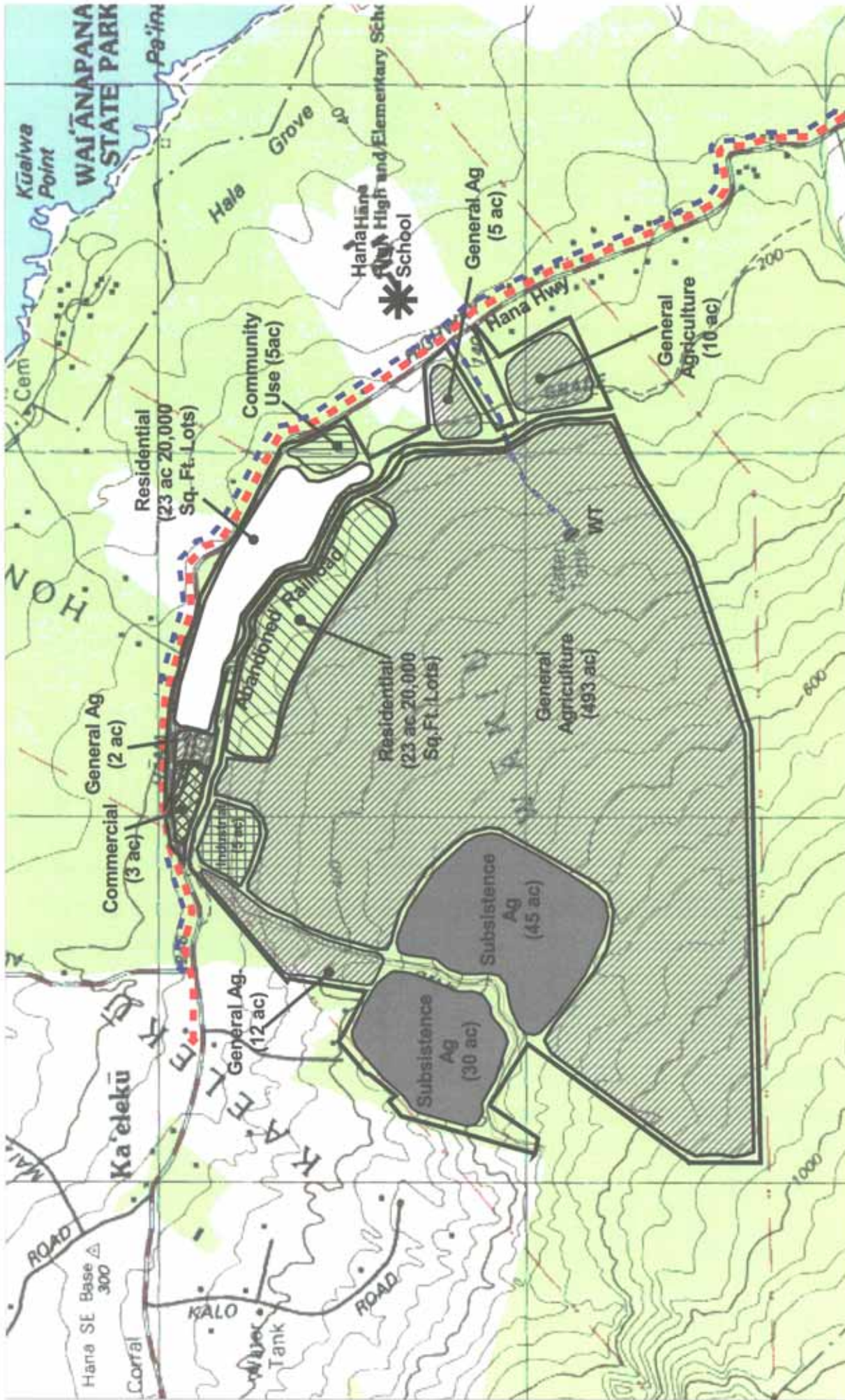
It is possible to use rural roadway standards in Wākiu. The *Hāna Community Plan* recommends 20-foot right-of-ways composed of two eight-foot lanes with two-foot grass shoulders on each side. Overhead power lines can also be used rather than underground utilities. The use of rural roadway standards preserves the rural character of the area and reduces overall construction costs.

1. PROPOSED USES

The proposed land use for Wākiu includes 46 acres of one-half acre residential lots, 75 acres of three-acre subsistence agricultural lots, five acres of community use, five acres of commercial use, five acres of industrial use, and the balance of the tract (522 acres) in general agriculture (Figure 6-9).

a. Residential

The *Maui Island Plan* beneficiary survey reports a residential demand of 79 units in the East Region. Community input indicated that of the three tracts in the east region, Wākiu was the first choice for residential use. The baseline data and analysis shows that the tract is suitable for residential use due to good access, existing on-site water resources, and available electricity, telephone, and cable service. Wastewater from residential use will be handled by individual septic systems.



Legend



DHHH Land Boundary
Water Line
Electrical Line

Land Use Summary		Lot Size	Number of Lots	Approx Acres
Land Use				
Commercial	3			3
Community Use	5			5
General Agriculture	522			522
Industrial	5			5
Residential	20,000 SF	40		23
Residential	20,000 SF	40		23
Subsistence Agriculture	3 ac	22		75
Total		102		656

Figure 6-9

WĀKIU
Alternative 1

MAUI LAND INVENTORY

DEPARTMENT OF HAWAIIAN HOME LANDS



PBR

7/01/03

MAUI ISLAND PLAN

A total of 80 one-half acre residential lots on 46 acres are proposed, which meets the demand reported in the beneficiary survey. Half-acre lots were chosen on the basis of the tract's large acreage and the rural character of Hāna, where larger lots are the norm, unlike urban areas of Maui where smaller lots are more common. Development of the proposed 80 residential lots will occur in two phases of 40 lots each.

Contributing factors to the selection of the proposed uses are discussed below:

Phase 1

Location

Phase 1 proposes development of 40 half-acre lots between Hāna Highway and the existing railroad right-of-way. The five-acre portion licensed by Kukulu Kumu Hāna is adjacent to the eastern corner of the Phase 1 area, and can be considered a community facility for the residential area.

Topography

Slopes in this location average five to 10 percent. Slopes in the range of five to 10 percent do not typically pose a constraint to residential development.

Access

Access points from Hāna Highway will service Phase 1, but should be limited to decrease the number of intersections and potential traffic impacts on the highway. An internal collector road will service the residential lots. The specifics of the circulation system of the subdivision can be engineered in the development plan stage.

Water

According to the *Water Development Analysis for the Department of Hawaiian Home Lands Tracts on the Island of Maui*, Phase 1 is within the service area of the existing 0.5 MG tank, located on the tract at an elevation of 310 feet. The maximum daily demand for the 40 lots and five acres of community use is 56,400 gallons and the necessary storage is 440,400 gallons, which allows 384,000 gallons for fire flow. The storage requirements can be met using the existing 0.5 MG water tank. This reduces the overall development costs of the Phase 1 residential lots.

Sewer

The County currently does not operate a sewer system in the Hāna region and all residential uses in Hāna utilize on-site septic or older cesspool-type systems. Sewage from parcels in the Wākiu tract will also be handled on-site via septic systems.

Electricity, Telephone, and Cable

Electricity, telephone, and cable service is readily available from existing overhead lines along Hāna Highway.

MAUI ISLAND PLAN

Phase 2

Phase 2 proposes 40 half-acre lots *mauka* of the existing railroad right-of-way at the 220-foot elevation. The railroad right-of-way forms the northern boundary of the area; to the south and east is vacant land; and to the west is land proposed for industrial use.

Topography

Similar to Phase 1, the slopes in this location average five to 10 percent and do not pose a constraint to residential development.

Access

Access points developed in Phase 1 will not be able serve Phase 2 without crossing the existing railroad easement, owned by Hāna Ranch, that separates Phase 1 from Phase 2. DHHL will have to obtain permission from Hāna Ranch to cross the right-of-way. The existing access road leading up to the cinder quarry can also serve as primary access for Phase 2. This gravel road would need to be improved to serve residential uses proposed in Phase 2.

Water

According to the *Water Development Analysis for the Department of Hawaiian Home Lands Tracts on the Island of Maui*, Phase 2 is outside the service area of the existing 0.5 MG tank located on the tract at an elevation of 325 feet. A new 750,000-gallon concrete reservoir will need to be constructed at the 520-foot elevation. The new reservoir will provide enough water storage capacity to meet both the maximum daily demand plus fire flow. A pressure reducing station will be installed at the 280-foot elevation to service the lower areas. A new 12-inch transmission line will connect the existing water tank and new reservoir. Another 12-inch transmission line will then run from the new reservoir to the railroad and be tied into the transmission line that services Phase 1.

Wastewater

As in Phase 1, sewage will be handled by on-site septic systems. However, DHHL will need to seek a variance from the Department of Health because the 40 additional lots constructed for Phase 2 will raise the total lot count to 80, which exceeds the 50-lot maximum that is described in the Department of Health's rules.

Electricity, Telephone, and Cable

Electricity, telephone, and cable service is readily available from existing overhead lines along Hāna Highway. These services will be extended to service the tract in Phase 1.

b. Subsistence Agriculture

Twenty-two three-acre subsistence agricultural lots are proposed on 75 acres of land located at the 600-foot elevation in the western portion of the tract.

MAUI ISLAND PLAN

Topography

According to site analysis, this area may have some steep slopes; however, the larger lots provide more buildable area.

Rainfall

Average annual rainfall ranges from 40 inches during the summer months to 120 inches in the winter. Catchment systems could be used during the winter season to supplement the proposed potable water system with irrigation water for agricultural uses. Typically, catchment is used in areas that average 60 inches of rainfall. The proposed potable water system should suffice during the dry season.

Soils

Soil suitability is crucial to the location of the agricultural lots. The soils along the western boundary of the tract are designated "Other Agricultural Lands" under the *ALISH* system. This designation may yield good crops if the soils are managed properly. The soils on the remainder of the tract are not classified under the *ALISH* system.

Access

The existing gravel access road that leads up to the cinder quarry will provide access to the subsistence agriculture lots. This is a gravel road will need to be improved to service the agricultural lots.

Water

The 22 subsistence agricultural lots span two upper pressure zones. According to the *Water Development Analysis for the Department of Hawaiian Home Lands Tracts on the Island of Maui*, The proposed agriculture lots are outside the service area of the existing 0.5 MG tank.

A new 100,000-gallon concrete or stainless steel reservoir will need to be constructed at the 860-foot elevation. The new reservoir will provide enough water storage capacity to meet both the maximum daily demand and fire flow. The maximum daily demand is estimated to be 19,800 gallons; the fire flow requirements are 60,000 gallons. The total required storage is approximately 79,800 gallons. A pressure reducing station will need to be installed at an elevation of 280 feet to service the lower areas. A new eight-inch transmission line will connect the 100,000-gallon reservoir to the 750,000-gallon reservoir developed for the Phase 2 residential area. Another eight-inch line will then run from the 100,000-gallon reservoir to the 22 lots.

Wastewater

Sewage for the agriculture lots will be handled by on-site septic systems. DHHL will need to seek a variance from the Department of Health for the septic systems because construction of the 22 agricultural lots in addition to the 80 residential lots will exceed the 50-lot threshold that would trigger the need for a sewage treatment plan per the Department of Health's rules.

MAUI ISLAND PLAN

Electricity, Telephone, and Cable

Electricity, telephone, and cable service is readily available from existing overhead lines along Hāna Highway. These services will need to be extended up the access road to the agriculture lots located in the upper elevation of the tract.

c. Commercial and Industrial Use

The *Maui Island Plan* proposes three acres of commercial use and five acres of industrial use on the Wākiu tract. These uses will be located at the intersection of the cinder pit access road and Hāna Highway. This location has good street frontage and visibility by traffic traveling in either direction on Hāna Highway.

Topography

Slopes in the area proposed for commercial and industrial use range from five to 10 percent.

Water

The proposed commercial and industrial area is outside the service area of the existing 0.5 MG tank located on the tract at an elevation of 325 feet. Service to the commercial and industrial area will come from construction of the proposed 100,000-gallon concrete or stainless steel reservoir at the 860-foot elevation and a pressure reducing station at the 280-foot elevation. This system will serve the agricultural lots and the commercial and industrial lots. A new eight-inch line will extend from the agricultural lot subdivision down to the commercial and industrial area. The estimated water needs for the commercial and industrial lots is approximately 48,000 gallons per day.

Wastewater

Sewage for the commercial and industrial lots will be handled by on-site septic systems. The estimated sewage discharge for the commercial and industrial lots is approximately 8,000 gallons per day.

Electricity, Telephone and Cable

Electricity, telephone and cable service is readily available from existing overhead lines along Hāna Highway.

d. Community Use

Five acres of community are proposed along Hāna Highway in the area that is currently licensed to Kukulu Kumu Hāna.

e. General Agriculture

The balance of the tract (522 acres) is designated general agriculture. The general agriculture designation gives DHHL the flexibility to re-designate the lands for homestead uses if demand increases in the future.

MAUI ISLAND PLAN

D. WĀKIU COST ESTIMATES

Cost estimates for development of the Wākiu tract based on the above land uses are summarized in the following tables.

Phase 1 – Residential

Total Lots = 40 lots

Lot Size = 20,000 square feet

Table 6-1: Projected Costs for Phase 1 Residential Lots at Wākiu

Improvements	Total Cost \$	Cost Per Lot \$
Off-Site	1,723,689	43,092
On-Site	2,067,611	51,690
Total	3,791,300	94,783

Cost Factors

- Rural Standards
- Sewer: Individual septic tank use
- Roads: Twenty-foot right-of-way, 16-foot wide asphalt road pavement, and four-foot grass shoulders
- Electrical: Overhead electrical lines
- Water system: Existing DWS system
- Off-site road connections to Hāna Highway

Phase 2 – Residential

Total Lots = 40 lots

Lot Size = 20,000 square feet

Table 6-2: Projected Costs for Phase 2 Residential Lots at Wākiu

Improvements	Total Cost \$	Cost Per Lot \$
Off-Site	1,723,689	43,092
On-Site	2,069,679	51,742
Total	3,793,368	94,834

MAUI ISLAND PLAN

Cost Factors

- Rural Standards
- Sewer: Individual septic tanks. Phase 2 will exceed the State Department of Health rules (11-62-31.1(1)(B)); a variance is needed for septic tank use on subdivisions with more than 50 lots.
- Roads: Twenty-foot right-of-way, 16-foot wide asphalt road pavement, and four-foot grass shoulders
- Electrical: Overhead electrical lines
- Water system: Existing DWS system
- Off-site road connections to Phase 1

Subsistence Agriculture

Total Lots = 22 lots

Lot Size = 3 acres

Table 6-3: Projected Costs for Subsistence Agriculture Lots at Wākiu

Improvements	Total Cost \$	Cost Per Lot \$
Off-Site	0	0
On-Site	814,330	37,015
Total	814,330	37,015

Cost Factors

- Rural Standards
- Sewer: Individual septic tank use
- Roads: Twenty-foot right-of-way, 16-foot wide asphalt road pavement, and four-foot grass shoulders
- Electrical: Overhead electrical lines
- Water system: Catchment system

MAUI ISLAND PLAN

E. WĀKIU TRACT FINAL PLAN

The final plan proposes the following land uses for Wākiu (Figure 6-10):

- 80 half-acre residential lots on 46 acres
- 22 three-acre subsistence agricultural lots on 75 acres
- Five acres of community use
- Three acres of commercial use
- Five acres of industrial
- Five hundred twenty-two acres of general agriculture

Rural roadway standards are recommended for the residential lots to lower the overall development costs. The use of rural standards also follows the objectives of the *Hāna Community Plan* to retain the overall rural character of the area.

In summary, 80 one-half acre residential lots along Hāna Highway will be developed in two phases of 40 lots each. Phase 1 takes advantage of the existing infrastructure, including water, utilities, and access from Hāna Highway. The per lot cost for Phase 1 is \$94,783. Phase 2 will be developed *mauka* of Phase 1 with per lot costs at \$94,834.

Twenty-two three-acre subsistence agriculture lots are proposed on 75 acres in the western portion of the tract. These lands have suitable agriculture soils. A new water system will provide water service to these lots. Rainfall is plentiful in the winter months and will supplement the potable water system to supply water for irrigation to the lots. The per lot cost is \$37,015.

Commercial and industrial uses will be located at the intersection of the access road and Hāna Highway. This location has adequate street frontage, available utilities along the highway, and topography that suits this type of use. The water reservoir developed to service the agriculture lots located *mauka* of the commercial/industrial area will handle water service to the lots. The need for additional commercial and industrial land identified in the *Hāna Community Plan* and community meetings supports these uses.

Five acres of community use is proposed along Hāna Highway, adjacent to the proposed residential development. As mentioned earlier, Kukulu Kumu Hāna currently licenses this five-acre site for cultural and community uses. This facility should be integrated into the residential development to provide community services to the Wākiu residents.

The balance of the tract (522 acres) is designated for general agriculture, which gives DHHL the flexibility to re-designate the lands for other uses, such as homesteads, in the future.

MAUI ISLAND PLAN

F. KE'ANAE TRACT BASELINE INFORMATION



1. INVENTORY

TMK and Acreage

Ke'anae is composed of two properties (*mauka* and *makai*) totaling approximately 150.6 acres. The *mauka* property is 148.7 acres and is identified by TMK 1-1-08:08 (Figure 6-1). The *makai* property is 1.9 acres and is composed of two contiguous parcels identified by TMK 1-1-03:60, 69 (Figure 6-1).

Existing Uses

Mauka Property:

Revocable Permit

Estate of Hansel Ah Koi - Pasture
TMK 1-1-08:08 148.7 acres

Portions of the *mauka* property have been cleared for pastoral use under the existing revocable permit. Minimal site grading is needed to make these cleared portions suitable for immediate use of the property.

Makai Property:

This property is vacant.

Adjacent Uses

The *mauka* property is bounded to the north by Hāna Highway, to the east by the Wainanalua Church and East Maui Irrigation parcels, and to the south and west by the Ko'olau Forest Reserve. The *makai* property is bounded to the north by the Pacific Ocean, to the east by State of Hawai'i Lands, to the south by Ke'anae Homestead Road, and to the west by a private residence.

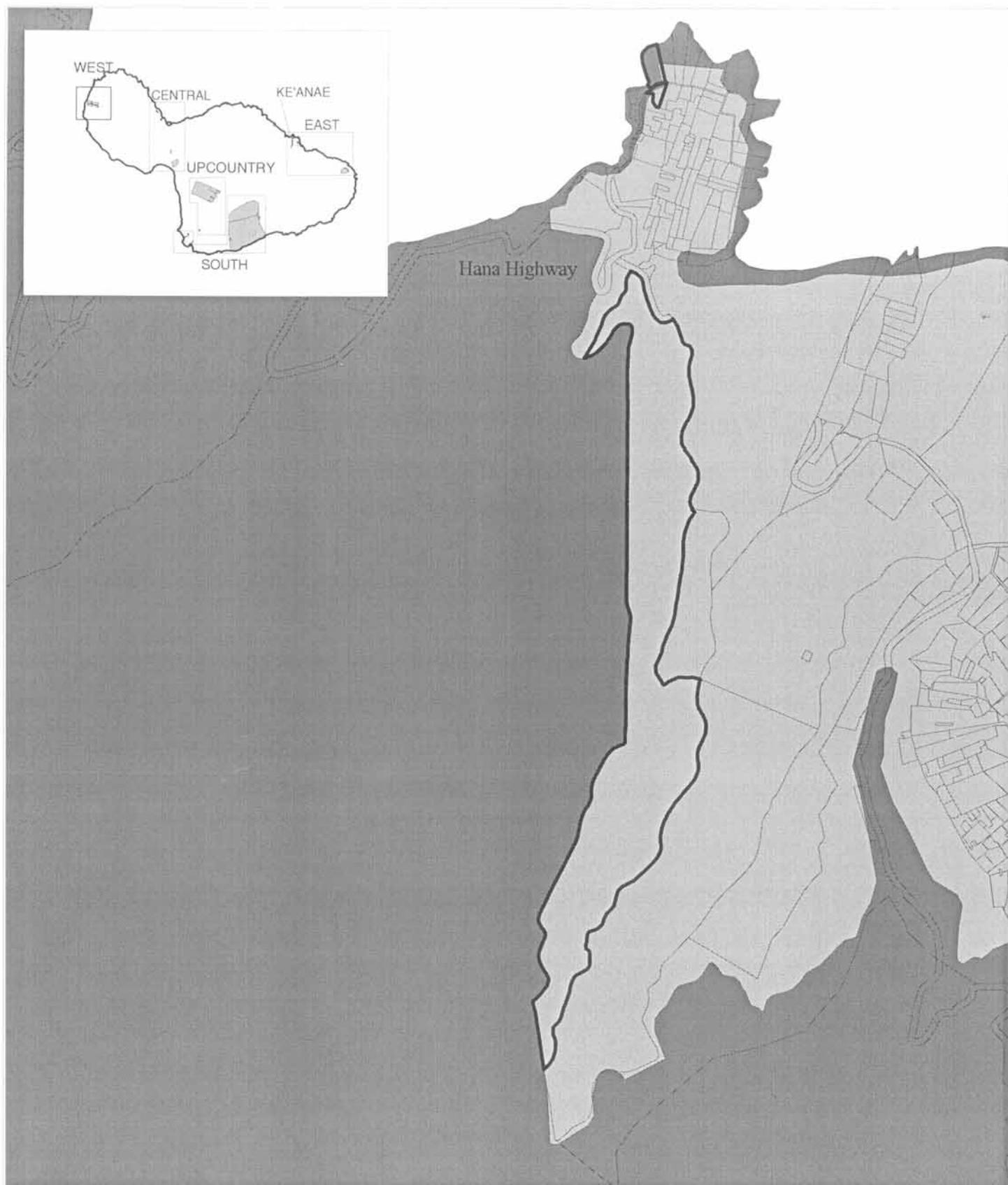
Proposed Future Surrounding Uses

There are no known proposed future surrounding uses.

2. REGULATORY

State Land Use District

The *mauka* property is entirely within the Agricultural District (Figure 6-11). Part of the *makai* property is within the Agricultural District and the remaining land is within the Conservation District (Figure 6-11).



Legend

- Agricultural District
- Conservation District
- DHHL Land Boundary

Figure 6-11
KE'ANAE
State Land Use

MAUI LAND INVENTORY

DEPARTMENT OF HAWAIIAN HOME LANDS



MAUI ISLAND PLAN

County Community Plan

The *Hāna Community Plan* designates the properties as Agricultural.

County Zoning

The Keʻanae properties are zoned Agricultural.

Special Management Area

The *mauka* property is not within the Special Management Area; the *makai* property is within the SMA (Figure 6-12).

Underground Injection Control Line

The *mauka* property is above the UIC line; the *makai* property is below the UIC line (Figure 6-13).

3. PHYSICAL CHARACTERISTICS

Climate

Temperature ranges from 60 to 83 degrees Fahrenheit in the summer and 61 to 79 degrees Fahrenheit in the winter.

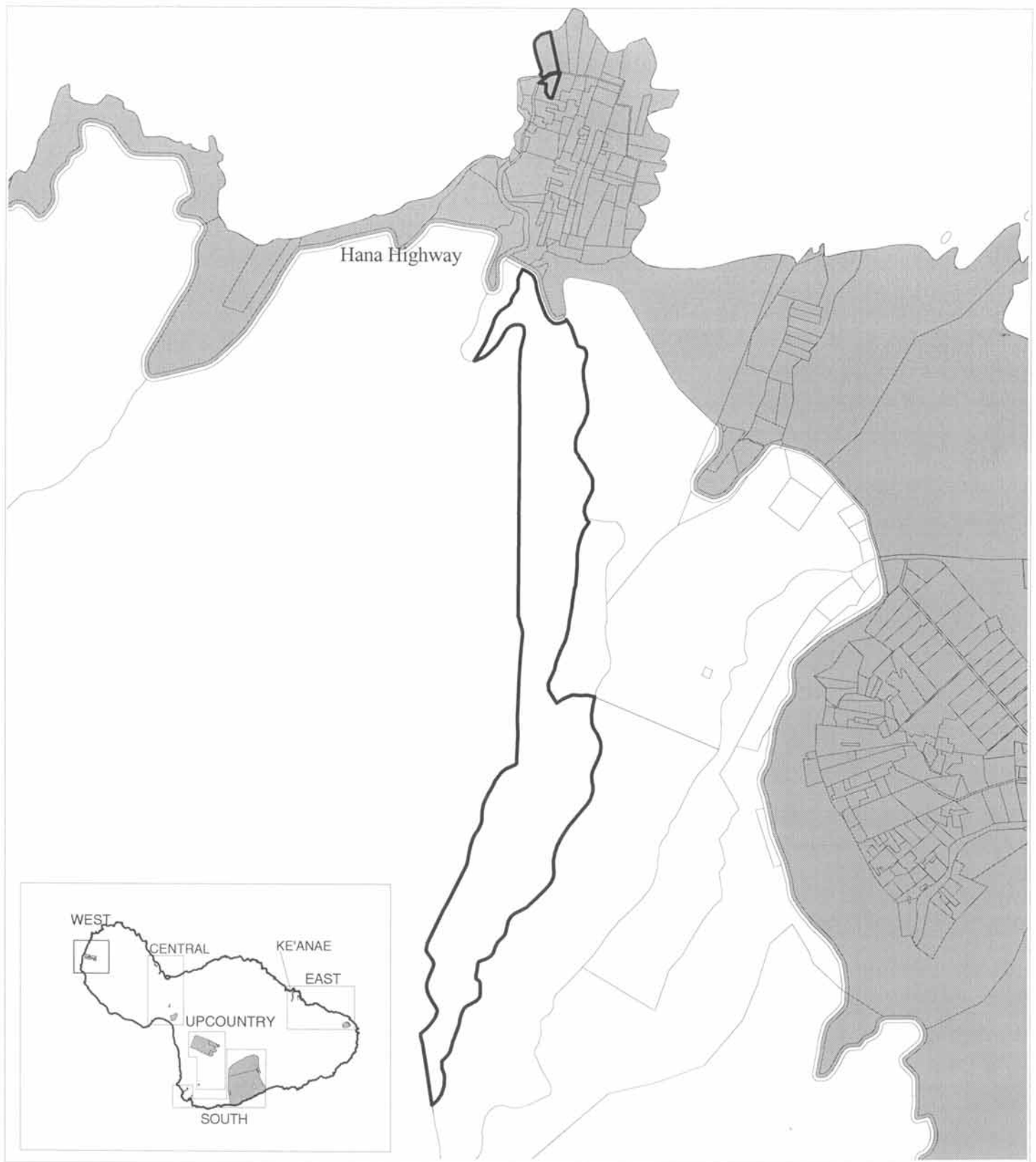
Soils

The USDA Soil Conservation Service Survey shows the following soil types on the Keʻanae properties (Figure 6-14):

- Rock Outcrop – This land type is not suited to farming. It is used for water supply, wildlife habitat, and recreation. It consists of areas where exposed bedrock covers more than 90 percent of the surface.
- Stony Alluvial Land – This type of land is suited to pasture in the dry areas and to pasture and woodland in the wet areas. It consists of stones, boulders, and soil deposited by streams along the bottoms of gulches and on alluvial fans. Improvement of this land is difficult because of the stones and boulders.
- Honolulu Silty Clay, 7 to 15 percent slopes – This soil is used for pineapple, pasture, and woodland. Permeability is moderately rapid. Runoff is slow to medium, and the erosion hazard is slight to moderate.
- Rough Mountainous Land – This land type is used for water supply, wildlife habitat, and recreation. The land surface is dominated by deep, V-shaped valleys that have extremely steep side slopes and narrow ridges between the valleys.

Agricultural Lands of Importance to the State of Hawaiʻi

The State of Hawaiʻi Department of Agriculture *ALISH* system of defining agricultural suitability classifies most of the soils in the *mauka* property as “Other Agricultural Land” (Figure 6-15). The remaining soils on the *mauka* property and the soils on the entire *makai* property are not classified by the *ALISH* system.



Legend

- Special Management Area
- DHHL Land Boundary

Figure 6-12

KE'ANAE

Special Management Area (SMA)

MAUI LAND INVENTORY

DEPARTMENT OF HAWAIIAN HOME LANDS

NORTH



1,000



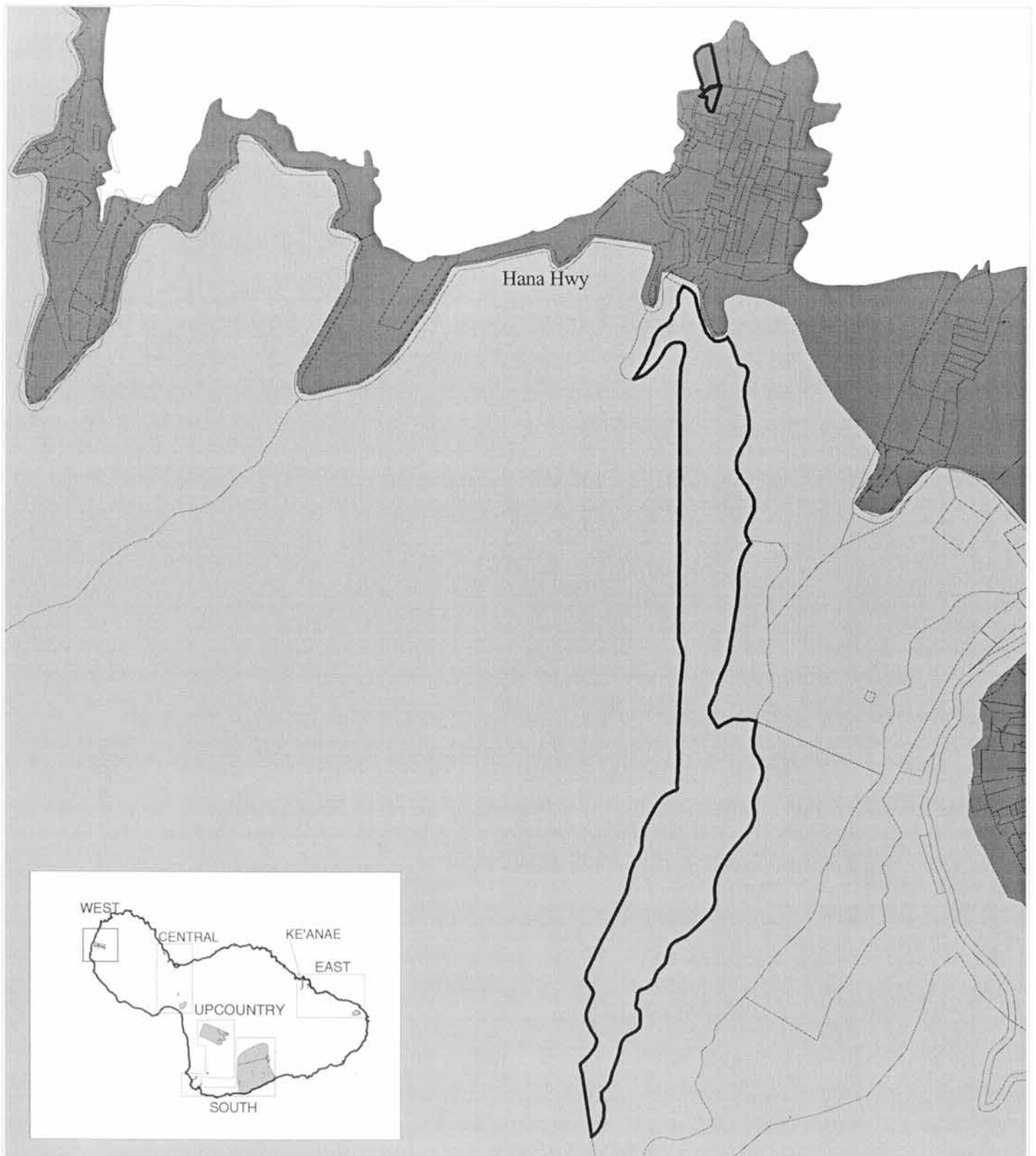
0



2,000

(FEET)





Legend

- Areas Below (Makai) Underground Injection Control Line
- Areas Above (Mauka) Underground Injection Control Line
- DHHL Land Boundary

Figure 6-13

KE'ANAE

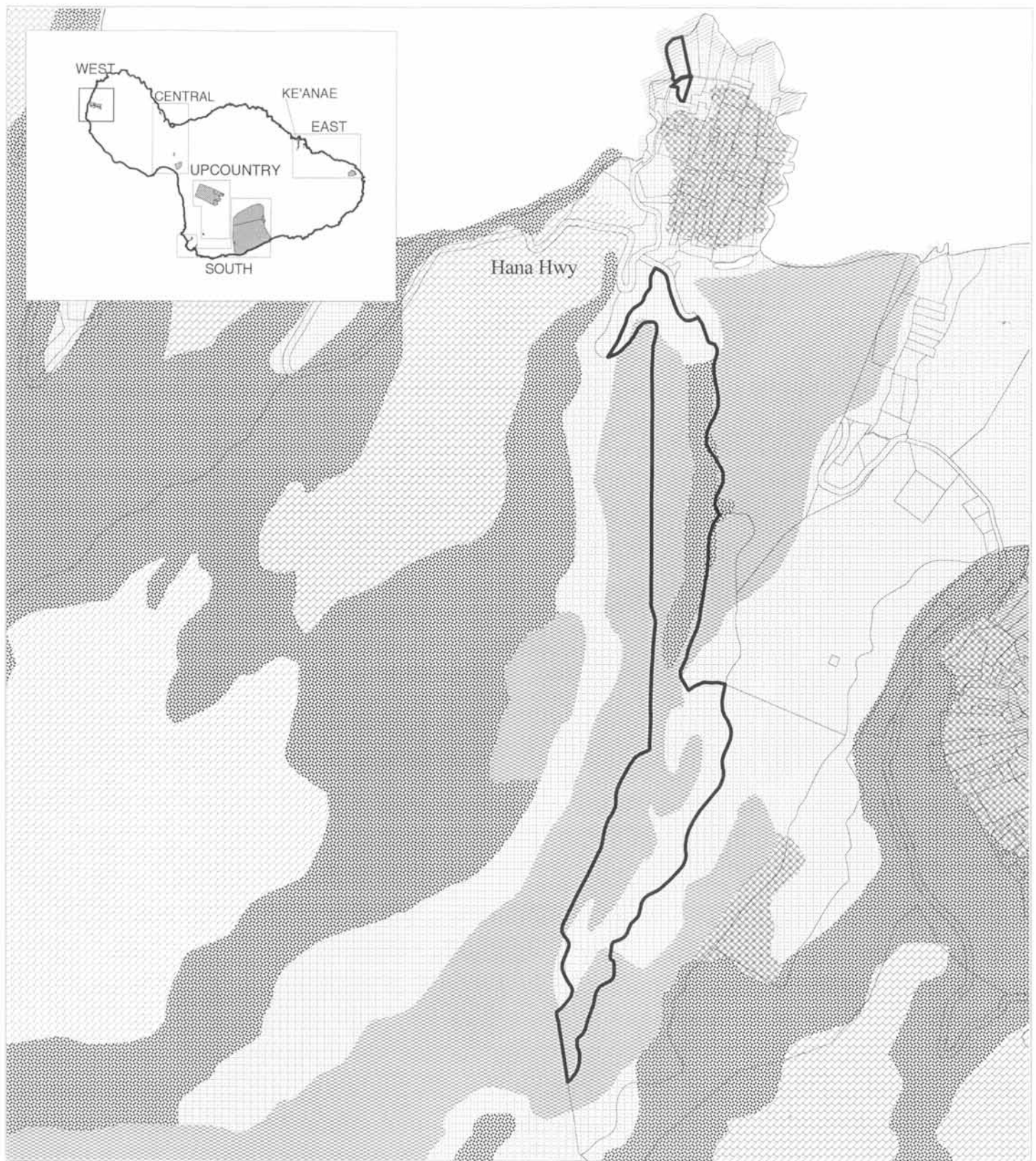
Underground Injection Control (UIC) Areas Map

MAUI LAND INVENTORY

DEPARTMENT OF HAWAIIAN HOME LANDS

NORTH





Legend






-  Rock Outcrop
-  Stony Alluvial Land
-  Honolua Silty Clay, 7-15% Slopes
-  Rough Mountainous Land
-  DHHL Land Boundary

Figure 6-14

KE'ANAE

Soil Conservation Service Survey

MAUI LAND INVENTORY

DEPARTMENT OF HAWAIIAN HOME LANDS

NORTH



1,000

0

2,000

(FEET)





Legend

-  Prime Agricultural Land
-  Unique Agricultural Land
-  Other Agricultural Land
-  Unclassified Land
-  DHHL Land Boundary

Figure 6-15

KE'ANAE

Agricultural Lands of Importance to the State of Hawaii (ALISH)

MAUI LAND INVENTORY

DEPARTMENT OF HAWAIIAN HOME LANDS

NORTH



MAUI ISLAND PLAN

Ground/Surface Water

The USGS topographic map shows Pālahulu Stream, which leads to Ke'ākū Falls, 'Ōhi'a Spring, and Pi'ina'au Stream within Ke'anae. Both streams are perennial.

Rainfall

Annual rainfall averages approximately 160 inches (Figure 6-16).

Topography/Slope

The USGS topographic map shows that the elevation in Ke'anae ranges from sea level to approximately 660 feet (Figure 6-16).

The topography of Ke'anae ranges from a rough lava coastline to an undulating upper region, with dense *hau* bushes in inland areas. According to the USGS, most of Ke'anae has undulating slopes; however, numerous streams traverse the *mauka* property and high slopes are present along the streams. Slopes range from flat, rolling pastures at lower elevations to steep slopes at the upper elevations.

Drainage

Runoff from the Ke'anae tract drains into Pi'ina'au and Pālahulu Streams and at Ke'anae Point into the Pacific Ocean.

Flood Zone

The Flood Insurance Rate Map indicates that the *mauka* property is within Zone X, which designates areas determined to be outside of the 500-year floodplain (Figure 6-17). The *makai* property is within Zone A, which designates special flood hazard areas inundated by the 100-year flood, for which base flood elevations are not determined (Figure 6-17).

Noise

Due to the rural nature of the area, there are no major sources of noise.

4. ENVIRONMENTAL CHARACTERISTICS

Historic Sites/Archeology

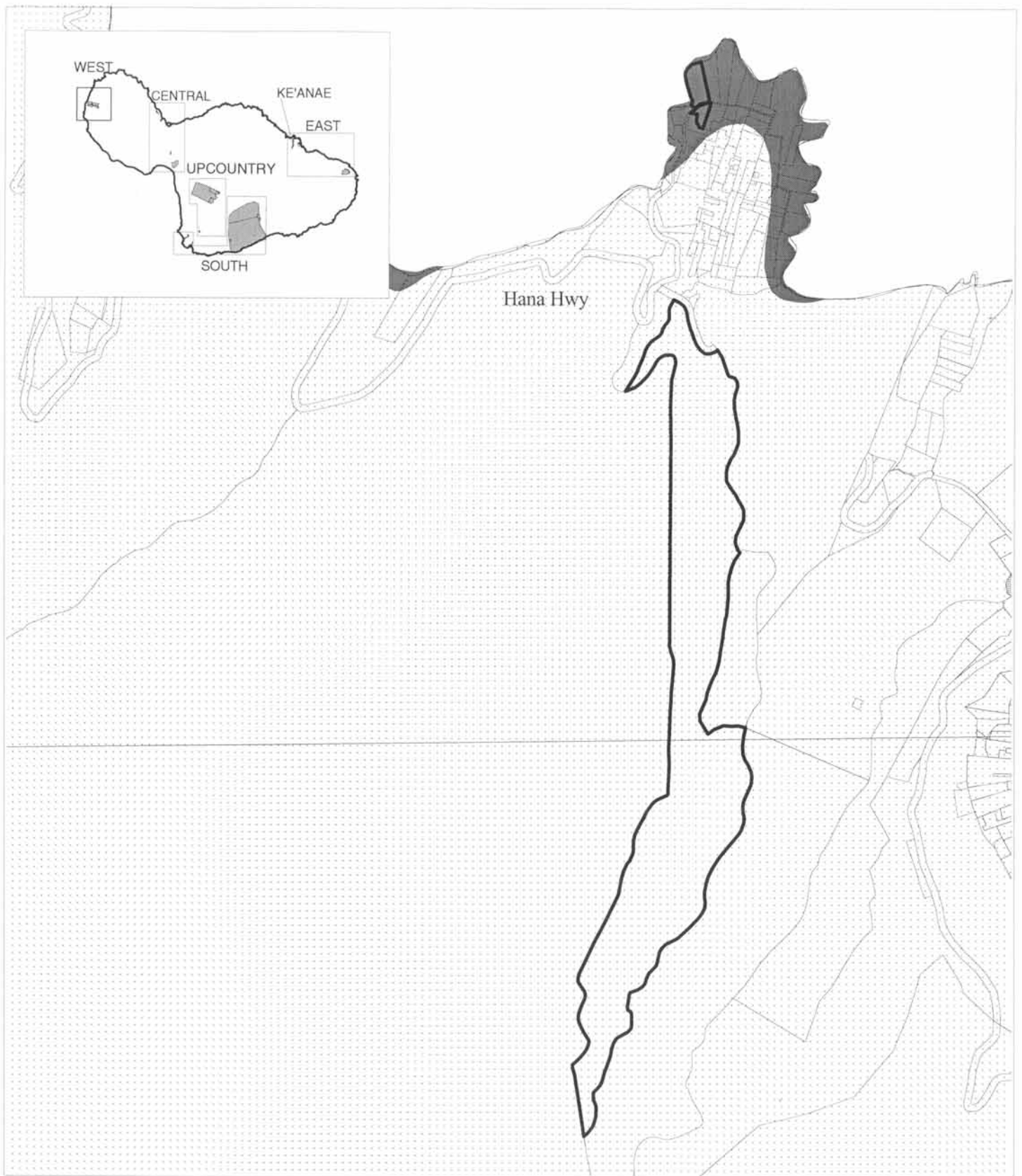
There are no known historic or archeological sites on this tract.

Cultural Resources

There are no known cultural resources on this tract; however, the *makai* property's oceanfront location offers ocean access and opportunities for community use or a gathering area.

Endangered Species

There are no species identified as candidate or endangered by the Hawai'i Natural Heritage Program *Biological Conservation Datasystem (BCD) for Department of Hawaiian Home Land* on this tract.



Legend




-  **ZONE A:**
Special Flood Hazard Areas Inundated by 100-Year Flood
No Base Flood Elevations Determined
-  **ZONE X:**
Areas Determined To Be Outside 500-Year Floodplain
-  **DHHL Land Boundary**

Figure 6-17
KE'ANAE
Flood Insurance Rate Map

MAUI LAND INVENTORY

DEPARTMENT OF HAWAIIAN HOME LANDS

NORTH



1,000

0

2,000

(FEET)



MAUI ISLAND PLAN

Critical Habitat

The U.S. Fish and Wildlife Service has not designated any critical habitat areas within the Ke'anae properties.

5. INFRASTRUCTURE

Access/Roadways

Access to the *mauka* property is via a four-wheel drive road running from Hāna Highway along the west boundary. Access to the *makai* property is from Ke'anae Homestead Road off of Hāna Highway.

Water System

The USGS topographic map shows one existing water tank within Ke'anae.

Water service to the Ke'anae properties is provided off Hāna Highway by the County Department of Water Supply.

Wastewater Treatment and Disposal

County wastewater facilities do not serve Ke'anae; cesspools and septic tanks are generally used.

Solid Waste Disposal

The County provides solid waste disposal service to Ke'anae. Solid waste is taken to the Hāna Landfill.

Telephone Service

There is currently no telephone service on the properties. If needed, Sandwich Isles Communications will provide the telephone service to the tract.

Electrical Service

MECO provides electrical service to Ke'anae through the extension of a 23-kV line running from Kahului through Pā'ia, around the base of Haleakalā, and ending in Hāna. An existing electrical line, owned by East Maui Irrigation Company, runs along the four-wheel drive road the forms the west south boundary of the *mauka* property.

Cable Television Service

These properties are within the Oceanic Cable service area.

MAUI ISLAND PLAN



G. KE'ANAE ANALYSIS

According to the *Maui Island Plan* beneficiary survey, the residential demand in the East Region is 79 units. Community input indicated that of the three tracts in the east region, Wākiu was the first choice for residential use.

Residential use is not being proposed in the alternatives for Ke'anae. The *mauka* parcel is better suited for pastoral and agricultural use due to its soils, high rainfall, and the existing pasture on a portion of the property (Figure 6-18). The *makai* property is not suitable for residential use due to its flooding designation and cultural/community qualities, including access to the ocean (Figure 6-18).

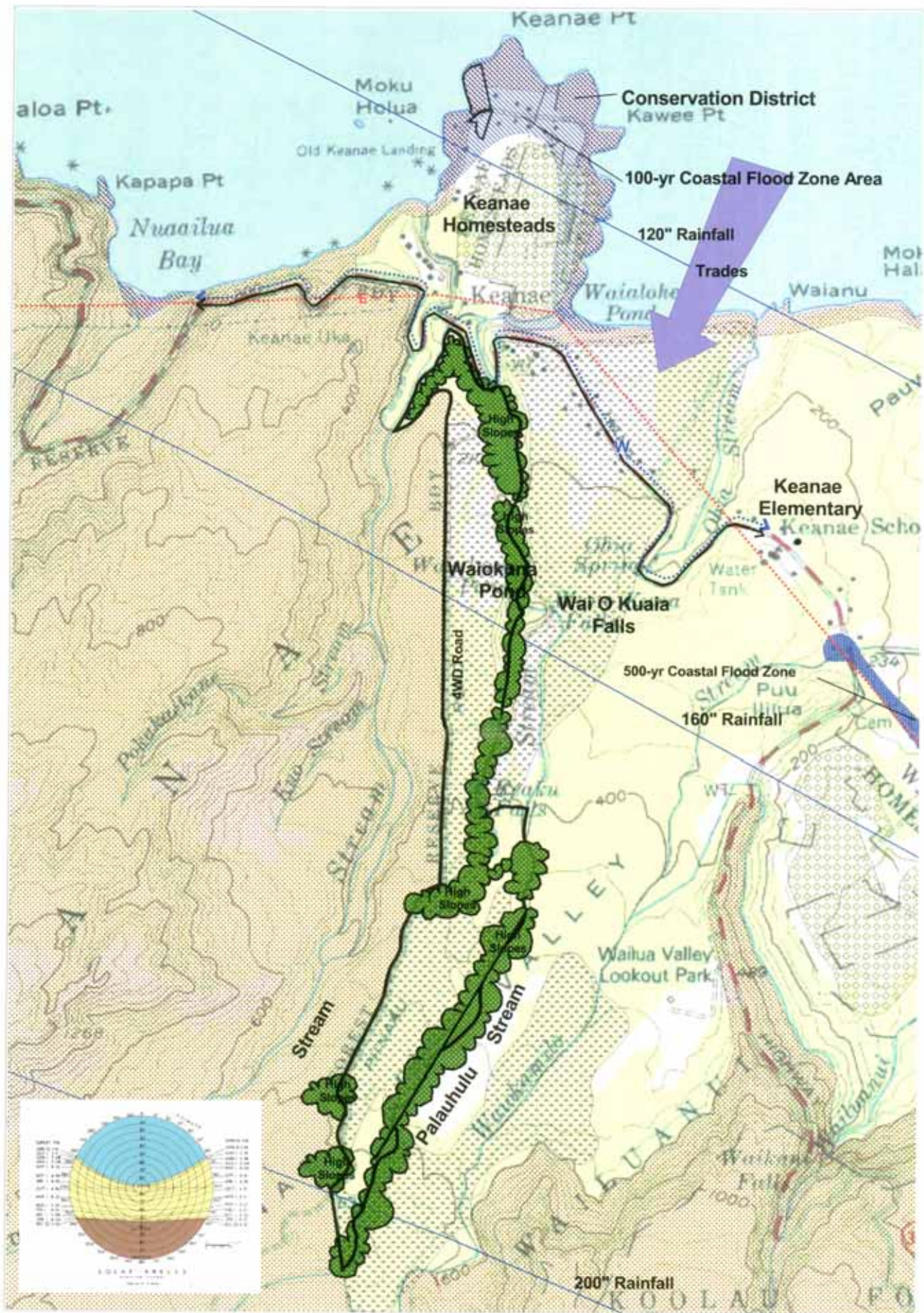
According to the *Maui Island Plan* beneficiary survey, there is a demand for 3,071 agricultural lots on Maui. The demand for the East 1 Region is 204 lots.

The *mauka* property has good opportunities for agriculture use, due to its soils, which are designated as "Other Agricultural Lands" under the *ALISH* system, and the streams flowing through the property. The *makai* property not does present agricultural opportunities based on its soils (unclassified under *ALISH*).

Both properties are fairly flat, with the exception of gully and stream areas. Proposed uses should be focused on the flatter areas of the properties to minimize the need for site grading and impacts to the environment.

The high rainfall on both properties presents an opportunity to use catchment systems for irrigation.

Uses proposed for the *makai* property should be sensitive to its location and vicinity to the ocean. Use of the property for homesteads would diminish access to the ocean. In addition, flooding is a significant concern on the *makai* property.



MAUI ISLAND PLAN

Improvements to the four-wheel drive road off of Hāna Highway are needed in order to access the *mauka* property. The current access road is accessible only with a four-wheel drive vehicle. Access to the *makai* property is satisfactory.

1. ALTERNATIVE 1

a. Proposed Uses

Alternative 1 proposes two acres of community use on the *makai* property and 57 acres of pastoral use on the *mauka* property (Figure 6-19). The remaining areas are designated for general agriculture.

Community Use

The two-acre *makai* property is proposed for community use because of its oceanfront location, which presents opportunities for a gathering area and for cultural practices. In addition, the *makai* property is within the flood zone, which prohibits homesteading use.

Access to the *makai* property is off of Keʻanae Road, making it readily accessible to the community.

County water service is available to the *makai* parcel, however, due to high rainfall in the area, a catchment system can supplement the County water system. Electricity, telephone, and cable service could be extended into the *makai* property at a minimal cost.

Pastoral

Alternative 1 proposes 57 acres of pastoral use divided between two parcels of at least 20 acres on the *mauka* property. The majority of the *mauka* property is flat and has generally good agricultural soils. A portion of the property has been cleared for pastoral use in the past. Due to high rainfall, catchment systems could supplement County water sources.

Improvements to the ingress and egress onto Hāna Highway are needed, as currently only four-wheel drive vehicles can access the *mauka* property.

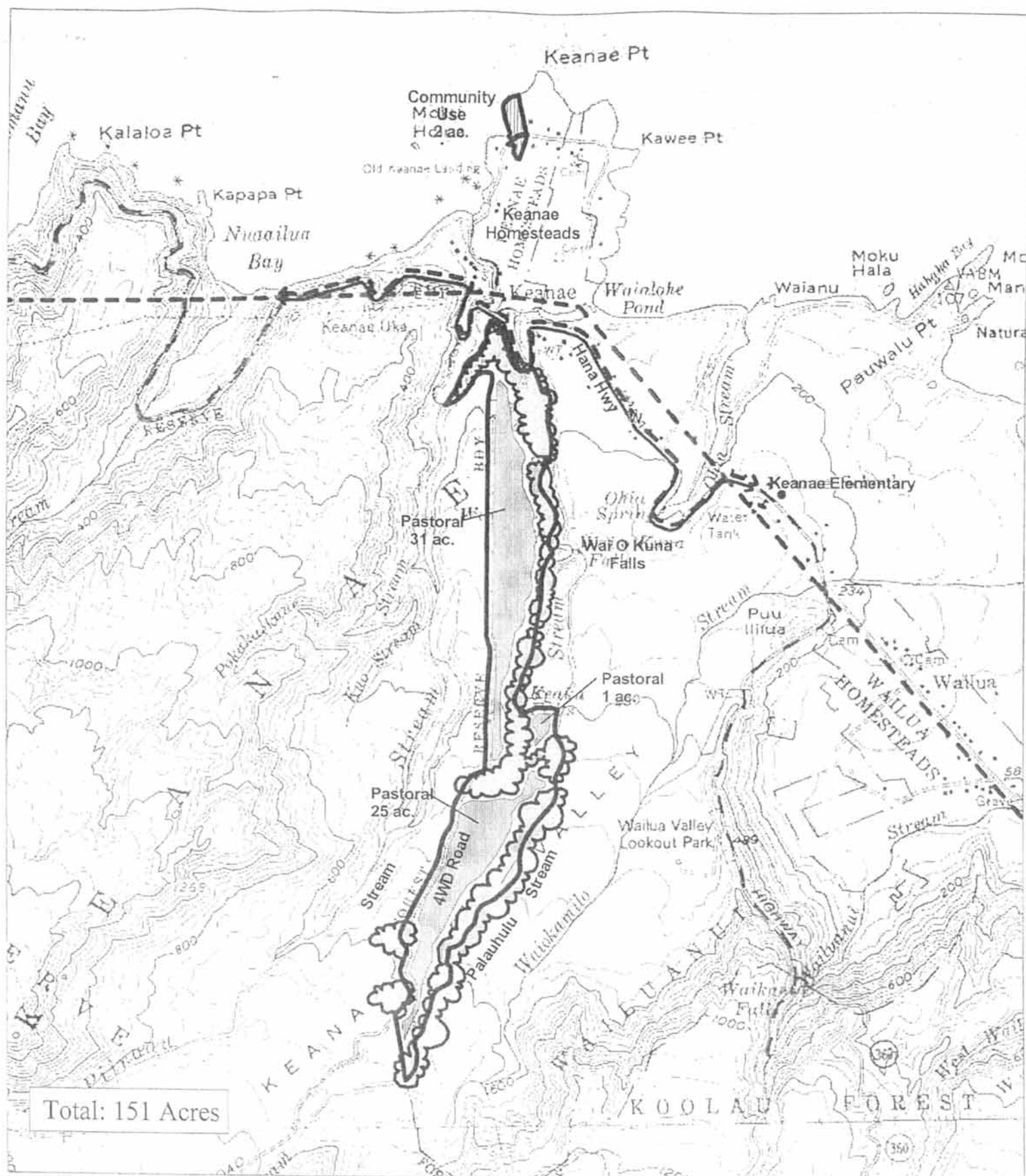
b. Alternative 1 Costs Estimates

The projected costs for the subsistence agriculture lots are as follows:

Pastoral

Total Lots = 2 lots

Lot Size = at least 20 acres



- Legend**
- DHHL Land Boundary
 - Water Line
 - Electrical Line

Land Use Categories			
	Pastoral	25 ac	2
	Community Use		2
	General Agriculture		92
	Total	2	151

Figure 6-19
KE'ANAE
Land Use Alternative 1
MAUI LAND INVENTORY
DEPARTMENT OF HAWAIIAN HOME LANDS

NORTH

800 0 1600
(FEET)

MAUI ISLAND PLAN

Table 6-4: Projected Costs for Alternative 1 Pastoral Lots at Ke‘anae

Improvements	Total Cost \$	Cost Per Lot \$
Off-Site	942,760	471,380
On-Site	158,002	79,001
Total	1,100,762	550,381

Cost Factors

- Rural Standards
- Sewer: None
- Roads: Gravel with grass shoulders
- Electrical: None
- Water system: Catchment

2. ALTERNATIVE 2

a. Proposed Uses

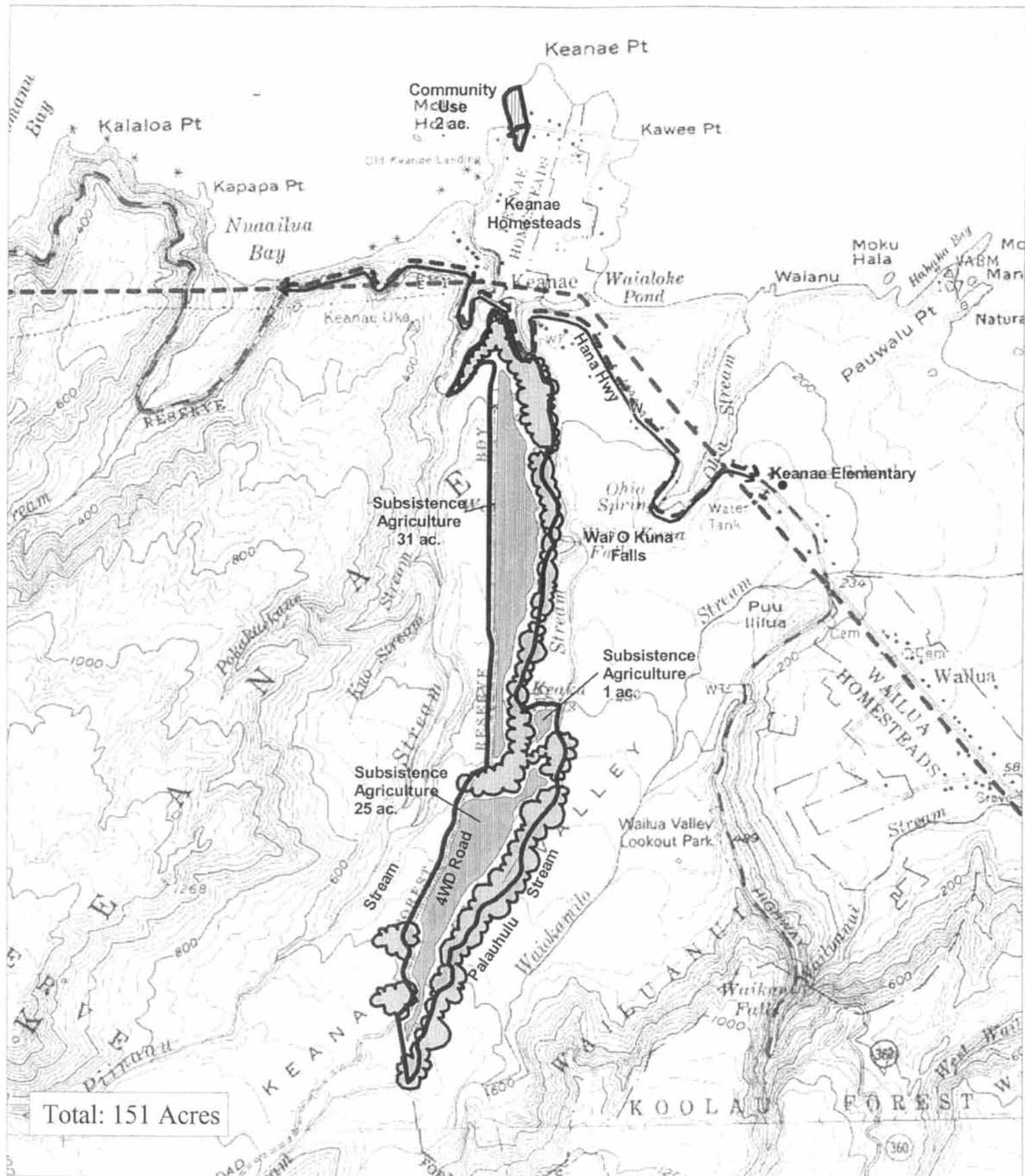
Alternative 2 proposes two acres of community use on the *makai* property and 32 three-acre agricultural lots on 57 acres of the *mauka* property (Figure 6-20). The remaining acres are designated for general agriculture.

Community Use

Community use is proposed for the *makai* site for the same reasons cited in Alternative 1.

Subsistence Agriculture Use

In general, the rationale for agricultural use on the *mauka* property is the similar to the discussion regarding pastoral use in Alternative 1 – generally good agricultural soils and level topography, existing pasture use on a portion of the property, and the potential to use catchment systems to supplement water requirements. Utilizing Geographic Information Systems (GIS) analysis and overlaying techniques, suitable agriculture lands are depicted on the Ke‘anae site analysis map and used to determine the location of the agriculture lots on the tract.



- Legend
- DHHL Land Boundary
 - Water Line
 - Electrical Line

Land Use Categories	Lot Size	Number of Lots	Approx Acres
Subsistence Agriculture	3 ac	32	57
Community Use			2
General Agriculture			92
Total		32	151

Figure 6-20
KE'ANAE
Land Use Alternative 2
MAUI LAND INVENTORY

DEPARTMENT OF HAWAIIAN HOME LANDS



MAUI ISLAND PLAN

The projected costs for the subsistence agricultural lots are as follows:

b. Alternative 2 Costs Estimates

Subsistence Agriculture

Total Lots = 32 lots

Lot Size = 3 acres

Table 6-5: Projected Costs for Alternative 2 Subsistence Agriculture Lots at Ke‘anae

Improvements	Total Cost \$	Cost Per Lot \$
Off-Site	503,798	15,744
On-Site	189,116	5,910
Total	692,915	21,654

Cost Factors

- Rural Standards
- Sewer: Individual septic tank use
- Roads: Sixteen-foot wide asphalt road pavement, two-foot grass shoulders
- Overhead electrical lines
- Water system: Catchment

H. KE‘ANAE TRACT FINAL PLAN

The final land use plan reflects Alternative 2, which proposes two acres of community use on the *makai* property and 32 three-acre subsistence agricultural lots on 57 acres of the *mauka* property (Figure 6-21). The remaining acres are designated for general agriculture.

Community use on the *makai* property is proposed in both alternatives because of its oceanfront location, which presents opportunities for gathering activities and other cultural practices.

Subsistence agriculture, which requires smaller lots, is selected over large-lot pastoral use for the final land use plan because beneficiary demand for agriculture lots on Maui is higher than pastoral lot demand. In addition to demand, more beneficiaries are served with 32 three-acre agriculture lots compared with two 20-acre pastoral lots. The subsistence agriculture designation also requires that the beneficiaries reside on the lot, whereas this is optional for pastoral lots. This is an important factor in insuring that everyone on the waiting list is served once, rather than one beneficiary requiring two awards.

MAUI ISLAND PLAN

Although the *mauka* property is currently in pastoral use, according to the baseline analysis, the property is well suited for agriculture due to its potentially productive soils (according to the *ALISH* designation) and high rainfall. According to the goals and objectives of DHHL's *General Plan* (2002), suitable agriculture lands should be retained in agricultural use when possible. The agricultural designation follows this objective and proposes the highest and best use for the land.

I. WAILUA TRACT BASELINE INFORMATION



1. INVENTORY

TMK and Acreage

Wailua is 91.4 acres and is identified by TMK 1-1-04: 07, 08, 33, 34, 41, 1-1-05:01, 08, 22, 35, 38, 47, 1-1-06:13, 31, 69, 73, and 1-1-08:14 (Figure 6-1).

Existing Uses

In a 1994 settlement with DLNR, DHHL acquired approximately 93 acres in Wailua Valley. The 16 parcels that make up the tract have lot sizes ranging from 0.5 to 60 acres and are spread throughout the existing Wailua Homesteads.

Adjacent Uses

The tract is bounded to the north by the Pacific Ocean and to the south, east, and west by Hāna Highway.

Proposed Future Surrounding Uses

There are no known proposed future surrounding uses.

2. REGULATORY

State Land Use District

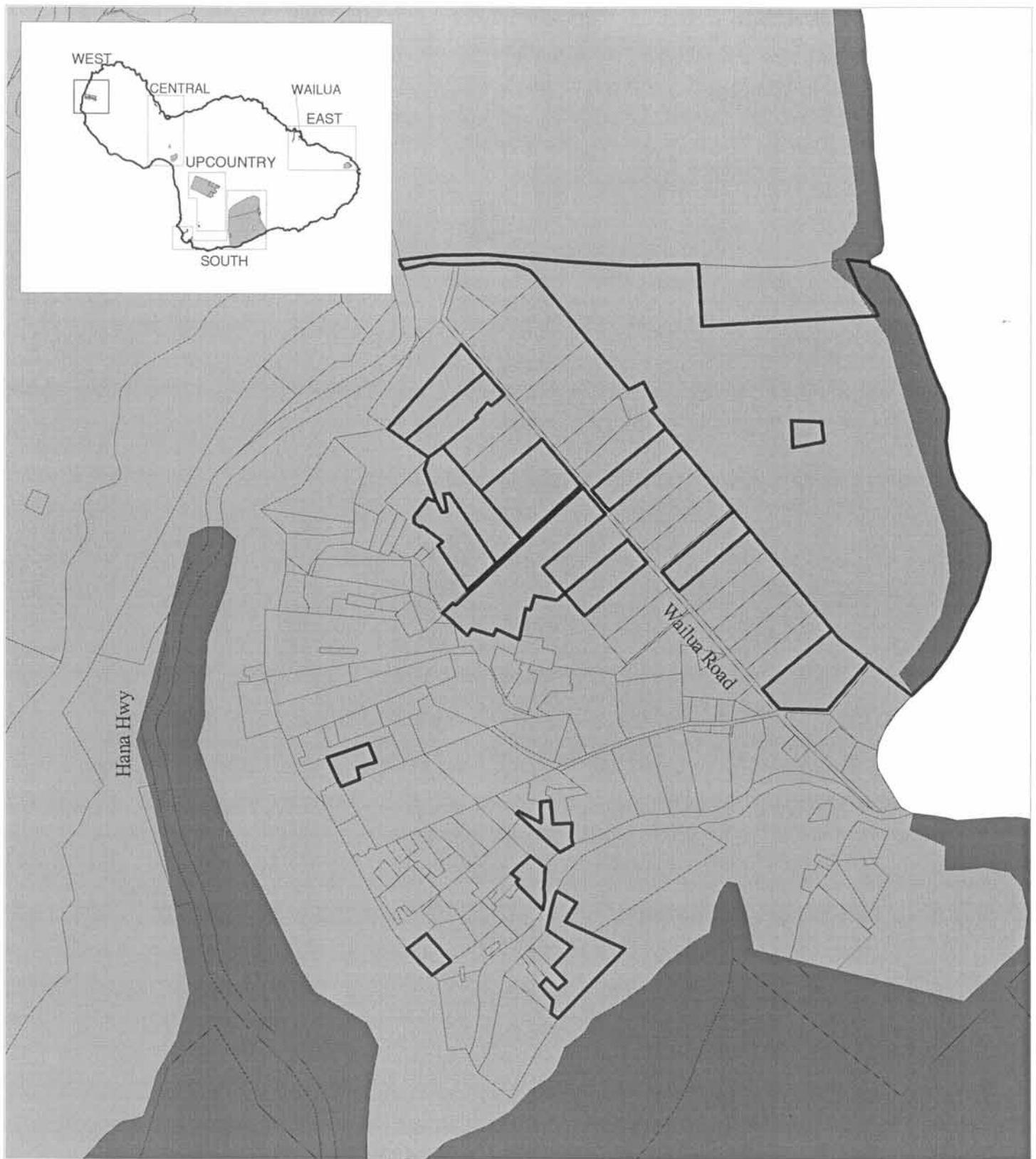
The majority of Wailua is in the Agricultural District; coastal areas are in the Conservation District (Figure 6-22).

County Community Plan

The *Hāna Community Plan* designates the tract as Agricultural.

County Zoning

The Maui County zoning designation is Agricultural.



Legend

- Agricultural District
- Conservation District
- DHHL Land Boundary

Figure 6-22

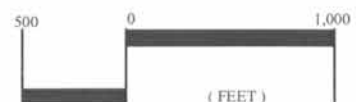
WAILUA

State Land Use

MAUI LAND INVENTORY

DEPARTMENT OF HAWAIIAN HOME LANDS

NORTH



MAUI ISLAND PLAN

Special Management Area

This tract is within the Special Management Area (Figure 6-23).

Underground Injection Control Line

This tract is below the UIC line (Figure 6-24).

3. PHYSICAL CHARACTERISTICS

Climate

Temperature ranges from 60 to 83 degrees Fahrenheit in the summer and 61 to 79 degrees Fahrenheit in the winter.

Soils

The USDA Soil Conservation Service Survey shows the following soil types in Wailua (Figure 6-25):

- Tropaquepts – These soils are used for production of taro, rice, and watercress on flooded paddies. They are poorly drained soils that are periodically flooded by irrigation in order to grow crops that thrive in water.
- Stony Alluvial Land – This type of land is suited to pasture in the dry areas and to pasture and woodland in the wet areas. It consists of stones, boulders, and soil deposited by streams along the bottoms of gulches and on alluvial fans. Improvement of this land is difficult because of the stones and boulders.
- Honolulu Silty Clay, 7 to 15 percent slopes – This soil is used for pineapple, pasture, and woodland. Permeability is moderately rapid. Runoff is slow to medium, and the erosion hazard is slight to moderate.
- Rough Mountainous Land – This land type is used for water supply, wildlife habitat, and recreation. The land surface is dominated by deep, V-shaped valleys that have extremely steep side slopes and narrow ridges between the valleys.

Agricultural Lands of Importance to the State of Hawai'i

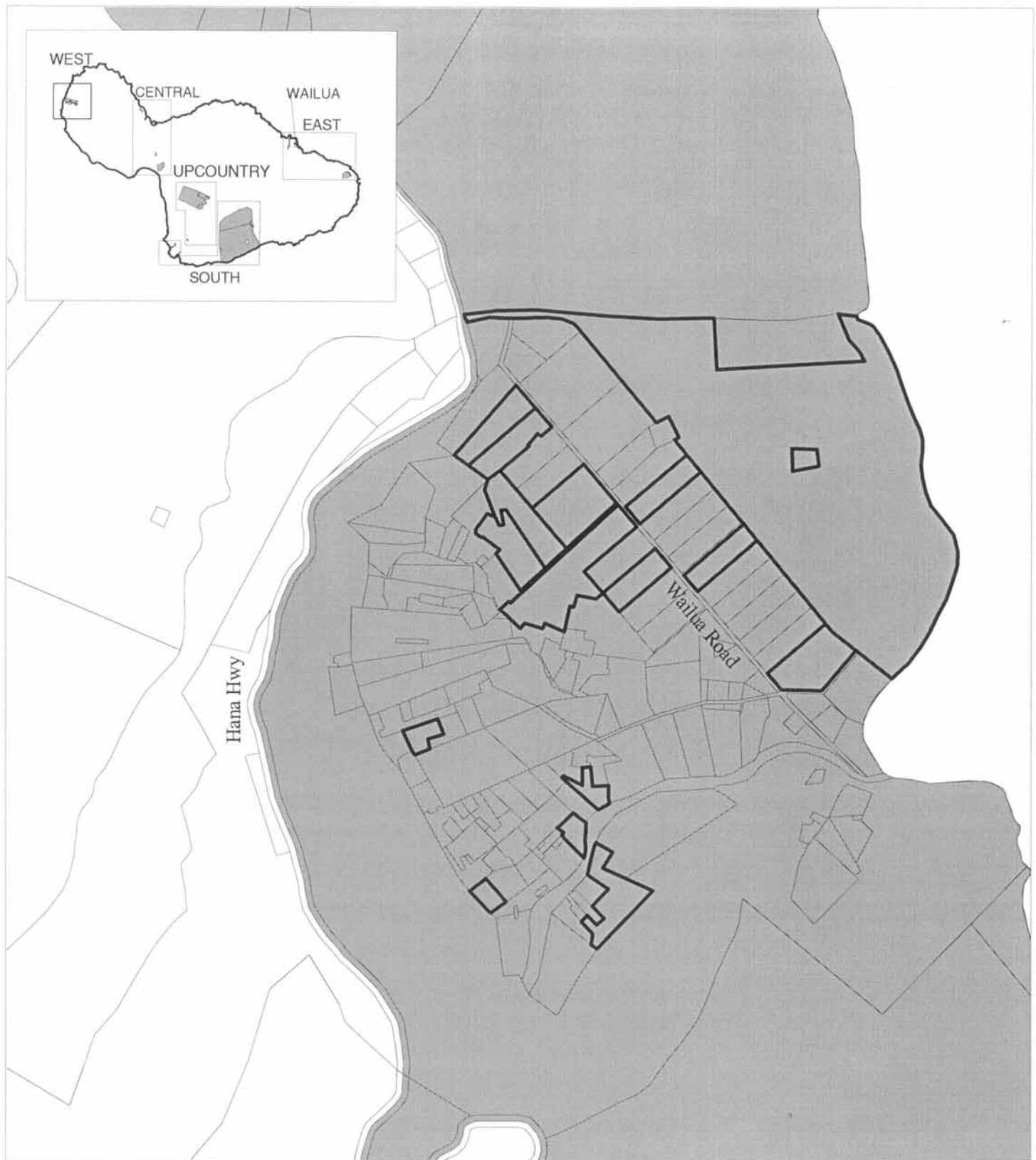
The State of Hawai'i Department of Agriculture *ALISH* system of defining agricultural suitability classifies some of the soils of Wailua as "Other Agricultural Land" and "Unique Agricultural Land." The remaining soils are not classified (Figure 6-26).

Ground/Surface Water

The USGS topographic map shows Wailuanui Stream, Waiokamilo Stream (along the western border), and Wakani Falls (along the southern border) within the Wailua tract. Both streams are perennial.

Rainfall

Annual rainfall at Wailua averages between 120 and 200 inches per year. The high rainfall and stream flow from Wailuanui Stream, which runs through Wailua, provides water to the taro crops planted throughout the valley (Figure 6-27).



Legend

- Special Management Area
- DHHL Land Boundary

Figure 6-23

WAILUA
Special Management Area (SMA)

MAUI LAND INVENTORY

DEPARTMENT OF HAWAIIAN HOME LANDS

NORTH



500

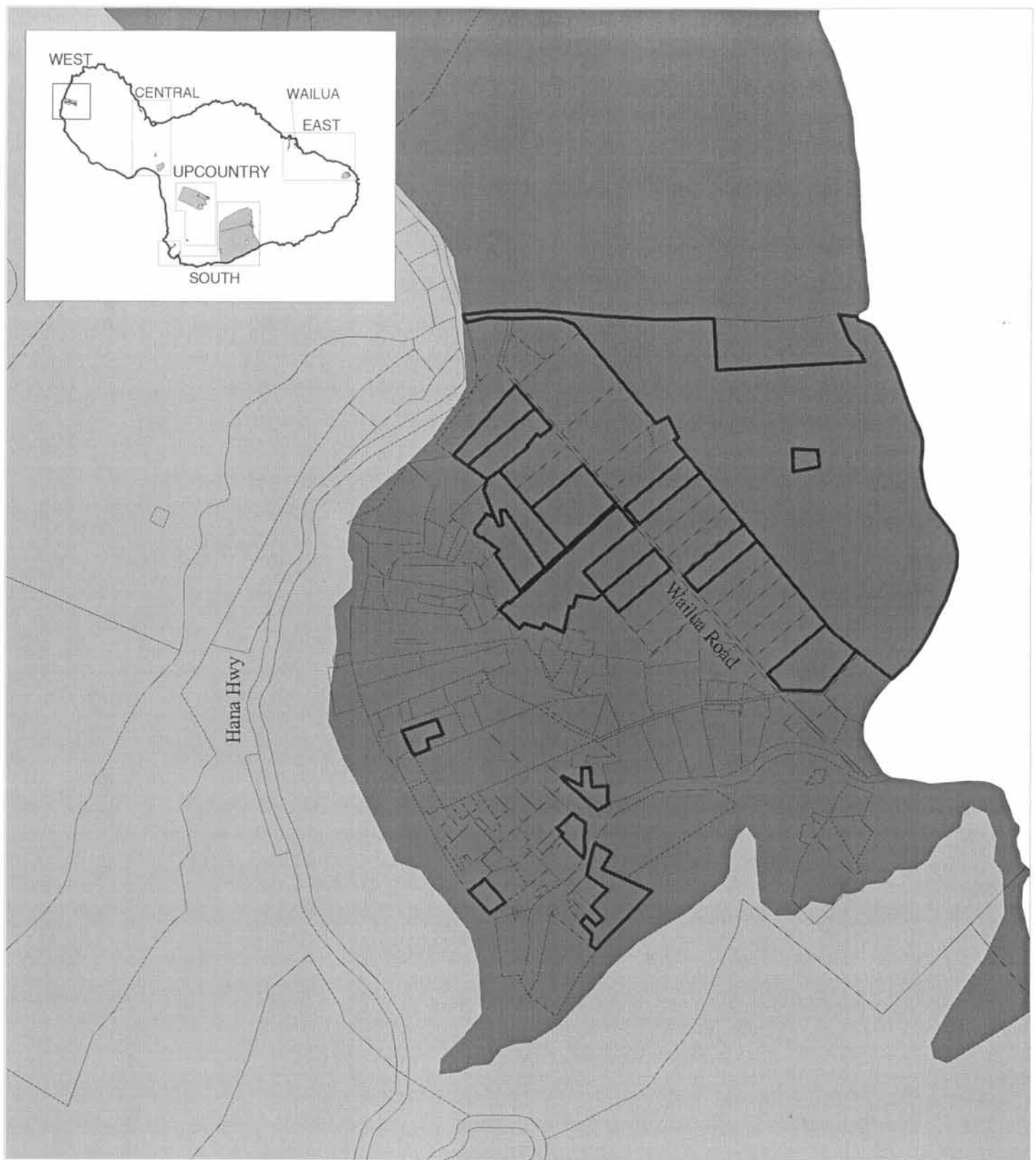
0

1,000



(FEET)





Legend

- Areas Below (Makai) Underground Injection Control Line
- Areas Above (Mauka) Underground Injection Control Line
- DHHL Land Boundary

Figure 6-24

WAILUA

Underground Injection Control (UIC) Areas Map

MAUI LAND INVENTORY

DEPARTMENT OF HAWAIIAN HOME LANDS

NORTH



500

0

1,000



(FEET)





Legend






-  Tropaequpts
-  Stony Alluvial Land
-  Honolua Silty Clay, 7-15% Slopes
-  Rough Mountainous Land
-  DHHL Land Boundary

Figure 6-25

WAILUA

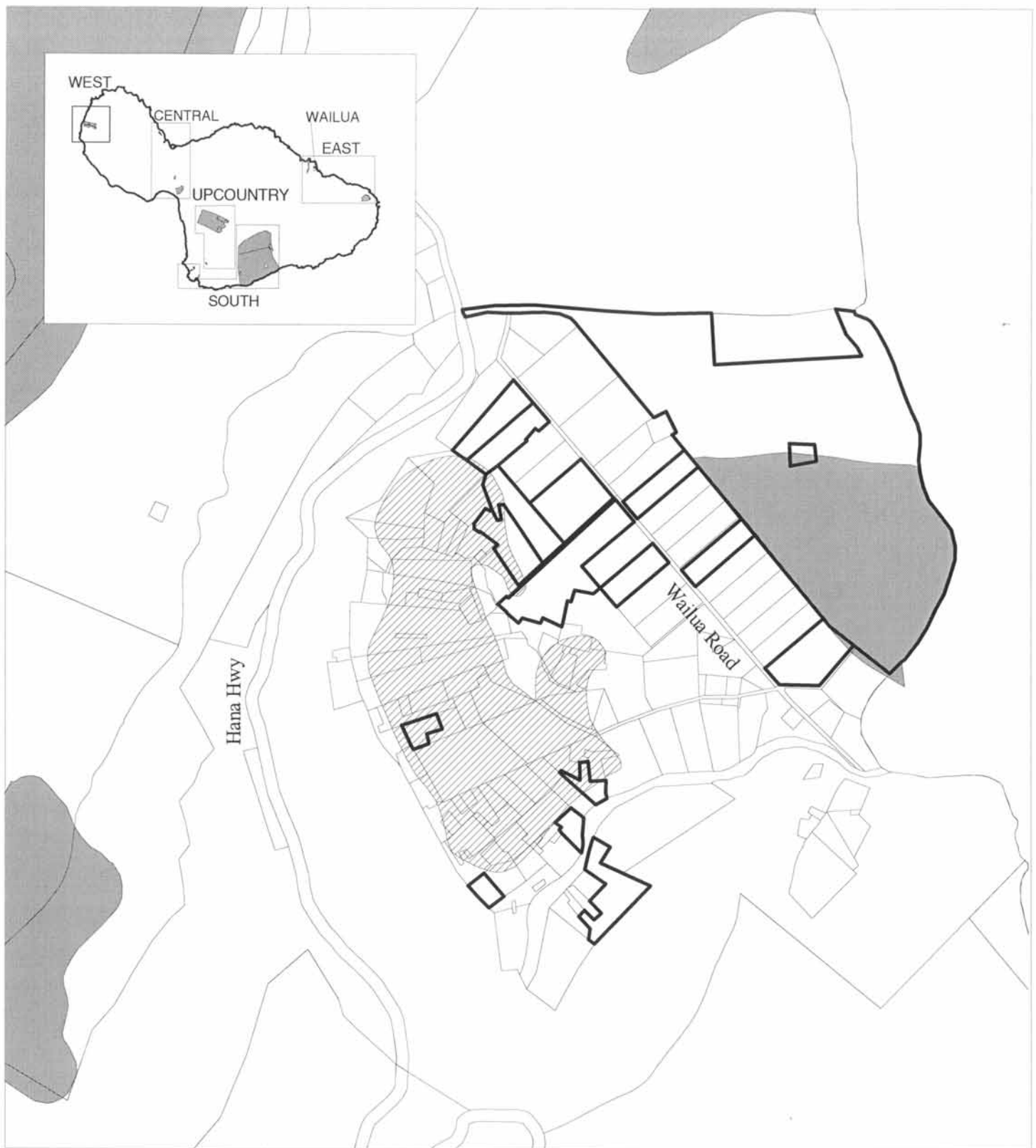
Soil Conservation Service Survey

MAUI LAND INVENTORY

DEPARTMENT OF HAWAIIAN HOME LANDS

NORTH





Legend

-  Prime Agricultural Land
-  Unique Agricultural Land
-  Other Agricultural Land
-  Unclassified Land
-  DHHL Land Boundary

Figure 6-26

WAILUA

Agricultural Lands of Importance to the State of Hawaii (ALISH)

MAUI LAND INVENTORY

DEPARTMENT OF HAWAIIAN HOME LANDS

NORTH



500

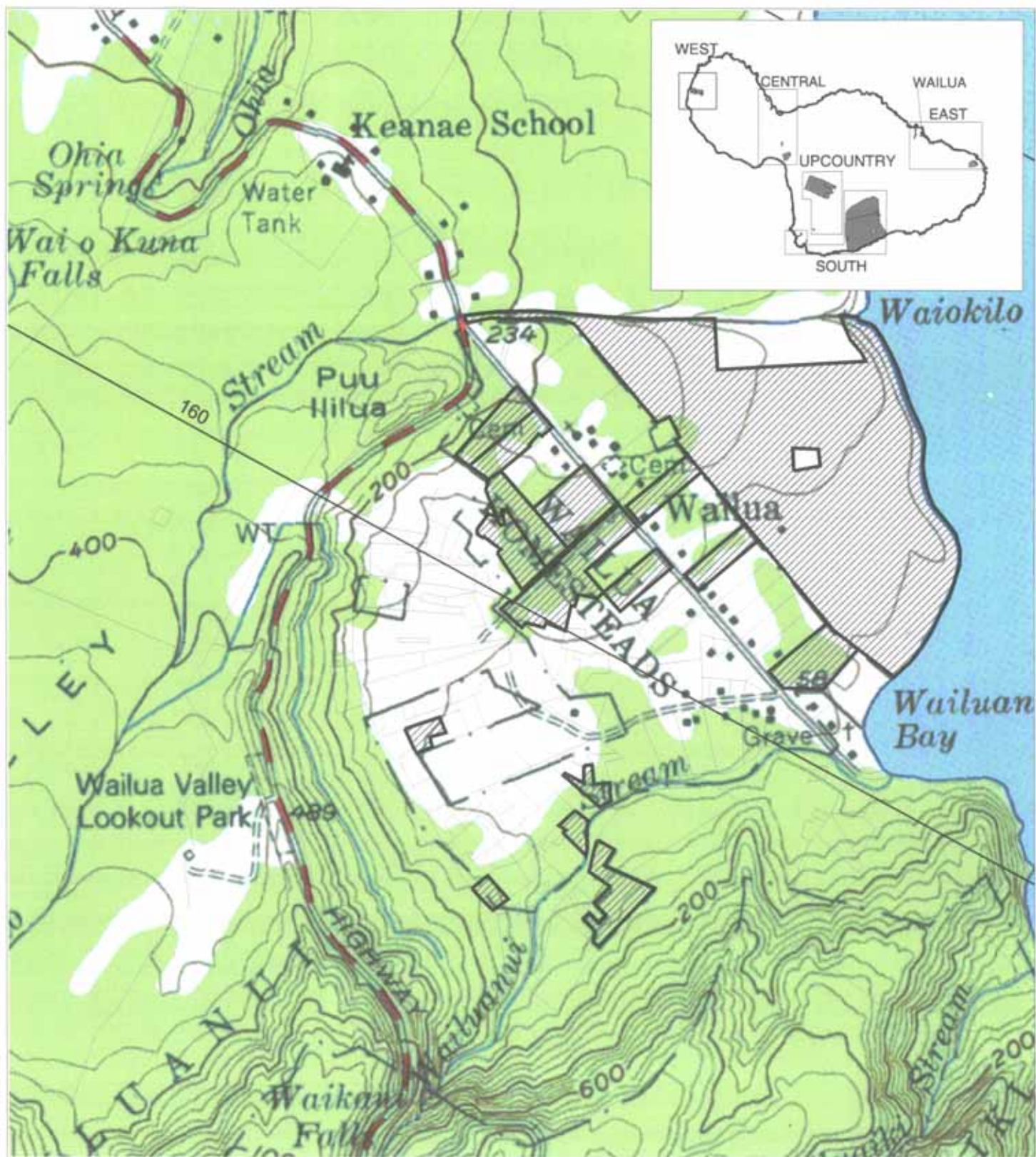
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1,000



(FEET)





Legend

-  DHHL Properties
-  Lines of Equal Average Annual Rainfall in Inches

Figure 6-27

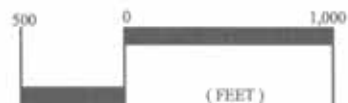
WAILUA

USGS Map with Rainfall Isohyets

MAUI LAND INVENTORY

DEPARTMENT OF HAWAIIAN HOME LANDS

NORTH



(FEET)



MAUI ISLAND PLAN

Topography/Slope

The USGS topographic map shows that the elevation in Wailua ranges from sea level to approximately 160 feet (Figure 6-27).

Wailua is generally flat, with slopes in the range of zero to five percent. Slopes increase along the walls of the valley. Wailua Homesteads and the 16 DHHL parcels are located on the flatter portion of the valley.

Drainage

The USGS topographic map shows Wailuanui Stream as a natural drainage way.

Flood Zone

The Flood Insurance Rate Map indicates that the majority of Wailua is within Zone X, which designates areas determined to be outside of the 500-year floodplain (Figure 6-28). Portions along Wailua Road are within Zone X500, which designates areas inundated by the 500-year flood.

Noise

Due to the rural nature of the area, there are no major sources of noise.

4. ENVIRONMENTAL CHARACTERISTICS

Historic Sites/Archaeology/Cultural Resources

There are no known historic sites, archaeological sites, or cultural resources on this tract.

Endangered Species

There are no species identified as candidate or endangered by the Hawai'i Natural Heritage Program *Biological Conservation Datasystem (BCD) for Department of Hawaiian Home Land* on this tract.

Critical Habitat

The U.S. Fish and Wildlife Service has not designated any critical habitat areas within the Wailua tract.

5. INFRASTRUCTURE

Access/Roadways

Wailua Road provides access to the Wailua parcels from Hāna Highway, which curves to the west of Wailua.

Water

The Maui County Department of Water Supply serves Wailua. The County system currently pumps an average of 168,000 gpd serving an area between Ka'elekū Agriculture



Legend




-  ZONE X:
Areas Determined To Be Outside 500-Year Floodplain
-  ZONE X500:
Areas of 500-Year Flood
-  DHHL Land Boundary

Figure 6-28

WAILUA

Flood Insurance Rate Map

MAUI LAND INVENTORY

DEPARTMENT OF HAWAIIAN HOME LANDS

NORTH



500

0

1,000



(FEET)



MAUI ISLAND PLAN

Park and Hāmoa Town. The system consists of three deep wells and a surface water source located at Wailua Stream. However, one well and surface water source are presently not in use. To meet a projected 65 percent increase in water consumption over the next 20 years, DWS plans to improve transmissions between Wākiu and Hāmoa and to add another well in Hāmoa. The County estimates that these improvements will cost approximately \$9 million over the next ten years.

Wastewater Treatment and Disposal

Maui County does not maintain a sewer system in Wailua. In the past, sewage has been handled by cesspools. In the future, development will probably use septic systems.

Solid Waste Disposal

Solid waste collected by the County is taken to the Hāna Landfill.

Telephone Service

Telephone service is readily available by overhead transmission lines located along Wailua Road. Sandwich Isles Communications will provide telephone service to the tract.

Electrical Service

MECO provides electrical service through the extension of a 23-kV line running from Kahului, through Pā'ia, around the base of Haleakalā, and ending in Hāna. Electrical service is readily available by overhead transmission lines located along Wailua Road.

Cable Television Service

This tract is within the Oceanic Cable service area.

J. WAILUA ANALYSIS

Several of the lots require minimal improvements and are appropriately sized for immediate awarding (Figure 6-29).

The soils along the coast and rear section of the Wailua Valley are designated under the *ALISH* system as “Unique Agricultural Land” and “Other Agricultural Land”. Existing agricultural uses across the entire valley make it evident that the soils can support agriculture and there may be opportunities for additional crops on the lots.

The perennial streams currently provide water to the Wailua Valley farms. Additional farms may also be able to use this water. In addition, the high rainfall in the area is conducive to agricultural use. Catchment systems could be used for both consumption and irrigation. Further, County water system has the capacity to serve these lands.

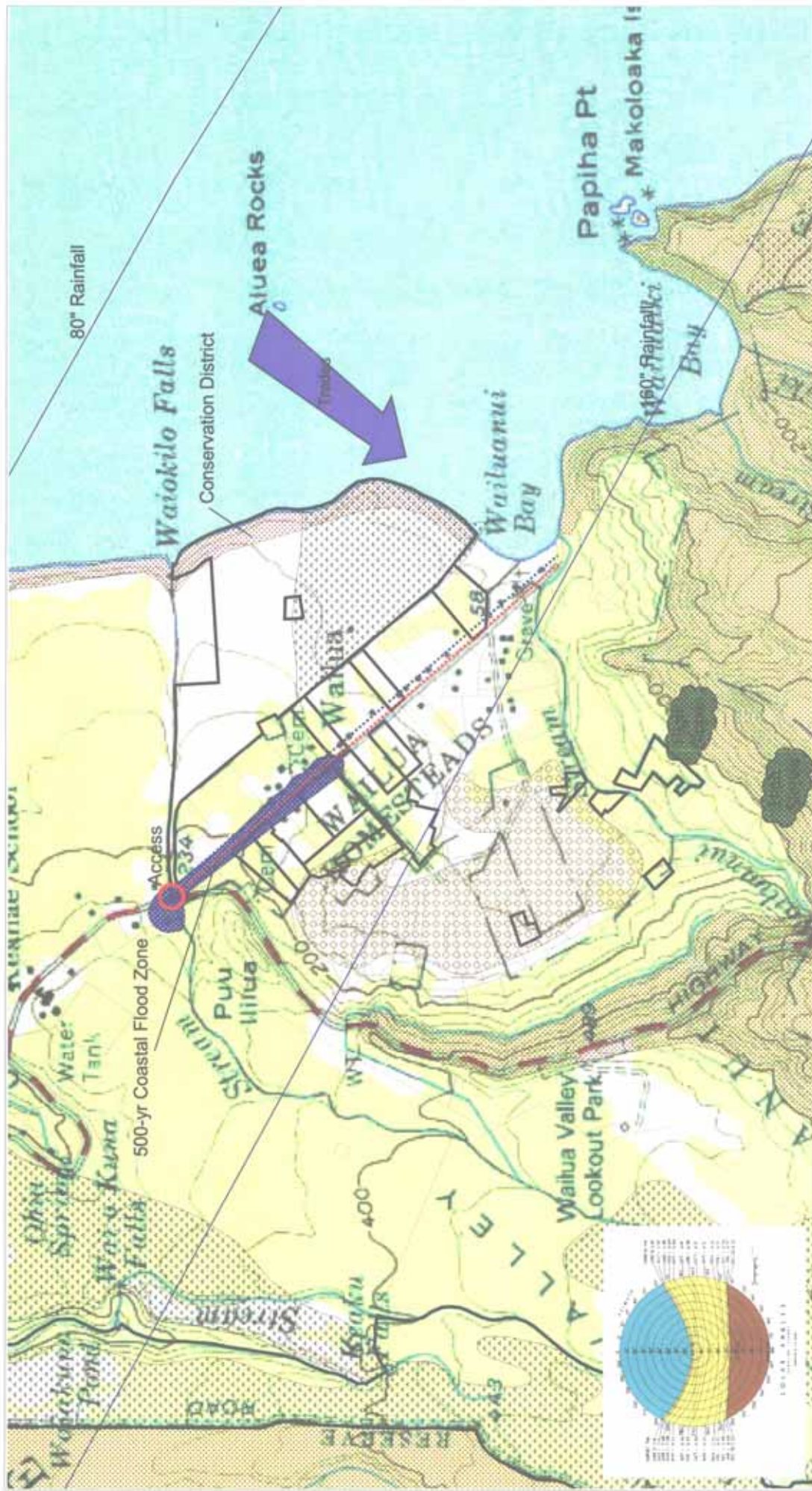


Figure 6-29

WAILUA
Site Analysis

MAULAND INVENTORY

DEPARTMENT OF LAND AND NATURAL RESOURCES

PLNR

Source: County of Maui, Department of Planning, Land and Natural Resources, and State of Hawaii Department of Agriculture

MAUI ISLAND PLAN

K. WAILUA TRACT ALTERNATIVES

The main priority for the *Maui Island Plan* is residential use. According to the *Maui Island Plan* beneficiary survey, the residential demand in the East Region is 79 units. Community input indicated that of the three tracts in the East region, Wākiu was the first choice for residential use.

Based on the baseline data and analysis for Wailua, the tract is better suited for agriculture due to its existing agricultural uses, potentially productive soils, and high rainfall. Because of these factors, residential use is not proposed for Wailua.

According to the *Maui Island Plan* beneficiary survey, the agricultural demand for Maui is 3,071 lots island wide. The demand for the East 1 region is 204 lots.

1. ALTERNATIVE 1

a. Proposed Uses

Alternative 1 for the Wailua tract proposes 28 acres of subsistence agricultural use, 52 acres of general agriculture use, and 10 acres of conservation (Figure 6-30).

Contributing factors to the selection of proposed uses are discussed below.

Subsistence Agriculture

Approximately 11 two- to three-acre subsistence agricultural lots are proposed on 28 acres. The area is currently vacant and the land is relatively flat.

The majority of soils in the 28-acre area proposed for the 11 lots are not classified by the *ALISH* system. However, the adjacent lots are currently being used for subsistence agriculture and house sites, which suggest that agriculture is an appropriate use for this area. The *ALISH*-classified lands located in the coastal and rear portions of the valley are designated for general agricultural use because of access limitations and high slopes. Utilizing GIS and overlaying techniques, the suitable agricultural lands are depicted on the Wailua site analysis map (Figure 6-29).

The high levels of rainfall in Wailua are conducive to agricultural use and the irrigation of crops. Based on the amount of rainfall, catchment systems could be used and are recommended. The Maui County Department of Water Supply currently serves Wailua via an existing system. According to the *County of Maui Infrastructure Assessment Update*, there is adequate capacity to serve the 11 lots, although the installation of a six-inch water line extending from the highway is needed.

MAUI ISLAND PLAN

Wailua Homestead Road and a network of unimproved roads towards the rear of the valley will provide access to the 11 lots is off. The current roads are adequate for agricultural activities.

Sewage for the agriculture lots will be handled by on-site septic systems. Electricity, telephone, and cable service are readily available from existing overhead lines along Wailua Homestead Road.

General Agriculture

Alternative 1 proposes a total of 52 acres of general agricultural use on various lots in Wailua. Limited access to the area and steep topography are determining factors for this proposal. Opportunities exist to bank, transfer, and lease these lands

Conservation

Ten acres of conservation use is proposed for the coastal region of the tract. This area is within the State Conservation district and should remain in conservation.

b. Alternative 1 Cost Estimates

Subsistence Agriculture

Total Lots = 11 lots

Lot Size = 2-3 acres

Table 6-6: Projected Costs for Alternative 1 Subsistence Agriculture Lots at Wailua

Improvements	Total Cost \$	Cost Per Lot \$
Off-Site	66,572	6,052
On-Site	182,432	16,585
Total	249,004	22,637

Cost Factors

- Rural Standards
- Sewer: Individual septic tank use
- Roads: Use existing roads
- Electric: Use existing overhead electrical lines
- Water system: Extend six-inch line from Hāna Highway to serve proposed lots

MAUI ISLAND PLAN

2. ALTERNATIVE 2

a. Proposed Uses

Alternative 2 for the Wailua tract proposes Special District use for the entire tract (Figure 6-31).

Contributing factors to the selection of proposed use are discussed below:

Special District

Na Moku Aupuni o Ko'olau Hui (NMAKH) represents approximately 500 families who are residents of Wailua and Ke'anae. NMAKH President, Edward Wendt gave a brief presentation to the Maui Island Plan Working Group on March 27, 2003 and submitted a letter dated March 27, 2003. According to the letter, NMAKH does not support the presence of the Hawaiian Home Lands program in Ke'anae and Wailua. According to NMAKH, Ke'anae and Wailua was never included in the original inventory when the Hawaiian Homes Commission Act was passed in 1920. These lands were under the Department of Land and Natural Resources and transferred to DHHL as part of a breach of trust settlement between the State and DHHL in the mid-1990s. NMAKH and its members opposed the transfer at every public hearing held and submitted numerous letters to the Maui Planning Department. According to NMAKH, their concerns were ignored and the lands were eventually transferred to DHHL despite community opposition.

NMAKH are concerned that settling DHHL beneficiaries who are unaccustomed to the traditional, subsistence lifestyle that has been preserved, protected, and carried on from ancient times in this area will severely disrupt and tear apart the fabric of the community. Some residents have been attempting for nearly thirty years to gain leases to house lots that were transferred to DHHL. NMAKH feels that it would be damaging to the community if DHHL beneficiaries on the wait list bypass these families.

The goal of NMAKH on this matter is to make these lands available to the families from Ke'anae and Wailua in order to continue their present way of life.

Alternative 2 addresses NMAKH's concerns by designating the entire Wailua tract as a special district. According to the DHHL *General Plan* (2002), the special district designation is applied to areas requiring special attention because of unusual constraints and/or opportunities, natural hazard areas, open space and raw lands far from infrastructure, mixed uses, and greenways.

The issues presented by NMAKH are considered unusual constraints and require special attention by DHHL because of the sensitivity of the situation.

The special district designation allows opportunities for discussions between DHHL and NMAKH in determining the future of Ke'anae and Wailua.

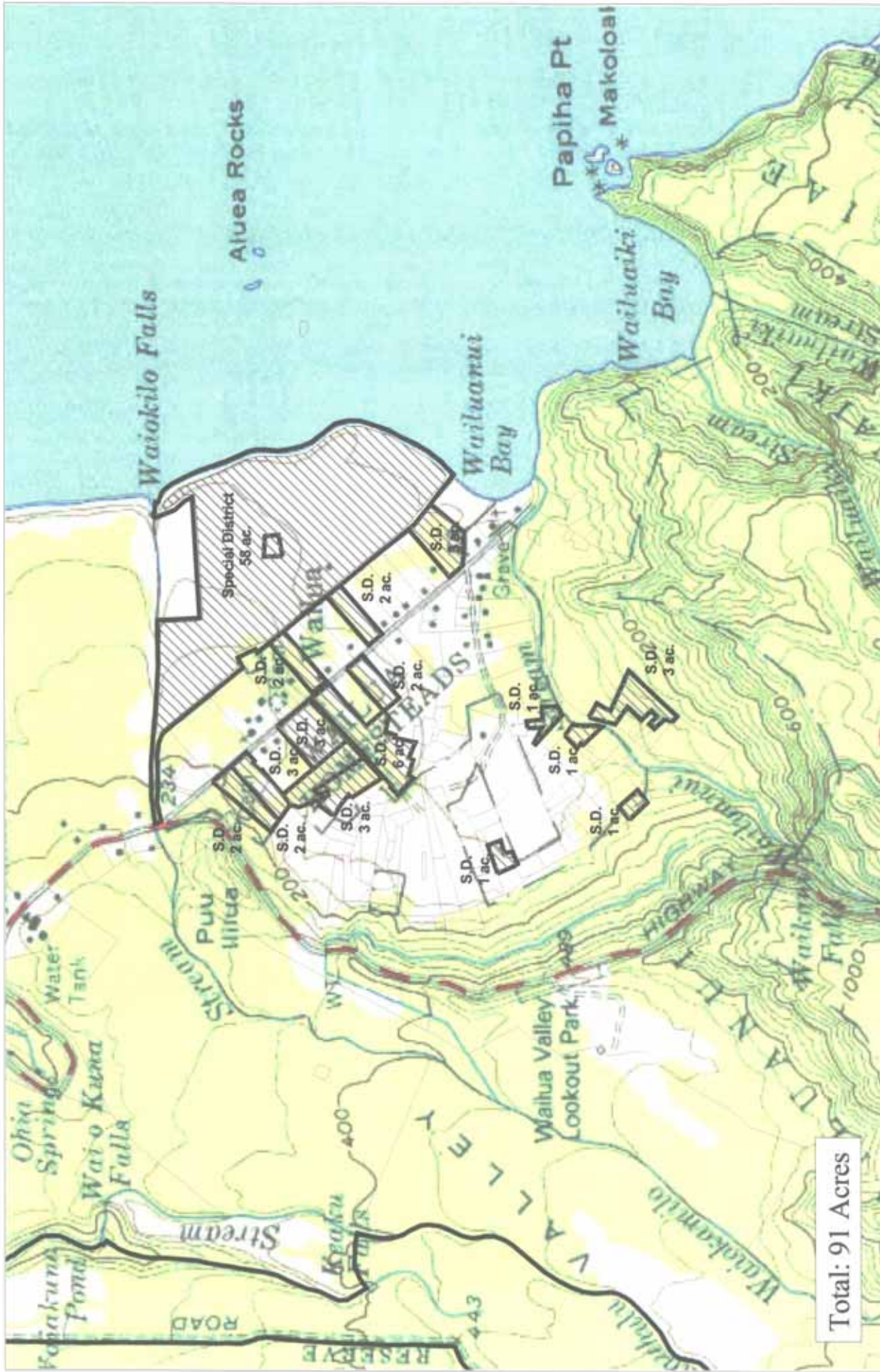


Figure 6-31
WAILUA
 Land Use Alternative 2
MAUI LAND INVENTORY

Land Use Summary		Approx Acres
	Special District	91
	Total	91

Legend

DHHL Land Boundary

DEPARTMENT OF HAWAIIAN HOME LANDS

NORTH

0 200 400
 (FEET)

7/02/03

MAUI ISLAND PLAN

L. WAILUA TRACT FINAL PLAN

The final land use plan (Figure 6-32) reflects Alternative 1 above, which proposes:

- 11 subsistence agricultural lots on 28 acres
- 52 acres of general agricultural use
- 10 acres of conservation land

Alternative 1 was selected over Alternative 2 because of the high beneficiary demand for agriculture lots on Maui. In addition to demand, 11 two- to three-acre agriculture lots are readily developable with minimal improvements needed to award these lots. The subsistence agricultural designation also requires that the beneficiary reside on the lot, thus adding to the agricultural community that currently exists in Wailua.

Per lot costs for the 11 subsistence agriculture lots are \$22,637, which is relatively inexpensive. The primary cost is for the extension of a six-inch waterline from the highway.

The Wailua final land use plan conflicts with issues posed by NMAKH in Alternative 2. However, the intent of DHHL, as determined by the Hawaiian Homes Commission Act passed in 1920, is to provide housing to native Hawaiians on its waiting list. Wailua has 11 readily available lots that could immediately be awarded to beneficiaries on the waiting list, therefore fulfilling the intent of the HHCA. NMAKH's goal of making Wailua available to the families from Ke'anae and Wailua to continue their present way of life is not a goal or objective of DHHL in its use of its Wailua lands.

The analysis of the tract illustrates that the lands where agriculture is proposed are well suited for agricultural use due to their existing agricultural use, potentially productive soils (according to the *ALISH* designation), and high rainfall. According to the goals and objectives of DHHL's *General Plan* (2002), suitable agriculture lands should be retained in agriculture use when possible. The agriculture designation follows this objective and proposes the highest and best use for the land.

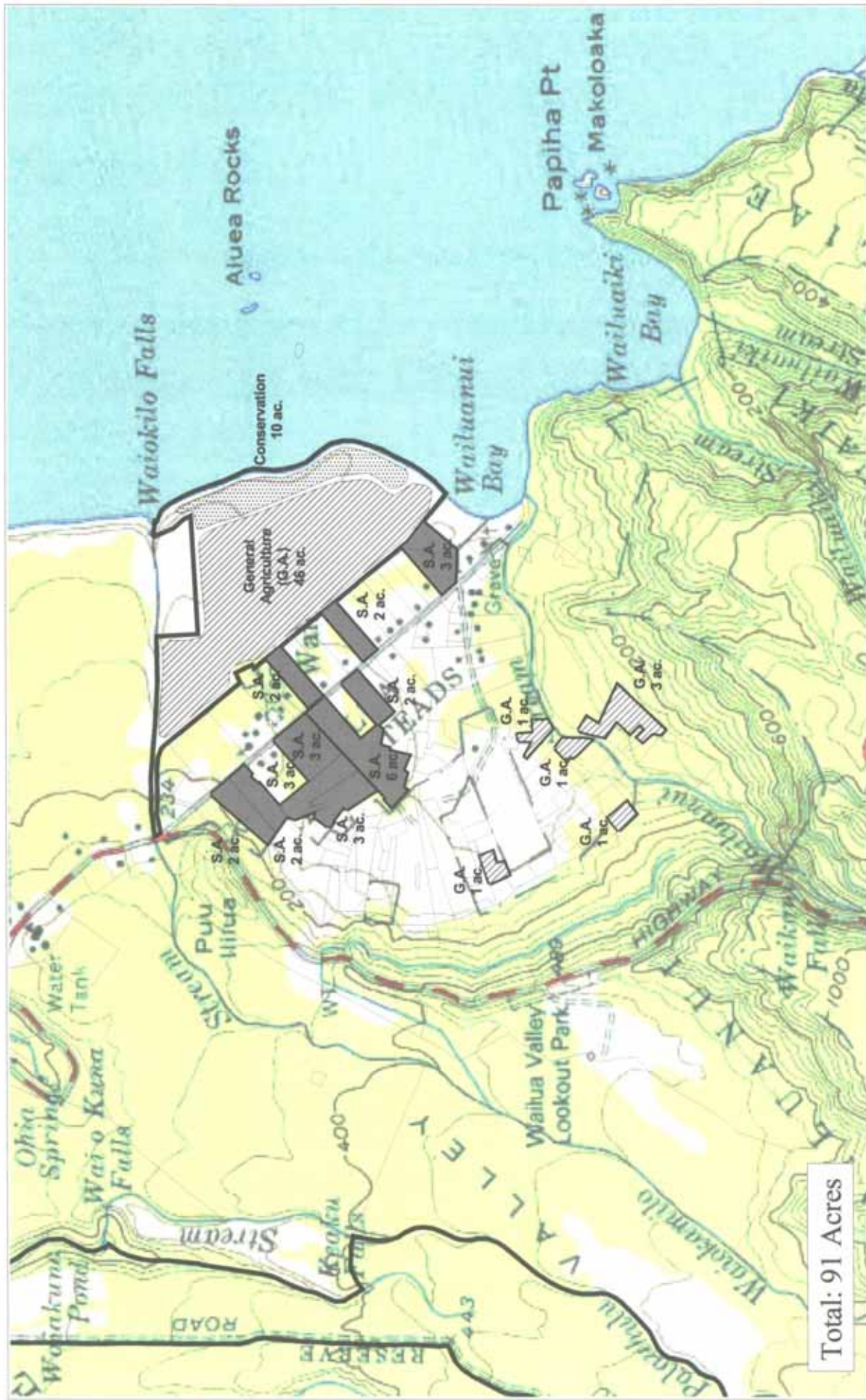


Figure 6-32
WAILUA
Land Use Plan
MAUI LAND INVENTORY
DEPARTMENT OF HAWAIIAN HOME LANDS

Land Use Summary		Approx Acres	
Land Use	Lot Size	Number of Lots	Approx Acres
Conservation			10 ac
General Agriculture			53 ac
Subsistence Agriculture	2-3 ac	11	28 ac
		11	91 ac

Legend
DHHL Land Boundary

NORTH
 0 200 400 (FEET)

The background of the page is a grayscale photograph of a tropical forest, featuring several palm trees and dense foliage. On the left side of the page, there is a vertical bar composed of four parallel lines of increasing width and color intensity from left to right: light pink, medium pink, dark pink, and a thin purple line.

7.0 SOUTH MAUI

MAUI ISLAND PLAN

7.0 SOUTH MAUI

A. REGIONAL OVERVIEW

The South Maui planning region encompasses three DHHL landholdings totaling 23,035.9 acres: Kahikinui, Kalihi/Kanahena, and 'Āhihi (Figure 7-1). The properties fall within three Maui County community plan regions: Kīhei-Mākena, Hāna, and Makawao-Pukalani-Kula (Figure 1-3). Although Kahikinui falls within both the Hāna Community Plan and Makawao-Pukalani-Kula Community Plan regions, for planning purposes, it is considered in relation to the Makawao-Pukalani-Kula Community Plan area because it is closer to the infrastructure of the Makawao-Pukalani-Kula Community Plan region than the Hāna Community Plan region. Kalihi/Kanahena and 'Āhihi are within the Kīhei-Mākena Community Plan region.

The properties in the South planning region are geographically remote with limited infrastructure and public services. The South region is characterized by light rainfall and volcanic soils. Elevations range from sea level to nearly 10,000 feet. In some areas, slopes range from 25 to 50 percent. Annual rainfall varies from 20 inches in *makai* areas of the region to 50 inches in the *mauka* regions. Coastal views include Kaho'olawe and Lāna'i.

Kula is the nearest major population center to Kahikinui. Kīhei is the nearest major population center to Kalihi/Kanahena and 'Āhihi.

1. REGIONAL INFRASTRUCTURE

Roads

The main access routes to the South region are from Kula/Pi'ilani Highway for Kahikinui and from Mākena Road for Kalihi/Kanahena and 'Āhihi.

Analysis

Because of the remoteness of these areas, it is unlikely that the County will improve or expand roads to these properties in the near future.

Water System

There is no existing water service to these properties, with the exception of a substandard County water line extending to the Kalihi/Kanahena tract.

Kula Water Line

The USGS topographic map also shows a Kula water line that is not referenced in the *County of Maui Infrastructure Assessment Update*. The original Kula Water Line began at Waikamoi and extended through Kula San, Paehua, 'Ulupalakua, Kanaio, Kahikinui, and ended at the Mahamenui Water tank. This is a high level water line that reaches 3,350 feet at its highest point in Kula San. Since construction of the line, service to Kahikinui



Figure 7-1
South Region
MAUI LAND INVENTORY
DEPARTMENT OF HAWAIIAN HOME LANDS
NORTH
4,000 0 8,000
(FEET)
PBR
HAWAII

Legend

 DHHL Properties

MAUI ISLAND PLAN

and the Mahamenui was cut and currently ends at Kanaio. The explanation for the cessation of service beyond Kanaio is not known.

According to minutes from a Department of Water Supply Public Hearing held on May 21, 2002, there had been discussions to renew the connection from Kanaio to Kahikinui to serve the existing DHHL Kahikinui Homesteads. However DWS currently has no plans to construct this extension.

Analysis

It is unlikely that County water systems will be improved or extended to any of the properties in the South region in the near future. However the Kula Water Line presents opportunities to renew water service to Kahikinui. DHHL should assess the Kula Water Line connection between Kanaio and Kahikinui whether this is feasible.

Wastewater Treatment and Disposal

Wastewater treatment and sewer disposal services are not provided to any of the properties in this region.

Analysis

Septic tanks would be used to treat wastewater within these properties.

Solid Waste Disposal

The County does not provide solid waste disposal pick up services to any of DHHL's properties in the South region.

Analysis

It is unlikely that the County will expand its service to the DHHL properties in the near future.

Electrical Service

Although electrical service is provided to most of the community plan areas within the South region, there is no electrical service to the DHHL properties.

Analysis

It is unlikely that electrical service will be extended to any of the DHHL properties in the South region in the near future.

2. SOCIO-ECONOMIC INFRASTRUCTURE

The regional socio-economic infrastructure information presented below reflects service to the current residents of Kahikinui.

MAUI ISLAND PLAN

Police

According to the *Public Facilities Assessment Update*, Kahikinui falls within the Maui Police Department's District 1 – Wailuku (Central). This police district is served by the Wailuku Station, which houses the MPD Headquarters for the entire County. The Wailuku Station is currently staffed with 111 budgeted uniformed patrol officers and an estimated share of 38 investigative officers. Approximately 32 uniformed officers and 10 investigative officers are on call to service the policing needs of the Makawao-Pukalani-Kula Community Plan region.

Analysis

According to the *Public Facilities Assessment Update*, the main problem facing the Kahikinui area is the distance from the Wailuku Station and the limited number of motorized beats serving the area. The Makawao-Pukalani-Kula Community Plan region encompasses a large region with varied topography and a limited road network. This can result in lengthy response times to incidents in outlying areas. For outlying regions this time lag can be considerable, leaving the Kahikinui tract with less than ideal levels of service.

By 2020, police service needs in the Makawao-Pukalani-Kula Community Plan region will increase by approximately 30 percent from the current allocation of 42 officers to 57. The 14 new officers will require a further addition of four new support positions (technical, clerical, and administrative) to be staffed at the existing Wailuku Station. In addition, total need in District 1 is projected to increase. To accommodate this growth, an expansion of the existing Wailuku Station may be required. Other alternatives include:

- Transferring patrol responsibilities for the Makawao-Pukalani-Kula Community Plan region out of the Wailuku Station to new police substations in those areas; and/or
- Expanding the service area of the planned Kihei-Mākena Station to include the Makawao-Pukalani-Kula Community Plan region.

An additional consideration for planning future police services is the number and distribution of patrol beats. The introduction of an additional patrol beat or new substation closer to the Makawao-Pukalani-Kula Community Plan region service population would significantly improve response times and service quality.

Fire

According to the *Public Facilities Assessment Update*, the Kahikinui tract falls within the coverage area of the Kula Fire Station. The Kula Fire Station serves portions of Pukalani, upper Kula, and the area towards Kēōkea.

Analysis

According to the *Public Facilities Assessment Update*, portions of southern Haleakalā, including Kahikinui, are beyond the maximum service radius of five road miles from the Kula Fire Station and therefore are not adequately covered. Narrow winding roads in parts of the area slow emergency vehicle response times and further worsen the situation.

MAUI ISLAND PLAN

Emergency Services

According to the *Public Facilities Assessment Update*, there is one 12-hour ambulance based in Kula that services the Makawao-Pukalani-Kula and Ha'ikū Community Plan regions.

Analysis

According to the *Public Facilities Assessment Update*, converting the 12-hour ambulance to a 24-hour service is a high priority (ranked seventh of the 10 highest priority areas island wide). Judging by population projections through 2020, one ambulance will continue to be sufficient to serve this area.

Health Care Services

Maui Memorial Medical Center, located in Wailuku, is the County of Maui's only critical care facility. The Kula Hospital provides limited acute care (two beds), inpatient skilled nursing and intermediate care, developmentally disabled inpatient services, Alzheimer's and dementia care, family practice clinic services, physical and occupational therapy, outpatient services, and a pharmacy.

Analysis

According to the *Public Facilities Assessment Update*, based on the estimated total demand, nine additional acute care (inpatient services provided to patients whose average length of stay is usually less than 30 days) beds will be needed in 2015 and 20 in 2020.

Schools

The 2002 *Public Facilities Assessment Update* lists the following schools in the Makawao-Pukalani-Kula region¹:

Public

Kula Elementary (18 miles)
Pukalani Elementary (22 miles)
Makawao Elementary (24 miles)
Kalama Intermediate (24 miles)
King Kekaulike High School (24 miles)

Private

Clearview Christian Girl's School (Grades 6-8) (18 miles)
Haleakalā Waldorf (Grades K-8) (18 miles)
Kamehameha Schools- Maui (Grades K-12) (22 miles)
Montessori School of Maui (Grades K-5) (24 miles)
Seabury Hall (Grades 6-12) (24 miles)
Carden Academy- Upcountry (Grades K-5) (24 miles)

¹Distances (approximate) given are from the Kahikinui tract to the listed school.

MAUI ISLAND PLAN

Analysis

The *2002 Public Facilities Assessment Update* projected the enrollment for schools in the Makawao-Pukalani-Kula Community Plan region to 2020 and made the following assessment:

Elementary Schools

Taken as a region, the elementary schools of Makawao-Pukalani-Kula appear to be adequate to meet demand throughout the planning period. This is consistent with current enrollment data for Makawao and Pukalani Elementary Schools, which are between 72 and 89 percent of capacity. It is also consistent with the high proportion of private school students in this region (35 percent of 2001 elementary-aged children).

Intermediate Schools

Using the Maui County forecast, demand for a second school increases in later years. However, Kalama Intermediate, with 2001 enrollment of 1,179 students, is already operating at 118 percent of its rated capacity of 998 students. Thus, the Maui County population forecast appears to underestimate the demand for this age group.

High Schools

Using the Board of Education design guideline of 1,000 students per high school, high school facilities appear adequate to 2020, although overcrowding will intensify at the existing facilities. However, the current high school has a rated capacity of 1,335 and an enrollment of 1,459 or 109 percent of capacity. At a rate of 1,000 students per high school, this region is already over capacity.

Recreation

According to the *Public Facilities Assessment Update*, the Makawao-Pukalani-Kula Community Plan region provides its residents with a number of quality park facilities, despite its lack of an extensive park system in terms of acreage. This area has three neighborhood parks, five district parks, six tennis courts, 21 sports fields, two sports courts, five community centers, and three gyms.

Analysis

According to the *Public Facilities Assessment Update*, based on 10 acres of sub-regional park space per 1,000 persons, by 2020 the Makawao-Pukalani-Kula region will need to increase its aggregate park acreage by 180.1 acres to a total of 285.7 acres of sub-regional park space. In addition, the existing community park facilities will need to be supplemented by 13 tennis courts and two sports courts.

MAUI ISLAND PLAN

B. KAHIKINUI TRACT BASELINE INFORMATION



Kahikinui extends from the southern crest of Haleakalā toward the ocean. It represents DHHL's largest landholding on Maui.

1. INVENTORY

TMK and Acreage

Kahikinui is 22,860 acres and is identified by TMK 1-9-01:03, 07, 08, and 11 (Figure 7-1).

Existing Uses

Although the majority of Kahikinui is undeveloped, DHHL initiated its *kuleana* program at Kahikinui, giving beneficiaries a chance to lease unimproved, off-grid homesteads. Approximately 75 homesteaders have accepted leases on these unimproved lands.

Revocable Permits:

Haleakalā Ranch- pasture use	
TMK 1-9-01:11	129 acres

Haleakalā Ranch- pasture use	
TMK 1-9-01:08	62 acres

Licenses:

Living Indigenous Forest Ecosystems - Stewardship and conservation of Kahikinui Forest	
TMK 1-9-01:03 (portion)	7,050 acres

Ka Ohana O Kahikinui- Transitional beneficiary housing/caretakers' living quarters	
TMK 1-9-01:03 (portion)	1.5 acres

Adjacent Uses

Kahikinui is bound to the north by Haleakalā National Park, to the west by 'Ulupalakua Ranch, to the south by the Pacific Ocean, and to the east by Haleakalā Ranch. Corresponding adjacent uses include ranchland and conservation land.

MAUI ISLAND PLAN

Proposed Future Surrounding Uses

Because of the area's remote nature and very limited infrastructure, there are no proposed future surrounding uses beyond the existing uses of ranchland and conservation land.

2. REGULATORY

State Land Use District

Kahikinui is in the Conservation District and the Agricultural District (Figure 7-2).

County Community Plan

The *Hāna Community Plan* designates the land of the tract as Conservation and Agricultural.

County Zoning

Maui County zoning for Kahikinui is Conservation and Agricultural.

Special Management Area

Coastal portions of Kahikinui are in the Special Management Area (Figure 7-3).

Underground Injection Control Line

The portion of the Kahikinui tract located *makai* of the four-wheel drive road is below the UIC. The remainder of the tract, located *mauka* of the four-wheel drive road is located above the UIC line (Figure 7-4).

3. PHYSICAL CHARACTERISTICS

Climate

Due to the tract's expansive acreage and wide range in elevation, temperatures vary from approximately 87 degrees Fahrenheit at sea level to approximately 60 degrees Fahrenheit or colder in the upper *mauka* regions.






Soils

The USDA Soil Conservation Service Soil Survey shows the following soils in the Kahikinui tract (Figure 7-5):

- Uma Loamy Course Sand, 40 to 70 percent slopes – This soil is used for pasture and wildlife habitat. The erosion hazard is severe.
- 'Io Silt Loam, 7 to 25 percent slopes – This soil is used for pasture, truck crops, and wildlife habitat. Permeability is moderately rapid. Runoff is slow to medium, and the erosion hazard is slight to moderate.
- Oanapuka Extremely Stony Silt Loam, 7 to 25 percent slopes – This soil is used for pasture and wildlife habitat.



Legend

-  Agricultural District
-  Conservation District
-  Rural District
-  Urban District
-  DHHL Land Boundary

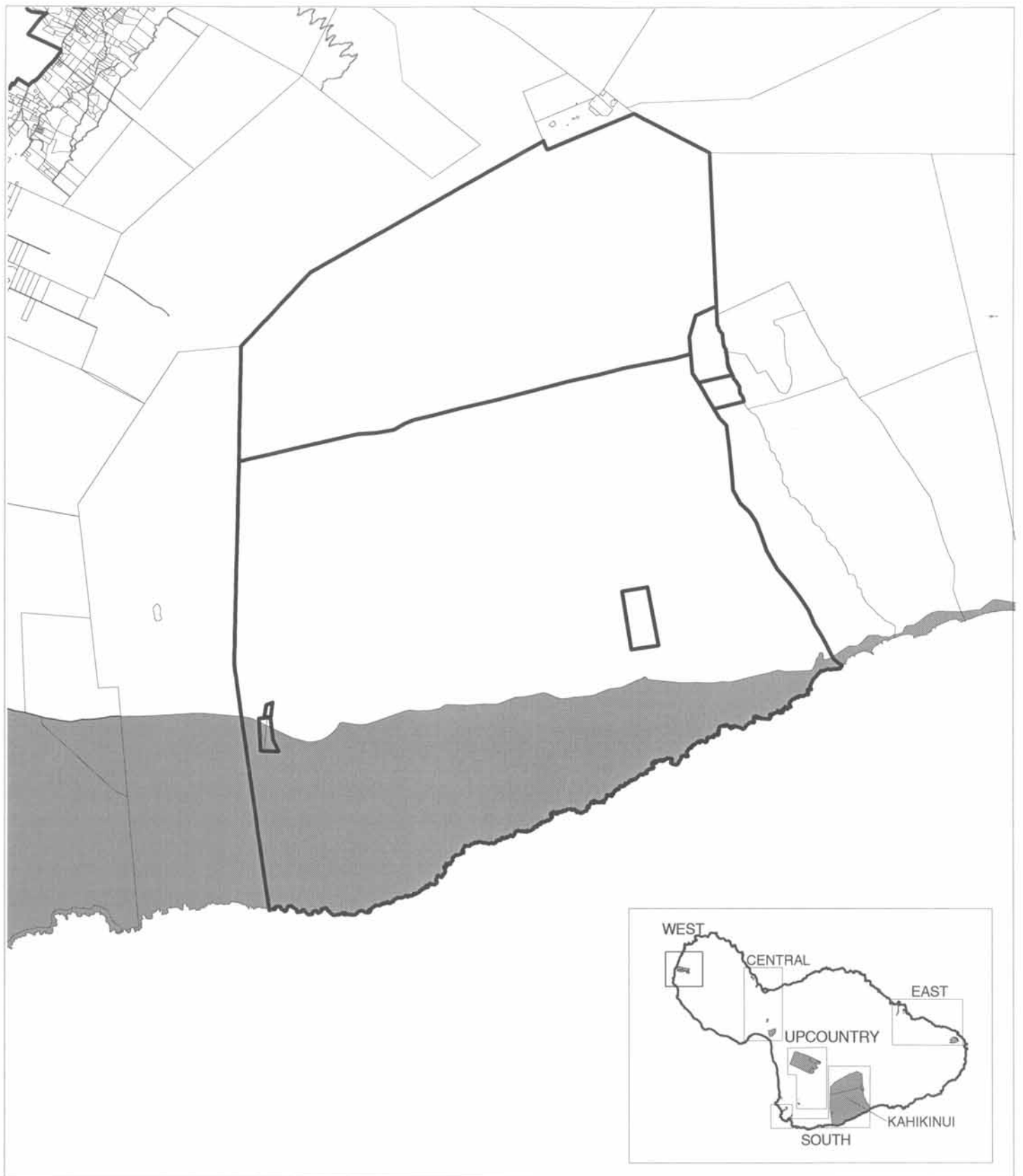
Source: State Land Use Commission

Figure 7-2
KAHIKINUI
State Land Use

MAUI LAND INVENTORY

DEPARTMENT OF HAWAIIAN HOME LANDS





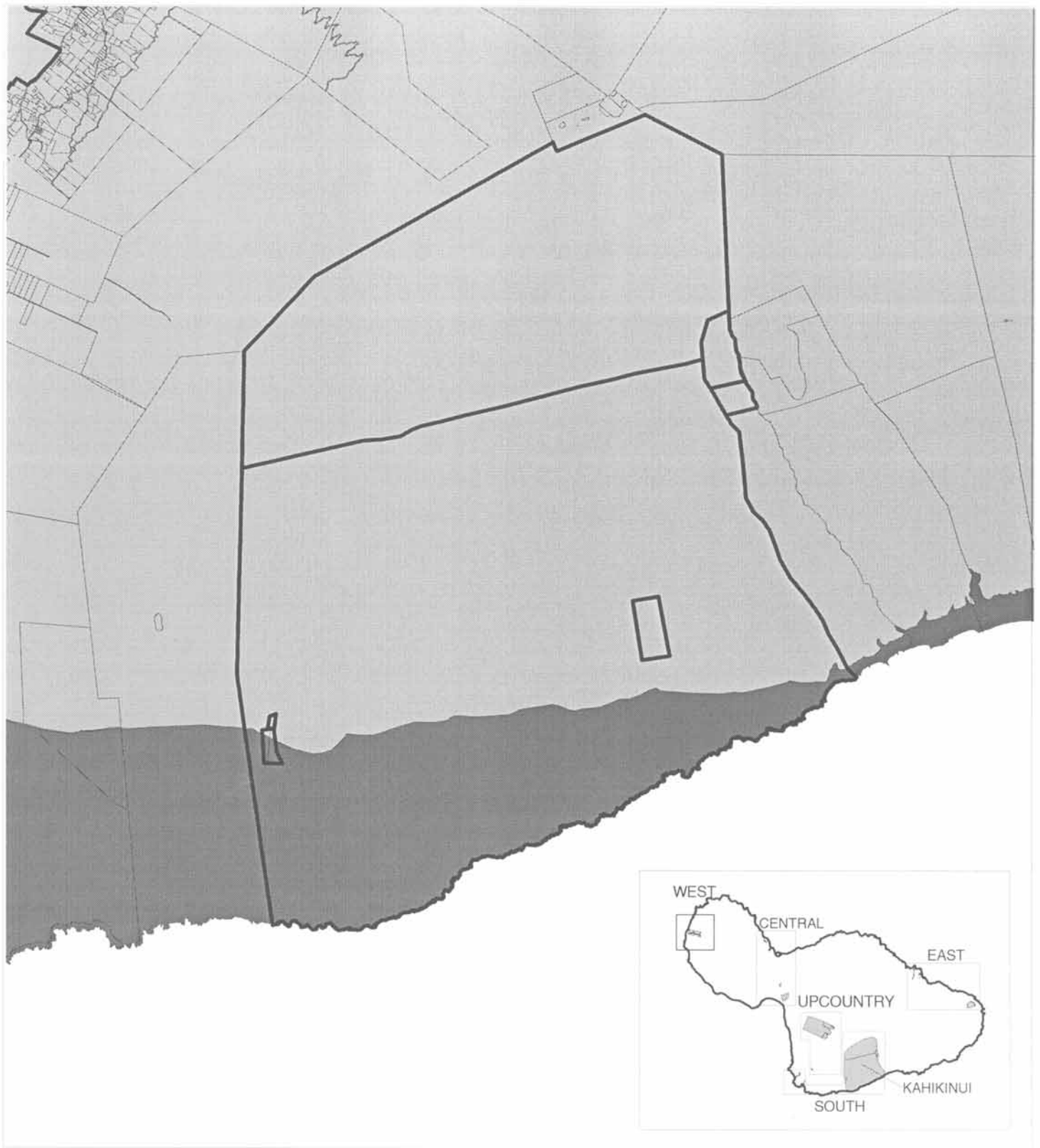
Legend

- Special Management Area
- DHHL Land Boundary

Source: County of Maui

Figure 7-3
KAHIKINUI
Special Management Area (SMA)
MAUI LAND INVENTORY





Legend




-  Areas Below (Makai) Underground Injection Control Line
-  Areas Above (Mauka) Underground Injection Control Line
-  DHHL Land Boundary

Figure 7-4

KAHIKINUI

Underground Injection Control (UIC) Areas Map

MAUI LAND INVENTORY

DEPARTMENT OF HAWAIIAN HOME LANDS

NORTH



4,000

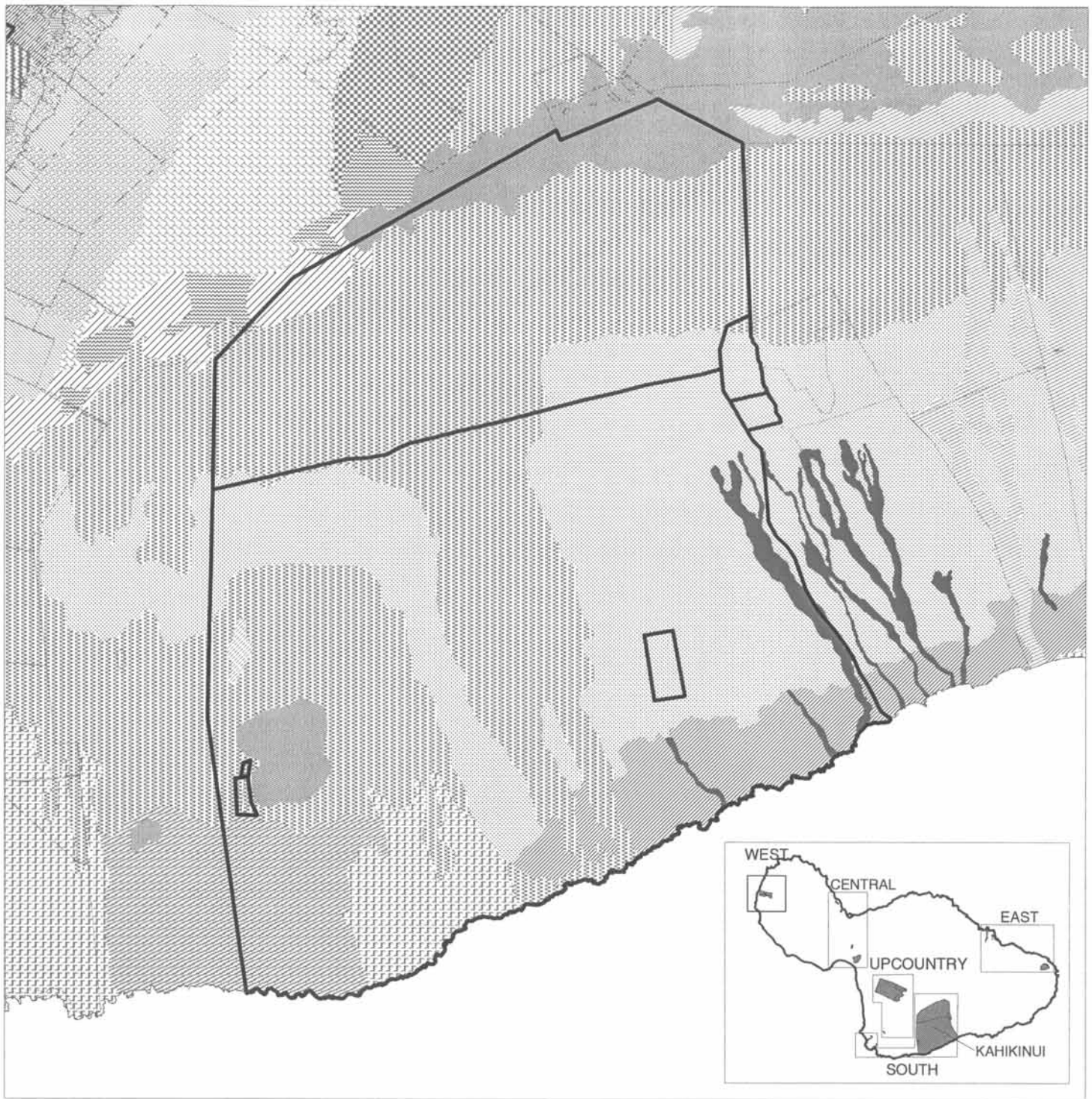
0

8,000



(FEET)





Legend












-  Uma Loamy Coarse Sand, 40-70% Slopes
-  Puu Pa Very Stony Silt Loam, 7-40% Slopes
-  Io Silt Loam, 7-25% Slopes
-  Oanapuka Extremely Stony Silt Loam, 7-25% Slopes
-  Uma Loamy Coarse Sand, 15-40% Slopes
-  Waiakoa Extremely Stony Silt Clay Loam, 3-25% Slopes, Eroded
-  Very Stony Land
-  Lava Flows, Aa
-  Cinder Land
-  Rock Land
-  DHHL Land Boundary

Figure 7-5

KAHIKINUI

Soil Conservation Service Survey

MAUI LAND INVENTORY

DEPARTMENT OF HAWAIIAN HOME LANDS

NORTH



MAUI ISLAND PLAN

- Uma Loamy Course Sand, 15 to 40 percent slopes – This soil is used for pasture and wildlife habitat. Permeability is very rapid. Runoff is slow, and the erosion hazard is slight to moderate.
- Waiakoa Extremely Stony Silt Clay Loam, 3 to 25 percent slopes, eroded – This soil is used for pasture and wildlife habitat. In most areas about 50 percent of the surface layer has been removed by erosion. Runoff is medium, and the erosion hazard is severe.
- Very Stony Land – This land type is used for pasture and wildlife habitat. Pasture improvement is very difficult because of the many stones.
- Lava Flows, ‘A‘ā – This miscellaneous land type is used for water supply, wildlife habitat, and recreation.
- Cinder Land – Although Cinder land commonly supports some vegetation, it has no value for grazing, because of its loose nature and poor trafficability. It is used for wildlife habitat and recreational areas.
- Rock Land – This land type is used for pasture, wildlife habitat, water supply, and urban development. Land is nearly level to very steep and has a high shrink-swell potential.

Agricultural Lands of Importance to the State of Hawai‘i

The State of Hawai‘i Department of Agriculture *ALISH* system of defining agricultural suitability classifies some of the soils of the Kahikinui tract as “Other Agricultural Land;” the remaining lands are not classified (Figure 7-6).

Ground/Surface Water

The USGS topographic map shows Kamole Stream, Kepuni Stream, Palaha Stream, and Manawainui Stream within the Kahikinui tract. Wai‘ōpai Stream is located along the eastern border of the tract. All of the streams are intermittent.

Rainfall

Depending on elevation, the tract receives approximately 20 (*makai* of Pi‘ilani Highway) to 50 (*mauka* of Pi‘ilani Highway) inches of rainfall per year (Figure 7-7).

Topography/Slope

The USGS topographic map shows that the elevation in Kahikinui ranges from sea level to approximately 9,760 feet. Slope varies from 20 to 50 percent (Figure 7-7).

Drainage

There are no improved drainage systems within the tract. The primary natural drainage ways within Kahikinui include Kamole Gulch, Kepuni Gulch, Palaha Gulch, Manawainui Gulch, and Wai‘ōpai Gulch (along the eastern border).



Legend

- Prime Agricultural Land
- Unique Agricultural Land
- Other Agricultural Land
- Unclassified Land
- DHHL Land Boundary

Figure 7-6

KAHIKINUI

Agricultural Lands of Importance to the State of Hawaii (ALISH)

MAUI LAND INVENTORY

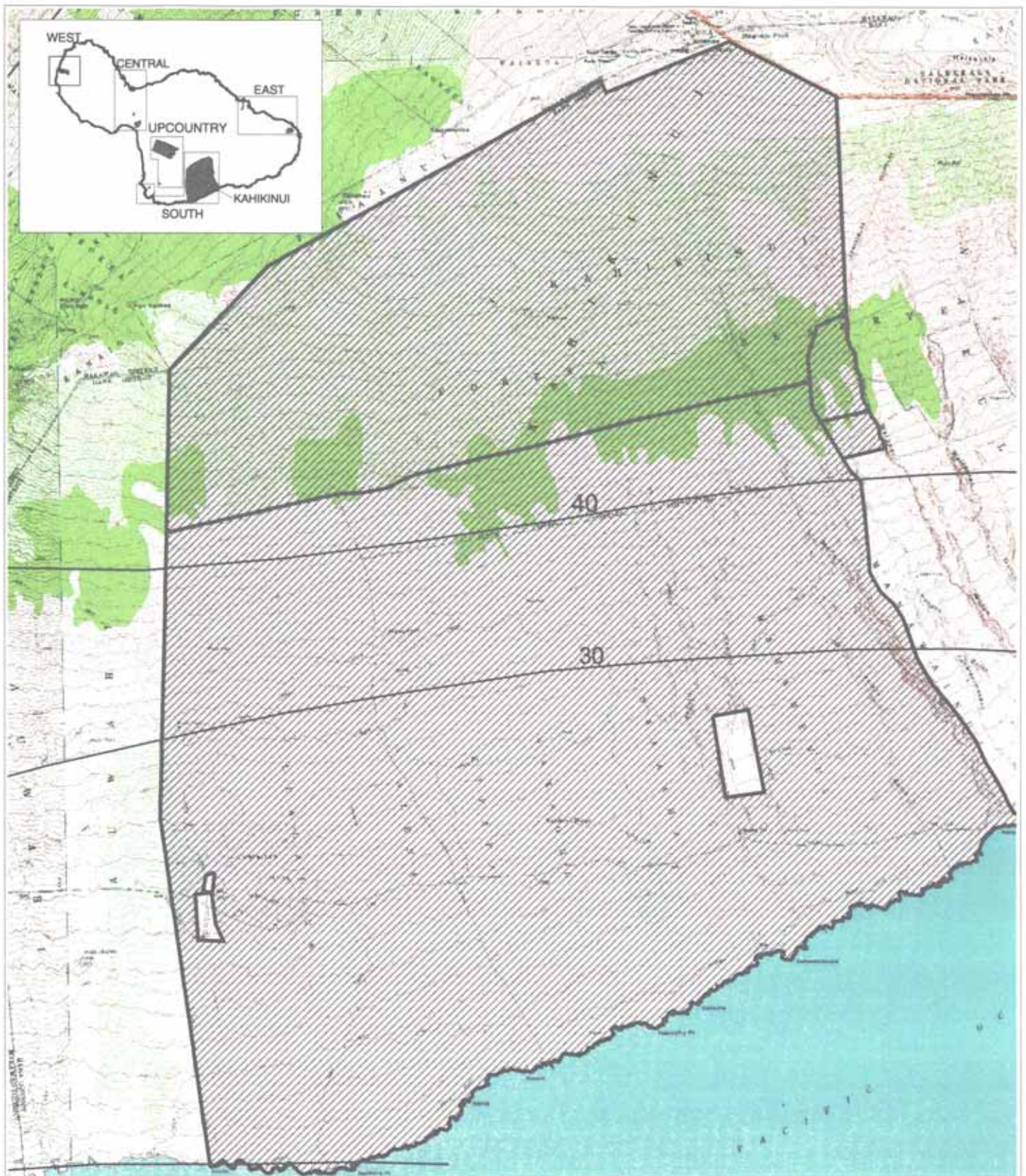
DEPARTMENT OF HAWAIIAN HOME LANDS

NORTH



(FEET)





Legend

-  DHHHL Properties
-  Lines of Equal Average Annual Rainfall in Inches

Figure 7-7
KAHIKINUI
USGS Map with Rainfall Isohyets
MAUI LAND INVENTORY

DEPARTMENT OF HAWAIIAN HOME LANDS

NORTH



3,000

0

6,000



(FEET)



MAUI ISLAND PLAN

Flood Zone

The Flood Insurance Rate Map indicates that Kahikinui is in Zone X, which designates areas determined to be outside of the 500-year floodplain (Figure 7-8). Flooding can occur along the Kahikinui coastline, primarily due to surf surge.

Noise

Due to the rural, undeveloped nature of the area, there are no major sources of noise, with the possible exception of helicopters from sightseeing tours.

4. ENVIRONMENTAL CHARACTERISTICS

Historic Sites/Archaeology/Cultural Resources

Kahikinui is rich in Hawaiian culture and history. Past reports indicate that Kahikinui is virtually unique within the Hawaiian Islands as an entire *moku* with its archaeological and cultural landscape essentially preserved intact (Kirch 1997).

Kahikinui is one of the rare places in modern Hawai'i where massive urbanism, resort development, and/or commercial cultivation have not touched the land. By the mid-1800s the majority of residents had moved elsewhere and Kahikinui was largely abandoned. Relatively low-impact ranching dominated the district since that time. As a result, most of the archaeological landscape is still intact. Shoreline sites still exist, as well as sites located high in the remnant dryland forest. Archaeological surveys have found important religious sites, residential sites, and a previously unknown *hōlua* slide complex.

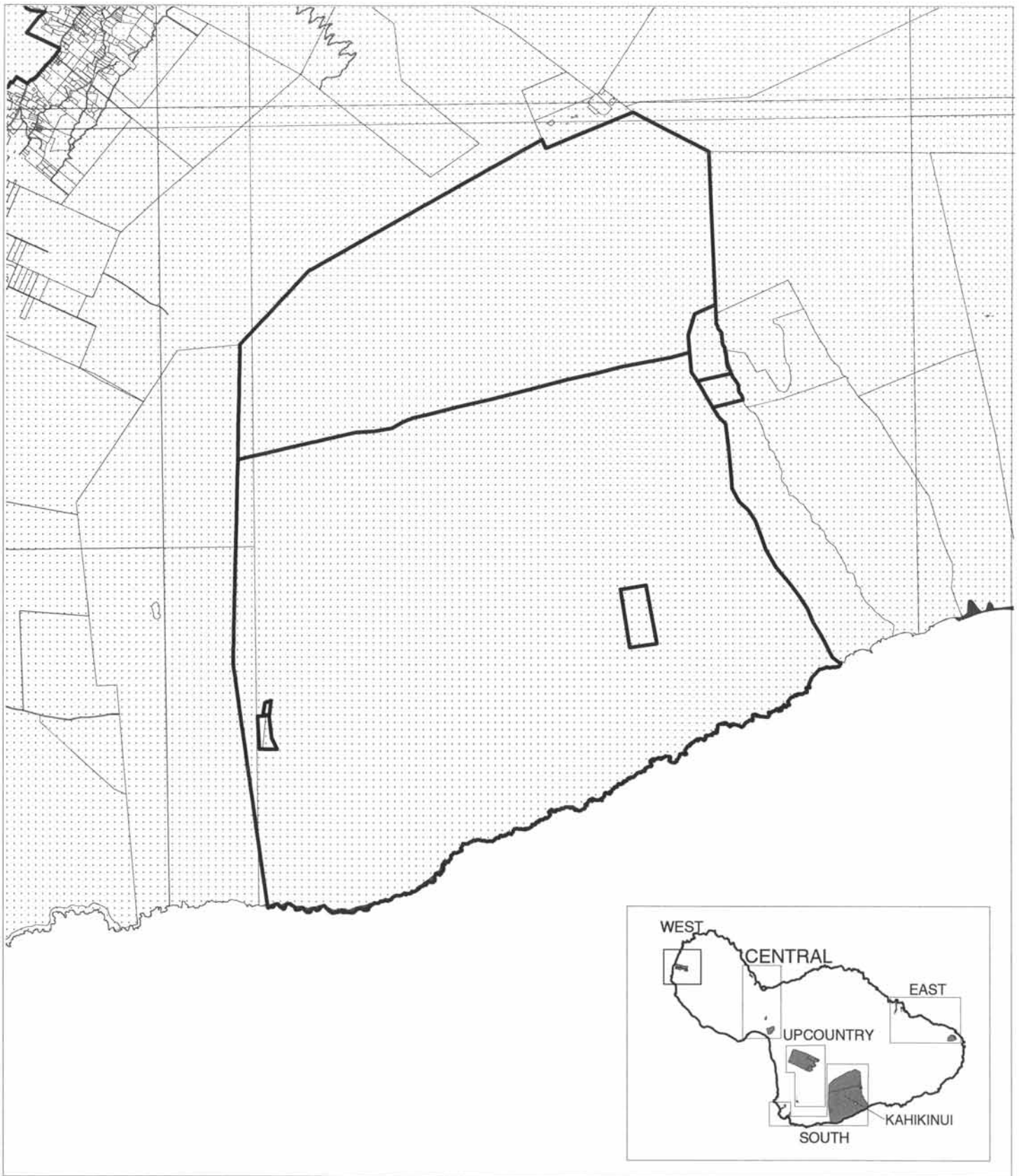
As an example of the number of archaeological sites in the region, an inventory survey conducted by the State Historic Preservation Division recorded 563 features grouped into 309 sites (Dixon et al 2000). This survey covered more than 2,000 acres in the three *ahupua'a* of Kipapa, Nakaohu, and Nakaaha, which are a part of the DHHL's *kuleana* homestead project.

Endangered Species




The following species found in the Kahikinui tract have been identified as candidates or endangered by the Hawai'i Natural Heritage Program *Biological Conservation Datasystem* (BCD) for Department of Hawaiian Home Lands and the U.S. Fish and Wildlife Service.

Candidates

- *Canavalia pubescens*, 'Āwikiwiki
- *Cyanea obtusa*, Haha
- *Cyrtandra oxybapha*, Ha'iwale
- *Nothocestrum latifolium*, 'Aiea
- *Ranunculus mauiensis*, Makou



Legend

-  **ZONE A:**
Special Flood Hazard Areas Inundated by 100-Year Flood
No Base Flood Elevations Determined
-  **ZONE X:**
Areas Determined To Be Outside 500-Year Floodplain
-  **DHHL Land Boundary**

Source: Federal Emergency Management Agency

Figure 7-8

KAHIKINUI

Flood Insurance Rate Map

MAUI LAND INVENTORY

DEPARTMENT OF HAWAIIAN HOME LANDS



MAUI ISLAND PLAN

Endangered

- *Bidens micrantha* spp *kalealaha*
- *Bonamia menziesii*
- *Branta sandvicensis*, *Hawaiian Goose*
- *Clermotia lindseyana*, *‘Ōhāwai*
- *Diellia erecta*, *Asplenium-Leaved Dellia*
- *Diplazium molokaiense*
- *Geranium arboreum*, *Hawaiian Red-Flowered Geranium*
- *Geranium multiflorum*, *Nohoanu*
- *Lipochaeta kamolensis*, *Nehe*
- *Loxops coccineus ochraceus*, *Maui ‘ākepa*, *Honeycreeper*
- *Melicope knudsenii*, *Alani*
- *Neraudia sericea*
- *Nototrichium humile*, *Kulu‘ī*
- *Phyllostegia mollis*
- *Zanthoxylum hawaiiense*, *A‘e*

Critical Habitat

The U.S. Fish and Wildlife Service has designated portions of the tract as critical habitat for the following species (Figure 7-9):

- *Alectryon macrococcus*, *Māhoe*
- *Argyroxiphium sandwicense* ssp. *macroceph*, *‘Āhinahina*
- *Bidens micrantha* ssp. *kalealaha*, *Ko‘oko‘olau*
- *Clermontia lindseyana*, *‘Ōhāwai*
- *Diellia erecta*, *Asplenium-leaved diellia*
- *Diplazium molokaiense*
- *Flueggea neowawraea*, *Mēhamehame*
- *Geranium arboreum*, *Hawaiian Red-Flowered Geranium*
- *Geranium multiflorum*, *Nohoanu*
- *Lipochaeta kamolensis*, *Nehe*
- *Melicope knudsenii*, *Alani*
- *Melicope mucronulata*, *Alani*
- *Nerauddia sericea*
- *Nototrichium humile*, *Kulu‘ī*
- *Phlegmariurus mannii*
- *Phyllostegia mollis*



Legend

-  USFWS Critical Habitat Areas
-  DHHL Kahikinui Tract

Source: US Fish and Wildlife Service

Figure 7-9

KAHIKINUI

USFWS Critical Habitat Areas

MAUI LAND INVENTORY

DEPARTMENT OF HAWAIIAN HOME LANDS

NORTH



6,000

0

12,000



(FEET)



MAUI ISLAND PLAN

5. INFRASTRUCTURE

The tract has no water, electricity, or sewer services. Existing homesteaders use independent living techniques, including trucking in water, using gas stoves and refrigerators, and using solar energy for electricity.

Access/Roadways

Kula Highway becomes Pi'ilani Highway in the 'Ulupalakua area. Access to the tract is from Pi'ilani Highway. A partially improved dirt four-wheel drive road provides access within Kahikinui.

Water Service (Lines, Wells)

The County Department of Water Supply (DWS) does not provide water service to Kahikinui. Homesteaders currently truck in their water.

Kula Water Line

The USGS topographic map shows the Kula Water Line, which transverses the Kahikinui tract. This water line is not referenced in the *County of Maui Infrastructure Assessment Update*. The original Kula Water Line began at Waiakamoi and extended through Kula San, Paeahu, 'Ulupalakua, Kanaio, Kahikinui, and ended at the Mahamenui water tank. This is a high level water line that reaches 3,350 feet at its highest point in Kula San. Since construction of the line, service to Kahikinui and the Mahamenui water tank was cut and now ends at Kanaio. An explanation for why the line was cut at Kanaio is not available.

According to the minutes from a Department of Water Supply Public Hearing held on May 21, 2002, there had been discussions to renew the connection from Kanaio to Kahikinui to serve the existing DHHL Kahikinui Homesteads. However, DWS currently has no plans to construct this extension, so it is unlikely that the Kula Water Line will be restored to provide water to Kahikinui.

Wastewater Treatment and Disposal

Septic systems are used within Kahikinui as wastewater treatment and disposal services are not provided.

Solid Waste Disposal

The County does not provide solid waste refuse disposal pick-up services to this area. Homesteaders truck out solid waste and dispose of it at the Central Maui Landfill.

Telephone Service

Sandwich Isles Communications provides telephone service to Kahikinui.

MAUI ISLAND PLAN

Electrical Service

No electrical service is provided to Kahikinui. MECO transmission lines do not extend into the area from Hāna or Kula. Solar, wind, and gas are used to provide energy. It is unlikely that electrical service will be extended to any of the tracts in the South region in the near future.

Cable Television Service

Oceanic Cable does not provide service to this tract.

C. KAHIKINUI TRACT ANALYSIS

Kahikinui is remote and has no infrastructure service. The 75 *kuleana* lots on Kahikinui are off-grid and do not have water, electric, sewer, or cable systems. Of the 75 *kuleana* lots, only a handful of residents permanently live in Kahikinui. These residents have built homes on the rough Kahikinui terrain and live a life that is far removed from the typical Maui resident. The homesteaders use independent living techniques to meet their most basic need. Conventional techniques such as water catchment, windmills, and septic tanks are used, however several progressive independent techniques have also been developed, including “fog-drip” to capture water from passing clouds, composting toilets, and photovoltaic solar shingles.

Water

Rainfall levels across the tract are too low to recommend the use of catchment systems, which are typically used in areas that receive more than 60 inches of annual rainfall. An assessment of the Kula Water Line is needed to determine the condition of the line. Reconnecting Kahikinui to Kanaio would provide water to *kuleana* lots in Kahikinui.

Soils and Topography

A portion of Kahikinui’s soil is suitable for agricultural use according to the Soil Conservation Service Survey and *ALISH* classification. These soils present opportunities for agricultural use on the tract. Any proposed uses on the tract should be located on the slopes ranging from zero to 20 percent. Higher slopes constrain development and increase overall development costs.

Archaeology

Any proposed uses on the tract should be sensitive to existing archaeological sites. According to baseline data, only portions of Kahikinui have been surveyed. Prior to development of any proposed use on the tract, an archaeological survey is recommended to assess the number of sites in that specific location, if the location has not already been surveyed.

MAUI ISLAND PLAN

Ka Ohana O Kahikinui

Ka Ohana O Kahikinui (Ka Ohana) is the homestead association for Kahikinui and is the driving force behind the development of the Kahikinui tract. Ka Ohana was integral in the original conception of the kuleana lease program in Kahikinui.

Ka Ohana's forest protection plan initiated the creation of the Kahikinui Forest Reserve and prompted DHHL to license this reserve to Living Indigenous Forest Ecosystems, Inc. (LIFE), a non-profit organization of citizens and Kahikinui homesteaders independent from other community development entities. LIFE was granted the license for the 7,050-acre Kahikinui Forest Reserve in 1996.

Ka Ohana has also been instrumental in surveying Kahikinui's archeological sites and preserving Kahikinui's rich history. In addition, Ka Ohana has plans for a coastline protection plan that will address the restoration and protection of Kahikinui's coast.

Recommendation

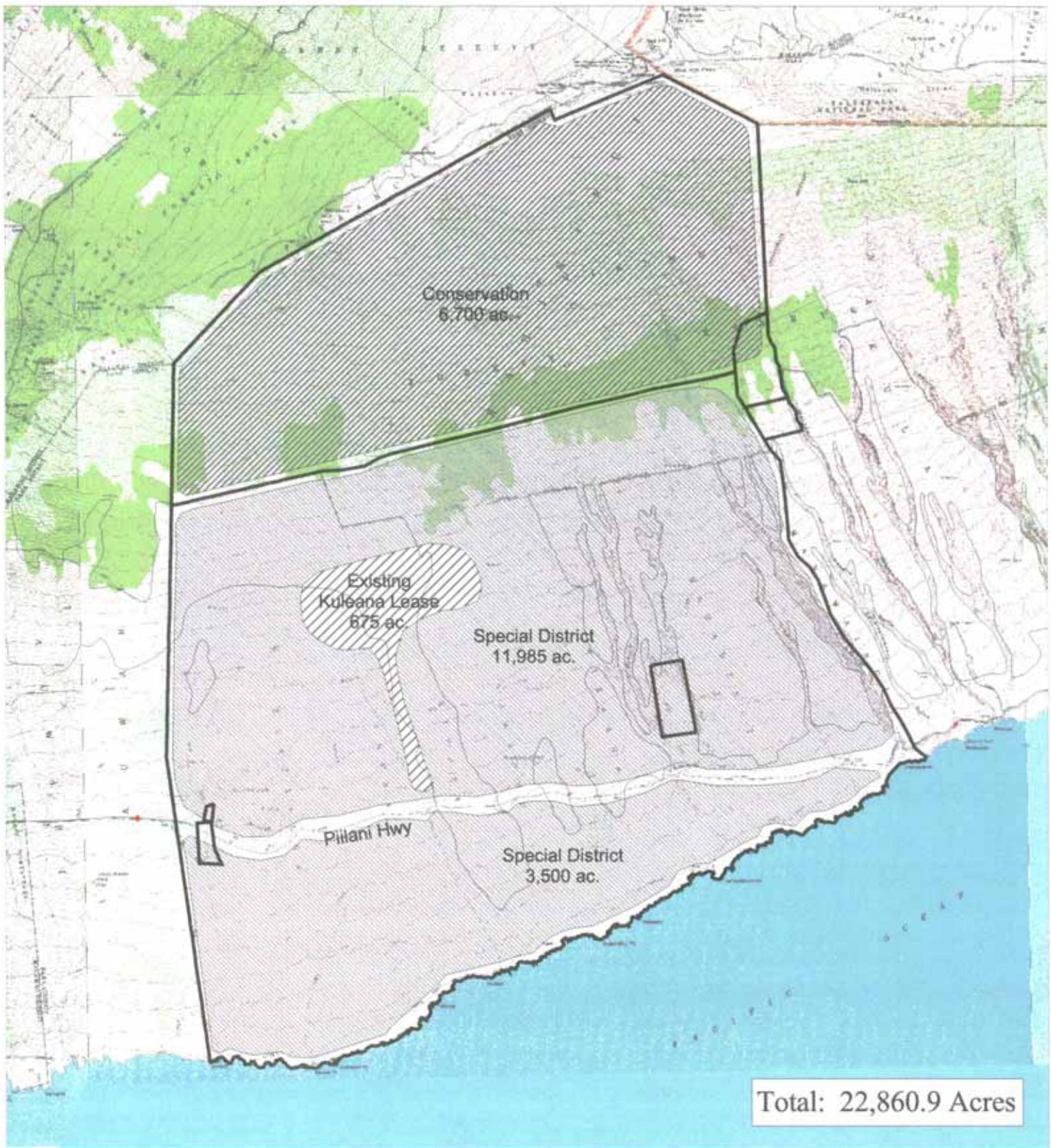
Protection of Kahikinui's natural resources is important to Ka Ohana O Kahikinui. Ka Ohana's past work and future plans reflects the group's commitment to the tract. Ka Ohana has worked with DHHL in planning Kahikinui and should continue to do so. Proposed uses should be sensitive to the past efforts of the Ka Ohana O Kahikinui in preserving and restoring Kahikinui's resources. Based on Ka Ohana's involvement on the Kahikinui tract, as well as factors related to the tract's remoteness and lack of infrastructure, the tract is designated as a Special District.

According to the DHHL *General Plan* (2002), the special district designation is applied to areas requiring special attention because of unusual constraints and/or opportunities, natural hazard areas, open space, raw lands far from infrastructure (and difficult to improve), mixed uses, and greenways. The factors illustrated in the baseline data and analysis sections are considered unique and unusual constraints that require special attention by DHHL.

The special district designation allows opportunities for Ka Ohana O Kahikinui and DHHL to guide the development or preservation of Kahikinui.

D. KAHIKINUI TRACT FINAL PLAN

15,485 acres of the 22,860 acres at Kahikinui are designated Special District (Figure 7-10). DHHL, together with the current residents/stewards of Kahikinui, can plan the tract accordingly. The remaining acres are designated conservation and encompass the existing Kuleana homestead.



Legend
 DHHL Land Boundary

Land Use Summary	
Land Use Categories	
Conservation	Approx Acres 6,700
Special District	15,485
Kuleana Lease	675
Total	22,860

Figure 7-10
 KAHIKINUI
 Land Use Plan

MAUI LAND INVENTORY

DEPARTMENT OF HAWAIIAN HOME LANDS



MAUI ISLAND PLAN

E. KALIHI/KANAHENA BASELINE INFORMATION

Kalihi, which is also known as Kanahena, is located at the public end of Mākena Road, near the entrance to the 'Āhihi-Kīna'u Natural Area Reserve (NAR).



1. INVENTORY

TMK and Acreage

The Kalihi/Kanahena property is 100.0 acres and is identified by TMK 2-1-04:121 and 122 (Figure 7-1).

Existing Uses

This property is currently vacant.

Adjacent Uses

The property is bounded to the north by 'Ulupalakua Ranch, to the west by 'Āhihi Bay, to the east by the 'Āhihi-Kīna'u NAR, and to the south by the Pacific Ocean. Corresponding adjacent uses include ranchland and conservation land.

Proposed Future Surrounding Uses

There are no known proposed future surrounding uses.

2. REGULATORY

State Land Use District

The majority of Kalihi/Kanahena is within the Conservation District. A small area in the *mauka* region of the tract is in the Agricultural District (Figure 7-11).

County Community Plan

The *Kīhei-Mākena Community Plan* designates land on the property as Conservation and Agriculture.

County Zoning

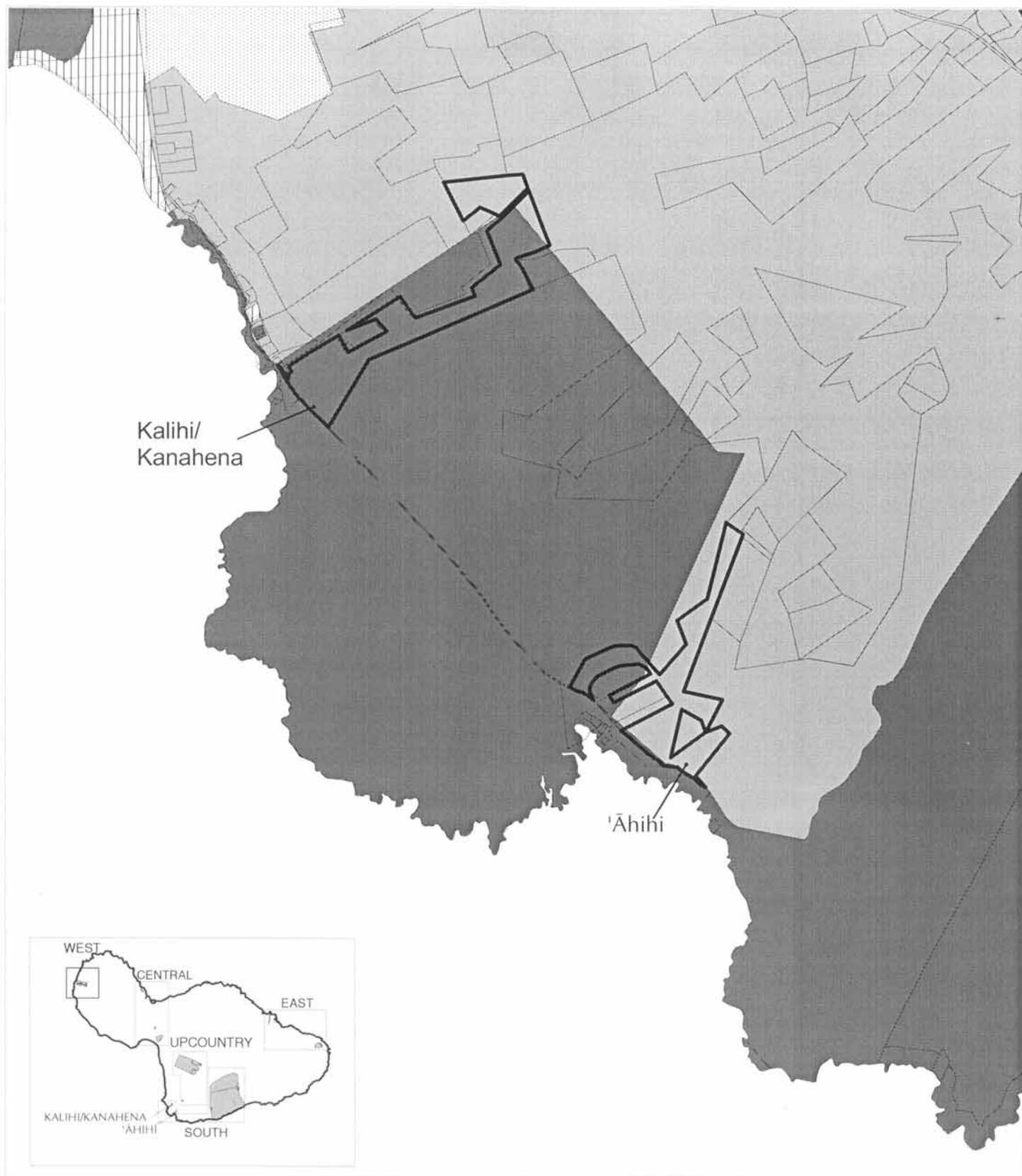
The Maui County zoning for Kalihi/Kanahena is Agriculture and Conservation, as delineated by the Maui County zoning map.

Special Management Area






The majority of Kalihi/Kanahena is within the Special Management Area (Figure 7-12).

Underground Injection Control Line

The entire Kalihi/Kanahena tract is below the UIC line (Figure 7-13).



Legend

-  Agricultural District
-  Conservation District
-  Rural District
-  Urban District
-  DHHL Land Boundary

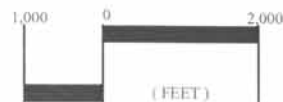
Source: State Land Use Commission

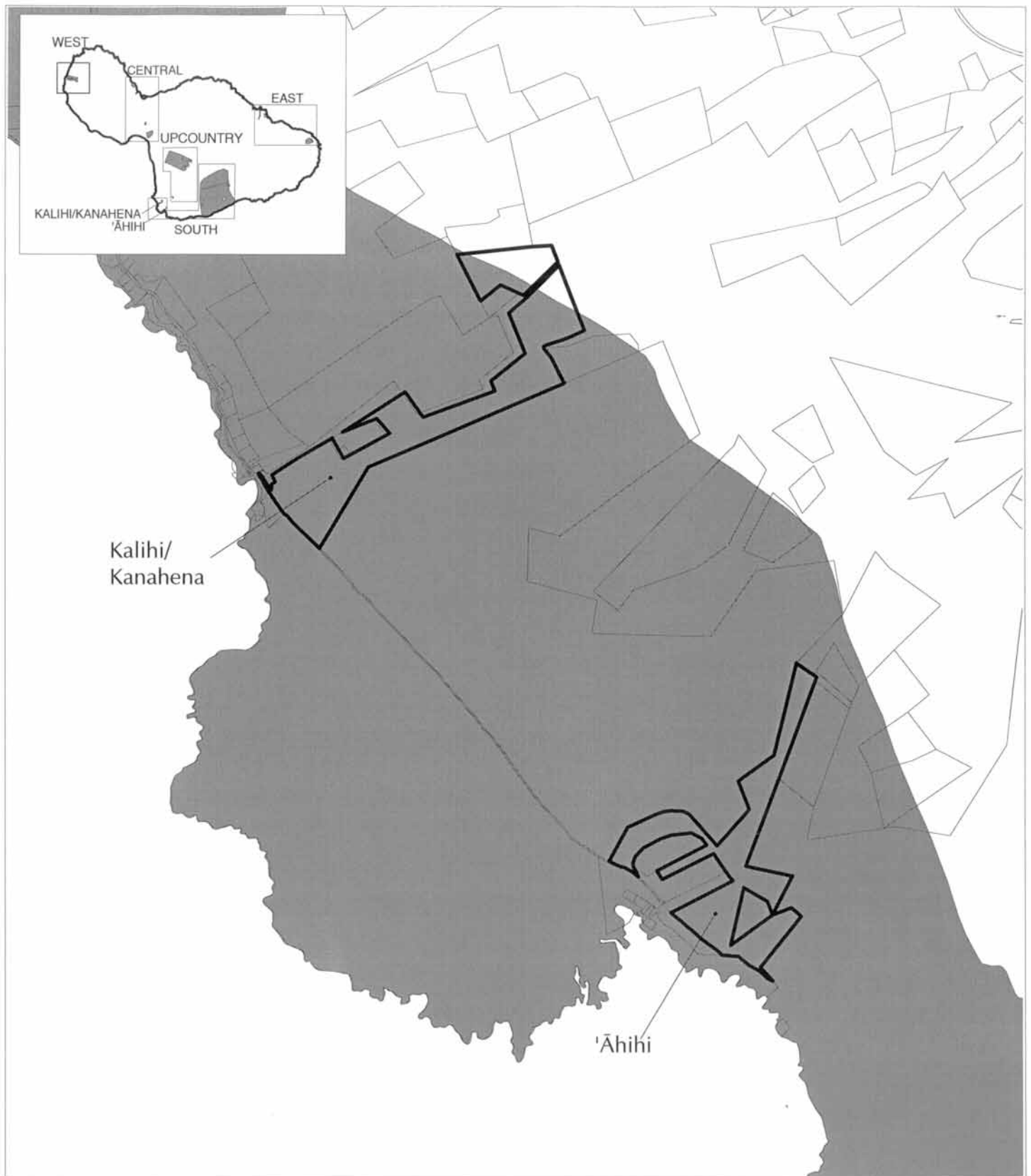
Figure 7-11
KALIHI/KANAHENA; 'ĀHIHI
State Land Use

MAUI LAND INVENTORY

DEPARTMENT OF HAWAIIAN HOME LANDS

NORTH





Legend

- Special Management Area
- DHHL Land Boundary

Figure 7-12

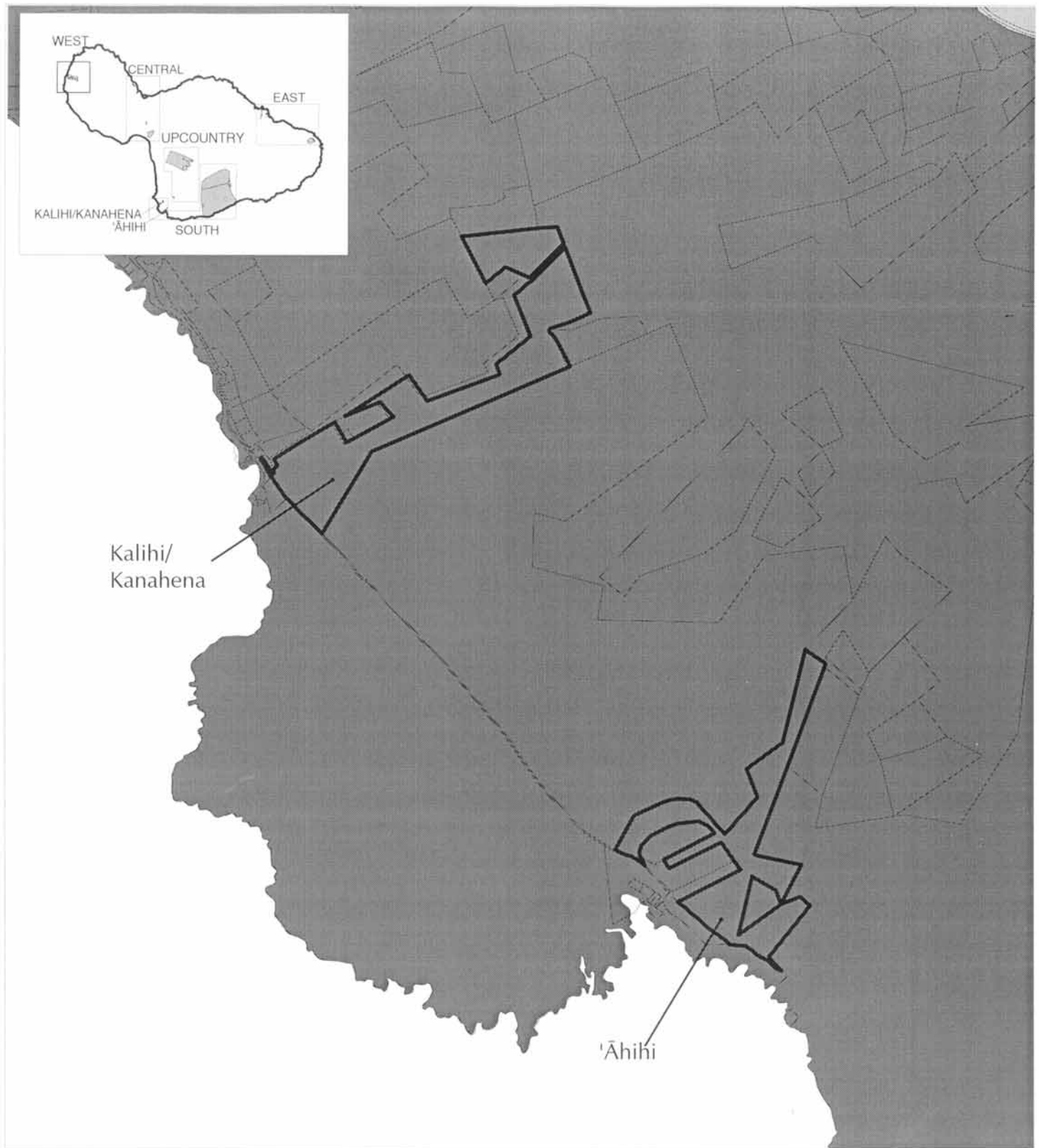
KALIHI/KANAHENA; 'ĀHIHI
Special Management Area (SMA)

MAUI LAND INVENTORY

DEPARTMENT OF HAWAIIAN HOME LANDS

NORTH





Legend




-  Areas Below (Makai) Underground Injection Control Line
-  Areas Above (Mauka) Underground Injection Control Line
-  DHHL Land Boundary

Figure 7-13

KALIHI/KANAHENA; 'ĀHIHI
Underground Injection Control (UIC) Areas Map

MAUI LAND INVENTORY

DEPARTMENT OF HAWAIIAN HOME LANDS



MAUI ISLAND PLAN

3. PHYSICAL CHARACTERISTICS

Climate

The average annual temperature is approximately 75 degrees Fahrenheit.

Soils

The USDA Soil Conservation Service Soil Survey shows the following soils in Kalihi/Kanahena (Figure 7-14).

- Mākena Loam, Stony Complex, 3 to 15 percent slopes – This complex is used for pasture and wildlife habitat. Permeability is moderately rapid, runoff is slow to medium, and erosion hazard is slight to moderate.
- Oanapuka Extremely Stony Silt Loam, 7 to 25 percent slopes – This soil type is used for pasture and wildlife habitat. Permeability is moderately rapid and runoff is slow.
- Lava Flows, 'A'ā – This miscellaneous land type is used for water supply, wildlife habitat, and recreation.

Agricultural Lands of Importance to the State of Hawai'i

The State of Hawai'i Department of Agriculture *ALISH* system of defining agricultural suitability has not classified the soils of the Kalihi/Kanahena property (Figure 7-15).

Ground/Surface Water

The USGS topographic map shows no streams within this property.

Rainfall

Annual rainfall averages approximately 20 inches per year (Figure 7-16).

Topography/Slope

The USGS topographic map shows that the elevation in Kalihi/Kanahena ranges from sea level to approximately 400 feet. Slope varies from five to 15 percent (Figure 7-16).

Drainage

There are no improved drainage systems within the property. The USGS topographic map shows no natural drainage ways within Kalihi/Kanahena.

Flood Zone





The Flood Insurance Rate Map indicates that Kalihi/Kanahena is in Zone X, which designates areas determined to be outside of the 500-year floodplain (Figure 7-17).

Noise

Due to the rural, undeveloped nature of the area, there are no major sources of noise.



Legend

-  Cinder Land
-  Makena Loam, Stony Complex, 3-15% Slopes
-  Oanapuka Extremely Stony Silt Loam, 7-25% Slopes
-  Lava Flows, Aa
-  DHHL Land Boundary

Source: U.S. Department of Agriculture Soil Conservation Service

Figure 7-14

KALIHI/KANAHENA; 'ĀHIHI
Soil Conservation Service Survey

MAUI LAND INVENTORY

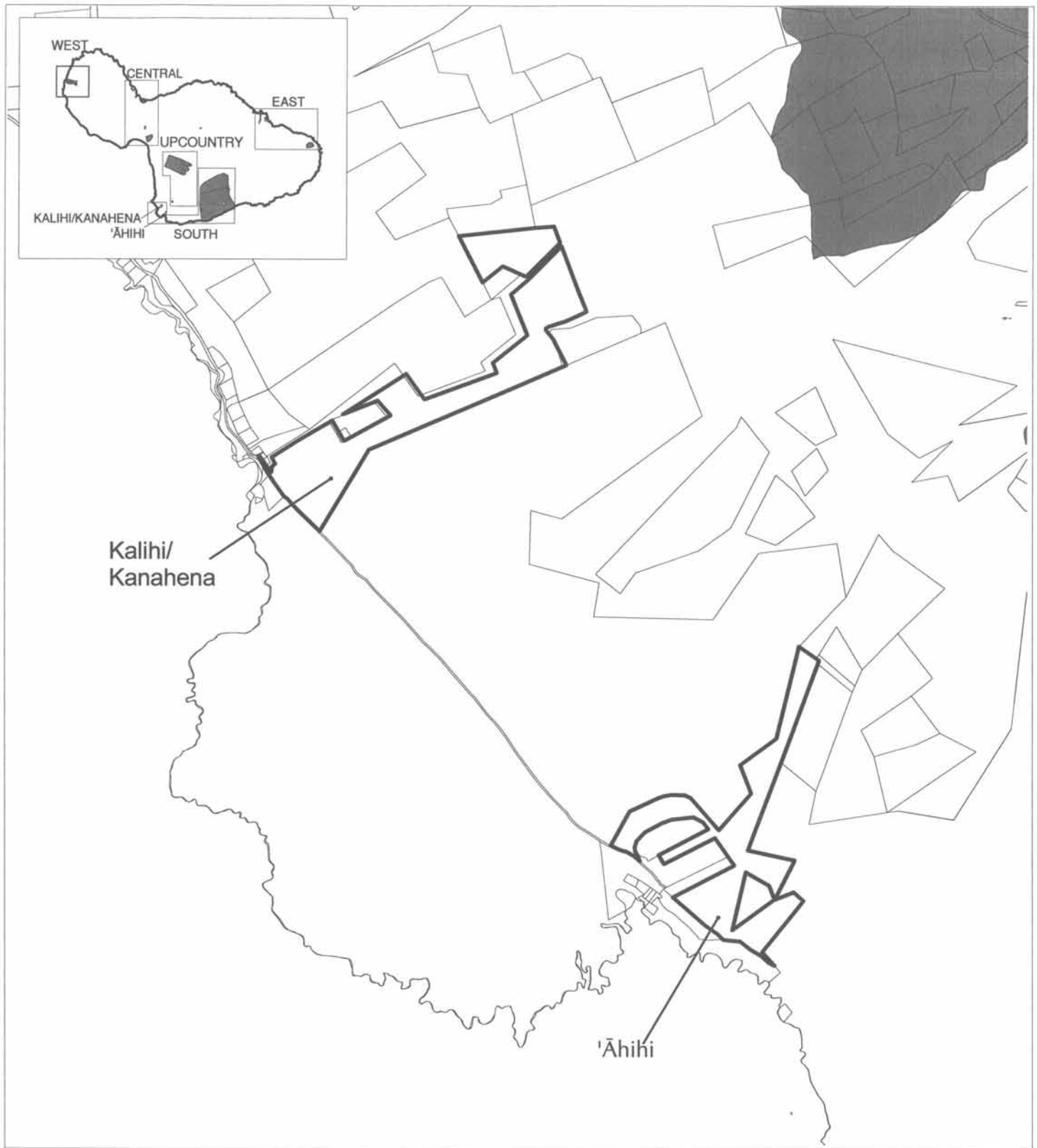
DEPARTMENT OF HAWAIIAN HOME LANDS

NORTH



(FEET)





Legend

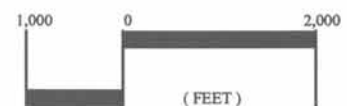
-  Prime Agricultural Land
-  Unique Agricultural Land
-  Other Agricultural Land
-  Unclassified Land
-  DHHL Land Boundary

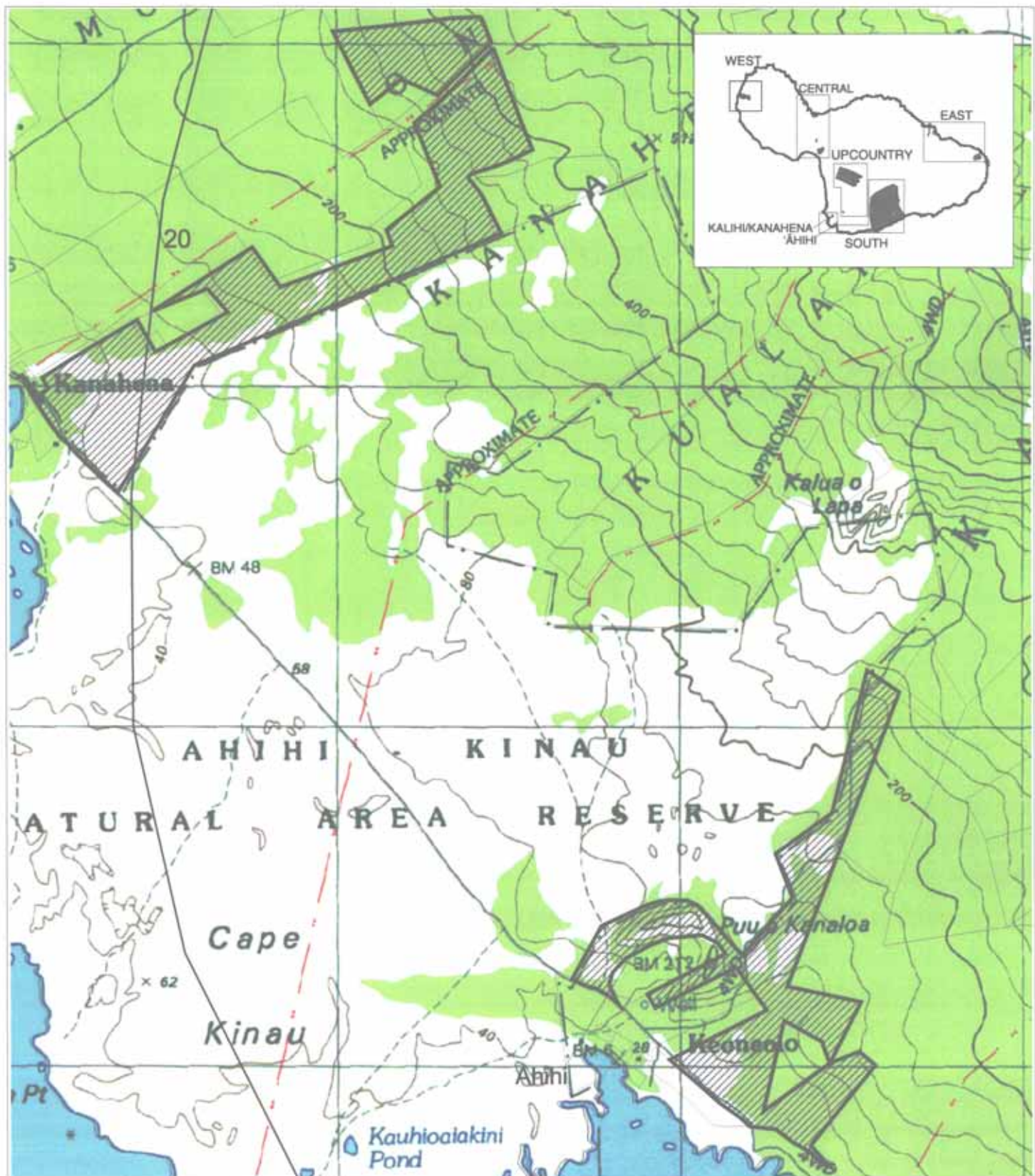
Figure 7-15

KALIHI/KANAHENA; 'ĀHIHI
Agricultural Lands of Importance to the State of
Hawaii (ALISH)

MAUI LAND INVENTORY

DEPARTMENT OF HAWAIIAN HOME LANDS





Legend

-  DHHL Properties
-  Lines of Equal Average Annual Rainfall in Inches





Legend




-  **ZONE A:**
Special Flood Hazard Areas Inundated by 100-Year Flood
No Base Flood Elevations Determined
-  **ZONE X:**
Areas Determined To Be Outside 500-Year Floodplain
-  **DHHL Land Boundary**

Figure 7-17

KALIHI/KANAHENA; 'ĀHIHI
Flood Insurance Rate Map

MAUI LAND INVENTORY

DEPARTMENT OF HAWAIIAN HOME LANDS

NORTH



(FEET)



MAUI ISLAND PLAN

4. ENVIRONMENTAL CHARACTERISTICS

Historic Sites/Archaeology/Cultural Resources

While it seems very likely that the property contains archaeological and cultural resources, this has not been verified by any available reports.

Endangered Species

There are no species identified as candidate or endangered by the Hawai'i Natural Heritage Program *Biological Conservation Datasystem (BCD) for Department of Hawaiian Home Land* on this property.

Critical Habitat

The U.S. Fish and Wildlife Service has not designated any critical habitat areas within the Kalihi/Kanahena property.

5. INFRASTRUCTURE

Access/Roadways

Mākena Road provides access to Kalihi/Kanahena.

Water Service (Lines, Wells)

Limited water service is provided by the Department of Water Supply. A four-inch Driscoll (plastic) water line exists along Mākena Road. The USGS topographic map does not show any constructed water lines, wells, or tanks.

Wastewater Treatment and Disposal

Wastewater treatment and disposal services are not provided for this property.

Solid Waste Disposal

The County does not provide solid waste disposal pick-up services for this property.

Telephone Service

There is currently no telephone service for the property. If needed, Sandwich Isles Communications will provide telephone service.

Electrical Service

No electrical service is provided for the Kalihi/Kanahena tract. MECO transmission lines do not extend into the area from Kihei-Mākena.

Cable Television Service

Oceanic Cable does not provide service for this area.

MAUI ISLAND PLAN

F. KALIHI/KANAHENA ANALYSIS

The Kalihi/Kanahena tract is located to the west of the 'Āhihi-Kīna'u NAR at the very end of Mākena's existing development. There is limited water service through an existing plastic water line, although water pressure from this line may not be adequate. Electric, sewer, telephone, and cable television are not available .

The baseline information and analysis suggests that there is a potential to develop a limited number of residential lots on the lower portion of the tract along Mākena Road. However, this type of small-scale development is not feasible in comparison with developing more suitable tracts in more desirable locations. In addition, beneficiaries surveyed favored homesteading uses in the Upcountry, West, and East regions of Maui.

Based on these factors, Kalihi/Kanahena should remain vacant and DHHL's homesteading efforts should be focused on other more readily developable tracts.

G. KALIHI/KANAHENA TRACT FINAL PLAN

All 100 acres are proposed for general agriculture (Figure 7-18). This designation is recommended after considering the site's unsuitability for residential development, which is based on water constraints, remoteness, and limited access. The general agriculture designation allows DHHL to: 1) lease the site to generate income; 2) land bank the parcel as an interim use; and 3) consider possible exchanges for the site or another use past the 20-year timeframe of the *Maui Island Plan*.

H. 'ĀHIHI TRACT BASELINE INFORMATION

'Āhihi is located at the eastern end of the 'Āhihi-Kīna'u NAR.

TMK and Acreage

The 'Āhihi tract is 75.0 acres and is identified by TMK 2-1-04:114 (Figure 7-1).

Existing Uses

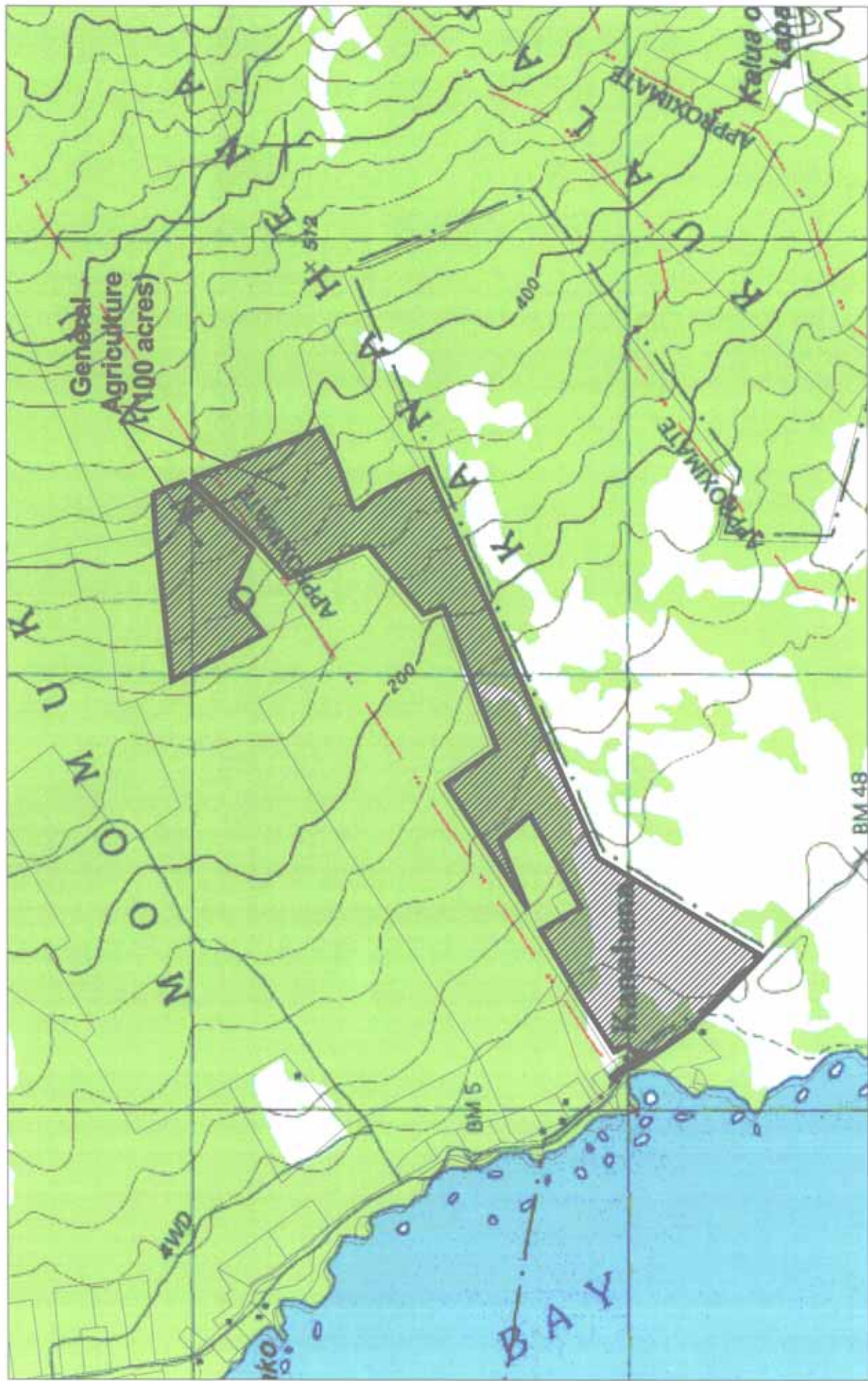
This parcel is currently vacant.

Adjacent Uses

The parcel is bound to the north by 'Ulupalakua Ranch, to the west by the 'Āhihi-Kīna'u NAR, to the east by La Perouse Bay, and to the south by the Pacific Ocean. Corresponding adjacent uses include ranchland and conservation land.

Proposed Future Surrounding Uses

There are no known proposed future surrounding uses.



Legend

DHIHL Land Boundary

Land Use Summary

General Agriculture
 Total

Approximate
Acres

100
100

Figure 7-18

KALIIHI/KANAHENA
Land Use Plan

MAUI LAND INVENTORY

DEPARTMENT OF HAWAIIAN HOMELANDS



PBR

MAUI ISLAND PLAN

1. REGULATORY

State Land Use District

The majority of 'Āhihi is in the Agricultural District, with the remaining portion in the Conservation District (Figure 7-11).

County Community Plan

The *Kīhei-Mākena Community Plan* designates the parcel for park use.

County Zoning

The Maui County zoning for 'Āhihi is Agricultural and Conservation.

Special Management Area

'Āhihi is within the Special Management Area (Figure 7-12).

Underground Injection Control Line

'Āhihi is below the UIC line (Figure 7-13).

2. PHYSICAL CHARACTERISTICS

Climate

The average temperature within the parcel is approximately 75 degrees Fahrenheit.

Soils

The USDA Soil Conservation Service Soil Survey shows the following soils in the 'Āhihi parcel (Figure 7-14):

- Cinder Land – This land type is used for wildlife habitat and recreational areas. It has no value for grazing due to its loose nature and poor trafficability.
- Oanapuka Extremely Stony Silt Loam, 7 to 25 percent – This soil type is used for pasture and wildlife habitat. Permeability is moderately rapid and runoff is slow.
- Lava Flows, 'A'ā – This miscellaneous land type is used for water supply, wildlife habitat, and recreation.

Agricultural Lands of Importance to the State of Hawai'i

The State of Hawai'i Department of Agriculture *ALISH* system of defining agricultural suitability has not classified the soils of the 'Āhihi parcel (Figure 7-15).

Ground/Surface Water

The USGS topographic map shows no streams within this parcel.

Rainfall

Annual rainfall averages approximately 20 inches per year (Figure 7-16).

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Topography/Slope

According to the USGS topographic map, the elevation in 'Āhihi ranges from approximately 20 feet to 300 feet. Slope varies from 5 to 15 percent (Figure 7-16).

Drainage

The USGS topographic map shows no natural drainage ways or improved drainage systems within 'Āhihi.

Flood Zone

The Flood Insurance Rate Map indicates that 'Āhihi is in Zone X, which designates areas determined to be outside of the 500-year floodplain (Figure 7-17).

Noise

Due to the rural, undeveloped nature of the area, there are no major sources of noise.

3. ENVIRONMENTAL CHARACTERISTICS

Historic Sites/Archaeology/Cultural Resources

While it seems very likely that the parcel contains archaeological and cultural resources, this has not been verified by any available reports.

Endangered Species

There are no species identified as candidate or endangered by the Hawai'i Natural Heritage Program *Biological Conservation Datasystem (BCD) for Department of Hawaiian Home Lands* on this parcel.

Critical Habitat

The U.S. Fish and Wildlife Service has not designated any critical habitat areas within the 'Āhihi parcel.

4. INFRASTRUCTURE

Access/Roadways

Access to the parcel is via a four-wheel drive road that crosses over the 'Āhihi-Kīna'u NAR.

Water Service (Lines, Wells)

No water service is provided to this parcel.

Wastewater Treatment and Disposal

Wastewater treatment and disposal services are not provided to this parcel.

Solid Waste Disposal

The County does not provide solid waste disposal pick-up services to this parcel.

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Telephone Service

There is currently no telephone service to this parcel. If needed, Sandwich Isles Communications will provide the telephone service.

Electrical Service

No electrical service is provided to 'Āhihi. MECO transmission lines do not extend into the area from Kīhei-Mākena.

Cable Television Service

Oceanic Cable does not provide service to this area.

I. 'ĀHIHI TRACT ANALYSIS

'Āhihi is located to the east of the 'Āhihi-Kīna'u NAR in a remote section of the island.

Access to 'Āhihi is limited, via an unimproved road over an existing lava field.

The parcel does not have water, electric, sewer, telephone and cable television service.

With the exception of the *kuleana* leases in Kahikinui, the majority of the proposed homesteading uses on Maui will be focused primarily in the Upcountry, West and East regions of Maui.

Based on these factors, the 'Āhihi tract should remain vacant and DHHL's homesteading efforts should be focused on other more readily developable tracts.

J. 'ĀHIHI TRACT FINAL PLAN

The entire 'Āhihi tract is designated for general agriculture (Figure 7-19). Factors contributing to this recommendation are outlined in the above analysis and include: 1) constraints on water, power, and basic utilities; 2) the property's remote location; and 3) limited access. The general agriculture designation permits DHHL to lease the tract to generate income as an interim use or land bank the property for the next 20 years.

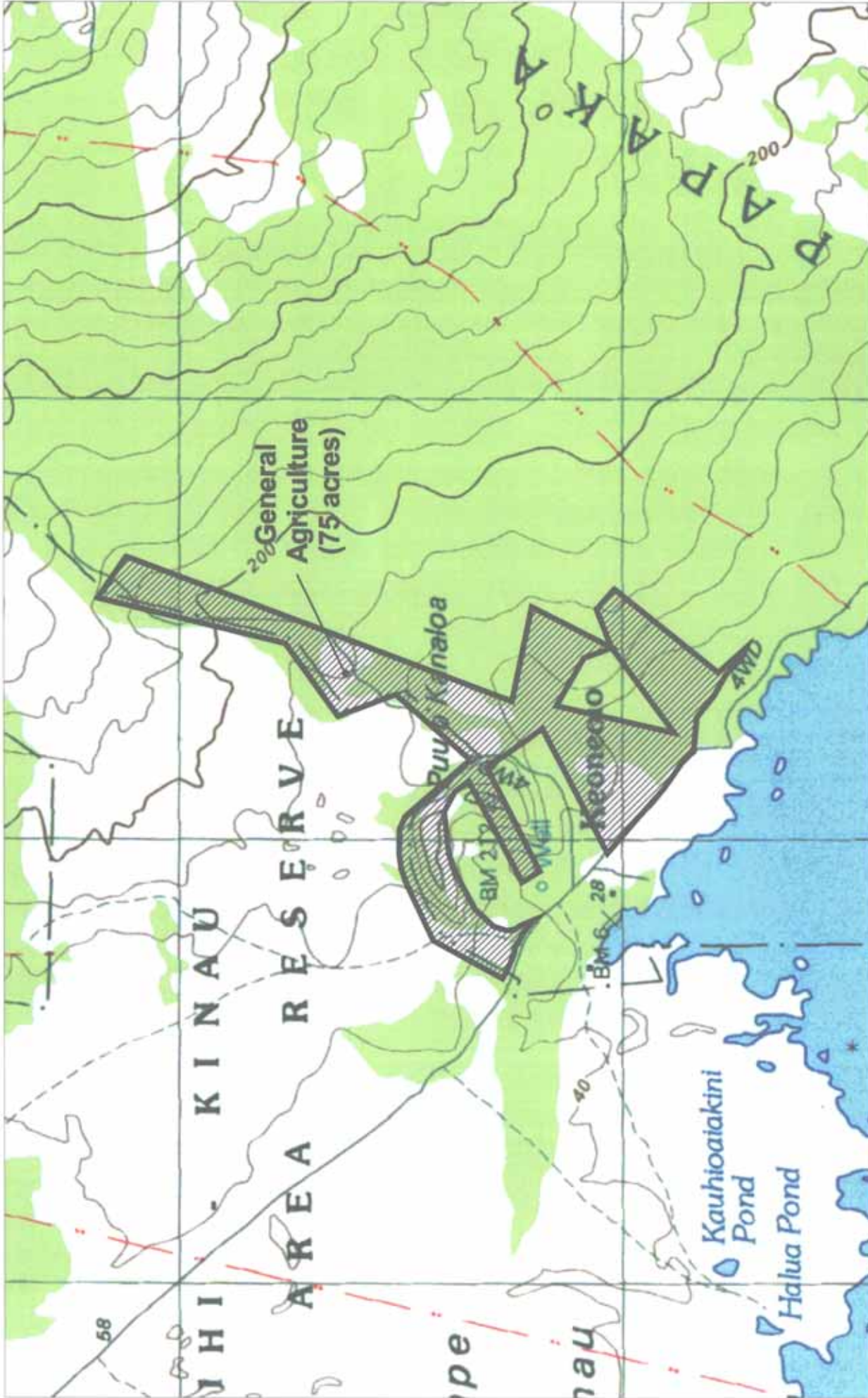


Figure 7-19
 'ĀHIHI
 Land Use Plan

Land Use Summary		Approx. Acres
	General Agriculture	75
	Total	75

Legend
 DHHHL Land Boundary

MAUI LAND INVENTORY

DEPARTMENT OF HAWAIIAN HOME LANDS





8.0 PRIORITY TRACTS

MAUI ISLAND PLAN

8.0 PRIORITY TRACTS

A. PHASE ONE RECOMMENDATIONS

Final land use development plans selected for Phase One of the *Maui Island Plan* represent the highest priority project to be developed in the near-term (one to six years) in order to best address the needs and preferences of DHHL's beneficiaries. Based on the assessments described in the previous chapters, residential homesteading plans in the West and Upcountry Regions of Maui are recommended for prioritization during this period.

Waiohuli is well suited for residential development in Phase One, given its large available acreage and proximity to an existing homestead. Many beneficiaries prefer the Upcountry region, and development at Waiohuli would help to satisfy this regional preferences. However, a limited existing water supply restricts the initial phase to 343 lots. A water system requiring new wells, storage facilities, and transmission lines would have to be built in order to develop additional lots (beyond the initial 343) at Waiohuli.

Honokōwai is also recommended for Phase One accelerated planning and award development. The tract is located in the West Region, an area of high beneficiary preference. It is easily accessed and is located near existing residential development and associated infrastructure. The site is a large tract with potential for accommodating numerous beneficiaries. It also is in a highly suitable climatic zone and is located near amenities and services available in Lahaina.

B. PHASE TWO RECOMMENDATIONS

Phase Two is a longer-term, seven- to 20-year DHHL planning period for Maui. One tract is recommended for priority attention within this time frame.

Wākiu will help satisfy demand for residential use in East Maui with development of 80 residential lots. It will also satisfy demand for agricultural lots with 22 three-acre subsistence agricultural lots. Three acres of commercial use and five acres of industrial use will generate income for DHHL and its beneficiaries, as well as provide needed industrial/commercial areas for the entire Hāna area. The Wākiu tract is easily accessible from Hāna Highway and is near existing amenities and services in Hāna.



9.0 REFERENCES

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9.0 REFERENCES

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