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DEPARTMENT OF ACCOUNTING AND GENERAL SERVICES | KA 'OIHANA LOIHELU A LAWELAWÉ LAULĀ
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APR 23 2024

MEMORANDUM

TO: Mary Alice Evans, Director
Office of Planning and Sustainable Development

FROM: Gordon S. Wood
Acting Public Works Administrator 

SUBJECT: Chapter 343 Final Environmental Assessment and Finding of No Significant Impact for Waikoloa Public Library, Kamakoa Nui Master Plan Area, Waikoloa Village, Waikoloa Ahupuaa, South Kohala District, Island of Hawai'i, State of Hawaii
TMK (3) 6-8-041: 020

The State of Hawai'i, Department of Accounting and General Services (DAGS) hereby transmits the Final Environmental Assessment and Finding of No Significant Impact (FEA-FONSI) for the Waikoloa Public Library, proposed by the Hawai'i State Public Library System.

Please publish notice of availability in the next available edition of the Office of Planning and Sustainable Development's *The Environmental Notice*. A PDF copy of the FEA-FONSI (searchable) and a Project Location Map have been submitted via the Environmental Review Program's online portal.

Should you have any questions, please contact Lance Maja from the Planning Branch at (808) 586-0483, or our Environmental Assessment consultant, PBR Hawaii & Associates, Inc., attention: Bradley Furuya at bfuruya@pbrhawaii.com, or at (808) 521-5631.

BI:mc

Attachments

C: Mallory Fujitani, HSPLS w/o attachments
Glenn Miura, CDS International, Inc. w/o attachments

From: webmaster@hawaii.gov
To: [DBEDT OPSD Environmental Review Program](#)
Subject: New online submission for The Environmental Notice
Date: Thursday, April 25, 2024 4:45:21 PM

Action Name

Waikoloa Public Library

Type of Document/Determination

Final environmental assessment and finding of no significant impact (FEA-FONSI)

HRS §343-5(a) Trigger(s)

- (1) Propose the use of state or county lands or the use of state or county funds

Judicial district

South Kohala, Hawai'i

Tax Map Key(s) (TMK(s))

TMK (3) 6-8-041:020

Action type

Agency

Other required permits and approvals

Chapter 343, HRS Compliance; Dust Control Plan; Noise Permit (if necessary); National Pollutant Discharge Elimination System (NPDES) construction site stormwater discharge permit; Americans with Disabilities Act (ADA) Compliance; Section 6E, HRS Review; Grading, Grubbing, and Stockpiling Permits; Building Permit (electrical, plumbing, civil); Certificate of Occupancy; and Plan Approval

Proposing/determining agency

Department of Accounting and General Services

Agency contact name

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[Map It](#)

Is there a consultant for this action?

Yes

Consultant

PBR HAWAII

Consultant contact name

Bradley Furuya

Consultant contact email

bfuruya@pbrhawaii.com

Consultant contact phone

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Consultant address

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[Map It](#)

Action summary

The proposed Project includes a new, approximately 12,000 square foot public library, approximately 3,000 square foot Early Learning Center (ELC), 71-stall surface parking lot, and complimentary landscaping. The proposed library includes shelving for a minimum of 50,000 books, private meeting rooms, a program room, a work room, support space, and a librarian's office. The ELC, connected to the library, will have two classrooms, each capable of accommodating roughly 20 students.

Reasons supporting determination

Please refer to Section 7.2 (Significance Criteria) of the Final EA

Attached documents (signed agency letter & EA/EIS)

- [Waikoloa-Public-Library-Final-EA.pdf](#)
- [dags-ltr-to-erp.final-EA-for-WaikoloaPL.2024-4-23.pdf](#)

Shapefile

- The location map for this Final EA is the same as the location map for the associated Draft EA.

Action location map

- [Project-Site.zip](#)

Authorized individual

Bradley Furuya

Authorization

- The above named authorized individual hereby certifies that he/she has the authority to make this submission.

Waikoloa Public Library Final Environmental Assessment

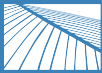
Finding of No Significant Impact

Prepared for:



Hawaii State
Public Library System

Prepared by:



PBR HAWAII
& ASSOCIATES, INC.

May 2024



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LIST OF ABBREVIATIONS & ACRONYMS

The following is a list of terms, abbreviations, and acronyms used in this document.

A

ADA	Americans with Disabilities Act
ALISH	Agricultural Lands of Importance to the State of Hawai‘i
AM	Morning
AMSL	Above Mean Sea Level

B

BMPs	Best Management Practices
------	---------------------------

C

CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CIA	Cultural Impact Assessment
CZM	Coastal Zone Management

D

DAGS	Department of Accounting and General Services
DBEDT	Department of Business, Economic Development & Tourism
DHS	State of Hawai‘i, Department of Human Services
DLNR	State of Hawai‘i, Department of Land and Natural Resources
DOFAW	State of Hawai‘i, DLNR, Division of Forestry and Wildlife

E

EA	Environmental Assessment
EIS	Environmental Impact Statement
ELC	Early Learning Center

F

FEMA	Federal Emergency Management Agency
FIRM	Flood Insurance Rate Map
FONSI	Finding of No Significant Impact
FUDS	Formerly Used Defense Sites

H

HAR	Hawai‘i Administrative Rules
HELCO	Hawai‘i Electric Light Company
HRS	Hawai‘i Revised Statutes
HSPLS	Hawai‘i State Public Library System

I

IfA	University of Hawai‘i Institute for Astronomy (IfA)
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L

LID	Low-Impact Development
LOS	Level of Service

LSB	Land Study Bureau
M	
mph	Miles Per Hour
N	
NOAA	National Oceanic and Atmospheric Administration
NPDES	National Pollutant Discharge Elimination System Permit
NRCS	Natural Resources Conservation Service
O	
OPSD	State of Hawai'i, Office of Planning and Sustainable Development
P	
PM	Afternoon
PVC	Polyvinyl Chloride
S	
SEFP	State Education Functional Plan
SFP	State Functional Plan
SHPD	State of Hawai'i, Department of Land and Natural Resources, Historic Preservation Division
SMA	Special Management Area
T	
TIAR	Transportation Impact Assessment Report
TMK	Tax Map Key
U	
USACE	U.S. Army Corps of Engineers
USFWS	U.S. Fish and Wildlife Service

1.0 INTRODUCTION

This Environmental Assessment (EA) is prepared in accordance with Chapter 343, Hawai'i Revised Statutes (HRS) for the construction of the proposed Waikōloa Public Library.

1.1 PROJECT SUMMARY

Project Name:	Waikōloa Public Library (Project)
Location:	The Project is located within the Kamakoa Nui Master Plan Area, Waikōloa Village, Waikōloa Ahupua'a, South Kohala District of the Island of Hawai'i
Judicial District:	South Kohala
Tax Map Key (TMK):	(3) 6-8-041:020
Proposing Agency:	State of Hawai'i – Department of Accounting and General Services (DAGS)
Landowner:	County of Hawai'i – Office of Housing and Community Development (OHCD)
Existing Uses:	Vacant
Proposed Action:	The proposed Project includes a new, approximately 12,000 square foot public library, approximately 3,000 square foot Early Learning Center (ELC), 71-stall surface parking lot, and complimentary landscaping. The proposed library includes shelving for a minimum of 50,000 books, private meeting rooms, a program room, a work room, support space, and a librarian's office. The ELC, connected to the library, will have two classrooms, each capable of accommodating roughly 20 students. Once the library is constructed, the existing Waikōloa Book Mobile would be decommissioned and staged in a wind-protected outdoor learning area that would be used for large gatherings, as well as to host book sales by the Friends of the Library, which has promoted, fundraised, and maintained the Book Mobile for the community.
Project Area:	Approximately 2.567 acres
Land Use Designations:	<ul style="list-style-type: none">• State Land Use: <i>Urban</i>• Community Development Plan Area: <i>South Kohala</i>• Land Use Pattern Allocation Guide: <i>Low Density Urban</i>• County Zoning: <i>RS-10</i>
Special Management Area (SMA):	None

**Permits/Approvals
Required (Subject to
Change):**

- Chapter 343, HRS Compliance
- Dust Control Plan
- Noise Permit (if necessary)
- National Pollutant Discharge Elimination System (NPDES) construction site stormwater discharge permit
- Americans with Disabilities Act (ADA) Compliance
- Section 6E, HRS Review
- Grading, Grubbing, and Stockpiling Permits
- Building Permit (electrical, plumbing, civil)
- Certificate of Occupancy
- Plan Approval

**Alternatives
Considered:**

No Action

The “No Action” alternative would not address the existing problem of a lack of permanent, convenient educational resources and community gathering spaces in Waikōloa Village. Currently, Waikōloa Village residents rely on a Book Mobile for library services. With limited hours and operations wholly dependent on the availability of funds from the non-profit, Friends of the Library – Waikōloa Region, reliable library services are not assured. The nearest permanent Hawai‘i State Public Library System (HSPLS) library is located approximately 18 miles away in Waimea.

Alternative Sites

Other vacant sites in Waikōloa Village could theoretically accommodate the proposed Project. However, as the proposed Project includes construction of a new public library building, ELC, surface parking lot, and complimentary landscaping, any alternative site in Waikōloa Village would require similar site acquisition costs, scope of construction, construction timeline, and construction costs. Resulting mitigation measures would also be very similar to those of the proposed Project.

**Potential Impacts and
Mitigation Measures:**

The potential impacts of developing a public library on the Project site are as follows: 1) there would be noise generated during construction related to grading, construction vehicle traffic, construction of any structures; 2) there is the potential for dust and air pollution generated from grading, and construction vehicle traffic; and 3) there is the potential for construction-generated traffic to impact area roadways, either from: the transport of construction vehicles to and from the site, the delivery of construction materials, the removal of construction waste, or commuting construction workers. Many of the above-mentioned potential impacts can be mitigated through very common standard best management practices described in this EA (Sections 3.3, 3.4, 3.5, 3.6, 4.3, 4.4 and 4.5). Once the library is in operation, there is a potential for increased traffic from library visitors.

The following measures mitigate potential adverse impacts:

1. Design Phase. The County will incorporate the following measures into the Project design:
 - 1) Low Impact Design. To the extent applicable, the civil engineering and landscape architectural

design for the Project will incorporate measures to reduce impermeable surfaces, and other design features that minimize nonpoint source pollution.

- 2) Landscape Architectural Design. Where possible, the library's landscape design will include native plant species that are appropriate for the area, plants for which climate conditions are suitable for them to thrive, plants that historically occurred there, etc.
2. Construction Phase. The County, as applicable, will incorporate the following measures into construction documents for all phases of the Project:
- 1) Erosion, Sedimentation, and Fugitive Dust. Grading plans will include best practices that comply with County and NPDES requirements to minimize air quality and nonpoint source impacts.
 - 2) Invasive Species. All equipment, materials, and personnel should be cleaned of excess soil and debris to minimize the risk of spreading invasive species.
 - 3) Traffic and Noise Impacts. Construction noise impacts of a short-term duration will be controlled through compliance with community noise permit requirements regulated by the State Department of Health. Traffic controls will be coordinated with DOT and the County Department of Public Works for any work along Paniolo Avenue and Kamakoa Drive, with sufficient notice to the public.
 - 4) Flora and Fauna Protections.

Hawaiian seabirds

Fully shielding all outdoor lights so the bulb can only be seen from below bulb height and only use when necessary. Installing timers, automatic motion sensor switches, and controls on all outdoor lights or turning off lights when human activity is not occurring in the lighted area. Avoiding nighttime construction during the seabird fledging period, September 15 through December 15.

Hawaiian Goose

The Hawaiian Goose is not expected to be found on the Project site. If encountered during construction, all activities within 100 feet will cease and the bird or birds will not be approached. If a nest is discovered at any point, the State of Hawai'i, Department of Land and Natural Resources (DLNR), Division of Forestry and Wildlife

(DOFAW), Hawai‘i Island Branch Office will be contacted.

Hawaiian Hawk

The Hawaiian Hawk is not expected to be found on the Project site. If work must be conducted during the March 1 through September 30 Hawaiian hawk breeding season, a biologist familiar with the species will conduct a nest search of the project footprint and surrounding areas immediately prior to the start of construction activities. If a nest is detected, a buffer zone of 100 meters (330 feet) will be established around it where no construction will occur until the chick or chicks have fledged, or the nest is abandoned. DOFAW staff will be notified. If adult individuals are detected in the area during construction, all activities within 30 meters (100 feet) of the bird will cease.

- 5) In the unlikely event that unanticipated archaeological resources are unearthed during ground disturbing activities associated with the project, work in the immediate area of the discovery will be halted and DLNR - State Historic Preservation Division (SHPD) will be contacted as outlined in Hawai‘i Administrative Rules 13§13-275-12.
3. Operational Phase. The County will implement the following operational measures:

- 1) Flora and Fauna Protections.

Hawaiian seabirds

Fully shielding all outdoor lights so the bulb can only be seen from below bulb height and only use when necessary. Installing timers, automatic motion sensor switches, and controls on all outdoor lights or turning off lights when human activity is not occurring in the lighted area.

- 2) Traffic

Based on the results of the Transportation Impact Assessment Report (TIAR) operations analysis, there are minimal roadway improvements recommended for the proposed Waikōloa Public Library site. Recommendations include the following:

- Implement stop control access at both of the proposed library driveways.
- Maintain line of sight around each of the proposed library driveways based on required stopping sight distance.
- Implement crosswalks and ADA-compliant curb ramps at the Kamakoa

Drive and proposed Road A intersection if there are none prior to the completion of the library.

- Install, as appropriate, pedestrian warning signs to alert drivers of potential pedestrian activities in the vicinity of the site.
- Consideration for potential future bicycle facilities as the surrounding area is developed.

3) Visual Resources

Project lighting will conform to the standards established by the County of Hawai‘i Outdoor Lighting Ordinance (Hawai‘i County Code Chapter 14, Article 9: “Outdoor Lighting”). The Project will use the minimum amount of exterior lighting possible. Outdoor lighting will be on timer, motion activated, and fully shielded. To comply with the County’s Outdoor Lighting Ordinance, exterior LED lighting will emit less than 2% of its total energy at wavelengths less than 500 nanometers. Any white light used will have a correlated color temperature of 2,700 Kelvin or less.

Determining Agency: DAGS

Determination: Finding of No Significant Impact (FONSI)

1.2 LOCATION

The proposed Project is located on the northwest corner of Kamakoa Drive and Road A on TMK (3) 6-8-041:020 in the Kamakoa Nui Master Plan area, Waikōloa Village, South Kohala District, island of Hawai‘i (Figure 1). The roughly 2.6-acre Project site is located approximately six miles mauka of the South Kohala shoreline and four miles mauka of the Queen Ka‘ahumanu Highway.

The Kamakoa Nui Master Plan area is approximately 240 acres, located at the northwest corner of Waikōloa Village and roughly bounded by Kamakoa Gulch and undeveloped lands to the north, existing and planned residential development to the east (mauka), an unnamed drainageway and undeveloped land to the south, and undeveloped lands to the west (makai). Figure 21 contains the Master Plan Area and Appendix A contains the Kamakoa Nui Master Plan (Master Plan). OHCD is using the Master Plan to guide development in Kamakoa Nui over the next 20 years. In addition to a public library, the Master Plan envisions up to 1,250 residential units in a range of housing types, a public school, a community park, and accompanying infrastructure. A more detailed discussion of the Master Plan can be found in Section 5.2.7 of this EA.

1.3 SURROUNDING LAND USES

The Project site is predominantly surrounded by undeveloped land (Figure 2). To the east (across Road A), there is an approximately 12-acre public park, which includes a playfield, restroom and skate park. However, due to disrepair of the irrigation system and resulting deterioration of the fields, the fields need to be repaired and restored to allow use. The existing skate park and restrooms continue to be used. The Master Plan envisions restoration and expansion of the park. To the south of the Project site are single-family houses and the greater Waikōloa Village neighborhood.

1.4 EXISTING INFRASTRUCTURE

The project is expected to be served by the following existing utilities:

- Roads: The Project site fronts Kamakoa Drive, which is paved from Paniolo Avenue to the eastern edge of the public park before transitioning into an unpaved road fronting the Project site and continuing makai. The future Road A will run north-south, mauka of the Project site and continue makai, creating a large loop road. The Project site will be accessed via a new driveway off Road A. All future roadway improvements and points of access will need to be coordinated with the Hawai‘i County Department of Public Works, which manages County roads, traffic signals, and streetlights.
- Sewer: An underground gravity sewer line begins at Paniolo Avenue and runs below Kamakoa Drive and the lower portion of the unpaved road to the makai terminus of the Property (Figure 3). The existing sewer main connects to the existing wastewater treatment plant (operated by Hawai‘i Water Service (HWS) that is located northwest of the Master Plan area. Currently the existing wastewater treatment plant can treat up to 100,000 gallons of sewer effluent per day. HWS anticipates construction of a new leach field facility (to begin by the end of 2023), which will increase effluent treatment capacity to 200,000 gallons per day.
- Water: The improved portion of Kamakoa Drive contains a subsurface water line that runs under the paved portion of Paniolo Avenue (Figure 3). DAGS will coordinate with HWS to connect to the existing subsurface water line.
- Electrical: Local electrical service will be provided by the Hawai‘i Electric Light Company (HELCO). Although the Master Plan area does not currently contain any electric lines, electrical capacity is expected to be sufficient for the proposed Project. Coordination with HELCO will continue as the Project design progresses.

1.5 LAND OWNERSHIP

Utilizing the TMK system, the land under the Waikōloa Public Library is TMK (3) 6-8-041:020, which is owned by the County of Hawai‘i, Office of Housing and Community Development (Figure 4).

Contact: Harry Yada
Office of Housing and Community Development
County of Hawai‘i
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Phone: (808) 961-8379

1.6 IDENTIFICATION OF PROPOSING AGENCY

The Department of Accounting and General Services is the Proposing Agency.

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1.7 IDENTIFICATION OF ENVIRONMENTAL CONSULTANT

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PBR HAWAII
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1.8 COMPLIANCE WITH STATE OF HAWAI‘I ENVIRONMENTAL LAWS

Preparation of this document is in accordance with the provisions of Chapter 343, HRS and Title 11, Chapter 200.1, Hawai‘i Administrative Rules (HAR) pertaining to Environmental Impact Statements. Section 343-5, HRS established nine types of actions that “trigger” compliance. The use of State or County lands or funds is one of these “triggers.” Because the County of Hawai‘i will use County lands and State or County funds for the proposed Project, compliance with HRS Chapter 343 and HAR Chapter 200.1, is required.

1.9 IDENTIFICATION OF AGENCIES CONSULTED

1.9.1 Early Consultation

A Pre-Assessment consultation was conducted from April 28, 2023, to May 30, 2023, prior to the

preparation of the Draft EA. The purpose of the Pre-Assessment consultation was to consult with agencies, organizations, and individuals with technical expertise or an interest in, or will be affected by, the Proposed Project. This process is part of the scoping process for the Draft EA. Comments and input received during this period were used to identify environmental issues and concerns that were addressed in the Draft EA.

As part of this early consultation process, the agencies, organizations, and individuals who were sent Pre-Assessment consultation letters are listed in Table 1 below. Those who provided written comments (either by hard copy or electronically) are indicated in Table 1. Copies of the written comments and responses are reproduced in Appendix B.

Table 1: Pre-Assessment Consultation

Agencies/Organizations/Individuals	Pre-Assessment Consultation Letter Sent	Pre-Assessment Comment Received
STATE		
Department of Agriculture	X	
Department of Business, Economic Development & Tourism (DBEDT)	X	
DBEDT – Hawai'i State Energy Office/Strategic Industries Division	X	
DBEDT - Office of Planning and Sustainable Development (OPSD)	X	5/23/2023
Department of Defense	X	5/16/2023
Department of Hawaiian Home Lands	X	
Department of Health (DOH)	X	
DOH – Environmental Health Administration	X	
Department of Human Services	X	5/8/2023
Department of Labor and Industrial Relations	X	
DLNR	X	5/3/2023
DLNR – DOFAW	X	6/13/2023
DLNR – SHPD	X	
Department of Transportation	X	
Hawai'i Housing Finance and Development Corporation	X	
Office of Hawaiian Affairs	X	
Hawaii State Public Library System	X	
Department of Education	X	5/22/2023
FEDERAL		
U.S. Army Corps of Engineers, Honolulu District	X	
U.S. Fish and Wildlife Service	X	
Federal Emergency Management Agency, Region IX	X	
COUNTY		
Department of Environmental Management	X	
Department of Parks and Recreation	X	

WAIKŌLOA PUBLIC LIBRARY
FINAL ENVIRONMENTAL ASSESSMENT/ FINDING OF NO SIGNIFICANT IMPACT

Agencies/Organizations/Individuals	Pre-Assessment Consultation Letter Sent	Pre-Assessment Comment Received
Department of Public Works	X	
Department of Research and Development	X	5/30/2023
Department of Water Supply	X	5/15/2023
Fire Department	X	
Office of Housing and Community Development	X	
Planning Department	X	6/14/2023
Cultural Resources Commission	X	
Police Department	X	5/5/2023
Mass Transit Agency	X	
Office of Aging	X	
ELECTED OFFICIALS		
State Senator Tim Richards	X	
State Representative David Tarnas	X	
County Councilmember Cynthia Evans	X	
UTILITIES		
Hawaiian Electric Company, Inc.	X	
Spectrum	X	
Hawaiian Telcom	X	
CITIZEN GROUPS/INDIVIDUALS, OTHER CONSULTED PARTIES		
Waikōloa Village Association	X	
Friends of the Library – Waikoloa Region	X	

1.9.2 Draft EA Public Review Comments

After the Pre-Assessment consultation, the Draft EA was prepared and submitted for publication in the OPSD, Environmental Review Program’s January 8, 2024, issue of *The Environmental Notice*. The agencies and organizations that were mailed a notification that the Draft EA was available for public comment are listed below in Table 2. The statutory 30-day public review and comment period ended on February 7, 2024. This table also notes which parties provided comments within the statutory 30-day public review period. Written responses were provided to all 6 comments received during the statutory 30-day public review period. Comments and input received during this period were incorporated into this Final EA and reproduced in their entirety in Appendix C. Written responses were also provided to the comment received outside of the statutory 30-day public review period. Comments received after the 30-day public review period are included in Appendix C-1, and noted below.

**WAIKŌLOA PUBLIC LIBRARY
FINAL ENVIRONMENTAL ASSESSMENT/ FINDING OF NO SIGNIFICANT IMPACT**

Table 2: Draft EA Public Comments Received

Agencies/Organizations/Individuals	Comments Received During Statutory 30-Day Public Review Period	Comments Received Outside of 30-Day Public Review Period
STATE		
Department of Agriculture		
DBEDT		
DBEDT – Hawai‘i State Energy Office/Strategic Industries Division		
DBEDT - OPSD	1/10/2024	
Department of Defense	1/18/2024	
Department of Hawaiian Home Lands		
Department of Health (DOH)		
DOH – Environmental Health Administration		
Department of Human Services		
DLNR		
DLNR – Engineering Division	2/6/2024	
DLNR – Land Division	2/6/2024	
DLNR – DOFAW		
DLNR – SHPD		
Department of Transportation		
Office of Hawaiian Affairs		
Hawaii State Public Library System		
Department of Education		
University of Hawai‘i Institute for Astronomy (IfA)	1/25/2024	
FEDERAL		
U.S. Army Corps of Engineers, Honolulu District		
U.S. Fish and Wildlife Service		
Federal Emergency Management Agency, Region IX		
COUNTY		
Department of Environmental Management		
Department of Parks and Recreation		
Department of Public Works		
Department of Research and Development		
Department of Water Supply		
Fire Department		
Office of Housing and Community Development		
Planning Department		2/8/2024
Cultural Resources Commission		
Police Department	1/24/2024	
Mass Transit Agency		
Office of Aging		
ELECTED OFFICIALS		

**WAIKŌLOA PUBLIC LIBRARY
FINAL ENVIRONMENTAL ASSESSMENT/ FINDING OF NO SIGNIFICANT IMPACT**

Agencies/Organizations/Individuals	Comments Received During Statutory 30-Day Public Review Period	Comments Received Outside of 30-Day Public Review Period
State Senator Tim Richards		
State Representative David Tarnas		
County Councilmember Cynthia Evans		
UTILITIES		
Hawaiian Electric Company, Inc.		
Spectrum		
Hawaiian Telcom		
CITIZEN GROUPS/INDIVIDUALS, OTHER CONSULTED PARTIES		
Waikōloa Village Association		
Friends of the Library – Waikoloa Region		
April Queja	1/10/2024	

1.9.3 HSPLS Community Meeting

On February 27, 2024, HSPLS hosted a community meeting at the Waikōloa Village Association Community Room from 5:00 PM to 6:30 PM. Notice of the meeting was circulated via the Friends of the Library – Waikoloa Region, State Representative David Tarnas, and County Councilmember Cynthia Evans.

HSPLS gave a general presentation on the proposed Waikōloa Public Library. Several conceptual drawings were shared and feedback was encouraged. HSPLS also hosted a brief question and answer period following the presentation. Popular topics of discussion included designing the library so that it is climate-adaptable, particularly to wind, and identifying the ideal uses of the new library. Approximately 65 people were in attendance, including State Representative David Tarnas, State Senator Tim Richards (online), County Councilmember Cynthia Evans, and State of Hawai‘i Board of Education Board Member Kaimana Barcarse.

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DATE: 7/24/2023

LEGEND



-  Project Site
-  TMK Parcels

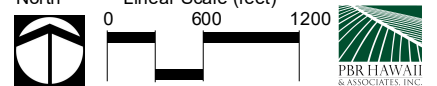


Figure 1
Regional Location Map

Waikoloa Public Library

State of Hawaii - Department of Accounting and General Services
Island of Hawaii
North

Linear Scale (feet)
0 600 1200

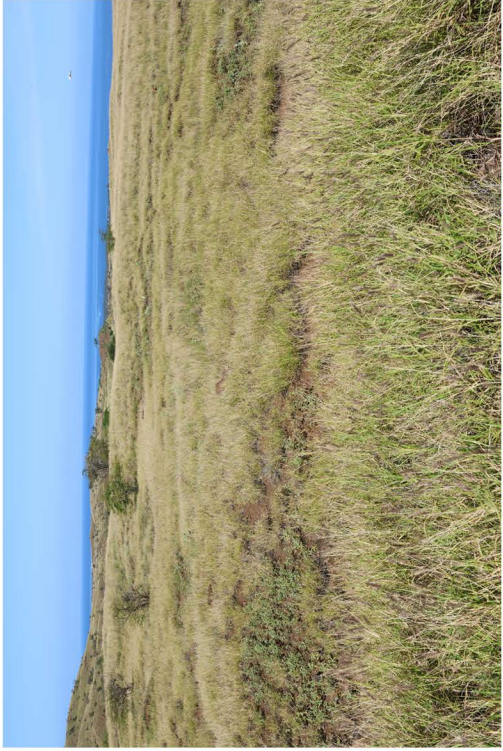


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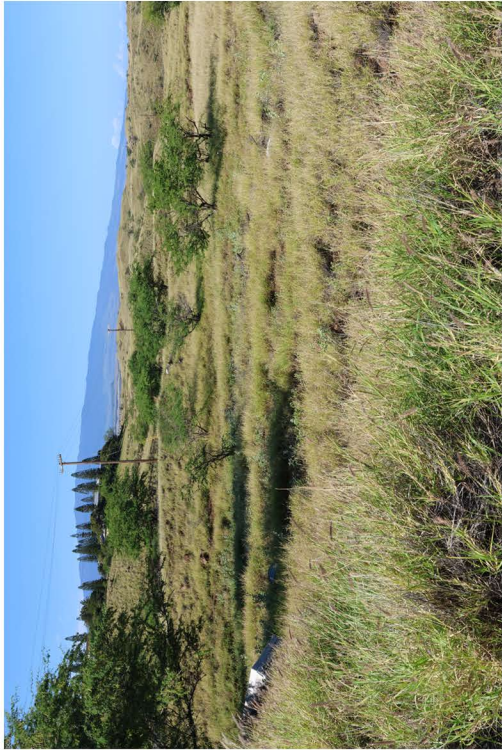
Source: County of Hawaii, 2022. Esri Basemap.
Disclaimer: This graphic has been prepared for general planning purposes only and should not be used for boundary interpretations or other spatial analysis.



• Photo 1: View mauka, existing groundcover on Project site



• Photo 2: View makai, existing groundcover on Project site.



• Photo 3: View mauka, existing groundcover on Project site.



• Photo 4: View makai, existing groundcover on Project site.

DRAFT 07/24/2023

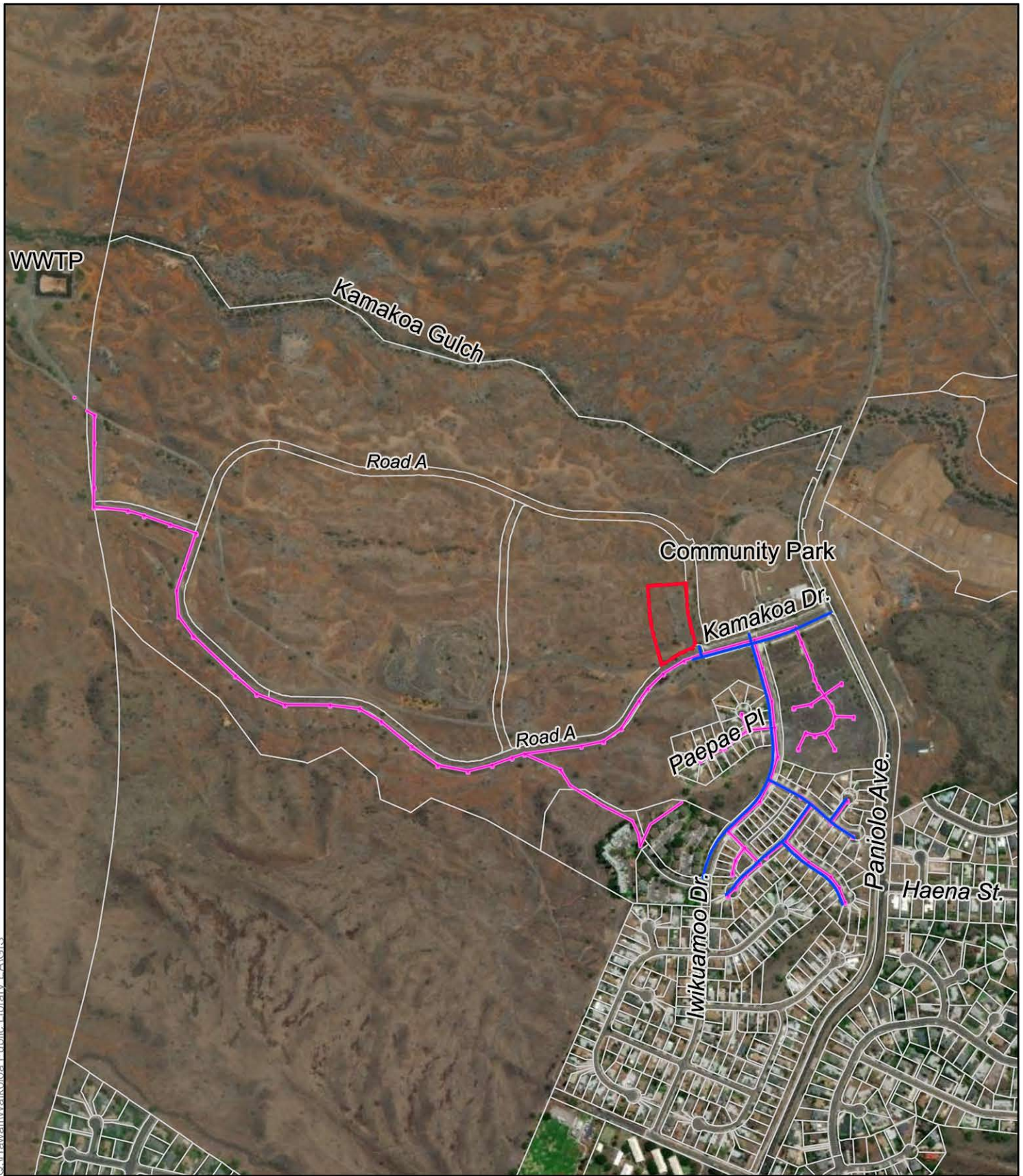
Figure 2: Site Photos

Waikoloa Public Library

State of Hawaii – Department of
Accounting and General Services

Island of Hawaii





C:\Hawaii\Waikoloa Public Library EA\GIS

LEGEND

- Project Area
- Gravity Sewer Line Installed In Road A ROW
- Water Line Installed Under the Paved Kamakoa Dr.

Figure 3

**Existing Infrastructure
Improvements**

Waikoloa Public Library

State of Hawai'i – Department of Accounting and General Services
 North Linear Scale (feet)
 0 400 800

Island of Hawai'i
 PBR HAWAII & ASSOCIATES, INC.

Source: County of Hawai'i, 2022. USDA NRCS, 2020.

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DATE: 7/24/2023

LEGEND




-  Project Site
-  TMK Parcels

Figure 4
Tax Map Key
Waikoloa Public Library

State of Hawaii - Department of Accounting and General Services
 Island of Hawaii
 North
 Linear Scale (feet)
 0 125 250

Source: County of Hawaii, 2022. USDA NRCS, 2020.
 Disclaimer: This graphic has been prepared for general planning purposes only and should not be used for boundary interpretations or other spatial analysis.

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2.0 PROJECT DESCRIPTION

This section provides background information and a general description of the Waikōloa Public Library (Project).

2.1 BACKGROUND AND NEED FOR THE PROJECT

Currently, the Waikōloa Village community is served by a Book Mobile, managed by the Friends of the Library. The Book Mobile includes a truck containing books and movable, covered picnic benches. According to the Friends of the Library website, the Book Mobile is open from 9 AM to 5 PM daily and is dependent on funding and volunteers from the Friends of the Library. The nearest permanent public library is located approximately 18 miles to the northeast in Waimea. With the population in Kamakoa Nui, Waikōloa Village, and South Kohala only expected to grow in the coming years, a permanent public library and ELC with modern technology, educational resources, and learning spaces is desired for the Waikōloa Village community.

2.2 PROJECT OBJECTIVES

As new residents move into Kamakoa Nui, a permanent public library and ELC with modern technology, educational resources, and learning spaces is desired for the greater Waikōloa Village community. As such, the Waikōloa Public Library is intended to support an increasing range of community needs including early learning programs, library programs, kupuna classes, and flexible meeting spaces.

2.3 DESCRIPTION OF THE PROJECT

The proposed Project includes a new, approximately 12,000 square foot public library, approximately 3,000 square foot ELC, 71-stall surface parking lot, and complimentary landscaping. The proposed library includes shelving for a minimum of 50,000 books, private meeting rooms, a program room, a work room, support space, and a librarian’s office. The ELC, connected to the library, will have two classrooms, each capable of accommodating roughly 20 students. Once the library is constructed, the existing Waikoloa Book Mobile would be decommissioned and staged in a wind-protected outdoor learning area that would be used for large gatherings, as well as to host book sales by the Friends of the Library, which has promoted, fundraised, and maintained the Book Mobile for the community.

During the Draft EA public review period, OPSD commented:

“Thank you for the opportunity to comment. The Office of Planning and Sustainable Development has no comments at this time.”

During the Draft EA public review period, April Queja, a Waikōloa Village resident, commented:

“This letter is in support of the proposed location, scope and timeline for the Waikoloa Public Library per the draft Environmental Impact Assessment found online. I appreciate

the thorough effort to ensure the development will be done in a responsible way. I also support the timeline of completion within this decade.

We moved to the village in 2009 with a newborn and a two year old. Those kids are now in high school and have grown up without a public library in their neighborhood. Our youngest is 9 and an avid reader and I sincerely hope he will be able to access this facility while he is still attending school within the village. (High school is 30 miles away and kids are gone from 8am to 4:30 pm with the long bus ride). We appreciate the bookmobile and also utilize the Thelma Parker library, but it can not compare to having a real library within bicycle distance. Please do everything in your power to continue bringing infrastructure and development to our growing neighborhood.”

During the Draft EA public review period, the State of Hawai‘i Department of Defense commented:

“The State of Hawaii Department of Defense has no comments to offer relative to the project at this time.”

During the Draft EA public review period, the State DLNR, Land Division wrote:

“We have no objections.”

2.4 PROJECT COST AND IMPLEMENTATION TIMEFRAME

The current construction budget is approximately \$25,000,000 in 2027 dollars. As of this publication, construction of the Waikōloa Public Library is anticipated to start in July 2026 and expected be completed in December 2028.

3.0 DESCRIPTION OF THE NATURAL ENVIRONMENT, POTENTIAL IMPACTS, AND MITIGATION MEASURES

This section describes the existing conditions of the physical or natural environment, potential impacts of the Project to the environment, and mitigation measures to minimize impacts.

3.1 CLIMATE

The climate of Hawai‘i is relatively moderate throughout the State and for most of the year. Hawai‘i lies within the belt of northeasterly trade winds generated by the semi-permanent Pacific high-pressure cell to the north and east. The South Kohala district, located on the northwestern slopes of Mauna Kea, is sheltered by trade winds and winds are generally light and variable. During the day, winds tend to move onshore because of sea breeze and upslope wind effects. At night and during the early morning hours, however, winds are generally land breezes and move downslope.

Areas exposed to the trade winds tend to have the least temperature variation, while inland and leeward areas often have the most variation. At the Property’s elevation, daily temperatures can range between 55 and 93 degrees Fahrenheit. Rainfall on Hawai‘i island is highly variable. The lower elevations of South Kohala are some of the driest areas in the State. Most rainfall in the South Kohala district occurs in conjunction with winter storms and summer afternoon showers. In Waikōloa Village, the average annual rainfall is approximately 12 inches. Humidity is relatively constant year-round at around 40 percent.

Potential Impacts and Mitigation Measures

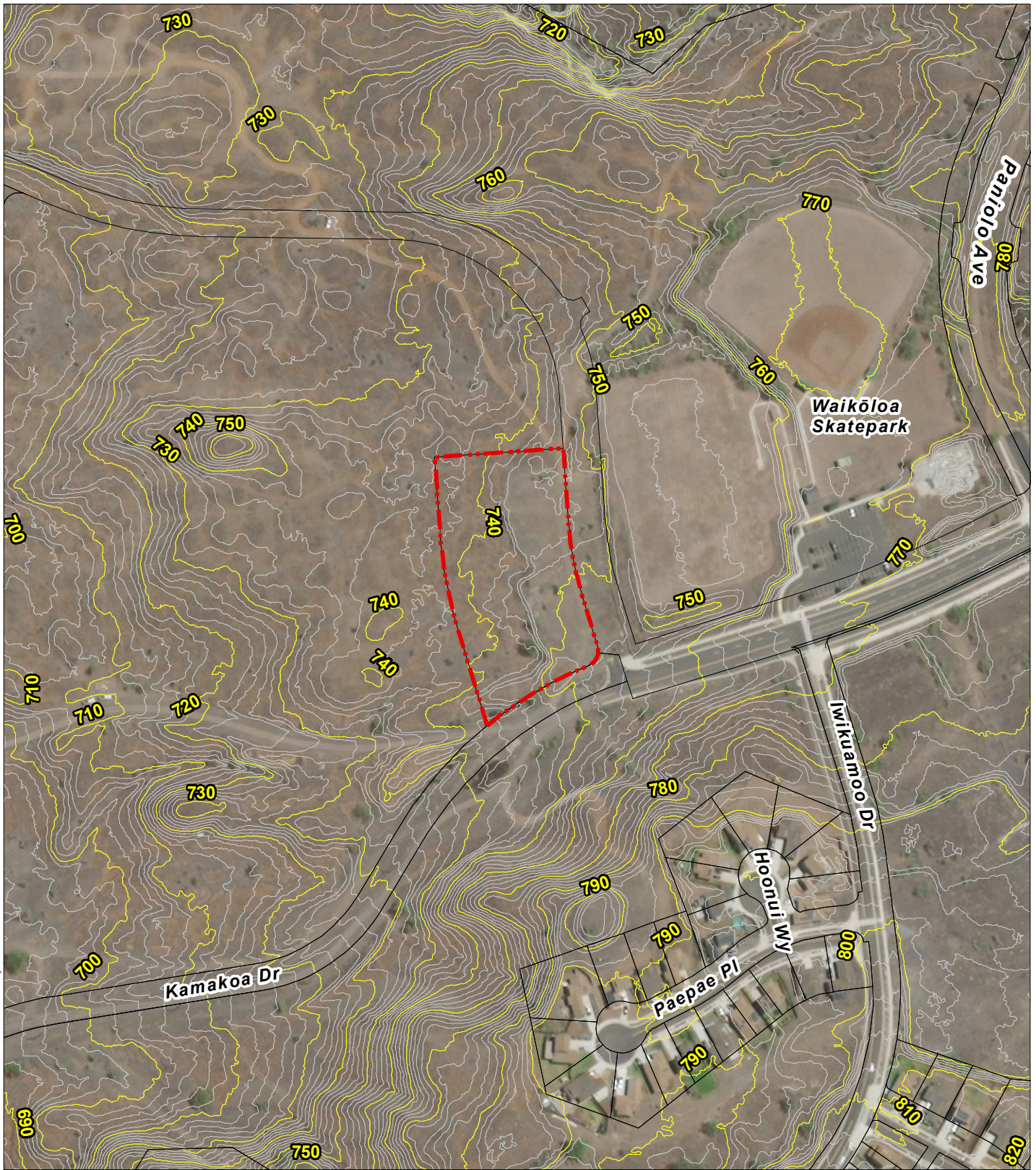
The proposed Project is not anticipated to result in nor constitute a source of impact to rainfall or climate of the Project area or region. Therefore, no mitigation measures are required.

3.2 TOPOGRAPHY

The Project site slopes up from west to east with the east side of the site roughly 10 feet higher in elevation than the west. The Project site consists of uncovered soil, low lying grasslands, and rock outcroppings. The elevation of the Project site is approximately 740 feet above mean sea level (AMSL).





Potential Impacts and Mitigation Measures

The proposed Project includes a new, approximately 12,000 square foot public library, approximately 3,000 square foot ELC, 71-stall surface parking lot, and complimentary landscaping. Grading and site preparation work will be minimal and thus, the proposed Waikōloa Public Library will have a negligible effect on the topography of the area (Figure 5).



DATE: 7/31/2023


LEGEND

-  Project Site
-  TMK Parcels
-  10 ft Topography
-  2 ft Topography


Source: County of Hawai'i, 2022.
 Disclaimer: This graphic has been prepared for general planning purposes only and should not be used for boundary interpretations or other spatial analysis.

Figure 5
Topography
Waikoloa Public Library

State of Hawai'i - Department of Accounting and General Services
 North
 Linear Scale (feet)
 0 125 250



Island of Hawai'i
 PBR HAWAII & ASSOCIATES, INC.



3.3 SOILS

There are three soil suitability studies prepared for lands in Hawai‘i whose principal focus has been to describe the physical attributes of land and the relative productivity of different land types for agricultural production. These studies are: 1) the U.S. Department of Agriculture Natural Resource Conservation Service Soil Survey; 2) the University of Hawai‘i Land Study Bureau Detailed Land Classification; and 3) the State Department of Agriculture’s Agricultural Lands of Importance to the State of Hawai‘i.

3.3.1 Natural Resources Conservation Service

The Natural Resources Conservation Service (NRCS) Soil Survey for the Island of Hawai‘i classifies one primary soil on the Project site: Hapuna-Waikui-Lalamilo complex, 0 to 20 percent slopes (Map Unit 373) (Figure 6). This complex consists of somewhat excessively drained and extremely stony soils that formed in volcanic ash. A representative profile contains a two-inch thick dark brown layer of extremely stony very fine sandy loam. Below that is a dark red-brown layer of stony silt loam. Hard pahoehoe lava bedrock is found at a depth of approximately 33 inches.

According to the Soil Survey of the island of Hawaii, State of Hawai‘i (USDA Soil Conservation Service, 1973), the Hapuna series consists of very cobbly, well drained soils. These soils formed in organic material mixed with minor amounts of basic volcanic ash over ‘a‘ā lava. Slopes range from 0 to 20 percent. The Waikui series also consists of very cobbly, deep, well drained soils. These soils formed in organic material mixed with minor amounts of basic volcanic ash over ‘a‘ā lava. Slopes range from 0 to 20 percent. The Lalamilo series also consists of fine sandy loam that is medium deep and well drained. These soils formed in organic material mixed with minor amounts of alluvium over basic volcanic ash. Slopes range from 0 to 20 percent.

3.3.2 Land Study Bureau Detailed Land Classification

The University of Hawai‘i Land Study Bureau (LSB) document, Detailed Land Classification, Island of Hawai‘i, classifies soils based on a productivity rating. Letters indicate class of productivity with A representing the highest class and E the lowest. The soils of the Project site are unclassified by LSB (Figure 7). This means that soils at the site are not considered to be suitable land for agriculture, or it was already designated within the State Land Use Urban District during the study

3.3.3 Agricultural Lands of Importance to the State of Hawai‘i

The Agricultural Lands of Importance to the State of Hawai‘i (ALISH) system classifies important agricultural lands as Prime, Unique, or Other Agricultural Land. The land underlying the Project site is unclassified (Figure 8).

Potential Impacts and Mitigation Measures

The proposed Project will not reduce the inventory of agriculturally significant land. The Project site has a NRCS land capability classification of VIs (Hapuna and Waikui series) and IVe

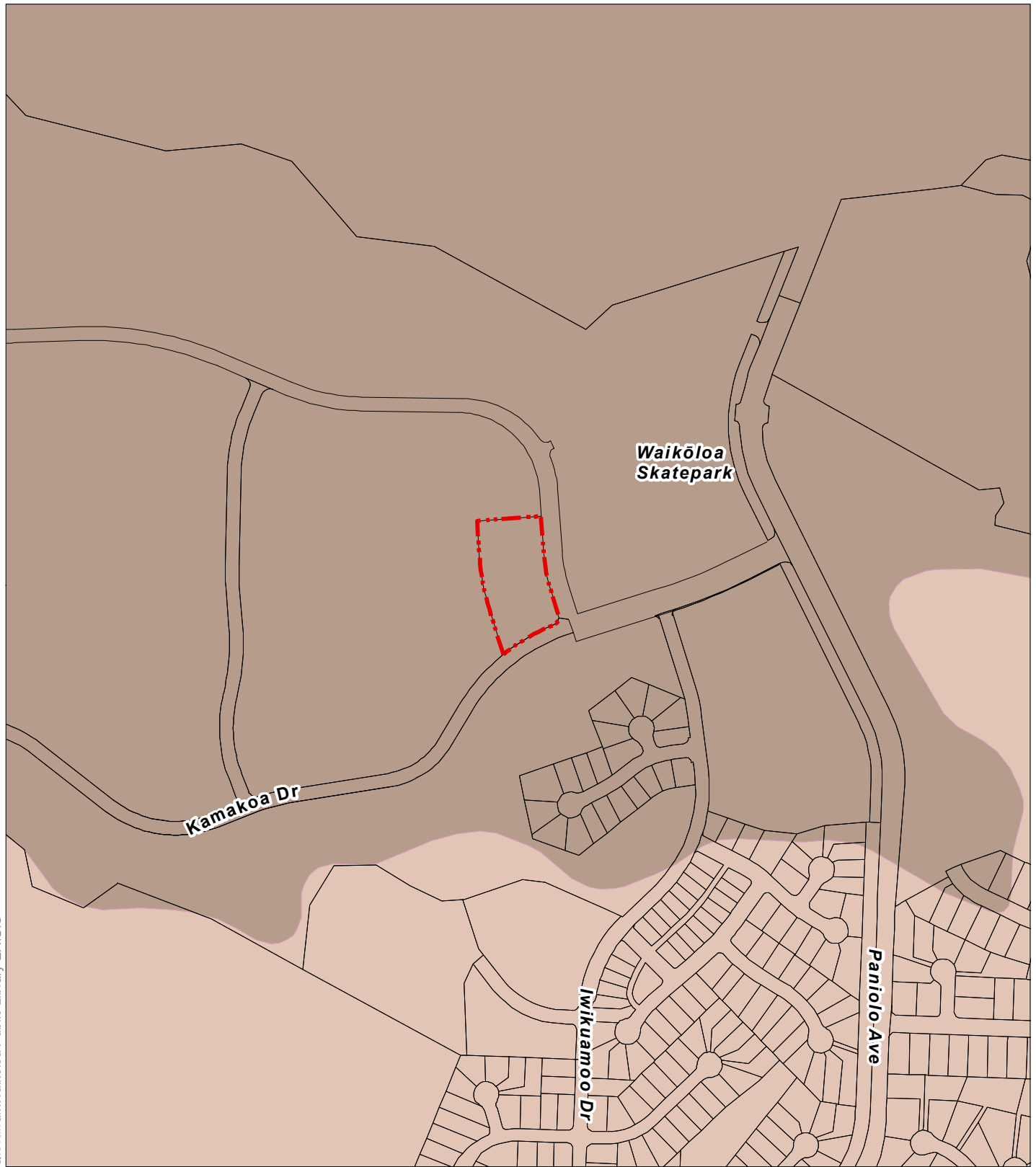
(Lalamilo series). Class VI soils have severe agricultural limitations that make them generally unsuited to cultivation and that limit their use mainly to pasture, range, forestland, or wildlife food and cover. Class IV soils and landforms have very severe limitations that restrict the choice of plants or require very careful management, or both. Subclass *s* soils have soil limitations within the rooting zone, such as shallowness of the rooting zone, stones, low moisture-holding capacity, low fertility that is difficult to correct, and salinity or sodium content. Subclass *e* soils are made up of soils for which the susceptibility to erosion is the dominant problem or hazard affecting their use. Erosion susceptibility and past erosion damage are the major soil factors that affect soils in this subclass. In addition, the Project site is not classified under the LSB and ALISH classification system.

Impacts to the soils of the Project site include the potential for soil erosion and the generation of dust during grading and construction. Clearing and grubbing activities will temporarily disturb the soil retention values of the existing vegetation and expose soils to erosional forces. Some wind erosion of soils could occur without a proper watering and re-grassing program. Heavy rainfall could also cause erosion of soils within disturbed areas of land. Best Management Practices (BMPs) that include both structural and non-structural controls will be incorporated into temporary construction practices and permanent site design to minimize impacts. BMPs utilized during construction may include the following:

- Minimizing the time of construction including coordinated phasing for site control;
- Retaining existing ground cover as long as possible;
- Constructing drainage and erosion control features early;
- Using temporary area sprinklers in non-active construction areas when ground cover is removed;
- Providing a water truck on-site during the construction period to provide for immediate sprinkling, as needed;
- Using temporary ground-cover, berms and cut-off ditches, where needed, for control of erosion;
- Watering graded areas when construction activity for each day has ceased;
- Grassing or planting all cut and fill slopes immediately after grading work has been completed; and
- Installing silt fences, sediment traps, and diversion swales, where appropriate.



Construction activities will comply with all applicable Federal, State, and County regulations and rules for erosion control. Grading activities will follow BMPs as described in the grading permit. After construction, establishment of permanent landscaping will provide long-term erosion control.

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DATE: 7/31/2023

LEGEND

-  Project Site
-  TMK Parcels

NRCS Soil Classifications



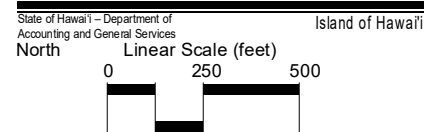
-  371: Waikui-Hapuna complex, 10 to 20 percent slopes
-  373: Hapuna-Waikui-Lalamilo complex, 0 to 20 percent slopes

Figure 6
Natural Resources Conservation
Service Soil Survey

Waikoloa Public Library



Source: County of Hawai'i, 2022. USDA NRCS, 2020.

Disclaimer: This graphic has been prepared for general planning purposes only and should not be used for boundary interpretations or other spatial analysis.



DATE: 7/31/2023

LEGEND

Project Site

TMK Parcels

LSB Land Classification

E - Very Poor

Figure 7
Land Study Bureau
Detailed Land Classification
Waikoloa Public Library






State of Hawaii - Department of Accounting and General Services
 Island of Hawaii
 North
 Linear Scale (feet)
 0 500 1000

Source: County of Hawaii, 2022.
 Disclaimer: This graphic has been prepared for general planning purposes only and should not be used for boundary interpretations or other spatial analysis.



DATE: 7/31/2023

LEGEND


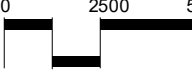

-  Project Site
- ALISH**
-  Prime ALISH
-  Unique ALISH
-  Other ALISH
-  Unclassified

Source: County of Hawai'i, 2022. State DOA & University of Hawaii at Hilo, 2021.
 Disclaimer: This graphic has been prepared for general planning purposes only and should not be used for boundary interpretations or other spatial analysis.

Figure 8
Agricultural Lands of Importance
to the State of Hawai'i

Waikoloa Public Library

State of Hawai'i - Department of Accounting and General Services
 North
 Linear Scale (feet)
 0 2500 5000

3.4 HYDROLOGY

Surface Water

There are no surface water bodies near the Project site. The lava flows associated with the Anaehoomalu aquifer system are less than 5,000 years old. Most rainfall, except in heavy storms, percolates rapidly into the porous lava. Due to higher rainfalls in the mauka areas, short and shallow stream valleys have been eroded into the surface of the volcano. The most prominent in the region is Wai‘aha Stream near Hōlualoa. Heavy localized rainfall can exceed the capacity of the shallow streams resulting in flooding of adjoining areas. Moreover, even relatively slight changes in topography through grading and other land-disturbing activities can affect the capacity of drainage courses or change the direction of flows. Areas that have not previously experienced flooding could flood during even short periods of high rainfall. The predominantly steep topography of Waikōloa Village causes runoff to flow quickly, resulting in short response times to potentially rapid flooding (County of Hawai‘i Planning Department, 2008).

Ground Water

The occurrence of groundwater resources in the State of Hawai‘i is highly variable in extent and type. Aquifers range from being limited in size to being very extensive, and from being isolated to being connected with other aquifers. Under the State’s Water Resource Protection Plan, aquifers of the Island of Hawai‘i have been classified under an aquifer coding system. This coding system is composed of Aquifer Sectors, and then Aquifer Systems located within these sectors. An Aquifer Sector reflects an area with broad hydrogeological (subsurface) similarities while maintaining traditional hydrographic (surface), topographic, and historical boundaries. The Aquifer System is an area within a sector that is more specifically defined by hydrogeologic continuity, particularly hydraulic connections among aquifer types and units.

On the Island of Hawai‘i, groundwater is the primary source of drinking water. In Waikōloa Village, groundwater occurs as both basal groundwater and high-level (dike-impounded perched) groundwater. The basal lens in Waikōloa Village is relatively thin and inconsistent due to the low rainfall input and the lack of a geological “plug” that could slow the leakage of the groundwater at the coastline. Consequently, wells drawing from basal groundwater in Waikōloa Village are susceptible to salinity if they are drilled too deep or if they are over-pumped. In the 1990s, exploratory wells drilled above the 1,600-foot elevation in Waikōloa Village encountered high-level (dike-impounded perched) groundwater 25 to 460 feet above sea level (County of Hawai‘i Planning Department, 2008).

The Project is situated in the Anaehoomalu Aquifer System (80701), which is within the Northwest Mauna Loa Aquifer Sector Area. Groundwater aquifers of the Northwest Mauna Loa Aquifer Sector Area volcanics are known to extend at least 5 to 10 miles inland.

Wetlands

There are no large freshwater surface streams, ponds, lakes, or wetlands near the proposed Waikōloa Public Library Project site (Figure 9).

Potential Impacts and Mitigation Measures

No adverse impacts on groundwater are anticipated with implementation of the proposed Project. The underlying aquifer at the site is not considered a drinking water source. No direct, indirect, or cumulative impacts on surface waters within or in the vicinity of the Project site are anticipated with implementation of the proposed Project as there are no surface water features such as rivers, streams, lakes, ponds, or wetlands on or within proximity of the Project site.

During construction, soil erosion impacts would be mitigated by incorporating BMPs and erosion control measures into the Project plans and specifications. Specific measures may include but are not limited to: phasing the Project to minimize the total area of exposed soil at any given time, revegetating or stabilizing disturbed areas of soil as soon as possible after working, minimizing disturbance of soil during periods of heavy rain, applying protective covers to soil and material stockpiles, and installing appropriate erosion and sedimentation control devices during construction. Strong engineering and management controls would also need to be implemented, such as the use of personal protective equipment for workers and air monitoring.

Soil erosion impacts would also be mitigated through coordination with the appropriate agencies during permitting and construction. A NPDES permit for storm water runoff from construction activities is anticipated to be required as individual and/or cumulative soil disturbances in the Project area would exceed one acre of land area. Any discharges related to Project construction or operation activities will comply with applicable State Water Quality Standards as specified in HAR, Chapter 11-54 Water Quality Standards and Chapter 11-55 Water Pollution Control, DOH.

Because the Project site lies outside of the floodplain, no additional flood mitigation measures are warranted. Although the proposed Project is anticipated to increase the amount of impervious surface area on the proposed Project site, improvements to the Project's existing storm drainage system will be designed to comply with the latest Storm Drainage Standards in Section 27-26 of the Hawai'i County Code 1983 (2005 Edition). To the extent practicable, the Project will be designed to maintain post-development peak runoff rate and average volume at levels that are similar to pre-development levels.

All NPDES permit requirements will be implemented. In accordance with these requirements, the Project will utilize several BMP categories, including infiltration practices, vegetated open channel practices, and filtering practices, defined in the Environmental Protection Agency's (EPA) guidance document entitled National Management Measures to Control Nonpoint Source Pollution from Urban Areas (November 2005, EPA-841-B-05-004). The EPA has found these practices to be representative of the types of practices that can be applied successfully to achieve the new development runoff management, and such measures are reflected in the State Office of Planning (OP), Coastal Zone Management's publication, Hawai'i Watershed Guidance.

OP has also created the Stormwater Impact Assessment to identify and evaluate information on hydrology, stressors, sensitivity of aquatic and riparian resources, and management measures to control runoff occurrences. Mitigation measures and BMPs listed in this guide can be applied to water runoff strategies to prevent damage to coastal ecosystems. Based on Project conditions, relevant BMPs from the Stormwater Impact Assessment that may be implemented during construction include:

- Early construction of drainage control features;

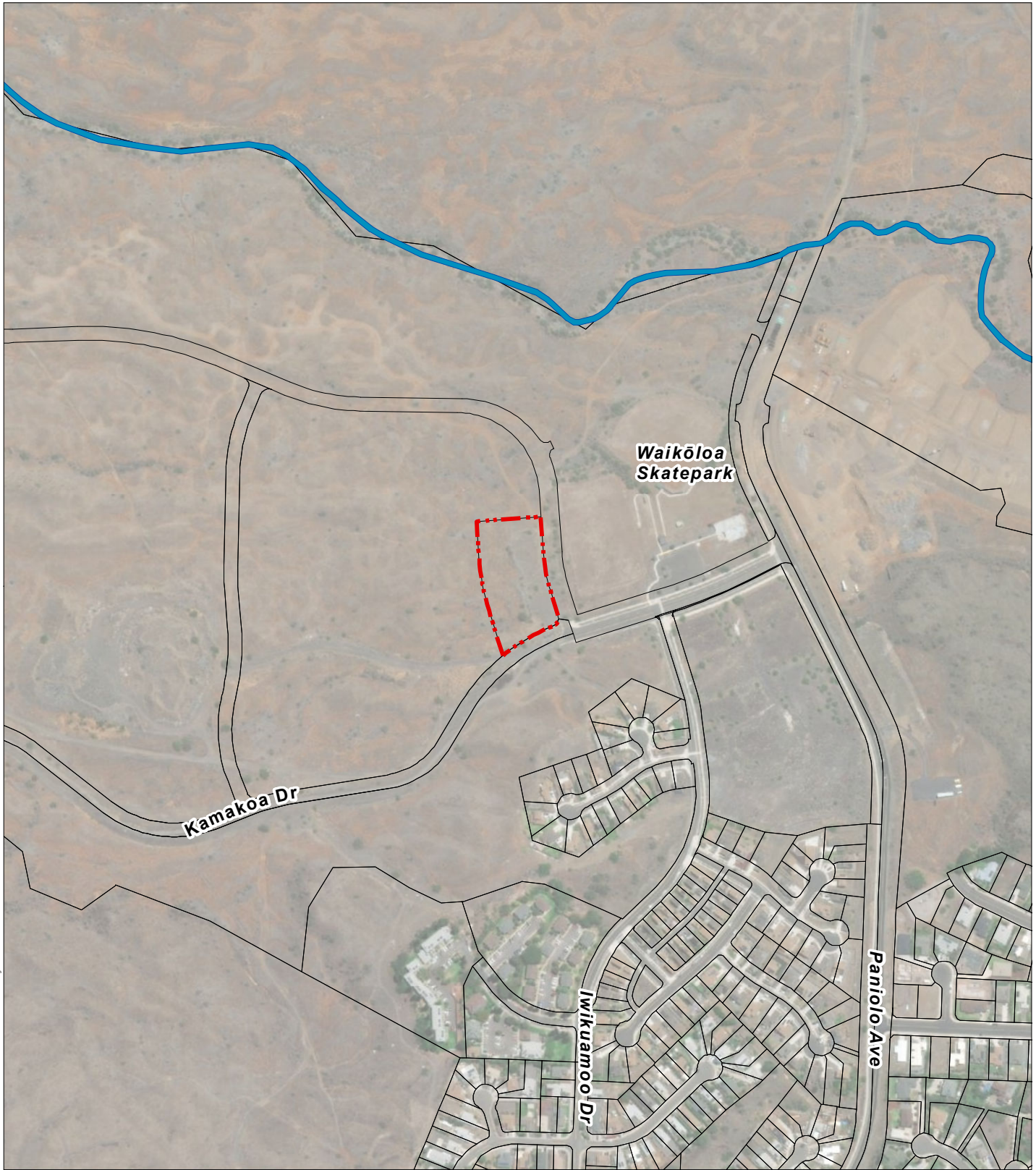
- Construction of temporary sediment basins to trap silt;
- Use of temporary berms and cut-off ditches where needed; and
- Use of temporary silt fences or straw bale barriers to trap silt.

All grading operations will be conducted in compliance with dust and erosion control requirements of Chapter 10 (Erosion and Sedimentation Control), HCC and applicable provisions of Chapter 11-60.1, HAR, Section 11-60.1-33 regarding Fugitive Dust. A watering program will be implemented during construction to minimize soil loss through fugitive dust emission. Other pollution control measures include cleaning job-site construction equipment and establishing groundcover as quickly as possible after grading. Permanent landscaping will also help to retain soil throughout the Project Site.

The proposed Project does not involve work in, over, or under waters of the United States and thus would not require permits issued by the U.S. Army Corps of Engineers. However, pursuant to Federal Water Pollution Control Act, (commonly known as the "Clean Water Act"), Paragraph 401(a)(1), a Section 401 Water Quality Certification (WQC) from the State of Hawai'i Department of Health, Clean Water Branch, will be required if it is determined that the Project may result in any discharge into navigable waters or as otherwise triggered. Direct discharges of storm water runoff into marine waters are not expected to occur due to: 1) the implementation of BMPs, to reduce airborne dust and waterborne silt during construction; and 2) the distance from the shoreline. Any discharges related to the construction and operation of the Project will comply with the State's Water Quality requirements contained in Chapters 11-54 and 11-55, HAR.

The Project is not anticipated to result in direct discharge of storm water runoff into marine waters due to its inland location. Similarly, due to distance from existing streams and topography, it is highly unlikely that storm runoff from the Project will impact surface water resources.

C:\Hawaii\Waikoloa Public Library EA\GIS



DATE: 7/31/2023

LEGEND




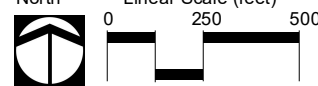

-  Project Site
-  TMK Parcels
- Wetlands**
-  Riverine

Figure 9
Surface Water and Wetlands
Waikoloa Public Library

State of Hawai'i - Department of Accounting and General Services
 North
 Linear Scale (feet)
 0 250 500



Island of Hawai'i
 PBR HAWAII & ASSOCIATES, INC.



Source: County of Hawai'i, 2022.USFWS National Wetland Inventory, 2019.
 Disclaimer: This graphic has been prepared for general planning purposes only and should not be used for boundary interpretations or other spatial analysis.

3.5 NATURAL HAZARDS

The Island of Hawai‘i is susceptible to potential natural hazards, such as flooding, tsunami inundation, hurricanes, earthquakes, lava flows, and wildfires. This section provides an analysis of the Site’s vulnerability to such hazards.

Flooding

During the Pre-Assessment consultation process, the State DLNR, Engineering Division wrote:

“The owner of the project property and/or their representative is responsible to research the Flood Hazard Zone designation for the project. Flood Hazard Zones are designated on FEMA’s Flood Insurance Rate Maps (FIRM). The official FIRMs can be accessed through FEMA’s Map Service Center (msc.fema.gov). Our Flood Hazard Assessment Tool (FHAT) (<http://gis.hawaiiinfip.org/FHAT>) could also be used to research flood hazard information.”

During the Draft EA public review period, the State DLNR, Engineering Division wrote:

“We have no additional comments.”

According to Flood Insurance Rate Map Number 1551660310F, the Waikōloa Public Library site is located within Flood Hazard Zone X, areas determined to be outside the 0.2% annual chance floodplain (Figure 10).

Tsunami

Twenty-five of the tsunamis recorded in Hawai‘i since 1812 have had an adverse impact on the Island of Hawai‘i, seven caused major damage, and three were generated locally. The most recent tsunami to impact Hawai‘i Island occurred on March 11, 2011, causing property damage at several locations on the Kona coast. There are no records of inundation of lands in the vicinity of the Project site during any of the recorded tsunami.

The proposed Project site is not located in a Tsunami Evacuation Zone or an Extreme Tsunami Evacuation Zone (Figure 11). Therefore, the Project site is not expected to be adversely affected by a Tsunami.

Hurricanes

Hurricanes are classified into one of five categories according to the Saffir-Simpson Hurricane Scale. This scale provides some indication of the potential damage and flooding a hurricane will cause upon landfall. Since 1980, two hurricanes have had a devastating effect on Hawai‘i. They were Hurricane ‘Iwa in 1982 (Category 1 - sustained winds between 75–95 miles per hour (mph)) and Hurricane ‘Iniki in 1992 (Category 4 - sustained winds between 131–155 mph). In both instances, damage was sustained primarily on the Islands of Kaua‘i and O‘ahu. While it is difficult to predict such natural occurrences, it is reasonable to assume that future hurricanes are likely, given historical events. However, the Island of Hawai‘i has historically received less threat and damage from hurricanes as compared to the Island of Kaua‘i.

Hurricane events may also cause a storm surge, which is an abnormal rise of water generated by a storm, over and above the normal tidal levels. This rise in water level can cause extreme flooding in coastal areas, particularly if a storm surge coincides with a normal high tide (NOAA, n.d.).

The proposed Project site is not located in an area identified by the US National Oceanic and Atmospheric Administration (NOAA) National Hurricane Center Storm Surge Risk Map as being inundated during even a Category 4 Hurricane event. Therefore, the Project site is not expected to be adversely affected by hurricanes (Categories 1 through 4).

Earthquakes

In Hawai‘i, most earthquakes are linked to volcanic activity, unlike other areas where a shift in tectonic plates is the cause of an earthquake. Each year, thousands of earthquakes occur in the islands, particularly on the Island of Hawai‘i, the vast majority of which are detectable only with highly sensitive instruments. However, moderate and disastrous earthquakes have occurred in the islands in the past. The largest earthquake in the state (magnitude 7.9) occurred in 1868 on the Island of Hawai‘i.

On the Island of Hawai‘i, earthquakes may occur before or during a volcanic eruption, or may result from the underground movement of magma that comes close to the surface. The majority of the island’s seismicity is related to the movement of magma within Kīlauea or Mauna Loa. A few of the island’s earthquakes are less directly related to volcanism. These originate in the zones of structural weakness at the base of volcanoes or deep within the earth beneath the island due to the gravitational adjustment of the volcanic edifice.

Non-volcanic Hawaiian earthquakes reflect the long-term accumulation and release of lithospheric stresses, rather than short-term processes associated with the motion of magma before or during an eruption. The long-term stresses consist in part of stresses generated in the crust and mantle by the weight of the volcanic rock that composes the islands. In that sense, most Hawaiian earthquakes that are not directly associated with eruptions are nonetheless broadly related to volcanic activity.

The seismic risk classification of the Island of Hawai‘i is Zone 4 Seismic Probability Rating, which indicates a 10 percent chance of severe shaking in a 50-year interval. Seismic tremors on the island have caused ground cracks, landslides, ground settlement, damaging tsunami, and mudflows. Buildings, bridges, and water tanks have been destroyed or damaged, and utility, sewer, and water lines have been disrupted (Fletcher III, Grossman, Richmond, & Gibbs, 2002). New construction could be impacted by seismic activity resulting in destruction and possible injury or loss of life.

The seismic hazard is highest along the southeast coast of the Island of Hawai‘i, followed by the Kona coast. The locations of larger damaging earthquakes of magnitude 6 or greater since 1868 on the Island of Hawai‘i have generally occurred on the southern half of the island, primarily on the eastern end. The most recent large earthquake on Hawai‘i Island occurred on May 4, 2018, on the south flank of Kīlauea, with a magnitude of 6.9.

The largest earthquake in recent history in closest proximity to the Project Site occurred off Kīholo Bay (about 10 miles from the Project Site), on October 15, 2006, and registered a magnitude of 6.7. On November 29, 1975, a magnitude 7.4 earthquake occurred at Kīlauea, resulting in the deaths of two people and causing significant damage in the southern part of Hawai‘i Island, while also triggering a brief eruption of Kīlauea. A magnitude 6.9 tremor on August 21, 1951, damaged

homes on the Kona coast and triggered numerous damaging landslides. As mentioned above, the largest earthquake on the Island of Hawai‘i on record was a magnitude 7.9 that occurred in 1868 near the south coast which triggered a tsunami along the Ka‘ū-Puna coast that drowned 46 people and which spawned numerous landslides that resulted in 31 deaths.

Volcanic Hazards

Hawaiian volcanoes erupt either at their summits where lava collects and may overflow from craters called calderas, or along their flanks where lava issues through fractures called rift zones. The volcanic hazard is associated with lava flows, explosive eruptions, airborne lava fragments, poisonous and corrosive volcanic gases, and ground cracks and settling. Airborne ash, cinders, and other lava fragments are usually only hazardous in the immediate vicinity of an eruption (Fletcher III, Grossman, Richmond, & Gibbs, 2002).

Volcanic hazard zone maps developed for the Island of Hawai‘i were revised by the U.S. Geological Survey in 1987. The current map divides this island into zones ranked from 1 through 9 based on the probability of coverage by lava flows, with Zone 1 having the most repeatedly active vents in historic time, and Zone 9 being least active. Lava flow risks are defined according to geology, seismic and volcanic activity history, and recent scientific predictions. Hazard zones from lava flows are based mainly on the location and frequency of both historic and prehistoric eruptions. Hazard zones also take into account larger topographic features of the volcanoes that will affect the distribution of lava flows.

Based on this map, the Project site is located within an area with a hazard zone rating of 8 (Figure 12). This hazard zone area includes the remaining part of Mauna Kea. Only a few percent of this area has been covered by lava in the past 10,000 years. Mauna Kea Volcano is considered dormant, having last erupted approximately 4,500 years ago. Property loss and economic devastation are the most frequent consequences of lava flow. Based on the low probability of lava flows in Zone 8, there is a low concern for developing structures in the Project site area.

Climate Change & Sea Level Rise

As global temperatures increase, established patterns of weather and climate are shifting. These erratic changes in weather patterns have increased the severity of events like droughts, storms, floods, and even hurricanes, while at the same time causing these events to be more difficult to predict and protect against. The fragility of the ecosystems and unique island nature of the Hawaiian Islands make the State particularly vulnerable to the damaging effects of climate change. Global sea levels are on the rise and have the potential to erode and even inundate coastal areas over the course of the next century. The Project Site’s location at elevations approximately 740 feet AMSL should protect the Project from the worst potential impacts of sea level rise (Figure 13)

Wild-land Fires

The greatest danger of fire is where wild-land (trees and brush) borders urban areas. Although all the Hawaiian Islands are vulnerable to wild-land fires (especially during the summer months, prolonged drought and/or high winds), the great majority of wildfires are human-caused (intentionally caused or by negligence) and start along roadsides. The numbers of such fires are increasing. Wildfires can and do also occur naturally. Hawai‘i County has a Fire Prevention Bureau that works to prevent fires before they can cause injuries and property damage. DOFAW

has authority under Chapter 185, Hawai‘i Revised Statutes, Land Fire Protection Law, for the prevention, pre-suppression, and suppression of wildfires for forest reserves. It also has the authority to cooperate with established fire control agencies for the protection of lands not within the Department’s protection areas. The Project will comply with all fire code requirements.

Potential Impacts and Mitigation Measures

The Project is not anticipated to increase the Site’s exposure to any natural hazard. However, the Project is anticipated to increase the amount of impervious surfaces which may increase runoff and flooding, especially during a storm or heavy rain event. Storm water will be managed to ensure that there are negligible increases to the volume of flow leaving the site from current conditions. The Storm Drainage Standards described in Section 27-26 of the Hawai‘i County Code 1983 (2005 Edition) will be incorporated into drainage design to ensure the Project does not impact the existing storm water quality or volume of runoff. To satisfy the County’s standards for the protection of water quality, low-impact development (LID) features will be integrated into the Project design where feasible to essentially maintain or improve the existing storm peak flows and storm water quality exiting the site of the Project. Filtration/infiltration through vegetation will capture the majority of the increased runoff resulting from the Project and allowing it to seep into the ground rather than leaving the Site. Overflow will primarily be conveyed to grassed areas. Additional LID design measures may include pavers or pervious pavement to counteract the increase in impervious surface area, and to help groundwater recharge and decrease stormwater runoff. During construction, BMPs will be implemented to reduce the potential for storm water pollution leaving the Project area.

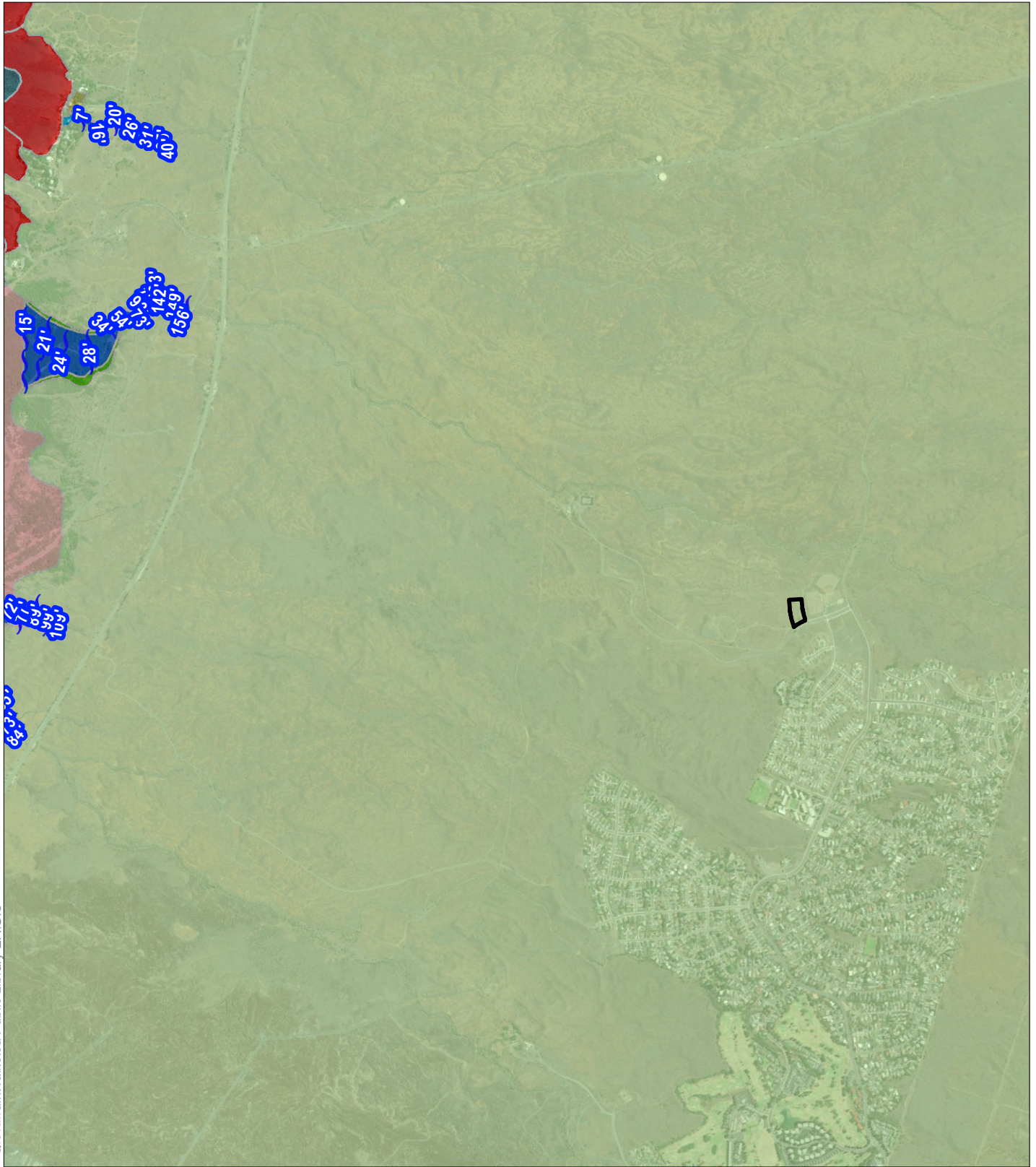
With the exception of an increase in impervious surface area, construction of the Project will not exacerbate any natural hazard conditions. Should there be a hurricane or earthquake, the potential impact of destructive winds and torrential rainfall and earth movement will be mitigated through compliance with the International Building Code. The site is located outside the designated tsunami evacuation zone and is at an elevation that is very unlikely to be impacted by a tsunami, high waves, or sea level rise. Based on the probability of lava flows in Zone 8, there is a very low concern for volcanic hazards in the area.

The Project will comply with all fire code requirements, mitigating potential impacts from wild-land fire hazards. Per comments received from DOFAW during the pre-Assessment consultation process (dated June 13, 2023):

“Due to the arid climate and risks of wildfire to listed species, we recommend coordinating with the Hawai‘i Wildfire Management Organization at (808) 850-900 or admin@hawaiiwildfire.org, on how wildfire prevention can be addressed in the project area.”

DAGS and HSPLS will coordinate with the Hawai‘i Wildfire Management Organization prior to any construction activities.

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LEGEND

Project Site

Base Flood Elevation (BFE) Line

Flood Hazard Areas

AE: 1%-Annual-Chance Flood, with BFE

AO: 1%-Annual-Chance Flood, Flood Depths of 1-3ft, Average Depths Determined

VE: 1%-Annual-Chance Coastal Flood, with BFE

AEF: Floodway Areas in

XS: 0.2%-Annual-Chance Flood

X: Outside 0.2%-Annual-Chance Floodplain

D: Unstudied

DATE: 7/31/2023

Figure 10
Flood Insurance Rate Map
Waikoloa Public Library



State of Hawaii - Department of Accounting and General Services
North
Island of Hawaii

Linear Scale (feet)
0 1250 2500

Source: County of Hawaii, 2022.USFWS National Wetland Inventory, 2019.
Disclaimer: This graphic has been prepared for general planning purposes only and should not be used for boundary interpretations or other spatial analysis.




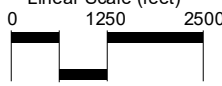

LEGEND

-  Project Site
-  Tsunami Evacuation Zone

DATE: 7/31/2023

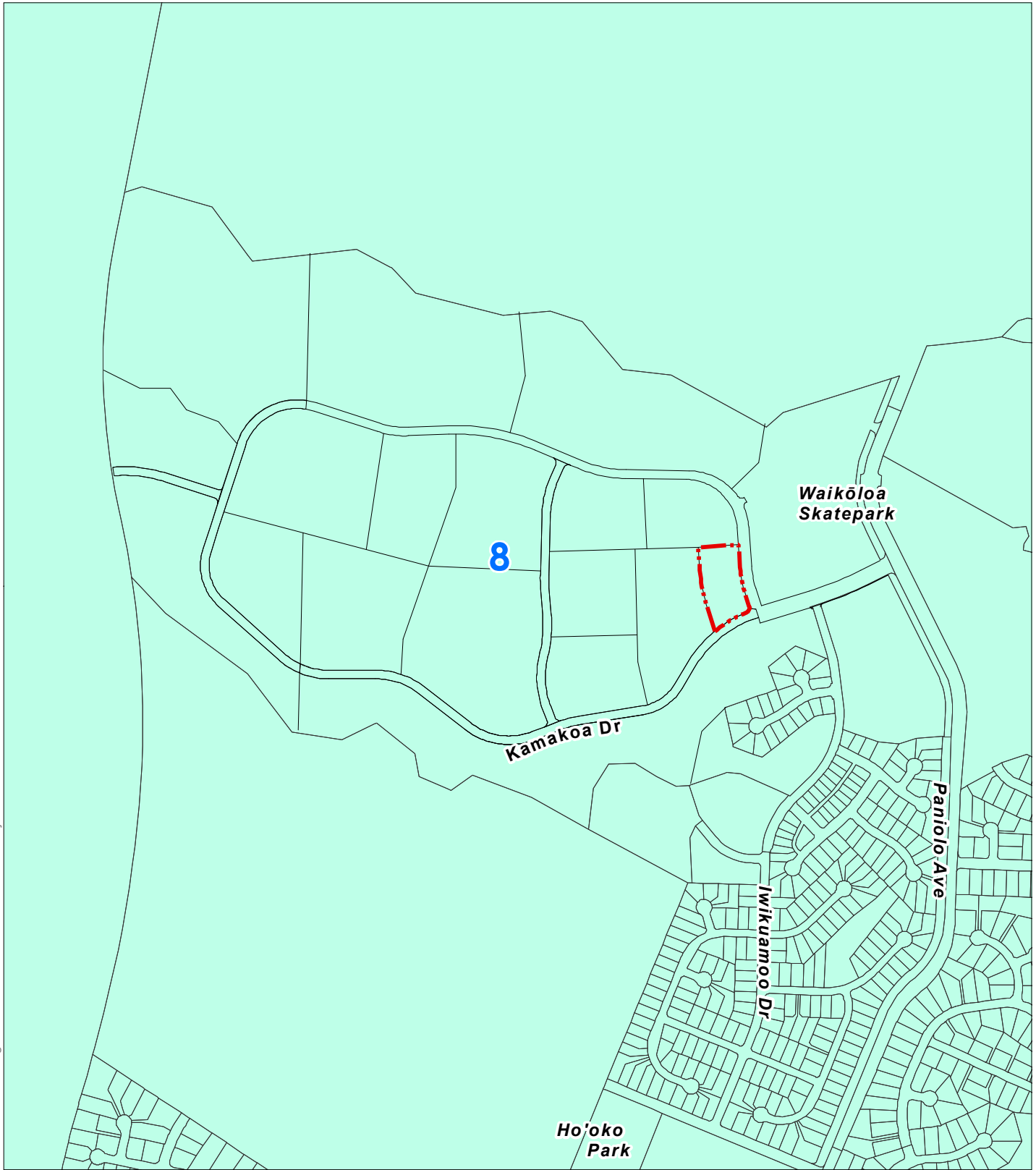
Figure 11
Tsunami Evacuation Zone
Waikoloa Public Library

State of Hawai'i - Department of Accounting and General Services
 Island of Hawai'i
 North
 Linear Scale (feet)
 0 1250 2500



Source: County of Hawai'i, 2022. Pacific Disaster Center, 1998.
 Disclaimer: This graphic has been prepared for general planning purposes only and should not be used for boundary interpretations or other spatial analysis.

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DATE: 7/31/2023

LEGEND

-  Project Site
-  TMK Parcels

Lava Flow Hazard Zones

- | | |
|---|---|
|  1 |  4 |
|  2 |  5 |
|  3 |  6 |
| |  7 |
| |  8 |
| |  9 |

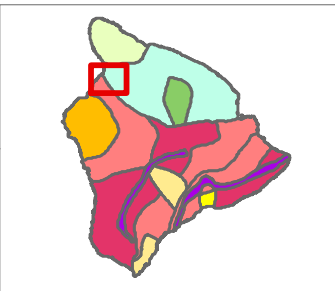
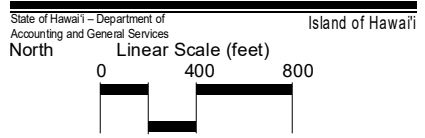


Figure 12
Lava Flow Hazard Zone Map

Waikoloa Public Library





Source: County of Hawai'i, 2022. U.S. Geological Survey, 1991.
Disclaimer: This graphic has been prepared for general planning purposes only and should not be used for boundary interpretations or other spatial analysis.

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LEGEND

-  Project Site
-  PacIOOS 3.2 ft Sea Level Rise Scenario

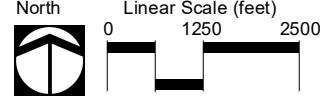

DATE: 7/31/2023

Figure 13
Sea Level Rise
Waikoloa Public Library

State of Hawai'i - Department of Accounting and General Services
 Island of Hawai'i

North

Linear Scale (feet)
 0 1250 2500

Source: County of Hawai'i, 2022. University of Hawaii Coastal Geology Group & Tetra Tech, Inc., 2017.
 Disclaimer: This graphic has been prepared for general planning purposes only and should not be used for boundary interpretations or other spatial analysis.

3.6 FLORA & FAUNA

The gently sloping Project site consists of uncovered soil, low lying grasslands, and rock outcroppings. The elevation of the Project site is approximately 740 feet AMSL. During a site assessment conducted by the Project's natural resources consultant, AECOS, on May 3, 2023, no protected botanical resources were detected. Additionally, all nine bird species observed were non-native. The Natural Resources Assessment is included as Appendix G.

Potential Impacts and Mitigation Measures

The proposed Project is not expected to impact endangered or threatened plant or animal species. There are no known significant habitats or rare, endangered, or threatened species of flora, fauna, and avifauna on the Project site. While temporary disturbance of wildlife during construction is possible, mitigation measures will be implemented to minimize impacts.

Hawaiian hoary bat

During the pre-Assessment consultation process, DOFAW wrote:

*“The State listed ‘Ōpe‘ape‘a or Hawaiian Hoary Bat (*Lasiurus cinereus semotus*) could potentially occur at or in the vicinity of the project and may roost in nearby trees. Any required site clearing should be timed to avoid disturbance to bats during their birthing and pup rearing season (June 1 through September 15). During this period woody plants greater than 15 feet (4.6 meters) tall should not be disturbed, removed, or trimmed. Barbed wire should also be avoided for any construction because bats can become ensnared and killed by such fencing material during flight.”*

The endangered Hawaiian hoary bat/‘ōpe‘ape‘a (*Lasiurus cinereus semotus*) roosts in both exotic and native woody vegetation across all islands and will leave young unattended in trees and shrubs when they forage. If trees or shrubs 15 feet or taller are cleared during the pupping season, there is a risk that young bats could inadvertently be harmed or killed since they are too young to fly or may not move away. Additionally, Hawaiian hoary bats forage for insects from as low as 3 feet to higher than 500 feet above the ground and can become entangled in barbed wire used for fencing. According to the Natural Resources Assessment prepared by AECOS, no suitable roost trees are present on the site, and it is not expected that the Project will result in deleterious impacts to the Hawaiian hoary bat.

Hawaiian seabirds

During the pre-Assessment consultation process, DOFAW wrote:

“Artificial lighting can adversely impact seabirds that may pass through the area at night by causing them to become disoriented. This disorientation can result in their collision with manmade structures or the grounding of birds. For nighttime work that might be required, DOFAW recommends that all lights used be fully shielded to minimize the attraction of seabirds. Nighttime work that requires outdoor lighting should be avoided during the seabird fledging season, from September 15 through December 15, when young seabirds make their maiden voyage to sea.”

If nighttime construction is required during the seabird fledgling season (September 15 to December 15), we recommend that a qualified biologist be present at the project site to monitor and assess the risk of seabirds being attracted or grounded due to the lighting. If seabirds are seen circling around the area, lights should then be turned off. If a downed seabird is detected, please follow DOFAW's recommended response protocol by visiting <https://dlnr.hawaii.gov/wildlife/seabird-fallout-season/#response>.

Permanent lighting also poses a risk of seabird attraction, and as such should be minimized or eliminated to protect seabird flyways and preserve the night sky. For illustrations and guidance related to seabird-friendly light styles that also protect seabirds and the dark starry skies of Hawai'i please visit <https://dlnr.hawaii.gov/wildlife/files/2016/03/DOC439.pdf>.

“Hawaiian seabirds” is the collective term referring to birds including the endangered Band-rumped Storm-Petrel/‘akē‘akē (*Hydobatis castro*), the endangered Hawaiian Petrel/‘ua‘u (*Pterodroma sandwichensis*), the threatened Newell’s Shearwater/‘a‘o (*Puffinus newelli*), and the Wedge-tailed shearwater/‘ua‘u kani (*Ardenna pacificus*).

Newell’s shearwaters are found in the highest densities on Kaua‘i with lower densities on all of the other islands. Hawaiian Petrel populations are greatest on Maui, Lāna‘i, and Kaua‘i with lower densities on Hawai‘i and Moloka‘i. Band-rumped Storm-Petrels are found in low densities throughout the islands. All islands may experience overflight at night.

For all projects, Hawaiian seabirds may traverse the Project area at night during the breeding season (March 1 to December 15). Outdoor lighting could result in seabird disorientation, fallout, and injury or mortality. Seabirds are attracted to lights and after circling the lights they may become exhausted and collide with nearby wires, buildings, or other structures or they may land on the ground. Downed seabirds are subject to increased mortality due to collision with automobiles, starvation, and predation by dogs, cats, and other predators. Young birds (fledglings) traversing the Project area between September 15 and December 15, in their first flights from their mountain nests to the sea, are particularly vulnerable.

To minimize potential Project impacts to Hawaiian seabirds, the Project intends to implement the following mitigation measures as recommended by the U.S. Fish and Wildlife Service (USFWS) Pacific Islands Fish and Wildlife Office:

- Fully shielding all outdoor lights so the bulb can only be seen from below bulb height and only use when necessary;
- Installing timers, automatic motion sensor switches, and controls on all outdoor lights; and
- Avoiding nighttime construction during the seabird fledging period, September 15 through December 15.

Hawaiian Goose

During the pre-Assessment consultation process, DOFAW wrote:

“The State listed Nēnē or Hawaiian Goose (Branta sandvicensis) could potentially occur in the vicinity of the proposed project site. It is against State law to harm or harass these species. If any are present during construction, all activities within 100 feet (30 meters) should cease and the bird or birds should not be approached. Work may continue after the bird or birds leave the area of their own accord. If a nest is discovered at any point, please contact the Hawai‘i Island Branch DOFAW Office at (808) 974-4221.”

The Nēnē or Hawaiian Goose is not expected to be found on the Project site. However, if encountered during construction, all activities within 100 feet will cease and the bird or birds will not be approached. If a nest is discovered at any point, the Hawai‘i Island Branch DOFAW Office will be contacted.

Hawaiian Hawk

During the pre-Assessment consultation process, DOFAW wrote:

“The State listed ‘Io or Hawaiian Hawk (Buteo solitarius) may occur in the project vicinity. Prior to undertaking vegetation clearing, DOFAW recommends that pre-construction surveys of the area be conducted by a qualified biologist following appropriate survey methods (Gorressen et al., 2008) to ensure no Hawaiian Hawk nests are present, which may occur during the breeding season from March to September. The survey should be conducted at least 10 days prior to the start of construction. If an ‘Io nest is detected, a buffer zone of 100 meters (330 feet) should be established around it where no construction shall occur until the chick or chicks have fledged, or the nest is abandoned, and DOFAW staff should be immediately notified. If adult individuals are detected in the area during construction, all activities within 30 meters (100 feet) of the bird should cease. Work may continue when the bird has left the area on its own.”

The Hawaiian Hawk is not expected to be found on the Project site. If work must be conducted during the March 1 through September 30 Hawaiian hawk breeding season, a biologist familiar with the species will conduct a nest search of the project footprint and surrounding areas immediately prior to the start of construction activities. If a nest is detected, a buffer zone of 100 meters (330 feet) will be established around it where no construction will occur until the chick or chicks have fledged, or the nest is abandoned. DOFAW staff will be notified. If adult individuals are detected in the area during construction, all activities within 30 meters (100 feet) of the bird will cease.

Blackburn’s Sphinx Moth

During the pre-Assessment consultation process, DOFAW wrote:

“The project area is within the range of the State listed Blackburn’s Sphinx Moth (Manduca blackburni) or BSM. Larvae of BSM feed on many nonnative hostplants, which includes tree tobacco (Nicotiana glauca), that grow in disturbed soil. We recommend contacting the Hawai‘i Island Branch DOFAW office at (808) 974-4221 for further information about where BSM may be present and whether a vegetation survey should be conducted to determine the presence of plants preferred by BSM. DOFAW recommends removing plants less than one meter in height or during the dry season to avoid harm to

BSM. If you intend to either remove tree tobacco over one meter in height or to disturb the ground around or within several meters of these plants, they must be thoroughly inspected by a qualified entomologist for the presence of BSM eggs and larvae.”

According to a Natural Resources Assessment performed by the Project’s natural resources consultant, AECOS, the Blackburn’s Sphinx Moth was not observed onsite and is not expected to be found onsite due to the lack of tree tobacco onsite and in the surrounding vicinity.

During the pre-Assessment consultation process, DOFAW wrote:

“DOFAW recommends using native plant species for landscaping that are appropriate for the area; i.e., plants for which climate conditions are suitable for them to thrive, plants that historically occurred there, etc. Please do not plant invasive species. DOFAW also recommends referring to www.plantpono.org for guidance on the selection and evaluation of landscaping plants and to determine the potential invasiveness of plants proposed for use in the project.

DOFAW recommends minimizing the movement of plant or soil material between worksites. Soil and plant material may contain detrimental fungal pathogens (e.g., Rapid ‘Ōhi ‘a Death), vertebrate and invertebrate pests (e.g., Little Fire Ants, Coqui Frogs, etc.), or invasive plant parts (e.g., African Tulip, Octopus Tree, Trumpet Tree, etc.) that could harm our native species and ecosystems. We recommend consulting the Big Island Invasive Species Committee (BIISC) at (808) 933-3340 to help plan, design, and construct the project, learn of any high-risk invasive species in the area, and ways to mitigate their spread. All equipment, materials, and personnel should be cleaned of excess soil and debris to minimize the risk of spreading invasive species.

To prevent the spread of Rapid ‘Ōhi ‘a Death (ROD), DOFAW requests that the information and guidance at the following website be reviewed and followed if ‘ōhi ‘a trees are present at the project site that will be removed, trimmed, or potentially injured: <https://cms.ctahr.hawaii.edu/rod>.”

Some ground disturbances will be necessary for construction and new landscaping related to the new Waikōloa Public Library building. Plant and soil movement will be minimized where possible for these activities and excess soil and debris will be removed from all equipment, materials, and personnel to avoid the risk of spreading invasive species. New landscaping for the Project will incorporate grass, canopy trees, and native plant species where appropriate and practicable for the intended uses of the new Waikōloa Public Library building as well as the surrounding climate conditions. No ‘Ōhi ‘a trees exist on the Project site.

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

This section describes the existing conditions of the human environment, potential impacts of the Waikōloa Public Library, and mitigation measures to minimize any impacts.

4.1 ARCHAEOLOGICAL AND CULTURAL RESOURCES

4.1.1 Archaeological Resources

ASM Affiliates, Inc. conducted an Archaeological Field Inspection for the Project in May 2023 and authored a memo summarizing its findings (Appendix H). The Archaeological Field Inspection was conducted in accordance with HAR Title 13, Subtitle 13, Chapter 275 (Rules Governing Procedures for Historic Preservation Review for Governmental Projects Covered Under Sections 6E-7 and 6E-8, HRS), and was performed in compliance with the Rules Governing Minimal Standards for Archaeological Inventory Surveys and Reports as contained in HAR 13§13-276. The purpose of the Archaeological Field Inspection was to identify and evaluate the historical significance of any archaeological properties located within the Project parcel.

Historical Background

The modern-day ahupua‘a of Waikōloa is bound to the north by Lālāmilo Ahupua‘a, to the east by Pā‘auhau Ahupua‘a, and to the south by the ahupua‘a of Pu‘u Anahulu. The place name “Waikōloa” is said to derive from the wild ducks that lived in Waikōloa stream, the name meaning “duck water”. An alternative origin of the name can be found in Ka‘ao Ho‘oniua Pu‘uwai No Ka Miki (The Heart-Stirring Story of Ka Miki), where the name refers to the wind named Waikōloa blows sacred water in an ‘awa bowl the long distance from Holoholokū in Waimea to Waiki‘i. The modern ahupua‘a of Waikōloa was traditionally an ‘ili (land section smaller than an ahupua‘a) of the kalana (or ‘okana) of Waimea, and in ancient times was referred to as Waikōloa Nui, or “large Waikōloa.” The neighboring area of Lālāmilo was referred to as Waikōloa Iki, or “little Waikōloa”.

The initial permanent settlements were established at sheltered bays with access to fresh water primarily in the windward valleys and gulches. These early communities would have shared extended familial relations and had an occupational focus on the collection of marine resources. The upland habitation that followed focused on agricultural field systems, which undoubtedly provided much of the produce for the coastal inhabitants. The upper reaches of Waikōloa Ahupua‘a and the greater Kohala District were ideal for bird hunting, where the prized feathers were utilized for the creation of ‘ahu‘ula (feather cloak), mahiole (feather helmet), and kahili (feather standard)—all iconic symbols of Hawaiian royalty. In addition, birds were an important source of meat for subsistence purposes. The current project area, located at a slightly lower elevation, was situated in pili grass plains on the kula lands.

Around the turn of the nineteenth century, Kamehameha I gave control of Waikōloa Nui Ahupua‘a (excluding the coastal ‘ili of ‘Anaeho‘omalua and Kalāhuipua‘a) to Isaac Davis. Although the land of Waikōloa Nui gifted to Davis encompassed a large area, it lacked extensive resources and was primarily a place for catching birds and gathering pili grass. When Davis died in 1810 without

naming an heir, John Young took control of the land and protected it for Davis' children, who were at that time too young to take on the responsibility. Waikōloa Nui would eventually become a favored pasture for the cattle given by Vancouver to Kamehameha during his 1793 and 1794 visits, which Kamehameha immediately made kapu, thus preventing them from being killed.

Over the course of the early nineteenth century, leeward settlement shifted to the windward side of Kohala as the leeward, agriculturally marginal areas were abandoned in favor of more productive and wetter sugarcane lands. The remnant leeward population nucleated into a few small coastal communities and dispersed upland settlements. These settlements were no longer based on traditional subsistence patterns, largely because of the loss of access to the full range of necessary resources. The wetter windward slopes of North Kohala and the Waimea plain were the focus of the shifting settlement pattern, and they eventually became the population centers for the district.

As a result of the Māhele of 1848, Waikōloa Nui was awarded to George Davis Hū'eu based on Kamehameha I's gift of the land to Hū'eu's father, Isaac Davis. This award (LCAw. 8521-B:1) did not include the coastal areas of 'Anaeho'omalū and Kalāhuipua'a, which were retained by the crown. The Davis Hū'eu award was primarily restricted to the non-agricultural pili lands south of the agriculturally productive Lālāmilo area and mauka of the rich coastal resource area. By the mid-1860s the Waimea Grazing and Agricultural Company (WGAC) had acquired considerable strategic assets around Waimea in an attempt to monopolize the livestock industry in the region (Bergin 2004). On July 2, 1868, G. D. Hū'eu leased lands in Waikōloa Nui to the WGAC for twenty years, which made the WGAC the largest ranching operation on the island (Maly and Maly 2002). Under the terms of the lease, the Hū'eu family was allowed to continue grazing their 1,000 head of cattle, 1,000 head of sheep, and 100 horses on the Waikōloa lands. By the late 1870s, largely due to persistent drought conditions, the WGAC went out of business, and its herd was purchased by Parker Ranch (Bergin 2004). Francis Spencer, one of the officers of the failed WGAC, formed Pu'uloa Sheep and Stock Company and continued to raise sheep on the leased lands in Waikōloa. In October of 1876, Spencer sold his interest in the sheep ranch and the leased Waikōloa Nui lands to George W. Macfarlane.

Meanwhile, Parker Ranch continued to expand its operations in the Waimea area throughout the 1870s and 1880s. The ranch eventually acquired the lease to roughly 95,000 acres in Waikōloa still held by G.D. Hū'eu, and in 1903, under the direction of Alfred W. Carter, the guardian and trustee for Thelma Parker, purchased a nine-tenths interest in the Waikōloa Nui lands. Much of these grazed lands were divided into paddocks, and transportation and water conveyance infrastructure projects were undertaken to increase the productivity of the Waikōloa rangelands.

By the early 1900s, Parker Ranch was under the direction of Alfred W. Carter, chosen as the guardian and trustee for Thelma Parker, John Parker III's daughter, upon his death at the age of nineteen. Early on in his tenure as Ranch Manager, Carter concentrated on acquiring and converting more of the ranch's lands from leasehold to fee simple. In 1903, with only a short period left on its lease, Carter acquired nine-tenths interest in the Waikōloa Nui lands from Ms. Lucy Peabody for \$112,000, along with others in South Kohala, securing important grazing lands for the ranch. In 1906, on behalf of Thelma Parker, Carter bought out Sam Parker's half-interest in Parker Ranch for a sum of \$600,000. The expansion of Parker Ranch's land- and lease holdings throughout the late 19th and early 20th centuries allowed the ranch to raise cattle and sheep in paddocks around the island. Once ready for the market, these animals would be brought back to Waimea for sorting before being driven down to Kawaihae to be shipped. During these cattle

drives, the cowboys followed a well-used network of trails that connected the distant stations at Waiki‘i, Kalai‘ehā, and Ke‘āmuku with the town of Waimea and shipping harbors on the Kohala coast.

Ranching operations were briefly interrupted during World War II. Several months before the bombing of Pearl Harbor in 1941, the U.S. Army established an infantry headquarters at Parker Ranch in the Pu‘ukapu area of Waimea. In December of 1943, the Second Marine Division arrived on Hawai‘i Island for rest and relaxation after fighting in the Gilbert Islands. They were dispersed into three camps: one at Hāpuna Bay, one at Pōhakuloa, and one in Waimea, which became known as Camp Tarawa. The U.S. War Department leased approximately 123,000 acres of land in the Waimea and Waikōloa area for use as a training area. With this lease the current APE became part of the U.S. Navy’s 91,000-acre Waikōloa Maneuver Area.

The 2nd Marine Division was the first to train at Waikōloa, spending five months there in preparation for the invasion of Saipan and Tinian. The 5th Marine Division replaced the 2nd Division in August 1944 and used the Waikōloa Maneuver Area to prepare for the assault on Iwo Jima. While training, the marines resided at Camp Tarawa just outside of Waimea Town. Camp Tarawa was the largest U.S. Marine training facility in the Pacific, covering an area of approximately 467 acres, and between 1943 and 1945 as many as 50,000 men passed through the camp on their way to the Pacific Theater. The last of the Marines of the 5th Division departed Camp Tarawa in June 1946, and the Waikōloa Maneuver Area was returned to the Parker Ranch in September of 1946. Clean-up of unexploded ordnance (UXO) within the Waikōloa Maneuver Area is still ongoing.

Substantial changes of the Parker Ranch lands began to occur in the mid-twentieth century with the transfer to its sixth-generation heir, Richard Palmer Smart. Among these changes was a decision to initiate resort and residential developments in coastal ‘Anaeho‘omalū and the lands extending north towards Kawaihae. By December 1959, Smart initiated the \$300,000,000 resort and residential development of 10,000 acres of land along the South Kohala coastline referred to as the “Gold Coast”. Although he initially intended to retain ‘Anaeho‘omalū as part of Parker Ranch and simply make its acreage available through lease, Smart sold 25,500 acres of land above ‘Anaeho‘omalū Bay in May of 1968 to the Boise Cascade Home and Land Corp. Although the development of the resort was aimed at attracting tourists to the famed coast, the ultimate success of the resort was at least partially reliant on the creation of Waikōloa Village, a residential subdivision located mauka of ‘Anaeho‘omalū Bay in the vicinity of the current project area.

By the late 1960s, groundwork for Waikōloa Village was underway, and on June 27, 1970, Boise Cascade held their first open house to welcome the public and to “celebrate the advances made by Boise Cascade and Morrison-Knudsen in reclaiming the Ahupua‘a of Waikōloa for Man”. Plans for this new community included construction of a vast water system to furnish future residents and businesses with water, creation of a golf course, a residential subdivision, equestrian center, condominiums, and a shopping center. Over the next 50 years, development of Waikōloa Village continued spreading to the north. The current project area is located at the northern extremity of the subdivision, adjacent to a park that was developed between 2007 and 2012.

Field Inspection Methods and Results

On May 22, 2023, Matthew R. Clark, M.A. (Principal Investigator) conducted an archaeological field inspection of the project area in compliance with HAR 13§13-275. The pedestrian surface survey included 100% ground coverage. The overall lack of vegetation provided excellent ground visibility for identification of historic properties. As a result of the pedestrian survey no historic properties were encountered within the project area. Observations made during the field inspection indicate that the entire eastern portion of the subject parcel had been previously graded and was used for staging during construction of the park to the east.

Potential Impacts and Mitigation Measures

No historic properties were identified as a result of the field inspection of TMK: (3) 6-8-041:020, therefore ASM recommended an effect determination of “no historic properties affected” for the proposed Waikōloa Library Project. Nevertheless, DAGS and its contractors will comply with all State and County laws and rules regarding the preservation of archaeological and historic sites. The construction documents will include a provision that should historic sites such as walls, platforms, pavements and mounds, or remains such as artifacts, burials, concentrations of shell or charcoal or artifacts be inadvertently encountered during construction activities, work will cease immediately in the vicinity of the find and the find will be protected. The contractor will immediately contact SHPD, which will assess the significance of the find and recommend appropriate mitigation measures, if necessary. No further mitigation measures are planned.

4.1.2 Cultural Resources

ASM Affiliates, Inc. (ASM) conducted a Cultural Impact Assessment (CIA) for the current Project in November 2023 (Appendix I), in accordance with the methodology and content protocol provided in the Guidelines for Assessing Cultural Impacts (Office of Environmental Quality Control, 1997).

According to the CIA prepared by ASM, a review of the culture-historical background material reveals that although it is referred to today as an ahupua‘a, Waikōloa was traditionally considered an ‘ili of the kalana of Waimea. The district of Kohala is renowned for its association with being the initial ruling center for the Pili dynasty, the burial place of the kahuna Pā‘ao, and later as the birthplace of Kamehameha. Furthermore, Waikōloa explicitly figures into the intensive sociopolitical history of Hawai‘i Island with its inclusion as the location of several notable battles and its association with ruling chiefs in addition to other distinguished individuals in Hawaiian pre-history.

The introduction of cattle in Waimea in 1793 by Captain George Vancouver paired with large herds and incessant roaming amongst the land, severely destroyed the native forest. By the mid-19th century, the population of South Kohala declined rapidly, and historical accounts indicate a pronounced shift from intensive utilization of coastal areas to the more fertile and productive uplands areas such as Waimea which were capable of supporting more stable agricultural pursuits. Traditional subsistence strategies were abandoned in favor of these more productive lands, and much of the population deviated as a result. Through the process established by the 1848 Māhele ‘Āina, Waikōloa Nui was awarded to the son of Isaac Davis, George Hū‘eu, which includes the current project area. Additionally, a total of nine residential kuleana parcels were

awarded in Waikōloa, all of which were situated in more mauka areas of Waikōloa closer to Waimea Town, reflective of the settlement shift from agriculturally marginal areas to the windward side of the district.

Further knowledge of the traditional settlement patterns of Waikōloa are derived from a review of the previous archaeological and cultural studies within and in the vicinity of the project area. These studies suggest that generally, precontact archaeological sites are sparse in the intermediate, pili lands of Waikōloa, which is situated between the more traditionally and intensively utilized coastal and upland resource/habitation areas. Additionally, intensive ranching activities spanning from the late 19th century to the present day combined with military use of the land have significantly impacted and/or obliterated much of the Precontact archaeological landscape in the vicinity of the project area, as has the development of the area to facilitate highly efficient modern-day transportation routes (e.g. Highway 190 and Waikōloa Road) that replaced traditional mauka-makai trail systems.

In addition to conducting background research into the traditional and historic importance of the Project area in the context of the South Kohala District, ASM also consulted outreach with community members. In an effort to identify individuals knowledgeable about traditional cultural practices and/or uses associated with the current subject property, a public notice was submitted to the Office of Hawaiian Affairs (OHA) for publication in their newspaper, Ka Wai Ola. The notice was submitted via email on July 5, 2023, and was published in the August 2023 issue. As of this publication, no responses have been received from the public notice. Six other individuals/organizations were contacted directly; however, none have responded as of this date.

Potential Impacts and Mitigation Measures

It is anticipated that there will be no valued cultural, historical, or natural resources, including traditional and customary native Hawaiian rights that will be affected or impaired by the Waikōloa Public Library. Based on the information presented in the culture-historical background and the lack of information obtained during the consultation process, coupled with the knowledge that previous CIA reports (Hammatt 2006; Ishihara and Brandt 2020; Vernon et al. 2018; Wong-Smith 2007) prepared for locations within Waikōloa have not identified ongoing traditional cultural practices occurring within the vicinity of the project area, the CIA found no ongoing cultural practices or valued cultural resources within the proposed Waikōloa Public Library Project area. In addition, archaeological research conducted on the subject parcel yielded no findings within the proposed project area. Therefore, the development of the Waikōloa Public Library will have no direct impact on any historic properties or traditional and customary Native Hawaiian practices or valued historical or cultural resources. No mitigation measures are proposed.

4.2 TRANSPORTATION

A TIAR was completed by AECOM for the Project in August 2023, and is attached to this EA as Appendix J.

4.2.1 Roadways and Traffic

The key existing roadways around the proposed Waikōloa Public Library site include Paniolo Avenue, Ho‘oko Street, Kamakoa Drive, and Iwikuamo‘o Drive. Paniolo Avenue serves as the

primary access and main circulation roadway for the Waikōloa Village subdivision. Ho‘oko Street, Iwikuamo‘o Drive, and Kamakoa Drive all primarily serve as local roads.

Paniolo Avenue – Paniolo Avenue is a collector roadway that provides access and circulation for Waikōloa Village. South of the intersection with Ho‘oko Street, Paniolo Avenue is a four-lane, undivided roadway with two lanes in each direction. It has a curb and gutter along both sides of the road. North of the intersection with Ho‘oko Street, it becomes a two-lane, undivided roadway with one lane in each direction. It has a curb and gutter for a portion of the road near the intersection. Further north, the road ends at the edge of pavement. The posted speed limit is 35 miles per hour; with the exception of the school zone around Waikōloa Elementary & Middle School that limits the speed limit to 20 mph when flashing. Paniolo Avenue is under the jurisdiction of the County of Hawai‘i.

Ho‘oko Street – Ho‘oko Street connects several residential areas within Waikōloa Village with Paniolo Avenue. Ho‘oko Street is a two-lane, undivided roadway with one lane in each direction. There is a curb and gutter along both sides of the road. The posted speed limit is 25 mph.

Iwikuamo‘o Drive – Iwikuamo‘o Drive connects several of the residential areas within Waikōloa Village and directs vehicles toward either Ho‘oko Street or Kamakoa Drive. It is a two-lane, undivided roadway with one lane in each direction. There is a curb and gutter along both sides of the road. The posted speed limit is 20 mph.

Kamakoa Drive – Kamakoa Drive is a local roadway that is near the proposed project site. It currently terminates approximately 400 feet west of Iwikuamo‘o Drive. East of the intersection with Iwikuamo‘o Drive, Kamakoa Drive is a four-lane, divided roadway with two lanes in each direction and a raised median. There is a curb and gutter along both sides of the road. West of the intersection, Kamakoa Drive is a four-lane, undivided roadway with two lanes in each direction. There is a curb and gutter along both sides of the road. The posted speed limit is 25 mph.

Roadway Intersection Conditions – The following existing intersections are in the vicinity of the project site:

- Paniolo Avenue/Ho‘oko Street; and
- Kamakoa Drive/Iwikuamo‘o Drive.

The Paniolo Avenue and Ho‘oko Street intersection is a four-legged, signalized intersection that is located adjacent to Waikōloa Elementary & Middle School. The northbound Paniolo Avenue approach has a right-turn lane, a through lane, and a left turn lane. The southbound Paniolo Avenue approach has a shared through/right-turn lane, a through lane, and a left turn lane. Both Ho‘oko Street approaches have a shared through/right-turn lane and a left turn lane.

The Kamakoa Drive and Iwikuamo‘o Drive is a four-legged, unsignalized intersection that is stop controlled and located near the proposed Waikōloa Public Library site. The Kamakoa Drive approaches have a shared through/right-turn lane and a shared through/left-turn lane. The Iwikuamo‘o Drive approach has a single lane for the left/through/right movements, which is included as all movements. The north leg of the intersection is the access to parking lot for the Waikōloa Skatepark. The Iwikuamo‘o Drive and skatepark parking lot access are stop controlled.

Existing Traffic Volumes – Manual transportation volume turning movement counts and observations were conducted on Wednesday, May 24, 2023, during the AM, midday, and PM peak periods. These intersection counts included vehicular, pedestrian, and bicycle counts at Paniolo Avenue/Ho‘oka Street and Kamakoa Drive/Iwikuamo‘o Drive. The midday count was included to capture the school-related traffic as part of the study. The bell schedule for Waikōloa Elementary & Middle School is from 8:00 AM to 1:00 PM on Wednesdays. On the other days, school finishes at 2:15 PM.

From these counts, the AM peak hour was determined to occur from 7:15 AM to 8:15 AM, the midday peak was determined to occur from 12:45 PM to 1:45 PM, and the PM peak hour was determined to occur from 3:00 PM to 4:00 PM. The traffic count worksheets are included in Appendix J. Appendix J, Figure 8 summarizes the existing vehicular counts for the AM, midday, and PM peak hours.

The pedestrian and bicycle counts were collected for both intersections. The pedestrian and bicycle count worksheets are included in Appendix J. The Kamakoa Drive/Iwikuamo‘o Drive intersection had very little pedestrian and bicycle activity. During the peak hour periods, it was observed that there were at maximum 3 pedestrians per hour entering the intersection. During the AM peak hour, it was observed that there were 6 bicycles turning right from Iwikuamo‘o Drive onto Kamakoa Drive. However, most of that bicycle volume was from a single bicyclist that appeared to be riding along a morning exercise route.

At the Paniolo Avenue/Ho‘oka Street intersection, during the AM peak hour, there were 22 pedestrians per hour crossing the crosswalk on the east side of the intersection toward Waikōloa Elementary & Middle School and 28 pedestrians per hour crossing the crosswalk on the southside of the intersection. Most of these pedestrians were children headed toward school along with some parents. During the midday peak, which occurred around the time school ended that day, there were 10 pedestrians crossing the east crosswalk and 41 crossing the south crosswalk. Similar to the Kamakoa Drive/Iwikuamo‘o Drive intersection, there were not many bicycles observed during any of the observation periods. During the AM peak hour, the same bicyclist observed at the Kamakoa Drive/Iwikuamo‘o Drive intersection was also observed at this intersection turning right from southbound Paniolo Avenue onto Ho‘oko Street.

Existing Intersection Operations – Traffic signal control and stop control schemes were used to evaluate the two intersections to determine any potential impacts resulting from the proposed Waikōloa Public Library. Based on consultation with the County of Hawai‘i, it was assumed that the roadways would maintain the existing lane configuration and traffic control operations under the future conditions.

For the Paniolo Avenue/Ho‘oka Street and Kamakoa Drive/Iwikuamo‘o Drive intersections, traffic operational analyses were conducted using Synchro/SimTraffic 11.0 in accordance with procedures outlined in the Highway Capacity Manual.

The goal of this analysis was to understand the operational sufficiency of the signalized and stop controlled intersection concepts to serve the added demand of traffic as a result of adding the proposed library. The following assumptions/input parameters were used in the intersection analysis:

- Peak hour factor: 0.77 during the AM Peak Hour and 0.92 for the PM Peak Hour
- Percent Heavy Vehicles: 2%
- Vehicle travel speed: the posted speed limit
- Lane widths: 12'
- Base saturation flow rate: 1,900 vehicles per hour per lane for all movements
- Right-turn on red movements: These traffic movements were included in the analysis
- and modeled in the software
- Signal cycle length: 90 seconds (based on field measurements of the existing signal
- timing)

Table 3 summarizes the existing (Year 2023) intersection Level of Service (LOS) and delay results for the AM and PM peak hours. The AM and PM existing traffic volumes are more conservative than the midday traffic volumes and were the volumes used for the remainder of the analysis.

Table 3: Existing Year 2023 Peak Hour Intersection Operations

Intersection	AM Peak Hour		PM Peak Hour	
	LOS	Delay (sec/veh)	LOS	Delay (sec/veh)
Paniolo Avenue/Ho'oko Street				
Paniolo Avenue/Ho'oko Street	B	16.8	B	14.0
Kamakoa Drive/Iwikuamo'o Drive*				
Kamakoa Drive WB LT	A	7.3	A	7.2
Kamakoa Drive EB LT	A	0.0	A	0.0
Iwikuamo'o Drive	A	9.0	A	8.4
Parking Lot Access	A	9.2	A	8.7
Notes: Based on counts conducted on Wednesday, 5/24/23 AM Peak Hour: 7:15 AM - 8:15 AM, PM Peak Hour: 3:00 PM - 4:00 PM * Unsignalized STOP-controlled intersection LOS = Level of service, sec/veh = seconds per vehicle, WB = Westbound, EB = Eastbound, LT = Left Turn				

Source: Transportation Impact Assessment Report, AECOM (2023)

The Paniolo Avenue/Ho'oko Street intersection currently operates at a LOS B during both the AM and PM peak hour periods while the key movements at the Kamakoa Drive/Iwikuamo'o Drive intersection operate at LOS A. The results from the analysis are consistent with what was observed during data collection. The Paniolo Avenue/Ho'oko Street intersection appeared to operate with minimal delay during the data collection study with the signal appearing to be an actuated traffic

signal. It was observed that the Kamakoa Drive/Iwikuamo‘o Drive intersection did not have many vehicles enter the intersection during the peak periods, which is reflected in the low levels of delay for the key movements.

Future Traffic Conditions – Background traffic accounts for the growth in traffic unrelated to the proposed Waikōloa Public Library. The proposed Waikōloa Public Library project is assumed to open in 2028, five years from the point of data collection. The future background traffic was grown and projected out to the Year 2028 and will be used for the following future traffic analyses.

In consultation with the County of Hawai‘i Traffic Division, it was determined that an annual growth rate of two (2) percent would be uniformly applied to all directions of traffic at both intersections. Appendix J, Figure 10 illustrates the projected Year 2028 peak hour turning movement volumes for the background traffic.

Table 4 summarizes the land use and estimated vehicular volumes that would be generated by the proposed Waikōloa Public Library. The vehicular volume is based on the trip generation rates documented in the Institute of Transportation (ITE) publication, Trip Generation, 11th Edition. Equations for the AM and PM peak hours of adjacent street traffic periods were used in this estimation.

Trip generation equations for Category 590 – Library were used to estimate the vehicular traffic generated by the proposed Waikōloa Public Library. The index used as the predictor of generated traffic was gross floor area (in 1000 square feet). For the ELC, Category 565 – Day Care Center was used to estimate the traffic generated by the ELC. The index used as the predictor of the generated traffic for this category was the number of students.

Table 4: Projected Trip Generation by Waikōloa Public Library

Land Use	Intensity	ITE Category	AM Peak Hour		PM Peak Hour	
			In	Out	In	Out
Library	12,000 sf	590	5	2	46	49
Day Care Center	40 students	565	17	15	15	17
Total			22	17	61	66

Notes: AM and PM Peak Hour traffic volumes are in vehicles per hour. Trip Generation is the estimation of vehicular traffic based on equations documented in the Institute of Transportation Engineers' publication, Trip Generation, 11th Edition.

For Category 590 - Library, the trip generation equations are:

AM Peak Hour: $T = 1.75 (X) - 14.59$, 79% inbound/21% outbound
 PM Peak Hour: $T = 9.33(X) - 17.13$, 48% inbound/52% outbound

where T = traffic volume (vehicles per hour), X = 1000 square feet gross floor area, and sf = square feet

For Category 656 - Day Care Center, the average rates for the AM and PM peak hours are:

AM Peak Hour: $T = 0.78 (X)$, 53% inbound/47% outbound
 PM Peak Hour: $T = 0.79 (X)$, 47% inbound/53% outbound

where T = traffic volume (vehicles per hour), X = number of students

Source: Transportation Impact Assessment Report, AECOM (2023)

The projected Year 2028 vehicular traffic volumes generated by the Waikōloa Public Library summarized in Table 4 were directionally assigned to the roadway network. It was assumed that the trips heading to and from the proposed library and ELC would primarily originate from the surrounding Waikōloa Village. For the purpose of this study, the project generated traffic was assigned to the roadway network using similar distribution patterns as the existing traffic. The trips generated and assigned to the roadway network are summarized in Appendix J, Figure 11.

The projected traffic volumes generated by the proposed Waikōloa Public Library summarized in Appendix J, Figure 11 were combined with the projected Year 2028 background traffic summarized in Appendix J, Figure 10 to calculate the total projected Year 2028 peak hour traffic

volumes. The total projected Year 2028 peak hour traffic volumes are summarized in Appendix J, Figure 12.

Future Intersection Operations – The projected Year 2028 peak hour traffic volumes with (build) and without (no build) the proposed Project were evaluated using the same methodologies described in Section 2.5.2, Intersection Operations Methodology using Synchro/SimTraffic analysis software. Table 5 and Table 6 summarize the results of the analysis for the AM peak hour conditions and the PM peak hour conditions, respectively.

Table 5: Projected Year 2028 AM Peak Hour Intersection Operations

Intersection	Year 2028 No Build		Year 2028 Build	
	LOS	Delay (sec/veh)	LOS	Delay (sec/veh)
Paniolo Avenue/Ho'oko Street				
Paniolo Avenue/Ho'oko Street	B	17.6	B	18.1
Kamakoa Drive/Iwikuamo'o Drive*				
Kamakoa Drive WB LT	A	7.3	A	7.3
Kamakoa Drive EB LT	A	0.0	A	0.0
Iwikuamo'o Drive	A	9.0	A	9.2
Parking Lot Access	A	9.3	A	9.4
Notes: * Unsignalized STOP-controlled intersection LOS = Level of service, sec/veh = seconds per vehicle, WB = Westbound, EB = Eastbound, LT = Left Turn				

Source: Transportation Impact Assessment Report, AECOM (2023)

Table 6: Projected Year 2028 PM Peak Hour Intersection Operations

Intersection	Year 2028 No Build		Year 2028 Build	
	LOS	Delay (sec/veh)	LOS	Delay (sec/veh)
Paniolo Avenue/Ho'oko Street				
Paniolo Avenue/Ho'oko Street	B	14.3	B	15.0
Kamakoa Drive/Iwikuamo'o Drive*				
Kamakoa Drive WB LT	A	7.2	A	7.4
Kamakoa Drive EB LT	A	0.0	A	0.0
Iwikuamo'o Drive	A	8.7	A	9.3
Parking Lot Access	A	8.8	A	9.0
Notes: * Unsignalized STOP-controlled intersection LOS = Level of service, sec/veh = seconds per vehicle, WB = Westbound, EB = Eastbound, LT = Left Turn				

Source: Transportation Impact Assessment Report, AECOM (2023)

As shown in Table 5 and Table 6, the intersection movements are projected to operate with a LOS B or better with or without the proposed Waikōloa Public Library during both peak hour periods. This analysis indicates that traffic generated from both the library and ELC is not expected to affect the operations at each intersection. The projected delays and LOS are very similar with both scenarios and the completion of the Waikōloa Public Library is not expected to affect traffic operations in the area.

Potential Impacts and Mitigation Measures

The Waikōloa Public Library is intended to serve the existing and future population of Waikōloa Village. Given the library's proximity to current and future residential communities, many visitors may walk or bike to the library, thereby reducing vehicle trips to and from the Project site.

Most of the potential traffic impacts would be short-term, occurring during the construction of the facility, and would be caused by construction traffic. The TIAR focuses on determining if there will be traffic impacts caused by construction of the facility. These would be temporary impacts, only occurring during construction. During operation, traffic impacts would occur during library operation hours. The TIAR identifies potential temporary traffic impacts associated with the construction of the proposed Waikōloa Public Library. Potential traffic impacts associated with construction vehicles, construction workers, and construction parking demand were evaluated. It was found that all three components of construction activity could be accommodated by existing facilities on the Waikōloa Public Library site and the adjacent roadway system.

Based on the results of the operations analysis, there are minimal roadway improvements recommended for the proposed Waikōloa Public Library site. Recommendations include the following:

- Implement stop control access at both of the proposed library driveways.
- Maintain line of sight around each of the proposed library driveways based on required stopping sight distance.
- Implement crosswalks and ADA-compliant curb ramps at the Kamakoa Drive and proposed Road A intersection if there are none prior to the completion of the library.
- Install, as appropriate, pedestrian warning signs to alert drivers of potential pedestrian activities in the vicinity of the site.
- Consideration for potential future bicycle facilities as the surrounding area is developed.

4.2.2 Parking

The proposed Project includes a surface parking lot with one driveway off of Road A and a second driveway off of Kamakoa Drive. The parking lot will contain 71 stalls for visitors and staff: 49 stalls for the public library and 15 for the ELC. Four stalls will have EV charging equipment and three stalls will be handicap accessible. The parking lot, located between Kamakoa Drive and the library, will also contain low-lying landscaping and canopy trees.

Potential Impacts and Mitigation Measures

The surface parking lot's 71 stalls are expected to provide sufficient parking for visitors and library staff. Given the library's proximity to current and future residential communities, many visitors may walk or bike to the library, thereby reducing the demand for vehicle parking.

4.2.3 Public Transportation

Public transit service is provided by the Hele-On bus system on Hawai'i island. Currently, there are a few bus routes that travel along Waikōloa Road, which is a minor arterial roadway that provides regional access to the Waikōloa Village area. These routes include Route 2, Route 75, and Route 76. Of these bus routes, Routes 75 and 76 travel along Paniolo Avenue. but do not travel near the proposed library site.

Route 2 – Blue Line – Hilo to Kailua-Kona via Daniel K. Inouye Hwy. Route 2 buses travel along Waikōloa Road between Hilo and Kailua-Kona. It stops at Stop #449 at the Waikōloa Village Highlands Shopping Center nine times a day (4 times for the eastbound route to Hilo and 5 times for the westbound route to Kailua-Kona).

Route 75 – N. Kohala – Waimea – S. Kohala Resorts – Kailua Kona and Route 76 – Honoka‘a to Kailua-Kona. Routes 75 and 76 both travel along Waikōloa Road when traveling to the respective destinations. Both make a loop in Waikōloa Village using Paniolo Avenue but do not pass by Waikōloa Elementary & Middle School. Route 75 stops at two bus stops in the Waikōloa Village area (Stop #449 and #451), once during the morning commuter peak period and once during the afternoon commuter peak period. Route 76 also stops at two stops in the vicinity of Waikōloa Village (Stop #449 and #451) during the morning commuter peak period and at two stops during the afternoon commuter peak period (Stop #451 and a stop without an ID number).

Potential Impacts and Mitigation Measures

DAGS will work with the Hawai'i County Mass Transit Agency to coordinate potential new bus stops to serve the proposed Waikōloa Public Library to better help Waikōloa Village residents access quality educational resources. In the long-term, no negative impact on regional public transportation is anticipated as a result of the proposed Project.

4.2.4 Bicycle and Pedestrian Facilities

In the vicinity of Waikōloa Elementary & Middle School, Paniolo Avenue has attached sidewalks along both sides of the road south of the intersection with Ho'oko Street. North of the intersection, Paniolo Avenue has a detached sidewalk along the west side of the road, while the sidewalk on the east side ends approximately 20 feet after the intersection.

Along Ho'oko Street, there are attached sidewalks along both sides of the road in the vicinity of Waikōloa Elementary & Middle School. On Iwikuamo'o Drive, there is a detached sidewalk on the east side of the road and no sidewalk on the west side.

Kamakoa Drive has detached sidewalks along both sides of the road east of the intersection with Iwikuamo'o Drive. There is a detached sidewalk only on the north side of Kamakoa Drive west of the intersection with Iwikuamo'o Drive.

At the signalized intersection of Paniolo Avenue and Ho'oko Street, there are marked crosswalks across all legs of the intersection. Prior to Waikōloa Elementary & Middle School beginning and ending each school day, a school crossing guard was observed at the intersection to help facilitate safe pedestrian crossing movements for students and parents. There is a single crosswalk across the east leg of Kamakoa Drive at Iwikuamo'o Drive.

There are no marked bicycle facilities along Paniolo Avenue and Ho'oko Street near Waikōloa Elementary & Middle School nor along Iwikuamo'o Drive and Kamakoa Drive in the vicinity near the proposed Waikōloa Public Library site. Bicyclists observed during the data collection process either shared the roadway with other vehicles or were traveling on the sidewalks.

Potential Impacts and Mitigation Measures

Given the library's proximity to current and future residential communities, many visitors may prefer the convenience of walking or biking to the proposed library. DAGS will coordinate with the County Department of Public Works Traffic Division and the DOT for bicycle and pedestrian facilities in the public rights-of-way surrounding the Project site. In the long-term, no negative impacts on bicycle or pedestrian facilities are anticipated as a result of the Project and therefore, no mitigation measures are required.

4.3 NOISE

As the Project site and the surrounding area are generally undeveloped, existing noise levels are minimal.

Potential Impacts and Mitigation Measures

The Project is expected to produce short-term increased noise levels during construction that will include an increase in heavy equipment/vehicular traffic in the area. Community Noise Control regulations (HAR Title 11, Chapter 46) establish maximum permissible sound levels for construction activities occurring within three “acoustical” zoning districts. Under these regulations, the Project area and immediate vicinity fall under the Class A zoning district. This district limits maximum permissible daytime noise (7AM-10PM) to 55 dB(A) and nighttime noise (10PM-7AM) to 45 dB(A).

In general, construction activities cannot exceed the permissible noise levels for more than ten percent of the time within any twenty-minute period except by permit or variance. Any noise source that emits noise levels in excess of the maximum permissible sound levels cannot be operated without first obtaining a noise permit from the DOH. Although the permit does not attenuate noise, it regulates the hours during which excessive noise is allowed.

Exposure to noise is expected to vary by construction activity, and the type of equipment used during the different activities. Heavy machinery and pneumatic impact equipment will likely generate noise in the range of 82-96 decibels-weighted (dB(A)) within 50 feet of the source. The general contractor(s) is expected to be responsible for obtaining necessary permits and complying with all permit conditions. There is a need to balance work activities to meet permit conditions for "acoustical" zoning districts while minimizing traffic disruptions. Work is expected to be scheduled primarily for daytime hours, as described in HAR Title 11, Chapter 46 (7AM-10:00 PM), Monday through Friday. The contractor is also expected to ensure that all construction equipment with motors is properly equipped with mufflers in good operating condition. The contractor may employ other mitigation measures to minimize those temporary noise impacts.

In the long term, no significant noise impacts are anticipated. Upon completion of the Project, since the proposed uses are primarily residential and will occur within buildings, the primary source of noise emission to the surrounding area is expected to be minimal, primarily from cars entering and exiting the site. Any mechanical equipment (e.g., ventilation and air conditioning systems) will be mitigated (e.g., enclosure) such that noise levels do not exceed the maximum permissible noise levels listed in HAR Title 11, Chapter 46. Once in operation, the Waikōloa Public Library will not produce noises louder than the ambient noise of the surrounding land uses and traffic along Waimano Home Road. Therefore, no mitigation measures are proposed as the noise generated as a result of the proposed Project represents no substantial change from current noise occurrences.

4.4 AIR QUALITY

Ambient air quality standards (AAQS) have been established by both Federal and State governments that limit ambient concentrations of six criteria pollutants: carbon monoxide (CO), nitrogen dioxide (NO₂), sulfur dioxide (SO₂), lead, ozone, and particulate matter less than 10 microns in aerodynamic diameter (PM₁₀) or less than 2.5 microns (PM_{2.5}). In addition, a State standard has been established for hydrogen sulfide (H₂S). State AAQS are more stringent than the

comparable national limits (NAAQS) except for the standards for sulfur dioxide, particulate matter, and lead, which are set at the same levels.

Hawai‘i’s standards are not divided into primary and secondary standards as are the National standards. Primary standards are intended to protect public health with an adequate margin of safety while secondary standards are intended to protect public welfare through the prevention of damage to soils, water, vegetation, man-made materials, animals, wildlife, visibility, climate, and economic values.

Air quality in Hawai‘i is generally characterized as relatively clean and low in pollution. Northeast trade winds that are predominant throughout the year typically carry emissions and other air pollutants from inland areas out toward the ocean. Air quality in the Project area is believed to be relatively good, except for occasional impacts from upwind sulfur dioxide volcanic emissions that convert to a particulate-sulfate volcanic haze (“vog”) and from localized traffic congestion, particularly in the Kailua-Kona community. Occasionally, wind patterns carry emissions from Kīlauea Volcano to the northwest, in the direction of the Site. Air flow from this southeast direction carrying vog can result in an increase in pollution and a decrease in visibility and can impair the health of sensitive receptors.

Kīlauea Volcano is recognized as the largest point source of SO₂ gas in the United States. Gaseous emissions increased dramatically in 2008 when a new vent opened at the volcano’s summit. Emission estimates increased to 3,000 – 5,000 tons per day (TPD) of SO₂, in contrast to previous average emission of 1,700 TPD. The 2018 eruptions at the Kīlauea summit and Lower East Rift Zone (LERZ) also resulted in highly elevated gas emissions.

The DOH has monitoring stations on the Island of Hawai‘i, which mainly measure air quality impacts from the volcano and geothermal energy production. The closest air monitoring station to the Project area is the Waikōloa station, approximately one mile north of the Project site.

Potential Impacts and Mitigation Measures

Short-term air quality impacts due to the Project may result from construction activities. However, emissions are unlikely to violate state or federal air quality standards based on the good air quality and moderate level of existing traffic volumes in the region. On a localized level during construction, air quality in the area may be impacted by exhaust generated from construction equipment and fugitive dust. The contractor will implement BMPs necessary to reduce any negative air quality impacts. BMPs for dust control may include but are not limited to:

- Planning the different phases of construction, focusing on minimizing the amount of airborne, visible fugitive dust-generating materials and activities, centralizing on-site vehicular traffic routes, and locating potential dust-generating equipment in areas of the least impact;
- Minimizing airborne, visible fugitive dust from shoulders and access roads;
- Controlling airborne, visible fugitive dust from debris being hauled away from the Project Site.
- Providing an adequate water source at the site prior to start-up construction activities;
- Irrigating the construction site during periods of drought or high winds;

- Landscaping and rapid covering of bare areas, starting from the initial grading phase;
- Disturbing only the areas of construction that are in the immediate zone of construction to limit the amount of time that the areas will be subject to erosion;
- Providing adequate dust control measures during weekends, after hours, and before daily start-up of construction activities; and
- Installing silt screening in areas of disturbance.

A combination of these and other measures to mitigate potential construction-related air quality impacts will be implemented as appropriate. Exhaust emissions from construction equipment and increased vehicular traffic should not violate State or Federal air quality standards based on the moderate level of existing traffic volumes in the region. In the long-term, the proposed Project is not anticipated to have a long-term impact on air quality in the immediate vicinity. As the proposed Project will not present any long-term impacts to air quality, no mitigation measures are required.

4.5 VISUAL RESOURCES

The Waikōloa Public Library will be located at the 740-foot elevation of the South Kohala region, approximately six miles from the coastline. From the Project site, prominent views include the peaks of Mauna Kea to the east, the Kohala Mountains to the north, and the Puakō coastline to the south and west (Figure 14). Waikōloa Village can be seen to the southeast. On clear days, views of Maui and Haleakalā Crater are available to the north.

Potential Impacts and Mitigation Measures

During the Draft EA public review period, the University of Hawai‘i Institute for Astronomy (IfA) commented:

“The University of Hawai‘i Institute for Astronomy (IfA) conducts research in astronomy using telescopes located on Haleakalā and Maunakea and operated by IfA and our partner institutions. Both Haleakalā and Maunakea are among the best sites in the world for astronomical facilities because of their elevation, clear skies, favorable atmospheric conditions, and low levels of light pollution. Hawai‘i-based observatories have played major roles in the advancement of astronomy and astrophysics for over 50 years and are well positioned to remain at the forefront of astronomical research for decades to come.

Because of the outstanding quality and productivity of these facilities, IfA is acutely concerned about negative impacts on astronomy from increased light pollution. Our work to combat light pollution has also brought us into contact with others concerned about light pollution for other reasons, including impacts on wildlife (particularly seabirds) and on human health. While IfA’s comments focus on the impacts of light pollution on astronomy, appropriate mitigation measures also help to reduce non-astronomy impacts.

With that background, we offer the following comments:

Any new or additional artificial light at night has an adverse effect on astronomical observations by increasing the night sky brightness. Nearly all observations performed by

the telescopes on Maunakea are sky-background limited. This means that there is a natural sky brightness coming from airglow and zodiacal light. Artificial light increases the sky brightness, thereby decreasing the sensitivity of the telescopes and effectively making the telescope smaller and less sensitive.

IfA makes it a practice to comment on environmental review documents both to address issues with specific projects and to emphasize the importance of appropriate lighting standards and dark sky protection in any planning process. While the Draft EA notes that outdoor lighting installed for construction purposes will be fully shielded, and also notes the adverse impact that outdoor lighting may have on seabirds that may overfly the project area at night, a more robust discussion of dark sky protection would be welcome. Appropriate steps to keep the skies friendly to both seabirds and the observatories include:

1. Any outdoor lighting, including both construction and permanent lighting, must conform to the standards established by the Hawai‘i County Outdoor Lighting Ordinance (Hawai‘i County Code Chapter 14, Article 9: “Outdoor Lighting”). IfA encourages project planners to include references to the Outdoor Lighting Ordinance in planning documents to confirm to readers that its requirements are being considered and addressed in project planning.

2. The minimum possible amount of outdoor/exterior lighting should be used and should be turned off when not needed. Motion sensor activated lighting is strongly preferred wherever feasible. IfA appreciates the Draft EA’s specific mention of the use of motion sensor activated outdoor lighting for the project.

3. All exterior lighting should be fully shielded. IfA appreciates the Draft EA’s specific recognition of this mitigation measure.

4. Conformity to the Outdoor Lighting Ordinance also requires the use of blue-deficient exterior lighting. This means that exterior LED lighting must emit less than 2% of its total energy at wavelengths less than 500 nm. The best choices for this are either filtered LED lights or amber LED lights.

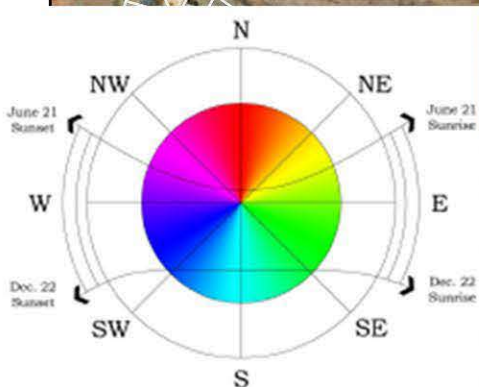
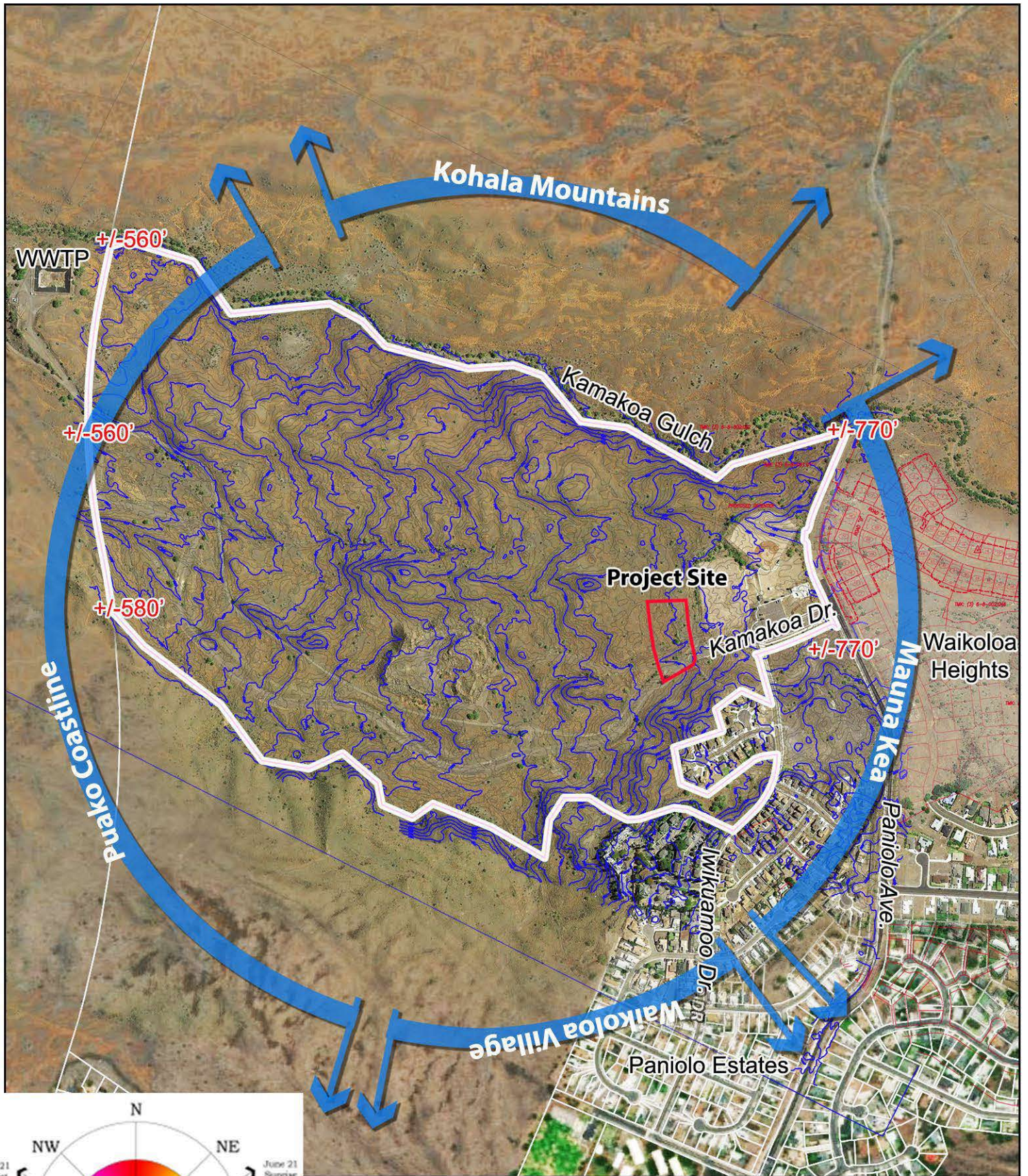
5. White light should be avoided in general because the blue component of white light significantly impacts astronomy. Any white light deemed essential should have a Correlated Color Temperature of 2700 K or below.”

As recommended by IfA, Project lighting will conform to the standards established by the County of Hawai‘i Outdoor Lighting Ordinance (Hawai‘i County Code Chapter 14, Article 9: “Outdoor Lighting”). The Project will use the minimum amount of exterior lighting possible, and, as mentioned in Section 3.6, outdoor lighting will be on timer, motion activated, and fully shielded. To comply with the County’s Outdoor Lighting Ordinance, exterior LED lighting will emit less than 2% of its total energy at wavelengths less than 500 nanometers. Any white light used will have a correlated color temperature of 2,700 Kelvin or less.

The Project site is located approximately 22 miles from the observatory on Mauna Kea and approximately 60 miles from the observatory on Haleakalā. The Project’s distance from these

observatories, combined with the mitigation measures discussed above, should minimize any visual impacts to Hawai‘i-based observatories.

As the Project will not exceed one story or 35 feet in height, no important view planes or scenic sites recognized in the Hawai‘i County General Plan would be affected. Neither the view of Mauna Kea Volcano from the coast nor the view of the Puakō coastline from higher elevations would be substantially affected. Some initial impacts to visual character may occur on a localized scale because of construction activities and vegetation clearing, mostly involving landscaped or non-native wild vegetation, and creation of paved surfaces. In the long-term, the Project is not anticipated to substantially affect the scenic character of this area due to the modest building heights and design, and landscaping improvements on the site will complement the natural beauty of the area.



Source: County of Hawai'i, 2022. USDA NRCS, 2020.

Disclaimer: This graphic has been prepared for general planning purposes only and should not be used for boundary interpretations or other spatial analysis.

Figure 14
View Orientation Map
Waikoloa Public Library

State of Hawai'i - Department of Accounting and General Services
 North
 Linear Scale (feet)
 0 200 400 800

Island of Hawai'i
 PBR HAWAII & ASSOCIATES, INC.

4.6 SOCIAL & ECONOMIC CHARACTERISTICS

Waikōloa Village is a census-designated place (CDP), as defined by the U.S. Census Bureau. In 2020, it was estimated to have roughly 7,100 residents and 2,500 households. The median age in the Waikōloa Village CDP is 38.5, with 6.9% under 5 years, 27.7% under 18 years, and 15.8% 65 years and over. The Waikōloa Village CDP median household income is \$74,000, with an unemployment rate of 4%, and an average household size of 2.62 people. Of those 25 years and older, 93% of Waikōloa Village residents have a high school degree or higher, while only 29% have a bachelor's degree or higher.

Waikōloa Elementary and Middle School is located less than a mile from the Project site. Therefore, the proposed Waikōloa Public Library will serve as a convenient educational resource and community gathering space for students and families. As educational uses, community needs, and technology evolve, a conveniently located library is needed to support a growing population.

Potential Impacts and Mitigation Measures

In the short term, the proposed Project will contribute positively to the construction industry and construction employment. In the long-term, the proposed Waikōloa Public Library and ELC are projected to be vital points of learning and community engagement. As the proposed Project is likely to have a positive impact on socio-economic conditions, no mitigation measures are required.

4.7 INFRASTRUCTURE AND UTILITIES

4.7.1 Water System

The Project site will be served by an existing 20-inch potable water line within the developed portion of Kamakoa Drive. This water line ends at the T-intersection of Kamakoa Drive and Road A with capped 20-inch lines in both Kamakoa Drive and Road A ending just beyond the developed portion of the intersection.

Potential Impacts and Mitigation Measures

During the Pre-Assessment consultation process, the County of Hawai'i, Department of Water Supply wrote:

“Please be informed that the water system in the area is privately owned and operated. We recommend that you contact the Hawai'i Water Service to determine any impacts the subject project will have on their water system.”

During the Pre-Assessment consultation process, the DLNR, Engineering Division wrote:

“The applicant should include water demands and infrastructure required to meet the project needs... The applicant is required to provide water demands and calculations to the Engineering Division so it can be included in the State Water Projects Plan Update projections.”

During the Draft EA public review period, the State DLNR, Engineering Division wrote:

“We have no additional comments.”

Future development plans indicate that the 20-inch water line will be extended in both directions, resulting in a looped system. Given the looped system and water main size, future water service for the Waikōloa Public Library will likely be available for both domestic and fire protection systems from either Kamakoa Drive or Road A. As recommended by the County of Hawai‘i, Department of Water Supply, DAGS will coordinate with HWS to connect to the existing subsurface water line and ensure minimal interruption of water services to adjacent areas. During the design phase, the construction drawings will be submitted to the HWS for review and approval. Water demands and calculations will be provided to the DLNR, Engineering Division for inclusion in the State Water Projects Plan Update projections.

Both domestic and fire meters will require a reduced pressure principal backflow preventer to be installed. Although the backflow preventer for the fire protection system will be quite large, it will be carefully located and screened from view. The Waikōloa Public Library is also expected to include various water conservation features such as low-flow plumbing fixtures, drought tolerant landscaping, and permeable pavement.

4.7.2 Wastewater System

The Project site is currently served by a 12-inch Polyvinyl Chloride (PVC) sewer main within Kamakoa Drive that connects to the to-be-constructed portion of Kamakoa Drive and Road D, leading to the Kamakoa Wastewater Treatment Plant. A sewer stub for the Project site has been provided in the sewer manhole at the southwest corner of the Project site. The invert for the sewer stub is 726.14. Even though the roadway is not yet constructed, the sewer main has already been constructed all the way to the existing sewer manhole that leads to the Kamakoa Wastewater Treatment Plant.

Potential Impacts and Mitigation Measures

The Library site has an existing 8-inch PVC stub from the manhole near the southwest corner of the parcel. The sizing of the Library connection to the stub will depend upon demand, but is not expected to exceed a 6-inch PVC line.

4.7.3 Drainage System

The Project site is currently undeveloped and has no drainage infrastructure. The overall development has existing sediment/detention basins, however, any increase in runoff due to library development will be mitigated onsite.

Potential Impacts and Mitigation Measures

In the long-term, the Project will result in an increase in impervious surface area and therefore more potential storm runoff. Preliminary drainage calculations show that four shallow drywells should be adequate to contain the anticipated increase in runoff. Smaller drainage structures (grated inlets, area drains) will be incorporated at various areas to direct runoff to the drywells. The runoff calculations include piping roof runoff underground and to the drywell system.

4.7.4 Electrical and Telecommunications Systems

The Project site is served by HELCO for electrical service, and by Hawaiian Telcom and Charter Communications for telecommunications service.

Currently, underground power and telecommunications lines run east-west along Kamakoa Drive originating from an underground connection at the Paniolo Avenue Intersection. The east-west underground lines end their westward run at the northeast corner of Kamakoa Drive and Road A, but extend north along the east side of Road A. The underground facilities along Road A end near the entrance to the park driveway.

Potential Impacts and Mitigation Measures

The Waikōloa Public Library building will be served by the existing HELCO service. New underground power and telecommunications lines will be extended west down Kamakoa Drive to enter the new library's driveway. The existing service is anticipated to have adequate capacity to serve this additional electrical load.

In an effort to decrease non-renewable energy consumption, the Project will incorporate PV panels on the library's south and west facing roofs. Four EV charging stations will also be provided in the parking lot. As the proposed Project will not present any long-term impacts to electrical and telecommunications systems, no mitigation measures are required.

4.7.5 Solid Waste

The County of Hawai'i, Department of Environmental Management Solid Waste Division operates one landfill in Waikōloa (West Hawai'i Sanitary Landfill or Pu'uanahulu Landfill). There are 21 solid waste transfer stations located around the island. The nearest transfer station is the Puakō Transfer Station located approximately 6 miles away from the Project site.

Potential Impacts and Mitigation Measures

Solid waste generated at the Site during the construction phase will increase over current conditions. Waste is expected to include materials from construction and grading activities. Every effort will be made to reduce the waste generated during the construction phase and when possible, materials/structures will be re-used and or recycled. The proposed Project will also comply with the provisions of Chapters 11-260 to 11-280, HAR, relating to hazardous waste.

In the long-term, although a moderate increase in solid waste generation is expected due to the Project, no significant impacts to solid waste services are anticipated. Efforts to encourage recycling and waste diversion will be considered for the Project.

4.8 PUBLIC SERVICES AND FACILITIES

4.8.1 Police Protection

The proposed Project is located in the Hawai'i Police Department South Kohala Patrol District. The closest Police Station is the Waimea Station located at 67-5185 Kamāmalu Street, approximately 20-miles from the Project site.

Potential Impacts and Mitigation Measures

During the Pre-Assessment consultation process, the County of Hawai‘i Police Department commented:

“...staff has reviewed your communication and has no input or comments to offer at this time.”

During the Draft EA public review period, the County of Hawai‘i Police Department commented:

“The Hawai‘i Police Department has reviewed the proposal and does not have any comments or concerns at this time.”

The Waikōloa Public Library may have onsite security guards during daily operation. The proposed Project is not expected to increase long-term demand on existing police protection services. As the proposed Project will not present any long-term impacts to police services, no mitigation measures are required.

4.8.2 Fire Protection

The Hawai‘i County Fire Department’s (HCFD) Fire Protection Division has the responsibility of protecting life and property from fire and other multifarious emergencies. The Waikōloa Fire Station (Hawai‘i County Fire Station #16) is located at 68-1771 Pua Melia Street, Waikōloa Village, approximately 2.4 miles from the Project site.

Potential Impacts and Mitigation Measures

The proposed Project is not expected to create an increased long-term demand on existing fire protection services. As the proposed Project will not present any long-term impacts to fire services, no mitigation measures are required.

4.8.3 Health Care Services

Health care facilities located near the proposed Waikōloa Public Library that provide emergency services include Hawai‘i Island Community Health Center (2.5 miles) and Queen’s North Hawai‘i Community Hospital (20 miles).

Potential Impacts and Mitigation Measures

Although there may be an unavoidable and occasional need for emergency health care services by employees or patrons of the library, the proposed Project is not expected to significantly increase the need for emergency services. Additionally, the proposed Project is not expected to have a long-term adverse impact on emergency medical providers or their ability to service the community. No mitigation measures are proposed.

4.8.4 Recreational Facilities

Recreational facilities near the Waikōloa Public Library include an approximately 12-acre public park, which includes a playfield, restroom and skate park, directly across Road A. Ho'oko Park and Waikōloa Community Park are also located nearby, south of the Project site.

Potential Impacts and Mitigation Measures

The proposed Project is not anticipated to displace any existing recreational facilities or add to the resident population and create any additional demand on recreational facilities in the vicinity of the Project. No mitigation measures are proposed.

4.8.5 Schools

The Project will include an approximately 3,000 square foot ELC, support space, and outdoor recreation area designed to provide early childhood education for approximately 40 students. Waikōloa Elementary and Middle School is located less than a mile from the Project site.

The proposed Waikōloa Public Library and ELC will serve as a convenient educational resource and community gathering space for students and families. As educational uses, community needs, and technology evolve, a conveniently located library is needed to support a growing population.

Potential Impacts and Mitigation Measures

During the Pre-Assessment consultation process, the State of Hawai'i Department of Education commented:

“Based on the information provided, the proposed project will not impact Hawaii State Department of Education facilities.”

The Project will directly benefit the public school system by providing additional facilities and resources for early childhood education and learning outside of the classroom. Both the library and the early learning facilities are expected to serve local Waikōloa Village residents. The Project will have no impact on enrollment or operations of other nearby public or private schools and no mitigation measures are proposed.

During the Pre-Assessment consultation process, the County of Hawai'i Department of Research and Development commented:

“If the library were to include a classroom, it would need to be single-use space, specifically for childcare and not available for other uses/meetings.”

The proposed public library includes shelving for a minimum of 50,000 books, private meeting rooms, a program room, a work room, support space, and a librarian's office. The ELC, connected to the library, will have two classrooms dedicated to ELC students. No classrooms are planned to be located in the library itself.

4.8.6 Other Public Services and Facilities

During the Pre-Assessment consultation process, the County of Hawai‘i Department of Research and Development commented:

“The location of the library appears quite distant from the heart of the community... There are several locations for childcare opportunities within the local area: Cole Academy at Mauna Lani; 4 licensed family childcare facilities within the community; preschool at Waikoloa Baptist Church; and EOEL classroom to be opened Fall 2024 at Waikoloa ES. We wonder what the requirement for preschool childcare is in Waikoloa Village.”

Also during the Pre-Assessment consultation process, the State of Hawai‘i Department of Human Services (DHS), which licenses childcare facilities throughout the State wrote:

“at this time, DHS has no comments.”

Potential Impacts and Mitigation Measures

Public Libraries have long been an educational resource for communities and young children. This has been supported by HRS Section 312-12, which allows for the building of ELCs on library-controlled properties focused on educational type setting/resources, thereby expanding the State of Hawai‘i, Department of Education’s reach beyond the K through 12 classroom to include 3-5 year old students. In the preliminary design of the Waikōloa Public Library, students of the ELC classrooms will have convenient access to the entire library via a secured passage when the library is open and a portion of the Children’s Collection when the library is closed.

The proposed Project will be located within the Kamakoa Nui Master Plan area, which is planned for up to 1,250 residential units over the next 20 years. Although its location may appear quite distant from the majority of existing residential development in Waikōloa Village, the proposed public library and ELC are anticipated to function as a vital point of learning and community engagement for future residents of the Kamakoa Nui Master Plan area and the greater Waikōloa Village community. As the population of Waikōloa Village is projected to grow in the coming years, the accompanying need for high-quality educational resources and community gathering spaces will only become more important. As the proposed Project is expected to increase the availability and accessibility of convenient public services and facilities, no mitigation measures are required.

4.9 Formerly Used Defense Sites Program

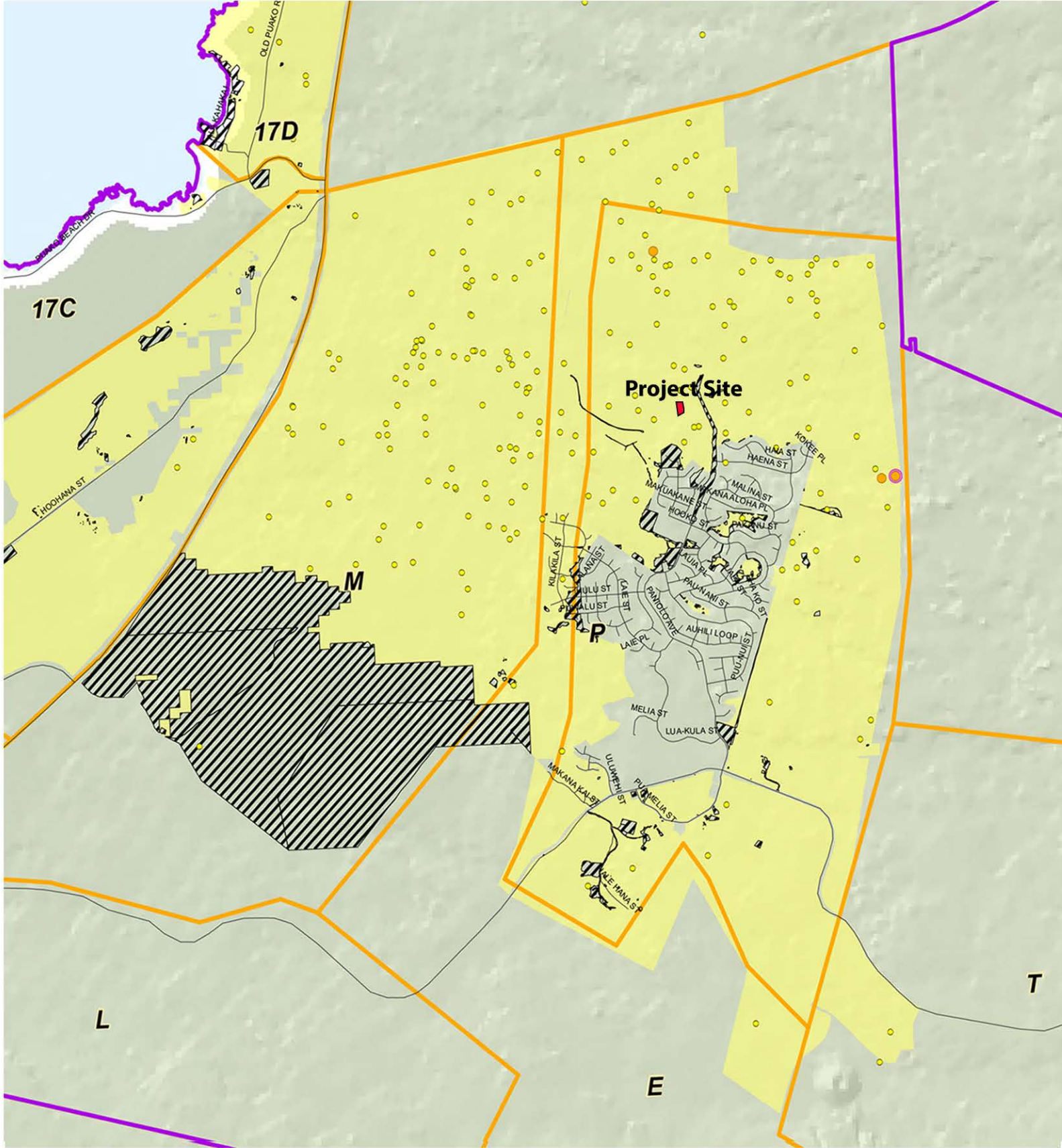
From 1943 to 1945, the United States Department of Defense used 137,000 acres of South Kohala land—including most of present-day Waikōloa Village and all of the Kamakoa Nui Master Plan area—for training and live military operations. Following the deactivation of Camp Tarawa and the Waikōloa Maneuver Area, the Department of Defense performed cleanup activities in accordance with the Explosive Ordnance Details for Disposal in 1946 and 1954. The formerly Used Defense Sites (FUDS) Program addresses potential UXO risks on lands formerly owned or controlled by the Department of Defense prior to 1986. The FUDS program is administered and

implemented nationally by the U.S. Army Corps of Engineers (USACE) and within the Pacific Islands by the Honolulu District of the USACE.

As shown in Figure 15, the Project site is located in FUDS work sector P, which has been cleared under the Explosive Ordnance Details for Disposal in 1946 and 1954. However, the USACE has not issued a Remedial Action Report (RAR) under the present-day process of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) for portions of TMKs (3) 6-8-041:002 and (3) 6-8-041:006, and (3) 6-8-041:009 in FUDS work sector E and TMKs (3) 6-8-041:005 and (3) 6-8-041:006 in FUDS work sector E. Because the current stockpile area on parcel 002 contains new fill, the USACE cannot access the soil layer that was exposed during FUDS program operation. Thus, CERCLA clearance cannot occur in this area until the new fill has been removed.

Potential Impacts and Mitigation Measures

The proposed Waikōloa Public Library is sited on TMK (3) 6-8-041:020, which has been cleared under the Explosive Ordnance Details for Disposal and CERCLA. Moreover, because it is not seeking Federal or State housing funds, the proposed Project will not be affected by its location in a FUDS area. Nevertheless, a UXO monitor will be onsite during construction activities.



LEGEND

MEC (1,802)

- 1
- 2 - 4
- 10 - 13
- 81
- 278

Background

- Exception Area (2,079 acres)
- Cleared Area (22,604 acres)
- Work Sector
- Former Waikoloa Maneuver Area (100,262 acres)

Figure 15
Formerly Used Defense Sites in
Waikoloa Village
Waikoloa Public Library

State of Hawai'i – Department of Accounting and General Services
 North
 Island of Hawai'i



Not to Scale



Disclaimer: This graphic has been prepared for general planning purposes only and should not be used for boundary interpretations or other spatial analysis.

5.0 LAND USE CONFORMANCE

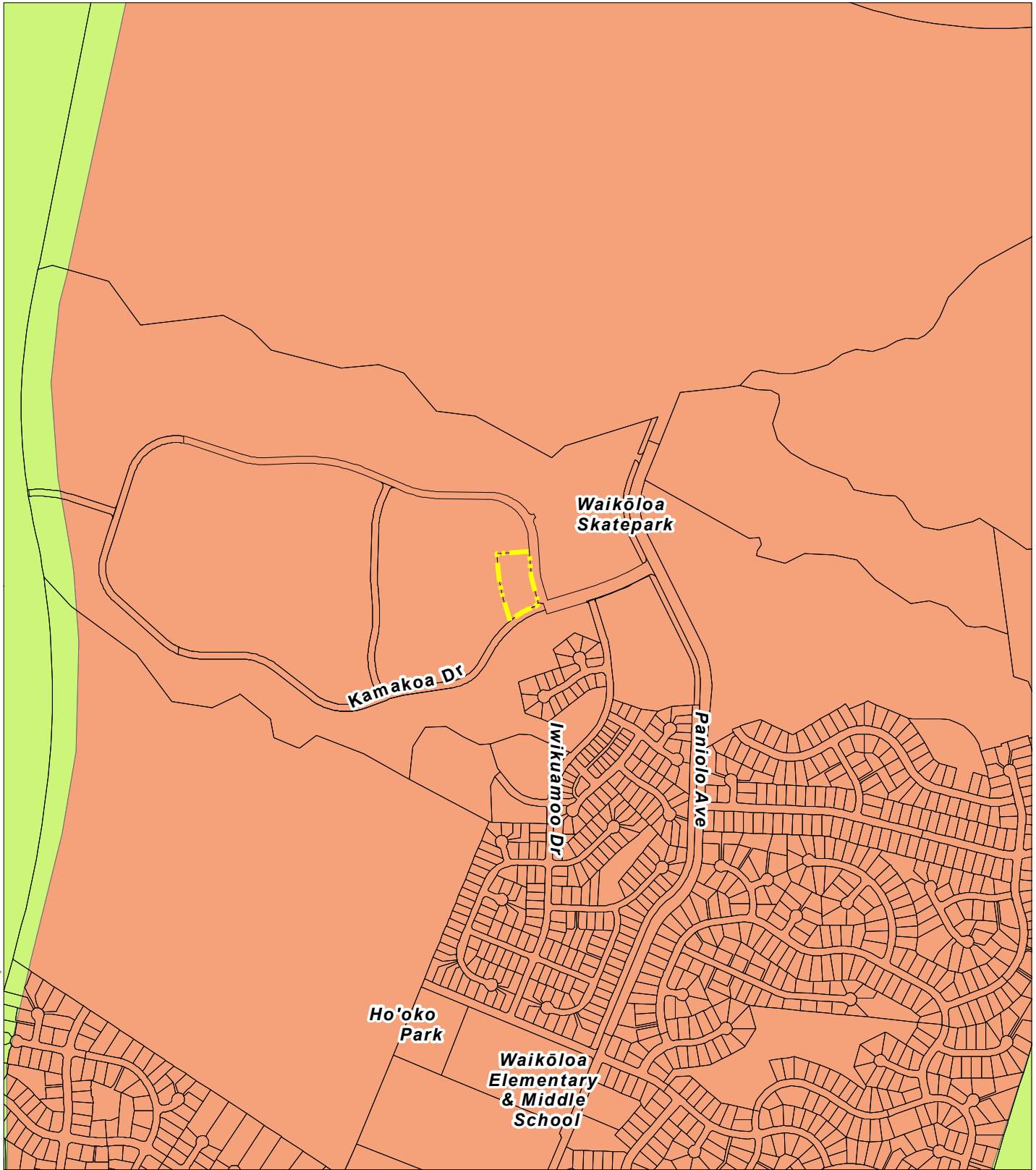
State and County land use plans and policies and required permits and approvals relevant to the Project are described below.

5.1 STATE OF HAWAI‘I

5.1.1 State Land Use Law, Chapter 205, Hawai‘i Revised Statutes

The State Land Use Law (Chapter 205, HRS), establishes the State Land Use Commission and authorizes this body to designate all lands in the State into one of four districts: Urban, Rural, Agricultural, or Conservation. These districts are defined and mapped by the State Land Use Commission in order to ensure compatibility with neighboring land uses and protection of public health.

The proposed Project is located within the State Urban District. According to HRS Section 205-2(b) “Urban districts shall include activities or uses as provided by ordinances or regulations of the county within which the urban district is situated.” Public libraries are a permitted use in the State Land Use Urban District (Figure 16). Section 5.2 of this EA describes the County of Hawai‘i regulations as applicable to this Project.



DATE: 7/31/2023

LEGEND





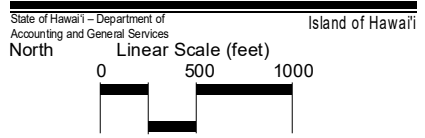
-  Project Site
-  TMK Parcels
- State Land Use Districts**
-  Agricultural
-  Urban

Figure 16
State Land Use Districts
Waikoloa Public Library



Source: County of Hawai'i, 2022.State Land Use Commission, 2020.
 Disclaimer: This graphic has been prepared for general planning purposes only and should not be used for boundary interpretations or other spatial analysis.

5.1.2 Coastal Zone Management Act, Chapter 205A, Hawai‘i Revised Statutes

During the Pre-Assessment consultation process, the County of Hawai‘i Planning Department wrote:

“Describe the proposed project’s consistency with HRS, Chapter 205A, Coastal Zone Management.”

After the Draft EA public comment period, the County of Hawai‘i Planning Department wrote:

“...the proposed project is consistent with Hawai‘i Revised Statutes (HRS), Chapter 205A, Coastal Zone Management...”

The U.S. Congress enacted the Coastal Zone Management (CZM) Act to assist States in better managing coastal and estuarine environments. The act provides grants to States that develop and implement Federally approved CZM plans. The State of Hawai‘i’s CZM Act Program was enacted pursuant to Chapter 205A, HRS.

The CZM area is defined as “all lands of the State and the area extending seaward from the shoreline to the limit of the State’s police power and management authority, including the U.S. territorial sea” (HRS §205A-1). The Project site thus falls within the CZM area. Program objectives and applicability to the proposed Project are discussed in Table 7 below.

Table 7: Coastal Zone Management Act, Chapter 205A, HRS

COASTAL ZONE MANAGEMENT ACT, CHAPTER 205A, HRS (Key: S = Supportive, N/S = Not Supportive, N/A = Not Applicable)	S	N/S	N/A
Recreational Resources			
<i>Objective: (A) Provide coastal recreational opportunities accessible to the public.</i>			
<i>Policies:</i>			
(A) Improve coordination and funding of coastal recreational planning and management; and			X
(B) Provide adequate, accessible, and diverse recreational opportunities in the coastal zone management area by:			
(i) Protecting coastal resources uniquely suited for recreational activities that cannot be provided in other areas;			X
(ii) Requiring replacement of coastal resources having significant recreational value including, but not limited to, surfing sites, fishponds, and sand beaches, when such resources will be unavoidably damaged by development; or requiring reasonable monetary compensation to the State for recreation when replacement is not feasible or desirable;			X
(iii) Providing and managing adequate public access, consistent with conservation of natural resources, to and along shorelines with recreational value;			X
(iv) Providing an adequate supply of shoreline parks and other recreational facilities suitable for public recreation;			X
(v) Ensuring public recreational uses of county, state, and federally owned or			X

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	controlled shoreline lands and waters having recreational value consistent with public safety standards and conservation of natural resources;			
(vi)	Adopting water quality standards and regulating point and nonpoint sources of pollution to protect, and where feasible, restore the recreational value of coastal waters;	X		
(vii)	Developing new shoreline recreational opportunities, where appropriate, such as artificial lagoons, artificial beaches, and artificial reefs for surfing and fishing; and			X
(viii)	Encouraging reasonable dedication of shoreline areas with recreational value for public use as part of discretionary approvals or permits by the land use commission, board of land and natural resources, and county authorities; and crediting such dedication against the requirements of section 46-6.			X
<p>Discussion: The proposed Project is not a coastal development and is not located on the coastline. Therefore, policies regarding shoreline recreation resources and shoreline public access are not applicable to the proposed Project. The water quality standards are discussed under the Coastal Ecosystems objectives and policies.</p>				
Historic Resources				
<i>Objective: (A) Protect, preserve, and, where desirable, restore those natural and manmade historic and prehistoric resources in the coastal zone management area that are significant in Hawaiian and American history and culture.</i>				
<i>Policies:</i>				
	(A) Identify and analyze significant archaeological resources;	X		
	(B) Maximize information retention through preservation of remains and artifacts or salvage operations; and			X
	(C) Support state goals for protection, restoration, interpretation, and display of historic resources.	X		
<p>Discussion: An Archaeological Field Inspection has been conducted to assess the proposed Project's potential impact on archaeological and historical resources. No historic properties were identified as a result of the field inspection of TMK: (3) 6-8-041:020, therefore ASM recommended an effect determination of "no historic properties affected" for the proposed Waikōloa Library Project. Nevertheless, DAGS and its contractors will comply with all State and County laws and rules regarding the preservation of archaeological and historic sites. The construction documents will include a provision that should historic sites such as walls, platforms, pavements and mounds, or remains such as artifacts, burials, concentrations of shell or charcoal or artifacts be inadvertently encountered during construction activities, work will cease immediately in the vicinity of the find and the find will be protected. The contractor will immediately contact SHPD, which will assess the significance of the find and recommend appropriate mitigation measures, if necessary. No further mitigation measures are planned.</p> <p>The Project is thus supportive of the State's objectives and policies for protection, restoration, interpretation, and display of historic resources. See discussion in Section 4.1 of this EA.</p>				

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Scenic and Open Space Resources			
<i>Objective: (A) Protect, preserve, and, where desirable, restore or improve the quality of coastal scenic and open space resources.</i>			
<i>Policies:</i>			
(A) Identify valued scenic resources in the coastal zone management area;			X
(B) Ensure that new developments are compatible with their visual environment by designing and locating such developments to minimize the alteration of natural landforms and existing public views to and along the shoreline;	X		
(C) Preserve, maintain, and, where desirable, improve and restore shoreline open space and scenic resources; and			X
(D) Encourage those developments that are not coastal dependent to locate in inland areas.			X
<p>Discussion: The Waikōloa Public Library will be located at the 740-foot elevation of the South Kohala region, approximately six miles from the coastline. As the Project will not exceed one story or 35 feet in height, no important view planes or scenic sites recognized in the Hawai‘i County General Plan would be affected. Neither the view of Mauna Kea Volcano from the coast nor the view of the Puakō coastline from higher elevations would be substantially affected. Some initial impacts to visual character may occur on a localized scale because of construction activities and vegetation clearing, mostly involving landscaped or non-native wild vegetation, and creation of paved surfaces. In the long-term, the Project is not anticipated to substantially affect the scenic character of this area due to the modest building heights and design. Landscaping improvements on the site will complement the natural beauty of the area.</p>			
Coastal Ecosystems			
<i>Objective: (A) Protect valuable coastal ecosystems, including reefs, from disruption and minimize adverse impacts on all coastal ecosystems.</i>			
<i>Policies:</i>			
(A) Exercise an overall conservation ethic, and practice stewardship in the protection, use, and development of marine and coastal resources;			X
(B) Improve the technical basis for natural resource management;			X
(C) Preserve valuable coastal ecosystems, including reefs, of significant biological or economic importance;			X
(D) Minimize disruption or degradation of coastal water ecosystems by effective regulation of stream diversions, channelization, and similar land and water uses, recognizing competing water needs; and			X
(E) Promote water quantity and quality planning and management practices that reflect the tolerance of fresh water and marine ecosystems and maintain and enhance water quality through the development and implementation of point and nonpoint source water pollution control measures.	X		

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Discussion: The Project will not directly impact coastal ecosystems as it is set back from the nearest shoreline by approximately six miles and is located more than 700 feet AMSL. BMPs will be implemented during construction to prevent erosion and stormwater runoff during the construction phase.			
Economic Uses			
Objective: (A) Provide public or private facilities and improvements important to the State's economy in suitable locations.			
Policies:			
(A) Concentrate coastal dependent development in appropriate areas;			X
(B) Ensure that coastal dependent development such as harbors and ports, and coastal related development such as visitor industry facilities and energy generating facilities, are located, designed, and constructed to minimize adverse social, visual, and environmental impacts in the coastal zone management area; and			X
(C) Direct the location and expansion of coastal dependent developments to areas presently designated and used for such developments and permit reasonable long-term growth at such areas, and permit coastal dependent development outside of presently designated areas when:			
(i) Use of presently designated locations is not feasible;			X
(ii) Adverse environmental effects are minimized; and			X
(iii) The development is important to the State's economy.			X
Discussion: The proposed Project is not a coastal dependent development.			
Coastal Hazards			
Objective: (A) Reduce hazard to life and property from tsunami, storm waves, stream flooding, erosion, subsidence, and pollution.			
Policies:			
(A) Develop and communicate adequate information about storm wave, tsunami, flood, erosion, subsidence, and point and nonpoint source pollution hazards;	X		
(B) Control development in areas subject to storm wave, tsunami, flood, erosion, hurricane, wind, subsidence, and point and nonpoint source pollution hazards;			X
(C) Ensure that developments comply with requirements of the Federal Flood Insurance Program; and	X		
(D) Prevent coastal flooding from inland projects.			X
Discussion: Information regarding flooding, tsunami evacuation zones, hurricane storm surge hazards and sea level rise are presented in section 3.5 of this EA.			

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Managing Development			
<i>Objective: (A) Improve the development review process, communication, and public participation in the management of coastal resources and hazards.</i>			
<i>Policies:</i>			
(A) Use, implement, and enforce existing law effectively to the maximum extent possible in managing present and future coastal zone development;			X
(B) Facilitate timely processing of applications for development permits and resolve overlapping or conflicting permit requirements; and			X
(C) Communicate the potential short and long-term impacts of proposed significant coastal developments early in their life cycle and in terms understandable to the public to facilitate public participation in the planning and review process.	X		
Discussion: Early consultation (scoping) comments were obtained, incorporated into this EA, and are reproduced in Appendix B. In addition, this EA discusses potential impacts and mitigation measures of the proposed Project and provided an opportunity for input during the Draft EA Public Comment period.			
Public Participation			
<i>Objective: (A) Stimulate public awareness, education, and participation in coastal management.</i>			
<i>Policies:</i>			
(A) Promote public involvement in coastal zone management processes;	X		
(B) Disseminate information on coastal management issues by means of educational materials, published reports, staff contact, and public workshops for persons and organizations concerned with coastal issues, developments, and government activities; and			X
(C) Organize workshops, policy dialogues, and site-specific mediations to respond to coastal issues and conflicts.			X
Discussion: Early consultation (scoping) comments were obtained, incorporated into this EA and are reproduced in Appendix B. In addition, this EA discusses potential impacts and mitigation measures of the proposed Project and provided an opportunity for input during the Draft EA Public Comment period.			
Beach Protection			
<i>Objective: (A) Protect beaches for public use and recreation.</i>			
<i>Policies:</i>			
(A) Locate new structures inland from the shoreline setback to conserve open space, minimize interference with natural shoreline processes, and minimize loss of improvements due to erosion;			X
(B) Prohibit construction of private erosion-protection structures seaward of the shoreline, except when they result in improved aesthetic and engineering solutions to erosion at the sites and do not interfere with existing recreational and waterline activities; and			X

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(C) Minimize the construction of public erosion-protection structures seaward of the shoreline.			X
(D) Prohibit private property owners from creating a public nuisance by inducing or cultivating the private property owner’s vegetation in a beach transit corridor; and			X
(E) Prohibit private property owners from creating a public nuisance by allowing the private property owner’s unmaintained vegetation to interfere or encroach upon a beach transit corridor.			X
Discussion: The proposed Project is located outside of the closest shoreline setback, and does not involve shoreline erosion protection structures, or actions that prohibit transit to the shoreline or lateral shoreline access.			
Marine Resources			
<i>Objective: (A) Promote the protection, use, and development of marine and coastal resources to assure their sustainability.</i>			
Policies:			
(A) Ensure that the use and development of marine and coastal resources are ecologically and environmentally sound and economically beneficial;			X
(B) Coordinate the management of marine and coastal resources and activities to improve effectiveness and efficiency;			X
(C) Assert and articulate the interests of the State as a partner with federal agencies in the sound management of ocean resources within the United States exclusive economic zone;			X
(D) Promote research, study, and understanding of ocean processes, marine life, and other ocean resources in order to acquire and inventory information necessary to understand how ocean development activities relate to and impact upon ocean and coastal resources; and			X
(E) Encourage research and development of new, innovative technologies for exploring, using, or protecting marine and coastal resources.			X
Discussion: The Project will not directly impact coastal ecosystems as it is set back from the nearest shoreline by approximately six miles and is located more than 700 feet AMSL. Therefore, the Project will not impact marine or coastal resources.			

5.1.3 Hawai‘i State Planning Act, Chapter 226, Hawai‘i Revised Statutes

The Hawai‘i State Plan, Chapter 226 HRS (2007) provides guidelines for the future growth of the State of Hawai‘i. The Hawai‘i State Plan identifies goals, objectives, policies, and priorities for allocating the State's resources, including public funds, services, human resources, land, energy, and water. The Plan was enacted to achieve “a desired physical environment, characterized by beauty, cleanliness, quiet, stable natural systems, and uniqueness that enhances the mental and

physical well-being of the people.” Table 7 below outlines the proposed Project’s conformance with each theme, goal, objective, policy, and guideline of the Plan.

5.1.3.1 Hawai‘i State Plan, Part I: Overall Theme, Goals, Objectives and Policies

Table 8: Hawai‘i State Plan, Chapter 226, HRS – Part I

HAWAI‘I STATE PLAN, CHAPTER 226, HRS – PART I. OVERALL THEME, GOALS, OBJECTIVES AND POLICIES (Key: S = Supportive, N/S = Not Supportive, N/A = Not Applicable)	S	N/S	N/A
HRS § 226-1: Findings and Purpose			
HRS § 226-2: Definitions			
HRS § 226-3: Overall Theme.			
<i>Hawai‘i’s people, as both individuals and groups, generally accept and live by a number of principles or values which are an integral part of society. This concept is the unifying theme of the State Plan. The following principles or values are established as the overall theme of the Hawai‘i State Plan:</i>			
<p>(1) Individual and family self-sufficiency refers to the rights of people to maintain as much self-reliance as possible. It is an expression of the value of independence, in other words, being able to freely pursue personal interests and goals. Self-sufficiency means that individuals and families can express and maintain their own self-interest so long as that self-interest does not adversely affect the general welfare. Individual freedom and individual achievement are possible only by reason of other people in society, the institutions, arrangements and customs that they maintain, and the rights and responsibilities that they sanction.</p> <p>(2) Social and economic mobility refers to the right of individuals to choose and to have the opportunities for choice available to them. It is a corollary to self-sufficiency. Social and economic mobility means that opportunities and incentives are available for people to seek out their own levels of social and economic fulfillment.</p> <p>(3) Community or social well-being is a value that encompasses many things. In essence, it refers to healthy social, economic, and physical environments that benefit the community as a whole. A sense of social responsibility, of caring for others and for the well-being of our community and of participating in social and political life, are important aspects of this concept. It further implies the aloha spirit--attitudes of tolerance, respect, cooperation and unselfish giving, within which Hawai‘i’s society can progress.</p>			
<i>One of the basic functions of our society is to enhance the ability of individuals and groups to pursue their goals freely, to satisfy basic needs and to secure desired socio-economic levels. The elements of choice and mobility within society’s legal framework are fundamental rights. Society’s role is to encourage conditions within which individuals and groups can approach their desired levels of self-reliance and self-determination. This enables people to gain confidence and self-esteem; citizens contribute more when they possess such qualities in a free and open society.</i>			
<i>Government promotes citizen freedom, self-reliance, self-determination, social and civic responsibility and goals achievement by keeping order, by increasing cooperation among many diverse individuals and groups, and by fostering social and civic responsibilities that affect the general welfare. The greater the number and activities of individuals and groups, the more complex government’s role becomes. The function of government, however, is to assist citizens in attaining their goals. Government provides for meaningful participation by the people in decision-making and for effective access to authority as well as an equitable sharing of benefits. Citizens have a responsibility to work with their government to contribute</i>			

HAWAI'I STATE PLAN, CHAPTER 226, HRS – PART I. OVERALL THEME, GOALS, OBJECTIVES AND POLICIES (Key: S = Supportive, N/S = Not Supportive, N/A = Not Applicable)	S	N/S	N/A
<i>to society's improvement. They must also conduct their activities within an agreed-upon legal system that protects human rights.</i>			
Discussion: Education is a force that promotes self-sufficiency, social and economic mobility, and community well-being. By providing new technology and facilities for learning and community gathering, the proposed Project is supportive of the State's principles for a free and prosperous society.			
HRS § 226-4: State Goals.			
<i>In order to guarantee, for the present and future generations, those elements of choice and mobility that insure that individuals and groups may approach their desired levels of self-reliance and self-determination, it shall be the goal of the State to achieve:</i>			
(1) A strong, viable economy, characterized by stability, diversity and growth that enables fulfillment of the needs and expectations of Hawai'i's present and future generations.			
(2) A desired physical environment, characterized by beauty, cleanliness, quiet, stable natural systems, and uniqueness, that enhances the mental and physical well-being of the people.			
(3) Physical, social and economic well-being, for individuals and families in Hawai'i, that nourishes a sense of community responsibility, of caring and of participation in community life.			
Discussion: Education is a force that promotes self-sufficiency, social and economic mobility, and community well-being. By providing new technology and facilities for learning and community gathering, the proposed Project is supportive of the State's goal of mental well-being and a stable, robust society for future generations.			
HRS § 226-5: Objectives and policies for population.			
(a) Objective: <i>It shall be the objective in planning for the State's population to guide population growth to be consistent with the achievement of physical, economic and social objectives contained in this chapter.</i>			
(b) Policies:			
(1) Manage population growth statewide in a manner that provides increased opportunities for Hawai'i's people to pursue their physical, social and economic aspirations while recognizing the unique needs of each county.			X
(2) Encourage an increase in economic activities and employment opportunities on the neighbor islands consistent with community needs and desires.			X
(3) Promote increased opportunities for Hawai'i's people to pursue their socio-economic aspirations throughout the islands.			X
(4) Encourage research activities and public awareness programs to foster an understanding of Hawai'i's limited capacity to accommodate population needs and to address concerns resulting from an increase in Hawai'i's population.			X
(5) Encourage federal actions and coordination among major governmental agencies to promote a more balanced distribution of immigrants among the states, provided that such actions do not prevent the reunion of immediate family members.			X

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(6) Pursue an increase in federal assistance for states with a greater proportion of foreign immigrants relative to their state's population.			X
(7) Plan the development and availability of land and water resources in a coordinated manner so as to provide for the desired levels of growth in each geographic area.	X		
Discussion: The Project will not increase population growth. The proposed Waikōloa Public Library and ELC are consistent with the State's goals to accommodate population needs and socioeconomic opportunities for the population in the South Kohala region.			
HRS § 226-6: Objectives and policies for the economy in general.			
<i>(a) Objectives: Planning for the State's economy in general shall be directed toward achievement of the following objectives:</i>			
(1) Increased and diversified employment opportunities to achieve full employment, increased income and job choice, and improved living standards for Hawai'i's people, while at the same time stimulating the development and expansion of economic activities capitalizing on defense, dual-use, and science and technology assets, particularly on the neighbor islands where employment opportunities may be limited.			X
(2) A steadily growing and diversified economic base that is not overly dependent on a few industries and includes the development and expansion of industries on the neighbor islands.			X
<i>(b) Policies:</i>			
(1) Promote and encourage entrepreneurship within Hawai'i by residents and nonresidents of the State.			X
(2) Expand Hawai'i's national and international marketing, communication, and organizational ties, to increase the State's capacity to adjust to and capitalize upon economic changes and opportunities occurring outside the State.			X
(3) Promote Hawai'i as an attractive market for environmentally and socially sound investment activities that benefit Hawai'i's people.			X
(4) Transform and maintain Hawai'i as a place that welcomes and facilitates innovative activity that may lead to commercial opportunities.			X
(5) Promote innovative activity that may pose initial risks, but ultimately contribute to the economy of Hawai'i.			X
(6) Seek broader outlets for new or expanded Hawai'i business investments.			X
(7) Expand existing markets and penetrate new markets for Hawai'i's products and services.			X
(8) Assure that the basic economic needs of Hawai'i's people are maintained in the event of disruptions in overseas transportation.			X

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(9) Strive to achieve a level of construction activity responsive to, and consistent with, state growth objectives.			X
(10) Encourage the formation of cooperatives and other favorable marketing arrangements at the local or regional level to assist Hawai'i's small scale producers, manufacturers, and distributors.			X
(11) Encourage labor-intensive activities that are economically satisfying and which offer opportunities for upward mobility.			X
(12) Encourage innovative activities that may not be labor-intensive, but may otherwise contribute to the economy of Hawai'i.			X
(13) Foster greater cooperation and coordination between the government and private sectors in developing Hawai'i's employment and economic growth opportunities.			X
(14) Stimulate the development and expansion of economic activities which will benefit areas with substantial or expected employment problems.			X
(15) Maintain acceptable working conditions and standards for Hawai'i's workers.			X
(16) Provide equal employment opportunities for all segments of Hawai'i's population through affirmative action and nondiscrimination measures.			X
(17) Stimulate the development and expansion of economic activities capitalizing on defense, dual-use, and science and technology assets, particularly on the neighbor islands where employment opportunities may be limited.			X
(18) Encourage businesses that have favorable financial multiplier effects within Hawai'i's economy, particularly with respect to emerging industries in science and technology.			X
(19) Promote and protect intangible resources in Hawai'i, such as scenic beauty and the aloha spirit, which are vital to a healthy economy.			X
(20) Increase effective communication between the educational community and the private sector to develop relevant curricula and training programs to meet future employment needs in general, and requirements of new, potential growth industries in particular.			X
(21) Foster a business climate in Hawai'i--including attitudes, tax and regulatory policies, and financial and technical assistance programs--that is conducive to the expansion of existing enterprises and the creation and attraction of new business and industry.			X
Discussion: The proposed Project will not have a significant impact on the overall State economy.			

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HRS § 226-7: Objectives and policies for the economy – agriculture			
<i>(a) Objectives: Planning for the State's economy with regard to agriculture shall be directed towards achievement of the following objectives:</i>			
• Viability of Hawai'i's sugar and pineapple industries.			X
• Growth and development of diversified agriculture throughout the State.			X
• An agriculture industry that continues to constitute a dynamic and essential component of Hawai'i's strategic, economic, and social well-being.			X
(b) Policies:			
(1) Establish a clear direction for Hawai'i's agriculture through stakeholder commitment and advocacy.			X
(2) Encourage agriculture by making best use of natural resources.			X
(3) Provide the governor and the legislature with information and options needed for prudent decision making for the development of agriculture.			X
(4) Establish strong relationships between the agricultural and visitor industries for mutual marketing benefits.			X
(5) Foster increased public awareness and understanding of the contributions and benefits of agriculture as a major sector of Hawai'i's economy.			X
(6) Seek the enactment and retention of federal and state legislation that benefits Hawai'i's agricultural industries.			X
(7) Strengthen diversified agriculture by developing an effective promotion, marketing, and distribution system between Hawai'i's food producers and consumers in the State, nation, and world.			X
(8) Support research and development activities that strengthen economic productivity in agriculture, stimulate greater efficiency, and enhance the development of new products and agricultural by-products.			X
(9) Enhance agricultural growth by providing public incentives and encouraging private initiatives.			X
(10) Assure the availability of agriculturally suitable lands with adequate water to accommodate present and future needs.			X
(11) Increase the attractiveness and opportunities for an agricultural education and livelihood.			X
(12) In addition to the State's priority on food, expand Hawai'i's agricultural base by promoting growth and development of flowers, tropical fruits and plants, livestock, feed grains, forestry, food crops, aquaculture, and other potential enterprises.			X

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(13) Promote economically competitive activities that increase Hawai'i's agricultural self-sufficiency, including the increased purchase and use of Hawai'i-grown food and food products by residents, businesses, and governmental bodies as defined under section 103D-104.			X
(14) Promote and assist in the establishment of sound financial programs for diversified agriculture.			X
(15) Institute and support programs and activities to assist the entry of displaced agricultural workers into alternative agricultural or other employment.			X
(16) Facilitate the transition of agricultural lands in economically nonfeasible agricultural production to economically viable agricultural uses.			X
Discussion: The proposed Project will not impact the State's agricultural industry.			
HRS § 226-8: Objectives and policies for the economy – visitor industry			
<i>(a) Objectives: Planning for the State's economy with regard to the visitor industry shall be directed towards the achievement of the objective of a visitor industry that constitutes a major component of steady growth for Hawai'i's economy.</i>			
(b) Policies:			
(1) Support and assist in the promotion of Hawai'i's visitor attractions and facilities.			X
(2) Ensure that visitor industry activities are in keeping with the social, economic, and physical needs and aspirations of Hawai'i's people.			X
(3) Improve the quality of existing visitor destination areas by utilizing Hawai'i's strengths in science and technology.			X
(4) Encourage cooperation and coordination between the government and private sectors in developing and maintaining well-designed, adequately serviced visitor industry and related developments which are sensitive to neighboring communities and activities.			X
(5) Develop the industry in a manner that will continue to provide new job opportunities and steady employment for Hawai'i's people.			X
(6) Provide opportunities for Hawai'i's people to obtain job training and education that will allow for upward mobility within the visitor industry.			X
(7) Foster a recognition of the contribution of the visitor industry to Hawai'i's economy and the need to perpetuate the aloha spirit.			X
(8) Foster an understanding by visitors of the aloha spirit and of the unique and sensitive character of Hawai'i's cultures and values.			X

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Discussion: Although Waikōloa Village is a popular destination for visitors, the proposed Project will not have a direct impact on the State's visitor industry as the library is expected to be used by long term residents.			
HRS § 226-9: Objective and policies for the economy – federal expenditures			
<i>(a) Objective: Planning for the State's economy with regard to federal expenditures shall be directed towards achievement of the objective of a stable federal investment base as an integral component of Hawai'i's economy.</i>			
(b) Policies:			
(1) Encourage the sustained flow of federal expenditures in Hawai'i that generates long-term government civilian employment.			X
(2) Promote Hawai'i's supportive role in national defense, in a manner consistent with Hawai'i's social, environmental, and cultural goals by building upon dual-use and defense applications to develop thriving ocean engineering, aerospace research and development, and related dual-use technology sectors in Hawai'i's economy.			X
(3) Promote the development of federally supported activities in Hawai'i that respect state-wide economic concerns, are sensitive to community needs, and minimize adverse impacts on Hawai'i's environment.			X
(4) Increase opportunities for entry and advancement of Hawai'i's people into federal government service.			X
(5) Promote federal use of local commodities, services, and facilities available in Hawai'i.			X
(6) Strengthen federal-state-county communication and coordination in all federal activities that affect Hawai'i.			X
(7) Pursue the return of federally controlled lands in Hawai'i that are not required for either the defense of the nation or for other purposes of national importance, and promote the mutually beneficial exchanges of land between federal agencies, the State, and the counties.			X
Discussion: The Project has no direct relation to the State's goals on federal expenditures.			
HRS § 226-10: Objectives and policies for the economy – potential growth and innovative activities.			
<i>(a) Objective: Planning for the State's economy with regard to potential growth and innovative activities shall be directed towards achievement of the objective of development and expansion of potential growth and innovative activities that serve to increase and diversify Hawai'i's economic base.</i>			
(b) Policies:			
(1) Facilitate investment and employment in economic activities that have the potential to expand and diversify Hawai'i's economy, including but not limited to diversified agriculture, aquaculture, renewable energy development, creative media, health care, and science and technology-based sectors.			X

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(2) Facilitate investment in innovative activity that may pose risks or be less labor-intensive than other traditional business activity, but if successful, will generate revenue in Hawai'i through the export of services or products or substitution of imported services or products.			X
(3) Encourage entrepreneurship in innovative activity by academic researchers and instructors who may not have the background, skill, or initial inclination to commercially exploit their discoveries or achievements.			X
(4) Recognize that innovative activity is not exclusively dependent upon individuals with advanced formal education, but that many self-taught, motivated individuals are able, willing, sufficiently knowledgeable, and equipped with the attitude necessary to undertake innovative activity.			X
(5) Increase the opportunities for investors in innovative activity and talent engaged in innovative activity to personally meet and interact at cultural, art, entertainment, culinary, athletic, or visitor-oriented events without a business focus.			X
(6) Expand Hawai'i's capacity to attract and service international programs and activities that generate employment for Hawai'i's people.			X
(7) Enhance and promote Hawai'i's role as a center for international relations, trade, finance, services, technology, education, culture, and the arts.			X
(8) Accelerate research and development of new energy- related industries based on wind, solar, ocean, and underground resources and solid waste.			X
(9) Promote Hawai'i's geographic, environmental, social, and technological advantages to attract new economic activities into the State.			X
(10) Provide public incentives and encourage private initiative to attract new industries that best support Hawai'i's social, economic, physical, and environmental objectives.			X
(11) Increase research and the development of ocean-related economic activities such as mining, food production, and scientific research.			X
(12) Develop, promote, and support research and educational and training programs that will enhance Hawai'i's ability to attract and develop economic activities of benefit to Hawai'i.			X
(13) Foster a broader public recognition and understanding of the potential benefits of new, or innovative growth-oriented industry in Hawai'i.			X
(14) Encourage the development and implementation of joint federal and state initiatives to attract federal programs and projects that will support Hawai'i's social, economic, physical, and environmental objectives.			X

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(15) Increase research and development of businesses and services in the telecommunications and information industries.			X
(16) Foster the research and development of nonfossil fuel and energy efficient modes of transportation.			X
(17) Recognize and promote health care and health care information technology as growth industries.			X
Discussion: Although the Project has no direct relation to the State's goals on potential growth and innovative activities, the new Waikōloa Public Library is expected to provide convenient educational resources for Waikōloa Village residents, thus promoting learning and innovation.			
HRS § 226-10.5: Objectives and policies for the economy – information industry			
<i>(a) Objective: Planning for the State's economy with regard to telecommunications and information technology shall be directed toward recognizing that broadband and wireless communication capability and infrastructure are foundations for an innovative economy and positioning Hawai'i as a leader in broadband and wireless communications and applications in the Pacific Region.</i>			
(b) Policies:			
(1) Promote efforts to attain the highest speeds of electronic and wireless communication within Hawai'i and between Hawai'i and the world, and make high speed communication available to all residents and businesses in Hawai'i.			X
(2) Encourage the continued development and expansion of the telecommunications infrastructure serving Hawai'i to accommodate future growth and innovation in Hawai'i's economy.			X
(3) Facilitate the development of new or innovative business and service ventures in the information industry which will provide employment opportunities for the people of Hawai'i.			X
(4) Encourage mainland- and foreign-based companies of all sizes, whether information technology-focused or not, to allow their principals, employees, or contractors to live in and work from Hawai'i, using technology to communicate with their headquarters, offices, or customers located out-of-state.			X
(5) Encourage greater cooperation between the public and private sectors in developing and maintaining a well-designed information industry.			X
(6) Ensure that the development of new businesses and services in the industry are in keeping with the social, economic, and physical needs and aspirations of Hawai'i's people.			X
(7) Provide opportunities for Hawai'i's people to obtain job training and education that will allow for upward mobility within the information industry.			X

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(8) Foster a recognition of the contribution of the information industry to Hawai'i's economy.			X
(9) Assist in the promotion of Hawai'i as a broker, creator, and processor of information in the Pacific.			X
Discussion: The Project has no direct relation to the State's goals in the information industry.			
HRS § 226-11: Objectives and policies for the physical environment – land-based, shoreline, and marine resources.			
<i>(a) Objectives: Planning for the State's physical environment with regard to land-based, shoreline, and marine resources shall be directed towards achievement of the following objectives:</i>			
(1) Prudent use of Hawai'i's land-based, shoreline, and marine resources.			X
(2) Effective protection of Hawai'i's unique and fragile environmental resources.			X
(b) Policies:			
(1) Exercise an overall conservation ethic in the use of Hawai'i's natural resources.			X
(2) Ensure compatibility between land-based and water-based activities and natural resources and ecological systems.			X
(3) Take into account the physical attributes of areas when planning and designing activities and facilities.			X
(4) Manage natural resources and environs to encourage their beneficial and multiple use without generating costly or irreparable environmental damage.			X
(5) Consider multiple uses in watershed areas, provided such uses do not detrimentally affect water quality and recharge functions.			X
(6) Encourage the protection of rare or endangered plant and animal species and habitats native to Hawai'i.			X
(7) Provide public incentives that encourage private actions to protect significant natural resources from degradation or unnecessary depletion.			X
(8) Pursue compatible relationships among activities, facilities, and natural resources.			X
(9) Promote increased accessibility and prudent use of inland and shoreline areas for public recreational, educational, and scientific purposes.	X		
Discussion: The Project is proposed on TMK (3) 6-8-041:020, a vacant site within the Kamakoa Nui Master Plan area. The new public library and ELC will provide convenient learning and community engagement opportunities for Waikōloa Village residents.			
HRS § 226-12: Objective and policies for the physical environment – scenic, natural beauty, and historic resources.			

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<i>(a) Objective: Planning for the State's physical environment shall be directed towards achievement of the objective of enhancement of Hawai'i's scenic assets, natural beauty, and multi-cultural/historical resources.</i>			
(b) Policies:			
(1) Promote the preservation and restoration of significant natural and historic resources.			X
(2) Provide incentives to maintain and enhance historic, cultural, and scenic amenities.			X
(3) Promote the preservation of views and vistas to enhance the visual and aesthetic enjoyment of mountains, ocean, scenic landscapes, and other natural features.			X
(4) Protect those special areas, structures, and elements that are an integral and functional part of Hawai'i's ethnic and cultural heritage.			X
(5) Encourage the design of developments and activities that complement the natural beauty of the islands.			X
Discussion: The Project has no relationship to the promotion and/or availability of scenic and historic resources in the State of Hawai'i. An Archaeological Field Inspection and CIA for the proposed Project, as well as previous literature and site development indicates that there will be no impact to cultural/archaeological/historic resources.			
HRS § 226-13: Objectives and policies for the physical environment – land, air, and water quality.			
<i>(a) Objectives: Planning for the State's physical environment with regard to land, air, and water quality shall be directed towards achievement of the following objectives:</i>			
(1) Maintenance and pursuit of improved quality in Hawai'i's land, air, and water resources.			X
(2) Greater public awareness and appreciation of Hawai'i's environmental resources.			X
(b) Policies:			
(1) Foster educational activities that promote a better understanding of Hawai'i's limited environmental resources.			X
(2) Promote the proper management of Hawai'i's land and water resources.			X
(3) Promote effective measures to achieve desired quality in Hawai'i's surface, ground, and coastal waters.			X
(4) Encourage actions to maintain or improve aural and air quality levels to enhance the health and well-being of Hawai'i's people.			X
(5) Reduce the threat to life and property from erosion, flooding, tsunamis, hurricanes, earthquakes, volcanic eruptions, and other natural or man-induced hazards and disasters.			X

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(6) Encourage design and construction practices that enhance the physical qualities of Hawai'i's communities.			X
(7) Encourage urban developments in close proximity to existing services and facilities.	X		
(8) Foster recognition of the importance and value of the land, air, and water resources to Hawai'i's people, their cultures and visitors.			X
Discussion: Providing a new public library in close proximity to existing and future Waikōloa Village residents is consistent with the State's goal of encouraging development near existing services and facilities, while reducing impacts to land, air, and water quality.			
HRS § 226-14: Objective and policies for facility systems – in general.			
<i>(a) Objective: Planning for the State's facility systems in general shall be directed towards achievement of the objective of water, transportation, waste disposal, and energy and telecommunication systems that support statewide social, economic, and physical objectives.</i>			
(b) Policies:			
(1) Accommodate the needs of Hawai'i's people through coordination of facility systems and capital improvement priorities in consonance with state and county plans.	X		
(2) Encourage flexibility in the design and development of facility systems to promote prudent use of resources and accommodate changing public demands and priorities.			X
(3) Ensure that required facility systems can be supported within resource capacities and at reasonable cost to the user.			X
(4) Pursue alternative methods of financing programs and projects and cost-saving techniques in the planning, construction, and maintenance of facility systems.			X
Discussion: By maintaining the parcel's "Urban" State Land Use Boundary designation and providing a permitted use, the Project is in consonance with both State and County plans.			
HRS § 226-15: Objectives and policies for facility systems – solid and liquid wastes.			
<i>(a) Objectives: Planning for the State's facility systems with regard to solid and liquid wastes shall be directed towards the achievement of the following objectives:</i>			
(1) Maintenance of basic public health and sanitation standards relating to treatment and disposal of solid and liquid wastes.	X		
(2) Provision of adequate sewerage facilities for physical and economic activities that alleviate problems in housing, employment, mobility, and other areas.			X
(b) Policies:			
(1) Encourage the adequate development of sewerage facilities that complement planned growth.			X

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(2) Promote re-use and recycling to reduce solid and liquid wastes and employ a conservation ethic.			X
(3) Promote research to develop more efficient and economical treatment and disposal of solid and liquid wastes.			X
Discussion: Solid waste and wastewater disposal systems will be efficiently designed to minimize impacts on existing solid and liquid waste facilities.			
HRS § 226-16: Objective and policies for facility systems – water.			
<i>(a) Objective: Planning for the State's facility systems with regard to water shall be directed towards achievement of the objective of the provision of water to adequately accommodate domestic, agricultural, commercial, industrial, recreational, and other needs within resource capacities.</i>			
(b) Policies:			
(1) Coordinate development of land use activities with existing and potential water supply.	X		
(2) Support research and development of alternative methods to meet future water requirements well in advance of anticipated needs.			X
(3) Reclaim and encourage the productive use of runoff water and wastewater discharges.			X
(4) Assist in improving the quality, efficiency, service, and storage capabilities of water systems for domestic and agricultural use.			X
(5) Support water supply services to areas experiencing critical water problems.			X
(6) Promote water conservation programs and practices in government, private industry, and the general public to help ensure adequate water to meet long-term needs.			X
Discussion: The Project will connect to existing water infrastructure (Hawai'i Water Service) on Kamakoa Drive and is not expected to significantly increase water consumption. DAGS will coordinate with HWS to connect to the existing subsurface water line and ensure minimal interruption of water services to adjacent areas. During the design phase, the construction drawings will be submitted to the HWS for review and approval. Water demands and calculations will be provided to the DLNR, Engineering Division for inclusion in the State Water Projects Plan Update projections.			
HRS § 226-17: Objectives and policies for facility systems – transportation.			
<i>(a) Objective: Planning for the State's facility systems with regard to transportation shall be directed toward the achievement of the following objectives:</i>			
(1) An integrated multi-modal transportation system that services statewide needs and promotes the efficient, economical, safe, and convenient movement of people and goods.			X

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(2) A statewide transportation system that is consistent with and will accommodate planned growth objectives throughout the State.			X
<i>(b) Policies:</i>			
(1) Design, program, and develop a multi-modal system in conformance with desired growth and physical development as stated in this chapter;			X
(2) Coordinate state, county, federal, and private transportation activities and programs toward the achievement of statewide objectives;			X
(3) Encourage a reasonable distribution of financial responsibilities for transportation among participating governmental and private parties;			X
(4) Provide for improved accessibility to shipping, docking, and storage facilities;			X
(5) Promote a reasonable level and variety of mass transportation services that adequately meet statewide and community needs;			X
(6) Encourage transportation systems that serve to accommodate present and future development needs of communities;			X
(7) Encourage a variety of carriers to offer increased opportunities and advantages to interisland movement of people and goods;			X
(8) Increase the capacities of airport and harbor systems and support facilities to effectively accommodate transshipment and storage needs;			X
(9) Encourage the development of transportation systems and programs which would assist statewide economic growth and diversification;			X
(10) Encourage the design and development of transportation systems sensitive to the needs of affected communities and the quality of Hawai'i's natural environment;			X
(11) Encourage safe and convenient use of low-cost, energy-efficient, non-polluting means of transportation;			X
(12) Coordinate intergovernmental land use and transportation planning activities to ensure the timely delivery of supporting transportation infrastructure in order to accommodate planned growth objectives; and			X
(13) Encourage diversification of transportation modes and infrastructure to promote alternate fuels and energy efficiency.			X
Discussion: The Project has no relationship to the provision or facilitation of transportation.			
HRS § 226-18: Objectives and policies for facility systems – energy.			
<i>(a) Objectives:</i> Planning for the State's facility systems with regard to energy shall be directed toward the achievement of the following objectives, giving due consideration to all:			

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(1) Dependable, efficient, and economical statewide energy systems capable of supporting the needs of the people;	X		
(2) Increased energy security and self-sufficiency through the reduction and ultimate elimination of Hawai'i's dependence on imported fuels for electrical generation and ground transportation;			X
(3) Greater diversification of energy generation in the face of threats to Hawai'i's energy supplies and systems;			X
(4) Reduction, avoidance, or sequestration of greenhouse gas emissions from energy supply and use; and	X		
(5) Utility models that make the social and financial interests of Hawai'i's utility customers a priority.			X
<i>(b) To achieve the energy objectives, it shall be the policy of this State to ensure the short- and long-term provision of adequate, reasonably priced, and dependable energy services to accommodate demand.</i>			
(c) Other Policies:			
(1) Support research and development as well as promote the use of renewable energy sources;			X
(2) Ensure that the combination of energy supplies and energy-saving systems is sufficient to support the demands of growth;			X
(3) Base decisions of least-cost supply-side and demand-side energy resource options on a comparison of their total costs and benefits when a least-cost is determined by a reasonably comprehensive, quantitative, and qualitative accounting of their long-term, direct and indirect economic, environmental, social, cultural, and public health costs and benefits;			X
(4) Promote all cost-effective conservation of power and fuel supplies through measures including:			
(A) Development of cost-effective demand-side management programs;			X
(B) Education;			X
(C) Adoption of energy-efficient practices and technologies; and			X
(D) Increasing energy efficiency and decreasing energy use in public infrastructure;			X
(5) Ensure, to the extent that new supply-side resources are needed, that the development or expansion of energy systems uses the least-cost energy supply option and maximizes efficient technologies;			X
(6) Support research, development, demonstration, and use of energy efficiency, load management, and other demand-side management programs, practices, and technologies;			X

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(7) Promote alternate fuels and transportation energy efficiency;			X
(8) Support actions that reduce, avoid, or sequester greenhouse gases in utility, transportation, and industrial sector applications;			X
(9) Support actions that reduce, avoid, or sequester Hawai'i's greenhouse gas emissions through agriculture and forestry initiatives.			X
(10) Provide priority handling and processing for all state and county permits required for renewable energy projects;			X
(11) Ensure that liquefied natural gas is used only as a cost-effective transitional, limited-term replacement of petroleum for electricity generation and does not impede the development and use of other cost-effective renewable energy sources; and			X
(12) Promote the development of indigenous geothermal energy resources that are located on public trust land as an affordable and reliable source of firm power for Hawai'i.			X
Discussion: The proposed Project will incorporate energy efficient fixtures to reduce overall energy consumption from the Project. The Waikōloa Public Library roof incorporates PV panels on the west and south facing elevations. Additionally, four EV charging stations will be provided in the parking lot.			
HRS § 226-18.5: Objectives and policies for facility systems – telecommunications.			
<i>(a) Objective: Planning for the State's telecommunications facility systems shall be directed towards the achievement of dependable, efficient, and economical statewide telecommunications systems capable of supporting the needs of the people.</i>			
<i>(b) To achieve the telecommunications objective, it shall be the policy of this State to ensure the provision of adequate, reasonably priced, and dependable telecommunications services to accommodate demand.</i>			
(c) Other Policies:			
(1) Facilitate research and development of telecommunications systems and resources;			X
(2) Encourage public and private sector efforts to develop means for adequate, ongoing telecommunications planning;			X
(3) Promote efficient management and use of existing telecommunications systems and services; and			X
(4) Facilitate the development of education and training of telecommunications personnel.			X
Discussion: The Project has no relationship to the State's telecommunications policies.			
HRS § 226-19: Objectives and policies for socio-cultural advancement – housing.			
<i>(a) Objectives: Planning for the State's socio-cultural advancement with regard to housing shall be directed toward the achievement of the following objectives:</i>			

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(1) Greater opportunities for Hawai'i's people to secure reasonably priced, safe, sanitary, and livable homes, located in suitable environments that satisfactorily accommodate the needs and desires of families and individuals, through collaboration and cooperation between government and nonprofit and for-profit developers to ensure that more affordable housing is made available to very low-, low- and moderate-income segments of Hawai'i's population.			X
(2) The orderly development of residential areas sensitive to community needs and other land uses.			X
(3) The development and provision of affordable rental housing by the State to meet the housing needs of Hawai'i's people.			X
(b) Policies:			
(1) Effectively accommodate the housing needs of Hawai'i's people.			X
(2) Stimulate and promote feasible approaches that increase housing choices for low-income, moderate-income, and gap-group households.			X
(3) Increase homeownership and rental opportunities and choices in terms of quality, location, cost, densities, style, and size of housing.			X
(4) Promote appropriate improvement, rehabilitation, and maintenance of existing housing units and residential areas.			X
(5) Promote design and location of housing developments taking into account the physical setting, accessibility to public facilities and services, and other concerns of existing communities and surrounding areas.			X
(6) Facilitate the use of available vacant, developable, and underutilized urban lands for housing.			X
(7) Foster a variety of lifestyles traditional to Hawai'i through the design and maintenance of neighborhoods that reflect the culture and values of the community.			X
(8) Promote research and development of methods to reduce the cost of housing construction in Hawai'i.			X
Discussion: Although the Kamakoa Nui Master Plan anticipates future residential development in the area around the Project site, the Project itself has no relationship to the availability of housing in the State of Hawai'i.			
HRS § 226-20: Objectives and policies for socio-cultural advancement – health			
(a) Objectives: <i>Planning for the State's socio-cultural advancement with regard to health shall be directed towards achievement of the following objectives:</i>			
(1) Fulfillment of basic individual health needs of the general public.			X

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(2) Maintenance of sanitary and environmentally healthful conditions in Hawai'i's communities.			X
(3) Elimination of health disparities by identifying and addressing social determinants of health.			X
(b) Policies:			
(1) Provide adequate and accessible services and facilities for prevention and treatment of physical and mental health problems, including substance abuse.			X
(2) Encourage improved cooperation among public and private sectors in the provision of health care to accommodate the total health needs of individuals throughout the State.			X
(3) Encourage public and private efforts to develop and promote statewide and local strategies to reduce health care and related insurance costs.			X
(4) Foster an awareness of the need for personal health maintenance and preventive health care through education and other measures.			X
(5) Provide programs, services, and activities that ensure environmentally healthful and sanitary conditions.			X
(6) Improve the State's capabilities in preventing contamination by pesticides and other potentially hazardous substances through increased coordination, education, monitoring, and enforcement.			X
(7) Prioritize programs, services, interventions, and activities that address identified social determinants of health to improve native Hawaiian health and well-being consistent with the United States Congress' declaration of policy as codified in title 42 United States Code section 11702, and to reduce health disparities of disproportionately affected demographics, including native Hawaiians, other Pacific Islanders, and Filipinos. The prioritization of affected demographic groups other than native Hawaiians may be reviewed every ten years and revised based on the best available epidemiological and public health data.			X
Discussion: The Project has no direct relationship to State of Hawai'i objectives and policies on public health.			
HRS § 226-21: Objective and policies for socio-cultural advancement – education.			
(a) Objectives: <i>Planning for the State's socio-cultural advancement with regard to education shall be directed towards achievement of the objective of the provision of a variety of educational opportunities to enable individuals to fulfill their needs, responsibilities, and aspirations.</i>			
(b) Policies:			
(1) Support educational programs and activities that enhance personal development, physical fitness, recreation, and cultural pursuits of all groups.	X		

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(2) Ensure the provision of adequate and accessible educational services and facilities that are designed to meet individual and community needs.	X		
(3) Provide appropriate educational opportunities for groups with special needs.	X		
(4) Promote educational programs which enhance understanding of Hawai'i's cultural heritage.			X
(5) Provide higher educational opportunities that enable Hawai'i's people to adapt to changing employment demands.			X
(6) Assist individuals, especially those experiencing critical employment problems or barriers, or undergoing employment transitions, by providing appropriate employment training programs and other related educational opportunities.			X
(7) Promote programs and activities that facilitate the acquisition of basic skills, such as reading, writing, computing, listening, speaking, and reasoning.			X
(8) Emphasize quality educational programs in Hawai'i's institutions to promote academic excellence.			X
(9) Support research programs and activities that enhance the education programs of the State.			X
<p>Discussion: Waikōloa Elementary and Middle School is located less than a mile from the Project site. The proposed Waikōloa Public Library and ELC will serve as a convenient educational resource and community gathering space for students and families. As educational uses, community needs, and technology evolve, a conveniently located library is needed to support a growing population. In the short term, the proposed Project will contribute positively to the local construction industry and construction employment. In the long-term, the proposed Waikōloa Public Library and ELC are projected to be vital points of learning and community engagement.</p>			
<p>HRS § 226-22: Objective and policies for socio-cultural advancement – social services.</p>			
<p><i>(a) Objective: Planning for the State's socio-cultural advancement with regard to social services shall be directed towards the achievement of the objective of improved public and private social services and activities that enable individuals, families, and groups to become more self-reliant and confident to improve their well-being.</i></p>			
<p>(b) Policies:</p>			
(1) Assist individuals, especially those in need of attaining a minimally adequate standard of living and those confronted by social and economic hardship conditions, through social services and activities within the State's fiscal capacities.			X
(2) Promote coordination and integrative approaches among public and private agencies and programs to jointly address social problems that will enable individuals, families, and groups to deal effectively with social problems and to enhance their participation in society.			X

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(3) Facilitate the adjustment of new residents, especially recently arrived immigrants, into Hawai'i's communities.			X
(4) Promote alternatives to institutional care in the provision of long-term care for elder and disabled populations.			X
(5) Support public and private efforts to prevent domestic abuse and child molestation, and assist victims of abuse and neglect.			X
(6) Promote programs which assist people in need of family planning services to enable them to meet their needs.			X
Discussion: The Project has no direct relation to the provision of social services by the State of Hawai'i, other than providing additional community gathering spaces and educational resources.			
HRS § 226-23: Objective and policies for socio-cultural advancement – leisure.			
<i>(a) Objective: Planning for the State's socio-cultural advancement with regard to leisure shall be directed towards the achievement of the objective of the adequate provision of resources to accommodate diverse cultural, artistic, and recreational needs for present and future generations.</i>			
(b) Policies:			
(1) Foster and preserve Hawai'i's multi-cultural heritage through supportive cultural, artistic, recreational, and humanities-oriented programs and activities.			X
(2) Provide a wide range of activities and facilities to fulfill the cultural, artistic, and recreational needs of all diverse and special groups effectively and efficiently.			X
(3) Enhance the enjoyment of recreational experiences through safety and security measures, educational opportunities, and improved facility design and maintenance.			X
(4) Promote the recreational and educational potential of natural resources having scenic, open space, cultural, historical, geological, or biological values while ensuring that their inherent values are preserved.			X
(5) Ensure opportunities for everyone to use and enjoy Hawai'i's recreational resources.			X
(6) Assure the availability of sufficient resources to provide for future cultural, artistic, and recreational needs.			X
(7) Provide adequate and accessible physical fitness programs to promote the physical and mental well-being of Hawai'i's people.			X
(8) Increase opportunities for appreciation and participation in the creative arts, including the literary, theatrical, visual, musical, folk, and traditional art forms.	X		
(9) Encourage the development of creative expression in the artistic disciplines to enable all segments of Hawai'i's population to participate in the creative arts.			X

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(10) Assure adequate access to significant natural and cultural resources in public ownership.			X
<p>Discussion: The proposed Project is centrally located in the Kamakoa Nui Master Plan area and will be in walking distance to schools, parks, and residential areas. The Project will provide current residents convenient access to quality educational resources. As educational uses, community needs, and technology evolve, a conveniently located library is needed to support a growing population. In the short term, the proposed Project will contribute positively to the local construction industry and construction employment. In the long-term, the proposed Waikōloa Public Library and ELC are projected to be vital points of learning and community engagement, including providing physical space and resources to promote the creative arts.</p>			
HRS § 226-24: Objective and policies for socio-cultural advancement – individual rights and personal well-being.			
<i>(a) Objective: Planning for the State’s socio-cultural advancement with regard to individual rights and personal well-being shall be directed towards achievement of the objective of increased opportunities and protection of individual rights to enable individuals to fulfill their socio-economic needs and aspirations.</i>			
(b) Policies:			
(1) Provide effective services and activities that protect individuals from criminal acts and unfair practices and that alleviate the consequences of criminal acts in order to foster a safe and secure environment.			X
(2) Uphold and protect the national and state constitutional rights of every individual.	X		
(3) Assure access to, and availability of, legal assistance, consumer protection, and other public services which strive to attain social justice.			X
(4) Ensure equal opportunities for individual participation in society.	X		
<p>Discussion: The proposed Project is centrally located in the Kamakoa Nui Master Plan area and will be in walking distance to schools, parks, and residential areas. The Project will provide current residents convenient access to quality educational resources, including materials relating to history and law. As educational uses, community needs, and technology evolve, a conveniently located library is needed to support a growing population. In the short term, the proposed Project will contribute positively to the local construction industry and construction employment. In the long-term, the proposed Waikōloa Public Library and ELC are projected to be vital points of learning and community engagement.</p>			
HRS § 226-25: Objective and policies for socio-cultural advancement – culture.			
<i>(a) Objective: Planning for the State’s socio-cultural advancement with regard to culture shall be directed toward the achievement of the objective of enhancement of cultural identities, traditions, values, customs, and arts of Hawai‘i’s people.</i>			
(b) Policies:			
(1) Foster increased knowledge and understanding of Hawai‘i’s ethnic and cultural heritages and the history of Hawai‘i.	X		

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(2) Support activities and conditions that promote cultural values, customs, and arts that enrich the lifestyles of Hawai‘i’s people and which are sensitive and responsive to family and community needs.	X		
(3) Encourage increased awareness of the effects of proposed public and private actions on the integrity and quality of cultural and community lifestyles in Hawai‘i.	X		
(4) Encourage the essence of the aloha spirit in people’s daily activities to promote harmonious relationships among Hawai‘i’s people and visitors.			X
Discussion: A new public library will provide educational materials focused on Hawai‘i’s ethnic and cultural heritages and the history of Hawai‘i. Additionally the library will provide physical spaces for community interaction and the sharing of ideas and information regarding Hawai‘i’s ethnic and cultural heritages and the history of Hawai‘i.			
HRS § 226-26: Objectives and policies for socio-cultural advancement – public safety.			
<i>Objectives: Planning for the State’s socio-cultural advancement with regard to public safety shall be directed towards the achievement of the following objectives:</i>			
(1) Assurance of public safety and adequate protection of life and property for all people.			X
(2) Optimum organizational readiness and capability in all phases of emergency management to maintain the strength, resources, and social and economic well-being of the community in the event of civil disruptions, wars, natural disasters, and other major disturbances.			X
(3) Promotion of a sense of community responsibility for the welfare and safety of Hawai‘i’s people.			X
(b) Policies related to public safety:			
(1) Ensure that public safety programs are effective and responsive to community needs.			X
(2) Encourage increased community awareness and participation in public safety programs.			X
(c) Policies related to criminal justice:			
(1) Support criminal justice programs aimed at preventing and curtailing criminal activities.			X
(2) Develop a coordinated, systematic approach to criminal justice administration among all criminal justice agencies.			X
(3) Provide a range of correctional resources which may include facilities and alternatives to traditional incarceration in order to address the varied security needs of the community and successfully reintegrate offenders into the community.			X

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<i>(d) Policies related to emergency management:</i>			
(1) Ensure that responsible organizations are in a proper state of readiness to respond to major war-related, natural, or technological disasters and civil disturbances at all times.			X
(2) Enhance the coordination between emergency management programs throughout the State.			X
Discussion: The Project has no direct relation to the State's goals for public safety, aside from the fact that the Project provides an expanded safe space for learning and community gathering.			
HRS § 226-27: Objectives and policies for socio-cultural advancement – government.			
<i>(a) Objectives: Planning the State's socio-cultural advancement with regard to government shall be directed towards the achievement of the following objectives:</i>			
(1) Efficient, effective, and responsive government services at all levels in the State.			X
(2) Fiscal integrity, responsibility, and efficiency in the state government and county governments.			X
<i>(b) Policies:</i>			
(1) Provide for necessary public goods and services not assumed by the private sector.	X		
(2) Pursue an openness and responsiveness in government that permits the flow of public information, interaction, and response.			X
(3) Minimize the size of government to that necessary to be effective.			X
(4) Stimulate the responsibility in citizens to productively participate in government for a better Hawai'i.			X
(5) Assure that government attitudes, actions, and services are sensitive to community needs and concerns.	X		
(6) Provide for a balanced fiscal budget.			X
(7) Improve the fiscal budgeting and management system of the State.			X
(8) Promote the consolidation of state and county governmental functions to increase the effective and efficient delivery of government programs and services and to eliminate duplicative services wherever feasible.			X
Discussion: The Project will provide the public good that is an educated citizenry and fulfills the goal of government responsiveness – specifically to the needs of Waikōloa Village residents.			

5.1.3.2 Hawai'i State Plan, Part II: Planning Coordination and Implementation

Part II of the State Plan establishes a statewide planning system to coordinate and guide all major state and county activities and to implement the overall theme, goals, objectives, policies, and priority guidelines. The system implements the State Plan through the development of functional plans and county general plans. Functional plans, general plans, and the formulation, administration, and implementation of state programs must be in conformance with the State Plan.

- State Functional Plans

State Functional Plans (SFPs) set forth the policies, statewide guidelines, and priorities within a specific field of activity, when such activity or program is proposed, administered, or funded by any agency of the state. Functional plans are developed by the state agency primarily responsible for a given functional area, which include: Agriculture, Conservation Lands, Education, Employment, Energy, Health, Higher Education, Historic Preservation, Housing, Human Services, Recreation, Tourism, and Transportation. Functional plans must identify priority issues in the functional area and contain objectives, policies, and implementing actions to address those priority issues. Actions may include organizational or management initiatives, facility or physical infrastructure development initiatives, initiatives for programs and services, or legislative proposals. Functional plans are approved by the governor and serve as guidelines for funding and implementation by state and county agencies. In addition, functional plans shall be used to guide the allocation of resources for the implementation of state policies adopted by the legislature.

- State Education Functional Plan

The applicable functional plan is the *State Education Functional Plan* (SEFP 1989). Specific SEFP policies and goals applicable to the proposed Project are discussed below.

A(4): Services and Facilities

- **Policy:** Ensure the provision of adequate and accessible educational services and facilities that are designed to meet individual and community needs. [Hawai'i State Plan, §226-21(b)(21)]
- **Goal:** Provide facilities that are sufficient in number, functional, well-paced [sic] and compatible with the physical surroundings.
- **Discussion:** The proposed Project is centrally located in the Kamakoa Nui Master Plan area and will be in walking distance to schools, parks, and residential areas. The Project will provide current residents convenient access to quality educational resources. As educational uses, community needs, and technology evolve, a conveniently located library and ELC are needed to support a growing population. In the short term, the proposed Project will contribute positively to the local construction industry and construction employment. In the long-term, the proposed Waikōloa Public Library and ELC are projected to be vital points of learning and community engagement.

As established in Part II of the State Plan, a statewide planning system implements the State Plan through the development of SFPs and County general plans. The applicable County general plan is the South Kohala Community Development Plan, which is discussed in Section 5.2 of this EA below.

5.1.3.3 Hawai'i State Plan, Part III: Priority Guidelines

Table 9: Hawai'i State Plan, Chapter 226, HRS – Part III

HAWAI'I STATE PLAN, CHAPTER 226, HRS – PART III. PRIORITY GUIDELINES (Key: S = Supportive, N/S = Not Supportive, N/A = Not Applicable)	S	N/S	N/A
HRS § 226-101: Purpose. <i>The purpose of this part is to establish overall priority guidelines to address areas of statewide concern.</i>			
HRS § 226-102: Overall direction. <i>The State shall strive to improve the quality of life for Hawai'i's present and future present and future population through the pursuit of desirable courses of action in five major areas of statewide concern which merit priority attention: economic development, population growth and land resource management, affordable housing, crime and criminal justice, quality education, principles of sustainability, and climate change adaptation.</i>			
HRS § 226-103: Economic priority guidelines.			
(a) Priority guidelines to stimulate economic growth and encourage business expansion and development to provide needed jobs for Hawai'i's people and achieve a stable and diversified economy:			
(1) Seek a variety of means to increase the availability of investment capital for new and expanding enterprises.			X
(A) Encourage investments which:			
(i) Reflect long term commitments to the State;			X
(ii) Rely on economic linkages within the local economy;			X
(iii) Diversify the economy;			X
(iv) Reinvest in the local economy;			X
(v) Are sensitive to community needs and priorities; and			X
(vi) Demonstrate a commitment to provide management opportunities to Hawai'i residents; and			X
(B) Encourage investments in innovative activities that have a nexus to the State, such as:			
(i) Present or former residents acting as entrepreneurs or principals;			X
(ii) Academic support from an institution of higher education in Hawai'i;			X
(iii) Investment interest from Hawai'i residents;			X
(iv) Resources unique to Hawai'i that are required for innovative activity; and			X
(v) Complementary or supportive industries or government programs or projects.			X
(2) Encourage the expansion of technological research to assist industry development and support the development and commercialization of technological advancements.			X

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(3) Improve the quality, accessibility, and range of services provided by government to business, including data and reference services and assistance in complying with governmental regulations.			X
(4) Seek to ensure that state business tax and labor laws and administrative policies are equitable, rational, and predictable.			X
(5) Streamline the processes for building and development permit and review and telecommunication infrastructure installation approval and eliminate or consolidate other burdensome or duplicative governmental requirements imposed on business, where scientific evidence indicates that public health, safety, and welfare would not be adversely affected.			X
(6) Encourage the formation of cooperatives and other favorable marketing or distribution arrangements at the regional or local level to assist Hawai'i's small-scale producers, manufacturers, and distributors.			X
(7) Continue to seek legislation to protect Hawai'i from transportation interruptions between Hawai'i and the continental United States.			X
(8) Provide public incentives and encourage private initiative to develop and attract industries which promise long-term growth potentials and which have the following characteristics:			
(A) An industry that can take advantage of Hawai'i's unique location and available physical and human resources.			X
(B) A clean industry that would have minimal adverse effects on Hawai'i's environment.			X
(C) An industry that is willing to hire and train Hawai'i's people to meet the industry's labor needs at all levels of employment.			X
(D) An industry that would provide reasonable income and steady employment.			X
(9) Support and encourage, through educational and technical assistance programs and other means, expanded opportunities for employee ownership and participation in Hawai'i business.	X		
(10) Enhance the quality of Hawai'i's labor force and develop and maintain career opportunities for Hawai'i's people through the following actions:			
(A) Expand vocational training in diversified agriculture, aquaculture, information industry, and other areas where growth is desired and feasible.			X
(B) Encourage more effective career counseling and guidance in high schools and post-secondary institutions to inform students of present and future career opportunities.			X

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(C) Allocate educational resources to career areas where high employment is expected and where growth of new industries is desired.			X
(D) Promote career opportunities in all industries for Hawai'i's people by encouraging firms doing business in the State to hire residents.			X
(E) Promote greater public and private sector cooperation in determining industrial training needs and in developing relevant curricula and on-the-job training opportunities.			X
(F) Provide retraining programs and other support services to assist entry of displaced workers into alternative employment.			X
(b) Priority guidelines to promote the economic health and quality of the visitor industry:			
(1) Promote visitor satisfaction by fostering an environment which enhances the Aloha Spirit and minimizes inconveniences to Hawai'i's residents and visitors.			X
(2) Encourage the development and maintenance of well-designed, adequately serviced hotels and resort destination areas which are sensitive to neighboring communities and activities and which provide for adequate shoreline setbacks and beach access.			X
(3) Support appropriate capital improvements to enhance the quality of existing resort destination areas and provide incentives to encourage investment in upgrading, repair, and maintenance of visitor facilities.			X
(4) Encourage visitor industry practices and activities which respect, preserve, and enhance Hawai'i's significant natural, scenic, historic, and cultural resources.			X
(5) Develop and maintain career opportunities in the visitor industry for Hawai'i's people, with emphasis on managerial positions.			X
(6) Support and coordinate tourism promotion abroad to enhance Hawai'i's share of existing and potential visitor markets.			X
(7) Maintain and encourage a more favorable resort investment climate consistent with the objectives of this chapter.			X
(8) Support law enforcement activities that provide a safer environment for both visitors and residents alike.			X
(9) Coordinate visitor industry activities and promotions to business visitors through the state network of advanced data communication techniques.			X
(c) Priority guidelines to promote the continued viability of the sugar and pineapple industries:			
(1) Provide adequate agricultural lands to support the economic viability of the sugar and pineapple industries.			X

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(2) Continue efforts to maintain federal support to provide stable sugar prices high enough to allow profitable operations in Hawai'i.			X
(3) Support research and development, as appropriate, to improve the quality and production of sugar and pineapple crops.			X
(d) Priority guidelines to promote the growth and development of diversified agriculture and aquaculture:			
(1) Identify, conserve, and protect agricultural and aquacultural lands of importance and initiate affirmative and comprehensive programs to promote economically productive agricultural and aquacultural uses of such lands.			X
(2) Assist in providing adequate, reasonably priced water for agricultural activities.			X
(3) Encourage public and private investment to increase water supply and to improve transmission, storage, and irrigation facilities in support of diversified agriculture and aquaculture.			X
(4) Assist in the formation and operation of production and marketing associations and cooperatives to reduce production and marketing costs.			X
(5) Encourage and assist with the development of a waterborne and airborne freight and cargo system capable of meeting the needs of Hawai'i's agricultural community.			X
(6) Seek favorable freight rates for Hawai'i's agricultural products from interisland and overseas transportation operators.			X
(7) Encourage the development and expansion of agricultural and aquacultural activities which offer long-term economic growth potential and employment opportunities.			X
(8) Continue the development of agricultural parks and other programs to assist small independent farmers in securing agricultural lands and loans.			X
(9) Require agricultural uses in agricultural subdivisions and closely monitor the uses in these subdivisions.			X
(10) Support the continuation of land currently in use for diversified agriculture.			X
(11) Encourage residents and visitors to support Hawai'i's farmers by purchasing locally grown food and food products.			X
(e) Priority guidelines for water use and development:			
(1) Maintain and improve water conservation programs to reduce the overall water consumption rate.			X
(2) Encourage the improvement of irrigation technology and promote the use of nonpotable water for agricultural and landscaping purposes.			X

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(3) Increase the support for research and development of economically feasible alternative water sources.			X
(4) Explore alternative funding sources and approaches to support future water development programs and water system improvements.			X
(f) Priority guidelines for energy use and development:			
(1) Encourage the development, demonstration, and commercialization of renewable energy sources.			X
(2) Initiate, maintain, and improve energy conservation programs aimed at reducing energy waste and increasing public awareness of the need to conserve energy.			X
(3) Provide incentives to encourage the use of energy conserving technology in residential, industrial, and other buildings.			X
(4) Encourage the development and use of energy conserving and cost-efficient transportation systems.			X
(g) Priority guidelines to promote the development of the information industry:			
(1) Establish an information network, with an emphasis on broadband and wireless infrastructure and capability, that will serve as the foundation of and catalyst for overall economic growth and diversification in Hawai'i.			X
(2) Encourage the development of services such as financial data processing, a products and services exchange, foreign language translations, telemarketing, teleconferencing, a twenty-four-hour international stock exchange, international banking, and a Pacific Rim management center.			X
(3) Encourage the development of small businesses in the information field such as software development, the development of new information systems, peripherals, and applications; data conversion and data entry services; and home or cottage services such as computer programming, secretarial, and accounting services.			X
(4) Encourage the development or expansion of educational and training opportunities for residents in the information and telecommunications fields.	X		
(5) Encourage research activities, including legal research in the information and telecommunications fields.			X
(6) Support promotional activities to market Hawai'i's information industry services.			X
(7) Encourage the location or co-location of telecommunication or wireless information relay facilities in the community, including public areas, where			X

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scientific evidence indicates that the public health, safety, and welfare would not be adversely affected.			
Discussion: The Project will provide the physical space and educational resources to promote educational and training opportunities for residents in business, information, and telecommunications fields.			
HRS § 226-104: Population growth and land resources priority guidelines.			
(a) Priority guidelines to effect desired statewide growth and distribution:			
(1) Encourage planning and resource management to insure that population growth rates throughout the State are consistent with available and planned resource capacities and reflect the needs and desires of Hawai'i's people.			X
(2) Manage a growth rate for Hawai'i's economy that will parallel future employment needs for Hawai'i's people.			X
(3) Ensure that adequate support services and facilities are provided to accommodate the desired distribution of future growth throughout the State.	X		
(4) Encourage major state and federal investments and services to promote economic development and private investment to the neighbor islands, as appropriate.			X
(5) Explore the possibility of making available urban land, low-interest loans, and housing subsidies to encourage the provision of housing to support selective economic and population growth on the neighbor islands.			X
(6) Seek federal funds and other funding sources outside the State for research, program development, and training to provide future employment opportunities on the neighbor islands.			X
(7) Support the development of high technology parks on the neighbor islands.			X
(b) Priority guidelines for regional growth distribution and land resource utilization:			
(1) Encourage urban growth primarily to existing urban areas where adequate public facilities are already available or can be provided with reasonable public expenditures, and away from areas where other important benefits are present, such as protection of important agricultural land or preservation of lifestyles.	X		
(2) Make available marginal or nonessential agricultural lands for appropriate urban uses while maintaining agricultural lands of importance in the agricultural district.			X
(3) Restrict development when drafting of water would result in exceeding the sustainable yield or in significantly diminishing the recharge capacity of any groundwater area.			X

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(4) Encourage restriction of new urban development in areas where water is insufficient from any source for both agricultural and domestic use.			X
(5) In order to preserve green belts, give priority to state capital-improvement funds which encourage location of urban development within existing urban areas except where compelling public interest dictates development of a noncontiguous new urban core.	X		
(6) Seek participation from the private sector for the cost of building infrastructure and utilities, and maintaining open spaces.			X
(7) Pursue rehabilitation of appropriate urban areas.			X
(8) Support the redevelopment of Kaka'ako into a viable residential, industrial, and commercial community.			X
(9) Direct future urban development away from critical environmental areas or impose mitigating measures so that negative impacts on the environment would be minimized.	X		
(10) Identify critical environmental areas in Hawai'i to include but not be limited to the following: watershed and recharge areas; wildlife habitats (on land and in the ocean); areas with endangered species of plants and wildlife; natural streams and water bodies; scenic and recreational shoreline resources; open space and natural areas; historic and cultural sites; areas particularly sensitive to reduction in water and air quality; and scenic resources.			X
(11) Identify all areas where priority should be given to preserving rural character and lifestyle.			X
(12) Utilize Hawai'i's limited land resources wisely, providing adequate land to accommodate projected population and economic growth needs while ensuring the protection of the environment and the availability of the shoreline, conservation lands, and other limited resources for future generations.	X		
(13) Protect and enhance Hawai'i's shoreline, open spaces, and scenic resources.			X
Discussion: The Project is located in an "Urban" State Land Use District and will address the needs of Hawai'i's families by providing much-needed educational resources, new technology, and community gathering spaces. By building on an underutilized site located in a future residential community, the Project is in line with the State's priorities for population growth and land resources.			
HRS § 226-105: Crime and criminal justice.			
<i>Priority guidelines in the area of crime and criminal justice:</i>			
(1) Support law enforcement activities and other criminal justice efforts that are directed to provide a safer environment.			X
(2) Target state and local resources on efforts to reduce the incidence of violent crime			X

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and on programs relating to the apprehension and prosecution of repeat offenders.			
(3) Support community and neighborhood program initiatives that enable residents to assist law enforcement agencies in preventing criminal activities.			X
(4) Reduce overcrowding or substandard conditions in correctional facilities through a comprehensive approach among all criminal justice agencies which may include sentencing law revisions and use of alternative sanctions other than incarceration for persons who pose no danger to their community.			X
(5) Provide a range of appropriate sanctions for juvenile offenders, including community-based programs and other alternative sanctions.			X
(6) Increase public and private efforts to assist witnesses and victims of crimes and to minimize the costs of victimization.			X
Discussion: The Project has no direct relationship to criminal justice.			
HRS § 226-106: Affordable housing.			
<i>Priority guidelines for the provision of affordable housing:</i>			
(1) Seek to use marginal or nonessential agricultural land and public land to meet housing needs of low- and moderate-income and gap-group households.			X
(2) Encourage the use of alternative construction and development methods as a means of reducing production costs.			X
(3) Improve information and analysis relative to land availability and suitability for housing.			X
(4) Create incentives for development which would increase home ownership and rental opportunities for Hawai'i's low- and moderate-income households, gap-group households, and residents with special needs.			X
(5) Encourage continued support for government or private housing programs that provide low interest mortgages to Hawai'i's people for the purchase of initial owner- occupied housing.			X
(6) Encourage public and private sector cooperation in the development of rental housing alternatives.			X
(7) Encourage improved coordination between various agencies and levels of government to deal with housing policies and regulations.			X
(8) Give higher priority to the provision of quality housing that is affordable for Hawai'i's residents and less priority to development of housing intended primarily for individuals outside of Hawai'i.			X

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Discussion: Although the Kamakoa Nui Master Plan anticipates affordable housing on nearby parcels, the Project itself has no relationship to affordable housing.			
HRS § 226-107: Quality education.			
Priority guidelines to promote quality education:			
(1) Pursue effective programs which reflect the varied district, school, and student needs to strengthen basic skills achievement;	X		
(2) Continue emphasis on general education "core" requirements to provide common background to students and essential support to other university programs;			X
(3) Initiate efforts to improve the quality of education by improving the capabilities of the education work force;	X		
(4) Promote increased opportunities for greater autonomy and flexibility of educational institutions in their decision-making responsibilities;			X
(5) Increase and improve the use of information technology in education by the availability of telecommunications equipment for:			
(A) The electronic exchange of information;	X		
(B) Statewide electronic mail; and	X		
(C) Access to the Internet.	X		
<i>Encourage programs that increase the public's awareness and understanding of the impact of information technologies on our lives;</i>	X		
(6) Pursue the establishment of Hawai'i's public and private universities and colleges as research and training centers of the Pacific;			X
(7) Develop resources and programs for early childhood education;	X		
(8) Explore alternatives for funding and delivery of educational services to improve the overall quality of education; and	X		
(9) Strengthen and expand educational programs and services for students with special needs.	X		
Discussion: Waikōloa Elementary and Middle School is located less than a mile from the Project site. The proposed Waikōloa Public Library and ELC will serve as a convenient educational resource and community gathering space for students and families. As educational uses, community needs, and technology evolve, a conveniently located library is needed to support a growing population. In the short term, the proposed Project will contribute positively to the local construction industry and construction employment. In the long-term, the proposed Waikōloa Public Library and ELC are projected to be vital points of learning and community engagement for all sectors of the local population.			

WAIKŌLOA PUBLIC LIBRARY
FINAL ENVIRONMENTAL ASSESSMENT/ FINDING OF NO SIGNIFICANT IMPACT

HAWAI'I STATE PLAN, CHAPTER 226, HRS – PART III. PRIORITY GUIDELINES (Key: S = Supportive, N/S = Not Supportive, N/A = Not Applicable)	S	N/S	N/A
HRS § 226-108: Sustainability.			
<i>Priority guidelines and principles to promote sustainability shall include:</i>			
(1) Encouraging balanced economic, social, community, and environmental priorities;			X
(2) Encouraging planning that respects and promotes living within the natural resources and limits of the State;			X
(3) Promoting a diversified and dynamic economy;			X
(4) Encouraging respect for the host culture;			X
(5) Promoting decisions based on meeting the needs of the present without compromising the needs of future generations			X
(6) Considering the principles of the ahupua‘a system; and			X
(7) Emphasizing that everyone, including individuals, families, communities, businesses, and government, has the responsibility for achieving a sustainable Hawai‘i.			X
Discussion: The Project has no direct relationship to the State’s priority guidelines for sustainability.			
HRS § 226-109: Climate change adaptation priority guidelines.			
<i>Priority guidelines to prepare the State to address the impacts of climate change, including impacts to the areas of agriculture; conservation lands; coastal and nearshore marine areas; natural and cultural resources; education; energy; higher education; health; historic preservation; water resources; the built environment, such as housing, recreation, transportation; and the economy shall:</i>			
(1) Ensure that Hawai‘i’s people are educated, informed, and aware of the impacts climate change may have on their communities;	X		
(2) Encourage community stewardship groups and local stakeholders to participate in planning and implementation of climate change policies;			X
(3) Invest in continued monitoring and research of Hawai‘i’s climate and the impacts of climate change on the State;			X
(4) Consider native Hawaiian traditional knowledge and practices in planning for the impacts of climate change;			X
(5) Encourage the preservation and restoration of natural landscape features, such as coral reefs, beaches and dunes, forests, streams, floodplains, and wetlands, that have the inherent capacity to avoid, minimize, or mitigate the impacts of climate change;			X
(6) Explore adaptation strategies that moderate harm or exploit beneficial opportunities in response to actual or expected climate change impacts to the natural and built environments;			X
(7) Promote sector resilience in areas such as water, roads, airports, and public health,			X

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HAWAI'I STATE PLAN, CHAPTER 226, HRS – PART III. PRIORITY GUIDELINES (Key: S = Supportive, N/S = Not Supportive, N/A = Not Applicable)	S	N/S	N/A
by encouraging the identification of climate change threats, assessment of potential consequences, and evaluation of adaptation options;			
(8) Foster cross-jurisdictional collaboration between county, state, and federal agencies and partnerships between government and private entities and other nongovernmental entities, including nonprofit entities;			X
(9) Use management and implementation approaches that encourage the continual collection, evaluation, and integration of new information and strategies into new and existing practices, policies, and plans; and			X
(10) Encourage planning and management of the natural and built environments that effectively integrate climate change policy.			X
<p>Discussion: The Project is located outside the 3.2-foot Sea Level Rise Exposure Area as modeled by the University of Hawai'i Coastal Geology Group. The Waikōloa Public Library will provide educational resources and promote the sharing of information, thereby helping to ensure that residents are informed and aware of the impacts climate change may have on their community.</p>			

5.1.4 State Environmental Policy, Chapter 344, Hawai'i Revised Statutes

The State Environmental Policy, as defined in Chapter 344, HRS, establishes the policy of the State of Hawai'i on natural resource conservation and the environment. The Project's consistency with the State Environmental Policy is outlined in Table 10 below:

Table 10: State Environmental Policy, Chapter 344, HRS

State Environmental Policy, Chapter 344, Hawai'i Revised Statutes (Key: S = Supportive, N/S = Not Supportive, N/A = Not Applicable)	S	N/S	N/A
State Environmental Policy			
<i>§344-3 Environmental policy. It shall be the policy of the State, through its programs, authorities, and resources to:</i>			
(1) Conserve the natural resources, so that land, water, mineral, visual, air and other natural resources are protected by controlling pollution, by preserving or augmenting natural resources, and by safeguarding the State's unique natural environmental characteristics in a manner which will foster and promote the general welfare, create and maintain conditions under which humanity and nature can exist in productive harmony, and fulfill the social, economic, and other requirements of the people of Hawai'i.			X
(2) Enhance the quality of life by:			
(A) Setting population limits so that the interaction between the natural and artificial environments and the population is mutually beneficial;			X
(B) Creating opportunities for the residents of Hawai'i to improve their quality of life through diverse economic activities which are stable and in balance with			X

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State Environmental Policy, Chapter 344, Hawai'i Revised Statutes (Key: S = Supportive, N/S = Not Supportive, N/A = Not Applicable)	S	N/S	N/A
the physical and social environments;			
(C) Establishing communities which provide a sense of identity, wise use of land, efficient transportation, and aesthetic and social satisfaction in harmony with the natural environment which is uniquely Hawaiian; and			X
(D) Establishing a commitment on the part of each person to protect and enhance Hawai'i's environment and reduce the drain on nonrenewable resources.			X
Discussion: The Project is planned in an urban area and will not involve State Conservation lands.			
Guidelines			
<i>§344-4 Guidelines. In pursuance of the state policy to conserve the natural resources and enhance the quality of life, all agencies, in the development of programs, shall, insofar as practicable, consider the following guidelines:</i>			
(1) Population.			
(A) Recognize population impact as a major factor in environmental degradation and adopt guidelines to alleviate this impact and minimize future degradation;			X
(B) Recognize optimum population levels for counties and districts within the State, keeping in mind that these will change with technology and circumstance, and adopt guidelines to limit population to the levels determined.			X
Discussion: The Project will neither encourage nor discourage population growth.			
(2) Land, water, mineral, visual, air, and other natural resources.			
(A) Encourage management practices which conserve and fully utilize all natural resources;			X
(B) Promote irrigation and waste water management practices which conserve and fully utilize vital water resources;			X
(C) Promote the recycling of waste water;			X
(D) Encourage management practices which conserve and protect watersheds and water sources, forest, and open space areas;			X
(E) Establish and maintain natural area preserves, wildlife preserves, forest reserves, marine preserves, and unique ecological preserves;			X
(F) Maintain an integrated system of state land use planning which coordinates the state and county general plans;			X

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State Environmental Policy, Chapter 344, Hawai'i Revised Statutes (Key: S = Supportive, N/S = Not Supportive, N/A = Not Applicable)	S	N/S	N/A
(G) Promote the optimal use of solid wastes through programs of waste prevention, energy resource recovery, and recycling so that all our wastes become utilized.			X
Discussion: The proposed Project has no direct relationship to the management of land, water, mineral, visual, air, and other natural resources, other than that the location of the Project will minimize impacts to natural and visual resources by using BMPs.			
(3) Flora and fauna.			
(A) Protect endangered species of indigenous plants and animals and introduce new plants or animals only upon assurance of negligible ecological hazard;			X
(B) Foster the planting of native as well as other trees, shrubs, and flowering plants compatible to the enhancement of our environment.			X
Discussion: The Project is not in any critical habitat areas and will have no impact on endangered species.			
(4) Parks, recreation, and open space.			
(A) Establish, preserve and maintain scenic, historic, cultural, park and recreation areas, including the shorelines, for public recreational, educational, and scientific uses;			X
(B) Protect the shorelines of the State from encroachment of artificial improvements, structures, and activities;			X
(C) Promote open space in view of its natural beauty not only as a natural resource but as an ennobling, living environment for its people.			X
Discussion: The Project is located more than six miles from the shoreline and over 700 feet AMSL. Although the Waikōloa Public Library will be located across the street from a renovated public park (TMK (3) 6-8-041:019), the Project itself will have no impact on available parks, recreation, and adjoining open spaces.			
(5) Economic development.			
(A) Encourage industries in Hawai'i which would be in harmony with our environment;			X
(B) Promote and foster the agricultural industry of the State; and preserve and conserve productive agricultural lands;			X
(C) Encourage federal activities in Hawai'i to protect the environment;			X
(D) Encourage all industries including the fishing, aquaculture, oceanography, recreation, and forest products industries to protect the environment;			X

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State Environmental Policy, Chapter 344, Hawai'i Revised Statutes (Key: S = Supportive, N/S = Not Supportive, N/A = Not Applicable)	S	N/S	N/A
(E) Establish visitor destination areas with planning controls which shall include but not be limited to the number of rooms;			X
(F) Promote and foster the aquaculture industry of the State; and preserve and conserve productive aquacultural lands.			X
Discussion: The Project is not directly related to the State's goals for economic development.			
(6) Transportation.			
(A) Encourage transportation systems in harmony with the lifestyle of the people and environment of the State;			X
(B) Adopt guidelines to alleviate environmental degradation caused by motor vehicles;			X
(C) Encourage public and private vehicles and transportation systems to conserve energy, reduce pollution emission, including noise, and provide safe and convenient accommodations for their users.			X
Discussion: The Project is not anticipated to have any impact on transportation systems.			
(7) Energy.			
(A) Encourage the efficient use of energy resources.	X		
Discussion: The proposed Project will incorporate energy efficient fixtures to reduce overall energy consumption from the Project. The Waikōloa Public Library roof incorporates PV panels on the west and south facing elevations. Additionally, four EV charging stations will be provided in the parking lot.			
(8) Community life and housing.			
(A) Foster lifestyles compatible with the environment; preserve the variety of lifestyles traditional to Hawai'i through the design and maintenance of neighborhoods which reflect the culture and mores of the community;			X
(B) Develop communities which provide a sense of identity and social satisfaction in harmony with the environment and provide internal opportunities for shopping, employment, education, and recreation;			X
(C) Encourage the reduction of environmental pollution which may degrade a community;			X
(D) Foster safe, sanitary, and decent homes;			X
(E) Recognize community appearances as major economic and aesthetic assets of the counties and the State; encourage green belts, plantings, and landscape plans and designs in urban areas; and preserve and promote mountain-to-			X

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State Environmental Policy, Chapter 344, Hawai'i Revised Statutes (Key: S = Supportive, N/S = Not Supportive, N/A = Not Applicable)	S	N/S	N/A
ocean vistas.			
Discussion: The proposed Project has no direct relationship to the State's environmental policy on community life and housing.			
(9) Education and culture.			
(A) Foster culture and the arts and promote their linkage to the enhancement of the environment;	X		
(B) Encourage both formal and informal environmental education to all age groups.	X		
Discussion: The proposed Project will be conveniently located in Waikōloa Village. As educational uses, community needs, and technology evolve, a conveniently located library is needed to support a growing population. In the short term, the proposed Project will contribute positively to the local construction industry and construction employment. In the long-term, the proposed Waikōloa Public Library and ELC are projected to be vital points of learning and community engagement. The Waikōloa Public Library will provide physical space and educational resources that promote formal and informal learning for all age groups. Providing the proposed Waikōloa Public Library and ELC puts the Project in line with the above State goals.			
(10) Citizen participation.			
(A) Encourage all individuals in the State to adopt a moral ethic to respect the natural environment; to reduce waste and excessive consumption; and to fulfill the responsibility as trustees of the environment for the present and succeeding generations; and			X
(B) Provide for expanding citizen participation in the decision making process so it continually embraces more citizens and more issues.	X		
Discussion: This EA discusses potential impacts and mitigation measures of the proposed Project and provided an opportunity for resident input during the Draft EA Public Comment period.			

5.2 COUNTY OF HAWAI‘I

County-specific land use plans and ordinances pertaining to the Project include the County of Hawai‘i General Plan, the South Kohala Community Development Plan, County of Hawai‘i Resolution No. 416-07, the County of Hawai‘i Zoning Code, Special Management Areas, and the Kamakoa Nui Master Plan.

5.2.1 County of Hawai‘i General Plan

During the Pre-Assessment consultation process, the County of Hawai‘i Planning Department wrote:

“Describe how the proposed use is consistent with the policies, standards and courses of action of the County of Hawai‘i General Plan, which can be found electronically at <https://www.planning.hawaiicounty.gov/general-plan-community-planning/gp/plan.>”

The County of Hawai‘i’s General Plan (amended 2006) is the policy document for the long-range comprehensive development of the Island of Hawai‘i. The General Plan is intended to guide the pattern of future development in the County based on long-term goals, while identifying and promoting the visions, values, and priorities important to its people. Specific General Plan goals and policies most applicable to the Project follow.

Public Facilities

Section 10.1.2 Goals

- (a) Encourage the provision of public facilities that effectively service community and visitor needs and seek ways of improving public service through better and more functional facilities in keeping with the environmental and aesthetic concerns of the community.

Section 10.1.3 Policies

- (a) Continue to seek ways of improving public service through the coordination of service and maximizing the use of personnel and facilities.
- (b) Coordinate with appropriate State agencies for the provision of public facilities to serve the needs of the community.
- (c) Develop short and long-range capital improvement programs and operating budgets for public facilities and services.
- (d) Develop and adopt an Impact Fees Ordinance.
- (e) Capital Improvement and Operating budgets shall reflect the goals and policies of the County General Plan.
- (f) Require a six-year, long-term, capital improvements budget by County Departments and agencies that shall be reviewed for consistency with the General Plan.

Education

Section 10.2.2 Policies

- (a) Encourage continuous joint pre-planning of schools with the Department of Education and the University of Hawai‘i to ensure coordination with roads, water, and other support facilities and considerations such as traffic and safety, and access for vehicle, bicycle, and pedestrian. Encourage master planning of present and proposed public and private institutions.
- (b) Encourage combining schoolyards with county parks and allow school facilities for afterschool use by the community for recreational, cultural, and other compatible uses.
- (c) Encourage joint community-school library facilities, where a separate community library may not be feasible, in proximity to other community facilities, affording both pedestrian and vehicular access.
- (d) Encourage implementation of the Department of Education's 'Educational Specifications and Standards for Facilities.'
- (e) Encourage the Hawai‘i State Library System to seek alternate sites for public libraries located on the campuses of public schools.

Section 10.2.4.4.3 Courses of Action (South Kohala)

- (a) Encourage the expansion of the public school and library facilities as needs arise.
- (b) Encourage continual improvements to existing educational facilities.
- (c) Encourage the installation of walkways to and around schools and street crossing facilities for pedestrian safety.
- (d) Encourage the development of State and private higher educational facilities in West Hawaii.
- (e) Support the development of an intermediate or middle school in Waikōloa.
- (f) Encourage the Hawai‘i State Library System to establish a public library in Waikōloa.

Discussion: After the Draft EA public comment period, the County of Hawai‘i Planning Department wrote:

“...the proposed project is consistent with...several Policies of the County of Hawai‘i General Plan 2005 (amended December 2006) related to Public Facilities and Education...”

The proposed Project is consistent with the above goals and policies of the County of Hawai‘i General Plan. Waikōloa Elementary and Middle School is located less than a mile from the Project site. The proposed Waikōloa Public Library and ELC will serve as a convenient educational resource and community gathering space for students and families. As educational uses, community needs, and technology evolve, a conveniently located library is needed to support a

growing population. In the long-term, the proposed Waikōloa Public Library and ELC are projected to be vital points of learning and community engagement.

As new residents move into the Kamakoa Nui Master Plan area, a permanent library and ELC with modern technology, educational resources, and learning spaces will be a necessary community asset for the greater Waikōloa Village community. As such, the Waikōloa Public Library is intended to support an increasing range of community needs including early learning programs, library programs, kupuna classes, and flexible meeting spaces.

5.2.2 Land Use Pattern Allocation Guide

The General Plan’s accompanying Land Use Pattern Allocation Guide (LUPAG) Map establishes the future land use patterns for the island, including the community of Waikōloa Village.

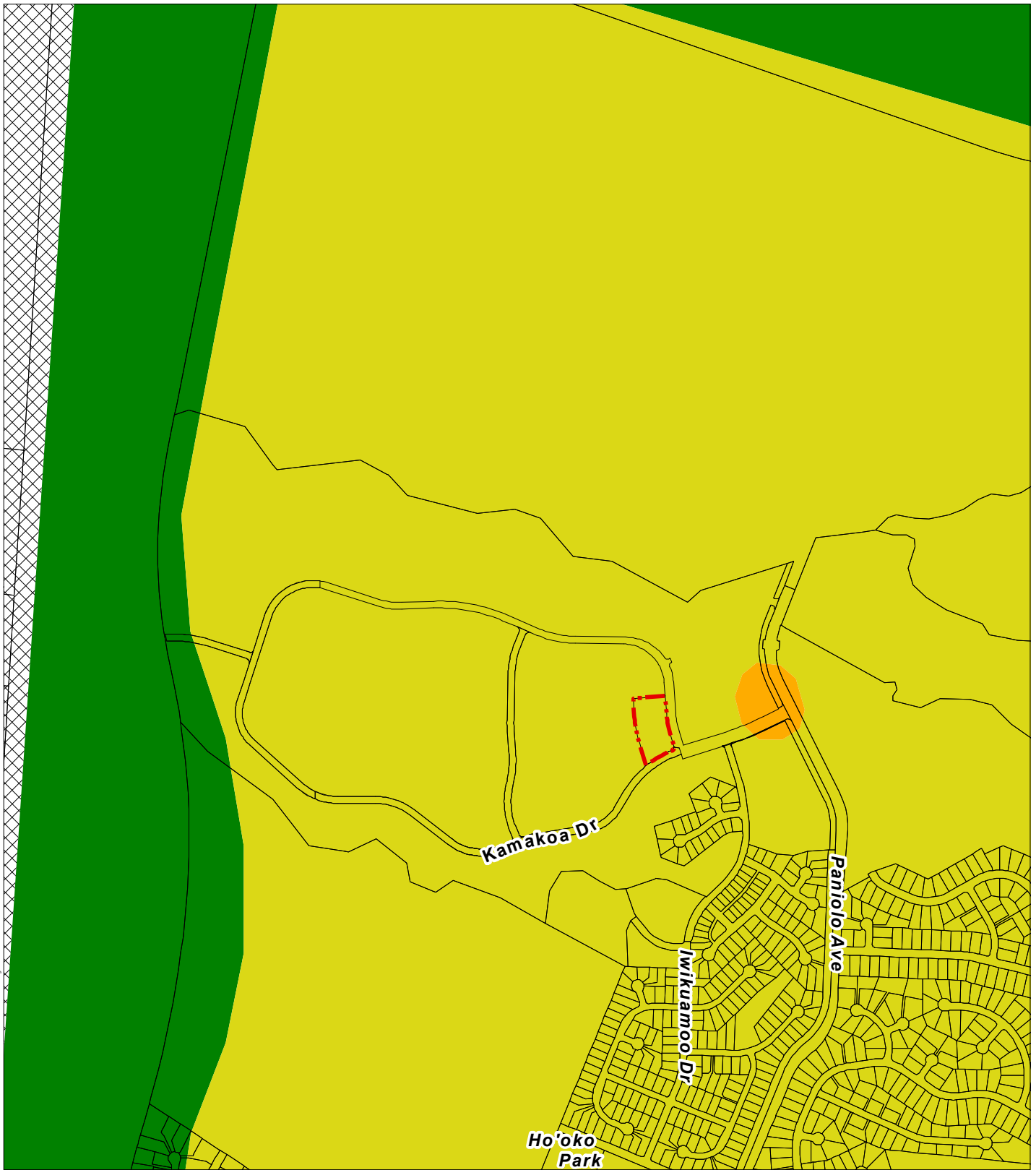
During the Pre-Assessment consultation process, the County of Hawai‘i Planning Department wrote:

“According to the County of Hawai‘i General Plan 2005, amended December 2006, the property is designated as Low Density Urban by the Land Use Pattern Allocation Guide (LUPAG) Map.”

As noted by the County Planning Department, the LUPAG designates the Project site as “Low Density Urban” (Figure 17), which allows for “residential, with ancillary community and public uses, and neighborhood and convenience-type commercial uses; overall residential density may be up to six units per acre.”

Discussion: The proposed Project is consistent with the “Low Density Urban” LUPAG designation, as the proposed Project involves a one-story public library meant to serve the local Waikōloa Village community.

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DATE: 7/31/2023

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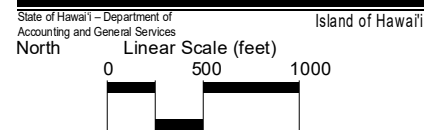
-  Project Site
-  TMK Parcels
- LUPAG**
-  Low Density Urban
-  Medium Density Urban
-  Open Area
-  Urban Expansion

Figure 17
County of Hawai'i General Plan
Land Use Allocation Guide
Waikoloa Public Library



Source: County of Hawai'i, 2022.
 Disclaimer: This graphic has been prepared for general planning purposes only and should not be used for boundary interpretations or other spatial analysis.

5.2.3 South Kohala Community Development Plan

During the Pre-Assessment consultation process, the County of Hawai‘i Planning Department wrote:

“The project site is located in the South Kohala Community Development Plan (CDP) planning area. The South Kohala CDP was adopted by Ordinance No. 08-159, effective as of November 20, 2008. Strategy 1.3 of the South Kohala CDP is to Plan, Fund, and Construct a Community Library. More specifically, the strategy notes that a modern library would be an important facility and amenity for Waikoloa Village, and would enhance the Village’s sense of community and identity. The proposed project would be consistent with the library priorities in the South Kohala CDP... Describe how the proposed project is in alignment with the South Kohala Community Development Plan (CDP) which can be found electronically at <https://www.planning.hawaiicounty.gov/general-plan-community-planning/cdp/skohala.>”

The Hawai‘i County General Plan requires that community development plans be adopted by the County Council for each judicial district in the County. The South Kohala Community Development Plan (CDP), which the County Council adopted in November 2008, represents the judicial district of South Kohala, where Waikōloa Village is located. The purpose of the South Kohala CDP is to:

- Identify the South Kohala community’s Priority Issues
- Develop Policies and Action Programs to address those Priority Issues

Within the South Kohala CDP is the Waikoloa Village Plan Conceptual Plan (Figure 18), which contains specific policies and strategies to implement those policies, in an effort to guide growth in Waikōloa Village:

Waikoloa Policy 1: Provide Infrastructure And Facilities For A Growing Community shall be an overarching planning policy for Waikoloa Village. The County shall work closely with the Waikoloa Village Community and area developers such that funding for important infrastructure projects and community facilities is provided.

Strategy 1.3 Plan, Fund, and Construct a Community Library – There has been some discussion on the need for a public library at Waikoloa Village, including ideas for a “state of the art” facility that would include advanced computer hardware and software as well as traditional books and other reading materials. A modern library would certainly be an important facility and amenity for Waikoloa Village, and would enhance the Village’s sense of community and identity. Options for a Library include: a stand-alone Library, a

Library developed as part of the Community Center, or a Library attached to the Middle School.

Discussion: After the Draft EA public comment period, the County of Hawai'i Planning Department wrote:

“...the proposed project is...in alignment with the South Kohala Community Development Plan.”

The Project is consistent with the above guiding policies and strategies of the South Kohala CDP. The proposed Waikōloa Public Library and ELC will serve as a convenient educational resource and community gathering space for students and families. As educational uses, community needs, and technology evolve, a conveniently located library is needed to support a growing population. In the long-term, the proposed Waikōloa Public Library and ELC are projected to be vital points of learning and community engagement.

As new residents move into the Kamakoa the Nui Master Plan area, a permanent library and ELC with modern technology, educational resources, and learning spaces will be a necessary community asset for the greater Waikōloa Village community. As such, the Waikōloa Public Library and ELC are intended to support an increasing range of community needs including early learning programs, library programs, kupuna classes, and flexible meeting spaces.

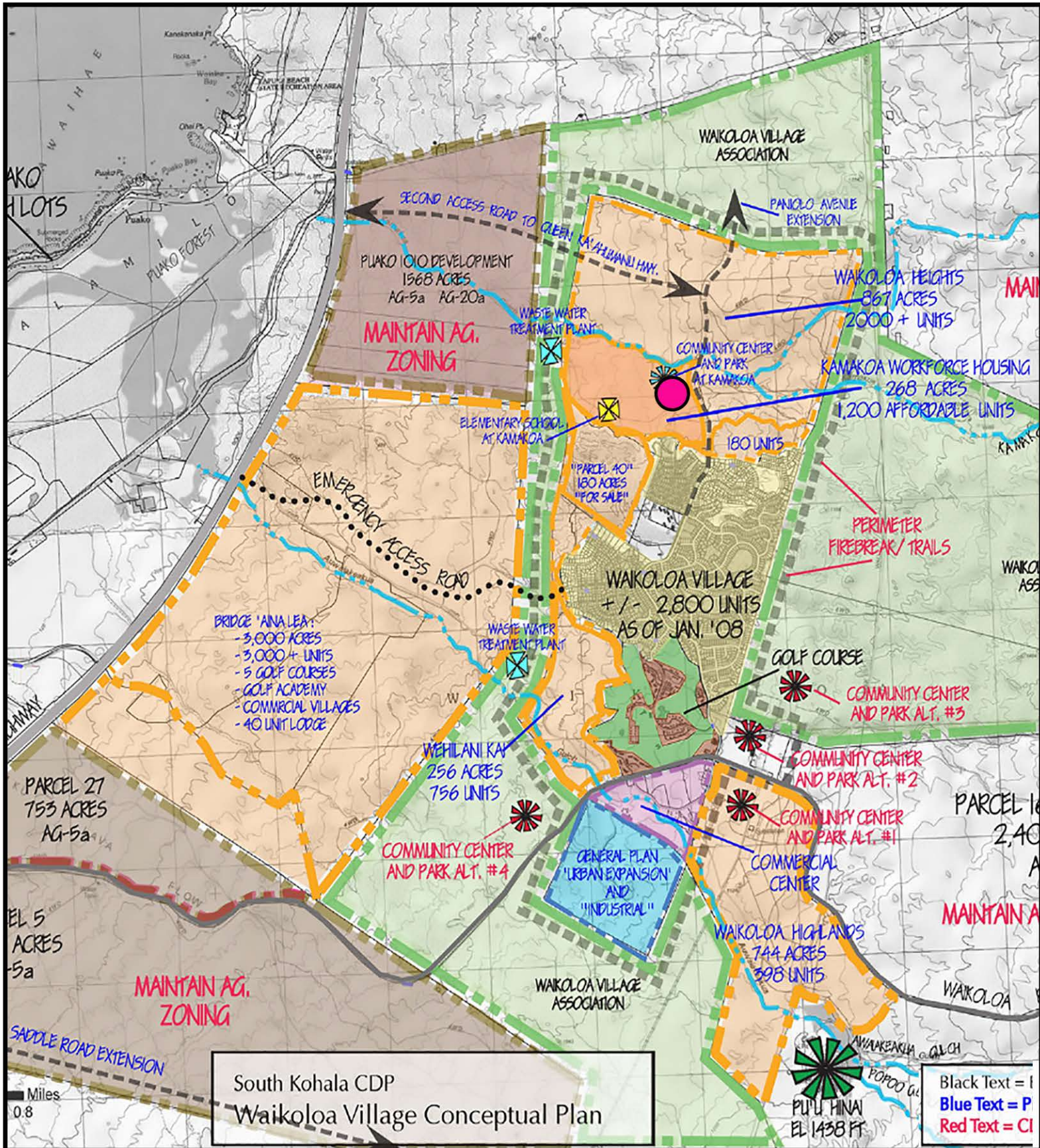


Figure 18 South Kohala CDP Waikoloa Village Conceptual Plan Date: 7/31/2023

Black Text = Existing Condition
 Blue Text = Planned Development
 Red Text = CDP Concept

 Project Area

Figure 18
South Kohala CDP Waikoloa
Village Conceptual Plan
Waikoloa Public Library

State of Hawai'i - Department of Accounting and General Services
 North Island of Hawai'i



Not To Scale



Disclaimer: This graphic has been prepared for general planning purposes only and should not be used for boundary interpretations or other spatial analysis.

5.2.4 County of Hawai‘i Resolution No. 416-07

According to HRS Chapter 46-15 (a):

The mayor of each county, after holding a public hearing on the matter and receiving the approval of the respective council, shall be empowered to designate areas of land for experimental and demonstration housing projects, the purposes of which are to research and develop ideas that would reduce the cost of housing in the State. Except as hereinafter provided, the experimental and demonstration housing projects shall be exempt from all statutes, ordinances, charter provisions, and rules or regulations of any governmental agency or public utility relating to planning, zoning, construction standards for subdivisions, development and improvement of land, and the construction and sale of homes thereon; provided that the experimental and demonstration housing projects shall not affect the safety standards or tariffs approved by the public utility commissions for such public utility.

Discussion: County of Hawai‘i Resolution No. 416-07 (included as Appendix K) identified the Waikoloa Employee Housing Project—which includes the Project site—as a qualified experimental and demonstration housing project and preempted the Waikoloa Employee Housing Project area from certain provisions of the Hawai‘i County Code and HRS. Appendix K includes the full list of preemptions, some of which apply to the proposed Waikōloa Public Library.

5.2.5 County of Hawai‘i Zoning Code

The zoning regulations for the County of Hawai‘i are prescribed in Chapter 25 of the Hawai‘i County Code. This Zoning Code is applied and administered within the framework of the General Plan, and for the purpose of promoting health, safety, morals, and the general welfare of the County.

During the Pre-Assessment consultation process, the County of Hawai‘i Planning Department wrote:

“The entire parcel is zoned Single-Family Residential (RS- 10) by the County and designated as Urban by the State Land Use Commission. Hawai‘i County Code, Chapter 25 (Zoning Code), Section 25-5-3 (a) notes community building as permitted uses within the RS district. In addition, Hawai‘i County Code, Chapter 25 (Zoning Code), Section 25-4-11 (c) requires that public uses, structures, and buildings and community buildings are permitted uses in any district, provided that the director has issued plan approval for such use. Therefore, the proposed project will require a Plan Approval issued by this office.”

Table 11 contains a complete list of expected permits and approvals. Under the Zoning Code, various zoning districts are established which regulate the type of development and permitted uses of property and are depicted on zoning district maps. As noted in the Planning Department’s comments quoted above, the current zoning for the Project site is RS-10, Single-Family Residential (Figure 19).

According to Section 25-5-1 of the Hawai‘i County Code:

The RS (single-family residential) district provides for lower or low and medium density residential use, for urban and suburban family life. It applies to areas having facilities, and to carry out the above stated purpose.

Discussion: The Project is consistent with the County of Hawai‘i Zoning Code as a public library is a permitted use in the Single-Family Residential District to encourage development and contribute to the general welfare and full enjoyment of the open land type.

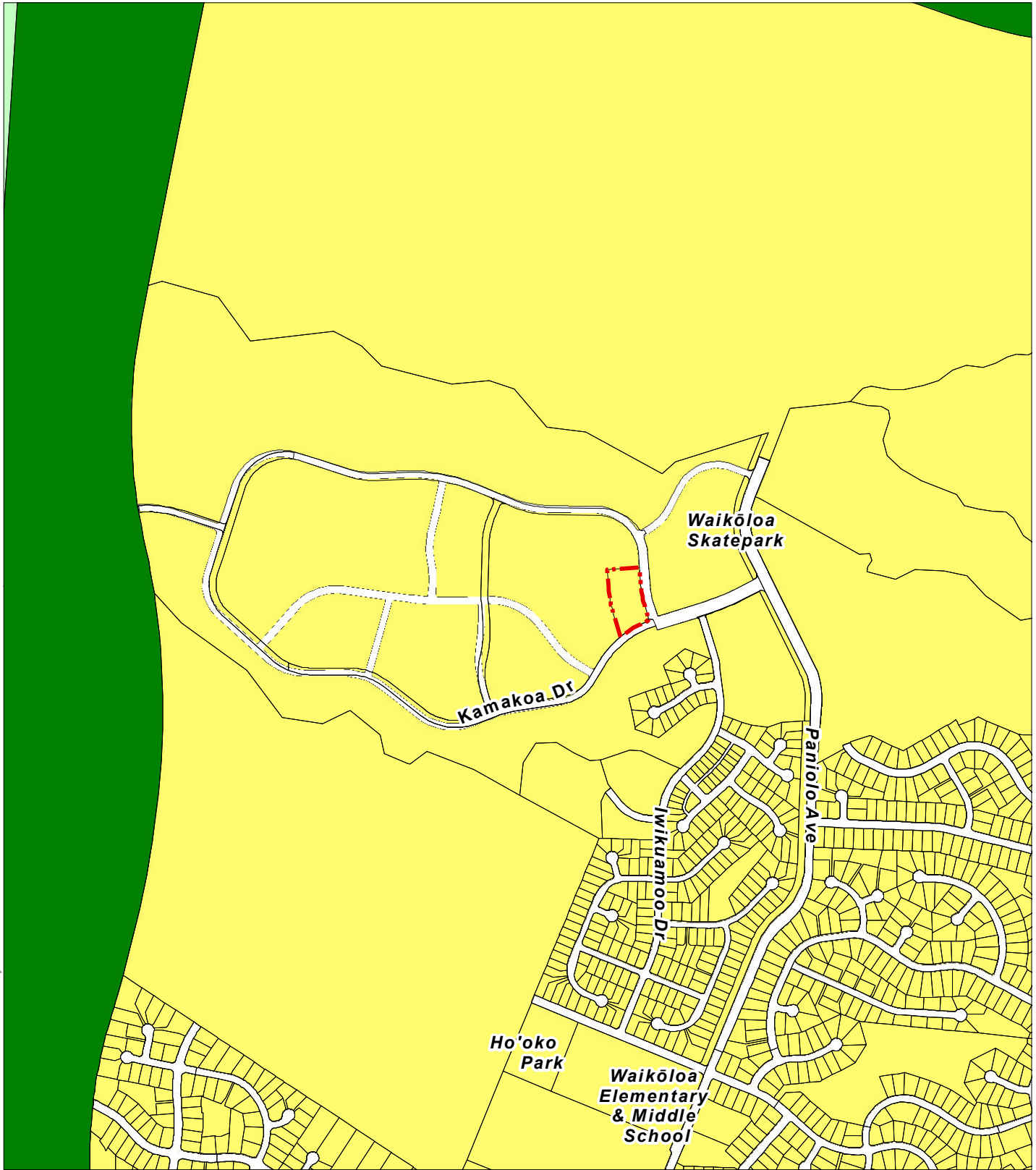
Pursuant to HRS Chapter 46-15, Resolution No. 416-07 (Appendix K) granted the Waikoloa Employee Housing Project area, which includes the Project site, preemptions from the Hawai‘i County Code and HRS. Notably, Resolution No. 416-07 preempts the Project site from Hawai‘i County Code Article 5, Division 1, Section 25-5-3 (a), Permitted Uses. Among other uses, Resolution No. 416-07 instead offers “Community buildings” and “Public uses and structures” as allowable uses in the Waikoloa Employee Housing Project area. The proposed Waikōloa Public Library and ELC are considered community buildings and/or public uses and structures because they will provide community gathering spaces and educational resources for the greater Waikōloa Village community. Therefore, the proposed Project is consistent with the permitted uses designated under Resolution No. 416-07.

5.2.6 Special Management Area

As shown in Figure 20, the proposed Project site is located outside of the Special Management Area. During the Pre-Assessment consultation process, the County of Hawai‘i Planning Department wrote:

“Although the entire island of Hawai‘i is within the Coastal Zone Management Area, the subject area is not located within the Special Management Area.”

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DATE: 7/31/2023

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



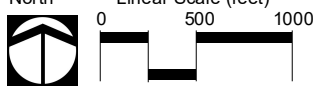

-  Project Site
-  TMK Parcels
- Zoning**
-  (road)
-  A-5a
-  OPEN
-  RS-10

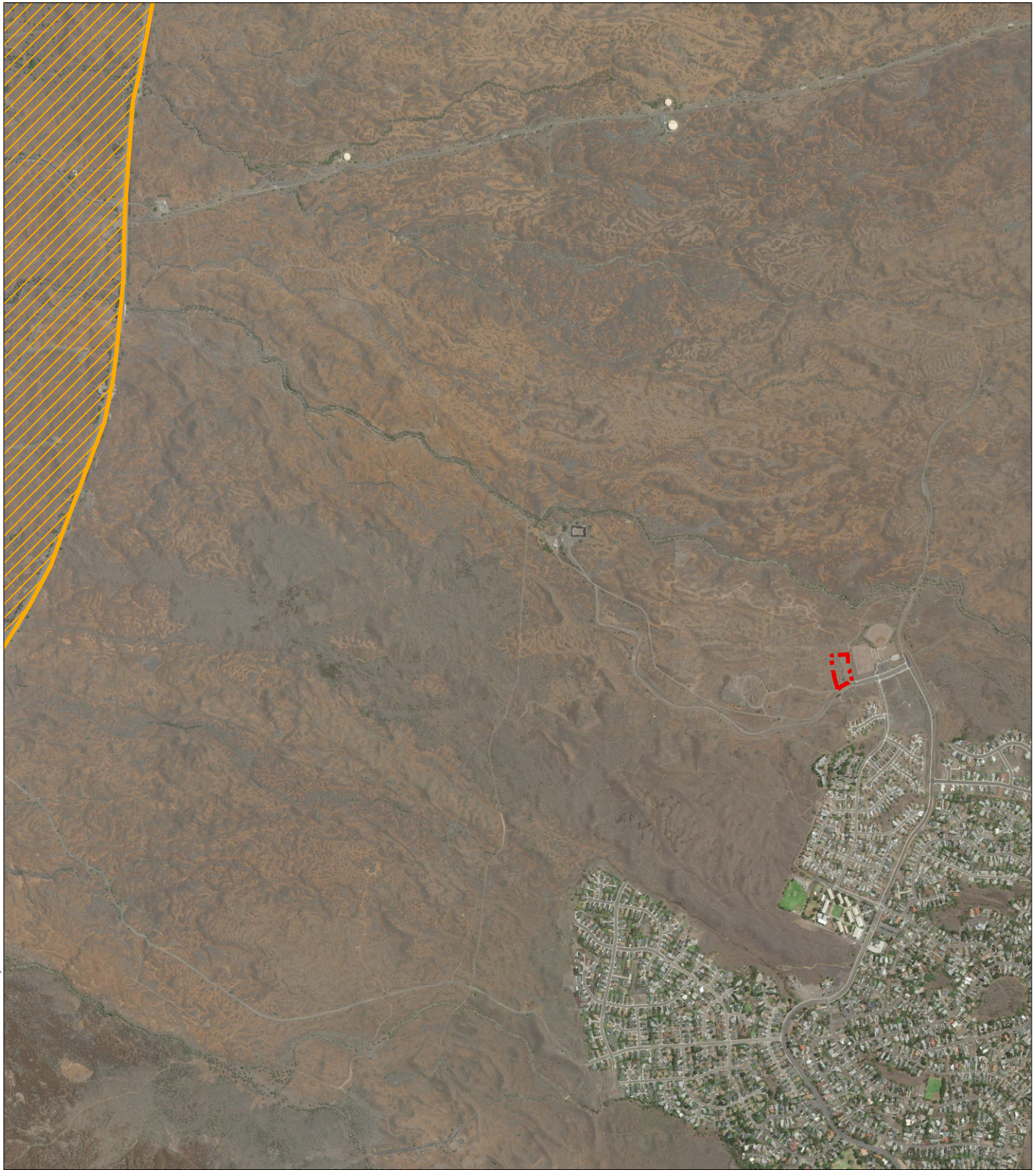
Figure 19
County of Hawai'i Zoning Map
Waikoloa Public Library

State of Hawai'i - Department of Accounting and General Services
 Island of Hawai'i
 North
 Linear Scale (feet)
 0 500 1000

Source: County of Hawai'i, 2022.
 Disclaimer: This graphic has been prepared for general planning purposes only and should not be used for boundary interpretations or other spatial analysis.

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DATE: 7/31/2023

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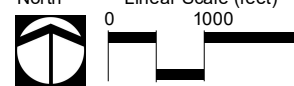

-  Project Site
-  Special Management Area

Figure 20
Special Management Area
Waikoloa Public Library

State of Hawaii - Department of Accounting and General Services
 Island of Hawaii
 North

Linear Scale (feet)
 0 1000 2000

Source: County of Hawaii, 2022.

Disclaimer: This graphic has been prepared for general planning purposes only and should not be used for boundary interpretations or other spatial analysis.

5.2.7 Kamakoa Nui Master Plan

The Kamakoa Nui Master Plan was prepared for OHCD in October 2022 (Appendix A). The purpose of the Master Plan is to:

guide initial and future development of the approximately 240-acre property over the next 20 or more years, beginning with a Phase 1 plan to be implemented within three to five years. The Master Plan provides guidance to support the design, entitlements, and development planning for Kamakoa Nui. Relative to the physical site conditions that were evaluated in the original EIS, the property is essentially unchanged, with only 27% of the originally envisioned number of units entitled or built and minimal infrastructure improvements. Thus, instead of preparing an entirely new Environmental Assessment (EA) or EIS, this Master Plan relies on the environmental analysis that was performed in the original EIS.

The objectives of the Master Plan are to:

- Review the current bulk lot subdivision layout;
- Analyze the current physical site constraints and opportunities of the Property;
- Update the forecast of future housing demand at Kamakoa Nui, including the number, type, and pricing of for-sale and rental housing;
- Identify a conceptual land use plan and phasing plan to guide practical and cost-effective long-term development of the Property; and
- Guide the civil engineering consultant to complete the updated bulk lot subdivision.

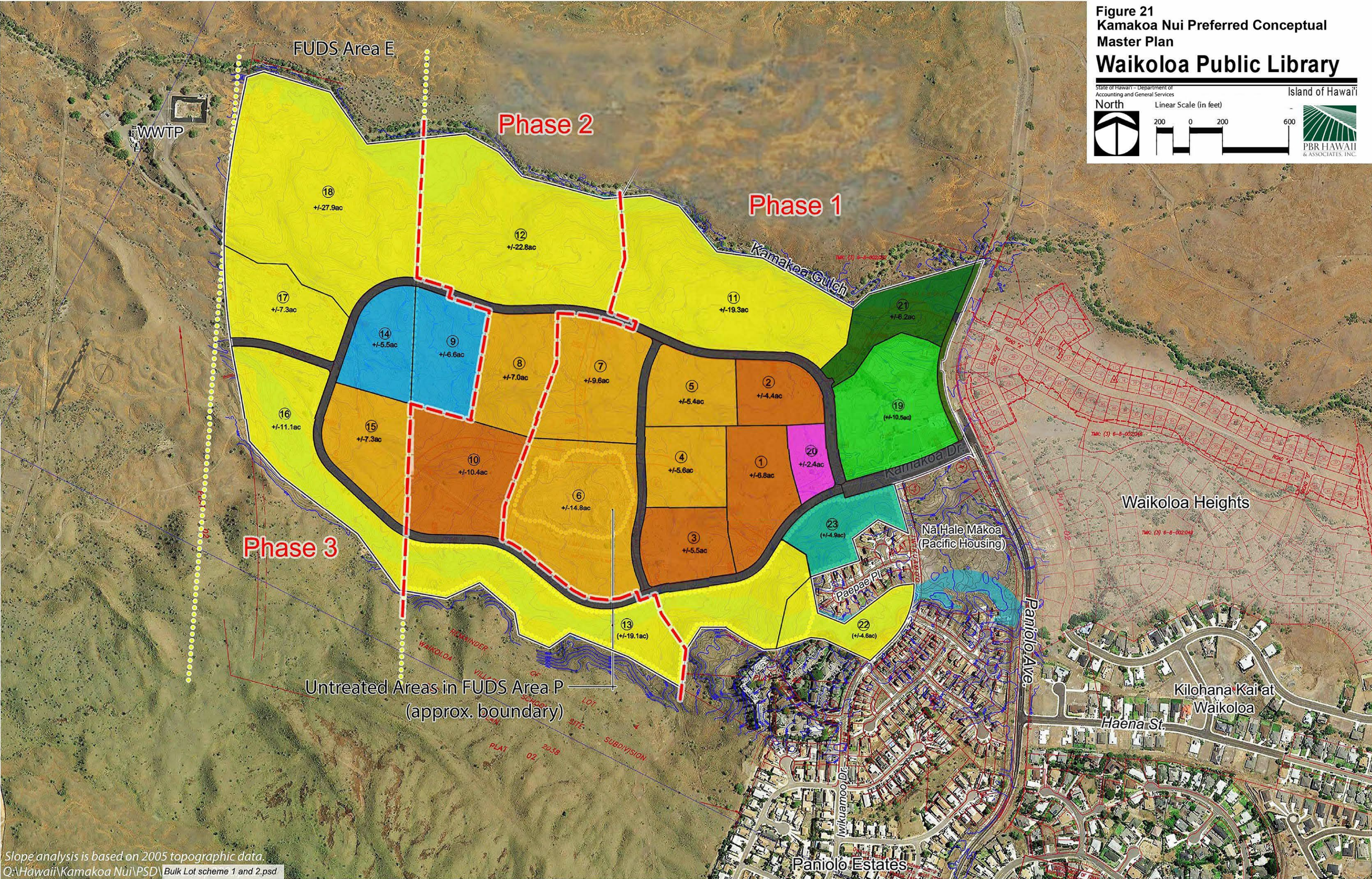
The Preferred Master Plan identified a roughly 2.4-acre site (the proposed Project site) at TMK (3) 6-8-041:020 (Figure 21).

Discussion: The Project is consistent with the purpose and objectives stated in the Kamakoa Nui Master Plan. Further, the proposed Project satisfies the vision of the identified Preferred Conceptual Master Plan by delivering a HSPLS library on TMK (3) 6-8-041:020.

The proposed Waikōloa Public Library and ELC will serve as a convenient educational resource and community gathering space for students and families. As educational uses, community needs, and technology evolve, a conveniently located library is needed to support a growing population. In the long-term, the proposed Waikōloa Public Library and ELC are projected to be vital points of learning and community engagement. As new residents move into the Kamakoa the Nui Master Plan area, a permanent library with modern technology, educational resources, and learning spaces will be a necessary community asset for the greater Waikōloa Village community. As such, the Waikōloa Public Library and ELC is intended to support an increasing range of community needs including early learning programs, library programs, kupuna classes, and flexible meeting spaces.

Figure 21
Kamakoia Nui Preferred Conceptual
Master Plan
Waikoloa Public Library

State of Hawaii - Department of Accounting and General Services
 North
 Linear Scale (in feet)
 200 0 200 600
 Island of Hawaii
 PBR HAWAII & ASSOCIATES, INC.



Slope analysis is based on 2005 topographic data.
 Q:\Hawaii\Kamakoia Nui\PSD\Bulk Lot scheme 1 and 2.psd

5.3 LIST OF REQUIRED PERMITS AND APPROVALS

During the Pre-Assessment consultation process, the County of Hawai‘i Planning Department wrote:

“Hawai‘i County Code, Chapter 25 (Zoning Code), Section 25-4-11 (c) requires that public uses, structures, and buildings and community buildings are permitted uses in any district, provided that the director has issued plan approval for such use. Therefore, the proposed project will require a Plan Approval issued by this office.”

Other anticipated permits and approvals that may be required are included in Table 11 below.

Table 11: Anticipated Permits and Approvals
(Subject to change)

AGENCY	PERMIT/APPROVAL
State of Hawai‘i	
Office of Environmental Quality Control	<ul style="list-style-type: none"> • Chapter 343, HRS Compliance
Department of Health	<ul style="list-style-type: none"> • Dust Control Plan • Noise Permit (if necessary) • NPDES construction site stormwater discharge permit
Department of Health – Disability and Communication Access Board	<ul style="list-style-type: none"> • Americans with Disabilities Act Compliance
Department of Land and Natural Resources, Historic Preservation Division	<ul style="list-style-type: none"> • Section 6E, HRS Review
County of Hawai‘i	
Department of Public Works	<ul style="list-style-type: none"> • Grubbing, Grading and Stockpiling Permit • Building Permits (including electrical, plumbing, and civil) • Certificate of Occupancy
Planning Department	<ul style="list-style-type: none"> • Plan Approval

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6.0 ALTERNATIVES

In complying with the provisions of Section 11-200-17(f), HAR relating to Environmental Impact Statements, an EA must discuss potential alternatives to the proposed action which could attain the objectives of the action in sufficient detail to explain why they were rejected. The alternatives considered include:

6.1 NO ACTION

The no-action alternative is no change to the existing site. While this alternative could alter adverse impacts, it would not address the existing problem of a lack of convenient educational resources and community gathering space in Waikōloa Village. Currently, Waikōloa Village residents rely on a Book Mobile for library services. With limited hours and operations wholly dependent on the availability of funds from the non-profit, Friends of the Library – Waikoloa Region, reliable library services are not assured. The nearest permanent HSPLS library is located approximately 18 miles away in Waimea.

Under this alternative, the proposed Waikōloa Public Library would not be constructed. Without the proposed Project, Waikōloa Village residents will have a scarcity of educational resources and community gathering spaces.

6.2 ALTERNATIVE SITES

As the proposed Project includes construction of a new public library, ELC, surface parking lot, and complimentary landscaping, any alternative site in Waikōloa Village would require similar site acquisition costs, scope of construction, construction timeline, and construction costs. Resulting mitigation measures would also be very similar to those of the proposed Project. As the Project site is surrounded by vacant land and an underutilized park, an alternative site in the Kamakoa Master Plan area would have similar impacts in relation to the natural and human environment. Further as the Project site is located at the southeast corner of the Kamakoa Nui Master Plan area—at the corner of Kamakoa Drive and Road A—it offers the most convenient access to both current and future Waikōloa Village residents. For these reasons, an alternative Project site was not pursued.

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7.0 FINDINGS, SUPPORTING REASONS, AND DETERMINATION

To determine whether the Waikōloa Public Library and ELC may have a significant impact on the physical and human environment, all phases and expected consequences of the proposed Project have been evaluated, including potential primary, secondary, short-range, long-range, and cumulative impacts. Based on this evaluation, the Approving Agency (DAGS) issues a Finding of No Significant Impact (FONSI) for the Project. The supporting rationale for this finding is presented in this chapter.

7.1 PROBABLE IMPACT, INCLUDING CUMULATIVE IMPACTS

Cumulative impacts are impacts on the environment that result from the action when added to other past, present, and foreseeable future actions by other agencies or persons. Examples of possible cumulative impacts of a proposed action could be those related to increased traffic and greater demand on water, sanitary sewer and storm drainage capacity. The proposed Project involves the construction of a new public library and ELC, which will not increase resident population. Therefore, the Project is not expected to significantly impact demand on infrastructure, increase traffic, increase demand on public services or facilities, or increase demand on natural resources in the vicinity of the Project site.

Socio-economic impacts resulting from the proposed Project are anticipated to be beneficial. Construction will generate excise taxes, employment, income taxes, and indirect economic opportunities. In the long term, the proposed Project will provide Waikōloa Village residents with increased access to education materials and community gathering spaces. Overall, the net cumulative impact is expected to have a positive effect on the Waikōloa Village community.

7.2 SIGNIFICANCE CRITERIA

Based upon the previous information presented in this document the proposed permitting and construction of the Project will likely have no significant environmental impacts. This determination is based upon the thirteen Significance Criteria outlined in Chapter 343, HRS, as amended and Title 11 Chapter 200.1-13 HAR 1996, discussed below.

(1) Irrevocably commit a natural, cultural, or historic resource;

The proposed Project would not irrevocably commit any natural, cultural or historic resources at the Project site. Biological, archaeological, and cultural studies were conducted for this EA. The site investigations revealed few natural resources potentially subject to irrevocable loss as a result of construction. Nevertheless, BMPs and mitigation measures would be implemented to avoid or minimize potential impacts that would result in significant losses or destruction to natural or cultural resources. Contractors will adhere to specific protocol for monitoring and preserving habitat of Federal or State-listed species should they be found at the Project Site during construction.

(2) Curtail the range of beneficial uses of the environment;

The proposed Project will not curtail the range of beneficial uses of the environment, as implementation of the Project represents an optimal use of the site to enhance the quality of life for the Waikōloa Village community by providing needed educational opportunities within an area designated for urban expansion, thereby preserving rural and agricultural lands elsewhere.

(3) Conflict with the State's environmental policies or long-term environmental goals established by law;

The environmental policies enumerated in Chapter 344, HRS promote conservation of natural resources, and an enhanced quality of life for all citizens. As detailed in Section 5.1.4 above, the proposed Project does not conflict with the State's long-term environmental policies, goals, or guidelines as expressed in Chapter 344, HRS, and will not significantly impact natural resources. Rather, the proposed Project will enhance the quality of life for the Waikōloa Village community by providing needed educational opportunities within an area designated for urban development.

(4) Have a substantial adverse effect on the economic welfare, social welfare, or cultural practices of the community and State;

The Project will positively influence social welfare by providing Waikōloa Village residents with increased access to education materials and community gathering spaces.

(5) Have a substantial adverse effect on public health;

The potential temporary impacts related to noise and air or water quality during construction will be addressed through construction management practices in compliance with Federal, State and County requirements. In the long term, the proposed Project is not expected to have an adverse effect on public health.

(6) Involve adverse secondary impacts, such as population changes or effects on public facilities;

The proposed Project is not expected to cause an increase in population. However, the Project is expected to provide Waikōloa Village residents with increased access to education materials and community gathering spaces.

(7) Involve a substantial degradation of environmental quality;

No substantial environmental degradation is anticipated. DAGS has committed itself to a development practice of environmental sustainability. The Project will need to meet minimum applicable statutes and regulations as well as more stringent self-imposed sustainability requirements.

(8) Be individually limited but cumulatively have substantial adverse effect upon the environment, or involves a commitment for larger actions;

The Project is not part of a larger project, nor does it commit the State or County to any other larger actions and will not generate any additional actions having a cumulative effect on the environment. As discussed throughout, construction activities may generate temporary, short-term

impacts that can be addressed through BMPs for construction. In the long term, the proposed Project is not anticipated to generate any cumulative impacts to the human or natural environment.

(9) Have a substantial adverse effect on a rare, threatened, or endangered species, or its habitat;

The Project site contains no other habitats for rare, threatened, or endangered plant or animal species listed by the USFWS or in the Endangered Species Act. Therefore, none are expected to be affected by the proposed Project. Minimization measures are included herein to ensure there is no adverse effect to any threatened or endangered species that may transit the area.

(10) Have a substantial adverse effect on air or water quality or ambient noise levels;

Air Quality: No State or Federal air quality standards will be violated during or after the construction of the Project.

Water Quality: No State or Federal water quality standards will be violated during or after the construction of the Project.

Ambient Noise Levels: Construction activities for the proposed Project will inevitably create temporary noise impacts. Contractors may employ mitigation measures to minimize those temporary noise impacts including the use of mufflers and implementing construction curfew periods. Pursuant to Chapter 11-46, HAR, the Project activities will comply with all community noise controls.

(11) Have a substantial adverse effect on or be likely to suffer damage by being located in an environmentally sensitive area such as a flood plain, tsunami zone, sea level rise exposure area, beach, erosion-prone area, geologically hazardous land, estuary, fresh water, or coastal waters;

The Project site does not lie in an environmentally sensitive area such as a flood plain, tsunami zone, sea level rise exposure area, beach, erosion-prone area, estuary, freshwater or coastal waters. Likewise, the Project is not anticipated to have any impact on any natural hazard conditions.

(12) Have a substantial adverse effect on scenic vistas and viewplanes, during day or night, identified in county or state plans or studies; or,

The Waikōloa Public Library and ELC building will not have a substantial adverse effect on scenic vistas and viewplanes, during day or night. As the Project will not exceed one story in height, no important view planes or scenic sites recognized in the Hawai'i County General Plan would be affected. Neither the view of Mauna Kea Volcano from the coast nor the view of the Puakō coastline from higher elevations would be substantially affected.

(13) Require substantial energy consumption or emit substantial greenhouse gases.

The proposed Project will not require substantial energy consumption nor produce substantial greenhouse gases. The Project will implement energy efficient fixtures as feasible to reduce overall energy consumption.

7.3 DETERMINATION

On the basis of impacts and mitigation measures examined in this document and analyzed under the above criteria, it is anticipated that the Project will not have a significant effect on the physical or human environments. Pursuant to Chapter 343, HRS, the approving agency, DAGS, issues a FONSI.

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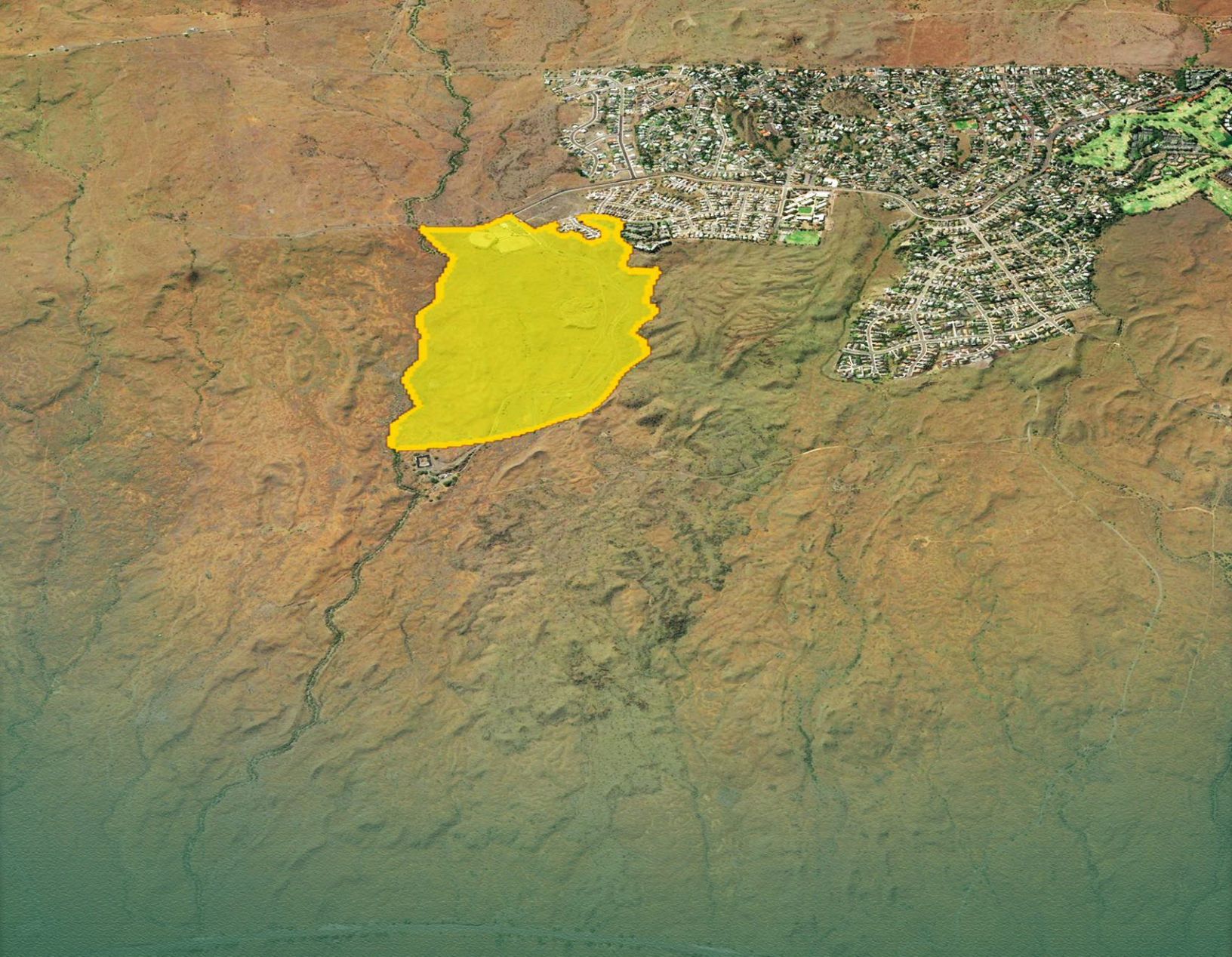
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Apppendices



Appendix A: Kamakoia Nui Master Plan





Kamakoia Nui Master Plan



October 2022

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1 Introduction

The County of Hawai‘i owns an approximately 240-acre tract of land (the Property)¹ in Waikoloa Village that was donated by Waikoloa Land Company in 1989, in satisfaction of its affordable housing requirements for Waikoloa Beach Resort. See Figure 1 for a regional location map and Figure 2 for a TMK map.

In 1991, R.M. Towill Corporation (RMTC) produced the Waikoloa Affordable Housing Project Master Plan (original Master Plan)², which envisioned a workforce housing development consisting of 1,200-1,400 housing units, including single-family homes and multifamily homes on finished lots. RMTC also prepared an Environmental Impact Statement (original EIS) to supplement the original Master Plan. The original EIS is included as Appendix A. Figure 3 shows the Property evaluated under the original Master Plan.

In 2007, the County of Hawai‘i partnered with Hawai‘i Island Housing Trust to develop the Kamakoa Workforce Housing Master Plan (2007 Master Plan), which envisioned roughly 1,200 single-family and multifamily homes, both for-sale and rental units, on the Property. Figure 4 shows the Kamakoa Workforce Housing Master Plan map. In January 2021, the Office of Housing and Community Development (OHCD) selected Pacific Housing Assistance Corporation (Pacific Housing) to develop Nā Hale Mākoa, a 140-unit multifamily project on the mauka end of the 2007 Master Plan area. In addition to these 140 planned units, 185 units have been built to date via multiple development projects. OHCD has also engaged in various design-build contracts that have allowed for mass-grading, infrastructure installation, and other improvements to be completed on the Property.

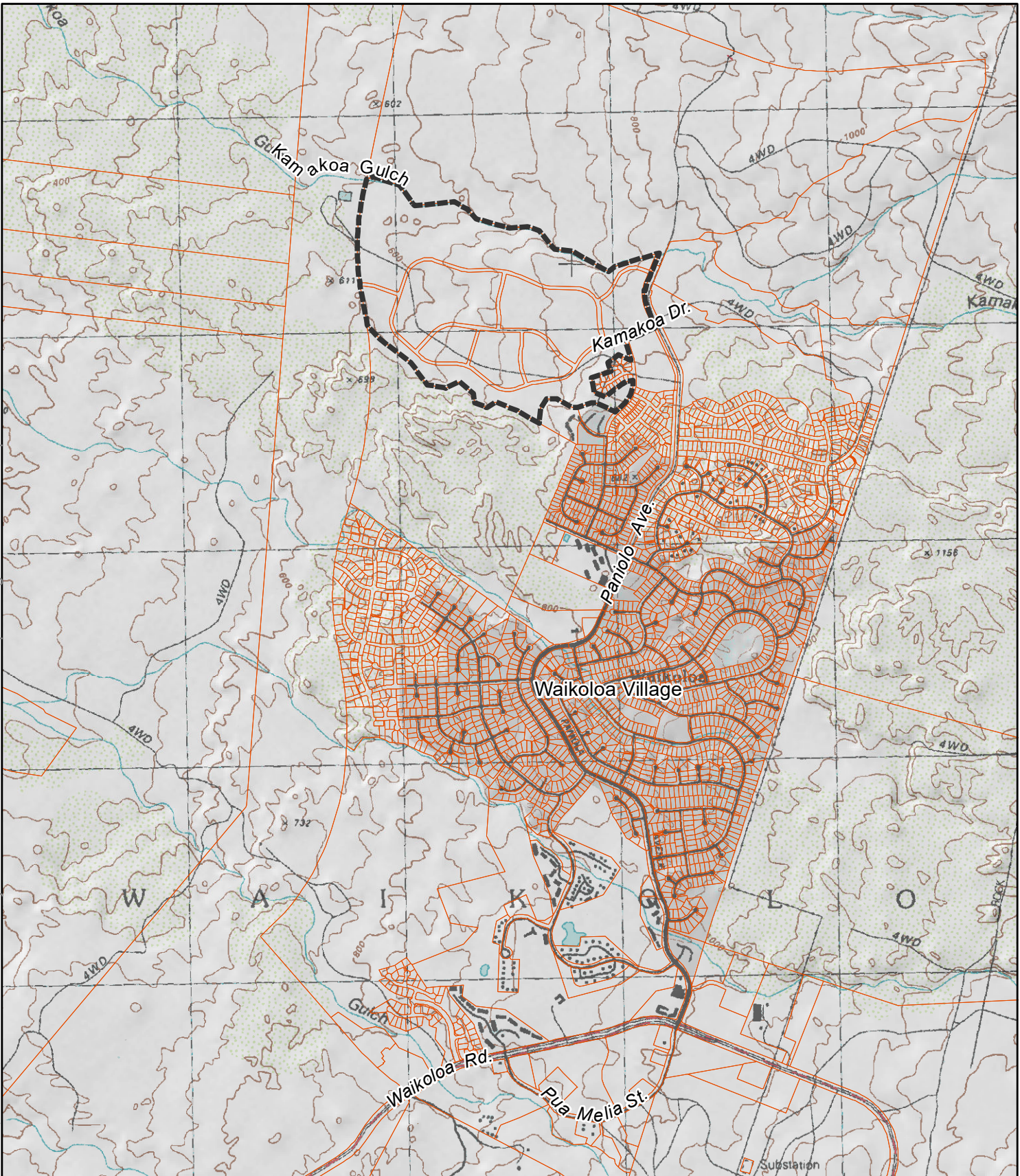
The original RMTC Master Plan is now over 30 years old and in anticipation of preparing requests for proposals to engage developers for future Kamakoa Nui development, OHCD is seeking an updated Master Plan that evaluates present-day land uses, infrastructure, market conditions, and housing plans for the Property. As such, this Master Plan encompasses the remaining approximately 240 acres and approximately 875 residential units that were originally proposed on the Property per the original EIS document. Figure 5 illustrates how the current Master Plan area compares to the two previous Master Plan areas, including existing and proposed developments.

This Master Plan report is broken down into several sections. The remainder of Section 1 discusses the purpose of the plan and previous master planning efforts on the Property. Section 2 evaluates the opportunities and constraints of the Property’s current physical characteristics. Using this information, Section 3 discusses two conceptual Master Plan options. Finally, Section 4 identifies the preferred Master Plan and includes a proposed phasing plan for development.

¹ TMK’s (3) 6-8-041:001 through (3) 6-8-041:011.

² R. M. Towill Corporation. Final Environmental Impact Statement for the Waikoloa Affordable Housing Project. March 1991.

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Date: 9/7/2022

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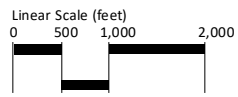
-  Kamakoa Nui Project Site
-  Hawaii County TMK 2021




Figure 1
Regional Location Map
Kamakoa Nui

County of Hawai'i Island of Hawai'i

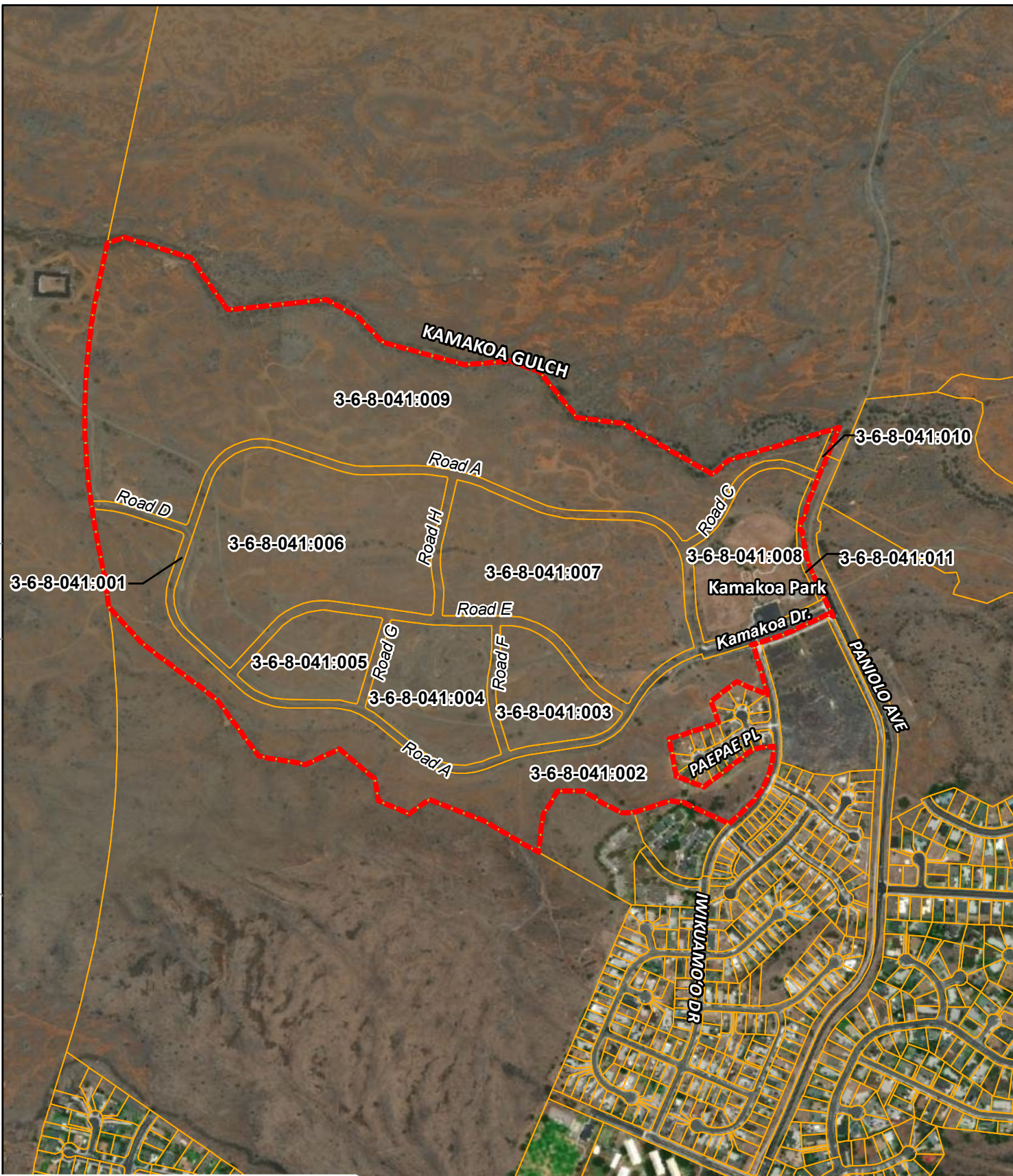
North 

Linear Scale (feet)
 0 500 1,000 2,000 


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Source: County of Hawai'i, 2020; ESRI Online Basemap
 Disclaimer: This graphic has been prepared for general planning purposes only and should not be used for boundary interpretations or other spatial analysis.

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Date: 9/7/2022

Legend





-  Kamakoa Nui Project Boundary
-  Hawaii County TMK 2021

Figure 2
Hawaii County TMK Map
Kamakoa Nui

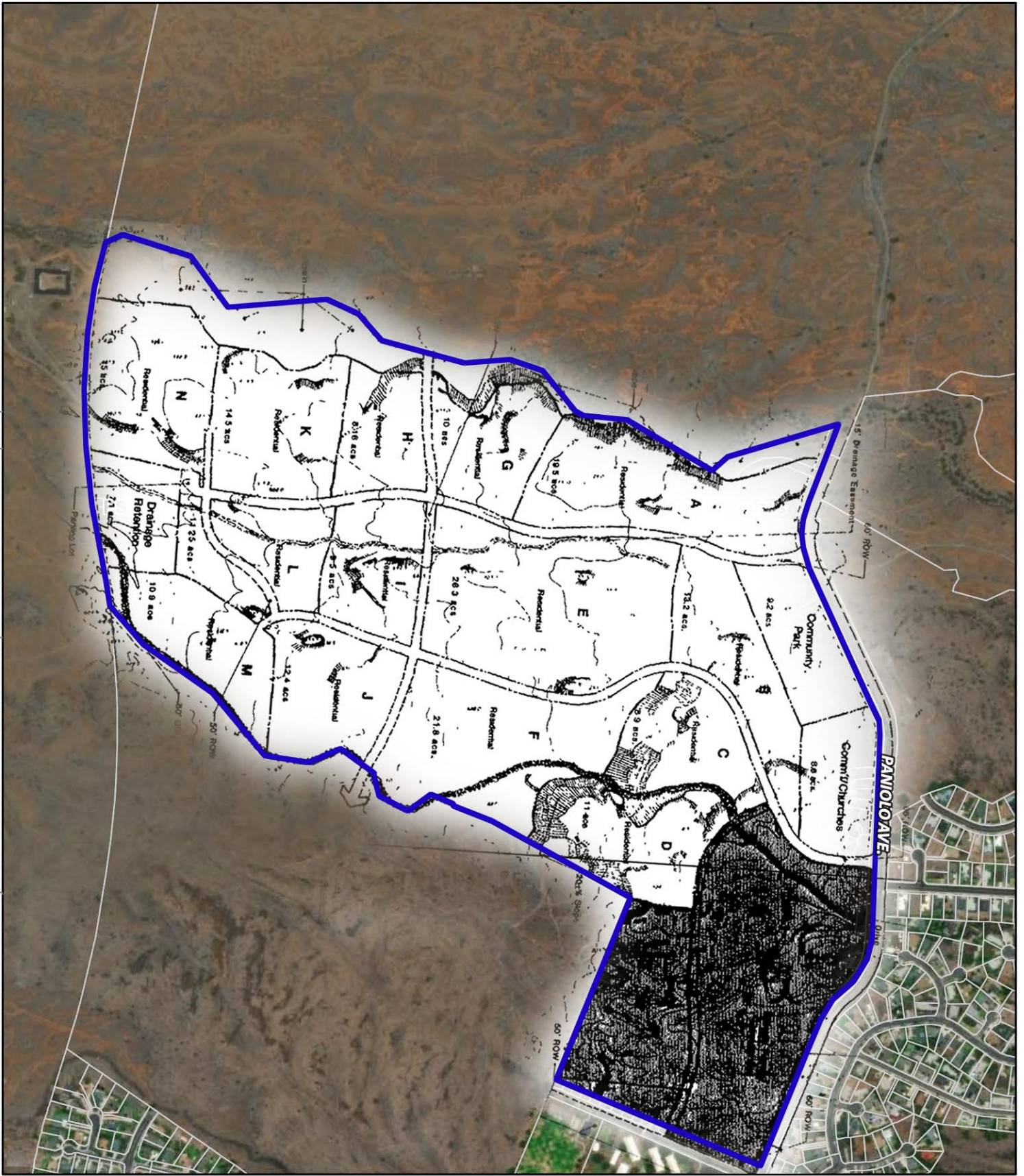
County of Hawai'i Island of Hawai'i

North 

Linear Scale (feet)
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Source: County of Hawai'i, 2021; ESRI Online Basemap
 Disclaimer: This graphic has been prepared for general planning purposes only and should not be used for boundary interpretations or other spatial analysis.

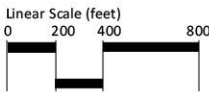



Date: 9/1/2022

Figure 3
1991 Kamakoa Workforce
Housing Master Plan Map
Kamakoa Nui

County of Hawai'i Island of Hawai'i

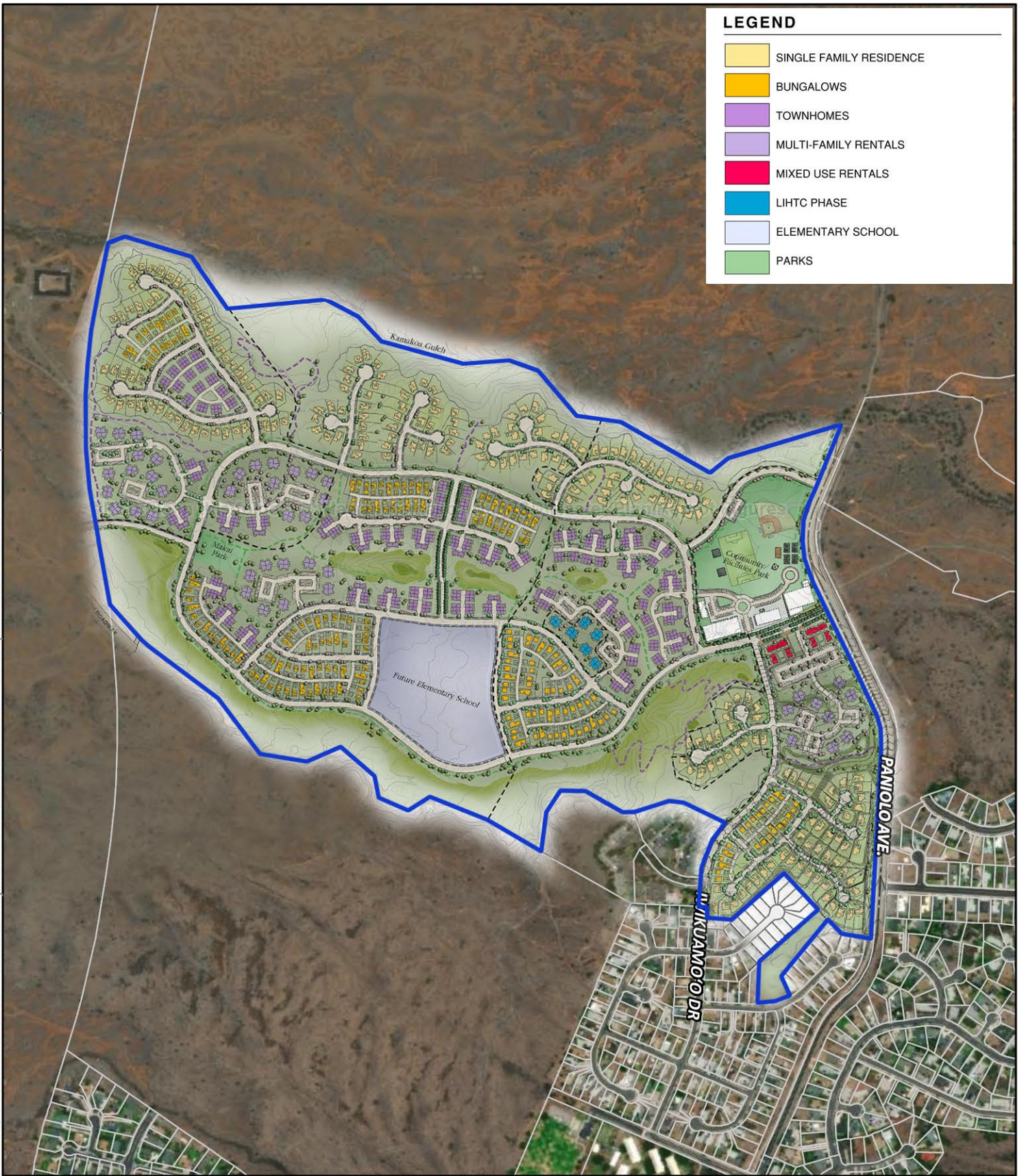
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LEGEND

-  SINGLE FAMILY RESIDENCE
-  BUNGALOWS
-  TOWNHOMES
-  MULTI-FAMILY RENTALS
-  MIXED USE RENTALS
-  LIHTC PHASE
-  ELEMENTARY SCHOOL
-  PARKS

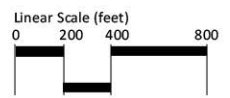


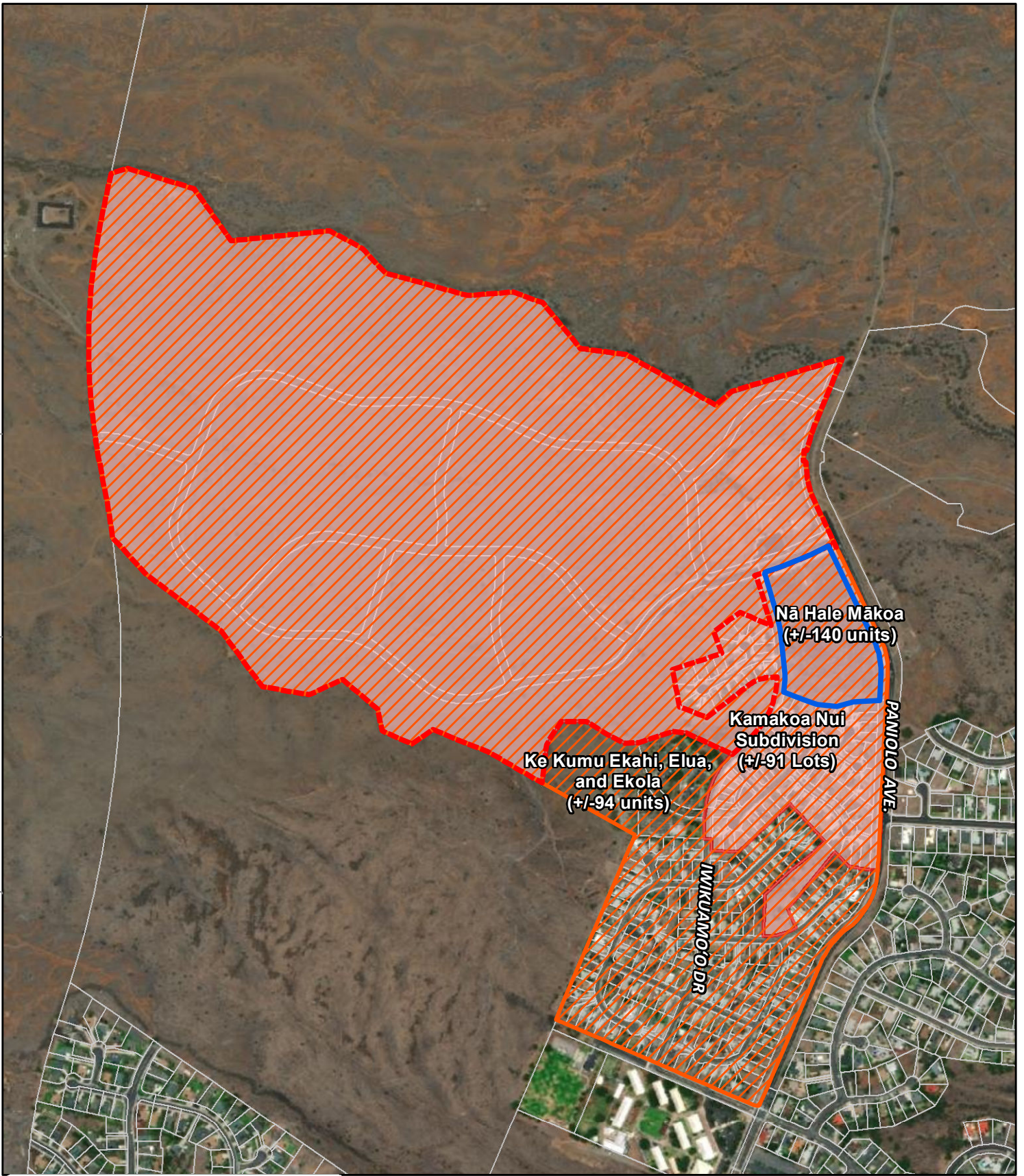
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Figure 4
2007 Kamakoa Workforce
Housing Master Plan Map
Kamakoa Nui

County of Hawai'i






Island of Hawai'i





Date: 9/7/2022


Legend

-  Kamakoa Nui Project Boundary
-  1991 Master Plan Project Area
-  2007 Master Plan Project Area
-  Nā Hale Mākoa Project Site
-  Hawaii County TMK 2021


Source: County of Hawai'i, 2021; 1991 RMTC EIS Document; 2007 Hawaii Island Housing Trust Master Plan; ESRI Online Basemap

Figure 5
Master Plan Project Area Evolution
Kamakoa Nui

County of Hawai'i Island of Hawai'i

North 

Linear Scale (feet)
 0 200 400 800



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1.1 Purpose of the Plan

The purpose of this Master Plan is to guide initial and future development of the approximately 240-acre property over the next 20 or more years, beginning with a Phase 1 plan to be implemented within three to five years. The Master Plan provides guidance to support the design, entitlements, and development planning for Kamakoa Nui. Relative to the physical site conditions that were evaluated in the original EIS, the property is essentially unchanged, with only 27% of the originally envisioned number of units entitled or built and minimal infrastructure improvements. Thus, instead of preparing an entirely new Environmental Assessment (EA) or EIS, this Master Plan relies on the environmental analysis that was performed in the original EIS.

Defining the objectives of the Master Plan is a vital component of the planning process. In coordinating with OHCD, the following objectives were identified:

- Review the current bulk lot subdivision layout;
- Analyze the current physical site constraints and opportunities of the Property;
- Update the forecast of future housing demand at Kamakoa Nui, including the number, type, and pricing of for-sale and rental housing;
- Identify a conceptual land use plan and phasing plan to guide practical and cost-effective long-term development of the Property; and
- Guide the civil engineering consultant to complete the updated bulk lot subdivision.

1.2 Previous Planning Efforts and Background

1991 Waikoloa Affordable Housing Project Master Plan

In 1989, the Waikoloa Land Company conveyed approximately 279 acres of land to the County of Hawai'i to develop workforce housing for families who lived in the region but would not be able to afford to rent or buy housing locally, given the market conditions at the time. Later that year, OHCD selected RMTTC to prepare the original Master Plan and corresponding EIS for the entire 279-acre site.

The original Master Plan envisioned 1,200-1,400 workforce housing units in a mix of single-family and multifamily homes on finished lots within 14 unique residential neighborhoods. Planned as a 100 percent affordable housing community, the original Master Plan sought to offer unique rental and homeownership opportunities for families with incomes within 50 percent of the Hula Mae Program financing limits. The original Master Plan proposed single-family homes on lots averaging 7,500 square feet in area, depending on the topography and location of the lot. Multifamily homes varied from duplexes with lot sizes of 3,450 square feet to row houses, six-plexes, and eight-plexes with decreasing floor area. To maintain the low-density nature of the Waikoloa Affordable Housing Project, multifamily neighborhoods were limited to 15 units per acre and 15 acres in total land area. In response to existing topographic conditions, steep slopes were utilized as natural buffers between housing clusters. Additional buffers and natural open space were created with the preservation of drainageways.

The original Master Plan included a 9-acre community park located at the Paniolo Drive entrance to serve the larger Waikoloa Village community. On the makai side of the Property, a 7-acre drainage retention parcel was envisioned as a second recreational field. An 8.6-acre parcel was designated for a church and small commercial area near the community park at the Paniolo Avenue entrance. At the intersection of

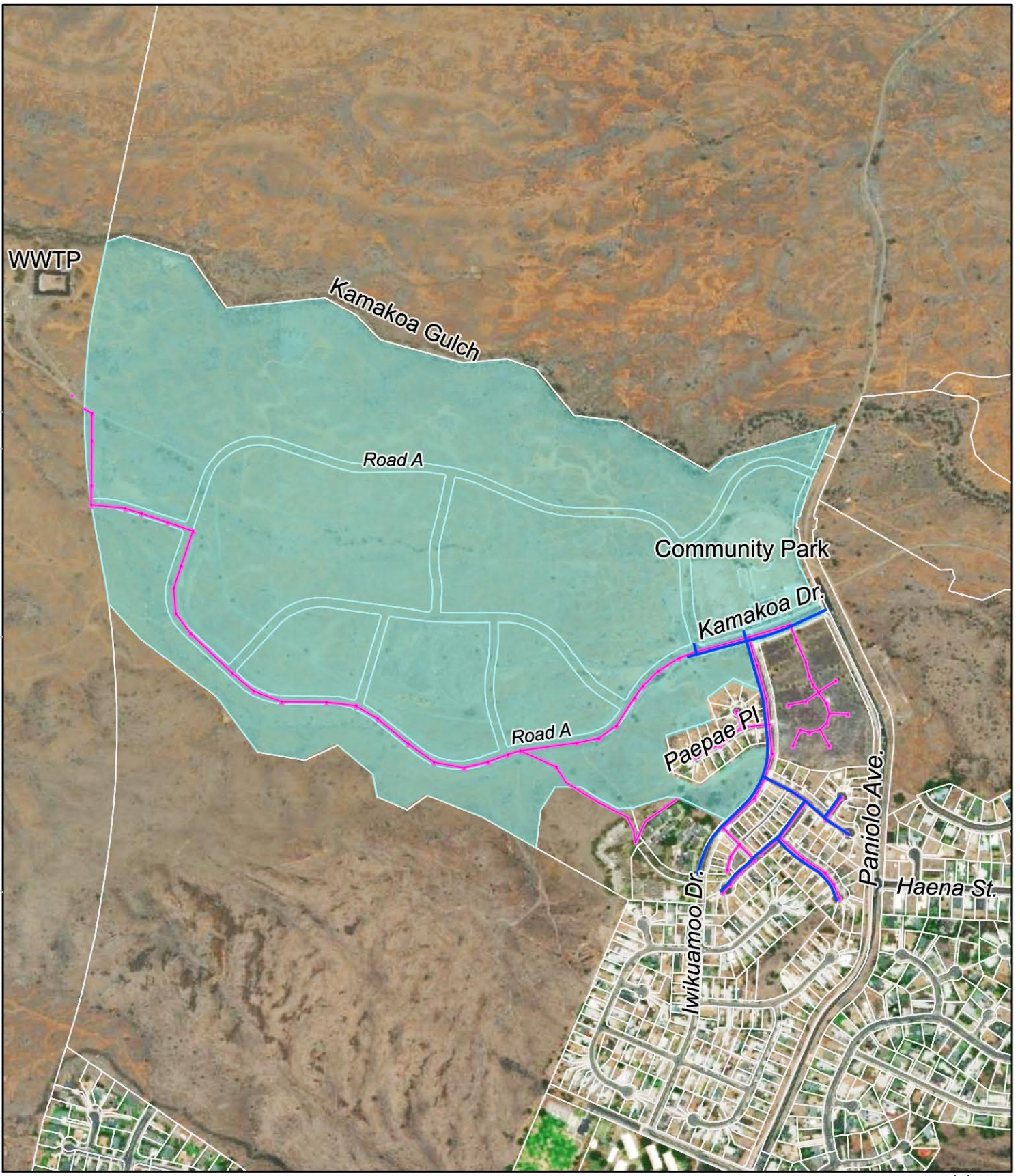
Ho‘oko Street and Paniolo Avenue, the Plan envisioned a 26-acre public school and recreation complex. The Property was to be served by a roadway network consisting of 50–60-foot rights-of-way with accompanying curbs, gutters, sidewalks, and dry wells for drainage.

2007 Kamakoa Workforce Housing Master Plan

With limited development occurring in the ensuing years, in 2007, the County of Hawai‘i partnered with Hawai‘i Island Housing Trust to plan and develop the remaining approximately 275 acres evaluated under the original Master Plan. In total, 1,200 single-family and multifamily homes, both for-sale and rental units, were envisioned for the Property. The first phase of the development proposed 91 single-family residences, ranging in size from 1,100 to 1,500 square feet. The 2007 Master Plan called for elements, such as neighborhood pocket parks, tree-lined sidewalks, natural multi-use trails, textured motor courts, courtyards, garden nodes and landscaped destination points that were designed to support a walkable environment for residents and guests.

To date, 185 units have been constructed via multiple projects and 140 units are being developed under the Nā Hale Mākoa project. Additional improvements to the Property include a community park at Kamakoa Drive and Paniolo Avenue; a short, paved segment of Kamakoa Drive at the mauka end of the Property fronting the community park and leading to a proposed loop road heading makai into the site; a water line has been installed under the paved portion of Kamakoa Drive; and a gravity sewer line with manholes running in the lower segment of the loop road right-of-way. Existing infrastructure improvements can be seen in Figure 6.

Path: Q:\Hawaii\Kamakoa Nui\GIS\Projects\Kamakoa Nui Master Plan Report\2007 Master Plan Map Map.mxd



Date: 9/1/2022

LEGEND





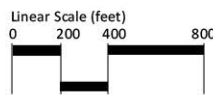

-  Gravity Sewer Line Installed In Road A ROW
-  Water Line Installed Under the Paved Kamakoa Dr.
-  Kamakoa Nui Project Area

Figure 6
Existing Infrastructure
Improvement
Kamakoa Nui

County of Hawai'i Island of Hawai'i

North 

Linear Scale (feet)
 0 200 400 800 


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Disclaimer: This graphic has been prepared for general planning purposes only and should not be used for boundary interpretations or other spatial analysis.

2 Site Assessment

2.1 Location and Surrounding Uses

Kamakoa Nui is located in the South Kohala district of the Island and County of Hawai‘i, at the north end of the existing Waikoloa Village. The Property is bounded by Kamakoa Gulch and undeveloped lands to the north, existing and planned residential development to the east (mauka), an unnamed drainageway and undeveloped land to the south, and undeveloped lands to the west (makai). With a maximum elevation of approximately 770 feet, the Property is located approximately six miles mauka of the South Kohala shoreline and four miles mauka of the Queen Ka‘ahumanu Highway.

Kamakoa Drive, an approximately 94-foot-wide public right-of-way, provides access to the Property from Paniolo Avenue. The improved portion of Kamakoa Drive and the water line below it terminate at the mauka end of TMK(3) 6-8-041:007 before transitioning into an unpaved road. This road continues makai through the length of the Property. An underground gravity sewer line begins at Paniolo Avenue and runs below Kamakoa Drive and the unpaved lower road portion to the makai terminus of the Property. An existing public park is located at the northwest corner of Kamakoa Drive and Paniolo Avenue.

The greater Waikoloa Village, a post-war residential community, is located to the south and east of Kamakoa Nui. Along with other residential subdivisions, Waikoloa Village contains Waikoloa Elementary and Middle School, a public K-8 school; Ho‘okō Park, a public park improved with playing fields and a comfort station; The Village Course at Waikoloa, an 18-hole golf course and club; a U.S. post office; several churches and other faith-based centers; and two shopping areas including Waikoloa Highlands Shopping Center and Waikoloa Plaza (under construction).

Planning Implications

As shown in Figure 3, Kamakoa Nui is located on the northern end of Waikoloa Village and can be expected to attract families that work in Waikoloa Village itself, the South Kohala resorts, Kawaihae Harbor, and parts of Waimea Town. Within a 10-mile radius of Kamakoa Nui, there are an estimated 740 business and more than 10,000 employees. Programming for the Kamakoa Nui Master Plan has therefore taken into consideration the anticipated needs of a new residential population, including a new public elementary school, a new State Library site, and expansion of the existing public park.

Another issue regarding Kamakoa Nui’s location at the north end of the existing Waikoloa Village is that Paniolo Avenue is a long-dead end road. In the event of an emergency (say a wildfire), there is only one route of egress. Kamakoa Drive has the potential to act as an initial segment of an emergency access road to Queen Ka‘ahumanu Highway.

2.2 Land Use Designations

The majority of the Property is located in the State Urban Land Use District and a sliver of land along the makai boundary is classified as State Land Use Agricultural District (Figure 7). The Property’s County General Plan Land Use Pattern Allocation Guide (LUPAG) designations are Medium Density Urban Development, Low Density Urban Development, and Open (Figure 8). The entire Property is zoned

Residential Single Family (RS-10) by the County (Figure 9).³ The South Kohala Community Development Plan includes a Waikoloa Village Conceptual Plan (Figure 10) that allocates land uses by need over the next 20 or more years. The Waikoloa Village Conceptual Plan also includes the following strategies:

- Providing needed community facilities for a growing town
- Environmental Stewardship, Sense of Place, Open Space
- Providing transportation and circulation improvements in a timely manner
- Affordable housing and smart growth

The Property is designated for workforce housing to serve West Hawai‘i communities, with approvals granted by the County Council pursuant to Resolutions 328-91, 439-06, 416-07, and 353-14, utilizing Hawaii Revised Statutes (HRS) Chapter 46-15 “Experimental and demonstration housing projects.”

“...experimental and demonstration housing projects shall be exempt from all statutes, ordinances, charter provisions, and rules or regulations of any governmental agency or public utility relating to planning, zoning, construction standards for subdivisions, development and improvement of land, and the construction and sale of homes thereon...”

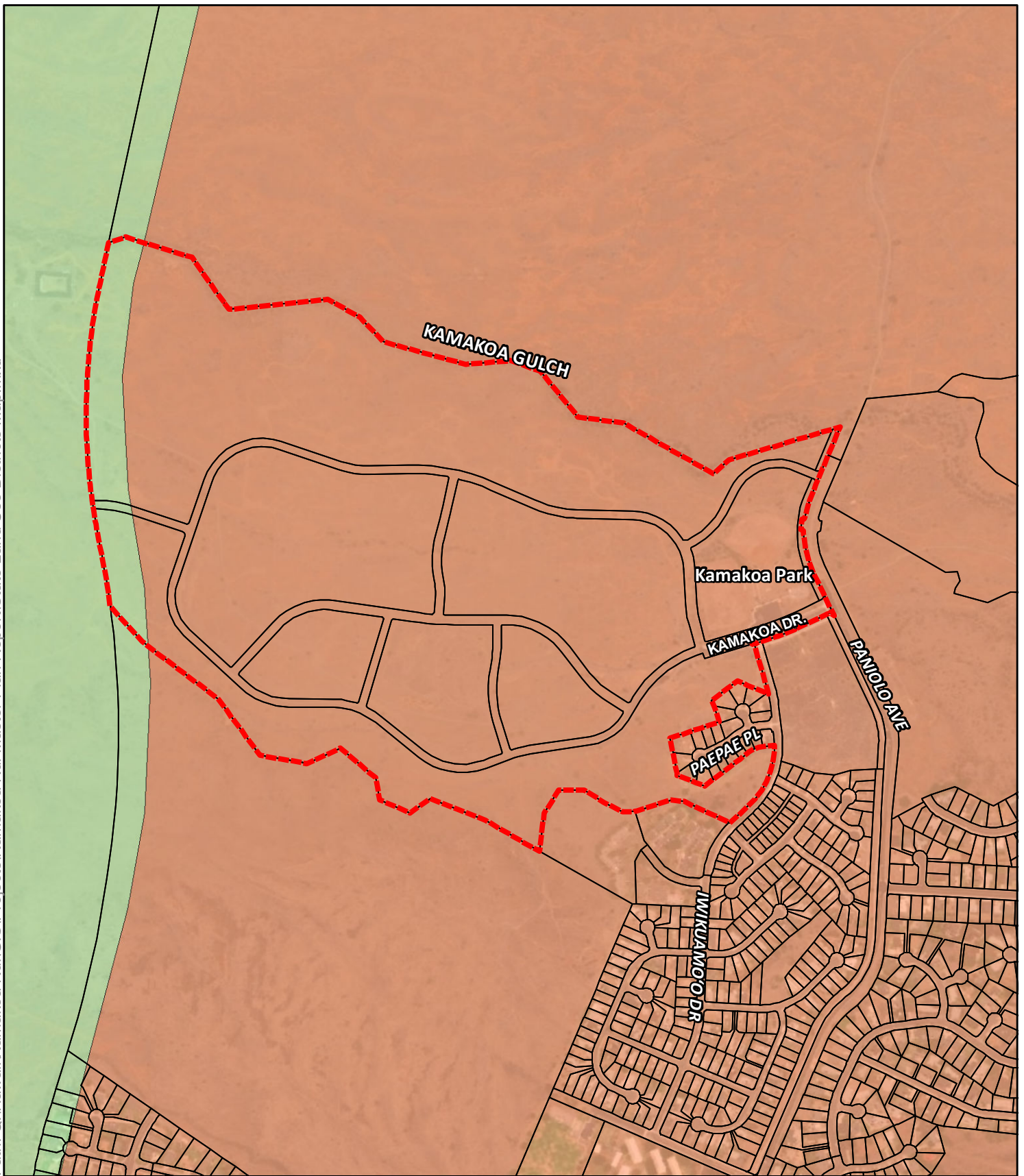
Planning Implications

The Waikoloa Village Conceptual Plan forecasts the Property to produce roughly 1,200 housing units—the same amount that was allocated under the original and 2007 Master Plans. Accounting for the 325 units already built or under construction, the Kamakoa Nui Master Plan envisions the development of the remaining roughly 875 housing units throughout Property. As set forth in this Master Plan, Kamakoa Nui will fulfill the strategies of the Waikoloa Village Conceptual Plan by:

- Allocating land for new recreation, school, and library facilities that will be in close proximity to Kamakoa Nui residents;
- Minimizing the disruption of natural topography and incorporating native vegetation and ample open space throughout the Master Plan area;
- Utilizing the existing road infrastructure—Kamakoa Drive and unpaved lower road—to design a roadway system that takes advantage of natural terrain while providing safe and efficient circulation options for vehicles, bicyclists, and pedestrians; and
- Providing at least 875 new units of workforce housing in a range of building typologies that will serve the needs of the greater Waikoloa Village community and South Kohala district.





In this way, the Kamakoa Nui Master Plan fulfills the land use designations and policy goals of applicable State and County plans and legislation.

³ To date, four Hawai‘i County Resolutions—328-91, 439-06, 416-07, and 353-14—have granted preemptions related to past planning efforts on the Property. See Appendix B for a detailed list of Preemptions Granted by Hawai‘i County Resolutions (pursuant to HRS § 46-15).



Date: 9/7/2022


Legend

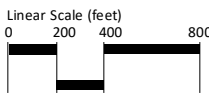
-  Kamakoa Nui Project Boundary
-  Hawaii County TMK 2021
-  Agricultural District
-  Urban District


Source: County of Hawai'i, 2021; ESRI Online Basemap
 Disclaimer: This graphic has been prepared for general planning purposes only and should not be used for boundary interpretations or other spatial analysis.

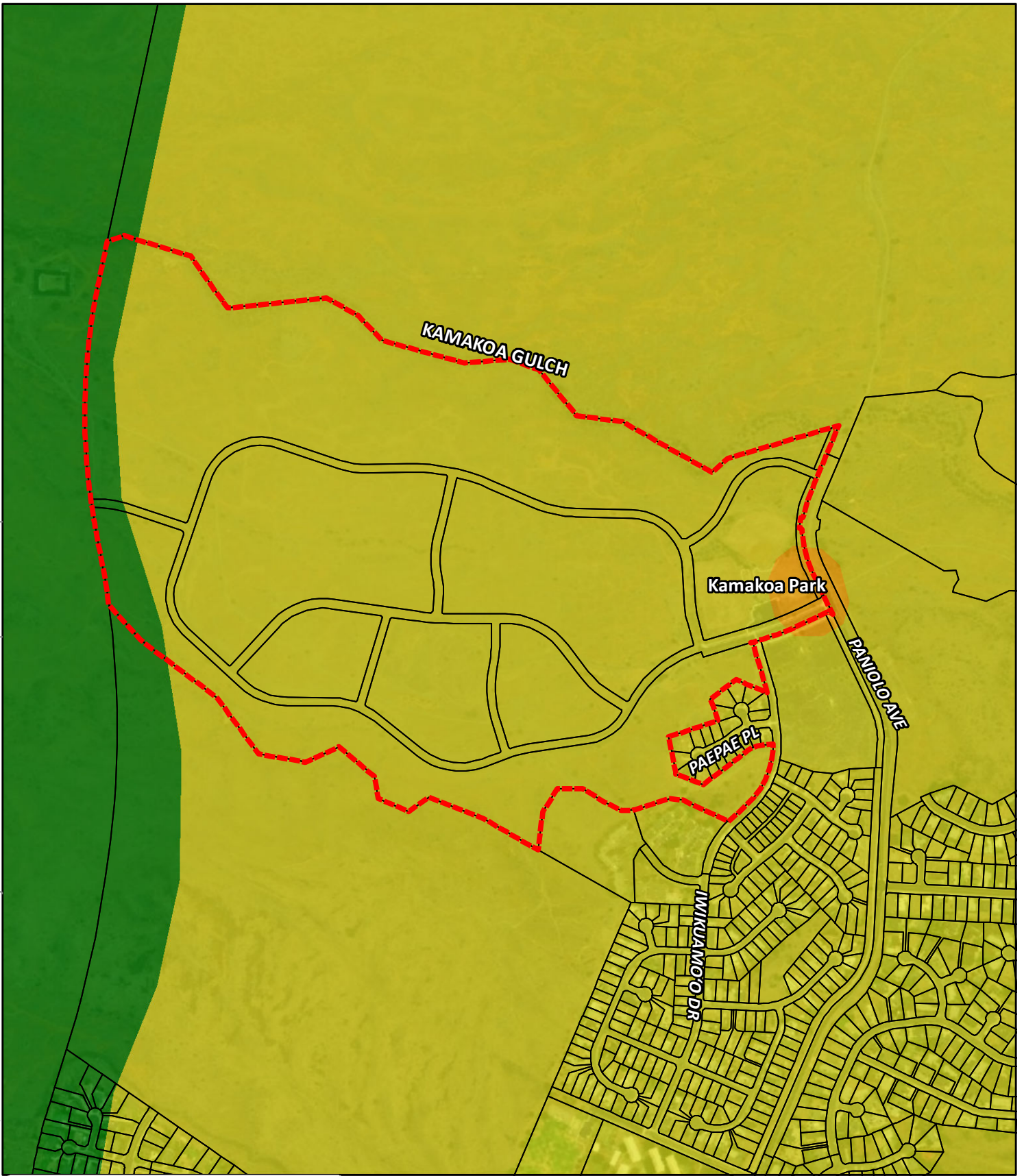
Figure 7
State Land Use Districts Map
Kamakoa Nui

County of Hawai'i Island of Hawai'i

North 






Linear Scale (feet)
 0 200 400 800 


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Date: 9/7/2022


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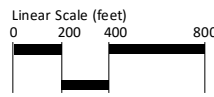
-  Kamakoa Nui Project Boundary
-  Hawaii County TMK 2021
-  Low Density Urban
-  Medium Density Urban
-  Open Area


Source: County of Hawai'i, 2021; ESRI Online Basemap
 Disclaimer: This graphic has been prepared for general planning purposes only and should not be used for boundary interpretations or other spatial analysis.

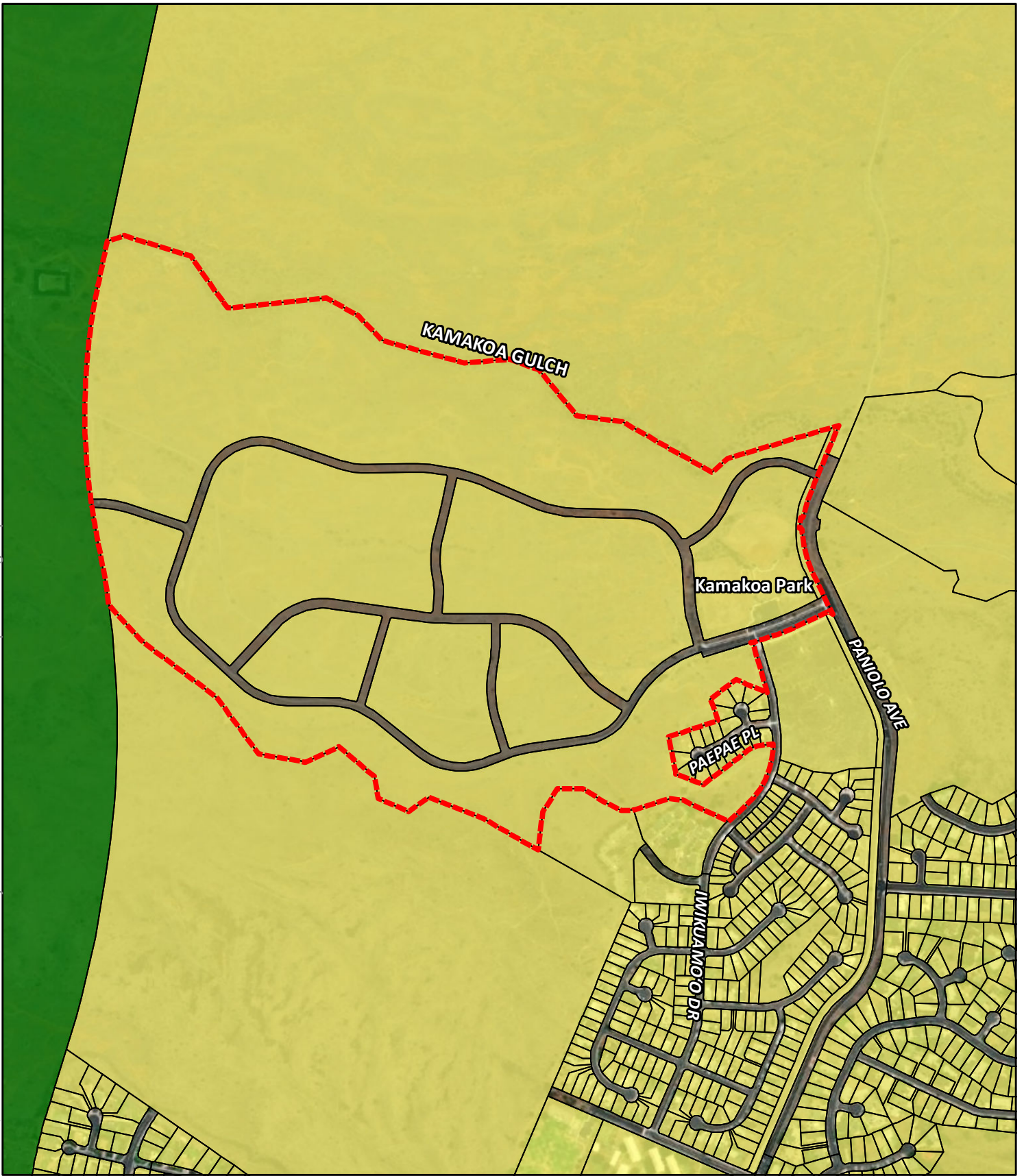
Figure 8
County General Plan Land Use
Pattern Allocation Guide
Kamakoa Nui

County of Hawai'i Island of Hawai'i

North 





Linear Scale (feet)
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Date: 9/7/2022


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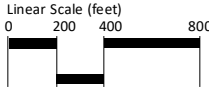
-  Kamakoa Nui Project Boundary
-  Hawaii County TMK 2021
-  OPEN
-  RS-10


Source: County of Hawai'i, 2021; ESRI Online Basemap
Disclaimer: This graphic has been prepared for general planning purposes only and should not be used for boundary interpretations or other spatial analysis.

Figure 9 County Zoning Map Kamakoa Nui

County of Hawai'i Island of Hawai'i

North 

Linear Scale (feet)
0 200 400 800 



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2.3 Geology, Topography, and Land Cover

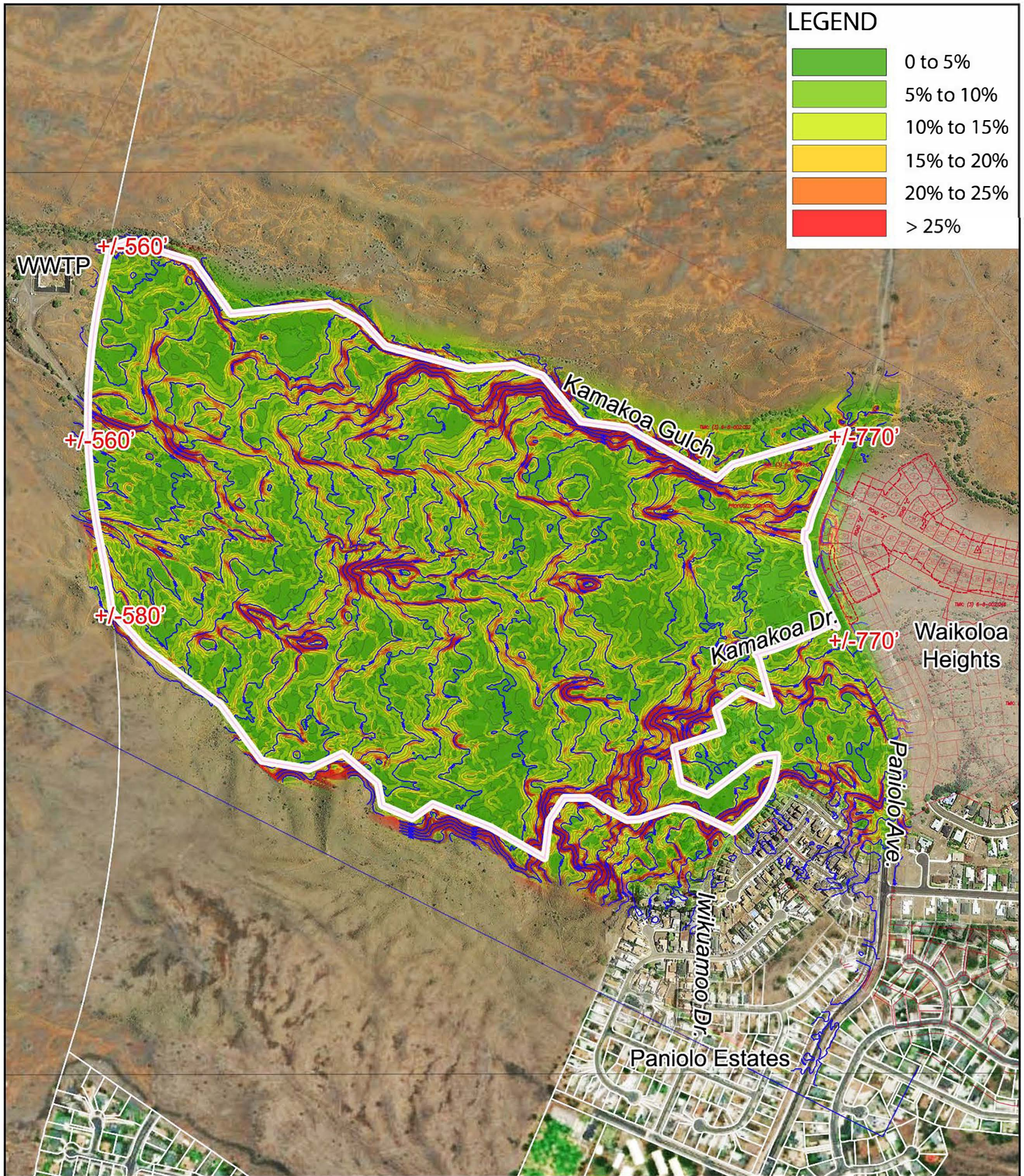
As shown in Figure 11, the Property has a minimum elevation of approximately 560 feet above sea level on the makai side and a maximum elevation of approximately 770 feet above sea level on the mauka side. Gently rolling hills, low-lying grasslands with scattered kiawe trees, and rock outcroppings characterize the Property's terrain. The northern portion of the Property has an average slope of 6 to 10 percent and the southern portion has an average slope between 11 percent and 20 percent. Approximately 40 percent of the Property consists of slopes of 0 to 5 percent; 33 percent consists of slopes of 6 to 10 percent; 17 percent consists of slopes of 11 to 20 percent; and 10 percent of the site consists of slopes greater than 20 percent.

As the Property sits on the western bank of Mauna Kea, the entire substrate is comprised of a prehistoric lava field. As shown in Figure 12, the United States Department of Agriculture, 2017 Resource Conservation Survey (NRCS) Soil Survey identifies two types of soil within the Property. The Hapuna-Waikui-Lalamilo complex, 0 to 20 percent slopes soil type characterizes the majority of the Kamakoa Nui Master Plan area. This series consists of somewhat excessively drained and extremely stony soils that formed in volcanic ash. A representative profile contains a two-inch thick dark brown layer of extremely stony very fine sandy loam. Below that is a dark red-brown layer of stony silt loam. Hard pahoehoe lava bedrock is found at a depth of approximately 33 inches. The southeastern portion of the Property is characterized by the Waikui-Hapuna complex, 10 to 20 percent slopes soil type, which consists of very shallow soil material and a high concentration of Aa lava outcrops. Typical vegetation found on this soil type includes sparse grass cover and Kiawe trees.

To verify the topographic conditions reflected in the 2005 aerial topographic survey and assess the current physical characteristics of the site, PBR HAWAII conducted a site visit on February 15, 2022, accompanied by OHCD staff. As most of the Property remains undeveloped, PBR HAWAII confirmed that the 2005 topographic data still largely reflects current site conditions. Several areas appear to have modified terrains, which are likely the result of mass grading of the community park, construction at Kamakoa Drive, and the sewer main installation at the lower portion of the unpaved road. Additionally, an approximately 4-acre stockpile area—10 to 20 feet high—is located at the previously proposed school parcel. The stockpile material also likely came from the grading of the community park and the unpaved road. Any future grading studies should reflect the updated topography in these areas.

Planning Implications

The site's varying topography with its gradually increasing elevation in the makai to mauka direction will require some excavation and embankment for the construction of residential communities and corresponding infrastructure (especially wastewater collection). However, the proposed Master Plan seeks to minimize grading where possible and takes advantage of the existing natural contours of the Property. For example, existing steep slope areas can be used as natural buffers between housing clusters. Additional buffers and natural open spaces are created with the preservation of drainageways to the north and south of the Property. The natural topographic variation also offers creative site planning opportunities in the form of varying architectural styles and building typologies, including split-level and cantilevered designs that can be incorporated to adapt to natural conditions.



LEGEND






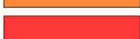

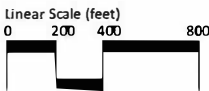
	0 to 5%
	5% to 10%
	10% to 15%
	15% to 20%
	20% to 25%
	> 25%


Figure 11
2005 Topographic Data and Slope Analysis Map
Kamakoa Nui

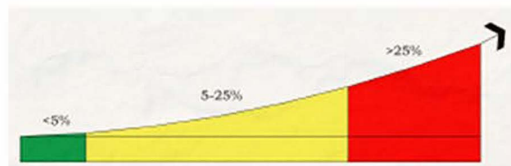
Date: 9/1/2022

County of Hawai'i Island of Hawai'i

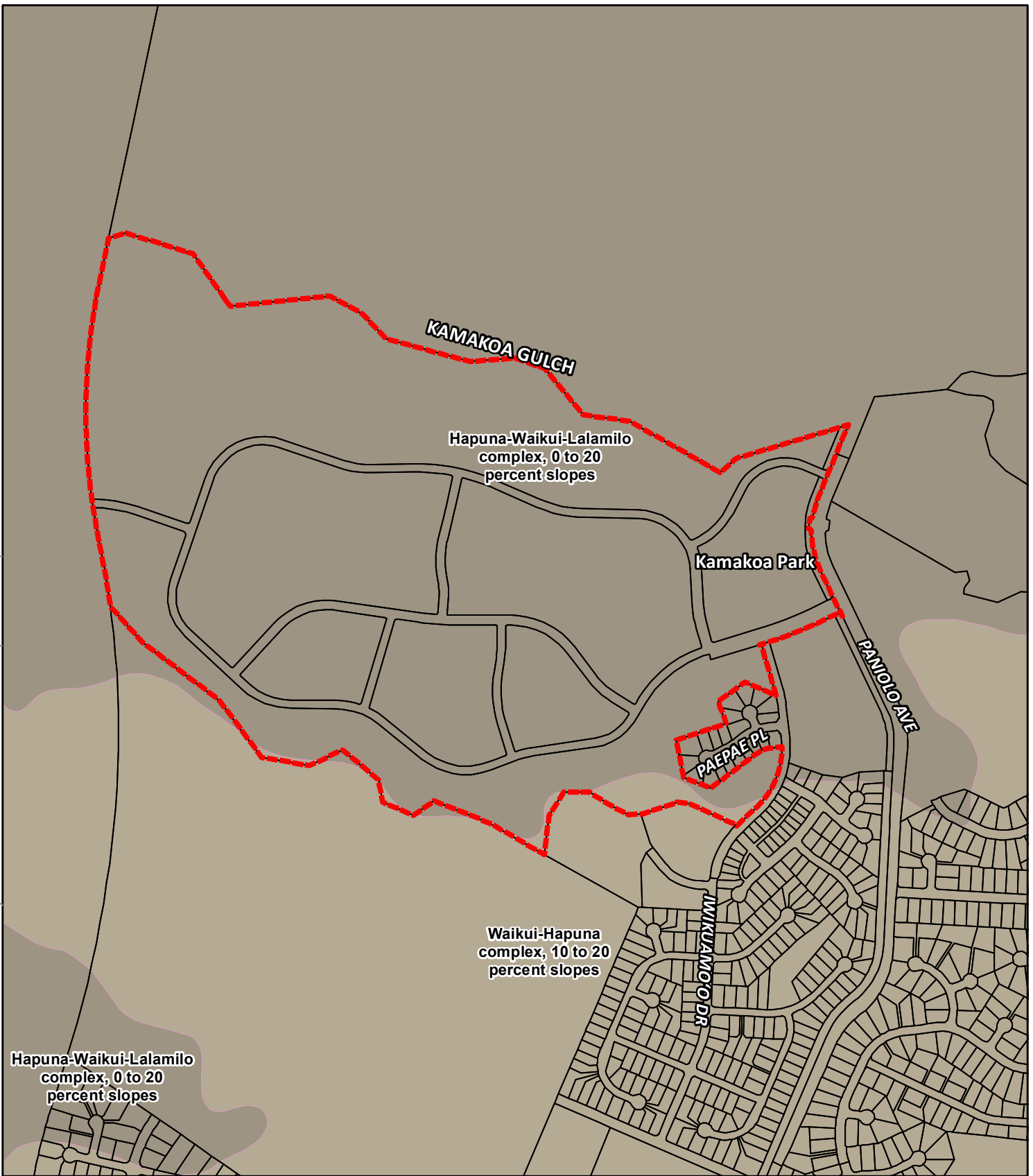
North 

Linear Scale (feet)
 0 200 400 800 



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Disclaimer: This graphic has been prepared for general planning purposes only and should not be used for boundary interpretations or other spatial analysis.



Legend

-  Kamakoa Nui Project Boundary
-  Hawaii County TMK 2021

NRCS Soil Classifications

-  371: Waikui-Hapuna complex, 10 to 20 percent slopes
-  373: Hapuna-Waikui-Lalamilo complex, 0 to 20 percent slopes


Source: Source: USDA National Resources Conservation Service, 2017. Hawai'i County, 2021. ESRI Basemap, 2016.
 Disclaimer: This graphic has been prepared for general planning purposes only and should not be used for boundary interpretations or other spatial analysis.

Date: 9/7/2022

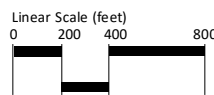

Figure 12
NRCS Soil Survey Map
Kamakoa Nui

County of Hawai'i Island of Hawai'i

North



Linear Scale (feet)

PBR HAWAII & ASSOCIATES, INC.

2.4 Flora and Fauna

The Property consists primarily of cultivated lands and there are no rare, threatened, or engendered vertebrate animal species found on the Property. Most of the Kamakoa Nui Master Plan area is comprised of rolling grasslands, scattered trees, and occasional rock outcroppings. Fountain grass dominates along Kamakoa Drive, the unpaved road, and Paniolo Avenue, while hard-stemmed love grass can be found away from cleared areas. Kiawe trees can be found in increasing density toward the makai portion of the Property.

Planning Implications

Where possible, existing native plants should be retained, and new landscaping should predominantly feature native plant species. Non-native plants may be removed to improve view planes, optimize trade winds, and incorporate solar panels.

However, projects that require federal funding, may be subject to review under the Endangered Species Act. Possible species of concern to the U.S. Fish and Wildlife Service are:

- Branta (=Nesochen) sandvicensis* (Hawaiian goose)
- Fulica americana alai* (Hawaiian coot)
- Himantopus mexicanus knudseni* (Hawaiian stilt)
- Lasiurus cinereus semotus* (Hawaiian hoary bat)
- Manduca blackburni* (Blackburn's sphinx moth)
- Oceanodroma castro* (Hawai'i distinct population segment of the Band-rumped storm-petrel)
- Pterodroma sandwichensis* (Hawaiian petrel)

Future developers should pay special attention to the possible presence of the Blackburn's sphinx moth (BSM). The County should adopt the following avoidance and minimization measures for BSM and require these conditions in their contracts and plans:

- A biologist familiar with the species should survey areas of proposed activities for Blackburn's sphinx moth and its larval host plants prior to work initiation.
 - Surveys should be conducted during the wettest portion of the year (usually November-April or several weeks after a significant rain) and within 4-6 weeks prior to construction.
 - Surveys should include searches for eggs, larvae, and signs of larval feeding (chewed stems, frass, or leaf damage).
 - If native aiea or tree tobacco over 3 feet tall, or adult Blackburn's sphinx moths are found during surveys, do not disturb them and contact the Service for additional guidance to avoid take.

If no Blackburn's sphinx moth, aiea, or tree tobacco are found during surveys, it is imperative that measures be taken to avoid attraction of Blackburn's sphinx moth to the project location and to prohibit tree tobacco from entering the site. Tree tobacco can grow greater than 3 feet tall in approximately 6 weeks. If it grows over 3 feet after surveys have been completed, the plants may become a host plant for Blackburn's sphinx moth larvae. If tree tobacco is found, the County will enact the following measures:

- Remove any tree tobacco less than 3 feet tall.
- Monitor the site every 4-6 weeks for new tree tobacco growth before, during, and after the proposed ground-disturbing activity. This monitoring for BSM can be completed by any staff, such as groundskeeper or regular maintenance crew, if they are provided with picture placards of tree tobacco at different life stages.

2.5 Hydrology and Drainage

The Property is bordered on the north by a major drainageway, the Kamakoa Gulch, which originates in the upper slopes of Mauna Kea and terminates makai of the Property, in the coastal plain above the Puako shoreline. A sizable portion of the Property is part of the Kamakoa Gulch drainage area. Branch tributaries, which vary in size, enter the Property on the mauka side, traverse makai through the Property, and rejoin the main branch located further makai of the Property. According to the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM) shown in Figure 13, the Property is located entirely in Flood Zone X, or an area determined to be outside the 0.2 percent annual chance (500-year) floodplain.

A drainage study was previously provided by RMTTC in September 1990 for the original Master Plan. Per the 1990 study, the approximately 58,000-acre watershed located mauka of the Property can produce about 12,000 cubic feet per second of runoff during a 100-year storm.⁴ Most of the Property's runoff drains into the Kamakoa Gulch. To the south of the Property is an unnamed gulch that originates in a residential subdivision southeast of the Property. Only a small portion of the on-site runoff drains into this gulch. There are no perennial streams or surface water bodies, no known areas of local (non-stream related) flooding, and no observable surface waters located within the Property's boundaries. The 1990 drainage study also designated the Kamakoa Gulch and the unnamed gulch as flood zones which are not suitable for residential uses. The approximate flood zone areas identified in the 1990 study are illustrated in Figure 13.

Since 1990, there have been improvements to the south and east of the Property. As a part of the Kamakoa Nui Master Plan, PBR HAWAII engaged civil engineering firm, Sam O. Hirota, Inc (SOH) and the water resource consultant, River Focus (RF) to conduct a Flood Determination Study for the Property, included as Appendix C. The Flood Determination Study evaluated current watershed conditions to determine potential water surface elevations and flood inundation areas that could be affected by 100-year flood events.

According to the Flood Determination Study, there are two Kamakoa Gulch tributary channels that run through the Property. One runs through the center of the Property and is diverted into Kamakoa Gulch to the north of the Property. The second runs along the Property's southern boundary and has been completely cut off by the mauka housing developments and Paniolo Avenue. The Flood Determination Study concluded that there is no flow running through this southern tributary and therefore the unnamed gulch at the southern boundary of the Property has been removed from the updated flood map in Figure 13. Figure 13 also contains an updated floodplain for the tributary running along Kamakoa Gulch.

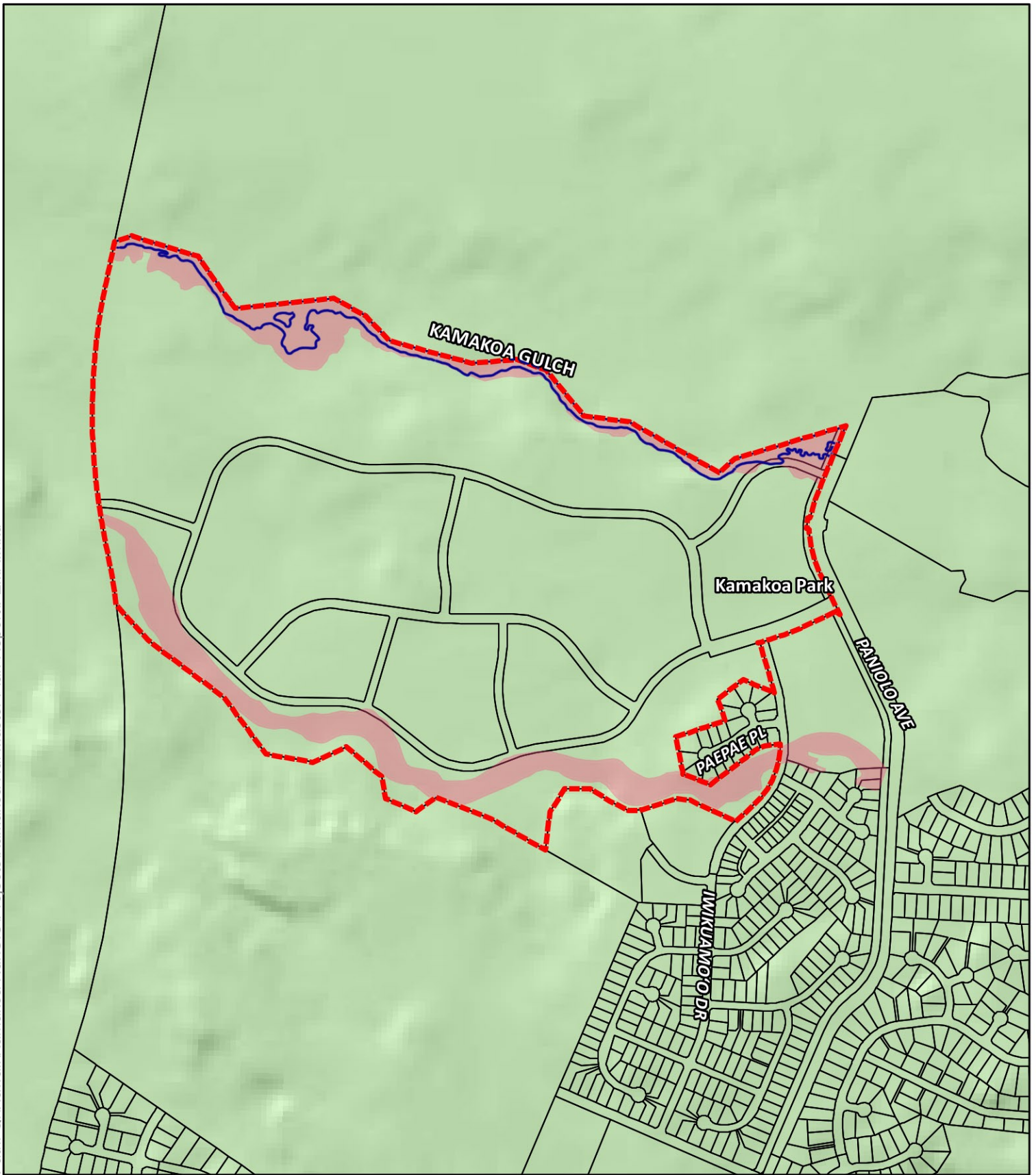
Planning Implications

Although the Property itself is identified as a Minimal Flood Area on FEMA's FIRM map, the Property is located immediately adjacent to the Kamakoa Gulch, which is the major tributary serving the approximately 58,000-acre watershed stretching from Mauna Kea towards Puako Bay. As such, peak flows during a 100-year storm event have historically caused inundation in the areas surrounding Kamakoa Gulch.

The updated flood map provides a better understanding of actual site constraints and opportunities and should be used to guide future development in Kamakoa Nui accordingly. Specifically, this Master Plan aims to respect the existing natural topography while minimizing runoff into the gulches to the north and south of the Property. Larger, steep slopes will not be graded and instead, they will be incorporated into the Master Plan as natural buffers of open space among the housing clusters. Existing rock outcrops will also

⁴ R. M. Towill Corporation. Page 2-6.

be preserved where possible and integrated into future housing developments. The Master Plan calls for most of the multifamily development to be located towards the center of the Property, thereby preserving the areas closest to the gulches as low-density, single-family housing or natural open space. This arrangement provides the greatest possible buffer between the highest intensity uses and the natural drainageways. Additionally, this Master Plan envisions the use of bioswales and catchment systems along hardscape elements to collect runoff from impervious surfaces, thus reducing the amount of runoff that proceeds into gulches.



Legend






-  Kamakoa Nui Project Boundary
-  100-year Flood Zone on Property per 1990 Drainage Study
-  Hawaii County TMK 2021
-  100-year Flood Zone on Property per 2022 Kamakoa Gulch Flood Determination Study
- Flood Hazard Areas**
-  X: Minimal flood areas


Figure 13


Flood Insurance Rate Map and Drainage Study Flood Zone Limits Kamakoa Nui


Date: 10/13/2022

Source: Federal Emergency Management Agency, 2021. Hawai'i County, 2021. ESRI Basemap, 2016. Disclaimer: This graphic has been prepared for general planning purposes only and should not be used for boundary interpretations or other spatial analysis.

County of Hawai'i Island of Hawai'i

North 

Linear Scale (feet)
0 200 400 800 

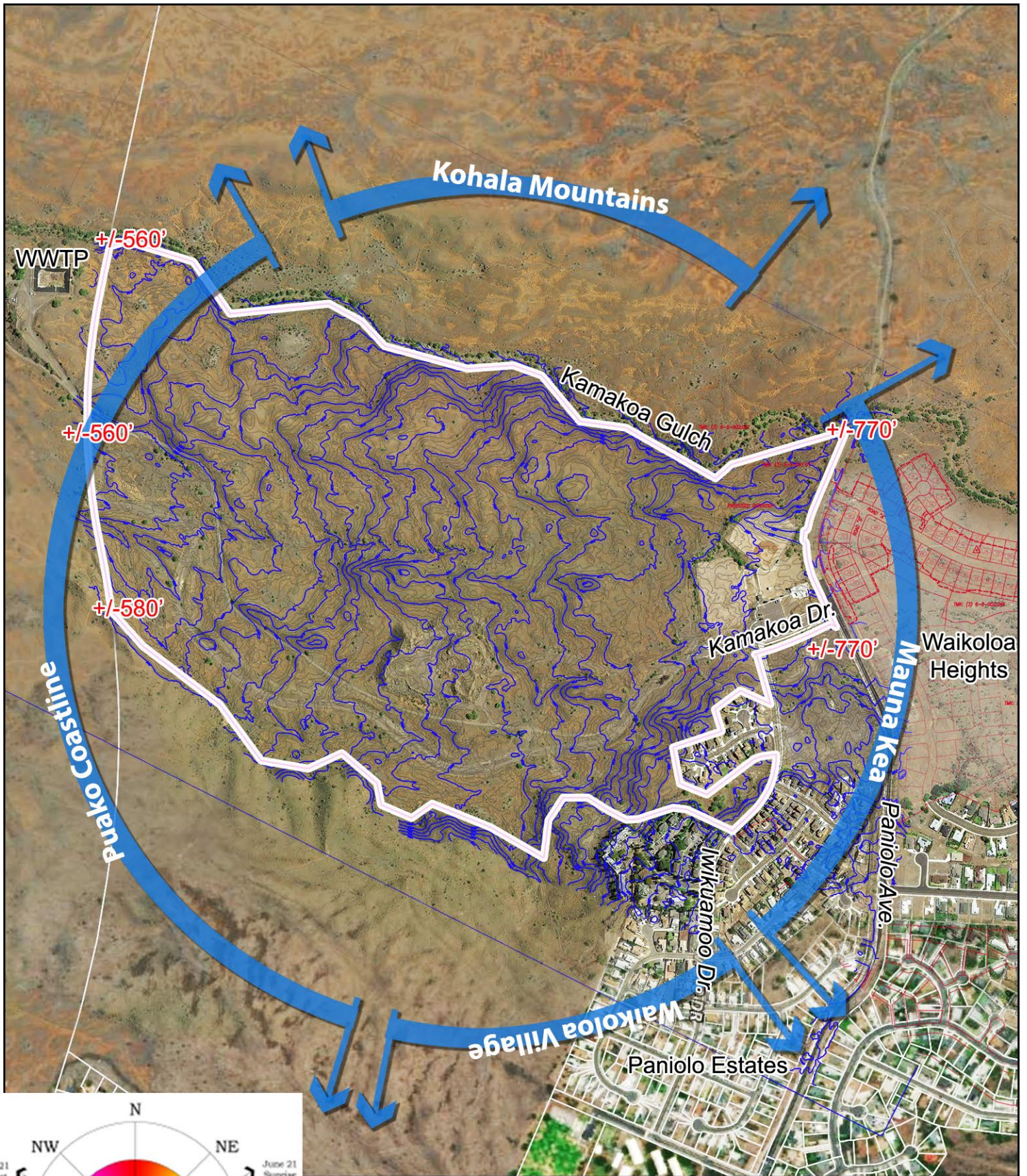
 PBR HAWAII & ASSOCIATES, INC.

2.6 Views

The Property is located at the 700-foot elevation of the South Kohala region, approximately six miles from the coastline. From the Kamakoia Nui Master Plan area, prominent views include the peaks of Mauna Kea to the east, the Kohala Mountains to the north, and the Puako coastline to the south and west. Waikoloa Village can be seen to the southeast. On clear days, views of Maui and Haleakalā Crater are available to the north. Figure 14 provides a view orientation map.

Planning Implications

The Property's varying topography and elevations will allow developers to creatively site houses in locations and orientations that minimize alterations to existing view planes. Additionally, existing rock outcroppings, stockpiled area, high areas of grading, and viewpoints will be preserved as much as possible. Future single-family and townhouse residential structures will offer residents minimally obstructed views of Mauna Kea, the Kohala Mountains, and the Kohala coast.



Date: 9/1/2022

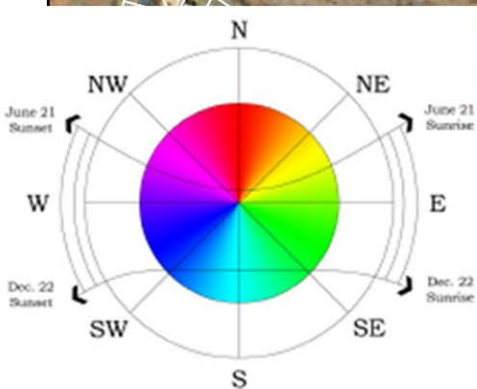

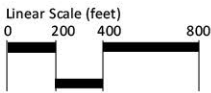



Figure 14
View Orientation Map
Kamakoa Nui

County of Hawai'i Island of Hawai'i

North 

Linear Scale (feet)
 0 200 400 800 


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Disclaimer: This graphic has been prepared for general planning purposes only and should not be used for boundary interpretations or other spatial analysis.

2.7 Climate

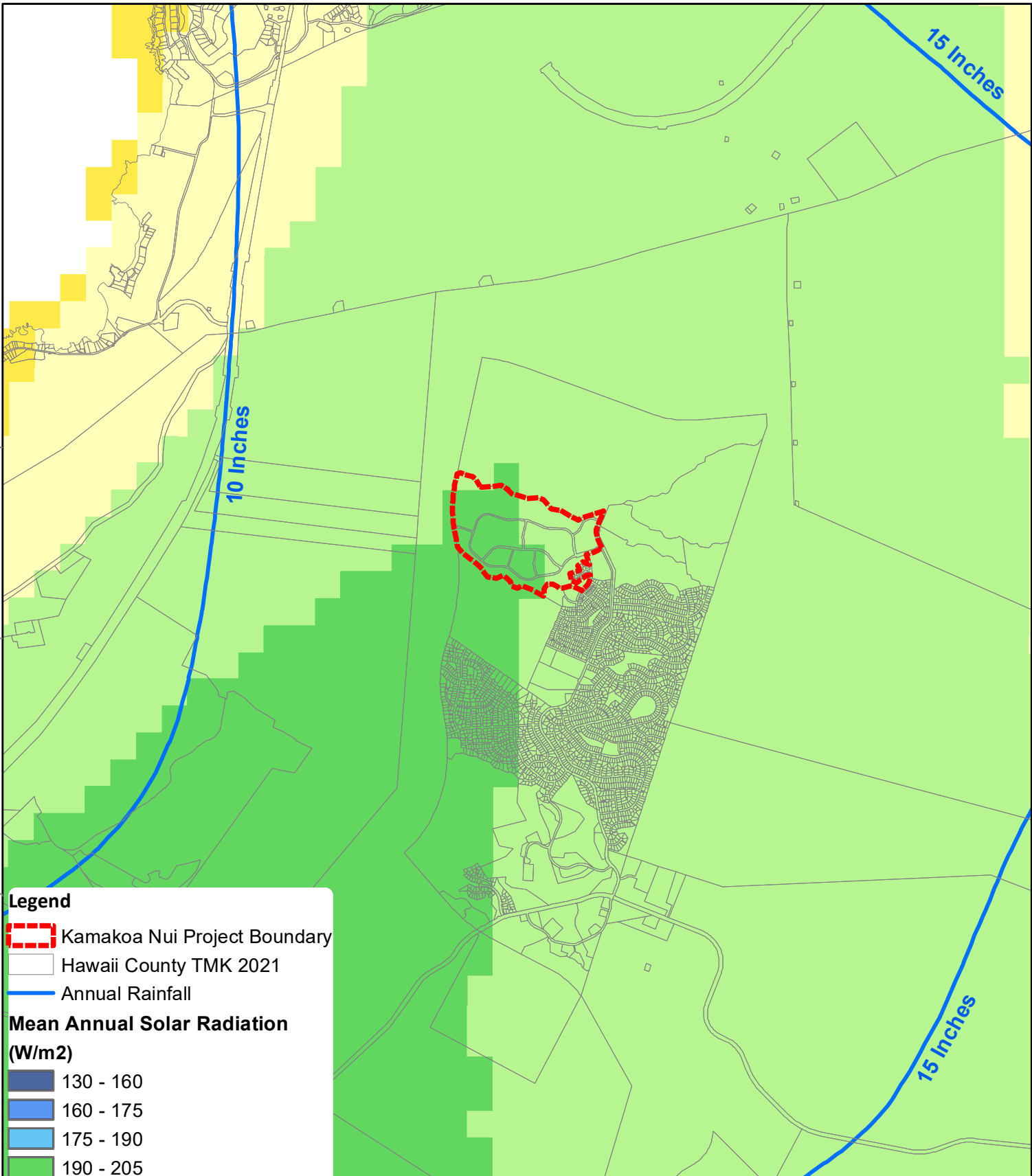
The climate of Hawai‘i is relatively moderate throughout the State and for most of the year. Hawai‘i lies within the belt of northeasterly trade winds generated by the semi-permanent Pacific high-pressure cell to the north and east. The South Kohala district, located on the northwestern slopes of Mauna Kea, is sheltered by trade winds and winds are generally light and variable. During the day, winds tend to move onshore because of sea breeze and upslope wind effects. At night and during the early morning hours, however, winds are generally land breezes and move downslope.

Areas exposed to the trade winds tend to have the least temperature variation, while inland and leeward areas often have the most variation. At the Property’s elevation, daily temperatures can range between 55- and 93-degrees Fahrenheit. Rainfall on Hawai‘i island is highly variable. The lower elevations of South Kohala are some of the driest areas in the State. Most rainfall in the South Kohala district occurs in conjunction with winter storms and summer afternoon showers. In Waikoloa Village, the average annual rainfall is approximately 12 inches. Humidity is relatively constant year-round at around 40 percent. Figure 15 shows a rainfall and solar map.

Planning Implications

Development in the Kamakoa Nui Master Plan area should take advantage of the moderate climate and light and variable trade winds. Residential structures should be placed on their lots to maximize cross-breezes for passive cooling. Landscaping and trees should be strategically located to provide shade. As much as possible, sloped roofs should be designed to accommodate solar panels and be oriented towards the south where they can take advantage of maximum sunlight. These design features will help to minimize long term energy consumption and costs.

Path: C:\Hawaii\Kamakoa Nui\GIS\Projects\Kamakoa Nui Master Plan Report\Rainfall and Solar Map.mxd



Legend

- Kamakoa Nui Project Boundary
- Hawaii County TMK 2021
- Annual Rainfall

Mean Annual Solar Radiation (W/m²)

- 130 - 160
- 160 - 175
- 175 - 190
- 190 - 205
- 205 - 220
- 220 - 235
- 235 - 250
- 250 - 265
- 265 - 280
- 280 - 300

Figure 15
Annual Rainfall and Mean Annual Solar Radiation Map
Kamakoa Nui

Date: 9/7/2022

Source: Federal Emergency Management Agency, 2021. Hawai'i County, 2021. ESRI Basemap, 2016.
 Disclaimer: This graphic has been prepared for general planning purposes only and should not be used for boundary interpretations or other spatial analysis.

County of Hawai'i Island of Hawai'i

North

Linear Scale (feet)

PBR HAWAII & ASSOCIATES, INC.

2.8 History and Culture

Anthropologists and archaeologists estimate that the first settlers arrived in the South Kohala region sometime between 750-1,000 AD. The warm coast and beaches on the western boundaries of the South Kohala area were used seasonally by early Polynesians who eventually migrated to the cooler plateau. Descendants of these early Polynesian explorers established fishing villages on the leeward coast of the district and along the western extremities of the plains and began cultivating lo'i kalo terraces along a series of streams at the southern base of the Kohala Mountains. Construction of the Waimea field system may have involved clearing and burning of the native forest. South Kohala, particularly Kawaihae and Waimea, was an important political region on the Island of Hawai'i. Many high-ranking ali'i regularly visited the area and held court there even up to the time of Kamehameha and his son Liholiho. From the mid-19th century to the mid-20th century, the district was heavily influenced by the paniolo way of life. This was disrupted somewhat by the Department of Defense (DoD) use of land on the island of Hawaii to conduct the live-fire training of 50,000 troops, ensuring military readiness from 1943-1945. After World War II, the development of three large resorts in the district shifted the district's economic base from agriculture to tourism, which has influenced land use and development patterns over the last several decades.

Waikoloa is known as the "kula" lands and the "plains". Waikoloa and its neighbors were identified as "'ili 'āina" (small land divisions within a larger political land unit) within the ahupua'a or kalana of Waimea, which may help to explain why Waikoloa (containing approximately 95,000 acres), apparently had no direct connection to the ocean. Waikoloa has two ancient major trail systems. One trail extended between the coastal settlements and marine fisheries of Puako to the Waikoloa-Waimea uplands. The second trail extended from the Puako shore to Napu'u, meeting the upland trail between Waimea and Kona, near Ke'amuku-Kuainiho. Both trails remained in use through the nineteenth century. Use of the Puako-Waimea Trail appears to have been discontinued primarily as a result of shifting population and the development of long-term leases between the Territorial Government and plantation-ranch business interests. The Puako-Napu'u Trail remained in limited use through the 1960s, as a part of the operations of Pu'uwa'awa'a Ranch and Parker Ranch.

Waikoloa Village was established in 1971 and was originally designed to be a retirement community, though today it has grown to be a more family-oriented community. Boise Cascade, the original developer of Waikoloa Village, agreed to convey approximately 10,000 acres of land and improvements to the Waikoloa Village Association. The clubhouse, swimming pool, tennis courts, and approximately 2,000 acres of land were conveyed to the Association in 1975 and an additional 8,000 acres were conveyed in 1987.

In 1989, the Waikoloa Land Company conveyed approximately 279 acres of land to the County of Hawai'i to develop workforce housing for families who lived in the region but would not be able to afford to rent or buy housing locally, given the market conditions at the time. This donation of land satisfied the Waikoloa Land Company's requirements for affordable housing in conjunction with the development of the Waikoloa Beach Resort.

The original 1991 Master Plan and subsequent 2007 Master Plan has produced 185 housing units—with 140 additional units currently in various stages of development—along with associated infrastructure improvements such as roads, sewers, and water lines.

Planning Implications

The Kamakoa Nui Master Plan seeks to update the forecast of future housing demand and guide such residential development in a phased approach to take advantage of the existing development on and near the Property. The Master Plan will also consider the impact of the Formerly Used Defense Sites (FUDS) program (discussed in detail below) in prioritizing certain areas of development.

2.9 Formerly Used Defense Sites (FUDS) Program

From 1943 to 1945, the United States Department of Defense used 137,000 acres of South Kohala land—including most of present-day Waikoloa Village and all of the Kamakoa Nui Master Plan area—for training and live military operations. Following the deactivation of Camp Tarawa and the Waikoloa Maneuver Area, the Department of Defense performed cleanup activities in accordance with the Explosive Ordnance Details for Disposal in 1946 and 1954. The FUDS program addresses potential risks on lands formerly owned or controlled by the Department of Defense prior to 1986. The FUDS program is administered and implemented nationally by the U.S. Army Corps of Engineers (USACE) and within the Pacific Islands by the Honolulu District of the USACE. The Waikoloa FUDS area covers 137,000 acres with approximately 50,000 acres considered to be “high risk.” Most of the “high risk” land is near Waimea, in the vicinity of the old Camp Tarawa. Since 1993 when the USACE began investigating the Waikoloa FUDS area, the USACE has cleared about 8,000 acres of land and removed over 2,700 munitions and 120 tons of debris. It is estimated that it would cost \$680 million over the next 50 years to clean up the entire 137,000-acre Waikoloa FUDS area. Figure 16 illustrates the Waikoloa FUDS area and the most recent progress that has been made to clear the Property and surrounding area.

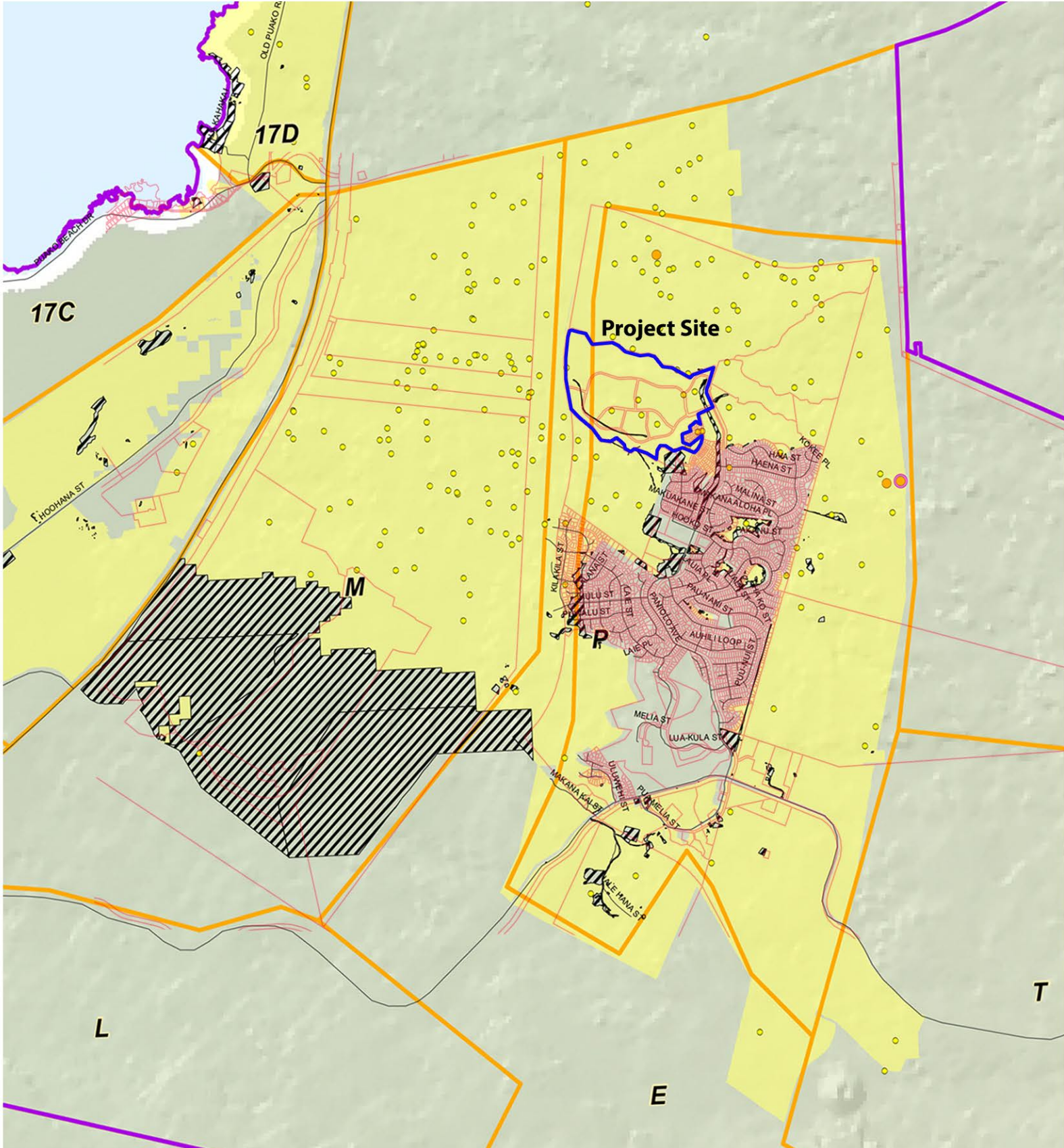
Planning Implications

As the Kamakoa Nui Master Plan seeks to update the forecast of future housing demand and guide residential development, it must consider the ongoing efforts of the USACE to clear the Property of munitions. As shown in Figure 16, the Property is located in FUDS work sector E and P. Both FUDS work sectors have been cleared under the Explosive Ordnance Details for Disposal in 1946 and 1954, however, the USACE has not issued a Remedial Action Report (RAR) under the present-day process of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) for portions of TMKs (3) 6-8-041:002 and (3) 6-8-041:006, and (3) 6-8-041:009 in FUDS work sector E and TMKs (3) 6-8-041:005 and (3) 6-8-041:006 in FUDS work sector E. Because the current stockpile area on parcel 002 contains new fill, the USACE cannot access the soil layer that was exposed during FUDS program operation. Thus, CERCLA clearance cannot occur in this area until the new fill has been removed. Because parcel 004 was planned for open space and no residential uses in the 2007 Master Plan, the USACE found it unnecessary to clear the area per CERCLA. Finally, the entire FUDS work sector E is currently identified as low priority per the USACE’s schedule. Since the timing of the cleanup of the makai-most portion (approximately 25%) of the Property is unknown, planning for the Master Plan area assumed that the makai quarter of the Property is undevelopable, and the planned number of units could be accommodated in the remainder of the Master Plan area.

The County of Hawai‘i Department of Health (DOH), Hazard Evaluation and Emergency Response Office (HEER), will not issue a Conditional No Further Action (CNFA) letter until the USACE has issued a RAR. If the proposed project site has not received a NFA letter from DOH, OHCD cannot access State and Federal housing funds for future developments. Therefore, it is critical that OHCD work with DOH and USACE to prioritize investigation and cleanup of land yet to be cleared under CERCLA. In the meantime, this Master

Kamakoa Nui Master Plan

Plan proposes development of CERCLA-cleared areas early in the phasing plan while untreated areas are being cleared. This approach allows initial development to occur simultaneously with FUDS cleanup. Alternatively, because developers typically do not use State or Federal housing funds for higher AMI residential developments, OHCD may consider directing high AMI single-family and multifamily developments towards areas without a CNFA letter.



LEGEND

MEC (1,802)

- 1
- 2 - 4
- 10 - 13
- 81
- 278

Background

- Exception Area (2,079 acres)
- Cleared Area (22,604 acres)
- Work Sector
- Former Waikoloa Maneuver Area (100,262 acres)

Figure 16
Formerly Used Defense Sites in
Waikoloa Village
Kamakoa Nui

Date: 9/1/2022

Disclaimer: This graphic has been prepared for general planning purposes only and should not be used for boundary interpretations or other spatial analysis.

2.10 Regional Demographics

Waikoloa Village is a census-designated place (CDP), as defined by the U.S. Census Bureau. In 2020, it was estimated to have roughly 7,100 residents and 2,500 households. The median age in the Waikoloa Village CDP is 38.5, with 6.9% under 5 years, 27.7% under 18 years, and 15.8% 65 years and over. The Waikoloa Village CDP median household income is \$74,000, with an unemployment rate of 4%, and an average household size of 2.62 people. Of those 25 years and older, 93% of Waikoloa Village residents have a high school degree or higher, while only 29% have a bachelor's degree or higher.⁵

Planning Implications

Like Waikoloa Village, Kamakoa Nui will offer proximity to major employment centers, with six of the Island's ten largest employers located in South Kohala. As of 2021, an estimated 740 businesses and more than 10,000 employees were reported within 10 miles of the Property. The original land conveyance to the County referred to providing housing options for persons who work within 45 miles of the Property. Today, that radius is believed to be home to nearly 3,000 businesses that support more than 36,000 employees.

Based on these socioeconomic conditions, the Kamakoa Nui Master Plan will help to address the housing needs of Waikoloa Village and the larger South Kohala district. Although there are only approximately 875 undeveloped units remaining from the Original and 2007 Master Plans, this Master Plan considers the possibility of planning for additional units beyond the remaining 875 units. Specific unit counts and types are discussed in Sections 3 and 4 of this Master Plan Report.

2.11 Infrastructure

Roadway System

On the mauka side, the Property is primarily accessed via Kamakoa Drive, an approximately 94-foot wide, four-lane public right-of-way that connects to Paniolo Avenue.⁶ Kamakoa Drive is paved from Paniolo Avenue to the eastern edge of parcel 007 before transitioning into an unpaved road. In addition, Iwikuamoo Drive T-intersects with Kamakoa Drive at the latter's middle section. The unpaved road continues makai and loops through the length of the Property. See Figure 6 for a map of existing infrastructure improvements.

Planning Implications

All roadway points of access will need to be coordinated with the Hawai'i County Department of Public Works, which manages County roads, traffic signals, and streetlights. Hawai'i County adopted the Complete Street Manual in October 2020 (significantly after the adoption of County Council Resolutions 328-91, 439-06, 416-07, and 353-14). Complete streets are designed to enable safe use and support mobility for all users. The Kamakoa Nui roadway system should be designed to incorporate the Complete Streets guidelines where possible.

⁵ For reference, Hawai'i County's demographic information is as follows: population (199,459), number of households (65,453), median age (42.7), median household income (\$62,409), unemployment rate (6%), average household size (2.82), high school degree (92.9%), and bachelor's degree (29.5%).

⁶ Paniolo Avenue is the main north-south road that bisects Waikoloa Village and provides access to Waikoloa Road.

Water System

The improved portion of Kamakoa Drive contains a subsurface water line that runs under the paved portion of Paniolo Avenue. In addition to residential water use, this water line will supply water for future fire hydrants and irrigation needs in Kamakoa Nui.

Planning Implications

Hawai‘i Water Service (HWS) provides water service to the greater Waikoloa Village area and based on a 2007 “will serve” letter from the Waikoloa Water company to OHCD, there appears to be adequate water capacity to serve the Kamakoa Nui Master Plan area.⁷ Using the updated housing forecast and phasing recommendations of this Master Plan, OHCD and future developers should coordinate with HWS to verify that adequate water service can still be provided to individual parcels as they are developed. This Master Plan also encourages the use of bioswales and catchment systems along hardscape elements to collect runoff from impervious surfaces, thus reducing the amount of runoff that proceeds into nearby gulches. This recycled water can also be used to irrigate landscaped areas and reduce ongoing maintenance costs.

Wastewater System

An underground gravity sewer line begins at Paniolo Avenue and runs below Kamakoa Drive and the lower portion of the unpaved road to the makai terminus of the Property. The existing sewer main connects to the existing wastewater treatment plant (operated by HWS) located at the area immediately adjacent to the northwest of the Property boundary. Currently the existing wastewater treatment plant can treat up to 100,000 gallons of sewer effluent per day. HWS anticipates construction of a new leach field facility (to begin by the end of 2023), which will increase effluent treatment capacity to 200,000 gallons per day. To save on development costs, future developments (especially those in earlier phases) should use the existing sewer main before extending the sewer main to serve the areas that are not currently connected to the existing line.

Planning Implications

HWS provides wastewater service to the greater Waikoloa Village area and based on a 2007 “will serve” letter from the Waikoloa Water company to OHCD, there appears to be adequate wastewater capacity to serve the Kamakoa Nui Master Plan area. Using the updated housing forecast and phasing recommendations of this Master Plan, OHCD and future developers should coordinate with HWS to verify that adequate wastewater service can still be provided to individual parcels as they are developed.

Utilities

The Hawai‘i Electric (HECO) supplies electricity for Hawai‘i County via their island-wide distribution network.

Planning Implications

Appropriate coordination with HECO and eligible service providers will need to be conducted during the planning and development of individual parcels. Opportunities for renewable energy, such as rooftop solar panels, exist and should be incorporated where feasible.

⁷ In 2008, Hawai‘i Water Service Company, a subsidiary of California Water Service Group, acquired West Hawai‘i Utilities, which included the Waikoloa Water Company.

Schools

Waikoloa Elementary and Middle School, a public K-8 school is located about one mile from the Kamakoa Nui Master Plan area. A site for a State of Hawai‘i Department of Education (DOE) Elementary School was shown on the 2007 Kamakoa Workforce Housing Master Plan. PBR HAWAII coordinated with DOE between January 2022 and March 2022 on whether a site for an elementary school was still needed, and finally confirmed that DOE will need an elementary school site within the Master Plan area. However, DOE was not able to provide timing for implementation.⁸

Planning Implications

With 875 or more new housing units forecasted for Kamakoa Nui, this Master Plan includes approximately 12 acres of land set aside for a school use. New public schools are an attractive amenity to new residents, but in this particular case, it is not known when the new school will be in operation.

Libraries

Currently Waikoloa Village does not have a Hawai‘i State Public Library. The closest public libraries are the North Kohala Public Library (approximately 19 miles) and the Honoka‘a Public Library (approximately 23 miles).

While there were previous plans to site a new public library across Waikoloa Road from Waikoloa Village, those negotiations with the private land owner failed and the Hawai‘i Public Library System (HSPLS) requested a site within Kamakoa Nui. In an effort to facilitate the development of a much-needed public library in Waikoloa, the County and HSPLS have identified a mutually acceptable 2.4-acre site adjacent to the park and a lease between the County and HSPLS is currently being negotiated. A proposed 2.4-acre site for the new public library has been included in the Preferred Master Plan and will serve as an attractive amenity to new residents.

Planning Implications

Subdivision of the library parcel will be done with the subdivision of the bulk parcels in accordance with the Preferred Master Plan, as discussed in Section 4.8 below.

Parks

There is an approximately 12-acre public park (parcel 008), including playfield, restroom and skate park, located at the northwest corner of Kamakoa Drive and Paniolo Avenue (refer to Figure 2). However, due to disrepair of the irrigation system and resulting deterioration of the fields, the fields need to be repaired and restored to allow use. The existing skate park and restrooms continue to be used. Plans for repair and restoration of the fields are being considered.

Planning Implications

With the anticipated development of residential units in the Kamakoa Nui Master Plan area, the existing public park on the Property will be well-used by future residents and possibly expanded by the County of Hawaii Department of Parks and Recreation (DPR). As discussed in Section 4.9, the land between the current park and the northern Property boundary has been added to the park site within the Preferred Master Plan for future park expansion. It is assumed that each of the future multi-family residential development

⁸ Even after a need has been determined, it can take many years for a school site to be planned and developed.

Kamakoa Nui Master Plan

parcels may include small recreational areas, such as outdoor barbeque facilities and picnic tables/benches, playground equipment, and possibly, community centers. OHCD will likely encourage future developers to integrate these planned open spaces and recreational facilities into future developments to provide Kamakoa Nui residents with various opportunities for recreation.

3 Conceptual Master Plan Alternatives

The 2007 Master Plan and the subsequent efforts by Hawai'i County under various design-build contracts have resulted in mass grading, various infrastructure improvements, and the bulk lot subdivision reflected in the TMK parcels shown in Figure 2. Given that the 2007 Master Plan is now 15 years old and not reflective of today's housing needs, OHCD seeks to review and update the Master Plan including land uses, infrastructure, and housing needs for the remaining 240-acre property. Using the Master Plan, OHCD will consolidate the current bulk lot layout and re-subdivide the Property. The Kamakoa Nui Master Plan will reconfigure the development parcels for engaging private developers through Request for Proposals (RFPs). OHCD will collaborate with private developers to implement individual parcel developments in the Kamakoa Nui Master Plan by phases.

After assessing the Property's current conditions and evaluating future housing demands, PBR HAWAII has prepared two conceptual master plan alternatives to explore potential Master Plan layouts. The two conceptual master plan alternatives were developed in conjunction with OHCD's consideration of:

1. Optimizing proposed roadway and utility systems, including costs for construction, operation, and maintenance.
2. Phased development, bulk lot size efficiencies, and parcel sizes attractive to affordable housing developers.
3. Coordinating with USACE and DOH on a FUDS treatment timeline, with the initial focus on mauka areas (FUDS work sector P).
4. Minimizing common areas and future maintenance responsibilities for the County, future developers, and future neighborhood associations or homeowner's associations.
5. Evaluating the current housing market and providing unit types at price points that are most in need for local residents.
6. Collaborating with the HSPLS, DOE and County of Hawai'i Department of Parks and Recreation (DPR) to provide library, park, and school facilities within the Master Plan area.
7. The existing drainageways and the updated findings of the Flood Determination Study.

Both conceptual master plan alternatives are informed by the findings and planning implications of the site assessment as discussed in Section 2. The conceptual master plan alternatives provide a rough residential yield based on the proposed land uses and residential density allocations. The proposed residential building typologies and the estimated densities are based on recommendations from the Market Assessment for Kamakoa Nui (Market Assessment), prepared for OHCD by PBR HAWAII, dated March 2022. A copy of the Market Assessment is provided in Appendix D.

Sections 3.1 and 3.2 provide a brief description of each alternative, respectively. Conceptual Master Plan Alternative 1 is shown in Figure 17 and Conceptual Master Plan Alternative 2 is shown in Figure 18. The two alternatives are then evaluated based on the criteria below (in Section 3.3).

1. Roadway and sewer system
2. Efficient phasing of development
3. Bulk lot configuration and size efficiencies
4. FUDS treatment timeline
5. Market considerations
6. Library, park, and school sites

3.1 Conceptual Master Plan Alternative 1

Roadway System

As in the 2007 Master Plan, Conceptual Master Plan Alternative 1 proposes a collector road that creates a large loop within the Master Plan area, providing the primary circulation route and defining the boundaries of most of the bulk lot subdivisions. The loop road is bisected by a vertical connector road running from parcel 9 to parcel 11. The loop road design creates a simple and efficient circulation system that provides direct and easy access to all proposed parcels. It avoids inefficient dead-end roads and minimizes paving (approximately 10,520 linear feet) and long-term maintenance.

Combined with the middle vertical connector road, the upper and lower segment of the loop road create a “mini loop” that provides access to parcels in the early phases of development, thereby avoiding two temporary dead-end roads at parcels 5 and 6, respectively. Because the “mini loop” fronts all parcels in Phase 1, it gives OHCD and future developers the flexibility to provide alternative layouts of bulk lot subdivisions in response to future changing market conditions. The loop road also provides relatively easy management and control on development phasing. When fully built out, the loop road will integrate the entire Kamakoa Nui Master Plan area and provide easy wayfinding and user orientation.

Proposed Residential Types and Estimated Yield

As illustrated in Tables 1 and 2, Conceptual Master Plan Alternative 1 proposes 453 single-family houses and 57 single-family clusters on 10 parcels over approximately 157 acres. The single-family houses will range from 1,200 square feet to 1,500 square feet and will be marketed to the 80%-140% Area Median Income (AMI) demographic. Single-family clusters will range from 1,150 square feet to 1,300 square feet and be marketed to the 60%-120% AMI demographic. Single-family developments will average 4 units per acre, while single-family clusters will average 5.5 units per acre.

53 for-sale multifamily townhomes will be located on approximately 4.8 acres and will range in size from 700 square feet to 1,200 square feet. These units will average 11 units per acre and be marketed to the 60%-120% AMI demographic. 312 multifamily rental units will be located on approximately 22 acres and will range in size from 600 square feet to 1,000 square feet. These units will average 16 units per acre and be marketed to the 30%-60% AMI demographic. Tables 1 and 2 provide a more detailed breakdown of the distribution of housing types and land uses proposed under Conceptual Master Plan Alternative 1.

As shown in Figure 17, most of the single-family development is designated to the periphery and the western core of the Master Plan area. Multifamily units are primarily found in the eastern core of the Master Plan area. The proposed residential densities are based on recommendations from the Market Assessment and are meant to illustrate the full development capacity of the Kamakoa Nui Master Plan area. The Market Assessment confirmed the remaining development potential (875 units) previously envisioned for the Master Plan area; however, the actual development buildouts may be greater and will ultimately depend on market conditions at the time OHCD issues RFPs for each bulk lot subdivision. This allows both OHCD and developers to respond to future market conditions and provide the most appropriate quantity and type of housing.

Kamakoa Nui Master Plan

Table 1: Conceptual Master Plan Alternative 1 Land Use Summary

Land Use Parcel ID	Approx. Land Area	Proposed Use	Estimated Residential Density	Estimated Residential Unit Count
	(acreage)		(DU/AC)	
1	6.3	Single-family Cluster	5.5	33
2	6.8	Multi-family Rental	16.0	90
3	4.9	Single-family Cluster	5.5	24
4	5.4	Multi-family	11.0	53
5	15.7	Single-family	4.0	51
6	14.7	Single-family	4.0	53
7	7.1	Single-family	4.0	27
8	11	Multi-family Rental	16.0	152
9	19.3	Single-family	3.4	66
10	22.8	Single-family	2.9	65
11	16.3	Single-family	1.8	30
12	27.9	Single-family	3.6	100
13	7.3	Single-family	4.0	35
14	11.1	Single-family	2.4	27
15	4.6	Multi-family Rental	16.0	70
Subtotal :	181			
16	12.8	DOE School Site		
17	2.4	State Library Site		
18	6.2	Community Park Expansion		
19	10.5	Community Park		
20	12.4	Mauka Steep Slope Area		
40' Buffer along Paniolo Ave	1.0	40' Buffer along Paniolo Ave		
Existing Kamakoa Dr.	1.8	Existing Kamakoa Dr. (830 LF)		
Future Subdivision Road (50' ROW)	12.1	Future Subdivision Road (50' ROW) 10,522 LF		
TOTAL GLA:	240	TOTAL Unit Count :		875

Table 2: Conceptual Master Plan Alternative 1 Residential Unit Summary

	Estimated Units	Ave. Density	Mix	AMI Range	Unit Size	Target Mix (%)
Ownership Units						
Single-family	453	4.0	51.8%	80% to 140%	1,200 to 1,500	53%
Single-family Cluster	57	5.5	6.5%	60% to 120%	1,150 to 1,300	4%
Multi-family (Townhome)	53	11.0	6.1%	60% to 120%	700 to 1,200	7%
Subtotal :	563					
Rental Units						
Multi-family (Stack-flat)	312	16.0	35.7%	30% to 60%	600 to 1,000	36%
Total :	875		100%			100%

Residential Bulk Lots

As recommended in the Market Assessment, for-sale parcels should be offered in the following sizes: single family homes should be offered in 20-50-acre parcels; single-family clusters and condominiums should be offered in 5-10-acre parcels; and town homes should be offered in 4-8-acre parcels. Rental parcels should be offered in 3-10-acre parcels with a minimum 65-year ground lease.

As shown in Table 2, the single-family parcels envisioned in Conceptual Master Plan Alternative 1 are 15 to 30 acres in area and can be developed in several increments. The multifamily parcels envisioned in Conceptual Master Plan Alternative 1 are 4 to 6 acres in area with similar sized parcels available in close proximity for additional phases should that be desirable for future developers. As mentioned above, actual buildouts may differ in size and density depending on market conditions at the time OHCD issues RFPs for each bulk lot subdivision.

Other Proposed Uses

Library site: OHCD is collaborating with the HSPLS to develop the approximately 2.4 acres at parcel 17 into a new HSPLS branch. HSPLS's architectural consultant is conducting a preliminary site assessment, which will inform the initial layout and design of parcel 17. After the lot has been formally subdivided, the HSPLS will negotiate the land lease with County and start the final design and development of the new library site, which is expected to occur in Phase 1.

School site: OHCD is coordinating with DOE to understand the potential need for an elementary school in the Master Plan area. As an elementary school would not be needed until a substantial residential population is established, the intent is to include the elementary school in the later phases of development, if needed. Conceptual Master Plan Alternative 1 currently designates parcel 16 as the potential future school site. DOE will evaluate the capacity of existing facilities and the need for new facilities once a larger residential population is established in the area. If it is later determined that a new elementary school is not needed, parcel 16 will be made available for additional workforce housing.

Park expansion: OHCD is coordinating with DPR on developing approximately 6.2 acres of land on parcel 18, immediately north of the existing community park (parcel 19) into an expanded park area. According to the Flood Determination Study, a portion of this area is within the updated 100-year flood zone. Although this area should not be used for residential structures, it is suitable for open space and outdoor recreation uses. The expanded park will have access from both Paniolo Avenue and the proposed loop road.

Sewer Connection

The existing 12-inch sewer main below Kamakoa Drive will continue beneath the lower portion of the loop road. Early developments—parcels 1, 2, 6, 17 and 11 (portion)— will receive direct sewer service from the existing 12-inch sewer main. The other parcels fronting the “mini loop”—lots 3, 4, 15, and 19 will connect to the existing sewer main via new sewer lines installed under the “mini loop” road. Lot 5 will require a sewer easement through lot 6 to connect to the sewer main under the lower loop road.

As the loop road is fully built out, additional sewer lines will be installed under the loop road and subsequent parcels will connect to these new lines. Where topography allows, gravity sewers should be used whenever possible. However, some lots, such as the lower areas of lots 10 and 12, will likely require a pump system and force main to transport sewage uphill. As proposed in Conceptual Master Plan Alternative 1, all of the parcels fronting the “mini loop” (Phase 1) will be able to use a gravity sewer to connect to the sewer main.

FUDS Treated Area

As FUDS work sector E is identified as a low priority area on the USACE work plan, it is assumed that this area will not be surveyed and treated for many years. As such, the proposed parcels in this area will not be able to receive an RAR letter from the USACE until CERCLA has been completed. Consequently, DOH will not issue a NFA letter and OHCD will not be able to issue RFPs and access State and Federal funds for these areas. To work around this expected delay, Conceptual Master Plan Alternative 1 proposes later phased development in the FUDS work sector E areas. For example, the proposed school site (lot 16) is strategically located in work sector E because a school will not be developed until after early residential developments are built out, if at all. Alternatively, because developers typically do not use State or Federal housing funds for higher AMI residential developments, OHCD may consider directing 120-140% AMI multifamily developments towards areas without an NFA letter.

The FUDS boundary between work sectors E and P is based on currently available FUDS maps, which illustrate approximate boundaries of work sectors. Since Area P has undergone CERCLA clearance, it is more accurate than untreated work sector E. It is expected that OHCD will continue to coordinate with the USACE to confirm the boundary for work sector P and update the boundary for work sector E to verify that Parcels 7, 8, 10, and 11 are not in untreated work sector E.

Existing Drainageways and the Identified Flood Zone

According to the Flood Determination Study, the unnamed drainageway along the Property's southern boundary is not within the 100-year flood zone. Therefore, Conceptual Master Plan Alternative 1 proposes approximately 55 single-family lots in this the area (parcels 11 and 14). It is anticipated that some grading and cleanup of the drainage channel will be necessary to provide additional developable area.

Along the northern boundary, Conceptual Master Plan Alternative 1 respects the topography of the Kamakoa Gulch and the updated 100-year flood zone. While residential structures should not be located in the updated flood zone, the area remains suitable for open space and recreation uses such as the expanded park area. Additionally, the updated flood zone areas can be used for open space on single-family lots, such as backyards. This approach reduces undevelopable common areas and their associated long-term maintenance costs.

Path: Q:\Hawaii\Kamakoia Nui\GIS\Projects\Kamakoia Nui Master Plan Report\2007 Master Plan Map Map.mxd

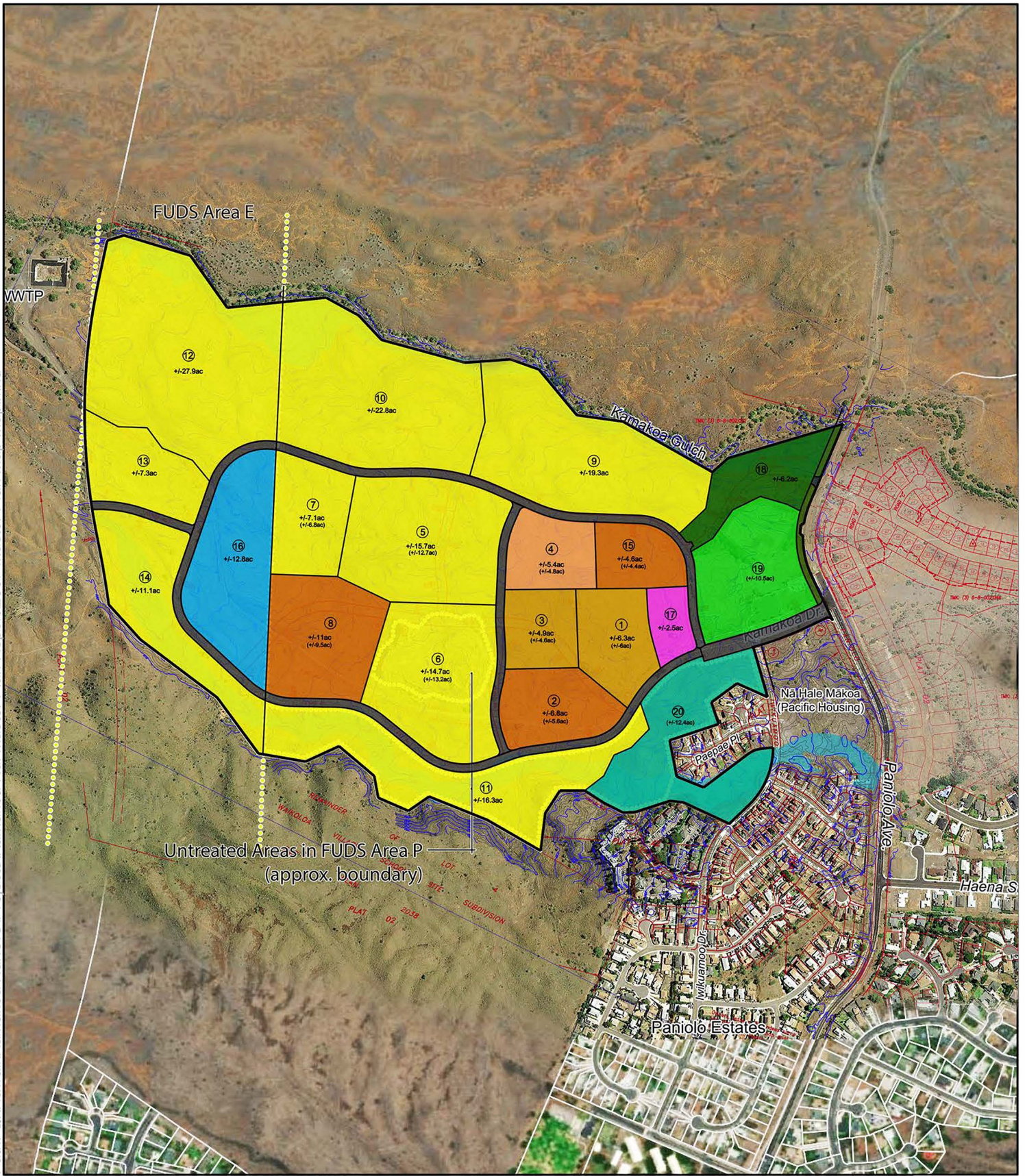


Figure 17
 Conceptual Master Plan
 Alternative 1
 Kamakoia Nui

Date: 9/1/2022

County of Hawai'i

Island of Hawai'i



Disclaimer: This graphic has been prepared for general planning purposes only and should not be used for boundary interpretations or other spatial analysis.

3.2 Conceptual Master Plan Alternative 2

Roadway System

Instead of a loop road, Conceptual Master Plan Alternative 2 proposes an east-west central spine road that traverses the Master Plan area from Kamakoa Drive on the mauka end to the western boundary on the makai end. Three vertical, dead-end roads provide access from the spine road to northern parcels. Some additional internal subdivision roads will likely be necessary in order to create a complete and efficient circulation system for the entire Master Plan area. To minimize the OHCD's initial road construction costs, the County plans to build collector roads to the boundary of each subdivision, then collaborate with developers to plan and fund internal subdivision roads. Similar to Conceptual Master Plan Alternative 1, Conceptual Master Plan Alternative 2 proposes a loop road through the southern Master Plan area in roughly the same alignment as the lower portion of the loop road proposed in Conceptual Master Plan Alternative 1. This lower loop road will provide access to parcels 11 and 14 and will be constructed by the developers developing these two parcels.

Although slightly different from the roadway system proposed in Conceptual Master Plan Alternative 1, the spine and lower loop system still provides easy access to all of the proposed bulk lots. Compared to Conceptual Master Plan Alternative 1, this fully built-out roadway system requires more linear feet of paving—12,505 linear feet vs. 10,520 linear feet—however, approximately 5,865 linear feet could be funded, at least partially, by future developers, thus reducing the County's overall financial commitment. At the same time, because Conceptual Master Plan Alternative 2 relies on future developer contributions to build internal roadways, the initial roadway system will include some dead-end roads and the final roadway system may be many years from completion. In this way, Conceptual Master Plan Alternative 2 carries an additional level of uncertainty and dependency on developers being willing to work with OHCD. As these bulk lots are more reliant on dead-end roads, the layout of lots also has less flexibility should future housing needs change.

Proposed Residential Types and Estimated Yield

As shown in Tables 3 and 4, Conceptual Master Plan Alternative 2 proposes 432 single-family houses and 65 single-family clusters on 11 parcels over approximately 152 acres. The single-family houses will range from 1,200 square feet to 1,500 square feet and will be marketed to the 80%-140% Area Median Income (AMI) demographic. Single-family clusters will range from 1,150 square feet to 1,300 square feet and be marketed to the 60%-120% AMI demographic. Single-family developments will average 4 units per acre, while single-family clusters will average 5.5 units per acre.

50 for-sale multifamily townhomes will be located on approximately 4.8 acres and will range in size from 700 square feet to 1,200 square feet. These units will average 11 units per acre and be marketed to the 60%-120% AMI demographic. 318 multifamily rental units will be located on approximately 22 acres and will range in size from 600 square feet to 1,000 square feet. These units will average 16 units per acre and be marketed to the 30%-60% AMI demographic. Tables 3 and 4 provide a more detailed breakdown of the distribution of housing types and land uses proposed under Conceptual Master Plan Alternative 2.

As illustrated in Figure 18, most of the single-family development is designated to the periphery and the southern core of the Master Plan area. Multifamily units are primarily found in the eastern core of the Master Plan area. The proposed residential densities are based on recommendations from the Market Assessment and are meant to illustrate the full development capacity of the Kamakoa Nui Master Plan area. The Market Assessment confirmed the remaining development potential (875 units) previously envisioned

for the Master Plan area; however, the actual development buildouts may be greater and will ultimately depend on market conditions at the time OHCD issues RFPs for each bulk lot subdivision. This allows both OHCD and developers to respond to future market conditions and provide the most appropriate quantity and type of housing.

Kamakoa Nui Master Plan

Table 3: Conceptual Master Plan Alternative 2 Land Use Summary

Land Use Parcel ID	Approx. Land Area	Proposed Use	Estimated Residential Density	Estimated Residential Unit Count
	(acreage)		(DU/AC)	
1	5.7	Single-family Cluster	5.5	30
2	6.8	Single-family Cluster	5.5	35
3	4.8	Multi-family	11.0	50
4	4.8	Multi-family Rental	16.0	72
5	9.9	Multi-family Rental	16.0	142
6	15.6	Single-family	4.0	56
7	10.5	Single-family	4.0	38
8	8.5	Single-family	4.0	24
9	7.2	Multi-family Rental	16.0	104
10	19.4	Single-family	3.4	66
11	16.3	Single-family	1.8	30
12	21.9	Single-family	3.0	65
13	28.3	Single-family	4.0	100
14	11.1	Single-family	2.4	27
15	7.7	Single-family	4.0	26
Subtotal :	179			
16	12.3	DOE School Site		
17	2.4	State Library Site		
18	6.2	Community Park Expansion		
19	10.5	Community Park		
20	12.7	Mauka Steep Slope Area		
40' Buffer along Paniolo Ave	1.0	40' Buffer along Paniolo Ave		
Existing Kamakoa Dr.	1.8	Existing Kamakoa Dr. (830 LF)		
Future Subdivision Road (50' ROW)	7.6	Future Subdivision Road (50' ROW) 6,640 LF		
Lower SF Road	4.2	Hatch Road (40' to 50' ROW) 3,690 LF		
Upper SF Road	2.5	Upper Loop Road (40' to 50' ROW) 2,175LF		
TOTAL GLA:	240	TOTAL Unit Count :	865	

Table 4: Conceptual Master Plan Alternative 2 Residential Unit Summary

	Estimated Units	Ave. Density	Mix	AMI Range	Unit Size	Target Mix (%)
Ownership Units						
Single-family	432	4.0	49.9%	80% to 140%	1,200 to 1,500	53%
Single-family Cluster	65	5.5	7.5%	60% to 120%	1,150 to 1,300	4%
Multi-family (Townhome)	50	11.0	5.8%	60% to 120%	700 to 1,200	7%
Subtotal :	547					
Rental Units						
Multi-family (Stack-flat)	318	16.0	36.8%	30% to 60%	600 to 1,000	36%
Total :	865		100%			100%

Residential Bulk Lots

As recommended in the Market Assessment, for-sale parcels should be offered in the following sizes: single family homes should be offered in 20-50-acre parcels; single-family clusters and condominiums should be offered in 5-10-acre parcels; and town homes should be offered in 4-8-acre parcels. Rental parcels should be offered in 3-10-acre parcels with a minimum 65-year ground lease.

As shown in Table 4, the single-family parcels envisioned in Conceptual Master Plan Alternative 2 are 15 to 30 acres in area and can be developed in several increments. The multifamily parcels envisioned in Conceptual Master Plan Alternative 2 are 4 to 6 acres in area with similar sized parcels available in close proximity for additional phases should that be desirable for future developers. As mentioned above, actual buildouts may differ in size and density depending on market conditions at the time OHCD issues RFPs for each bulk lot subdivision.

Other Proposed Uses

Library site: OHCD is collaborating with the HSPLS to develop approximately 2.4 acres at parcel 17 into a new HSPLS branch. HSPLS's architectural consultant is conducting a preliminary site assessment, which will inform the initial layout and design of parcel 17. After the lot has been formally subdivided, the HSPLS will negotiate the land lease with County and start the final design and development of the new library site, which is expected to occur in Phase 1.

School site: OHCD is coordinating with DOE to understand the potential need for an elementary school in the Master Plan area. As an elementary school would not be needed until a substantial residential population is established, the intent is to include the elementary school in the later phases of development, if needed. Conceptual Master Plan Alternative currently designates parcel 16 as the potential future school site. DOE will evaluate the capacity of existing facilities and the need for new facilities once a larger residential population is established in the area. If it is later determined that a new elementary school is not needed, parcel 16 will be made available for additional workforce housing.

Park expansion: OHCD is coordinating with DPR on developing approximately 6.2 acres of land on parcel 18, immediately north of the existing community park (parcel 19) into an expanded park area. According to the Flood Determination Study, a portion of this area is within the updated 100-year flood zone. Although this area should not be used for residential structures, it is suitable for open space and outdoor recreation uses. The expanded park will have access from both Paniolo Avenue and the proposed easternmost dead-end vertical road.

Sewer Connection

The existing 12-inch sewer main below Kamakoa Drive will continue beneath the lower portion of the loop road, serving lots 11 and 14 directly. All other lots to the north will rely on a new gravity sewer line connecting to new sewer lines below the spine road and dead-end vertical roads or sewer easements through lots 5, 6, 7, and 15 connecting to the existing sewer main. Either scenario would increase development costs through increased sewer piping or equipment (force mains, pumps, etc.) and potentially limit the total development capacity of individual bulk lots.

FUDS Treated Area

As FUDS work sector E is identified as a low priority area on the USACE work plan, it is assumed that this area will not be surveyed and treated for many years. As such, the proposed parcels in this area will not be

able to receive an RAR letter from the USACE until CERCLA has been completed. Consequently, DOH will not issue a NFA letter and OHCD will not be able to issue RFPs and access State and Federal funds for these areas. To work around this expected delay, Conceptual Master Plan Alternative 2 proposes later phased development in the FUDS work sector E areas. For example, the proposed school site (lot 16) is strategically located in work sector E because a school will not be developed until after early residential developments are built out, if at all. Alternatively, because developers typically do not use State or Federal housing funds for higher AMI residential developments, OHCD may consider directing 120-140% AMI multifamily developments towards areas without an NFA letter.

The FUDS boundary between work sectors E and P is based on currently available FUDS maps, which illustrate approximate boundaries of work sectors. Since Area P has undergone CERCLA clearance, it is more accurate than untreated work sector E. It is expected that OHCD will continue to coordinate with the USACE to confirm the boundary for work sector P and update the boundary for work sector E to verify that Parcels 6, 7, 8, 9, 11 and 12 are not in untreated work sector E.

Existing Drainageways and the Identified Flood Zone

According to the Flood Determination Study, the unnamed drainageway along the Property's southern boundary is not within the 100-year flood zone. Therefore, Conceptual Master Plan Alternative 2 proposes approximately 55 single-family lots in this the area (parcels 11 and 14). It is anticipated that some grading and cleanup of the drainage channel will be necessary to provide additional developable area.

Along the northern boundary, Conceptual Master Plan Alternative 2 respects the topography of the Kamakoa Gulch and the updated 100-year flood zone. While residential structures should not be located in the updated flood zone, the area remains suitable for open space and recreation uses such as the expanded park area. Additionally, the updated flood zone areas can be used for open space on single-family lots, such as backyards. This approach reduces undevelopable common areas and their associated long-term maintenance costs.

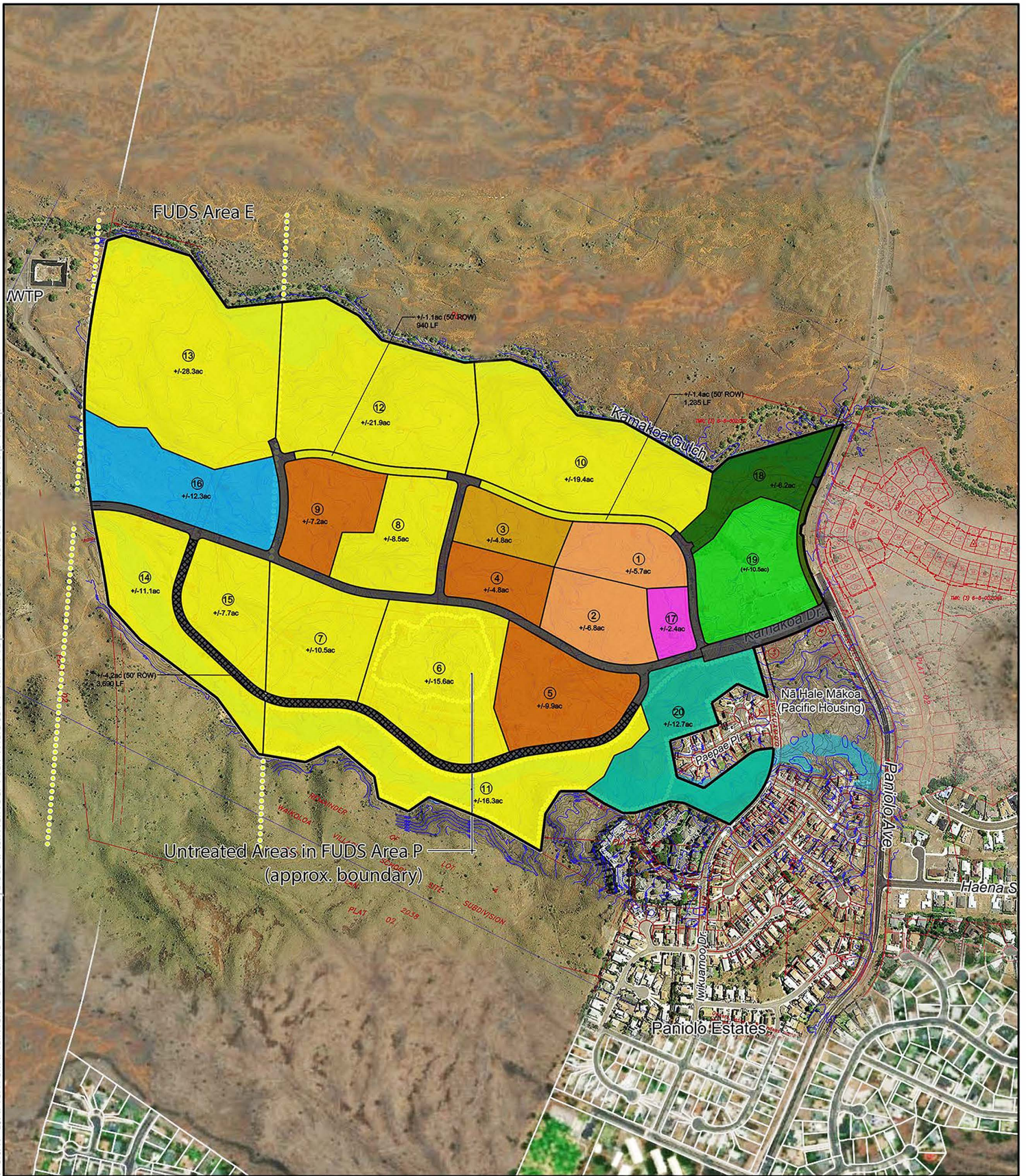



Figure 18
Conceptual Master Plan
Alternative 2
Kamakoa Nui

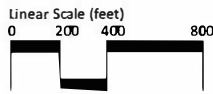

Date: 9/1/2022

County of Hawai'i Island of Hawai'i

North



Linear Scale (feet)
 0 200 400 800

PBR HAWAII
 & ASSOCIATES, INC.

3.3 Comparison of Conceptual Master Plan Alternatives

The table below summarizes a comparison of Conceptual Master Plan Alternative 1 and Conceptual Master Plan Alternative 2 relative to the established criteria.

Table 5: Evaluation of Conceptual Master Plan Alternatives

<u>Criteria</u>	<u>Conceptual Master Plan Alternative 1</u>	<u>Conceptual Master Plan Alternative 2</u>
Roadway and Sewer System	<p>A large loop road and vertical collector road provides efficient circulation and easy wayfinding. Initial development phases can be served by a “mini loop” road, which provides accessibility to all initial development parcels and flexibility to developers and OHCD, should residential needs change. In total, approximately 10,520 linear feet of paving will be required.</p> <p>The Existing 12-inch sewer main will continue beneath the lower portion of the loop road. Early developments will receive direct sewer service from the existing 12-inch sewer main. Subsequent developments will connect to the existing sewer main via new sewer lines installed under the “mini loop” road. Most lots, including all lots fronting the “mini loop,” will be able to use a gravity sewer to connect to the sewer main.</p> <p style="text-align: center;">Preferred</p>	<p>An east-west central spine, three short dead-end vertical roads, and a lower loop road provides circulation throughout the Master Plan area. This roadway system requires 12,505 linear feet of paving, though approximately 5,865 linear feet could be funded, at least partially, by future developers, thus reducing the County’s overall financial commitment.</p> <p>As Conceptual Master Plan Alternative 2 relies on future developer contributions to build internal roadways, the initial roadway system will include some dead-end roads and the final roadway system may be many years from completion.</p> <p>The existing 12-inch sewer main below Kamakoa Drive will continue beneath the lower portion of the loop road, serving lots 11 and 14 directly. All other lots to the north will rely on a new gravity sewer line connecting to new sewer lines below the spine road and dead-end vertical roads, or sewer easements through lots 5,6, 7, and 15 connecting to the existing sewer main. Either scenario would increase development costs through increased sewer piping or equipment (force mains, pumps, etc.) and potentially limit the total development capacity of individual parcels.</p>
Efficient Phasing of Development	<p>The large loop road and the early phase “mini loop” creates a simple and efficient circulation system that provides access to all parcels, particularly in the early phases of development. As such, the loop road system gives OHCD and future developers the flexibility to provide alternative layouts of parcel subdivisions in response to future changing market conditions.</p>	<p>The spine road layout system will eventually provide convenient access to all proposed parcels. However, because Conceptual Master Plan Alternative 2 relies on future developer contributions, the initial roadway system will include some dead-end roads and the final roadway system may be many years from completion. In this way, Conceptual Master Plan Alternative 2 carries an additional level of uncertainty and dependence on developers being willing to work with the OHCD. As these bulk lots are more reliant on dead-end roads, the layout of lots also has less flexibility should future housing needs</p>

Kamakoa Nui Master Plan

	<p align="center">Preferred</p>	<p>change. Finally, as the phasing of development will be more reliant on the construction of dead-end roads, coordinating multiple simultaneous developments will be more challenging.</p>
<p>Bulk Lot Configuration and Size Efficiencies</p>	<p>As recommended in the Market Assessment, single-family parcels are 15 to 30 acres in area and can be developed in several increments. The multifamily parcels are 4 to 6 acres in area with similar sized parcels available in close proximity for additional phases should that be desirable for future developers. Actual buildouts may differ in size and density depending on market conditions at the time OHCD issues RFPs for each bulk lot subdivision.</p> <p align="center">Equal</p>	<p>As recommended in the Market Assessment, single-family parcels are 15 to 30 acres in area and can be developed in several increments. The multifamily parcels are 4 to 6 acres in area with similar sized parcels available in close proximity for additional phases should that be desirable for future developers. Actual buildouts may differ in size and density depending on market conditions at the time OHCD issues RFPs for each bulk lot subdivision.</p> <p align="center">Equal</p>
<p>FUDS Treatment Timeline</p>	<p>As FUDS work sector E is identified as a low priority area on the USACE work plan, it is assumed that this area will not be surveyed and treated for many years. As such, the proposed parcels in this area will not be able to receive an RAR letter from the USACE until CERCLA has been completed. Consequently, DOH will not issue a NFA letter and OHCD will not be able to issue RFPs and access State and Federal funds for these areas. To work around this expected delay, FUDS work sector E areas are reserved for later phase developments. For example, the proposed school site (lot 16) is strategically located in work sector E because a school will not be developed until after early residential developments are built out, if at all. Alternatively, because developers typically do not use State or Federal housing funds for higher AMI residential developments, OHCD may consider directing 120-140% AMI multifamily developments towards areas without an NFA letter.</p> <p>In the meantime, OHCD should coordinate with the USACE to confirm the boundary for work sector P and update the boundary for work sector E to verify that Parcels 7, 8, 10, and 11 are not in untreated work sector E.</p> <p align="center">Equal</p>	<p>As FUDS work sector E is identified as a low priority area on the USACE work plan, it is assumed that this area will not be surveyed and treated for many years. As such, the proposed parcels in this area will not be able to receive an RAR letter from the USACE until CERCLA has been completed. Consequently, DOH will not issue a NFA letter and OHCD will not be able to issue RFPs and access State and Federal funds for these areas. To work around this expected delay, FUDS work sector E areas are reserved for later phase developments. For example, the proposed school site (lot 16) is strategically located in work sector E because a school will not be developed until after early residential developments are built out, if at all. Alternatively, because developers typically do not use State or Federal housing funds for higher AMI residential developments, OHCD may consider directing 120-140% AMI multifamily developments towards areas without an NFA letter.</p> <p>In the meantime, OHCD should coordinate with the USACE to confirm the boundary for work sector P and update the boundary for work sector E to verify that Parcels 6, 7, 8, 9, 11, and 12 are not in untreated work sector E.</p> <p align="center">Equal</p>

Kamakoa Nui Master Plan

<p>Market Considerations</p>	<p>Conceptual Master Plan Alternative 1 proposes 875 total units: 453 single-family houses, 57 single-family clusters, 53 for-sale multifamily townhomes, and 312 multifamily rental units. All unit types follow the recommended lot sizes and densities as stated in the Market Assessment.</p> <p style="text-align: center;">Equal</p>	<p>Conceptual Master Plan Alternative 2 proposes 865 total units: 432 single-family houses, 65 single-family clusters, 50 for-sale multifamily townhomes, and 318 multifamily rental units. All unit types follow the recommended lot sizes and densities as stated in the Market Assessment.</p> <p style="text-align: center;">Equal</p>
<p>Library, Park, and School sites</p>	<p>OHCD is collaborating with the HSPLS to develop the approximately 2.4 acres at parcel 17 into a new HSPLS branch. After the lot has been formally subdivided, the HSPLS will negotiate the land lease with County and start the final design and development of the new library site, which is expected to occur in Phase 1.</p> <p>OHCD is coordinating with DOE to understand the potential need for an elementary school on lot 16. If it is determined that a new elementary school is not needed, parcel 16 will be made available for additional workforce housing.</p> <p>OHCD is coordinating with DPR on developing approximately 6.2 acres of land immediately north of the existing community park (lot 18) into an expanded park area.</p> <p style="text-align: center;">Equal</p>	<p>OHCD is collaborating with the HSPLS to develop the approximately 2.4 acres at parcel 17 into a new HSPLS branch. After the lot has been formally subdivided, the HSPLS will negotiate the land lease with County and start the final design and development of the new library site, which is expected to occur in Phase 1.</p> <p>OHCD is coordinating with DOE to understand the potential need for an elementary school on lot 16. If it is determined that a new elementary school is not needed, parcel 16 will be made available for additional workforce housing.</p> <p>OHCD is coordinating with DPR on developing approximately 6.2 acres of land immediately north of the existing community park (lot 18) into an expanded park area.</p> <p style="text-align: center;">Equal</p>

Based on the above, Conceptual Master Plan Alternative 1 is the preferred Master Plan option. While both Conceptual Master Plan Alternatives satisfy many of the established evaluation criteria, Conceptual Master Plan Alternative 1 is superior in providing an efficient and cost-effective roadway system and sewer system, as well as providing opportunities for flexible phased developments on bulk lots.

4 Preferred Master Plan

In evaluating Conceptual Master Plan Alternative 1, OHCD considered additional information in the form of an engineering analysis, a Flood Determination Study (Appendix C), and a Market Assessment Report prepared by PBR HAWAII for OHCD in March 2022 (Appendix D). Further refinements were made to Conceptual Master Plan Alternative 1 resulting in the Preferred Master Plan, which is discussed in this section and illustrated in Figure 19.

As illustrated in Tables 6 and 7, the Preferred Master Plan proposes up to 1,250 total residential units over approximately 240 acres. The proposed residential types and densities are based on recommendations from the Market Assessment and are meant to illustrate the full development capacity of the Kamakoa Nui Master Plan area. The actual development buildouts may differ and will ultimately depend on market conditions at the time OHCD issues RFPs for each bulk lot subdivision.

As described in Section 4.10, the Preferred Master Plan proposes development over three phases. Please refer to Table 8 below for a Phasing Plan Summary. The proposed land uses are consistent with the State Urban Land Use District, Low Density Urban Development of the County General Plan Land Use Pattern Allocation Guide, Residential Single-Family Zoning (RS-10) by the County, and the strategies of the South Kohala Community Development Plan Waikoloa Village Conceptual Plan. The land uses and corresponding infrastructure associated with the Preferred Master Plan are discussed below.

Table 6: Preferred Master Plan Land Use Summary

Land Use Parcel ID	Proposed Use	Approx. Gross Land Area	Estimated Residential Density	Estimated Residential Unit Count	Anticipated County Zoning
		(acreage)	(DU/AC)		
1	Multi-family Rental	6.8	19	129	RM-2 to 2.5
2	Multi-family Rental	4.4	19	84	RM-2 to 2.5
3	Multi-family Rental	5.5	19	105	RM-2 to 2.5
4	Multi-family Ownership	5.6	12	67	RM-3.5
5	Multi-family Ownership	5.4	12	65	RM-3.5
6	Single Family or Detached Unit	14.8	5	74	
7	Single Family or Detached Unit	9.6	5.5	53	
8	Multi-family Ownership	7.0	10	70	RM-4
10	Multi-family Ownership	10.4	11	114	RM-3.5 to 4
11	Single-family (7,000+SF Lots)	19.3	3.6	70	
12	Single-family (7,000+SF Lots)	22.8	3.0	68	
13	Single-family (7,000+SF Lots)	19.1	1.7	33	
15	Multi-family Rental	7.3	19	139	RM-2 to 2.5
16	Single-family (7,000+SF Lots)	11.1	2.7	30	
17	Single-family (5,000+SF Lots)	7.3	4.8	35	
18	Single-family (6,000+SF Lots)	27.9	3.6	100	
22	Single-family (5,000+SF Lots)	4.6	3.3	15	
TOTAL : Multi-Family - 772, Single Family or Detached - 478					
Subtotal Land Area :		189	TOTAL Unit Count:	1,250	
9	DOE School Site	6.6			
14		5.5			
19	Existing Community Park	10.5			
20	State Library Site	2.4			
21	Community Park Expansion	6.2			
23	Mauka Steep Slope Area	4.9			
40' Buffer along Paniolo Ave		1.0			
Existing Kamakoa Dr. (830 LF)		1.8			
Future Subdivision Road (50' ROW) 10,522 LF		12.3			
TOTAL Gross Land Area :		240			

Table 7: Preferred Master Plan Residential Unit Summary

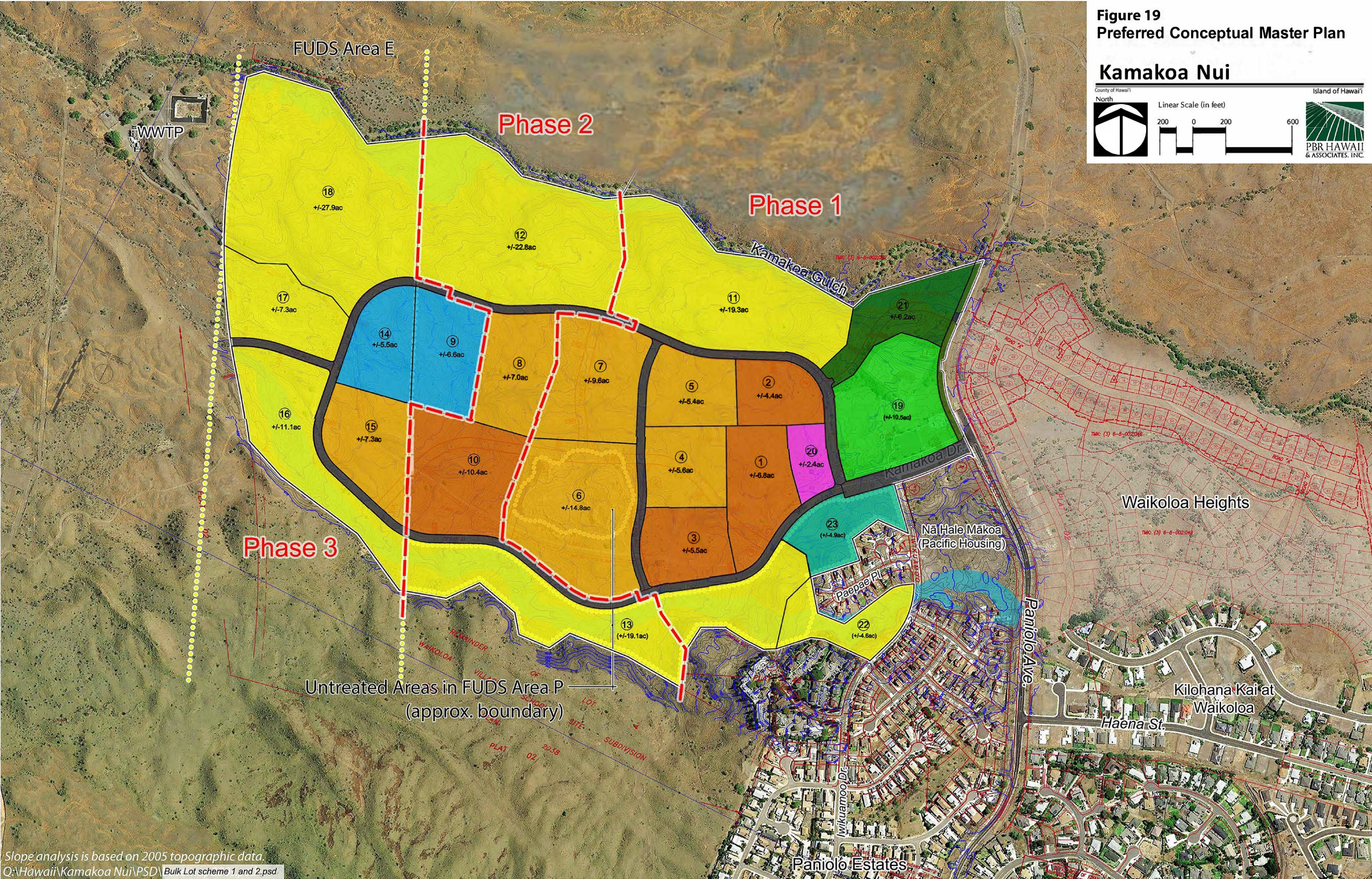
	Estimated Units	Ave. Density	AMI Range	Unit Size	Mix	Target Mix (%)
Ownership Units						
Single-family	478	2.0 to 5.5	80% to 140%	1,200 to 1,500	38.2%	53%
Single-family Cluster	0	5.5	60% to 120%	1,150 to 1,300	0.0%	4%
Multi-family	315	10 to 12	60% to 120%	700 to 1,200	25.2%	7%
Subtotal :	793					
Multi-Family Rental Units						
Multi-family (Stack-flat)	457	19.0	30% to 60%	600 to 1,000	36.6%	36%
Total :	1,250					100%

Figure 19
Preferred Conceptual Master Plan

Kamakoia Nui

County of Hawai'i
North
Island of Hawai'i
PBR HAWAII & ASSOCIATES, INC.

Linear Scale (in feet)
200 0 200 600



Slope analysis is based on 2005 topographic data.
Q:\Hawaii\Kamakoia Nui\PSD\Bulk Lot scheme 1 and 2.psd

4.1 Single-family housing

The Preferred Master Plan proposes 478 single-family houses in nine parcels over approximately 133 acres. The single-family houses will range from 1,200 square feet to 1,500 square feet and will be marketed to the 80%-140% AMI demographic. Single-family developments will range between 2-5.5 units per acre. Most of the single-family development is designated to the northern, western, and southern periphery of the Master Plan area.

4.2 Multifamily housing

The Preferred Master Plan proposes 315 for-sale multifamily houses on approximately 28 acres that will range in size from 700 square feet to 1,200 square feet. These units will average 11 units per acre and be marketed to the 60%-120% AMI demographic.

457 multifamily rental units will be located on approximately 24 acres and will range in size from 600 square feet to 1,000 square feet. These units will average 19 units per acre and be marketed to the 30%-60% AMI demographic. Multifamily units are mostly found in the core of the Master Plan area.

4.3 Roads

The Preferred Master Plan proposes a loop road system, similar to the road system proposed in Conceptual Master Plan Alternative 1. The loop road is bisected by a vertical connector road running from parcel 11 to parcel 13. The loop road design creates a simple and efficient circulation system that provides direct and easy access to all proposed parcels. It avoids inefficient dead-end roads and minimizes paving and long-term maintenance. As described in detail in Section 4.2 below, a “mini loop” road system will be implemented in the early phases of development to provide each parcel with direct access to the road system.

4.4 Water System

As noted in Section 2.11 above, the County of Hawai‘i has entered into an agreement with HWS via a 2007 “will serve” letter. As such, HWS will provide water service for the future Kamakoa Nui Master Plan area. HWS manages and maintains the regional water system in Waikoloa Village and will increase water capacity to support future community development in the greater Waikoloa Village area. As of this writing, it is understood that HWS and the County of Hawai‘i will collaborate to update the existing “will serve” letter. OHCD will coordinate the timing of the need for water service with water system improvements made by HWS to meet forecasted demand.

4.5 Wastewater System

As noted in Section 2.11 above, the County of Hawai‘i has entered into an agreement with HWS via a 2007 “will serve” letter. As such, HWS will provide wastewater service for the future Kamakoa Nui Master Plan area. HWS manages and maintains the regional wastewater system in Waikoloa Village and will increase wastewater capacity to support future community development in the greater Waikoloa Village area. As of this writing, it is understood that HWS and the County of Hawai‘i will collaborate to update the existing “will serve” letter. OHCD will coordinate the timing of the need for wastewater service with wastewater system improvements made by HWS to meet forecasted demand.

As the vertical connector road slopes downhill from north to south, a new gravity sewer line beneath the road will connect to the existing sewer line beneath the loop road and stub out to individual parcels 2, 3, 4, 5, and 6. For areas that are located at a lower elevation or slope away from the road—portions of parcels 12, 17 and 18—pump systems and force mains may be installed. As with Conceptual Master Plan Alternative 1, the Conceptual Master Plan takes advantage of topography and uses a gravity sewer for most parcels, thus reducing construction costs.

4.6 Utilities

During the planning and design phases of individual parcel developments, OHCD and future developers will coordinate with HECO on projected utility needs. Where feasible, renewable energy features, such as rooftop solar panels, should be incorporated.

4.7 DOE Public School

Conceptual Master Plan Alternatives 1 and 2 provide an approximately 12-acre parcel for the future DOE school site. However, neither of the parcel configurations meets DOE's site selection standard. Typically, DOE prefers rectangular-shaped sites for efficient site layout. As such, the Preferred Master Plan proposes a 12.1-acre school site on parcels 9 and 14 that is rectangular in shape. OHCD is coordinating with DOE to understand the potential need for an elementary school in the Master Plan area. As an elementary school would not be needed until a substantial residential population is established, the elementary school would not be developed until Phase 3. DOE will evaluate the capacity of existing facilities and the need for new facilities once a larger residential population is established in the area. If it is later determined that a new elementary school is not needed, parcels 9 and 14 will be made available for additional workforce housing.

4.8 Hawai'i State Public Library

The Preferred Master Plan proposes a new HSPLS branch on 2.4 acres at parcel 20. HSPLS's architectural consultant is conducting a preliminary site assessment, which will inform the initial layout and design of parcel 20. After the lot has been formally subdivided, the HSPLS will negotiate the land lease with County and start the final design and development of the new library site, which is expected to occur in Phase 1.

4.9 Park

The Preferred Master Plan proposes an expansion of the existing 10.5-acre park on parcel 19 to include 6.2 acres of parcel 21, resulting in a new 16.7-acre community park. According to the Flood Determination Study, a portion of this area is within the updated 100-year flood zone. Although this area should not be used for residential structures, it is suitable for open space and outdoor recreation uses. The expanded park will have access from both Paniolo Avenue and the proposed loop road.

4.10 Phasing Plan

As Federal and State funding becomes available, OHCD will contract with developers to build different portions of the Kamakoa Nui Master Plan area. Table 8 below summarizes the projected development that will occur in each of the three Preferred Master Plan phases. Many of the site constraints and opportunities discussed in section 2 and the criteria used to evaluate the Conceptual Master Plan Alternatives in Section 3—utilizing existing infrastructure, bulk lot configuration and size efficiencies, FUDS treatment, and

market considerations—have informed this proposed phasing plan. As market conditions change, the phasing plan may evolve over time.

Table 8: Phasing Plan Summary

	Gross Land Area (acre)	Estimated Yield (DU)	Ave. Density (DU/AC)
Phase I			
Lot 1 to 7 and 11 and portion 13 and 22	80	668	8.4
Phase II			
Lot 8, 10, 12 and portion 13	52.5	279	5.3
Phase III			
Lot 15 to 18	53.5	303	5.7
TOTAL:	186	1,250	

Phase 1

Phase 1 comprises the eastern half of the Master Plan area and includes parcels 1, 2, 3, 4, 5, 6, 7, 11, 13 (por.), 19, 20, 21, 22 and 23. This includes approximately 668 dwelling units over approximately 80 acres of land. Also included in Phase 1 is the library site (parcel 20) and the park redevelopment and expansion site (parcels 19 and 21).

During Phase 1, the “mini loop” road—the eastern half of the loop road and the vertical connector road—will be constructed to provide access to all Phase 1 parcels. Because the “mini loop” fronts all parcels developed in Phase 1, it gives OHCD and future developers the flexibility to provide alternative layouts of parcel subdivisions in response to future changing market conditions. Phase 1 parcels will receive direct sewer service via gravity sewer connection from the existing 12-inch sewer main below the loop road. In this way, the loop road and sewer system provide immediate efficiencies and future flexibility at a relatively low cost.

During Phase 1, OHCD should coordinate with the USACE to confirm the boundary for work sector P and update the boundary for work sector E to verify that parcels in Phases 2 and 3 will not be limited by the lack of an RAR letter from the USACE and subsequent NFA letter from DOH. If an RAR letter is necessary, OHCD should work with the USACE as early as possible to receive CERCLA clearance well ahead of any planned RFPs.

Phase 2

Phase 2 involves the middle section of the Master Plan area and includes parcels 8, 10, 12, and 13 (por.). This area includes approximately 279 dwelling units over approximately 52 acres of land. During Phase 2, the loop road will be extended further makai to include the areas fronting the corresponding parcels. Accordingly, sewer service will also be extended to these parcels. OHCD should continue to coordinate with the USACE during Phase 2 to prepare for the timely development of Phase 3 parcels.

At some point in Phase 2, DOE may also begin to study the need for a new elementary school on parcels 9 and 14. Although design and construction of the school would not start until Phase 3, a demographic study and facility needs assessment should be conducted before the actual need for a school arises.

Phase 3

Phase 3 involves the western end of the Master Plan area and includes parcels 9, 14, 15, 16, 17, and 18. This area includes approximately 303 dwelling units over approximately 54 acres of land. During Phase 3 the loop road will be completed and will include the areas fronting the corresponding parcels. Underground sewer service will follow the completed loop road and provide connections to these parcels.

If DOE determines that a new elementary school is needed, construction on parcels 9 and 14 should begin. Otherwise, those parcels may be used for additional residential development that fits the market need at that time.

If FUDS treatment has not progressed as planned during Phases 1 and 2, coordination efforts with the USACE may need to be accelerated to allow for the timely and complete development of Phase 3 parcels.

4.11 Master Plan Order of Magnitude Cost Estimate

Appendix E contains an Order of Magnitude Cost Estimate for the proposed main road prepared by SOH. The estimated costs are broken down into two phases: one for the mini loop road segment encompassing lots 1 through 5 and 20, and the second for the remaining large loop road encompassing lots 6 through 10, 14, and 15. Note that these phases are for major roadway construction increment purposes only and do not correspond to the Phasing Plan discussed above. As detailed in Appendix E, the Cost Estimate accounts for general conditions, earthwork, site work, sewer system work, water system work, and electrical system work related to the construction of roadways. The cost estimate doesn't include site improvements on the proposed development parcels. These costs will depend on future proposed uses and the conceptual plan for each parcel.

Phase 1 is estimated to cost a total of \$13,400,400 and phase 2 is estimated to cost \$11,300,000. All dollar figures are stated in 2022 dollars and includes an additional 15% contingency to account for possible inflation and unforeseen expenditures. Appendix E also includes a separate Cost Estimate for the potential roadway on Lot 11, which is expected to be the first lot developed for single-family houses.

SOH's Cost Estimate does not account for roadway landscaping. To account for landscaping within the proposed roadways, PBR HAWAII performed a separate landscape cost estimate. The estimated unit cost is \$5 per square foot which accounts for hydro seed grass (no street trees), topsoil, and temporary irrigation. Phase 1 roads will have approximately 47,500 square feet of grass area and is estimated to cost approximately \$237,000. The grass area in the phase 2 road is approximately 58,000 square feet and is estimated to cost \$290,000. The Lot 11 road will include approximately 15,600 square feet of grass and is estimated to cost \$78,000.

APPENDIX A

Final Environmental Impact Statement for the Waikoloa Affordable
Housing Project

William P. Kenoi
Mayor



Stephen J. Arnett
Housing Administrator

Susan K. Akiyama
Assistant Housing Administrator

County of Hawai'i
Office of Housing and Community Development

50 Wailuku Drive • Hilo, Hawai'i 96720 • (808) 961-8379 • Fax (808) 961-8685
KONA: 74-5044 Ane Keohokalole Highway • Kailua-Kona, Hawai'i 96740
(808) 323-4305 • Fax (808) 323-4301

March 28, 2014

TRANSMITTAL

TO: Joseph Kamelamela, Senior Deputy Corporation Counsel
Corporation Counsel

SUBJECT: KAMAKOA NUI

WE ARE TRANSMITTING THE FOLLOWING FOR YOUR USE:

<u>COPIES</u>	<u>DATED</u>	<u>DESCRIPTION</u>
1	March 1991	Final Environmental Impact Statement for Waikoloa Affordable Housing Project (Kamakoa Nui)

REMARKS:

If there are any questions, please call Kaloa Robinson at 961- 8379. Thank you!



Stephen J. Arnett
Housing Administrator



EQUAL HOUSING OPPORTUNITY
"HAWAII COUNTY IS AN EQUAL OPPORTUNITY
PROVIDER AND EMPLOYER"

**FINAL
ENVIRONMENTAL IMPACT STATEMENT for the**

**WAIKOLOA AFFORDABLE HOUSING PROJECT
Waikoloa, South Kohala, Hawaii**

MARCH 1991

PREPARED FOR:

**Office of Housing and Community Development
County of Hawaii**

RMTC

R. M. Towill Corporation

**420 Waiakamilo Rd., Suite 411
Honolulu, Hawaii 96817-4941
(808) 842-1133 • Fax: (808) 842-1937**

FINAL

ENVIRONMENTAL IMPACT STATEMENT

FOR

WAIKOLOA AFFORDABLE HOUSING PROJECT

Waikoloa, South Kohala, Hawaii

This document has been prepared pursuant to
Chapter 343, Hawaii Revised Statutes

PROPOSING AGENCY:

COUNTY OF HAWAII
OFFICE OF HOUSING AND COMMUNITY DEVELOPMENT

RESPONSIBLE OFFICIAL:



BRIAN T. NISHIMURA, Housing Administrator

3/13/91 _____
Date

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PREFACE

This document is a final environmental impact statement that documents analysis and conclusions for the proposed Waikoloa Affordable Housing Project and the surrounding environment, located in South Kohala on the Island of Hawaii. The document is divided into sections describing the master plan, the affected environment, alternatives considered during the planning stages of the master plan and impacts that may result from the proposed development. Additionally, separate studies of traffic, air quality, flora and fauna, archaeology, and the market, conducted by technical consultants, are provided as appendices.

Consulted agencies and organizations were requested to submit their comments, corrections, and/or clarifications on the draft environmental impact statement to the County of Hawaii Planning Department.

SECTION 1

INTRODUCTION AND SUMMARY

1.1 INTRODUCTION AND BACKGROUND

The Office of Housing and Community Development (OHCD) of the County of Hawaii is proposing a unique, quality affordable residential development in Waikoloa Village, in the South Kohala district of West Hawaii. This master planned development is proposed to contain approximately 1,200 single- and multi-family housing units all of which will be available for rent or sale in the affordable price ranges, as defined by federal, state and county standards.

The project site is currently undeveloped and is located at the north end of the existing Waikoloa Village. Ownership of 279 acres of the 340-acre site is being conveyed from the present land owner, Waikoloa Land Company, to the County of Hawaii through an agreement between the two parties. Development of the remainder parcel will be undertaken by Waikoloa Land Company in conjunction with other developers.

Master planning of the Waikoloa Affordable Housing project began in summer 1989 when the Office of Housing and Community Development issued a request for proposals to develop a conceptual master plan including preliminary infrastructure development plans. In September 1989, R. M. Towill Corporation was selected to prepare the Master Plan. A land use plan, backbone infrastructure plans, and development costs have been completed.

This Final Environmental Impact Statement (FEIS) will evaluate the Master Plan components -- i.e., the land use plan and backbone infrastructure plans. While the developer of this project may have a somewhat different plan, it will not be substantively different from the current Master Plan. Thus, the impacts, analysis, and applicable mitigation measures as discussed in this environmental impact statement will apply to the overall development project.

1.2 INTENDED USES OF THIS DOCUMENT

This environmental impact statement has been prepared in accordance with Chapter 343,

Hawaii Revised Statutes and the rules and regulations of the Office of Environmental Quality Control. It has been determined that an environmental impact statement is required pursuant to Chapter 200 of Title 11, Administrative Rules, Subchapter 5(b).

The purpose of the environmental impact statement is to provide information to public officials and members of the community on the nature of the subject action; to assess existing environmental conditions of the property and surrounding areas; to evaluate potential impacts that may result from development of the project and to propose mitigating measures for those impacts; and to consider alternatives to the proposed action.

1.3 DEVELOPMENT SUMMARY

Applicant: Office of Housing and Community Development

Accepting Authority: Mayor of the County of Hawaii

Approving Agency: Planning Department

Tax Map Keys: 6-8-02:31 and por. 26, Third Division

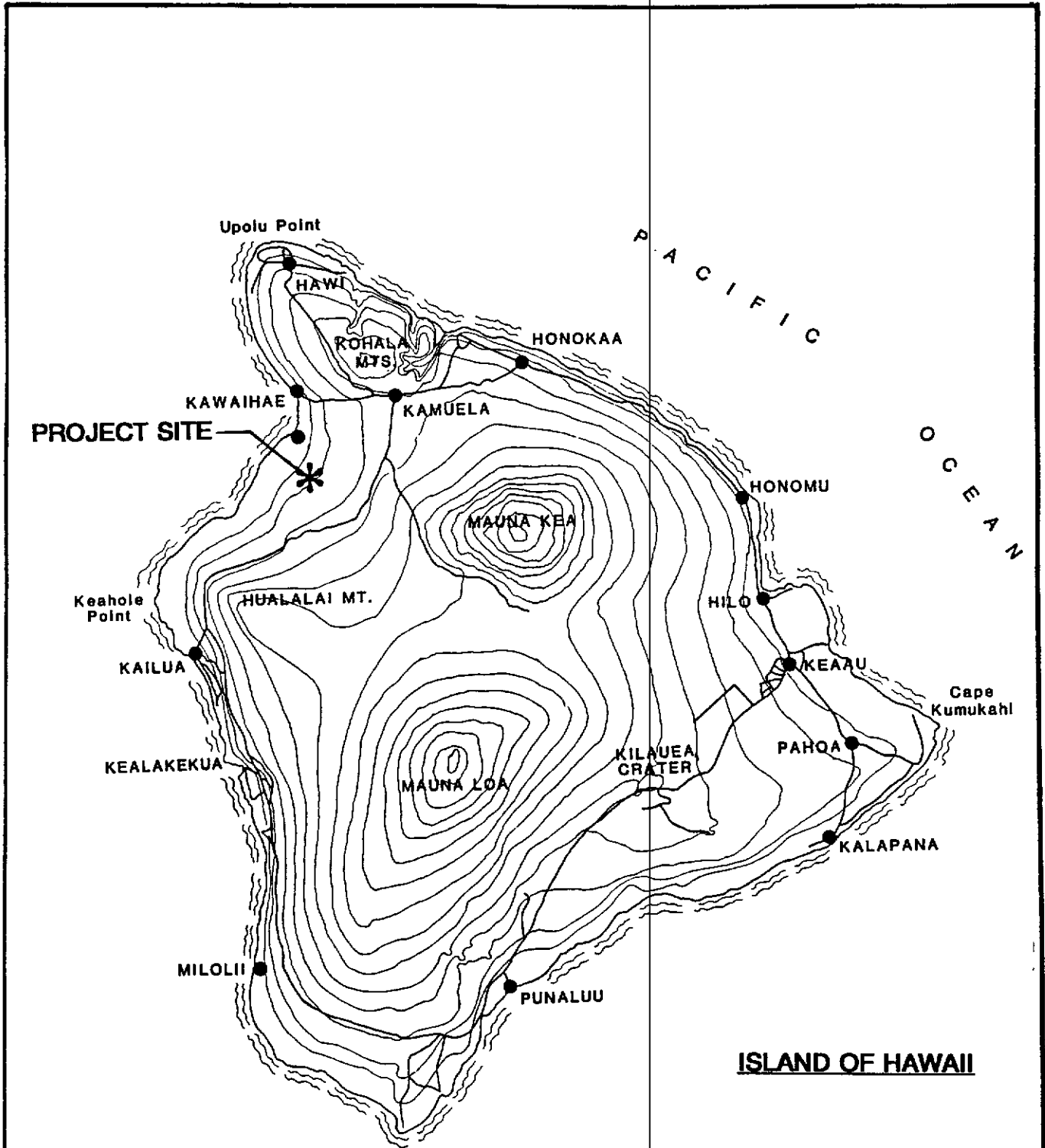
Area: 279 acres

Location: South Kohala District, at the north end of the existing Waikoloa Village; bounded to the west by conservation lands and to the north, east and south by vacant lands that are planned for future Waikoloa development.

Owner:	Waikoloa Land Company; transfer to County of Hawaii imminent
Existing Land Uses:	Undeveloped
State Land Use Designation:	Urban District
County General Plan Land Use Pattern Allocation Guide Map:	Low Density Urban Development
County Zoning:	RS-10, Residential Single-Family
Proposed Uses:	Residential, Neighborhood Commercial, Parks
Proposed Action:	The applicant proposes to develop 279 acres of land in Waikoloa, South Kohala. Development of the master planned community will offer a mix of residential housing, church/commercial areas, and recreation facilities. The proposed project is designed to offer a unique mix of housing that will be 100% affordable (targeted to households from less than 80% up to 140% of the County's median family income).

1.4 LOCATION AND OWNERSHIP

The proposed project is located in the South Kohala district of West Hawaii, at the north end of the existing Waikoloa Village (see Figure 1-1). The property is located approximately 4 miles east, or mauka of Queen Kaahumanu Highway. The project site is bounded to the west by conservation lands and to the north, east and south by vacant lands that are planned for future Waikoloa development.



**WAIKOLOA AFFORDABLE HOUSING
PROJECT MASTER PLAN**

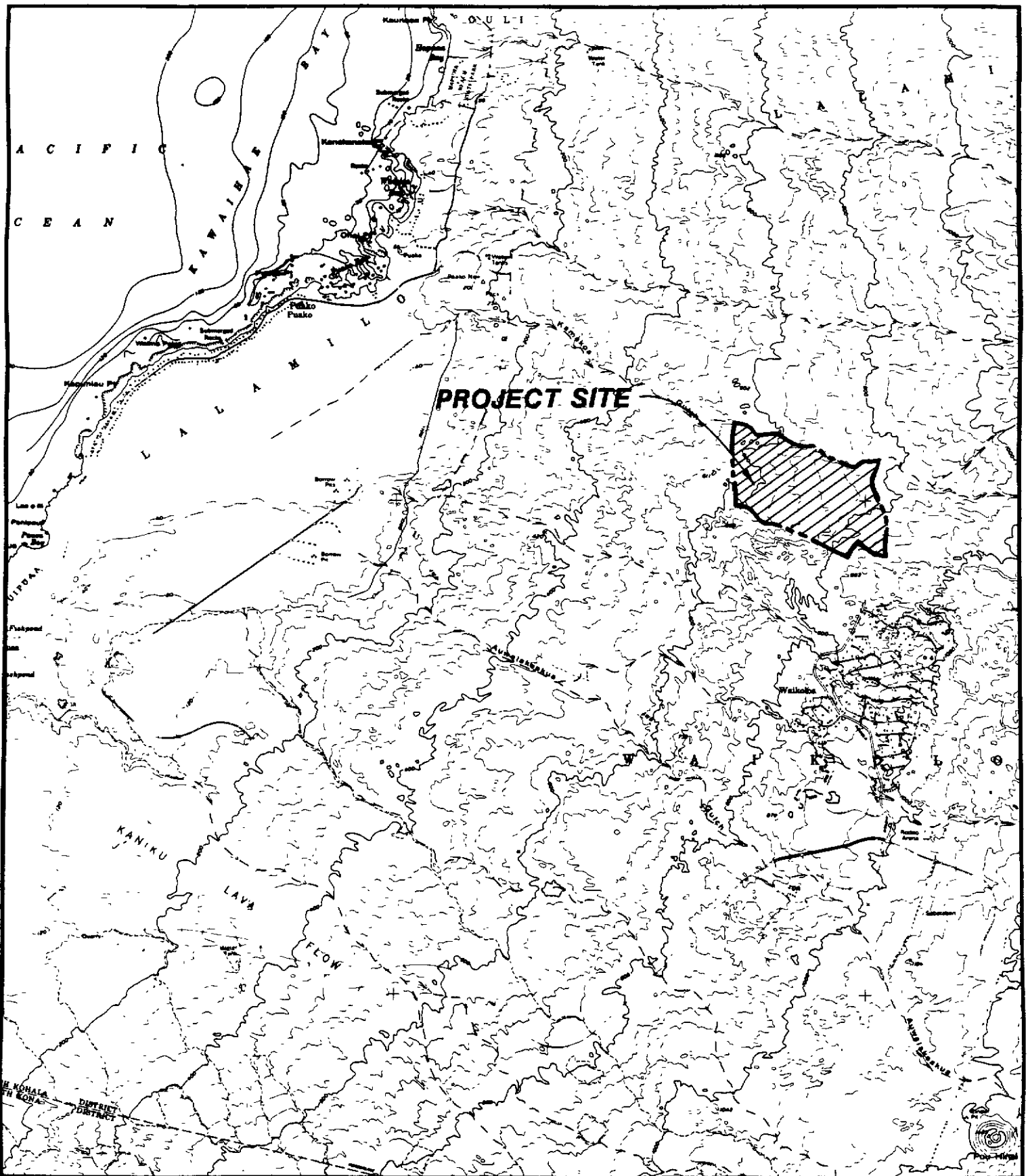
For: County of Hawaii Dept. of Housing & Community Development
Hilo, Hawaii

By: R. M. Towill Corporation
Honolulu, Hawaii

NOVEMBER 1989

**FIGURE 1-1
PROJECT LOCATION
MAP**





WAIKOLOA AFFORDABLE HOUSING PROJECT MASTER PLAN

AREA MAP

FIGURE 1-2

For: County of Hawaii Dept. of Housing & Community Development
Hilo, Hawaii

By: R. M. Towill Corporation
Honolulu, Hawaii

NOVEMBER 1988



Situated at the 700-foot elevation of the Kohala region, the site has views of the peaks of Mauna Kea to the east, the Kohala Mountains to the north, and the Kohala coastline to the west. Southeast of the project area are residential units nestled in the rolling hills of Waikoloa Village. The south slope of Haleakala Crater on Maui is visible on a clear day.

Paniolo Drive, an 80-foot wide public right-of-way, currently provides access to the site from Waikoloa Road. The completed or improved portion of Paniolo Drive terminates near the eastern border of the site. Extension of Paniolo Drive over an existing dirt road is expected to be completed no later than March 1993 when development in the eastern section of Waikoloa Village occurs.

Ownership of this parcel is currently being conveyed by Waikoloa Land Company to the County of Hawaii for the purpose of enabling the County to develop affordable housing units on this site. Surrounding parcels are owned by Waikoloa Land Company/Waikoloa Development Company and several other development companies.

1.5 SUMMARY OF PROBABLE IMPACTS AND MITIGATION MEASURES

1.5.1 Traffic

The proposed project will increase traffic on the existing and proposed roadways in the area of the project. Projected traffic volumes resulting from development of the Waikoloa Affordable Housing project include the following:

PROJECT TRAFFIC

<u>Land Use (Parameter)</u>	<u>Daily (vpd)</u>	<u>A.M. Peak Hour</u>		<u>P.M. Peak Hour</u>	
		<u>Enter (vph)</u>	<u>Exit (vph)</u>	<u>Enter (vph)</u>	<u>Exit (vph)</u>
Single-family (560 d.u.)	3644	104	283	346	203
Multi-family (840 d.u.)	5024	76	348	263	124
Park (9.2 acres)	336	6	16	8	23
Commercial (5,000 s.f.)	4435	169	169	182	174
Church (75,000 s.f.)	<u>577</u>	<u>4</u>	<u>1</u>	<u>21</u>	<u>18</u>
Total:	14,016	359	817	820	542

NOTE:

vpd = vehicles per day
vph = vehicles per hour

The Waikoloa Affordable Housing project proposes a loop road system in which two 60-foot wide rights-of-way will intersect the improved extension of 80-foot wide Paniolo Drive.

The total estimated project traffic volumes at full development will impact the existing regional transportation network, however, at or near over capacity conditions will exist at peak periods even without the affordable housing project.

1.5.2 Air Quality

The major short-term air quality impact will be the potential emission of significant quantities of fugitive dust during project construction phases. Uncontrolled fugitive dust emissions from construction activities are estimated to amount to about 1.2 tons per acre per month. During the period of construction, emissions from engine exhausts (primarily consisting of carbon monoxide and nitrogen oxides) will also occur both from on-site construction equipment and from vehicles used by construction workers and from trucks travelling to and from the project.

Mitigation measures will include the establishment of a regular dust-watering program and covering of dirt-hauling trucks in compliance with State of Hawaii Air Pollution Control Regulations.

The primary long-term air pollution impact from the project will arise from the increased motor vehicle traffic associated with the project. Potential increased levels of carbon monoxide concentrations along roadways leading to and from the proposed development will be the primary concern. The "with the project" carbon monoxide concentrations along roadways in the project vicinity will unavoidably be higher at several locations compared

to the "without project" case, but worst-case concentrations will remain within the national standards. With or without the project, the more stringent State standards may be exceeded near traffic-congested areas. The highest concentrations will occur in the vicinity of Queen Kaahumanu Highway at Waikoloa Road.

Mitigation measures available to minimize traffic-related air pollution include the improvement of roadways, reduction of traffic or reduction of individual vehicular emissions. Roadway improvements recommended in the traffic study will be implemented to move traffic efficiently through the project area. Traffic will be reduced to the extent possible by encouraging bus use, car pooling, and/or the adjustment of local school and business hours to begin and end during off-peak times. Reduction of individual vehicular emissions is beyond the control of the project.

Some long-term impacts on air quality also could occur due to indirect emissions from power generating facilities supplying the project with electricity and from the disposal of waste materials generated by the project. Impacts will be small, however, due to the magnitude of the project electrical and solid waste demands compared to the present and future County demands.

Indirect emissions from project electrical demand could be reduced somewhat by utilizing solar energy design features to the maximum extent possible. This would include installing solar water heaters, designing homes and building spaces so that window positions maximize indoor light without unduly increasing indoor heat, and using landscaping where feasible to provide afternoon shade to cut down on the use of air conditioning.

1.5.3 Socio-Economic Conditions

The Waikoloa Affordable Housing project will increase the population in the area by an estimated 3,600 persons, assuming average persons per household of 3.0 to 3.3. This total represents approximately 15 percent of the South Kohala district's population per DBED's M-K Series B and County Planning Department's population projections by the

year 2005. The Waikoloa Affordable Housing project is expected to provide a wide range of housing opportunities, all in the affordable range, for varied levels of family incomes. Total housing units are estimated at approximately 1,200 to 1,400 units for the development.

This development will provide badly needed affordable housing in the West Hawaii region; and by increasing the supply of affordable housing units, the project will facilitate an expanded labor force for the area's resorts.

1.5.4 Topography and Soils

Slopes in the project area range from 0 percent to over 20 percent. The northern portion of the site has an average slope of 6 to 10 percent and the southern portion has an average slope between 11 percent and 20 percent. Elevations range from 550 feet above sea level near the makai boundary to 900 feet near the mauka boundary of the site.

Two soil types are found on the project site: Kawaihae (KNC) and Very Stony Land (rVS). Hard pahoehoe lava bedrock can be found at a depth of about 33 inches in the areas where Kawaihae soils occur. Bedrock occurs at a depth of 5 to 20 inches in areas where Very Stony lands occur.

The varying topography and elevations of the project site will necessitate careful siting of roadway and other utility systems as well as residential lots, in order to minimize construction costs for this affordable housing project.

1.5.5 Flora and Fauna

According to the Botanical Survey Report written by Char & Associates, the proposed project is not expected to have a significant impact on flora as the site consists primarily of cultivated lands. According to the Survey of Avifauna and Feral Mammals undertaken by Phillip L. Bruner, there are no rare, threatened or endangered vertebrate animal species known to exist on the project site.

1.5.6 Water

The Waikoloa Water Company owns the wells, reservoirs, and primary transmission mains that supply potable water to Waikoloa Village. The Waikoloa Water Company's potable water wells draw from the Waikoloa aquifer. It has been determined that the project will require a 12-inch water line laid along the entire length of backbone roadways.

The proposed project will require approximately 560,000 gallons per day at build-out. The Waikoloa water system has adequate capacity to provide for these needs.

1.5.7 Sewer

At present, there is no sewer system in the immediate vicinity of the project area. The nearest sewer system is located approximately 7,000 feet southwest of the project site, and serves the commercial and multi-family areas of Waikoloa Village. This existing sewer system is not available for use by the proposed project.

Preliminary analysis of the sewer system needs for the project indicates that the project will generate a total average flow of 0.5 million gallons per day (mgd). The proposed on-site improvements will primarily include 8-inch and 12-inch gravity lines. Sewage treatment facilities are to be provided off-site by Waikoloa Sanitary Sewer Company.

The plans for these new facilities are still at a very early stage. The new sewage treatment plant and its associated effluent disposal system will be designed, constructed, and operated in accordance with applicable Federal, State and County rules and regulations.

1.5.8 Drainage

A new drainage system consisting of a ten-foot concrete channel running along Paniolo Drive, and two mauka-makai concrete channels to divert runoff to offsite drainageways will be constructed as part of the project. Other major improvements will include 2-foot and 5-foot channels to be built on the project site. Among the necessary infrastructure improvements and associated costs to be borne by the project, drainage improvement

costs are the highest -- approximately \$12 million. Unlined channels may be possible under certain conditions. Other offsite mitigation measures are being evaluated and may further reduce direct project costs.

A mitigation measure will be to attribute the cost of constructing the ten-foot channel along Paniolo Drive to Transcontinental Development Company, based on the Agreement dated February 25, 1988. In this scenario, cost of this item would be attributed to the original landowner, thereby reducing the drainage improvement costs to \$8.6 million.

1.5.9 Solid Waste

Solid waste generated by the project when fully completed is expected to amount to about 10 tons of refuse (approximately one 12-ton truckload) per day. At present, the refuse district handles about 100 tons daily. The nearest existing solid waste transfer station is located at Puako, however, a new transfer station is being planned near a former quarry site immediately adjacent of Waikoloa Village. This transfer station should be operational before this project breaks ground.

Currently, solid waste is disposed of at the Kailua-Kona landfill located at Kealakehe. The Kealakehe Landfill is scheduled to close within the next 24 months and is not expected to continue to function as the refuse disposal site for the West Hawaii region. A new sanitary landfill site has been selected, and plans are being put together for its development. This facility will accommodate the proposed project's solid waste disposal needs.

1.5.10 Power and Communications

At present power and communications are provided by an existing underground duct bank containing a 750 MCM cable (14.47 KVY) which originates from a substation located mauka of the Waikoloa Village general store and runs along Paniolo Avenue to the project area. A new substation will be necessary to provide power to the project. The Hawaii Electric Light Company (HELCO) is developing additional electrical energy generating capacity, and therefore it is expected that HELCO will be able to provide the required

electricity to meet this additional demand.

1.6 ALTERNATIVES CONSIDERED

The economic mix of housing units was reviewed and analyzed to preliminarily determine financially feasible scenarios. Numerous cash flow analyses were conducted, each containing different sets of assumptions, such as varying per square foot building construction costs, and dwelling unit sizes. One scenario indicates that total revenues from the sale of 1,000 units are \$129.4 million, while total development costs (including building construction, subdivision or on-site development, backbone infrastructure, sales/processing fees, indirect costs for design, management, loan points, contingencies at 15%, and developer's profit at 5% of revenues) are \$131.7 million. At an annual deficit financing rate of 12%, the deficit after financing will be \$17 million.

Achieving a balance between the project's social objectives of providing all housing units at affordable rent and sales price levels while maintaining the project's overall economic feasibility will have a significant influence on the final mix of unit types and sizes.

It is recognized that the modification of certain subdivision standards may result in significant cost savings, and may result in more affordable housing. These modifications need, however, to ensure that such cost-saving methods, (1) will not result in health and safety risks; (2) will not result in significant added post-construction maintenance costs for the County and/or for the residents; (3) will not have an adverse visual impact; (4) will clearly result in a greater number of affordable houses and/or lower prices for some or all of the homes.

1.7 NECESSARY PERMITS AND APPROVALS

A. Federal

U. S. Army Corps of Engineers: Dept. of the Army Permit for Streambank Improvements Along Kamakoa Gulch

B. State of Hawaii

Department of Health: Approval of new distribution systems for public water. UIC permits for proposed drywells.

C. County of Hawaii

Mayor and County Council Experimental and Demonstration Housing Project Designation (46-15, HRS)

Planning Department: Subdivision Approvals

Department of Water Supply: Water Master Plan Approval

Department of Public Works: Building Permits; Grading Permits; Drainage Master Plan Approval; Sewer Master Plan Approval

D. Other

Waikoloa Water Company: Water Master Plan Approval.
Subdivision Plan Approval.

Waikoloa Sanitary Sewer Co.: Sewer Master Plan Approval.
Subdivision Plan Approval.

SECTION 2

PROJECT DESCRIPTION

2.1 INTRODUCTION

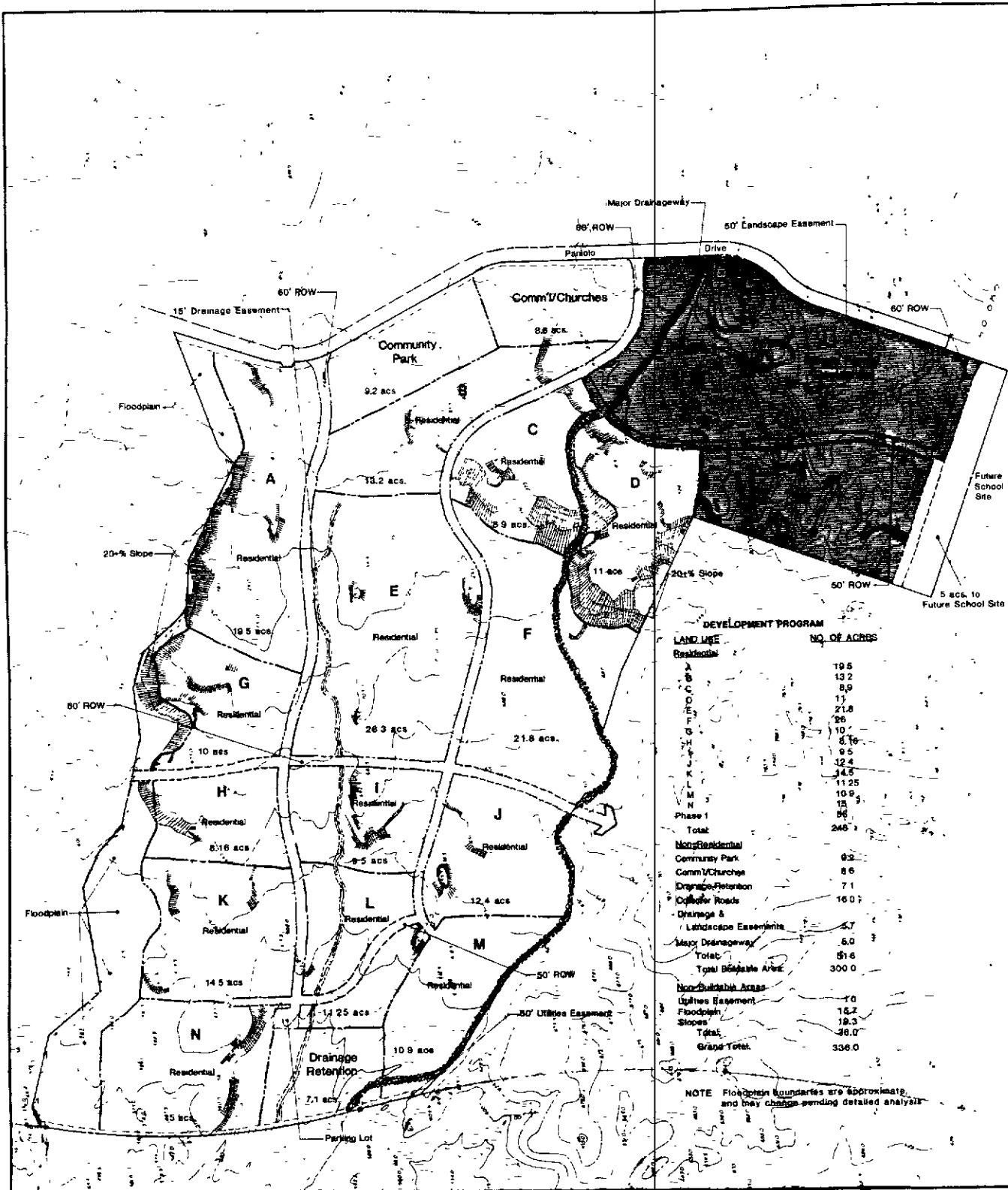
The Waikoloa Affordable Housing project will consist of approximately 279 acres. Envisioned is a 1,200 to 1,400 dwelling unit mix of single family and multi-family homes on finished lots (see Figure 2-1). Master planned as a 100 percent affordable residential community, the project will offer unique rental and homeownership opportunities to families whose incomes fall within the 50 percent to Hula Mae Program financing limits. The project will also include a parcel for churches and a small commercial area near the Paniolo Drive entrance. A community park will be located next to the commercial/churches area at the entrance to the project at Paniolo Drive. A public school site is planned near the southeastern edge of the project site near the Ho'oko Street and Paniolo Drive intersection.

2.2 THE MASTER PLAN

Single family detached dwellings are proposed in the Master Plan to have lots averaging 7,500 square feet in size, depending on the topography and location of the lot. Some of these lots will have dramatic views of the ocean and mountains. The selected developer may ultimately provide smaller lots in order to achieve a greater number of house lots for project feasibility.

In response to the topographic conditions, steep slopes will be utilized as buffers between clusters of houses. Other open spaces will be created by the preservation of drainageways. The use of unbuildable lands for open space creates a more pleasant, natural environment.

Multi-family units will vary from duplex units with lot sizes of 3,750 square feet per unit, to other multi-family housing types such as row houses, six-plex or eight-plex units. Gross project density for multi-family projects will be no more than 15 units per acre. To maintain the low density nature of the overall development, multi-family projects will not be more than 15 acres in size.



DEVELOPMENT PROGRAM

LAND USE	NO. OF ACRES
Residential	
A	19.5
B	13.2
C	8.9
D	11
E	21.8
F	26
G	10
H	8.16
I	9.5
J	12.4
K	14.5
L	11.25
M	10.9
N	15
Phase 1	246
Total	246
Non-Residential	
Community Park	9.2
Comm/Churches	8.6
Drainage/Retention	7.1
Collector Roads	16.0
Drainage & Landscape Easements	5.7
Major Drainageway	6.0
Total	51.6
Total Developable Area	300.0
Non-Buildable Areas	
Utilities Easement	1.0
Floodplain	18.2
Slopes	19.3
Total	38.5
Grand Total	336.0

NOTE: Floodplain boundaries are approximate and may change pending detailed analysis.

WAIKOLOA AFFORDABLE HOUSING PROJECT MASTER PLAN

PRELIMINARY LAND USE PLAN

For: County of Hawaii Dept of Housing & Community Development
 Hilo, Hawaii
 By: R. M. Towill Corporation
 Honolulu, Hawaii
 NOVEMBER 1989

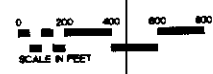


Figure 2-1

4-27-80

An overall sense of neighborhood identity will be created by physically identifiable "villages" or neighborhoods within the 279 acre project. This will be achieved through the creative use of roads, drainageways, topography, views and vistas, as well as through varying site layouts and architectural design. The Land Use Plan identifies a total of 14 development clusters.

A 9-acre community park has been located at the Paniolo Drive entrance to serve the wider Waikoloa Village community. This recreational facility will also function as an entry feature/statement to the overall development. A drainage retention parcel of 7 acres has been located at the makai or western end of the project site. This parcel will be grassed over and will serve a dual function as a second recreational field for this family-oriented project.

An 8.6-acre parcel has been set aside for churches and a small convenience commercial area adjacent to the community park at the Paniolo Drive entrance. This grouping of uses is proposed for the optimum use of parking facilities at this site.

Near the southeastern boundary of the project site is a future 36-acre public school and recreation complex located near the Ho'oko Street and Paniolo Drive intersection. Waikoloa Land Company is in the process of conveying this land to the State Department of Education for this purpose.

The major roadway network consists of 50-foot and 60-foot wide rights-of-way, with curbs, gutters and sidewalks, and dry wells for drainage. Roadway grades were maintained at a maximum slope of eight-percent, with a few exceptions where ten or twelve-percent was used because of the steep character of the area. The Land Use Plan shows a 60-foot right-of-way to be reserved in the mid-section of the site. This right-of-way would be a part of a collector roadway that would be constructed to provide the project site and other area developments with a second route to Waikoloa Road.

PROJECT DESCRIPTION

SECTION 2

Off-site infrastructure systems, including access roadway, potable water, and sewage treatment and disposal will be provided by the Waikoloa Land Company at no cost to the County or to the prospective developer.

The acreage allocations for the various land uses are shown in the accompanying table below:

**TABLE 2-1
Development Program**

<u>LAND USE</u>	<u>NO. OF ACRES</u>
<u>Residential:</u>	
A	19.5
B	13.2
C	8.9
D	11.0
E	21.8
F	26.0
G	10.0
H	8.1
I	9.5
J	12.4
K	14.5
L	11.2
M	10.9
N	15.0
Total:	192.0
<u>Non-Residential:</u>	
Community Park	9.2
Comm'l/Churches	8.6
Drainage Retention	7.1
Collector Roads	16.0
Drainage & Landscape Easements	5.7
Major Drainageway	5.0
Total:	51.6
Total Buildable Area:	243.0
<u>Non-Buildable Areas</u>	
Utilities Easement	1.0
Floodplain	15.7
Slopes	19.3
Total:	36.0
Grand Total:	279.0

2.3 SUPPORT INFRASTRUCTURE

An evaluation of existing sewer, water, and drainage systems was conducted in March 1989 to determine necessary improvements for the project. Preliminary backbone infrastructure requirements and associated costs were documented in a report prepared by R. M. Towill Corporation in June, 1990. These findings are subject to further in-depth study. The following infrastructure system requirements were discussed in the report:

2.3.1 Wastewater System

At present, there is no sewer system in the immediate vicinity of the project area. The nearest sewer system is located approximately 7,000 feet southwest of the study area and serves the commercial and multi-family areas of Waikoloa Village. This existing sewer system is not available for use by the proposed project. A preliminary analysis of the sewer system needs for the project indicates that the project will generate a total average flow of 0.5 million gallons per day (mgd). The proposed on-site improvements will consist primarily of 8-inch and 12-inch gravity lines.

A new sewage treatment and disposal facility will be provided by the Waikoloa Land Company, through its subsidiary, the Waikoloa Sanitary Sewer Company. This new facility is presently in the early stages of planning. Thus, the capacity and general mechanical characteristics of the plant, as well as its service area, location, and effluent disposal method have yet to be determined. Preliminary concepts for this new facility suggest an off-site location near the makai boundary of the County's land.

The new sewage treatment and disposal system will be designed and constructed in accordance with applicable Federal, State, and County rules and regulations.

2.3.2 Water System

The Waikoloa Water Company owns the wells, reservoirs and primary transmission mains that supply potable water to Waikoloa Village. The Waikoloa Water Company's potable water wells draw from the Waikoloa aquifer. These wells, known as Parker wells No. 4

and No. 5, and Waikoloa Wells No. 1 and 2 (under construction), are located at the 1,200-foot level nearly five miles inland from Puako Bay. These wells tap high quality water (25 ppm chloride content) from the Waikoloa aquifer.

The point of connection to the water system from the project area is an 8-inch main at Paniolo Drive and Ho'oko Street. It has been determined that the project will require a 12-inch water line laid along the entire length of main roadway. Fire hydrants were assumed to be spaced every 300 feet.

2.3.3 Drainage System

The approximately 58,000-acre watershed located mauka of the site produces about 12,000 cubic feet per second (cfs) of runoff during a "100-year" storm, which naturally collects in Kamakoa Gulch. Kamakoa Gulch is a natural major drainageway which forms the northern boundary of the project site. Under existing conditions, a portion of this mauka-generated runoff runs through the project site before entering Kamakoa Gulch. The preliminary analysis, using the 100-year, 24-hour storm, indicates that the project will generate an on-site increase in peak runoff of approximately 380 cfs. Based on the County of Hawaii's Standards of 5 cfs per well of 20 foot depth, 76 dry wells are required to control the increase in runoff. Because a portion of the runoff runs through the site before entering Kamakoa, a ten-foot concrete channel running along Paniolo Drive will be used to divert this runoff to Kamakoa before it can enter the site. Alternatively, a channel could be considered along the mauka boundary of other developments that are located mauka of the County's project site.

A subdivision drainage plan provided by Imata and Associates shows over 750 cfs entering the project site from future developments located mauka of the site.

Two concrete channels are needed to divert runoff to off-site drainageways. A trapezoidal channel, with a ten-foot bottom width and 1:1 side slopes, will run along the lower, or west side of Paniolo Avenue to collect approximately 1,600 cfs of runoff from the 1,500 acre drainage area directly above the site and divert it into Kamakoa Gulch, which runs

along the north side of the project site. A second similar channel, with a 5-foot bottom width, running from Paniolo Drive to the lower end of the project site is needed to carry approximately 550 cfs to an off-site drainageway that eventually empties into Kamakoa Gulch. Unlined channels may be possible, provided that erosion can be controlled and that maintenance does not become a major problem.

Swale and dry well systems will be used to collect runoff from roads and road rights-of-way. Dry wells are to be spaced every 250 feet along both sides of all roadways. The swales, drywells, and related drainage facilities will need to be properly maintained.

2.3.4 Electrical/Telephone

An existing underground duct bank which contains a 750 MCM cable (14.47 KVY) originates from a substation located mauka of the Waikoloa Village's general store and runs along Paniolo Avenue to the project site. Conduits to accommodate cable and telephone lines are also located within this same duct bank.

The project's electrical and telephone utilities will be located underground. In general, underground electrical and telephone lines within dedicable roadways will be concrete jacketed.

2.3.5 Infrastructure Costs

Preliminary infrastructure cost estimates were prepared in June, 1990 by R. M. Towill Corporation. The following is a summary of the estimates:

- * Roadway System and Landscaping. This cost includes the construction of the backbone roadways with curbs, gutters, and sidewalks, and of 2 major and 5 minor intersections.

\$2,996,000.00

- * Sewer System. The system will include 8" and 12" gravity sewers and manholes.

\$836,000.00

PROJECT DESCRIPTION

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- * Water System. This will involve a 12" water line, fire hydrants and fittings.
\$988,000.00

- * Drainage System. These major infrastructure improvements assume 2-foot, 5-foot, and 10-foot channels, catch basins, dry wells, 18-inch drains, and culverts. There is also an assumption that the cost to construct the 10-foot channel will be assumed by Transcontinental Development Corporation per the Memorandum of Agreement dated February 25, 1988.
\$8,614,000.00

- * Power and Telephone. It is assumed that these utilities will be underground.
\$1,461,000.00

- * Site Work. This cost involves excavation for roadways and drainage channels.
\$1,442,000.00

A drainage study for Kamakoa Gulch is needed and is currently underway. The cost of any required drainage improvements to Kamakoa Gulch will depend on what is designed and any cost sharing agreement that can be worked out with other affected parties.

The total cost estimate for these infrastructure improvements (including a 15% construction contingency, and 10% for survey and design work) is \$20,665,000. This will be approximately \$17,221 per dwelling unit if the total number of units is 1,200.

2.4 MIX/TYPES OF UNITS

The Waikoloa Affordable Housing development will have units for rent and for sale to families whose incomes are between 50% of the County's median income (\$16,000) to Hula Mae program limits (\$45,800).

In order to achieve the County's objectives relative to affordable housing, the distribution of the types of units will be focused on providing as many units as possible for families at the lower end of the income scale. The overall project size will be approximately 1,200 to 1,400 units. A recommended mix of unit types and prices is provided below:

- 200 Multi-Family rental units -- possibly developed by the State;
- 1,000 Multi-Family and Single Family For Sale units.

The multi-family rental units could be developed under the State's Rental Housing System (RHS). Under this program, rental projects are financed with the proceeds of tax-exempt revenue bonds issued by the State's Housing Finance and Development Corporation (HFDC). The RHS could be used in conjunction with HFDC's Rental Assistance Program which provides rent subsidies to lower the rent for eligible tenants.

Consideration will also be given to Policy C(7) of the State Housing Functional Plan which strives to integrate special needs housing into new and existing neighborhoods.

The suggested mix of for-sale homes is as follows:

<u># of Units</u>	<u>Income Group</u>	<u>Sale Price Per Unit</u>	<u>Type of Unit</u>
400	100% of Median	\$ 95,952	Duplex/Fourplex
200	120% of Median	\$117,876	Single Family
200	140% of Median	\$140,160	Single Family
200	Hula Mae Limit*	\$167,000	Single Family

*Numbers are currently being updated in the Hula Mae program. The \$167,000 sales price may be feasible for families within the Hula Mae income limits; however, new mortgage limits have not yet been made official.

2.5 PROJECT CASHFLOW SUMMARY

As part of the master planning process, a projection of project development costs (including financing) and revenues from home sales was prepared, assuming project build out within six years. The Cash Flow Analysis model has been summarized and is shown below as Table 2-2.

The following assumptions were made in the preparation of this cash flow analysis:

- 1) Sales price limits for homes targeted for each of the income groups are:

<u>Price</u>	<u>Income Group</u>
\$ 95,952	100% of Median
\$117,876	120% of Median
\$140,160	140% of Median
\$167,000	Hula Mae Limit* (see above)

- 2) The assumed mix of the units will be 40% or 400 units for the 100% of median income group, 20% or 200 units for the 120% of median income group, 20% or 200 units for the 140% of median income group, and 20% or 200 units for households whose incomes are up to the Hula Mae program limit.
- 3) Cost of construction for the multi-family units is assumed to be \$75 per square foot, while for single family units it is \$70 per square foot.
- 4) Dwelling unit sizes are assumed as: up to 800 square feet for duplex/fourplex units; 1,000 square feet for units built for the 120% of median income group; 1,200 square feet for the 140% of median income group; and 1,250 square feet for the Hula Mae limit group.
- 5) The project will be developed in 6 years, with the dwelling units being constructed starting with year 2; 77 units constructed in Year 2; 311 units constructed in Year

SECTION 2

PROJECT DESCRIPTION

3; 272 units constructed in Year 4; 119 units constructed in Year 5; and 221 units constructed in Year 6. Unit counts for each year were derived from the Land Use Plan.

Several iterations of the cash flow analysis were conducted, each containing different sets of assumptions, such as varying per square foot building construction costs, and dwelling unit sizes. The rental units were not included in the analysis as these will be developed either by the State or private developer(s). The total number of units for sale was 1,000 in this analysis.

TABLE 2-2
WAIKOLOA AFFORDABLE HOUSING PROJECT
PRELIMINARY CASHFLOW ANALYSIS SUMMARY
(1990 Dollars - In Thousands)

REVENUES	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Totals By Items
Home Sales	0	11376	36380	33017	16882	25745	123400
MF Site Sales	0	2000	2000	0	2000	0	6000
TOTAL REVENUES	0	13376	38380	33017	18882	25745	129400 (1000 Units)
DEVELOPMENT COSTS							
Building Construction	6300	21605	19552.5	9590	15252.5	0	72300
On-Site	1694	6230	5524	2618	4334	0	20400
Backbone Infrastructure*	4572	3878	3258	3600	0	0	15308
Fixed Sales Fees @ \$1000/unit	0	77	311	27	119	221	1000
Indirect Costs @ 15% for Design, Management, Loan Points, Contingencies	1885	4757	4250	2371	2938	0	16201
Developers Profit @ 5% of Revenues	0	669	1919	1651	944	1287	6470

PROJECT DESCRIPTION

SECTION 2

TOTAL DEVELOPMENT COSTS	14451	36547	32896	18451	22643	6691	131679
REVENUES minus COST	-14451	-23171	5484	14566	-3761	19054	-2279
CUMULATIVE REVENUES BEFORE FINANCING	-14451	-37622	-32138	-17572	-21333	-2279	-2279
FINANCING @ 12%	-1734	-4515	-3857	-2109	-2560	0	-14774
CUMULATIVE REVENUES AFTER FINANCING	-16185	-43871	-42243	-29786	-36107	-17053	-17053

*Total estimated cost of \$3,703,000 will be assumed by Transcontinental based on agreement regarding offsite infrastructure.

Total revenues from the sale of the 1000 units are \$129.4 million, while total development costs (including building construction, subdivision or on-site development, backbone infrastructure, sales/processing fees, indirect costs for design, management, loan points, contingencies at 15%, and developer's profit at 5% of revenues) are \$131.7 million. At an annual deficit financing rate of 12%, the deficit after financing will be \$17 million.

Project backbone infrastructure requirements are assumed to conform to County subdivision standards, and to the requirements of the County Department of Public Works. However, it is recognized that the modification of certain standards may result in significant cost savings, and may result in more affordable housing opportunities. These modifications need, however, to ensure that such cost-saving methods, (1) will not result in health and safety risks; (2) will not result in significant added post-construction maintenance costs for the County and/or for the residents; (3) will not have an adverse visual impact; and (4) will clearly result in a greater number of affordable houses and/or lower prices for some or all of the homes.

Any substantive cost-savings methods in infrastructure and subdivision design will help to reduce the project deficit that is indicated in Table 2-2. Further, if the construction cost per square foot-- i.e., \$75 per square foot for multi-family units, and \$70 per square foot for single family units -- can be reduced, additional reduction of the project deficit can be realized.

2.6 PROJECT SCHEDULE

Construction of the model units in the Phase 1 development is expected to begin in the first quarter of 1991, while construction of the rest of the homes is projected to begin during the third quarter of 1991. Construction of the County's portion of the project will commence with the construction of the initial infrastructure -- this is expected to begin in early 1992. Construction of homes can be expected to begin in mid-1992.



SECTION 3

PHYSICAL ENVIRONMENT



3.1 TOPOGRAPHY AND SOILS**3.1.1 Topography**

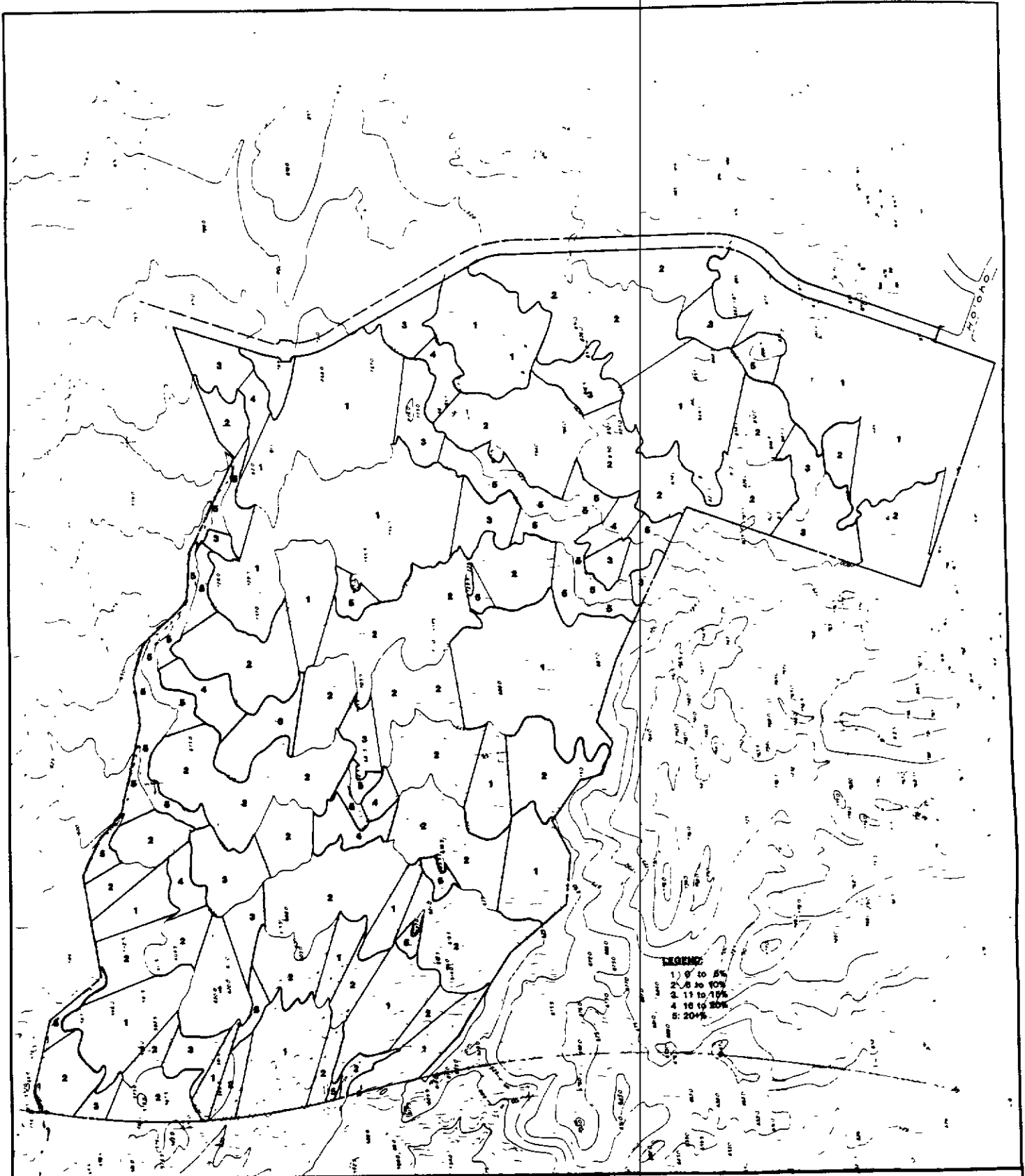
Slopes in the project area range from 0 percent to over 20 percent. Gently rolling hills, low-lying grasslands with scattered kiawe trees and rock outcroppings characterize the terrain of the project site. The northern portion of the site has an average slope of 6 to 10 percent and the southern portion has an average slope between 11 percent and 20 percent. Approximately 40 percent of the site consists of slopes of 0 to 5 percent; 33 percent consists of slopes of 6 to 10 percent; 17 percent consists of slopes of 11 to 20 percent; and 10 percent of the site consists of slopes greater than 20 percent (see Figure 3-1).

Elevations range from 550 feet above sea level near the northwest boundary of the project site to 900 feet near the southeast boundary. Kamakoa Gulch and an unnamed gulch border the northern and southern boundaries, respectively.

Impacts and Mitigation

The site's varying topography with its gradually increasing elevation in the makai to mauka direction will necessitate some excavation and grading of the ground for construction of the homes. This natural topographic variation also offers creative site planning opportunities in that houses of varying architectural styles including split-level and pole designs can be incorporated to adapt to these conditions. Design adaptation to the existing topography offers the potential to develop more interesting and attractive residential structures.

However, the disadvantages of working with a site that has a varying topography are that excavation, infrastructure systems design, and multiple architectural designs add to overall development costs. Such additional costs may affect the financial feasibility of any development, but this is particularly so for a project whose homes are all targeted to fall within the "affordable" range.



WAIKOLOA AFFORDABLE HOUSING PROJECT MASTER PLAN

For: County of Hawaii Dept. of Housing & Community Development
Hilo, Hawaii

By: R. M. Towill Corporation
Honolulu, Hawaii

NOVEMBER 1968



SLOPE MAP

FIGURE 3-1

Costs can be contained through careful siting of residential lots, roadways, and utility systems.

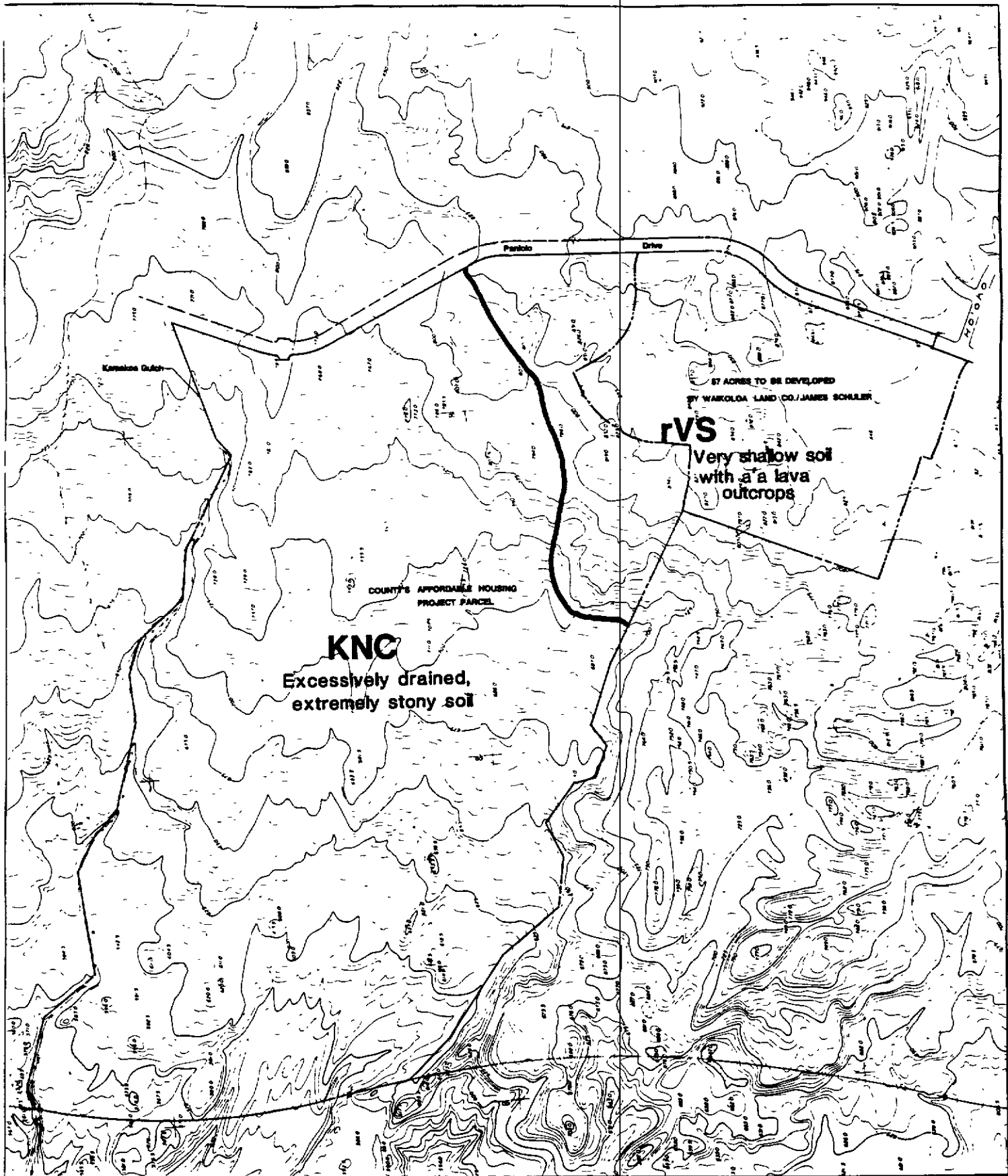
3.1.2 Soils

The U. S. Department of Agriculture, Soil Conservation Service (SCS) identified and mapped two soil types within the project site: Kawaihae (KNC) and Very Stony Land (rVS). The Kawaihae soil type characterizes the major portion of the project area. This series consists of somewhat excessively drained extremely stony soils that formed in volcanic ash. A representative profile contains a surface layer of dark reddish brown extremely stony very fine sandy loam about two inches thick. Below this is dark reddish brown and dusky red stony silt loam and loam. Hard pahoehoe lava bedrock is at a depth of about 33 inches. Kawaihae land is commonly used for pasture, wildlife habitat and recreation areas (see Figure 3-2).

The southeastern sector is characterized by the Very stony land (rVS) soil type. This soil consists of very shallow soil material and a high proportion of Aa lava outcrops. Between the lava outcrops and in the cracks of the lava, the soil material extends to a depth of 5 to 20 inches. The typical vegetation is a sparse cover of grass and kiawe trees in dry areas. The erosion hazard is slight. Very Stony Land is commonly used for pasture, watershed and wildlife habitat.

Impacts and Mitigation

No significant impacts are expected with regard to existing soils and soil conditions on the project site. Standard grading procedures, in accordance with State and County public works requirements will be adhered to in the design and site preparation stages of development. Any specific considerations in the grading plan(s) will be adhered to during the engineering design phase of the project.



KNC
Excessively drained,
extremely stony soil

57 ACRES TO BE DEVELOPED
BY WAIKOLOA LAND CO./JAMES SCHULER
rVS
Very shallow soil
with a lava
outcrops

COUNTY'S AFFORDABLE HOUSING
PROJECT PARCEL

Panolo Drive

Kamaloa Gulch

WAIKOLOA AFFORDABLE HOUSING PROJECT MASTER PLAN

For: County of Hawaii Dept. of Housing & Community Development
Hilo, Hawaii
By: R. M. Towill Corporation
Honolulu, Hawaii
NOVEMBER 1989

Figure 3-2:
Soil Types



The ash-soil in the northeastern section of the site appears to be subject to rapid erosion. It should be landscaped as soon as possible after disturbance. This would also mitigate problems with dust.

3.2 SEISMOLOGY AND VOLCANIC ZONES

The Island of Hawaii is classified as Seismic Risk Zone 3 on a scale of 1 to 4 (4 being higher). The earthquake of 1868 was estimated to have had a magnitude of 7.25 to 7.75 on the Richter scale at its epicenter along the Kau District Coast; and at the Waikoloa Beach Resort, located 5.5 miles west of the study area, intensities were only slightly less. The 1951 and 1975 earthquakes were estimated to have had intensities of about 5 at the Waikoloa Beach Resort.

The study area location on the flanks of Mauna Kea places the property in Lava Flow Risk Zone 8 for Mauna Kea and close to the edge of the boundary of Lava Flow Risk Zone 3 for Mauna Loa. Lava Flow Risk Zones 1 to 9 - 1 being highest risk - are based upon the probability of coverage by lava flows. The risk of damage from new lava flows from either volcano within the next 100 years is remote.

Impacts and Mitigation

Site development standards and criteria applicable to areas classified as Risk Zone 3 for seismologic risks shall be adhered to by the developer(s) of this site. Although the risk of direct damage from new lava flows within the next 100 years is reportedly remote, the possibility of a lava flow from Mauna Loa crossing and blocking one or more of the major area roadways should be considered.

3.3 CLIMATE

Regional and local climatology significantly affect the air quality of a given location. Wind, temperature, atmospheric turbulence, mixing height and rainfall all influence air quality. Although the climate of Hawaii is relatively moderate throughout most of the state and most of the year, significant differences in these parameters may occur from one location to another. Most differences in regional and local climates within the state are caused by the mountainous topography.

South Kohala, the district in which the project site is located, is situated on the northwestern side of the island of Hawaii. The topography of this island is dominated by the great volcanic masses of Mauna Loa (13,653 feet), Mauna Kea (13,796 feet), and of Hualalai, the Kohala Mountains and Kilauea. The island consists entirely of the slopes of these mountains and of the broad saddles between them. Mauna Loa and Kilauea, located on the southern half of the island, are still active volcanoes. The site of the proposed project occupies a portion of the lower northwestern slope of Mauna Kea, extending from an elevation of about 550 feet near the northwest boundary up to an elevation of about 900 feet near the southeast boundary.

Hawaii lies well within the belt of northeasterly trade winds generated by the semi-permanent Pacific high pressure cell to the north and east. Nearly the entire western coast of the island of Hawaii, however, is sheltered from the trade winds by high mountains, except when unusually strong trade winds sweep through the saddle between the Kohala Mountains and Mauna Kea and reach the areas to the leeward side. Due to wind shadow effects caused by the terrain, winds in the South Kohala area are predominantly light and variable. Local winds such as land/sea breezes and/or upslope/downslope winds tend to dominate the wind pattern for the area. During the daytime, winds typically move onshore because of seabreeze and/or upslope effects. At night and during the early morning hours, winds generally are land breezes and/or drainage winds which move downslope from the east and out to sea; oftentimes, early morning drainage winds are quite strong for a few hours just near sunrise and then subside. Calms occur about 9 percent of the time at nearby Kawaihae.

In Hawaii, the annual and daily variation of temperature depends to a large degree on elevation above sea level, distance inland and exposure to the trade winds. Average temperatures at locations near sea level generally are warmer than those at higher elevations. Areas exposed to the trade winds tend to have the least temperature variation, while inland and leeward areas often have the most. The project site's leeward location and low-level elevation result in a relatively moderate temperature profile compared to windward locations near sea level. At Kamuela, located to the northeast of

the project and at an elevation on about 2,700 feet, average daily minimum and maximum temperatures are 55 degrees Fahrenheit and 73 degrees Fahrenheit, respectively. The extreme minimum temperature on record at this location is 34 degrees Fahrenheit, and the extreme maximum is 90 degrees Fahrenheit. Temperatures at the project site are estimated to be about 5 to 10 degrees warmer on the average than those at Kamuela due to the lower elevation.

Rainfall in Hawaii is highly variable depending on elevation and on location with respect to the trade winds. The lower elevations of South Kohala are some of the driest areas in the state. Some of the rainfall occurs in conjunction with winter storms, and some occurs during summer afternoons and evenings as a result of the onshore and upslope movement of moisture laden marine air. Annual rainfall reported for Waikoloa Village during 1988 was about 18 inches. This may vary substantially from one year to the next.

Humidity at the project site is relatively constant year round. It is generally below 40 percent during the late morning and afternoon hours.

Impacts and Mitigation

The project will have no significant impacts on the existing climatic conditions. The dwelling units and other project buildings are expected to be constructed to take advantage of the natural ventilation that the prevailing winds can provide in this area.

3.4 HYDROLOGY AND DRAINAGE

The project area is bordered on the northern side by a major drainage way, Kamakoa Gulch, which originates in the upper slopes of Mauna Kea and terminates in the coastal plain above the Puako shoreline. A large portion of the site is part of the Kamakoa Gulch drainage area. Branch tributaries, which vary in size, enter the site on the east side, traverse through the site and join the main branch located downstream of the site. It appears from field observations, that these branch tributaries are partially diverted toward

of the project site (Figure 3-3).

The approximately 58,000 acre watershed located mauka of the site produces about 12,000 cubic feet per second (cfs) of runoff during a "100-year" storm," which naturally runs through Kamakoa Gulch.

Bordering the site to the south is an unnamed gulch with a tributary area that originates in the existing subdivision to the southeast. Only a small portion of the study area drains to this gulch.

As indicated on the drainage map and through field observations, it is evident that over the years, the project site has been subjected to significant drainage impacts from areas mauka.

The proposed project is situated above the Underground Injection Control line (UIC line) as established by the State Department of Health.

According to the Map Index and Street Index of the Federal Emergency Management Agency's latest Flood Insurance Rate Map (FIRM), dated July 16, 1990, the project area lies within the borders of Panel 283C, which has not yet been printed. However, all areas covered by this panel have been designated Zone X, areas determined to be outside the 500-year flood plain (U.S. Army Engineer District, Sept., 1990).

Low-lying areas adjacent to Kamakoa Gulch, however, appear to be prone to minor flooding based on field observations conducted during the master planning process (September 1989 to March 1990).

A detailed analysis of the project's drainage system and floodway boundaries will be conducted for the design and development phases. The detailed study is intended to verify and refine the preliminary engineering analysis, and to set floodway boundaries along the northern border which is defined by Kamakoa Gulch.

of the project site (Figure 3-3).

The approximately 58,000 acre watershed located mauka of the site produces about 12,000 cubic feet per second (cfs) of runoff during a "100-year" storm," which naturally runs through Kamakoa Gulch.

Bordering the site to the south is an unnamed gulch with a tributary area that originates in the existing subdivision to the southeast. Only a small portion of the study area drains to this gulch.

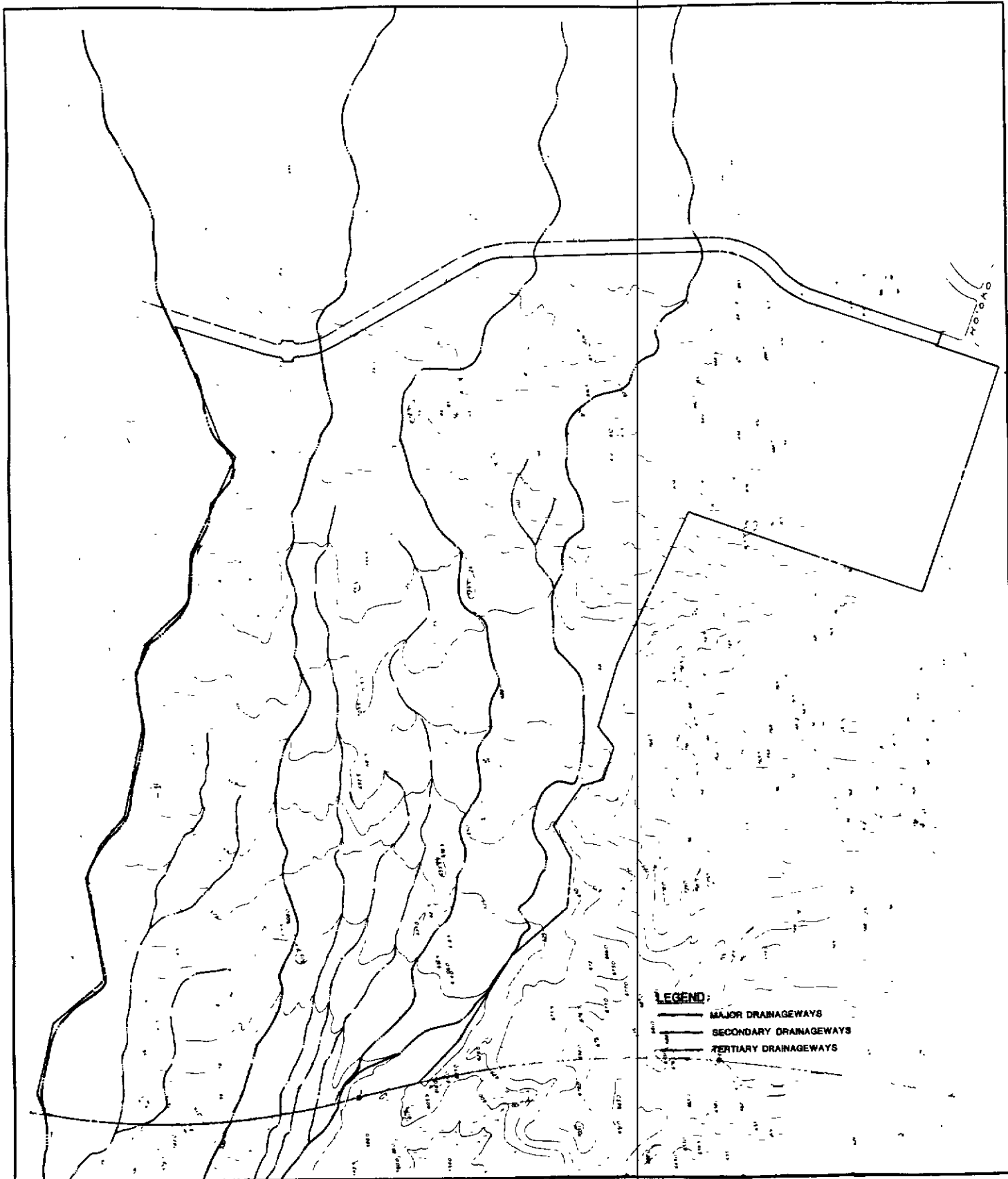
As indicated on the drainage map and through field observations, it is evident that over the years, the project site has been subjected to significant drainage impacts from areas mauka.

The proposed project is situated above the Underground Injection Control line (UIC line) as established by the State Department of Health.

According to the Map Index and Street Index of the Federal Emergency Management Agency's latest Flood Insurance Rate Map (FIRM), dated July 16, 1990, the project area lies within the borders of Panel 283C, which has not yet been printed. However, all areas covered by this panel have been designated Zone X, areas determined to be outside the 500-year flood plain (U.S. Army Engineer District, Sept., 1990).

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WAIKOLOA AFFORDABLE HOUSING PROJECT MASTER PLAN

For: County of Hawaii Dept. of Housing & Community Development
 Hilo, Hawaii
 By: R. M. Towill Corporation
 Honolulu, Hawaii
 NOVEMBER 1988

DRAINAGE MAP



FIGURE 3-3

Impacts and Mitigation

Preliminary backbone infrastructure requirements and associated costs were projected by R. M. Towill Corporation in June, 1990. The following describes and summarizes the necessary system improvements and assessment of the impacts:

County of Hawaii subdivision standards which will apply to the affordable housing project require that surface runoff levels shall be no more than the levels prior to development. Because a portion of the mauka-generated runoff flows through the County site before entering Kamakoa Gulch, a ten-foot concrete channel running along Paniolo Drive will be constructed to divert this runoff to Kamakoa before it can enter the project site. This will be a trapezoidal channel with a ten-foot bottom width and 1:1 side slopes, and will collect approximately 1,600 cfs of runoff from the 1,500 acre drainage area directly mauka of the project site and divert it into Kamakoa Gulch.

The Preliminary Engineering Report shows this channel located on the lower, or west side of Paniolo Drive. However, further study indicated that the preferred location for this channel would be the upper, or east side of Paniolo Drive. This issue will have to be resolved through further discussions with Transcontinental Development Corporation. The cost to construct this channel has been estimated at \$3.36 million. Other offsite mitigation measures are being evaluated and may alter the drainage improvements that will be required.

As a mitigation measure to minimize project infrastructure costs, the \$3.36 million cost to construct this channel should not be incurred by the Waikoloa Affordable Housing project due to the fact that the origin of the mauka flows are other developments off-site.

To control project-generated surface flows, a second similar channel, with a 5-foot bottom width, running from Paniolo Drive to the lower or makai end of the project site, is needed to carry approximately 550 cfs to an off-site drainageway that eventually empties into Kamakoa Gulch. Other onsite improvements include swale

and dry well systems which will be used to collect runoff from roads and road rights-of-way. Dry wells and catch basins are to be spaced every 250 feet along both sides of all roadways. Total estimated cost for these improvements is approximately \$8.6 million.

Given the project's location above the UIC line, care must be taken to avoid contamination of groundwater resources. Among other measures, UIC permits will be required for all proposed drywells, and disposal of sewage effluent by means of injection wells will not be permitted.

3.5 FLORA AND FAUNA

3.5.1 Flora

Char and Associates conducted a botanical survey on the project site in August, 1988. This report is included in its entirety as Appendix A in this Final Environmental Impact Statement.

The survey was conducted with the use of a walk-through method with plants identified by sight. Plants that could not be positively identified were collected for later determination by comparison with known specimens in the herbarium and reference to standard taxonomic literature. Taxonomy of ferns is based on Wagner and Wagner (1987). Taxonomy and nomenclature of the flowering plants follows Wagner et al. (in press).

The entire site is a prehistoric lava field, though the substrate was of two distinct types. In the northeast portion of the site, the soil was a fine yellowish ash, with occasional rock outcroppings. Erosional features revealed that the ash was, at least in some places, more than three feet thick and divided into two soil zones marked by a change in color. The upper layer was approximately one foot deep. A herd of approximately 50 goats was found in a large cave in the south bank of Kamakoa Gulch. Such evidence as tracks and droppings indicated that they travel widely through the site, and may contribute to the composition of the vegetation.

In general, vegetation in the northeast portion of the site consists of rolling grasslands with widely scattered trees. The soil is a deep, yellow ash with occasional rock outcroppings. In the southwest section, vegetation consists of savannah-scrubland. This substrate is overlain by a thick, weathered a'a. The soil is thinner and rock outcroppings predominate. For the most part, the species composition is the same throughout the site.

In specific areas, fountain grass (Pennisetum setaceum) predominates along the dirt road and Paniolo Avenue, and in the bottom of Kamakoa Gulch. Away from the road the predominant grass is native hard-stemmed love grass (Eragrostis atropiodes). Where erosion or disturbance by animals was heaviest, the exotic buffel grass (Cenchrus ciliaris) has replaced the native grass. The only tree species on the site is kiawe (Prosopis pallida). This tree is found in increasing density toward the southwest section of the property.

A total of 46 plant species were found, an extremely low number for an area of this size. Of these, 40 (87 percent) were identified as exotic weeds or introduced plants, and 6 (13 percent) native, or presumed native plants.

Impacts and Mitigation

No listed, proposed, or candidate threatened and endangered species, as designated by the Federal and/or State governments (U.S. Fish and Wildlife Service 1985; Herbst 1987) were found on the site. The Eragrostis grassland appears to be a remnant native plant community, but is so disturbed that essentially only the grass remains. Most other native plants associated with this grassland community are either so uncommon on the site as to have all but disappeared, or like wiliwili (Erythrina sandwicensis) and a'ali'i (Dodonaea viscosa), were observed a short distance outside of the site, but were not found on the site itself.

Native plants should be used in future landscaping of the site. A number are both attractive and adapted to the present climate, while others would thrive with

common landscape practices. Some control should be exercised in bringing in exotic species. A number of undesirable weedy species (toxic, invasive, or both) could potentially escape from cultivation and become serious problems in the future. Examples are a cactoid euphorbia (Euphorbia lactea) and Aloe, both of which were found on or near the site.

The presence of exploded ordnance on the site suggests that unexploded ordnance may be present, though none was seen during the survey. Another problem is that the ash-soil in the northeastern half of the site appears to be subject to rapid and severe erosion. It should be landscaped as soon as possible after disturbance. This would also mitigate problems with dust.

3.5.2 Fauna

A three-day field survey of the avifauna and feral mammals at the study area was conducted by Phillip L. Bruner in August, 1988. This report in its entirety is included as Appendix B in this document.

The objectives of the field survey were to:

- Document what bird and mammal species occur on the property or may likely occur given the range of habitats available.
- Provide some baseline data on the relative density of each species.
- Determine the presence or likely occurrence of any native fauna particularly any that are considered "endangered" or "threatened." If such occur or are likely to occur on the property identify what features of the habitat may be essential for these species and suggest how those resources may be protected.

No endemic or native birds were recorded during the course of the field survey. The Short-eared Owl or Pueo (Asio flammeus sandwichensis) is relatively common on the Island of Hawaii and potentially could occur on the site (Berger 1972, Hawaii Audubon Society 1984, Pratt et al. 1987). This endemic subspecies is listed as endangered on

Oahu by the State of Hawaii Department of Land and Natural Resources Division of Forestry and Wildlife, but not elsewhere in Hawaii. No other endemic birds would be expected given the location and type of habitat.

Migratory shorebirds migrate to Hawaii between the months of August and May. Some juveniles will stay through the summer months (Johnson et al. 1981, in press). Of all the shorebird species that winter in Hawaii the Pacific Golden Plover (Pluvialis fulva) is the most abundant. Plovers prefer open areas such as mud flats, lawns and grazed pasture land. They arrive in Hawaii in early August and depart to their arctic breeding grounds during the last week of April (Johnson et al. 1981). A total of only two plover were counted during the survey. These plover were seen flying over the property. No plover were actually seen on the ground. Both plover observed had some remaining breeding plumage which would indicate they had recently returned from the arctic.

No resident indigenous or native birds were recorded or expected in this habitat at this project site. Further, no resident indigenous or native seabirds were observed on the property.

A total of nine species of exotic or introduced birds were recorded during the field survey. No species were abundant. Populations of all species were smaller than expected. Given the type of habitat and its location and based on earlier studies (Bruner 1979, 1980, 1984a, 1984b, 1984c, 1985a, 1985b), and information provided in Berger (1972), Hawaii Audubon Society (1984) and Pratt et al. (1987) the following exotic species might also be expected to occur on the property: Ring-necked Pheasant (Phasianus colchicus), Erckel's Francolin (Francolinus erckelii), California Quail (Callipepla californica), Japanese Quail (Coturnix japonica), Barn owl (Tyto alba), Yellow-billed Cardinal (Paroaria capitata), Northern Mockingbird (Mimus polyglottos), Saffron Finch (Sicalis flaveola), Lavender Waxbill (Estrilda caerulescens), House Finch (Carpodacus mexicanus) and House Sparrow (Passer domesticus).

The feral mammals observed during the survey were the Small Indian Mongoose (Herpestes auropunctatus), dogs and goats. No rats, mice or cats were recorded but it would be highly unusual if these ubiquitous mammals did not occur on the property. Without a trapping program it is difficult to draw conclusions about the relative abundance of rats, mice, mongooses, dogs, cats and goats. However, it is likely that their numbers are typical of what one would find elsewhere in similar habitat on the island.

Records of the endemic and endangered Hawaiian Hoary Bat (Lasiurus cinerus semotus) are sketchy but the species has been reported from Hawaii (Tomich 1986). However, none were observed on this field survey. Bats were found at locations makai of the project site (Bruner 1984d).

Overall, results of the survey indicated that the study area provides a limited range of habitats which are utilized by the typical array of exotic bird species expected at this elevation and in this type of environment.

Some species typically found on the island in this habitat were not recorded during the survey. This may be due to the very dry conditions found at the study area. No endemic birds or seabirds were recorded nor were they expected. Also, no threatened or endangered species were encountered and there was no evidence suggesting such species being in the project area.

Impacts and Mitigation

The proposed development would create a more diversified habitat than presently exists and would likely result in the following changes in the avifauna and feral mammals on this site:

1. Some species might experience a decline in numbers of individuals. Species in this situation could be Gray Francolin, and perhaps Spotted Dove.

2. Populations of all exotic species, with the exception of Gray Francolin and Spotted Dove, will likely increase dramatically following the proposed development. Residential property to the east of the site clearly demonstrates this effect. A drive/walk through census of birds in the residential area revealed more total species and greater numbers of individuals of all species.

3.6 NOISE

3.6.1 Existing Conditions

The project site is undeveloped. The closest development to the project site are single-family homes mauka of Paniolo Avenue. The houses nearest to the project site are about 2,000 feet from the project boundary.

The site is not near any major highways and is not in the flight path of any airports.

Impacts and Mitigation

Construction-related (grading and infrastructure development) noise may impact on the neighboring homes located near the project site due to the general wind pattern during the day. Certain construction equipment may be required to be muffled to minimize the higher noise levels. These higher noise levels will, however, be short-term impacts. Also, since the nearest houses are about 2,000 feet from the project boundary, significant noise impacts are not expected.

Once the project has been developed, there will be some noise impact from vehicular traffic on Paniolo Drive and on project roadways. However, the relatively low volume of traffic, coupled with speed limits of 35 mph or lower, will be mitigating factors. Noise impacts from roadways are therefore not expected to be a significant problem.

3.7 AIR QUALITY

A report on the air quality was prepared in October 1990 and is included in this document as Appendix C. Present air quality in the project area is mostly affected by air pollutants from natural, agricultural and/or vehicular sources. Natural sources of air pollution emissions which may affect the project area but cannot be quantified very accurately include ocean, plants, wind-blown dust and volcanoes. Of these natural sources of air pollution, volcanoes are the most significant.

Volcanic emissions have chronically plagued the project area since the latest eruption phase of Kilauea Volcano began in 1983. Air pollution emissions from Kilauea consist primarily of sulfur dioxide. After entering the atmosphere, these sulfur dioxide emissions are carried away by the wind and either washed out as acid rain or gradually transformed into particulate sulfates. Although emissions from Kilauea are vented more than 60 miles southeast of the project site, the prevailing wind patterns eventually carry the emissions into the Kona and South Kohala areas. These emissions can be seen in the form of volcanic haze (vog) which persistently hangs over the area. The American Lung Association is currently studying the character and concentrations of volcanic air pollution in the Kona area, but to date no results of the study are available.

Although the project is located between two major regional arterial roadways, Queen Kaahumanu Highway and Mamalahoa Highway, it is several miles from either and unlikely to be significantly affected by the exhausts of motor vehicles traversing these roadways. Any air pollution from motor vehicles is likely confined to limited areas near intersections where and when traffic congestion occurs during poor dispersion conditions.

The State Department of Health operates a network of air quality monitoring stations at various locations around the state. Unfortunately, very little data are available for the Island of Hawaii, and none are available for the South Kohala area specifically. As is indicated in Table 3-1, the only existing monitoring data anywhere near the project site consist of sulfur dioxide and particulate measurements that were made about 30 miles to the south at Kealakekua during 1985 and 1986. During this two-year period,

measurements of 24-hour average sulfur dioxide concentration at this location were consistently low with daily mean values ranging from less than 5 to 12 milligrams per cubic meter (mg/m³). No exceedances of the state/national 24-hour AAQS for sulfur dioxide were recorded. Twenty-four hour average particulate concentrations ranged from 4 to 28 milligrams per cubic meter. Hence, no violations of the state AAQS were measured.

TABLE 3-1

ANNUAL SUMMARY OF AIR QUALITY MEASUREMENTS FOR
MONITORING STATIONS NEAREST
WAIKOLOA AFFORDABLE HOUSING PROJECT

Parameter/Location	1985	1986
Sulfur Dioxide/Kealakekua, Kona		
Period of Sampling (months)	7	8
No. of 24-Hr Samples	31	40
Range of 24-Hr Values (ug/m ³)	<5-8	<5-12
Average Daily Value (ug/m ³)	<5	<5
No. of State AAQS Exceedances	0	0
Particulate/Kealakekua, Kona		
Period of Sampling (months)	7	8
No. of 24-Hr Samples	34	40
Range of 24-Hr Values (ug/m ³)	6-22	4-28
Average Daily Value (ug/m ³)	12	16
No. of State AAQS Exceedances	0	0

SOURCE: State of Hawaii, Department of Health, "Hawaii Air Quality Data for the Period of January 1985 to December 1987"

At this time, there are no reported measurements of lead, ozone, nitrogen dioxide or carbon monoxide in the project vicinity. These are primarily motor vehicle related air pollutants. Lead, ozone, and nitrogen dioxide typically are regional scale problems; concentrations of these contaminants generally have not been found to exceed AAQS elsewhere in the state. Carbon monoxide air pollution, on the other hand, typically is a microscale problem caused by congested motor vehicular traffic. In traffic congested areas such as urban Honolulu, carbon monoxide concentrations have been found to

occasionally exceed the state AAQS. Present concentrations of carbon monoxide in the project area are estimated later in this study based on mathematical modeling of motor vehicle emissions.

Impacts and Mitigation

1. Short-Term Construction-Related Impacts and Mitigation

Short-term direct and indirect impacts on air quality could occur due to project construction. There are two potential types of air pollution emissions which could directly result during construction: (1) fugitive dust from vehicle movement and site excavation; and (2) exhaust emissions from on-site construction equipment.

State of Hawaii Air Pollution Control Regulations stipulate that emissions of fugitive dust from construction activities cannot be visible beyond the property line. Thus, an effective dust control plan for the construction phases will be necessary to mitigate these impacts. In dust-prone areas like South Kohala, limiting the area that can be disturbed at any given time, regular watering of exposed soil areas, applying chemical soil stabilizers, use of mulches and erosion control fabrics and/or using wind screens may be necessary. Control regulations also specify that open-bodied trucks be covered when in motion. Paving of parking areas and roads and establishing landscaping as early in the construction process as possible can also lower the potential for fugitive dust emissions.

On-site mobile and stationary construction equipment will also emit some air pollutants in the form of engine exhausts. The largest of this equipment is usually diesel-powered. Nitrogen oxides emissions from diesel engines can be relatively high compared to gasoline-powered equipment, but the standard for nitrogen dioxide is set on an annual basis and is not likely to be violated by short-term construction equipment emissions. Carbon monoxide emissions from diesel engines, however, are low and should be

insignificant compared to vehicular emissions on roadways.

Indirectly, slow-moving construction vehicles could obstruct normal traffic flow to the extent of increasing overall vehicular emissions. However, this can be mitigated by moving heavy construction equipment during periods of low traffic volume. Likewise, the schedules of commuting construction workers can be adjusted to avoid peak hours in the project vicinity.

2. Long-Term Roadway and Vehicular Movement Impacts and Mitigation

The primary long-term air pollution impact from the project will arise from the increased motor vehicle traffic associated with the project. Potential increased levels of carbon monoxide concentrations along roadways leading to and from the proposed development will be the primary concern. Based on mathematical modeling of projected vehicular traffic and on atmospheric dispersion estimates of vehicular emissions (CALINE4), the proposed project carbon monoxide concentrations along roadways in the project vicinity will unavoidably be higher at several locations compared to the without project case, but worst-case concentrations will remain within the national standards. The highest concentrations will occur in the vicinity of Queen Kaahumanu Highway at Waikoloa Road.

In 1997 with the project, the estimated maximum worst-case 8-hour concentration was 7.6 mg/m³ near Queen Kaahumanu Highway and Waikoloa Road; other locations studied ranged from 3.1 mg/m³ at Mamalahoa Highway and Waikoloa Road to 6.6 mg/m³ at the intersection of Paniolo Drive and Waikoloa Road. Either with or without the project, 1997 concentrations will be higher than existing concentrations at most locations. Comparing the projected values for the existing case to the AAQS, it appears that both the State and National 8-hour standards will be met during 1990. The same is true without the project in 1997 except at the intersection of Queen Kaahumanu Highway and Waikoloa Road. With the

project, worst-case 8-hour concentrations will meet the national standard but may occasionally exceed the more stringent state standard along Waikoloa Road at Queen Kaahumanu Highway and at Paniolo Drive.

Roadway improvements, reduction of traffic or reduction of individual vehicular emissions will help mitigate increased air pollution levels. Roadway improvements such as a grade-separated interchange at Queen Kaahumanu Highway and Waikoloa Road will help lower future air pollution concentrations. Also, air quality impacts near the intersection of Paniolo Drive and Waikoloa Road will be diminished if the north-south collector road west of and parallel to Paniolo Drive is built in 1995 as planned.

Air pollution impacts from vehicular emissions can also be mitigated by reducing traffic through the use of buses and car pooling, and/or by adjusting local school and business hours to begin and end during off-peak times. It is also possible that at some point in the future, the State may adopt either a motor vehicle inspection and maintenance program, which ensures that emission control devices are properly maintained and thereby reduces emissions, or more restrictive emission control standards.

3. Long-Term Project Electrical and Solid Waste Generated Impacts and Mitigation

The proposed project will generate indirect emissions from power generating facilities as a consequence of electrical power usage. Peak power demand at project completion is not expected to exceed 3 megawatts. Present generating capacity on the Big Island is 161 megawatts with most of this power provided by oil-burning generating units. Island-wide, peak power demand is currently 120 megawatts. Based on the ratio of peak project power demand to total present peak power demand on Hawaii, the project power demand will result in about a 3 percent increase in emissions from the electric utility if all project power is derived

from fuel oil.

Indirect emissions from project electrical demand could be reduced by the use of solar energy design features to the maximum extent possible. This would include installing solar water heaters, designing homes and building space so that window positions maximize indoor light without unduly increasing indoor heat, and using landscaping where feasible to provide afternoon shade to cut down on the use of air conditioning. Use of wind power generating unit, solar energy, geothermal energy, ocean thermal energy conversion and/or other alternative energy sources by the utility instead of fuel-burning facilities also would minimize indirect emissions from project electrical demand.

Solid waste generated by the project is expected to amount to about 10 tons of refuse (about one 12-ton truckload) per day. At present, the refuse district handles about 100 tons per day. Most, if not all project refuse will likely be hauled and either landfilled or burned at another location.

Most solid waste from the project will be buried at the West Hawaii Sanitary landfill, and any air pollution impacts will be minimal if the landfill is operated properly. If project refuse is burned instead at a municipal incinerator, air pollution impacts could be reduced substantially if the incinerator is fitted with pollution control equipment; i.e., electrostatic precipitators or fabric filters. Conservation and recycling programs will also reduce solid waste which would reduce any related air pollution emissions proportionately.

3.8 VIEWS

The project area is located at the 700-foot elevation of the Kohala region, approximately four miles from the coastline. The predominant views from the project area are the peaks of Mauna Kea to the east, the Kohala Mountains to the north, and the Kohala coastline to the west. Southeast of the project area are residential units nestled in the rolling hills

of Waikoloa Village. The south slope of Haleakala Crater on Maui is visible on a clear day. Views onto the project site are of an undisturbed environment, as it is currently undeveloped. Residents of neighboring mauka houses have clear views of the Kohala coast.

Impacts

The project will have no significant adverse impacts on existing views. Due to the relative low-density and mix of single-family and multi-family units planned for the project, views will be enhanced rather than impeded. The varying topography and elevations will allow the developer(s) to site buildings and homes in areas within the site to minimize significant alterations to the existing views and view planes.

The views of the project site from existing neighborhoods will be somewhat impacted due to the introduction of this residential development. To mitigate this potentially adverse impact, a 50-foot planting easement which will consist of trees is proposed to run along the length of Paniolo Drive.

3.9 HISTORIC AND ARCHAEOLOGICAL RESOURCES

An archaeological reconnaissance survey was conducted for the project area by William J. Bonk in August, 1988. The archaeological report, in its entirety, is included as Appendix D in this document.

Literature research, aerial photographs, and field reconnaissance survey methods were used to conduct the historic and archaeological resource study for the project site.

The prehistoric land use pattern in the Waimea-Waikoloa area was originally subsistence horticulture and subsistence marine exploitation. By the latter half of the 16th century, changes in this pattern occurred as the economy expanded. This trend reached its peak in the late prehistoric period of the second half of the 18th century (Bonk, 1985:6). As foreign ships increased in numbers at Kawaihae in the early historic period, further development of a "subsistence-trade" economy occurred. Through the 19th century, as

cattle became a more important part of the economic base, the transporting of products and a money-based economic system gradually evolved.

These cultural changes occurred simultaneously with the related environmental evolution in the form of botanical and zoological changes. Subsequently, this had an effect on the land surface. Exotic animals and plants began to replace endemic varieties, and these changes transformed the physical as well as cultural environment.

"At the Mahele of 1848, the land, Waikoloa, was awarded to George Huen Davis, son of Isaac Davis, the English companion and advisor to Kamehameha I (Soehren, 1980)." Waikoloa was regarded as "an 'ili'aina of Waimea" as Waimea developed as the "food basket" of South Kohala. In aboriginal times, before cattle, Soehren (1984) says, these lands (Waikoloa) were marginal to the Hawaiian economy, serving as a reservoir of material products such as pili grass and birds. Without an assured source of water, the midlands of Waikoloa were not able to support horticulture.

Marine exploitation was more readily available for the coastal inhabitants of Waikoloa and its neighboring ahupua'a. Starting with Reinecke in 1930 and extending to the present, there is an increasing number of reports covering the lowland regions. The summarization and analysis of these data show the use of these coastal, inland and offshore areas as of economic importance in the prehistoric period. If the midlands were marginal, the coastal regions were of importance. This produced an attraction for people and cultural development within the coastal region, but not in the midlands. Here, only off and on incursions were made for the gathering of pili grass for the thatching of homes and other structures, and the passage through these lands on travels elsewhere, hardly a reason for settlement, or even lingering long enough to leave their cultural marks on the surface of the ground.

Prior to the development of the village of Waikoloa in the early 1970's only the military left their mark on the project site. Evidence of the presence of the military (from World War II) were the remains of field communication wire as well as a number of examples of

shrapnel fragments.

Impacts and Mitigation

The study reported that no sites of prehistoric or historic significance were found on the project site. Thus, any land transformation would not be "archaeologically detrimental". In conclusion, Bonk indicated that no further archaeological work is recommended for the project site.

Notwithstanding the negative survey results, it is always possible that archaeological artifacts or human burials could be uncovered during construction. In the event of such discoveries, construction in the immediate vicinity should be halted, and the State Historic Preservation Division should be contacted as soon as possible. A staff person from the Division will then assess the situation and recommend appropriate mitigation measures.

SECTION 4

SOCIO-ECONOMIC ENVIRONMENT

4.1 OVERVIEW

Real Estate Services, Inc. prepared a Market Research and Analysis report for the Waikoloa Affordable Housing master plan in June, 1990. The findings of this report are summarized below. The report reviewed and addressed the anticipated housing demands created by the resort development at Waikoloa, outlined the affordable housing alternatives for the County's designated property for this purpose, and identifies the market for such housing. The report, in its entirety, is included as Appendix E in this FEIS.

The demographics of consumers for the affordable housing market at Waikoloa include:

- Construction workers for continued resort development along the North Kona/South Kohala coast;
- Permanent work force at completed hotels;
- General population growth resulting from continued economic growth.

While housing opportunities for employees of the developments in Waikoloa cannot be reserved for these consumers exclusively, primary emphasis should be placed on their needs.

4.2 POPULATION TRENDS

The County of Hawaii is the southernmost and largest island of the Hawaiian Archipelago. The land area of the County is approximately twice that of all the other islands of the State combined.

Within the past twenty-five years, tourism has emerged as the primary economic activity on the island. Much of the economic growth experienced during this period can be linked with the expansion of the visitor industry.

In 1970, just prior to the adoption of the County General Plan, the population in the County of Hawaii numbered 63,468. The 1970 census count was the first to show an increase since 1930. Population peaked at 73,325, largely as a result of the importation of labor for the sugar industry.

Since 1970, the county's population has continued to grow. The 1980 census registered an island-wide population of 92,053 people representing a growth of 28,585 residents for a 45% increase over the 1970 census. Estimates prepared in the 1989 Hawaii State Data Book suggest a population of 117,500 in 1988.

Three sets of population projections were developed for the County's comprehensive planning review program, series A, B, and C. The major variable in each of these projections is the rate of growth of the visitor industry.

Series A is the most conservative projection. It assumes the demise of the sugar industry and modest expansion in the visitor industry. The overall 1985-2005 rate of growth for series A of 2.0% per annum is less than the 2.9% rate of employment growth in the County during the last five years.

Series B projections were developed as a medium series. Sugar employment is maintained and the overall per annum employment growth rate is 3.7%.

Series C reflects an optimistic outlook of the County's future. It is assumed that 17,800 hotel rooms plus additional condominium units will be built in the County by 2005. The average annual growth rate of employment is 4.7%.

The above described population projections are summarized below:

TABLE 4-1
District Distribution
(Year 2005 Projections)

District	Series A	Series B	Series C
Puna	39,790	49,910	58,340
S. Hilo	44,115	55,335	65,790
N. Hilo	1,211	1,519	1,806
Hamakua	5,363	6,721	7,896
N. Kohala	5,363	6,721	7,896
S. Kohala	19,203	24,087	28,638
N. Kona	43,250	54,250	64,500
S. Kona	10,899	13,671	16,254
Kau	3,806	4,774	5,676
Total	170,000	216,988	256,796

The proportion of 1980 residential population in East Hawaii to West Hawaii was 67 percent to 33 percent, respectively. County projections for the year 2005 indicate a shift in population from East Hawaii to West Hawaii. The county projects that by the year 2005, 45.5% of the residential population will be living in West Hawaii.

Patterns and population settlement and growth are defined for the most part by an area's economic opportunities and its energy resources. The West Hawaii region has many opportunities to sustain a stable and diversified economy supported by energy resources, high technology research and development, aquaculture, diversified agriculture, commercial and sport fishing, seafood marketing and ocean research. Expansion in these areas will increase job choice and the availability of higher paying jobs.

4.3 AFFORDABLE HOUSING NEEDS/DEMAND

Unpublished population estimates from a Department of Transportation study show that, within Waikoloa Village, 334 single family units, 226 multi-family units and 69 resort condos existed in 1987. Projections for 2010 show an additional 2,430 single family and 1,000 multi-family units coming on line. Projected total dwelling units by 2010 are 3,921 with a population of 11,760.

The housing needs of the County of Hawaii's West Hawaii region have been documented in HUD's Housing Market Analysis report, the State's Regional Plan for West Hawaii, the County's Infrastructure Needs Assessment report, Queen's Medical study, Peat Marwick and Mitchell's preliminary Kealakehe plan for the Housing Finance and Development Corporation, and studies done for Puako Mauka, Signal Puako and Parker 2020.

Based on these studies, the projected housing demand in the West Hawaii area ranges between 1,000 units and over 2,000 units per year. Not only is there a significant pent-up demand in the area, the situation will be impacted by the thousands of construction and permanent full- and part-time hotel workers at the Ritz Carlton Mauna Lani, the soon to be completed Four Seasons at Kaupulehu, South Kohala Resort at Mauna Kea Resort, the Regent Beach-Kona at Kukio, Kohanaiki, and the Princess Hotel at Kaupulehu.

This demand will be complemented with the necessary support community that will come along with this hotel construction. This housing demand can be accommodated throughout the coast, in Kona, Waikoloa, and other parts of the coast.

It is reasonable to estimate that the housing demand (at prices in the 'affordable' range) at a level of 1,500 to 2,000 units per year exists in the West Hawaii area for the foreseeable future.

Definition of Affordable

It has been customary to separate affordable units into family income categories as follows*:

VERY LOW: families earning less than 50% of median income (under \$16,000).

LOW: families earning between 50% and 80% of median income (between \$16,000 and \$25,600).

LOW/MODERATE: families earning between 80% and 120% of median income (between \$25,600 and \$38,400).

MODERATE: families earning between 120% and 140% of median income (between \$38,400 and \$44,800).

* According to the Office of Housing and Community Development (OHCD), the 1990 HUD median income estimate for Hawaii County is \$32,000, assuming a household size of 4 persons.

These income limits can be converted to selling price ranges. A bank and savings and loan were contacted for current loan underwriting policies and they are as follows:

Loan underwriting for typical bank:

- gross monthly income/mortgage payment 3.6 to 1
- gross monthly income/mortgage and all debt 2.8 to 1
- Current 30 year loans (amortization and term) have rates at approximately 10.58% per annum.
- Loan to value ratios are typically 80% to 90%.

Loan underwriting for typical savings and loan:

- Housing debt = 28% of gross monthly income
- Total debt = 36% of gross monthly income

- Current 30 year fixed loans have rates at 10.50%
- Loan to value ratios are typically 80% to 90%.

Sales Price Ranges

The various selling prices for houses within the income groups (i.e., low, low/mod, and mod) can be computed based on the underwriting policies of the lenders and the current home mortgage terms.

<u>Category</u>	<u>Sales Price Range</u>
Very Low Income (up to 50%)	(Assume Rentals only)
Low Income (50% to 80%)	up to \$77,800
Low/Moderate (80% to 120%)	\$77,800 - \$117,900
Moderate (120% to 140%)	\$117,900 - \$140,200

Rental Ranges

Based on HUD evaluation standards, a projected rent to income ratio of 30% is used. Based on this policy, the following are indicated rental ranges for each income group.

Assume: Rent is 30% of gross monthly income

	Annual Income	Monthly Income	Rent Range
Very Low	up to \$16,000	up to \$ 1,330	up to \$ 400
Low	\$16,000-\$25,600	\$1,330-\$2,130	\$ 400 - \$640
Low/Mod	\$25,600-\$38,400	\$2,130-\$3,200	\$ 645 - \$960
Moderate	\$38,400-\$44,800	\$3,200-\$3,730	\$ 960 - \$1120

NOTE: The above projections are based strictly on a family of four people. For varying family sizes the estimated median income is adjusted; therefore the selling price and rental ranges must be adjusted.

4.4 PROJECT IMPACTS

The Waikoloa Affordable Housing Project is proposed to provide approximately 1,200 dwelling units which will all be targeted to West Hawaii households whose incomes fall within the below 50% of median to Hula Mae income ranges. Based on the analysis above, the project will provide the equivalent of about one year's demand for affordable housing in this region. While the recommended rental rates and sales prices of these units are not yet firm, the County's policy will be to provide the greatest possible opportunity to each of the groups defined and described in these categories.

A major concern in West Hawaii is the affordability of housing: the cost of housing is comparatively high, while wages in the visitor industry are regarded as low. The problem is expected to become worse, given the outlook for substantial growth driven by the visitor industry.

West Hawaii has experienced cycles of rapid and slow housing appreciation, and will experience similar cycles in the future. These cycles reflect both local conditions (such as rapid employment growth) and national economic conditions, such as dramatic changes in inflation and interest rates.

Population and housing impacts of economic development shift over time, in ways that are not always easy to predict. For example, four recently hired new resort workers might be young singles sharing one housing unit. A generation later, these four young people might each be supporting a family of five or six, living now in four different housing units. Alternatively, the original four young workers might have left, only to be replaced by four other people sharing the same unit.

Entry level employees can seldom afford to solve their housing needs in ways which are considered to be conventional; i.e., by purchase or rental of single-family homes or condominiums in an improved neighborhood for a nuclear family. Instead, most find less expensive solutions, including staying with their parents or other relatives until they can

afford their own place; finding a roommate to share the rent; commuting long distances from non-conforming subdivisions where housing is less expensive; and renting units (often illegal) from owners of single-family homes, and thereby supplementing the income of these house owners.

SECTION 5

*INFRASTRUCTURE SYSTEMS
AND SERVICES*

5.1 TRAFFIC/TRANSPORTATION

A traffic impact study for the project was conducted by Parsons Brinckerhoff Quade & Douglas, Inc. in August 1990. The report findings, analysis, and recommendations are summarized in this section. The traffic study in its entirety can be found in this Final Environmental Impact Statement as Appendix F.

5.1.1 Existing Roadways

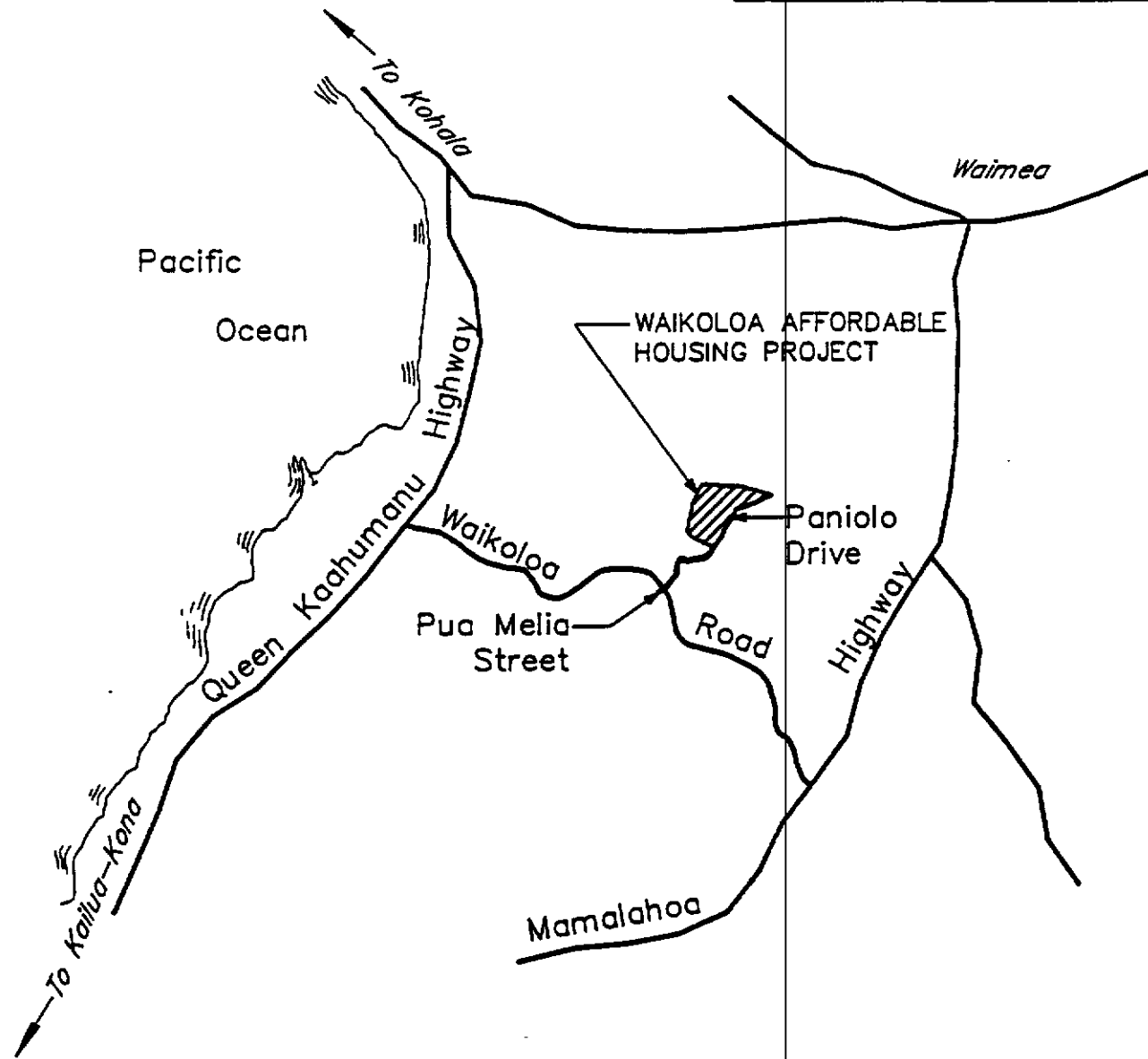
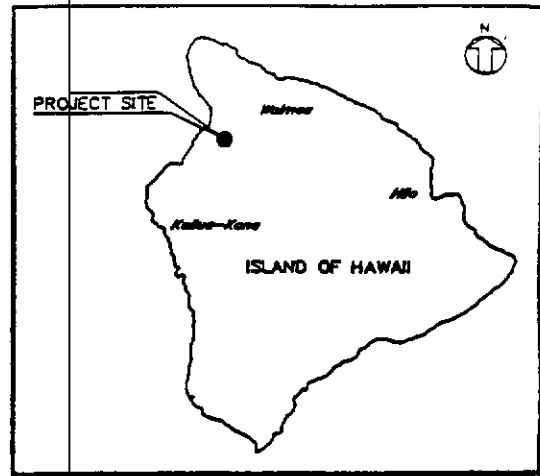
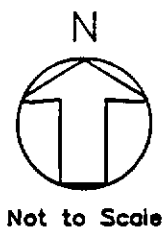
Located in the South Kohala district on the island of Hawaii, the site is located just north of the existing Waikoloa Village. Vehicular access to the site will be provided by the northerly extension of Paniolo Drive (see Figure 5-1).

A. Local Roadway System

Paniolo Drive serves as a collector road for Waikoloa Village. Paniolo Drive has an 80-foot right-of-way and its southern terminus intersects Waikoloa Road and Pua Melia Street forming a cross intersection. The posted speed limit of Paniolo Drive is 35 miles per hour.

B. Regional Roadway System

Queen Kaahumanu Highway is a two-lane arterial road with unpaved shoulders. The posted speed limit for Queen Kaahumanu Highway is 55 mph. Left turn bays for southbound traffic and right turn acceleration and deceleration lanes are provided for northbound traffic at the intersection with Waikoloa Road. Mamalahoa Highway is a narrow two-lane major collector road with sharp vertical and horizontal curves. The posted speed limit for Mamalahoa Highway is 55 miles per hour. Waikoloa Road is a two-lane east-west collector road that widens to four lanes in the vicinity of Waikoloa Village. The posted speed limit is 55 miles per hour, which decreases to 35 miles per hour near Waikoloa Village.



Source: Parsons Brinckerhoff Quade & Douglas, 1990

WAIKOLOA AFFORDABLE HOUSING PROJECT MASTER PLAN

Figure 5-1:
Existing Roadways

For: County of Hawaii Dept. of Housing & Community Development
Hilo, Hawaii
By: R. M. Towill Corporation
Honolulu, Hawaii
October 1990

C. Existing Traffic Conditions

Manual traffic counts were taken on August 7 and 8, 1990, at the intersections of Queen Kaahumanu Highway/Waikoloa Road, Waikoloa Road/Pua Melia Street/Paniolo Drive, and Mamalahoa Highway/Waikoloa Road. The morning peak hour occurs from 6:30 to 7:30 a.m., and the afternoon peak was from 3:30 to 4:30 p.m.

The unsignalized intersection methodology specified in the 1985 Highway Capacity Manual evaluates gaps in the major street traffic flow and calculates capacities available for left turns from the major street to cross oncoming traffic. It also calculates capacities available for left turns from the minor street onto the major street and for right turns from the minor street onto the major street. Operating conditions at unsignalized intersections are expressed in terms of levels of service (LOS), which are designated from A to F, with LOS A representing the best operating conditions and LOS F the worst. LOS of D or better is considered to be adequate operating conditions.

At present, all turning movements within the project vicinity's regional roadway system operate at LOS D or better.

5.1.2 Future Conditions Without Project

Future conditions refer to the year 1997 -- the projected completion period of the project. The Draft Report of Island of Hawaii Long-Range Highway Plan (Parsons Brinckerhoff, September, 1990) and a traffic study for Mauna Lani Cove (Belt Collins & Associates, October, 1989) project a 15 percent annual increase in traffic in the vicinity of Waikoloa.

A. Impacts

Overcapacity conditions on the regional roadway intersections as described below will occur even without the proposed affordable housing project:

The Queen Kaahumanu Highway/Waikoloa Road intersection would experience overcapacity, or LOS F, conditions for southbound left turns from Waikoloa Road because of the increase in traffic volumes. The Mamalahoa Highway/Waikoloa Road intersection would experience LOS E conditions for the northbound left turn movements from Waikoloa Road during the p.m. peak hour. At the Waikoloa Road/Paniolo Drive/Pua Melia Street intersection, near-capacity, or LOS E, conditions would result for the northbound approach during the a.m. and p.m. peak hours. The southbound left turn movements from Paniolo Drive will function at LOS E during the p.m. peak hour.

Two-lane highway analysis reveals that traffic conditions on Queen Kaahumanu Highway would increase to LOS E during the a.m. and p.m. peak hours. Traffic on Mamalahoa Highway north of Waikoloa Road would increase to LOS E conditions during both peak hours.

5.1.3 Future Conditions with Project Traffic

Trip generation for the proposed project is based on the following assumed land uses and square footages: 560 single-family and 840 multi-family dwelling units, a 9.2-acre park, a 5,000 square foot commercial building, and several churches with a total area of 75,000 square feet. (Note: The higher total of 1,400 units was used on the traffic study to ensure a conservative analysis of traffic impacts.)

A. Trip Generation

Table 5-1 summarizes the trips generated by the Waikoloa Affordable Housing project.

TABLE 5-1
Project Traffic

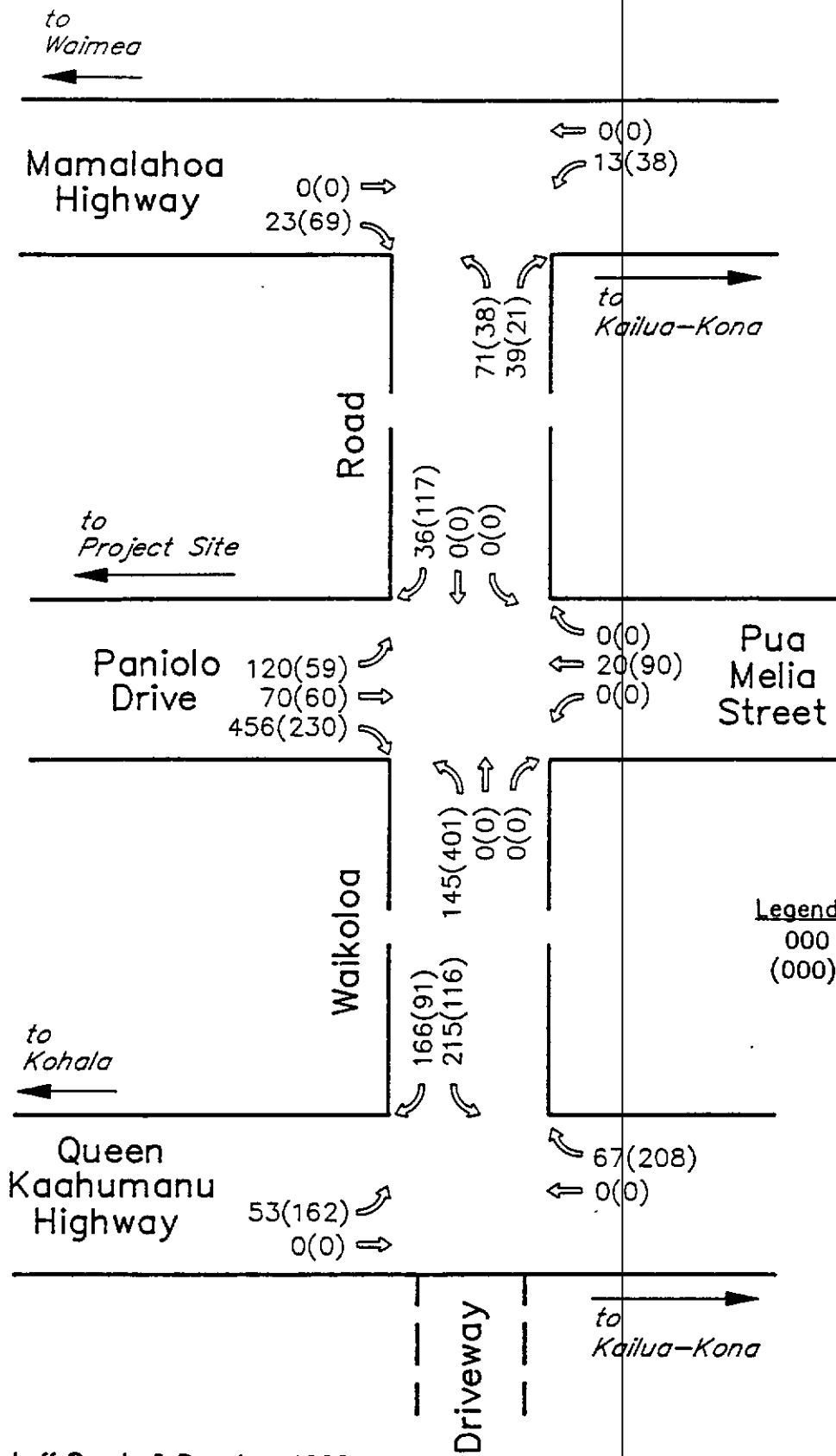
Land Use (Parameter)	Daily (vpd)	A.M. Peak Hour		P.M. Peak Hour	
		Enter (vph)	Exit (vph)	Enter (vph)	Exit (vph)
Single-family (560 d.u.)	3644	104	283	346	203
Multi-family (840 d.u.)	5024	76	348	263	124
Park (9.2 acres)	336	6	16	8	23
Commercial (5,000 s.f.)	4435	169	169	182	174
Church (75,000 s.f.)	577	4	1	21	18
Total:	14,016	359	817	820	542

NOTE: vpd = vehicles per day
vph = vehicles per hour

B. Trip Distribution/Traffic Assignment

Various land uses would encourage internal trips within Waikoloa Village. Internal trips include trips between residential areas and nonresidential areas such as industrial/shopping centers, parks, and churches. The internal trips ranged from 25 percent for residential generated trips to 90 percent for trips generated by the park, commercial and church land uses. These internal trips were deducted from the total project trips to determine the number of external trips that would take place on the regional roadway system. Table 5-2 shows the external trips generated by the affordable housing project.

The project traffic was distributed to and from two directions: north and south via Mamalahoa Highway and Queen Kaahumanu Highway. Table 5-2 shows the trip distribution of the generated trips for the affordable housing project. Figure 5-2 shows the traffic assignment for the generated trips for the affordable housing project.



Source:
Parsons Brinckerhoff Quade & Douglas, 1990

WAIKOLOA AFFORDABLE HOUSING PROJECT MASTER PLAN

For: County of Hawaii Dept. of Housing & Community Development
Hilo, Hawaii
By: R. M. Towill Corporation
Honolulu, Hawaii
October 1990

Figure 5-2:
Project Generated Traffic

TABLE 5-2
Trip Distribution
(Location of Other Trip Ends)

	EXTERNAL	SOUTH	NORTH
A.M. IN	43% 156	51% 80	49% 76
A.M. OUT	60% 491	52% 254	48% 237
P.M. IN	58% 477	52% 246	48% 231
P.M. OUT	42% 266	52% 137	48% 129

C. Project Impacts

1. Local Roadway System

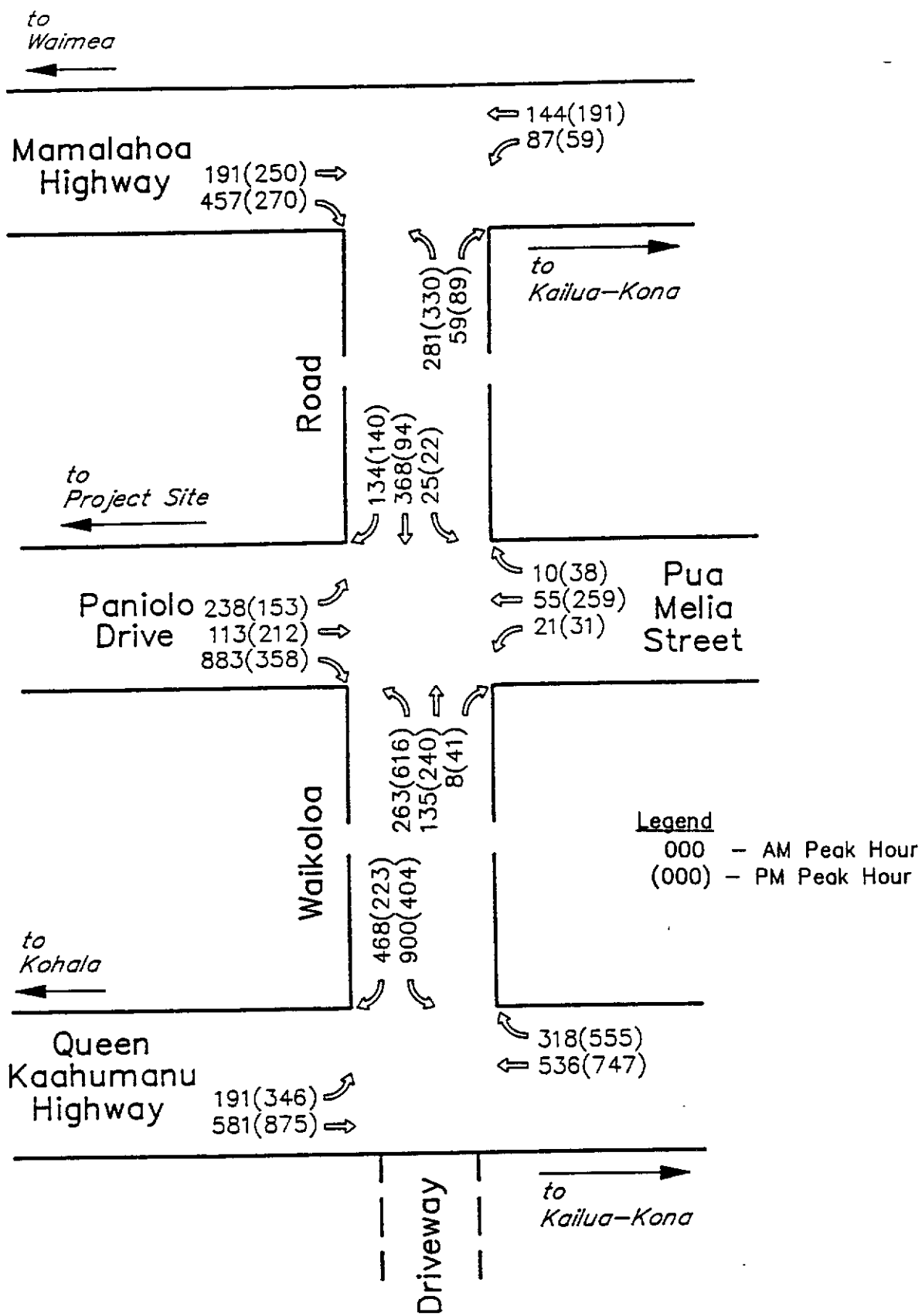
It is assumed that Paniolo Drive will be four lanes wide and will terminate south of the project. The proposed collector roads will form the stem of a T-intersection with Paniolo Drive. At these intersections, the proposed project collector roads will be striped to provide a dedicated left-turn and a dedicated right-turn lane. Dedicated left-turn lanes will also be provided on Paniolo Drive at these collector roads. Roadway cross sections and striping will conform to the County of Hawaii Standard Details R-32, T-9 and T-10 dated September 1984. Preliminary analysis indicates that signalization will not be warranted.

The total estimated project traffic volumes at full development will contribute to the existing regional transportation network, however, at or near overcapacity conditions will exist at peak periods even without the affordable housing project.

Project generated traffic volumes for the affordable housing project were added to the 1997 future traffic volumes (without project), and the assignment is shown in Figure 5-3. Tables 5-3 and 5-4 summarize the levels of service for future traffic conditions with and without the project.

TABLE 5-3
Levels of Service
(Unsignalized Intersection)

	Existing		Future Conditions (Year 1997)			
	A.M.	P.M.	w/o Project		w/Project	
	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.
Queen Kaahumanu/Waikoloa Road						
Westbound						
Left	D	D	F	F	F	F
Right	A	A	D	D	F	E
Southbound Left	A	A	A	C	B	E
Waikoloa Rd./Paniolo Dr./ Pua Melia St.						
Eastbound Left	A	A	A	A	A	C
Westbound Left	A	A	A	A	A	A
Pua Melia St. Approach						
Left	B	B	E	E	F	F
Through	A	A	E	E	F	F
Right	A	A	E	E	F	F
Paniolo Dr. Approach						
Left	A	B	D	E	F	F
Through	A	A	B	D	E	F
Right	A	A	C	A	F	A
Mamalahoia Hwy./Waikoloa Rd.						
Eastbound						
Left	A	A	D	E	E	F
Right	A	A	A	A	A	A
Northbound Left	A	A	A	A	A	A



Source:
Parsons Brinckerhoff Quade & Douglas, 1990

WAIKOLOA AFFORDABLE HOUSING PROJECT MASTER PLAN

For: County of Hawaii Dept. of Housing & Community Development
Hilo, Hawaii
By: R. M. Towill Corporation
Honolulu, Hawaii
October 1990

Figure 5-3:
1997 Traffic Volumes
(w/Project)

TABLE 5-4
Levels of Service
(Two-Lane Highways)

	Existing		Future Conditions (Year 1997)			
	A.M.	P.M.	w/o Project		w/Project	
	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.
Queen Kaahumanu Highway						
North of Waikoloa Rd.	C	C	E	E	E	E
South of Waikoloa Rd.	C	C	E	E	E	E
Mamalahoa Highway						
North of Waikoloa Rd.	C	C	E	E	E	E
South of Waikoloa Rd.	B	B	C	D	C	D

D. Mitigation Measures for Regional Roadway System

For 1997 the capacity of the westbound left turn storage lane at the unsignalized intersection of Queen Kaahumanu Highway and Waikoloa Road would be exceeded even without the affordable housing project traffic. There are two alternatives that could improve operating conditions at this intersection:

- Alternative A: Signalization of this intersection would be warranted based on the Peak-Hour Volume criteria in the Federal Highway Administration's Manual on Uniform Traffic Control Devices (1988) even without the project traffic. Reconstruction of the Queen Kaahumanu Highway and Waikoloa Road intersection would be needed with project traffic to include double left turn bays and a single right turn lane for westbound traffic on Waikoloa Road. A two-phase traffic signal at the Queen Kaahumanu Highway/Waikoloa Road intersection, with these improvements is projected to operate at LOS D or better during the a.m. and p.m. peak hours for 1997 with the proposed project. Note that this alternative is not consistent with current State Department of Transportation Policy.

- Alternative B: Realignment of Waikoloa Road to intersect Queen Kaahumanu at the intersection of Queen Kaahumanu Highway with the Waikoloa Resort access road and construction of a grade-separated interchange at this new cross intersection. This alternative involves constructing Waikoloa Road over or under Queen Kaahumanu Highway with on-ramps and off-ramps. The State Department of Transportation prefers this alternative.

The intersection of Queen Kaahumanu with Waikoloa Road will experience LOS F conditions for southbound left turns from Waikoloa Road as early as 1991; however, completion of a grade-separated interchange is not anticipated before 1995. Interim improvements, such as signalization, would provide additional capacity until an interchange is constructed.

The Mamalahoa Highway/Waikoloa Road intersection may not need to be signalized with the project traffic if the grade-separated interchange is constructed. Construction of the grade separated interchange at Queen Kaahumanu Highway may divert traffic away from the Mamalahoa Highway/Waikoloa Road intersection and lower volumes by providing easier access to Queen Kaahumanu Highway.

The Waikoloa Road/Paniolo Drive/Pua Melia Street intersection will experience over capacity conditions in 1997 with the project traffic. Signalization would also be warranted under Peak-Hour Volume criteria. Reconstruction and signalization of this intersection will be needed to provide sufficient capacity at this intersection. The provision of a separate eastbound left turn lane and use of a westbound through lane for traffic on Waikoloa Road would be adequate to serve the projected volumes. A three-phase traffic signal, with improvements, at this intersection would operate at LOS D or better for both a.m. and p.m. peak hours. However, a north/south collector road mauka or west of and parallel to Paniolo Drive

is proposed. This road which will connect Paniolo Drive with Waikoloa Road west of Paniolo Drive should divert some traffic away from the Waikoloa Drive/Pua Melia Street intersection; completion of the intersection is estimated to be in 1995.

With the proposed improvements described above, the roadway system would have sufficient capacity to serve the project traffic. The County will need to coordinate with other developers who are active in the area so that a coordinated program for regional roadway improvements can be implemented.

5.2 WATER SYSTEM

The Waikoloa Water Company owns the wells, reservoirs and primary transmission mains that supply potable water to Waikoloa Village.

The Waikoloa Water Company's potable water wells draw from the Waikoloa aquifer. These wells, known as Parker wells No. 4 and No. 5, are located at the 1,200 foot level nearly five miles inland from Puako Bay. Both of these wells tap high quality water (25 ppm chloride content).

In addition, a new well, Waikoloa Well No. 1, with a capacity of 2 million gallons per day has recently been completed, and a fourth well, Waikoloa Well No. 2, is under construction. A new 1-million gallon storage tank will also be constructed together with the fourth well.

The combined pumping capacity of the three wells currently in use is 3,000 gallons per minute, or 4.3 million gallons per day and a sustained yield of 2.3 million gallons per day. The fourth well will increase the sustainable yield to 3.4 million gallons per day.

In addition to these potable water wells, the existing water system includes a one million gallon (mg) capacity reservoir near the wells, a transmission main connecting to a second reservoir of 1.0 mg capacity located at the 300 foot elevation above the Queen Kaahumanu Highway and the beach resort. The point of connection to the water system from the project area is an 8-inch main at Paniolo Avenue and Ho'oko Street.

Impacts

If as many as 1,400 units are developed, the project will have an average daily demand of approximately 560,000 gallons. The Waikoloa water system has sufficient capacity to satisfy these demands.

On-site system development costs are estimated to be about \$988,000. Pursuant to Section 23-84 of the Hawaii County Code regulating subdivisions, the following minimum requirements will be complied with for subdivision design and approval:

- Provide a water system designed to deliver water at adequate pressure and volume under peak flow and fire-flow conditions in accordance with the Water System Standards, State of Hawaii, and the Rules and Regulations of the Department of Water Supply. The water system shall include, but not be limited to, the installation of the necessary distribution pipeline, fire hydrants, and service laterals.
- A fee requirement of four-tenths of one percent of the estimated cost for the construction of the water system, but not less than \$25.00, to cover the costs for plan review, testing, and inspection, shall be applied to the overall development costs of the project.

All construction plans for on-site water system improvements are subject to review and approval by Waikoloa Water Company (the Water Company) pursuant to the Water Company's Rules and Regulations. The Water Company shall inspect and approve on-site water improvements as they

are completed.

5.3 WASTEWATER

At present, there is no sewer system in the immediate vicinity of the project area. The nearest sewer system is located approximately 7,000 feet southwest of the project site, and serves the commercial and multi-family areas of Waikoloa Village. The development of the subject project, as well as the development of other sites in the vicinity, will result in the need for a new sewage treatment and disposal system.

Impacts and Mitigation

The existing sewer system is not available for use by the proposed project. Preliminary analysis of the sewer system needs for the project indicates that the project will generate a total average flow of 0.5 million gallons per day (mgd). The proposed on-site improvements will consist primarily of 8-inch and 12-inch gravity lines. Sewage treatment facilities will be provided off-site by Waikoloa Sanitary Sewer Company.

As noted in the Project Description, the new sewage treatment plant is still in the early planning stages. One of the critical environmental issues that will require thorough analysis is the issue of effluent disposal methods and possible adverse impacts on area groundwater resources. This and other issues will be addressed during the detailed planning work for the new sewage treatment plant. This analysis, however is beyond the scope of the present EIS.

All materials and construction of on-site sewer system facilities and appurtenances shall be in accordance with the Department of Public Works of the County of Hawaii's "Standard Specifications for Public Works Construction," dated 1986, and the "Standard Details for Roads, Storm Drains and Sewers," dated 1984, and all subsequent amendments and additions.

All construction plans for wastewater system improvements are subject to review and approval by the Waikoloa Sanitary Sewer Co. (the Sewer Company) prior to construction in accordance with the Sewer Company's rules and regulations. The Sewer Company shall inspect and approve the complete on-site improvements.

5.4 POWER AND COMMUNICATIONS

An existing underground duct bank which contains a 750 MCM cable (14.47 KVY) originates from a substation located mauka of the Waikoloa Village's general store and runs along Paniolo Drive to the project site. Conduits to accommodate cable and telephone lines are also located within this same duct bank.

Impacts and Mitigation

A new electrical substation will be required to service the proposed and other future projects. The cost of a new electrical substation will be in the range of \$1 million. Project power and communications development costs are estimated at approximately \$1.46 million, assuming that these utility systems will be located underground. The increased demand for electrical power will probably be met by oil-fired generating facilities. Geothermal produced electricity may also be a source of energy for the project.

Energy conservation measures should be utilized to help reduce the project's energy requirements. These measures should include: (1) engineering and architectural designs that stress energy conservation, (2) the installation of energy-saving devices such as solar water heating systems, energy efficient refrigeration, and energy efficient lighting.

5.5 SOLID WASTE

The proposed project will generate in the range of 10 tons of solid waste per day at build-out, assuming 1,200 to 1,400 units and 3+ people per unit.

Currently, the solid waste disposal system for West Hawaii has some significant problems. At best, the existing landfill at Kealakehe can be utilized for another two years. The County is currently developing plans on an expedited basis for a new sanitary landfill project, to be located some miles south of the project site.

Existing solid waste transfer stations at Puako and at Kohala are currently operating near capacity. A new solid waste transfer station is being planned at Waikoloa.

Impacts and Mitigation

The proposed project at build-out will generate a significant volume of solid waste which will add to the volumes of refuse being produced by other residential and resort developments in West Hawaii. A new solid waste transfer station will probably be needed to service the project and other area developments. Families living in the County's "affordable housing" project at Waikoloa should be encouraged to participate in waste recycling and other waste volume reduction programs.

5.6 POLICE AND FIRE PROTECTION

5.6.1 Police Protection

The Waimea Police Station provides police protection to a 680 square mile area which includes South Kohala. There are, at present, 4 patrolmen assigned to each 8-hour shift. According to current staffing expansion plans at the Waimea Station, an additional 10 to 12 more people are expected to help meet the district's immediate needs.

Impacts and Mitigation

In order to meet the proposed project's police protection requirements as well as those of the growing regional population, by the year 2000, a new Waikoloa Substation has been recommended to be in service (Captain Lawrence Mahuna, October 31, 1990).

5.6.2 Fire Protection

The Mauna Lani Fire Substation, located 10 miles from Waikoloa, provides fire protection services to an area that stretches from Mahukona to Kona Village, including the project area. Currently, 5 firefighters are assigned to each of three weekly shifts.

Impacts and Mitigation

In order to respond to the proposed project's fire protection requirements as well as those of the growing regional population, the County of Hawaii is planning a new fire station in the Waikoloa area (telecon with Mauna Lani Fire Station representative, October 1990). The schedule for this new facility has not yet been set. In the interim, the project will be served by the Mauna Lani fire substation.

5.7 MEDICAL FACILITIES

The State's Kona Hospital located in Kealahou, provides medical and health care services to the Waikoloa area. This hospital's service area covers Kohala to Hawaiian Oceanview Estates. It is a 75-bed acute care facility which provides a range of services including long-term care, skilled and interim nursing care, obstetrical, pediatrics, laboratory, cat scan, physio- and occupational therapy, chemotherapy, and a 24-hour emergency room. Kona Hospital is currently in the process of expanding its facilities and services to include a surgical suite and new recovery room.

Two other facilities, Kohala Hospital in Kapaau and Lucy Enriquez out-patient services in Kamuela, also provide medical services to the project area.

Impacts and Mitigation

The proposed development will result in an increased population in Waikoloa Village that will require the full range of medical and health care services. The expansion of the Kona Hospital will help meet some of the health care needs of this new residential community. A West Hawaii Regional Health Center is currently being planned in the Kailua-Kona area. North Hawaii Hospital in Kamuela which is a joint-venture between government and private enterprise, is in the process of

development as a full-service, primary care facility.

5.8 SCHOOLS

At present, Waimea Elementary, Waimea Intermediate, and Honokaa High Schools include Waikoloa Village in their educational services area. Both Waimea Elementary and Intermediate Schools, and Honokaa High School are operating beyond capacity and have severe shortages of classrooms, according to the State's Superintendent of Education (August, 1990).

Impacts and Mitigation

The DOE schools cannot accommodate the large additional enrollment growth which will result from the Waikoloa Affordable Housing project and other Waikoloa projects until additional classrooms are built.

Projected enrollment demand by the project is summarized as follows:

<u>School</u>	<u>Projected Grades</u>	<u>Students</u>
Waimea Elementary	K thru 5	425-475
Waimea Intermediate	6 thru 8	175-225
Honokaa High	9 thru 12	275-325

NOTE: Projections are based on a total of 1,400 dwelling units.

The Department of Education is evaluating the offer of approximately 36 acres of land from the Waikoloa Land Company for use as a school site and combined community recreation center. The enrollment projections for the Waikoloa area will be monitored to determine the DOE's timing for constructing new schools in the area.

5.9 RECREATION FACILITIES

The recreational facilities offered in Waikoloa Village are a private golf course and a 4.3-

acre park. The park, which is under construction, is scheduled to be open to the public in September 1991. It is planned to include a soccer field, softball diamond, and playground equipment.

Impacts and Mitigation

The proposed affordable housing development will provide a variety of recreational facilities on the project site: a community park of approximately 9 acres located at the entrance of the development, and a neighborhood park of 7 acres at the makai end of the development. The proposed 36-acre public school site adjacent to the southeast boundary of the proposed project may also offer additional community recreational facilities, such as ballfields.

SECTION 6

*ALTERNATIVES TO
THE PROPOSED ACTION*

6.0 OVERVIEW

The alternatives considered for this evaluation include the "no project" alternative, income mix alternatives and economic range of housing units, and alternative land use concepts. Because the original transfer of this property from Transcontinental Development Company to the County of Hawaii was intended specifically for the purpose of increasing the badly needed affordable housing supply in West Hawaii, there was no doubt that the focus of the County's use of this property was for the development of housing.

6.1 NO ACTION

The "no action" alternative would result in continuation of existing conditions for the Waikoloa project site. The site would most likely continue in its undeveloped condition. However, as surrounding development occurs as part of the overall Waikoloa Village expansion, other uses of this site could occur.

Advantages of the "no action" alternative are few. These advantages include: no further expenditures of resources by public and private agencies; continued non-use of the site; and no adverse impacts on the project site generated by development.

The primary disadvantage of this no-project alternative would be the absence of a planned residential community with a unique mix of affordable housing opportunities to suit lower and low-to-moderate income families. Additionally, losses resulting from this alternative would include lost housing and employment opportunities, as well as lost tax revenues for County and State governments.

6.2 SITE SELECTION

The initial site selection process conducted by Transcontinental Development Company (TDC, the original land owner of the site), involved initially identifying a general area of approximately 580 acres for evaluation and analysis to determine suitability for residential development. The purpose of this site study was to help Transcontinental locate a large enough land area to accommodate a planned affordable residential community.

To determine the best possible location for the affordable housing project site, the 580-acre study area's physical characteristics were assessed-- topography, soils, climate, flora, fauna, archaeological sites, natural hazards, and existing infrastructure. As part of the analysis, site constraints were generally identified, and developable areas were delineated. The result of the analysis provided for the selection of the northern portion or most developable area of the property for the County's housing project.

Even in this selected area, some development constraints exist. Thus, additional land was allocated for the recommended site. A total of 340 acres was set aside, of which 25 acres encompass potential flood plains, 10 acres are steep lands, and 5 acres are for a sewage treatment site. The total net area for the recommended site was thus 300 acres.

6.3 ECONOMIC MIX OF HOUSING UNITS

Maintaining the project's overall economic feasibility while truly providing all of the housing units at affordable rent and sales price levels has been one of the project's major objectives. To theoretically achieve this balance between the County's social objectives and economic viability, numerous cash flow analyses were conducted to reflect different scenarios of economic mixes of types of housing units. Each of the cash flow analyses contained different sets of assumptions regarding varying per square foot building construction costs, dwelling unit sizes, and numbers of units assigned to each intended target group of buyers.

One scenario indicated that total revenues from the sale of 1,000 units would be \$129 million, while total development costs (including building construction, subdivision or on-site development, backbone infrastructure, sales/processing fees, indirect costs for design, management, loan points, contingencies at 15%, and developer's profit at 5% of revenues) are \$132 million. At an annual deficit financing rate of 12%, the deficit after financing will be \$17 million.

The conclusion to this series of analyses and evaluations was that, to a certain extent, modification of certain subdivision standards may result in significant cost savings, and

may further result in more affordable housing. These modifications need, however, to ensure that such cost-saving methods, (1) will not result in health and safety risks; (2) will not result in significant added post-construction maintenance costs for the County and/or for the residents; (3) will not have an adverse visual impact; and, (4) will clearly result in a greater number of affordable houses and/or lower prices for some or all of the homes.

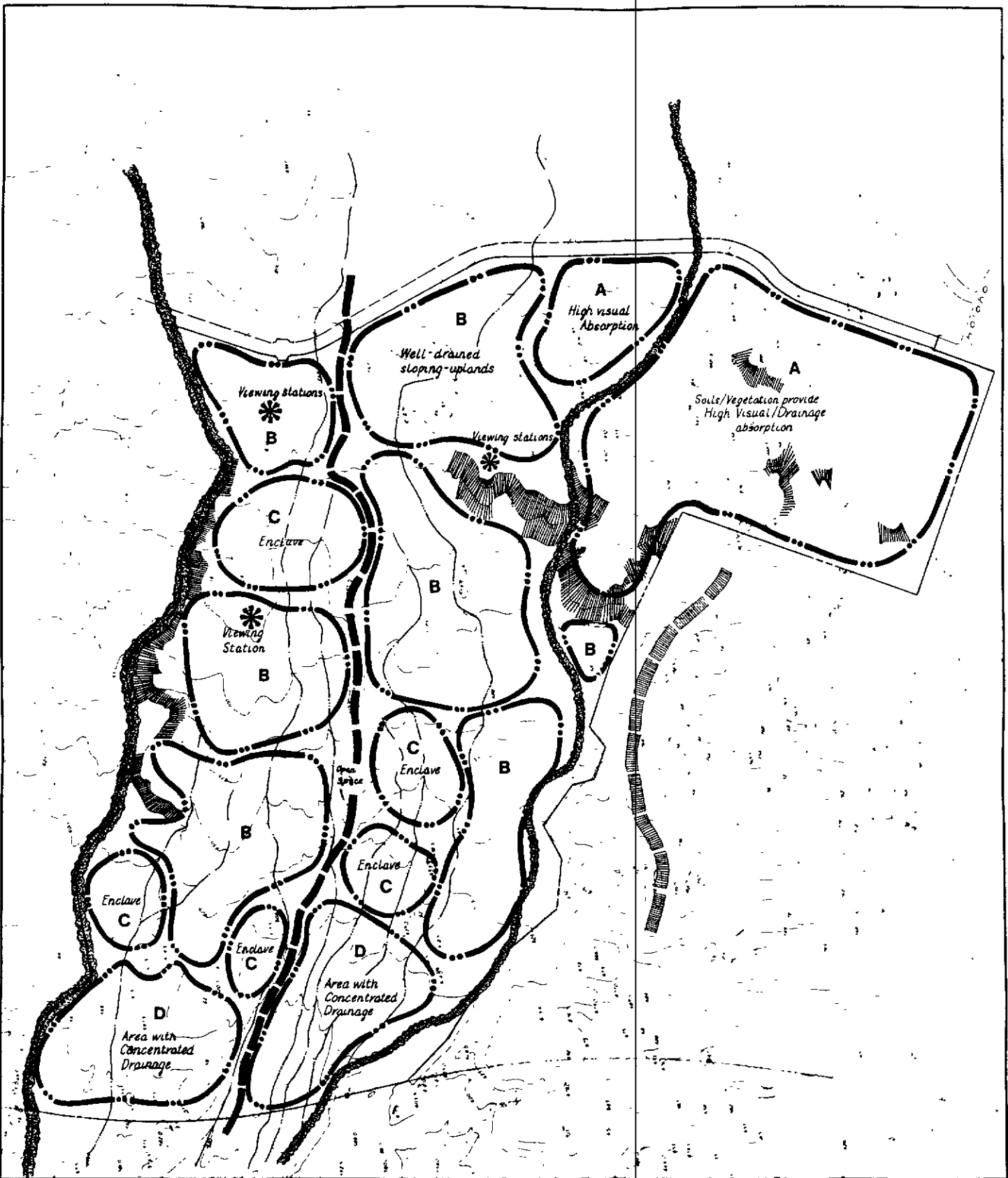
6.4 LAND USES WITHIN THE AFFORDABLE HOUSING PROJECT

Various alternative development concepts were explored during the master plan preparation process. This process involved identification of the opportunities and constraints, which provided the basis for the environmental concept (Figure 6-1). Developable areas excluded steep slopes, primary ridgeline, and major drainageways. These constraints added a new dimension to the overall development concept. The analysis revealed opportunities to enhance the development pattern by incorporating unbuildable areas as buffer areas. Constraints were thus turned into amenities.

The developable areas were grouped into four different general types:

- A) Land type characterized by having soils and vegetation which provide high visual and drainage absorption.
- B) Lands that may be characterized as well-drained sloping uplands.
- C) Enclaves, or valley-like topographic features.
- D) Areas found in the western or makai end of the site -- these are areas of concentrated drainage.

The different site types presented land use planning and development opportunities in the general siting within the project site of the internal collector roadway system, housing sites, neighborhood and community parks, and church/commercial areas.



WAIKOLOA AFFORDABLE HOUSING PROJECT MASTER PLAN

For: County of Hawaii Dept. of Housing & Community Development
 Hilo, Hawaii

By: R. M. Towill Corporation
 Honolulu, Hawaii

NOVEMBER 1989

ENVIRONMENTAL CONCEPT

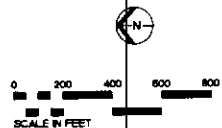


FIGURE 6-1

The general land use planning criteria used were:

- Provide approximately 1,200 multi- and single-family housing units in development clusters averaging 10-20 acres each.
- Provide at least one community park located near Paniolo Drive so that it would be utilized by not only the County project residents, but by adjacent neighborhoods as well.
- Provide an area for "church/convenience commercial" uses that will service the project as well as adjacent neighborhoods.

The Master Land Use Plan was developed based on these guidelines and criteria.

SECTION 7

*RELATIONSHIP TO LAND USE
PLANS AND POLICIES*

7.1 THE HAWAII STATE PLAN

The Hawaii State Plan represents a guide for the future of Hawaii. The State Plan sets forth a broad range of goals, objectives, and policies to serve as guidelines for growth and development of the State and establishes a coordination system between the State and County agencies. Chapter 226, Hawaii Revised Statutes, as amended, 1986, states the following purpose of the State Plan:

"(it) shall serve as a guide for the future long-range development of the State; identify the goals, objectives, policies, and priorities for the State of Hawaii; provide the basis for determining priorities and allocating limited resources, such as public funds, services, manpower, land, energy, water, and other resources; improve coordination of state and county plans, policies, programs, projects, and regulatory activities; and to establish a system for a plan formulation and program coordination to provide for an integration of all major state and county activities."
(Chapter 226-1: Findings and Purpose, HRS)

The proposed project is generally consistent with objectives and policies of the Hawaii State Plan. The following sections analyze relevant goals, objectives, policies and guidelines of the State Plan relative to the proposed project.

A. Section 226-5 Objectives and Policies for Population

The Waikoloa Affordable Housing Project will contribute to the distribution of future growth expectations of the West Hawaii region by providing a well managed community offering a mix of housing types and community support facilities.

B. Section 226-6 Objectives and Policies for the Economy In General

Development of this project will directly benefit the economy in terms of construction, commercial/retail, public institutional, and real estate opportunities.

C. Section 226-12 Objectives and Policies for the Physical Environment - Scenic, Natural Beauty, and Historic Resources

The project will be designed to promote views of the surrounding peaks of Mauna Kea to the east, the Kohala Mountains to the north, and the Kohala coastline to the west. Southeast of the project site are the rolling hills of Waikoloa Village. The south slope of Haleakala Crater on Maui is visible on a clear day.

D. Section 226-13 Objectives and Policies for the Physical Environment - Land, Air and Water Quality

Air quality of the Waikoloa Village area will be impacted by traffic generated from the proposed project and surrounding neighborhoods. Water quality impacts will be minimal due to implementation of an effective potable water system and drainage system.

In some areas of the project site, grading of the land will be needed for roadways and subdivision development. This action will change some of the natural slopes of the site.

E. Section 226-15 Objectives and Policies for Facility Systems - Solid and Liquid Wastes

Wastewater generated from this project will utilize a new sewage treatment plant which will be provided off-site by the Waikoloa Sanitary Sewer Company. Solid waste will be disposed of at the proposed new West Hawaii Sanitary Landfill.

F. Section 226-16 Objectives and Policies for Facility Systems - Water

The proposed project is located within the service area of Waikoloa Water Company, and will utilize the potable water supplied by the wells tapped by this Company.

- G. Section 226-17 Objectives and Policies for Facility Systems - Transportation
The proposed project will add to traffic volumes around the project site. Measures to mitigate the increased traffic include roadway improvements to off-site roadways and intersections.
- H. Section 226-18 Objectives and Policies for Facility Systems - Energy/Telecommunications
Energy and telecommunication facilities necessary for the development of the Waikoloa Affordable Housing Project will be planned and coordinated with the appropriate agencies and public utilities. Energy conservation and the utilization of energy-saving devices will be encouraged through guidelines for designers and developers as well as through homeowner information and orientation programs provided by the County.
- I. Section 226-19 Objectives and Policies for Socio-Cultural Advancement - Housing
The proposed project is designed to accommodate a variety of housing types suited to families with incomes ranging from below 50% of the median income to the Hula Mae qualifying levels. This income range is representative of the general worker population in West Hawaii. The Waikoloa Affordable Housing Project will be consistent with this section by offering a mix of housing types (including gap-group and assisted housing), and costs to suit the needs of a large portion of the housing market. Integral planning of the overall development will provide necessary support facilities for these housing areas.
- J. Section 226-20 Objectives and Policies for Socio-Cultural Advancement - Health
Medical and health care facilities are currently located in Kapaau (North Kohala), Kealahou (Kona), and Kamuela, with emergency services provided by the Kohala Hospital and the Kona Hospital. There are

anticipated increases of medical and health care services and facilities for West Hawaii as the development of the region continues. In the planning stages is a North Hawaii Hospital located in Kamuela. This new 50-60 bed hospital will be a joint venture project between government and private enterprise, and is planned as a full-service facility. Additionally, the abundance of recreational facilities anticipated within the project area will promote "wellness" through physical and mental health.

K. Section 226-21 Objectives and Policies for Socio-Cultural Advancement - Education

The Waikoloa Land Company is in the process of donating a parcel of land to the State Department of Education for the development of a school site to service the Waikoloa Affordable Housing project and the surrounding community. The site is adjacent to the southeastern boundary of the project site. Close cooperation with the Department of Education will be maintained to ensure adequate provision of educational services.

L. Section 226-23 Objectives and Policies for Socio-Cultural Advancement - Leisure

Recreational facilities will be provided within the development offering a variety of activities including a neighborhood park, ballfields, and recreation centers. These facilities, as well as the adjacent school site provide an abundant amount of open space within the project site.

M. Section 226-104 Population Growth and Land Resources Priority Guidelines

Development of the Waikoloa Affordable Housing project will result in the permanent loss of open space as it exists, however, the master plan of the project is designed with open space areas including parks. The proposed urban use of the land is consistent with the State and County land use policies for this site.

The project site was not determined to be environmentally critical in the areas of archaeology, flora, and fauna. Any environmental impacts resulting from development will be mitigated where possible.

N. Section 226-106 Affordable Housing, Priority Guidelines for the Provision of Affordable Housing

The proposed project will incorporate a mix of housing types to include gap group and assisted housing. While other residential development projects attempt to offer a mix of market rate and affordable housing units, the Waikoloa Affordable Housing project is intended to offer all of its units at rental and sales price levels that will be affordable to families in West Hawaii that would otherwise be priced out of the housing market.

7.2 STATE FUNCTIONAL PLAN

The Hawaii State Plan is used as the primary tool for directing the planning process for Hawaii's long-term and short-term goals. Functional plans, created as extensions of the State Plan, are prepared by the appropriate State agencies to specify objectives, policies, and implementation actions of their respective concerns. These plans were reviewed and evaluated with regard to the proposed project. The following are descriptions of functional plans applicable to the proposed project.

7.2.1 Education Plan

This functional plan relates to educational functions, school systems, goals and growth. Topics within the plan are organized under four categories: personal skills and knowledge; employability and economy; social and natural resources; and educational support services.

Development of the Waikoloa Affordable Housing project, as well as neighboring communities, will result in an increased demand for educational facilities for the West Hawaii region. The school site adjacent to the proposed project may include a facility that will accommodate grades K through 8.

7.2.2 Housing Plan

This functional plan, managed by the Housing Finance and Development Corporation, deals with orderly development of housing and expanded housing opportunities for Hawaii's people. Objectives of the functional plan are to:

"develop greater opportunities for Hawaii's people to secure reasonably priced, safe, sanitary, liveable homes located in suitable environments that satisfactorily accommodate the needs and desires of families and individuals";

"assist the orderly development of residential areas sensitive to community needs and other land uses."

An innovative concept of the proposed project is to offer a wide range of housing types with varying costs. The Waikoloa Affordable Housing project will address the need for affordable housing by providing homeownership and rental opportunities to families and individuals with varied income levels. For-sale units will be available to families whose income levels are too low for conventional home buying methods. Housing within the development will include approximately 1,200 units.

7.2.3 Health Plan

The primary purpose of the State Health Plan is to serve as a guide for State and County agencies and the private sector in outlining environment related objectives and health care objectives for Hawaii. This plan, under the jurisdiction of the State Department of Health (DOH), focuses on: "preventing disease and promoting healthful life styles and environmental conditions; ensuring and promoting appropriate provisions and access to health care; protecting society from potential dangers; and enhancing the quality of air, land and water resources and preventing environmental degradation."

Currently, the State's Kona Hospital, located in Kealahou, provides medical and health care services to the Waikoloa area. Two other facilities, Kohala Hospital in Kapaau and the Lucy Enriquez out-patient services in Kamuela, currently provide additional medical

Office of Housing and Community Development

50 Waiulike Drive • Hilo, Hawaii 96720 • (808) 961-8379 • Fax (808) 935-4725



Lorraine R. Inouye
Mayor
Brian T. Nishimura
Housing Administrator

Mr. Norman K. Hayashi

February 28, 1991

-2-

February 28, 1991

Mr. Norman K. Hayashi
Planning Director
25 Aupuni Street
Hilo, Hawaii 96720

Dear Mr. Hayashi:

SUBJECT: Waikoloa Affordable Housing Project
Draft Environmental Impact Statement (EIS)

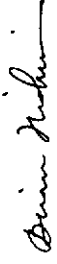
We have received your memorandum of January 7, 1991 concerning the DEIS for the subject project. In view of the detailed nature of your memorandum, we will respond point by point.

1. Page 1-2, Paragraph 3 and Page 1-11: The Final EIS will briefly discuss the County's intention to utilize a pre-emption process for the subject project.
2. Page 1-3: An "Area Map" will be provided in the Final EIS.
3. Page 1-3: The last sentence will be deleted.
4. Page 1-8: Reference will be made to the botanical survey.
5. Page 1-9: The proposed wastewater treatment system will be discussed in the Final EIS. However, as you know, this system is still in the early planning stages.
6. Page 1-10 and Page 5-14: Future power generation facilities will be discussed in the Final EIS, and the approximate cost of the new electrical substation will be noted.
7. Page 1-10 and Section 5: Solid waste collection and disposal will be discussed in the Final EIS.
8. Page 1-11: The list of Necessary Permits and Approvals will be expanded to include "Housing Agency Exemption" (359G, HRS) as well as other permits noted in several other comment letters.

9. Page 2-2: The commercial/church site acreage will be consistently shown as 8.6 acres.
10. Page 2-6: The Final EIS will include a more detailed discussion of drainage system options.
11. Page 3-5: The text should read: "Mamalahoa Highway."
12. Page 3-10: The occurrence of strong winds will be noted.
13. Page 5-2: A second access road will be available if and when the proposed new "North-South" collector road is constructed. This possibility will be mentioned in the Final EIS.
14. Page 5-4: The traffic study used the higher number of "1,400 units" in order to be on the conservative side. With respect to your comments on the absorption rate of 200 or more units per year, we believe that this rate can be achieved, given the fact that all of the units to be constructed here will be affordable.
15. Page 5-8: The headings for Table 5-3 will be properly aligned.
16. Page 5-10: The fact that signalization of Queen Kaahumanu Highway at Waikoloa Road is inconsistent with current State DOT policy will be noted in the Final EIS.
17. Page 5-11: The requirement for an interchange to be constructed by the Waikoloa Land Co. will be noted in the Final EIS.
18. Pages 5-16: The need for new schools will be addressed in the Final EIS.
19. Pages 7-9 and 7-10: New zoning district designations will not be required, as the project will be implemented as an "Experimental and Demonstration Housing Project."

We appreciate the thoroughness of your review and thank you for your participation in the planning stages of this project.

Very truly yours,


Brian Nishimura
Housing Administrator



EQUAL HOUSING OPPORTUNITY

DEPARTMENT OF PUBLIC WORKS

COUNTY OF HAWAII
HILO, HAWAII

RMT	YES		
DK	BT		
RYK	RT		
			BT
REC'D	JAN 6 1991	RMTC	
GSV			
DKM			

Memorandum

DATE January 4, 1991

Planning Department
Page 2
January 4, 1991
Maikoloa Affordable Housing Project Draft EIS

TO : Planning Department

FROM : Robert K. Yanabu, Division Chief, Engineering Division *[Signature]*

SUBJECT: MAIKOLOA AFFORDABLE HOUSING PROJECT DRAFT EIS
Location: Maikoloa, South Kohala, Hawaii
TMK: 6-8-02:31

We have reviewed the subject draft EIS and our comments are as follows:

SOLID WASTE

1. Impacts of solid waste generation need to be addressed.
 - a. The nearest transfer station is at Puako and is presently operating near capacity.
 - b. The two other transfer stations in Kohala are also operating near capacity.
 - c. The stated 15 tons/day refuse volume would more than double the refuse hauling of at least two refuse trailers per day. The typical County refuse trailer has a capacity of about 16 tons but normally carries about 12 tons due to the varying density of refuse.
2. The cost of hauling and landfilling of all construction wastes must be included in the cost of development.

TRAFFIC

3. Intersections affected by this project are Maikoloa/Paniolo, Maikoloa/Mamalahoa, and Maikoloa/Queen Kaahumanu Highway. From the report, these intersections will be over capacity in the near future without the project. The Maikoloa/Paniolo intersection is proposed to be improved and signalized by Maikoloa Development Company in conjunction with the Highlands Golf Estates project. The Queen Kaahumanu and Mamalahoa intersections with Maikoloa Road are under the jurisdiction of the State Dept. of Transportation and required improvements to these intersections should be addressed by them. The EIS should address definite commitments for necessary improvements at all these intersections to resolve the over-capacity conditions.

DRAINAGE

4. Drainage impact analysis and proposed drainage systems meets with our approval.

We also recommend as an alternative to the proposed channel along the lower or west side of Pantolo Avenue, a channel be considered along the mauka boundary of future developments mauka of the Maikoloa Affordable Housing property.

WASTEWATER

5. No comments to offer.

ELECTRICAL/TELEPHONE

6. In general all underground electrical and telephone lines within dedicable roadways shall be concrete jacketed with the exception of telephone service laterals.

GO:st

cc: OHGD
R.M. Towill
State, Office of Environmental Quality Control



Planning Department

25 Aupuni Street, Room 109 • Hilo, Hawaii 96720 • (808) 961-8288

Lorraine R. Inouye
Mayor
Norman K. Hayashi
Director
Tad Nagasako
Deputy Director

February 26, 1991

Mr. Robert K. Yanabu
Chief, Engineering Division
Dept. of Public Works
County of Hawaii
25 Aupuni Street
Hilo, Hawaii 96720

Dear Mr. Yanabu:

SUBJECT: Waikoloa Affordable Housing Project
Draft Environmental Impact Statement (EIS)

We have received your memorandum of January 4, 1991 on the DEIS for the subject project.

Impacts relating to solid waste generation will be addressed in the Final EIS. The Final EIS will also address intersection improvements in more detail. However, definite commitments for intersection improvements will have to be coordinated with other development entities who are or will be active in the Waikoloa Village area.

Your suggestions on drainage and electrical/telephone lines will be incorporated into the Final EIS.

Thank you for your participation in the planning stages of this project.

Very truly yours,

Norman K. Hayashi
Planning Director



DATE	FILE	RECD	INITIALS
JAN 22 1991	100		ST
IN	OUT	GENY	D-11

County of Hawaii
January 22, 1991
Page Two

January 22, 1991

County of Hawaii
Planning Department
Attn: Mr. Norman Hayashi
25 Aupuni Street
Hilo, Hawaii 96720

RE: Environmental Impact Statement
Waikoloa Affordable Housing Project

Gentlemen:

The proposed project falls within the designated service zones approved by the Public Utilities Commission for the private utility companies Waikoloa Water Company (WVC) and Waikoloa Sanitary Sewer Co. (WSSC). As such, development within this project will be subject to the approved Rules and Regulations of these two companies.

Certain amendments to the tariff structures of the Rules and Regulations were made by separate agreement between Waikoloa Development Co. and the County. However, WVC and WSSC continue to have approval obligations for all utility plans within this project. As such, we request that the following addition be made to Section 1.7, page 1-11:

C. Other

Waikoloa Water Company:	Water Master Plan Approval; Subdivision Improvement Drawing Approval
Waikoloa Sanitary Sewer Co.:	Sewer Master Plan Approval; Subdivision Improvement Drawing Approval

and in Section 5.2, page 5-13, that a third paragraph under IMPACTS be added, as follows:

- All construction plans for on-site water system improvements are subject to review and approval by Waikoloa Water Company (the Water Company) pursuant to the Water Company's Rules and Regulations. The Water Company shall inspect and approve on-site water improvements as they are complete.

and in Section 5.3, WASTEWATER, on page 5-14, add a second and third paragraph under IMPACTS and Mitigation:

- All materials and construction of on-site sewer system facilities and appurtenances shall be in accordance with the Department of Public Works of the County of Hawaii's "Standard Specifications for Public Works Construction," dated 1986, and the "Standard Details for Roads, Storm Drains and Sewers," dated 1984, and all subsequent amendments and additions.

- All construction plans for wastewater system improvements are subject to review and approval by the Waikoloa Sanitary Sewer Co. (the Sewer Company) prior to construction in accordance with the Sewer Company's Rules and Regulations. The Sewer Company shall inspect and approve the complete on-site improvements.

Further, you should be aware of water system expansions that have been completed and which are presently not reflected in the DEIS. Waikoloa Well No. 1, with a capacity of 2 million gallons per day, has been completed and is in service. This should be included in Section 2.3.2, Water Systems, on page 5-12. The combined pumping capacity of the three wells is 3,000 gallons per minute, or 4.3 million gallons per day, resulting in a sustained yield of 2.3 million gallons per day. A fourth well, known as Waikoloa Well No. 2, is under construction and, when complete, will increase the sustainable yield to 3.4 million gallons per day. An additional 1 million gallon storage tank will also be completed coincident with the fourth well. Both will be in service in the first quarter of 1991.

County of Hawaii
January 22, 1991
Page Three



Planning Department

25 Aupuni Street, Room 109 • Hilo, Hawaii 96720 • (808) 961-8288

Lorraine R. Inouye
Mayor
Norman K. Hayashi
Director
Tad Nagasaki
Deputy Director

Thank you for your consideration of our comments.

Sincerely,

Stephen D. Hicks
General Manager / Vice President
Waikoloa Water Company and
Waikoloa Sanitary Sewer Co.

February 26, 1991

Mr. Stephen D. Hicks
General Manager/Vice President
Waikoloa Water Company and
Waikoloa Sanitary Sewer Co.
HCOZ Box 5050
Waikoloa, Hawaii 96743

SH:ac

cc: Mr. Ken Melrose
Director of Planning
Waikoloa Development Co.
P. O. Box 3028
Waikoloa, Hawaii 96743

Mr. Brian Nishimura, Administrator
Office of Housing and Community Development
County of Hawaii
50 Wailuku Drive
Hilo, Hawaii 96740

Office of Environmental Quality Control
465 South King Street, Room 104
Honolulu, Hawaii 96813

Ms. Colette M. Sakoda
Senior Planning
R. M. Towill Corporation
420 Waiakamilo Road, Suite 411
Honolulu, Hawaii 96817-4941

Dear Mr. Hicks:

SUBJECT: Waikoloa Affordable Housing Project
Draft Environmental Impact Statement (EIS)

We have received your letter of January 22, 1991 on the DEIS for the subject project.

The Final EIS will include a listing of approvals needed from the Waikoloa Water Company and from the Waikoloa Sanitary Sewer Company. Your suggested additions to the sections on water system and wastewater system impacts will also be incorporated in the Final EIS, as well as the updated information on your recent water system expansions.

Thank you for your participation in the planning stages of this project.

Very truly yours,

Norman K. Hayashi
Planning Director



University of Hawaii at Manoa

Environmental Center
Unit of Water Resources Research Center
1960 Ford 317 • 2550 Campus Road
Honolulu, Hawaii 96822
Telephone (808) 956-7361

January 7, 1991
RE:0569

RMTC	DK	RYK	REC'D JAN 11 1991	RMTC
GSY	DWH			

Mr. Duane Kanuha
Planning Department
County of Hawaii
25 Aupuni Street
Hilo, Hawaii 96720

Dear Mr. Kanuha:

Draft Environmental Impact Statement
Waikoloa Affordable Housing Project
South Kohala, Hawaii

The above mentioned project includes a Master Plan Development of approximately 1200 single family housing units, church/commercial areas, and recreational facilities on 279 acres.

The Environmental Center has reviewed this EIS with the assistance of Michael Graves, Anthropology; Joseph Halbig, UH Hilo/Geology; and Lee Lyttle, Environmental Center.

General Comments

Our reviewers were concerned about the general low quality of this EIS. The impact analysis in many sections were speculative and incomplete. While we appreciate the need for cost containment in the development of affordable housing projects, the quality of environmental analysis should not be compromised as a cost saving measure. It is hoped that the Final EIS will show an improvement in the level of analysis.

Noise (page 3-16)

The analysis is vague and unspecific. What are the anticipated construction related noise levels? Will neighboring homes be affected during early morning or evening hours?

Mr. Duane Kanuha
January 7, 1991
Page 2

Historic and Archaeological Resource (page 3-24)

Our reviewers felt that the archaeological survey is insufficient. Too little time was spent in the field for an adequate search. No field map was prepared for the report. The discussion of the survey methodology is also inadequate. The finding of no archaeological sites is highly suspect, since other sites along the Waimea-Kawaihae road corridor exist at the same elevation (see "Archaeological Investigations of the Mudlane-Waimea-Kawaihae Road Corridor, Island of Hawaii" edited by J.T. Clark and P.V. Kirch, 1983, Departmental Report Series, 83-1. Bishop Museum).

Water System (page 5-13)

There is no discussion on the impact of this proposal on the capacity of the water system. How much water will the proposal require, and how will this affect the system's capacity?

Wastewater (page 5-14)

Where 'off-site' will the waste water be carried? What are the characteristics and capacity of that facility? How will this proposal's wastewater discharge requirements impact it and other area users?

Fire Protection (page 5-15)

What is the timing of the construction of the new fire station mentioned in this section vis-a-vis the construction of this project? Is adequate fire protection dependant upon this new facility?

Unresolved Issues (page 9-1)

The Kamakoa Gulch floodplain drainage study should have been a part of this Draft EIS. The Final EIS should include not merely the 'preliminary findings' of this study, but the final boundary demarkations, particularly if some elements of the project are to be constructed in or near the floodplain.

Thank you for the opportunity to comment on this document.

Yours truly,

John T. Harrison, Ph.D.
Environmental Coordinator

cc: OEQC
Office of Housing and Community Development
R.M. Towill Corp.
Roger Fujioka
Joseph Halbig
Michael Graves
Lee Lyttle



Planning Department

25 Aupuni Street, Room 109 • Hilo, Hawaii 96720 • (808) 961-8288

Lorraine R. Inouye
Mayor
Norman K. Hayashi
Director
Tad Nagasaki
Deputy Director

February 26, 1991

Mr. John T. Harrison, Ph.D.
Environmental Coordinator
University of Hawaii at Manoa
Environmental Center
Crawford 317 - 2530 Campus Road
Honolulu, Hawaii 96822

Dear Dr. Harrison:

SUBJECT: Waikoloa Affordable Housing Project
Draft Environmental Impact Statement (EIS)

We have received your letter of January 7, 1991 on the DEIS for the subject project.

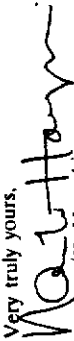
The Final EIS will provide more details on proposed facilities and probable impacts, including a more detailed description of subjects mentioned in your letter: Noise, Water System, Wastewater, Fire Protection, and Flooding.

Your comments on the archaeological survey have been noted. However, please refer to the comment letter from the Department of Land and Natural Resources (DLNR), dated January 10, 1991. DLNR states that "we agree that construction of this planned housing development is likely to have "no effect" on historic sites."

On the subject of the "Kamakoa Gulch floodplain drainage study," we agree that such a study is an important element in the planning process. However, the detailed drainage study that is needed for Kamakoa Gulch cannot be undertaken until detailed topographic data are available, and until an overall strategy for drainage management has been resolved for the several developments that are being planned in this area of Waikoloa. At this time, both the topographic data and the drainage management discussion are in process. Thus, conclusions cannot yet be documented in the Final EIS. Please be assured, however, that the Final Master Plan and subsequent design plans for the subject project will incorporate the findings and recommendations of the detailed drainage study.

Thank you for your participation in the planning stages of the project.

Very truly yours,


Norman K. Hayashi
Planning Director

Lorraine R. Inouye
Mayer
Norman K. Hayashi
Director
Tad Nagasako
Deputy Director

Planning Department

25 Aupuni Street, Room 109 • Hilo, Hawaii 96720 • (808) 961-8288



ALEXIS T. LUM
MAJOR GENERAL
ADJUTANT GENERAL
MAJES M. MARAISHI
COLONEL
DEPUTY ADJUTANT GENERAL

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February 26, 1991

Engineering Office

Mr. Jerry Matsuda
Lieutenant Colonel
Hawaii Air National Guard
Contracting and Engineering Officer
Office of the Adjutant General
Dept. of Defense
3949 Diamond Head Road
Honolulu, Hawaii 96816-4495

County of Hawaii Planning Dept.
25 Aupuni Street
Hilo, Hawaii 96720

Attn: Mr. Duane Kanuha

Gentlemen:

Waikoloa Affordable Housing Project DEIS

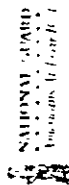
Thank you for providing us the opportunity to review the above subject project.

We have no comments to offer at this time regarding this project.

Sincerely,

Jerry M. Matsuda
Jerry M. Matsuda
Lieutenant Colonel
Hawaii Air National Guard
Contracting & Engineering Officer

cc: Mr. A. Scott Letthead,
County of Hawaii
Office of Housing & Community Development
✓ Ms. Colette Sakoda,
R.M. Towill Corporation



SUBJECT: Waikoloa Affordable Housing Project
Draft Environmental Impact Statement (EIS)

We have received your letter of November 28, 1990 indicating that you have no comments on the DEIS for the subject project. Thank you for your participation in the planning stages of this project.

Very truly yours,

Norman K. Hayashi
Norman K. Hayashi
Planning Director

Lorraine R. Inouye
Mayor
Norman K. Hayashi
Director
Tad Nagasako
Deputy Director



Planning Department

25 Aupuni Street, Room 109 • Hilo, Hawaii 96720 • (808) 961-8288

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NOV 29 1990

County of Hawaii
Planning Department
25 Aupuni Street
Hilo, Hawaii 96720

Attention: Mr. Duane Kanuha

Gentlemen:

Subject: Waikoloa Affordable Housing Project
Draft EIS

Thank you for the opportunity to review the subject document. We have no comments to offer.

Should there be any questions, please contact Mr. Ralph Yukumoto of the Planning Branch at 548-7192.

Very truly yours,

Teuane Tominaqa
TEUANE TOMINAGA
State Public Works Engineer

RY:jk
cc: County of Hawaii, Office of Housing and
Community Development
✓ R. M. Towill Corporation
Office of Environmental Quality Control

February 26, 1991

Mr. Teuane Tominaqa
State Public Works Engineer
Dept. of Accounting and
General Services
State of Hawaii
P.O. Box 119
Honolulu, Hawaii 96819

Dear Mr. Tominaqa:

SUBJECT: Waikoloa Affordable Housing Project
Draft Environmental Impact Statement (EIS)

We have received your letter of November 29, 1990 indicating that you have no comments on the DEIS for the subject project. Thank you for your participation in the planning stages of this project.

Very truly yours,

Norman K. Hayashi
Norman K. Hayashi
Planning Director



STATE OF HAWAII
DEPARTMENT OF BUSINESS, ECONOMIC DEVELOPMENT & TOURISM
LAND USE COMMISSION
Room 184, Old Federal Building
335 Merchant Street
Honolulu, Hawaii 96813
Telephone: 548-4611

ESTHER UEDA
EXECUTIVE OFFICER



Planning Department

25 Aupuni Street, Room 109 • Hilo, Hawaii 96720 • (808) 961-8298

Lorraine R. Inouye
Mayor
Norman K. Hayashi
Deputy Director
Tad Nagasako
Deputy Director

January 7, 1991

Mr. Brian T. Nishimura
Administrator
Office of Housing and Community
Development
50 Walluku Drive
Hilo, Hawaii 96720

Dear Mr. Nishimura:

Subject: Waikoloa Affordable Housing Project DEIS

We have reviewed the draft EIS on the proposed Waikoloa Affordable Housing Project. We have no comments to offer at this time except to confirm that the subject property is in the State Land Use Urban District

Thank you for the opportunity to comment on this matter.

Sincerely,

ESTHER UEDA
Executive Officer

March 13, 1991

Ms. Esther Ueda
Executive Officer
Land Use Commission
335 Merchant Street
Room 104
Honolulu, Hawaii 96813

Dear Ms. Ueda:

SUBJECT: Waikoloa Affordable Housing Project
Draft Environmental Impact Statement (EIS)

We have received your letter of January 4, 1991 indicating that you have no comments on the DEIS for the subject project except to confirm that the subject property is in the State Land Use Urban District. Thank you for your participation in the planning stages of this project.

Very truly yours,

Norman K. Hayashi
Planning Director

Lorraine R. Inouye
Mayor
Norman K. Hayashi
Director
Tad Nagasako
Deputy Director

Planning Department

25 Aupuni Street, Room 109 • Hilo, Hawaii 96720 • (808) 961-8288



OFFICE OF STATE PLANNING

Office of the Governor
STATE CAPITOL HONOLULU HAWAII 96813 TELEPHONE (808) 546-5983

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December 24, 1990

February 26, 1991

Mr. Harold S. Masumoto
Director
Office of State Planning
Office of the Governor
State Capitol
Honolulu, Hawaii 96813

Dear Mr. Masumoto:

SUBJECT: Waikoloa Affordable Housing Project
Draft Environmental Impact Statement (EIS)

We have received your letter of December 24, 1990 indicating that you have no comments on the DEIS for the subject project. Thank you for your participation in the planning stages of this project.

Very truly yours,

Norman K. Hayashi
Planning Director

County of Hawaii
Planning Department
25 Aupuni Street
Hilo, Hawaii 96720

Attention: The Honorable Norman Hayashi
Planning Director

Gentlemen:

SUBJECT: Draft Environmental Impact Statement
Waikoloa Affordable Housing Project
Waikoloa, South Kohala, Hawaii
November 1990

It is our understanding that the Office of Housing and Community Development (OHCD) of the County of Hawaii is proposing to develop an affordable residential development on 340 acres in Waikoloa Village. Approximately 1,200 single- and multi-family housing units are proposed either for rent or sale.

According to page 7-8 of the DEIS, the entire proposed project site lies within the State Urban District. Therefore we do not have any comments to offer at this time.

Thank you for the opportunity to comment.

Sincerely,

Harold S. Masumoto
Director

cc: IHHC
County of Hawaii, OHCD
✓ R.M. Towill Corporation



STATE OF HAWAII
OFFICE OF ENVIRONMENTAL QUALITY CONTROL
465 SOUTH KING STREET, ROOM 109
HONOLULU, HAWAII 96813

January 4, 1991

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The Honorable Duane Kanuha
Director
County of Hawaii
Department of Planning
25 Aupuni Street
Hilo, Hawaii 96720

Dear Mr. Kanuha:

SUBJECT: WAIKOLOA AFFORDABLE HOUSING PROJECT:
DRAFT ENVIRONMENTAL IMPACT STATEMENT

We have reviewed the document listed above and have no comments to offer at this time.

Thank you for the opportunity to submit comments on this project.

Sincerely,

Bruce S. Anderson

Bruce S. Anderson, Ph.D.
Acting Director

cc: A. Scott Leithead
Colette Sakoda

Bruce S. Anderson, Ph.D.
Acting Director
TELEPHONE NO.
548-8915



Planning Department

25 Aupuni Street, Room 109 • Hilo, Hawaii 96720 • (808) 961-8288

Lorraine R. Inouye
Mayor
Norman K. Hayashi
Director
Ted Nagasaki
Deputy Director

February 26, 1991

Bruce S. Anderson, Ph.D.
Acting Director
Office of Environmental Quality Control
State of Hawaii
465 South King Street, Rm. 104
Honolulu, Hawaii 96813

Dear Dr. Anderson:

SUBJECT: Waikoloa Affordable Housing Project
Draft Environmental Impact Statement (EIS)

We have received your letter of January 4, 1991 indicating that you have no comments on the DEIS for the subject project. Thank you for your participation in the planning stages of this project.

Very truly yours,

Norman K. Hayashi

Norman K. Hayashi
Planning Director

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STATE OF HAWAII
DEPARTMENT OF EDUCATION
P O BOX 1580
HONOLULU, HAWAII 96810

OFFICE OF THE SUPERINTENDENT

December 12, 1990

Mr. Duane Kanuha -2- December 12, 1990

Mr. Duane Kanuha
Planning Director
Planning Department
County of Hawaii
25 Aupuni Street
Hilo, Hawaii 96720

Dear Mr. Kanuha:

SUBJECT: Draft Environmental Impact Statement
Waikoloa Affordable Housing Project
Waikoloa, South Kohala, Hawaii
TMK: 6-8-02:31 and por 26

Our review of the subject report indicates that the proposed project of 1,200 single and multiple family units may have the following enrollment impact on the two schools listed below:

School	Grades	Projected Enrollment
Waimea Elementary/	K-5	425 - 475
Waimea Intermediate	6-8	175 - 225
Honokaa High	9-12	275 - 325

We agree with section 5.7 (Schools) which states that both schools are operating beyond capacity and have severe shortages of classrooms. We must emphasize that the schools cannot accommodate the additional enrollment until additional classrooms are built.

Honokaa High already has limited space for expansion and also requires the replacement of old wooden buildings. A new elementary school serving grades K-5 will need to be considered in the Waikoloa area if this project is developed. Additional Legislative funds will be required to address the need for more classrooms.

We request that no conditions be imposed for off-site infrastructure requirements by the County as conditions for building permits. We are having critical funding problems for classroom building projects because of added County requirements.

The Department of Education needs to be kept informed of plans for the development to allow for the timely addition of classrooms.

Please contact the Facilities Branch at 737-4743 if there are any questions.

Sincerely,

Charles T. Toguchi
Superintendent

CTT:jf/s

cc: E. Imai
A. Garson
Ofc. of Housing & Community Development
County of Hawaii
M. M. Towill Corporation



Planning Department

25 Aupuni Street, Room 109 • Hilo, Hawaii 96720 • (808) 961-8288

Lorraine R. Inouye
Mayor
Norman K. Hayashi
Director
Ted Nagasaki
Deputy Director

February 26, 1991

Mr. Charles T. Toguchi
Superintendent
State of Hawaii
Department of Education
P.O. Box 2360
Honolulu, Hawaii 96804

Dear Mr. Toguchi:

SUBJECT: Waikoloa Affordable Housing Project
Draft Environmental Impact Statement (EIS)

We have received your letter of December 12, 1990 on the DEIS for the subject project.

We agree that a new elementary school serving grades K-5 will be needed in the Waikoloa area. This new school would serve the subject project and other existing and planned residential neighborhoods in the Waikoloa area.

Your concern relating to conditions for off-site infrastructure requirements has been noted. However, the County cannot respond to this request within the context of this EIS process.

We will certainly keep you informed as the subject project moves ahead, and we thank you for your participation in the planning stages of this project.

Very truly yours,

Norman K. Hayashi
Planning Director



**DEPARTMENT OF BUSINESS,
ECONOMIC DEVELOPMENT & TOURISM**

JOHN WAJAE
DIRECTOR
ROGER A. LEE
DEPUTY DIRECTOR
BARBARA LEM STANTON
DEPUTY DIRECTOR
LESLIE S. MATSUBARA
DEPUTY DIRECTOR

ENERGY DIVISION, 338 MECHANI ST. RM. NO. HONOLULU, HAWAII 96813 PHONE (808) 548-4000 FAX (808) 531-5243

County of Hawaii Planning Department
Page Two
January 7, 1991

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January 7, 1991

County of Hawaii Planning Department
25 Aupuni Street
H110, Hawaii 96720

Attention: Mr. Norman Hayashi

Dear Mr. Hayashi:

Subject: Draft Environmental Impact Statement (DEIS)
for Waikoloa Affordable Housing Project

The Energy Division has received the above DEIS and has the following comments.

We note that the proposed project will result in a significant increase in electrical energy demand: a peak demand of about 3 megawatts and an average annual demand of about 15 million kilowatt-hours (Appendix F, pages 20-21). The DEIS suggests that the increased demand will probably be met by oil-fired generating facilities and does not mention the possibility of geothermal-produced electricity as a source of energy for the project. Given the fact that considerable activity is underway to develop geothermal power on the island of Hawaii, it should be mentioned as a likely source of electricity for the project.

Absent in this DEIS is any mention of energy conservation issues that should be addressed. The Energy Division would like to see language in the Final Environmental Impact Statement (FEIS) that commits the County of Hawaii to the use of energy conservation measures to help meet the project's energy requirements. In particular, we would like to see the FEIS indicate that the County will (1) require the project's design architects and engineers to include energy conservation measures in their designs, and (2) require the installation of solar water heating systems, heat pumps or the most efficient conventional water heating technology, and energy efficient refrigeration and lighting to the maximum extent possible.

Also, we recommend that the County adopt "energy efficiency design guidelines" for this project. We are enclosing the following for the County's consideration: (1) energy efficiency design guidelines which the Energy Division prepared for the Housing Finance and Development Corporation (HFDC) and which were included in HFDC's request for proposals for villages two and three of the Villages of Kapolei, and (2) calculations by our consultant, Peter Flachsbart, showing the positive impacts that installation of solar water heaters and heat pumps would have on home buyers at Kapolei.

In addition, we note that in Section 7, neither the State's goals, objectives, and policies for energy as set out in the Hawaii State Plan, nor the State Energy Functional Plan is mentioned. We recommend that the FEIS examine the proposed project for consistency with the energy provisions of both of the above plans. The requirement for such an examination is spelled out in the enclosed excerpt from the OEQC Bulletin. We are also enclosing the relevant portion of Act 319 of the 1990 Legislature which amends Section 226-18(c), Hawaii Revised Statutes.

Thank you for the opportunity to provide comments.

Sincerely,

Maurice H. Raya
Energy Program Administrator

MHK/PE:do
Enclosures

cc: A. Scott Leithead
Collette Sakoda
OEQC

DESIGN GUIDELINES - ADDENDUM NO. 1

ENERGY EFFICIENCY DESIGN GUIDELINES

To minimize the life cycle energy use and life cycle cost of the project while maintaining the project development objectives of cost effectiveness, health, safety, security and aesthetics, the following guidelines should be considered and, where applicable, incorporated into the project plans.

- 1.0 Site Planning and Landscaping
- 1.1 Orient streets to provide an east/west orientation for the long dimension of the houses to minimize heat gains in the morning and afternoon.
- 1.2 Incorporate pedestrian walkways and bikeways to encourage walking and bicycling between home, school, parks and commercial areas.
- 1.3 Select and place landscape materials on the site to provide shading to minimize heat gains in the morning and afternoon.
- 1.4 Minimize exterior paved surfaces that are not shaded by trees, awnings, trellises, roofing or house.
- 1.5 Provide for enclosed yard areas where clochehouses could be utilized.
- 1.6 Incorporate drip irrigation where appropriate, and automatic irrigation system to conserve water.
- 1.7 Select drought-tolerant landscape materials where appropriate to reduce the need for water and energy consumption associated with landscape maintenance.

2.0 Building Design

- 2.1 Use operable windows to allow cross ventilation in every room, and orient openings toward prevailing winds.
- 2.2 Utilize eaves (minimum 30"), louvers, trellises, or shade screens to shade windows, especially on west, south and east sides.
- 2.3 Ventilate attic with devices such as louvers or near the roof ridge to reduce attic heat buildup and resultant heat transfer to living areas.
- 2.4 Install a radiant barrier (reflective foil-faced kraft paper material or similar product) in the attic to reduce heat gain into the house attic. Typically installed at the underside of the

roof rafters on the top side of the ceiling joists per manufacturer's recommendations.

- 2.5 Use light colored finishes on roof and wall to reflect sunlight.
- 3.0 Mechanical Equipment and Systems
- 3.1 Consider use of heat pump water heaters.
- 3.2 Consider use of solar water heater or provide for future installation by pre-plumbing and running power and control wiring.
- 3.3 Utilize the most efficient refrigerators, clothes dryers, and dishwashers.
- 3.4 Install ceiling fans or provide for future installation.
- 3.5 Use time switches to cut off electricity when not needed to high-usage applications or equipment such as electric water heater.
- 3.6 Install fluorescent lights with high efficiency ballasts.
- 3.7 Use low water consumption water closets.
- 3.8 Install flow restrictors on showers and other water uses which can have high flow rates.

IMPACTS OF H. B. 3299 ON HOME BUYERS

by
Peter G. Flachsbart, Ph.D.

June 23, 1990

HB 3299 allows homeowners to take a 35% (up to \$1,750) tax credit for installation of a solar hot water system and a 20% (up to \$400) tax credit for installation of a heat pump. This report summarizes the financial impacts that this legislation could have on home buyers. Impacts are shown for a family of four that buys a home at Kumu Iki Village in Kapolei. These homes, which will have gas water heaters and ranges, are used as the baseline case for home prices, qualifying incomes and energy consumption (i.e. 445 kwh/mo. and 25.6 therms/mo.) Table I shows the financial impacts if Kumu Iki buyers install energy-saving equipment. Table II shows the impacts if all-electric appliances are provided in a future Kapolei increment.

Methodology

At Kumu Iki Village, a family of four would consume 585 kwh/mo. if their home had a heat pump and 485 kwh/mo. if it had a solar system. To accommodate the energy improvements, electric water heaters would replace the gas units. The range would consume 3.4 therms/mo. if it was gas and 55 kwh/mo. if electric. The family would pay 83.4¢/kwh and \$1.20/therm plus the \$6/mo. service charges. Utility rates would increase an average 4%/year. The family would need an 80 gal tank for either the heat pump or solar system, and the combined solar panels would be 48 square feet. Installed cost would be \$2,000 for the heat pump and \$4,000 for the solar system.

Affordable housing (\$89,000-\$120,000) would require FHA/Hula line financing, mid-level market homes (\$179,000-\$217,000) would use FHA financing, and upper-level market homes (> \$226,000) would use conventional financing. All home buyers would use a 30-year, fixed rate mortgage. However, buyers who invest in solar hot water

systems and who use FHA financing are eligible for more favorable qualifying ratios. Conventional mortgage underwriters may credit borrowers for their reduced utility bills when calculating the borrower's qualifying income. The underwriter treats the reduced utility bill as a compensating factor that enhances borrowing ability. Since most of the higher mortgage payment is interest, it can be claimed as an itemized deduction on the home owner's income tax returns. Assuming a fixed interest rate on the mortgage, the increase in the mortgage payment for energy equipment will remain level over time, while the utility bill savings may increase if utility rates increase.

The attached tables show the net total savings for the buyer's pocketbook if the home is held either two or five years. The net total savings for the pocketbook equal

(the tax credit with interest + cumulative savings on utility bills)
- (increase in down payment + sum of increased mortgage payments).

Findings

Home buyers who install energy equipment would face a change in qualifying annual incomes, from a decrease of \$983 to an increase of \$1,307, and all would make higher down payments (\$119-\$896) to finance the energy improvements. Further, the amortized cost of the energy improvement would result in higher monthly mortgage payments (\$15.02-\$33.53), which would be offset by the savings on monthly utility bills (\$14.96-\$30.02).

Net total savings for the pocketbook vary from \$95-\$1,404 for property held two years and from \$455-\$1,973 for property held five years. Variation is due to the type of mortgage financing, the buyer's income tax bracket, how long the property is held, and whether a home has gas appliances or is all-electric. Net savings were found to be greater for solar systems over heat pumps, all-electric homes those with gas appliances, and homes owned five instead of two. Affordable homes have the greatest net savings for the pocketbook.



OEOC BULLETIN

OFFICE OF ENVIRONMENTAL QUALITY CONTROL

JOHN WAIHEE
GOVERNOR

MARVIN T. MIURA, Ph.D.
DIRECTOR

Volume 5

September 23, 1988

Number 18

REGISTER OF CHAPTER 343, HRS DOCUMENTS

All Chapter 343, HRS documents submitted for publication in the OEOC Bulletin must be addressed to the Office of Environmental Quality Control, 465 South King Street, Room 104, Honolulu, Hawaii 96813. Documents addressed otherwise will not be considered for publication.

NEGATIVE DECLARATIONS

The following are Negative Declarations or determinations made by proposing or approving agencies that certain proposed actions will not have significant effects on the environment and therefore do not require EISS (EIS Rules 11-200-11). Publication in the Bulletin of a Negative Declaration initiates a 60-day period during which litigation measures may be instituted. Copies are available at 25 cents per page upon request to the Office. Parties wishing to comment may submit written comments to the agency responsible for the determination (indicated in project title). The Office would appreciate a copy of your comments.

KAUAI

GOLF COURSE AT HYATT REGENCY, POIPEU, Alinako Resort Associates-Grove Farm Properties, Inc./County of Kauai Planning Commission

The applicant proposes to develop an 18-hole championship-calibre golf course and operate it in association with the planned 605-room Hyatt Regency Kauai at Keonelo Bay. The proposed development will be maintained as a resort-oriented facility but will be opened to the public. It will be developed also to accommodate an increasing demand for golf play in Poipu and to make South Kauai more competitive with other visitor destination areas on the island.

The golf course will consist of 18 holes, a driving range, putting green, and clubhouse. The clubhouse will be located near the planned Hyatt Regency Kauai and will include parking and access from Poipu Road extension. The clubhouse will include a golf pro shop, restaurant, golf club storage room and golf cart maintenance area. Also proposed are a golf course maintenance building and temporary field nursery that will be located within the golf fairways away from the golf clubhouse.

NOTEWORTHY

NEWS FROM THE EPA

Rule finalized for Premanufacture Notification Fees

The EPA Administrator signed a final rule requiring fees from manufacturers, importers, and processors who are seeking Agency review of premanufacture notices (PMNs) for new chemicals, exemption applications and significant new-use notices submitted under Section 5 of the Toxic Substances Control Act (TSCA). The rule will be published in the Federal Register within two weeks. Contact: ISCA Assistance Information Service (202) 554-1404.

Chemical Fact Sheets

EPA has distributed about 180 fact sheets prepared by the State of New Jersey on chemicals which must be reported under Section 313 of Title III (annual toxic chemical release reports). EPA and New Jersey have committed to developing fact sheets on the remaining Section 313 chemicals by December 31, 1988. Each fact sheet contains a 2- to 5-page summary of relevant information on each chemical and was developed primarily for individuals working with chemicals, and also offers relevant and important information for general use. To obtain copies of the fact sheets, call the TSCA Infor-

mation Assistance Service (202)554-1404.

Lead in Drinking Water

Safe Drinking Water Hotline's correct number: 1-800-426-4791 or (202)382-5533 in the Washington metropolitan area.

ENERGY IMPACTS

Draft Environmental Impact Statements should comply with the requirements found in State laws for evaluating any energy impacts that the project will have. The mandate for such an evaluation is found in Chapter 344, HRS ("State Environmental Policy") and Chapter 226, HRS ("Hawaii State Planning Act"). In particular, Chapter 226-18(a)(2) and (c)(3); 226-52(a)(2) and (b)(2)(D); and 226-103(f)(1) and (2) should be noted.

ENVIRONMENTAL COUNCIL MEETINGS

The Environmental Council is currently updating its list of individuals, organizations, and agencies that receive notices of its meetings. All those wishing to be kept on or added to the list are asked to submit their names and addresses to: Environmental Council, 465 S. King Street, Room 104, Honolulu, HI 96813.

Lorraine R. Inouye
Mayor
Norman K. Hayashi
Director
Ted Nagasako
Deputy Director

Planning Department

25 Aupuni Street, Room 109 • Hilo, Hawaii 96720 • (808) 961-8288



February 26, 1991

Mr. Maurice H. Kaya
Energy Program Administrator
State of Hawaii
Dept. of Business, Economic
Development and Tourism
335 Merchant St., Room 110
Honolulu, Hawaii 96813

Dear Mr. Kaya:

SUBJECT: Waikoloa Affordable Housing Project
Draft Environmental Impact Statement (EIS)

We have received your letter of January 7, 1991 on the DEIS for the subject project.

In accordance with your suggestion, we will mention geothermal power as a possible future source of electricity for the project.

Your suggestions concerning energy conservation measures and design guidelines are appreciated and, where practical, will be implemented in the design and construction of the project. We will also discuss the State's goals, objectives and policies for energy in the Final EIS.

Thank you for your participation in the planning stages of this project.

Very truly yours,

Norman K. Hayashi
Planning Director

SECTION 2 This Act shall take effect upon its approval
(Approved July 3, 1990)

ACT 319

H.B. NO 3299

A Bill for an Act Relating to Energy Conservation

Be It Enacted by the Legislature of the State of Hawaii

SECTION 1 The legislature recognizes the need to promote and support energy conservation and renewable energy resources in the State of Hawaii. The legislature finds, however, that the State's dependency on imported fossil fuel remains unabated, even in the face of the emergence of cost-effective and energy-saving technologies. Accordingly, the use of commercially available energy conservation systems, the adoption of energy-saving measures, and the development of demand-side management programs should be promoted to encourage the consumer's efficient use of energy resources.

Solar water heating systems and heat pumps are off-the-shelf, commercially available energy conservation systems that give every resident the opportunity to use an abundant renewable energy resource—the sun. Additionally, ice storage systems are designed to shift the consumption of energy to off-peak periods.

Although solar energy systems and heat pumps for water heating can play a major role in energy conservation, the current low price of imported oil has adversely affected the competitive viability of such devices. Further, the continued prudent use of energy by devices, such as ice storage systems, should be encouraged. As such, the legislature finds that incentives in the form of higher state tax credits are needed to ensure that progress will continue toward the State's goals of reducing its dependence on imported oil and using energy prudently. One of the purposes of this Act then, is to provide for a tax credit increase for the installation of ice storage systems and of solar water heating systems and to clarify the tax credit for heat pumps in new and existing buildings.

Recognizing our dependency on imported oil and our fragile and vulnerable economic foundation, the Hawaii state plan promotes the prudent use of power and fuel supplies through conservation measures. Consumer demand for energy must be considered an important variable that can be influenced by public utility actions. Demand-side management is the planning and implementation of utility actions to influence consumer use of energy to affect the utility system's demand characteristics. Acknowledging the importance of demand-side management, this Act also amends the state policy relating to the use of energy to include demand-side management programs as a conservation measure.

SECTION 2 Section 226-18(c), Hawaii Revised Statutes, is amended by amending subsection (c) to read as follows:

"(c) To further achieve the energy objectives, it shall be the policy of this State to

- (1) Support research and development as well as promote the use of renewable energy sources[.],
- (2) Ensure a sufficient supply of energy to enable power systems to support the demands of growth[.],

- (3) Promote prudent use of power and fuel supplies through conservation measures including [education and energy-efficient practices and technologies];
(A) Development of cost-effective demand-side management programs.
(B) Education, and
(C) Adoption of energy-efficient practices and technologies, and
- (4) Ensure that the development or expansion of power systems and sources adequately consider environmental, public health, and safety concerns, and resource limitations."

SECTION 3 Section 235-12, Hawaii Revised Statutes, is amended to read as follows:

"§235-12 [Solar or wind energy devices, heat pumps or ice storage systems; Energy conservation; income tax credit. (a) [Each] For taxable years ending before January 1, 1990, except in the case of ice storage systems for taxable years ending before January 1, 1991, each individual and corporate resident taxpayer who files an individual or corporate net income tax return for a taxable year, may claim a tax credit under this section against the Hawaii state individual or corporate net income tax. The tax credit may be claimed for any solar or wind energy device, heat pump, or ice storage system in an amount not to exceed ten per cent of the total cost of the device, heat pump, or ice storage system, provided that the tax credit shall apply only to the actual cost of the solar or wind energy device, the heat pump, or ice storage system, their accessories, and installation and shall not include the cost of consumer incentive premiums unrelated to the operation of the solar or wind energy device, the heat pump, or ice storage system offered with the sale of the solar or wind energy device, the heat pump, or ice storage system. The credit shall be claimed against net income tax liability for the year in which the solar or wind energy device, the heat pump, or ice storage system was purchased and placed in use, provided

- (1) The tax credit shall be applicable only with respect to solar devices, which are erected and placed in service after December 31, 1974, but before [December 31, 1992.] January 1, 1990,
- (2) In the case of wind energy devices and heat pumps, the tax credit shall be applicable only with respect to wind energy devices and heat pumps which are installed and placed in service after December 31, 1980, but before [December 31, 1992, and] January 1, 1990, and
- (3) In the case of ice storage systems, the tax credit shall be applicable only with respect to ice storage systems which are installed and placed in service after December 31, 1985, but before [December 31, 1992.] January 1, 1990.

Tax credits which exceed the taxpayer's income tax liability may be used as a credit against the taxpayer's income tax liability in subsequent years until exhausted. If federal energy tax credits are not extended beyond December 31, 1985, are not retroactively extended or reenacted, or federal energy tax credits the same as or less in amount than the credits in effect during the 1985 taxable year are not enacted during the taxable year 1986, then the state tax credit shall be increased to [twenty] fifteen per cent of the total cost after [December 31, 1989, to December 31, 1992.]

(b) The director of taxation shall prepare such forms as may be necessary to claim a credit under this section. The director may also require the taxpayer to furnish reasonable information in order to ascertain the validity of the claim for credit made under this section and may adopt rules necessary to



STATE OF HAWAII
DEPARTMENT OF BUDGET AND FINANCE
HOUSING FINANCE AND DEVELOPMENT CORPORATION
SEVEN WATERFRONT PLAZA, SUITE 300
500 ALA MOANA BOULEVARD
HONOLULU, HAWAII 96813
FAX (808) 542-8841

RMV	WES	BIT	1
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REC'D	JAN 4 1991	RMTC	
GSY			
WJDKM			

JOSEPH K. CONANT
EXECUTIVE DIRECTOR

IN REPLY REFER TO

91:PLNG/9jt

January 2, 1991

TO: Norman K. Hayashi
County of Hawaii Planning Department

FROM: Joseph K. Conant
Executive Director

SUBJECT: DRAFT EIS FOR THE WAIKOLOA AFFORDABLE HOUSING PROJECT

Thank you for the opportunity to review the subject EIS. Our comments are as follows.

With respect to the proposed multi-family rental units, it is possible that the units could be developed under the State's Rental Housing System (RHS). Under this program, rental projects are financed from the proceeds of tax-exempt revenue bonds issued by the Housing Finance and Development Corporation. The HFDC would retain ownership of the rental projects and bonds would be payable from and secured by a lien on, and pledge of, the net revenues of the entire system. The RHS could be used in conjunction with the HFDC's Rental Assistance Program which provides rent subsidies to lower the rent to eligible tenants.

As for the single family, for sale units targeted for the Hula Mae income group, please note that the maximum sales price for a newly constructed unit in the County of Hawaii is presently \$134,100 (not \$167,000).

Consideration should also be given to Policy C(7) of the State Housing Functional Plan which strives to integrate special needs housing in new and existing neighborhoods. As defined in the housing plan, "special needs housing" means housing for persons for whom social problems, age, or physical or mental handicaps impair their ability to live independently and for whom such ability can be improved by more suitable housing conditions.

JT:eks

C: Brian Nishimura, Office of Housing and Community Development
Colette Sakoda, R.M. Towill Corporation
Office of Environmental Quality Control

Lorraine R. Inouye
Mayor
Norman K. Hayashi
Director
Ted Niggasako
Deputy Director

Planning Department

25 Aupuni Street, Room 109 • Hilo, Hawaii 96720 • (808) 961-6288



February 26, 1991

Mr. Joseph K. Conant
Executive Director
State of Hawaii
Housing Finance and Development
Corporation
500 Ala Moana Blvd.
Honolulu, Hawaii 96813

Dear Mr. Conant

SUBJECT: Waikoloa Affordable Housing Project
Draft Environmental Impact Statement (EIS)

We have received your memorandum of January 2, 1991 on the DEIS for the subject project.

We appreciate your comments concerning the possible applicability to this project of the State's Rental Housing System and Rental Assistance Program. The County and the selected Master Developer will, I believe, wish to explore these possibilities in greater depth.

Your comments on for sale units for the Hula Mae income group and on special needs housing have been noted, and will be incorporated in the Final EIS.

Thank you for your participation in the planning stages of this project.

Very truly yours,

Norman K. Hayashi
Planning Director



STATE OF HAWAII
DEPARTMENT OF HEALTH
P O BOX 3378
HONOLULU HAWAII 96801

January 31, 1991

RMT	WES	
DK	BIT	
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REC'D FEB 1 1991	RMT	
GSY		
STATE OF HAWAII		

JOHN C. LEWIN, M.D.
DIRECTOR OF HEALTH

In reply, please refer to:
EPHSD

91-1-006

MEMORANDUM

TO: Norman K. Hayashi, Director
Planning Department County of Hawaii

FROM: Director of Health

SUBJECT: Draft Environmental Impact Statement
Waikoloa Affordable Housing Project
Waikoloa, South Kohala, Hawaii
TMK: 6-8-02: 31 and por. 26

We have examined the Draft Environmental Impact Statement (DEIS) and have the following comments to offer:

Drinking Water

1. According to the DEIS, the proposed project will be served by the Waikoloa Water Company (Public Water System No. 135). The development will require the installation of a new 12-inch waterline, fire hydrant, and service laterals. Section 11-20-30 of Chapter 20 requires that new or substantially modified distribution systems for public water systems be approved by the Director.
2. The proposed development is situated above the Department's Underground Injection Control (UIC) line. Land areas located above the UIC line are generally considered to contain underground sources of drinking water. These areas should therefore be protected against all sources of groundwater contamination.
3. According to the DEIS, drywells will be used for the disposal of surface water runoff. Since these drywells would be classified as injection wells, they must comply with the Department's Administrative Rules, Title 11, Chapter 23, "Underground Injection Control." Chapter 23 requires UIC permits for the construction and operation of all injection wells.

NORMAN K HAYASHI

-2-

January 28, 1991

If you should have any questions, please contact the Safe Drinking Water Branch at 543-8258

Wastewater Disposal

At this time, the details of wastewater treatment and disposal plans from the site are incomplete

In our previous comments to the Master Plan, Environmental Impact Statement Preparation Notice dated September 1990, we recommended the use of a centralized collection and treatment system meeting the current requirements of Chapter 11-62. However, please be informed that proposed revisions to Chapter 11-62, "Wastewater Systems" will require that such a centralized wastewater treatment facility be constructed to meet county standards. Also, the subject area is above the UIC line, therefore the use of injection wells as a means of effluent disposal are prohibited.

If you should have any questions, please contact Harold Yee of the Wastewater Branch at 543-8295.

Very truly yours,

John C. Lewin
JOHN C. LEWIN, M.D.
Director of Health

cc: Wastewater Branch
Safe Drinking Water Branch
Office of Housing Community Development (Hawaii County)
✓R.M. Towill Corp



Planning Department

25 Appunui Street, Room 109 • Hilo, Hawaii 96720 • (808) 961-8288

Lorraine R. Inouye
Mayor
Norman K. Hayashi
Director
Tad Nagasako
Deputy Director

February 26, 1991

John C. Lewin, M.D., Director
State of Hawaii
Department of Health
P.O. Box 3378
Honolulu, Hawaii 96801

Dear Dr. Lewin:

**SUBJECT: Waikoloa Affordable Housing Project
Draft Environmental Impact Statement (EIS)**

We have received your letter of January 31, 1991 on the DEIS for the subject project.

Your comments concerning the need for the Director's approval of the proposed public water system and the need for UIC permits for injection wells have been noted and will be mentioned in the Final EIS. The need to protect groundwater resources in this area will also be discussed. The Final EIS will include a description of the proposed wastewater treatment and disposal systems.

Thank you for your participation in the planning stages of the project.

Very truly yours,

Norman K. Hayashi
Planning Director

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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION

808 PUNCHBOWL STREET
HONOLULU HAWAII 96813-5097

January 18, 1991

EDWARD Y. HIRATA
DIRECTOR

DEPUTY DIRECTORS
DANIEL C. JOHNSON
RONALD K. HIRATA
JEANNE K. SCHULTZ
CALVIN M. TSUDA

IN REPLY REFER TO

HWY-PS
2.5251

Dr. Bruce Anderson
Page 2
January 18, 1991

HWY-PS 2.5251

5. Utilities should be placed underground to mitigate any impact on scenic vistas.
6. Bikepaths and highway landscaping should be considered and addressed.
7. This project should be coordinated with other developments in the adjacent areas.
8. Costs for required roadway improvements shall be borne by the developer.

bc: R.M. Towill Corporation

MEMORANDUM

TO: Dr. Bruce Anderson, Acting Director
Office of Environmental Quality Control

FROM: Edward Y. Hirata, Director

SUBJECT: DRAFT EIS, WAIKOLOA AFFORDABLE HOUSING PROJECT
TRK: 6-8-02: 31 AND PORTION 26

We have the following comments:

1. (a) A grade-separated, full diamond interchange should be constructed at the intersection of Waikoloa Road and Queen Kaahumanu Highway, and (b) Mitigation measures for the intersection of Waikoloa Road and Mamalahoa Highway should be proposed and submitted for our review. Plans for these improvements should be coordinated with our Highways Division.
2. The developer should be aware of our plans to have Queen Kaahumanu Highway serve as a high speed, limited access, divided freeway. Access to the freeway will be allowed only at designated locations.
3. Any work within the State highway right-of-way will require a permit and construction plans must be submitted for our review and approval.
4. Additional regional traffic mitigation measures required as a cumulative result of this and other projects in the area should also be provided by the developer. The developer should participate in the funding and construction of such regional traffic improvements on a prorata basis, as determined by the State Department of Transportation.



Planning Department

25 Aupuni Street, Room 109 • Hilo, Hawaii 96720 • (808) 961-8288

Lorraine R. Inouye
Mayor
Norman K. Hayashi
Director
Tad Nagasako
Deputy Director

February 26, 1991

Mr. Edward Y. Hirata
Director
State of Hawaii
Department of Transportation
869 Punchbowl Street
Honolulu, Hawaii 96813-5097

Dear Mr. Hirata:

SUBJECT: Waikoloa Affordable Housing Project
Draft Environmental Impact Statement (EIS)

We have received a copy of January 18, 1991 memorandum addressed to Mr. Bruce Anderson, Acting Director, Office of Environmental Quality Control, concerning the DEIS for the subject project.

We agree that intersection improvements will be needed at Waikoloa Road/Queen Kaahumanu Highway, and at Waikoloa Road/Mamalahoa Highway. However, a resolution of these improvements is beyond the scope of this EIS process. The County will work with other development entities that are active in the Waikoloa area to develop intersection improvement plans that will be acceptable to your department.

Your other comments and suggestions have been taken under advisement and will be incorporated into the Final EIS as appropriate.

Thank you for your participation in the planning stages of the project.

Very truly yours,

Norman K. Hayashi
Planning Director

JOHN WAHNEE
GOVERNOR OF HAWAII

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STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
P O BOX 871
HONOLULU, HAWAII 96809

WILLIAM W. PATY, CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES

DEPUTIES
BETIN W. ANZE
MAMARU TAGOMORI
RUSSELL N. FUKUMOTO

AGRICULTURE DEVELOPMENT PROGRAM
AQUATIC RESOURCES
CIVILIZATION AND REPAIRS
CONSERVATION AND REPAIRS
RESOURCES ENFORCEMENT
CONSERVATION RESERVE
HISTORIC PRESERVATION PROGRAM
LAND MANAGEMENT
LAND USE
WATER AND LAND DEVELOPMENT

Mr. Norman Hayashi -2- Doc. No.: 9545E

Our State Historic Preservation Division should then be contacted as soon as possible so that one of our staff can assess the situation and recommend appropriate mitigation measures if necessary.

Our Divisions' of Water Resource Management and Forestry and Wildlife will comment directly to you if they have comments.

Thank you for your cooperation in this matter. Please feel free to call me or Bob Johnson at our Office of Conservation and Environmental Affairs, at 548-7837, if you have questions.

Very truly yours,
William W. Paty
William W. Paty

cc: Office of Housing & Community Development, County of Hawaii
R.M. Towill Corp.
Environmental Quality Control

File No.: 91-223
Doc. No.: 9545E

JAN 10 1991

The Honorable Norman Hayashi, Director
Planning Department
County of Hawaii
25 Aupuni Street
Hilo, Hawaii 96720

Dear Mr. Hayashi:

Subject: Environmental Impact Statement (EIS) Waikolos
Affordable Housing Project South Kohala, Hawaii, TMK:
6-8-02: 31 and portion 26

Thank you for giving our Department the opportunity to comment on this matter. We have reviewed the materials submitted by the State of Hawaii--Office of Environmental Quality Control and have the following comments.

We concur that the archaeological survey adequately demonstrates the probable absence of historic sites in the 279 acre planned housing development and that the historic literature review depicts the area as having been marginal for major subsistence and residential activities. These results are also adequately addressed within the main text of the EIS. We agree that construction of this planned housing development is likely to have "no effect" on historic sites.

We would, however, ask that one addition be made to the main text of the EIS where Historic and Archaeological Resources are discussed. Despite negative survey results and an overall low probability of finding historic remains, it is always possible that some, including human burials, could be uncovered during construction. Please ask the Applicant to add a statement which acknowledges this possibility and commits them to halting construction in the immediate vicinity of an inadvertent discovery.



Planning Department

25 Aupuni Street, Room 109 • Hilo, Hawaii 96720 • (808) 961-8288

Lorraine R. Inouye
Mayor
Norman K. Hayashi
Director
Tad Nagasako
Deputy Director

February 26, 1991

Mr. William W. Paty, Chairman
State of Hawaii
Department of Land and
Natural Resources
P.O. Box 621
Honolulu, Hawaii 96809

Dear Mr. Paty:

SUBJECT: Waikoloa Affordable Housing Project
Draft Environmental Impact Statement (EIS)

We have received your letter of January 10, 1991 on the DEIS for the subject project.

Thank you for your concurrence with the DEIS finding that the subject project is likely to have "no effect" on historic sites. In accordance with your request, we will add a paragraph to the Final EIS that addresses procedures to be followed in the event that historic remains are discovered during construction.

Thank you for your participation in the planning stages of this project.

Very truly yours,

Norman K. Hayashi
Planning Director

UNITED STATES
DEPARTMENT OF
AGRICULTURE

SOIL
CONSERVATION
SERVICE

UNIT	P. O. BOX 50004
DK	HONOLULU, HAWAII
RYK	96850
REC'D	FEB 11 1991 RMITC
GSY	
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Planning Department

25 Aupuni Street, Room 109 • Hilo, Hawaii 96720 • (808) 961-8298

Lorraine R. Inouye
Mayor
Norman K. Hayashi
Director
Tad Nagasako
Deputy Director

County of Hawaii Planning Department
(On behalf of the Mayor, County of Hawaii)
25 Aupuni Street
Hilo, Hawaii 96720

Attention: Mr. Duane Kanuha

Dear Mr. Kanuha:

Subject: Draft Environmental Impact Statement (DEIS) - Waikoloa Affordable Housing Project, South Kohala, Hawaii

The above-mentioned document has been reviewed as requested. We offer the following comments your consideration:

Blowing dust and dirt can be expected to be a problem during construction, hence the developer will need to ensure that proper dust control measures are in place and operational prior to ground breaking. These measures could include water trucks, temporary irrigation systems, mulches, and erosion control fabrics. The soils in the Waikoloa area are highly susceptible to wind erosion from the periodic winds that occur.

This development can be expected to reduce infiltration of rain water and increase runoff to Kanakoa Gulch. This problem was discussed in Section 2.3.3, page 2-6. Mention should be made of operation and maintenance for the dry wells and channels to ensure their proper operation.

Thank you for the opportunity to review this document. We would appreciate the opportunity to review the final EIS.

Sincerely,

Warren M. Lee Acting

WARREN M. LEE
State Conservationist

cc: County of Hawaii Office of Housing & Community Development, 50 Wailuku Drive, Hilo, Hawaii 96720, Attention: A. Scott Leithead
R. M. Towill Corporation, 420 Hialehale Road, Room 411, Honolulu, Hawaii 96817, Attention: Colette Sakoda
Office of Environmental Quality Control, 465 South King Street, Room 104, Honolulu, Hawaii 96813

February 26, 1991

Mr. Warren M. Lee
Acting State Conservationist
U.S. Department of Agriculture
Soil Conservation Service
P.O. Box 50004
Honolulu, Hawaii 96850

Dear Mr. Lee:

SUBJECT: Waikoloa Affordable Housing Project
Draft Environmental Impact Statement (EIS)

We have received your letter of January 8, 1991 on the DEIS for the subject project.

We agree that proper dust control measures will be needed during construction, and we will discuss this issue in the Final EIS. The need for proper maintenance of dry wells and drainage channels will also be discussed.

Thank you for your participation in the planning stages of this project.

Very truly yours,

Norman K. Hayashi
Norman K. Hayashi
Planning Director



United States Department of the Interior



GEOLOGICAL SURVEY

WATER RESOURCES DIVISION
677 Ala Moana Blvd., Suite 415
Honolulu, Hawaii 96813

January 02, 1991

County of Hawaii Planning Dept
(on behalf of the Mayor, County of Hawaii)
25 Aupuni Street
Hilo, Hawaii 96720
Attn: Duane Kanuha

Dear Mr. Duane Kanuha:

The Honolulu District Office of the Water Resources Division, U.S. Geological Survey has reviewed the subject DEIS, and offers the following comments. The principal reviewer was Mark Underwood. Please contact him at (808) 541-2653 if you have any questions.

Section 2.3.1. A description of the wastewater treatment was not given, nor is a reference given where this can be looked up within the report. Where is the treatment and sewerage discharge? What will the addition of this new development be on the wastewater treatment? Will the addition of this proposed increase in sewerage affect the treatment facility? Does this comply to EPA standards, both currently and with the additional development?

Section 2.3.2. Several unsubstantiated facts were given. It was stated that 100,000 million gallons of ground water lies stored in the aquifer that supplies the water for Waikoloa Village. Is this water stagnant? Is this all freshwater or brackish water? What is its source? The other troublesome statement is that 3 0 to 5.0 Mgal/d is flowing through the aquifer in the vicinity of the well. Do these figures refer to flow per unit width (i.e. per mile) of aquifer?

Section 2.3.3. 3 3 and 3 9 It is stated that 58,000 acres produces about 12,000 cfs of runoff which drains through Kamakoa Gulch. When does this occur? During a typical day, or during a small shower, a large rainstorm? Is it only the 58,000 acres that produces 12,000 cfs of runoff, or is this the amount that the whole watershed produces? A flow of 12,000 cfs is very substantial.

Section 9. The basic fundamentals of streamflow, as relevant to this specific area, appear to be poorly understood. Perhaps with better understanding, you could better address the unresolved issue of drainage.

Thank you for the opportunity to review this document.
Sincerely,

William Meyer
William Meyer
District Chief

cc: A. Scott Leithead, Hawaii County
Colette Sakoda, R.M. Towill Corp.
Office of Environmental Quality Control

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Planning Department

25 Aupuni Street, Room 109 • Hilo, Hawaii 96720 • (808) 961-8288

Lorraine R. Inouye
Mayor
Norman K. Hayashi
Director
Ted Nagasako
Deputy Director

February 26, 1991

Mr. William Meyer
District Chief
U.S. Department of the Interior
Geological Survey
Water Resources Division
677 Ala Moana Blvd.
Suite 415
Honolulu, Hawaii 96813

Dear Mr. Meyer:

**SUBJECT: Waikoloa Affordable Housing Project
Draft Environmental Impact Statement (EIS)**

We have received your letter of January 2, 1991 on the DEIS for the subject project.

The Final EIS will describe the proposed wastewater treatment system. Your questions and comments on groundwater and drainage have been noted, and these sections will be expanded and clarified in the Final EIS.

Thank you for your participation in the planning stages of this project.

Very truly yours,

Norman K. Hayashi
Planning Director



DEPARTMENT OF THE NAVY
 COMMANDER
 NAVAL BASE PEARL HARBOR
 BOX 110
 PEARL HARBOR, HAWAII 96860-5020

HMT	WKS	BY	RMTC
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IN REPLY REFER TO:
 5090
 Ser 00F2/3937
 27 NOV 1990

Mr. Duane Kanuha
 County of Hawaii, Planning Department
 24 Aupuni Street
 Hilo, HI 96720

Dear Mr. Kanuha:

WAIKOLOA AFFORDABLE HOUSING PROJECT

The Draft Environmental Impact Statement (DEIS) for Waikoloa Affordable Housing Project, South Kohala, Hawaii, has been reviewed, and we have no comments to offer. Since we have no further use for the DEIS, it is being returned to your office.

Thank you for the opportunity to review the draft.

Sincerely,

W. K. Liu

W. K. LIU
 Assistant Base Civil Engineer
 in Charge of
 the Commander

Copy to:
 Ofc of Hsg & Comm Dev
 R.M. Towill Corp
 DEQC (w/DEIS)



Planning Department

25 Aupuni Street, Room 109 • Hilo, Hawaii 96720 • (808) 961-8288

Lorraine R. Inouye
 Mayor
 Norman K. Hayashi
 Director
 Tad Nagasaki
 Deputy Director

February 26, 1991

Mr. W. K. Liu
 Assistant Base Civil Engineer
 Dept. of the Navy
 Commander
 Naval Base Pearl Harbor
 Box 110
 Pearl Harbor, Hawaii 96860-5020

Dear Mr. Liu:

SUBJECT: Waikoloa Affordable Housing Project
 Draft Environmental Impact Statement (EIS)

We have received your letter of November 27, 1990 indicating that you have no comments on the DEIS for the subject project. Thank you for your participation in the planning stages of this project.

Very truly yours,

Norman K. Hayashi

Norman K. Hayashi
 Planning Director



DEPARTMENT OF THE ARMY
U. S. ARMY ENGINEER DISTRICT, HONOLULU
BUILDING 230
FT SHAFTER HAWAII 96858-5440

REPLY TO
ATTENTION OF
Planning Division

RM1					
DK					
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Mr. Duane Kanuha
County of Hawaii Planning Department
25 Aupuni Street
Hilo, Hawaii 96720

Dear Mr. Kanuha:

We have reviewed the Draft Environmental Impact Statement (DEIS) for the Waikoloa Affordable Housing Project, Waikoloa, South Kohala, Hawaii. Our comments in response to the Preparation Notice (letter dated September 4, 1990) have been incorporated into the DEIS. We have no additional comments.

Sincerely,


Mr. Kisuk Cheung
Director of Engineering

Copies Furnished:

County of Hawaii
Office of Housing and Community Development
50 Wailuku Drive
Attn: A. Scott Leithhead
Hilo, Hawaii 96720

✓ R.M. Towill Corporation
420 Waiakamilo Road, Room 411
Attn: Colette Sakoda
Honolulu, Hawaii 96817

Office of Environmental Quality Control
State of Hawaii
465 South King Street, Room 104
Honolulu, Hawaii 96813



Planning Department

25 Aupuni Street, Room 109 • Hilo, Hawaii 96720 • (808) 961-8288

Lorraine R. Inouye
Mayor
Norman K. Hayashi
Director
Tad Nagasaki
Deputy Director

February 26, 1991

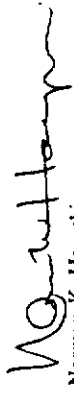
Mr. Kisuk Cheung
Director of Engineering
Dept. of the Army
U.S. Army Engineer District, Honolulu
Building 230
Ft. Shafter, Hawaii 96858-5440

Dear Mr. Cheung:

SUBJECT: Waikoloa Affordable Housing Project
Draft Environmental Impact Statement (EIS)

We have received your letter of January 2, 1991 indicating that you have no comments on the DEIS for the subject project. Thank you for your participation in the planning stages of this project.

Very truly yours,


Norman K. Hayashi
Planning Director

1. County of Hawaii General Plan, Ordinance No. 439, 1971, County of Hawaii.
2. County of Hawaii Draft General Plan, 1986, revised 1989, County of Hawaii.
3. West Hawaii Regional Plan, November 1989, Office of State Planning, State of Hawaii.
4. Chapter 226, Hawaii Revised Statutes, An Act Relating to the Hawaii State Plan, approved May 29, 1986.
5. State Housing Functional Plan, Hawaii Housing Authority, State of Hawaii, June 1984.
6. State Transportation Functional Plan, Department of Transportation, State of Hawaii, 1984.
7. State Recreation Functional Plan, Department of Land and Natural Resources, State of Hawaii, June 1984.
8. State Educational Functional Plan, Department of Education, State of Hawaii, May 1985.
9. State Health Functional Plan, Department of Health, State of Hawaii, June 1984.
10. Data Book 1989: A Statistical Abstract, Department of Business and Economic Development, State of Hawaii, 1989.
11. Environmental Assessment and Site Selection Analysis, Waikoloa County Housing, March 1989, Belt Collins & Associates.
12. Waikoloa Affordable Housing Project Master Plan Report, September 1990, R. M. Towill Corporation.
13. Soil Survey of the Island of Hawaii, State of Hawaii, Washington, D.C., August 1972.

APPENDICES

Botanical Survey - APPENDIX A

Survey of Avifauna & Feral Animals - APPENDIX B

Air Quality Impact Analysis - APPENDIX C

Archaeological Reconnaissance Survey - APPENDIX D

Market Analysis - APPENDIX E

Traffic Impact Analysis - APPENDIX F

APPENDIX A

Botanical Survey by Char & Associates

BOTANICAL SURVEY

580-ACRE RESIDENTIAL DEVELOPMENT, WAIKOLOA VILLAGE

DISTRICT OF SOUTH KOHALA

HAWAII

by

George K. Linney
Winona P. Char

CHAR & ASSOCIATES
Botanical/Environmental Consultants
Honolulu, Hawaii

APPENDIX A

Botanical Survey
580-Acre Residential Development, Waikoloa Village
District of South Kohala
Hawaii

Prepared By:
Char & Associates
Botanical/Environmental Consultants

Prepared for: BELT COLLINS & ASSOCIATES

August 1988

TABLE OF CONTENTS

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DESCRIPTION OF SITE 2

THREATENED AND ENDANGERED SPECIES. 4

RECOMMENDATIONS 4

LITERATURE CITED 5

SPECIES LIST 6

A botanical survey was carried out on a parcel of approximately 580 acres proposed for future residential development adjacent to, and just north of Waikoloa Village. The site is divided into two almost equal halves by soil type. In the northeast, the soil is a deep, yellow ash with occasional rock outcroppings. In the southwest, this substrate is overlain by a thick, weathered 'a'a. The soil is thinner and rock outcroppings predominate. Vegetation in the northeast consists of rolling grasslands with widely scattered trees. In the southwest, vegetation is a savannah-scrubland. Differences in vegetation represent little more than shifts in relative abundance of the constituent plants. For the most part, the species composition is the same throughout the site. Only 46 species of vascular plants were found growing on the site, an extremely low number for an area of this size. Of these, 40 (87%) were exotic weeds or deliberately introduced plants, and 6 (13%) native, or presumed-native plants. None of the species found on the site are officially listed as endangered or threatened; nor are any species proposed or candidate for such status.

SURVEY METHODS

A walk-through method was used for this survey, with plants identified on sight. Plants that could not be positively identified were collected for later determination by comparison with known specimens in the herbarium and reference to standard taxonomic literature. Taxonomy of ferns is based on Wagner and Wagner (1987). Taxonomy and nomenclature of the flowering plants follows Wagner *et al.* (in press). Species composition recorded for the site is subject to the problem of identifying small annuals and perennials that were sterile, dormant, or dead at the time of the survey. Access to the site was from a dirt road, representing an extension of Paniolo (or Paniola, according to maps) Avenue. An abandoned ranch road running through the site also facilitated access for short portions of the transects.

DESCRIPTION OF THE SITE

The study site consisted of approximately 580 acres contiguous with Maikoloa Village and located just to the north of the presently developed land. The upper boundary of the site corresponded to a dirt road extending beyond the paved Panfola (or Panfola) Avenue, at an elevation of approximately 880-780 feet. The lower boundary was at an elevation of approximately 580-600 feet. The northern boundary was Kamakoa Gulch, while the southern boundary was an apparently unnamed gulch that serves as the drainage for central Maikoloa Village. Throughout the site, metal fragments were common, decreasingly so to the south. These were tentatively identified as ordnance. At least some of the site disturbance (change of species composition, serious erosion) may be attributable to this former bombing, as well as to browsing by animals, and range fires.

The entire site is prehistoric lava field, though the substrate was of two distinct types. In the northeast portion of the site, the soil was a fine yellowish ash, with occasional rock outcroppings. Erosional features revealed that the ash was, at least in some places, more than three feet thick and divided into two soil zones marked by a change in color. The upper layer was approximately one foot deep. A herd of approximately 50 goats was found in a large cave in the south bank of Kamakoa Gulch. Browsed plants, tracks, and droppings indicated that they travel widely through the site, and may contribute to the composition of the vegetation. They certainly appeared to have an impact on soil erosion. This portion of the site was covered by grassland, with very widely scattered trees. Along the road and in the bottom of Kamakoa Gulch, fountain grass (*Pennisetum setaceum*) predominated, with many patches of 'aheahea (*Chenopodium sahuense*) and wild zinnia occurring along the road. Away from the road, the predominant grass was native hard-stemmed love-grass (*Eragrostis atropioides*). Where erosion or disturbance by animals was heaviest, the exotic buffel grass (*Cenchrus ciliaris*) replaced the native grass. The only tree on the site was kiawe (*Prosopis pallida*). Generally a minor component of the vegetation in this part of the study site, there were some large groves along Kamakoa Gulch. Shrubs were not a major component of the

vegetation, but were represented by 'aheahea, 'ilima (*Sida fallax*), and 'uhaloa (*Malthesia indica* var. *americana*). The native prostrate vines pa'u-o-hi'i'aka (*Jacquemontia ovalifolia* subsp. *sandwicensis*), and alena (*Boerhavia diffusa*) were occasional between tussocks of the love-grass. Peppergrass (*Lepidium hyssopifolium*) and centaury (*Centaureum erythraea*) were the only widespread weedy annuals. In low areas, where water persisted longest, ageratum (*Ageratum conyzoides*), sowthistle (*Sonchus oleraceus*), and threadstem carpetweed (*Mollugo cerviana*) were found. Weedy annuals were also common on the cliff-faces above Kamakoa Gulch.

In the southwestern portion of the study site, a more recent 'a'a flow, or series of flows, overlay the substrate that was exposed in the northeastern portion. This flow rose above the northeastern ash-plain by 20-80 or more feet, and was marked by boulders of various sizes with little intervening soil. Walking in this area was very treacherous. Vegetation was similar to that in the northeastern portion, with a relative decrease in grass-cover and increase in shrubs and trees. On the rocky hillsides, the diminutive fern 'iwa'iwa was occasional. Only single occurrences of nehe (*Lipochaeta lavarium*), uhiuhi (*Senna gaudichaudii*), and pua-kala (*Argemone glauca*) were noted. Spider flower (*Cleome* sp.) and hairy merremia (*Merremia aegyptia*) were locally common. The shrubs lantana (*Lantana camara*) and koa-haole (*Leucaena leucocephala*) were characteristic of this part of the site. The latter formed a very dense stand along the dry stream bottom that marked the southern boundary of the study site. Kiawe trees were found in increasingly denser stands toward the south, at times approaching a scrub-forest situation.

Along the road at the upper boundary of the site, there were numerous piles of landscape rubbish. For the most part, the plant materials were dying, posing little threat to the future composition of the vegetation of the site. At least three exotic species, however, were observed to have established: bittermelon (*Momordica charantia*), an unknown bean (*Phaseolus* sp.), and California pepper tree (*Schinus molle*). Bittermelon is probably of little significance, as it is already widely established in the Islands where there is somewhat more soil moisture. The bean will probably not be able to

persist indefinitely, and so may also be ignored. California pepper tree, on the other hand, is not widely established as an escaped plant, but has the potential to do so. The related Christmas berry (*Schinus terebinthifolius*) has escaped from cultivation and has become an extremely serious noxious weed in wetter parts of the Islands.

THREATENED AND ENDANGERED SPECIES

No listed, proposed, or candidate threatened and endangered species, as designated by the Federal and/or State governments (US Fish and Wildlife Service 1985; Herbst 1987) were found on the site. The *Eragrostis* grassland appears to be a remnant native plant community, but is so disturbed that essentially only the grass remains. Most other native plants associated with this grassland community are either so uncommon on the site as to have all but disappeared, or like williwili (*Erythrina sandwicensis*) and a'ali'i (*Dodonaea viscosa*), were observed a short distance outside of the site, but were not found on the site itself.

RECOMMENDATIONS

It is suggested that native plants be used in future landscaping of the site. A number are both attractive and adapted to the present climate, while others would thrive with common landscape practices. Some control should be exercised in bringing in exotic species. A number of undesirable weedy species (toxic, invasive, or both) could potentially escape from cultivation and become serious problems in the future. Examples are a cactoid euphorbia (perhaps *Euphorbia lactea*) and *Aloe*, both of which were seen in rubbish piles along the roadside.

The presence of exploded ordnance on the site suggests that unexploded ordnance may be present, though none was seen during the survey. Another problem is that the ash-soil in the northeastern half of the site appears to be subject to rapid and severe erosion. It should be landscaped as soon as possible after disturbance. This would also mitigate problems with dust.

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SPECIES LIST

A list of all the vascular plants found on the site follows. Plants are organized in three groups -- ferns, monocots, and dicots. Within each group, they are further arranged in alphabetical order by family and genus. For each species, an accepted common name is given. For Hawaiian plants, the Hawaiian name is given if known. Biogeographic status is indicated by a letter code. An explanation of abbreviations used (other than author citations) is given below.

SCIENTIFIC NAME

sp. - correct species name not determined

STATUS

- E - endemic, native only to the Hawaiian Islands
- I - indigenous, native to the Hawaiian Islands, but also native elsewhere.
- P - Polynesian, not considered native, but thought to have been introduced by the Polynesians prior to 1778
- X - exotic, not native, introduced after 1778

SPECIES LIST

SCIENTIFIC NAME COMMON NAME STATUS

BIOGEOGRAPHIC

FERNS AND FERN ALLIES

Adiantaceae

Doryopteris decora Brack.

FLOWERING PLANTS

MONOCOTS

Gramineae

Aristida adscensionis L.

Cenchrus ciliaris L.

Eragrostis atropioides Hitchc.

Heteropogon contortus (L.) Beauv. ex R. & S.

Pennisetum setaceum (Forsk.) Chiov.

Rhynchosyris repens (Willd.) C. E. Hubb.

DICOTS

Anacardiaceae

Schinus molle L.

Cactaceae

Hylocereus undatus (Haw.) Britt. & Rose

Opuntia ficus-indica (L.) Mill.

X night-blooming cereus

X California pepper tree

X Natal redtop

X fountain grass

P pill

E hard-stemmed love-grass

X buffel grass

X arista

I 'iwa

SCIENTIFIC NAME

Capparaceae

Cleome sp.

Chenopodiaceae

Chenopodium murale L.Chenopodium oahuense (Meyen) Aellen

Compositae

Ageratum conyzoides L.Bidens cynapiifolia HBK.Bidens pilosa L.Cirsium arvense (L.) Scop.Lipochaeta lamarum (Gaud.) DC.Pluchea symphytifolia (Miller) GillisSonchus oleraceus L.Zinnia pauciflora L.

Undetermined composite

Convolvulaceae

Jacquemontia ovalifolia (Choisy) H. Hallier
subsp. sandwicensis (Gray) RobertsonMerremia aegyptia (L.) Urban

Cruciferae

Lepidium hyssopifolium Desv.SCIENTIFIC NAME

Cucurbitaceae

Momordica charantia L.

Euphorbiaceae

Chamaesyce hirta (L.) Millsp.Ricinus communis L.

Gentianaceae

Centaurium erythraea Rafn.

Labiatae

Hyptis pectinata (L.) Poit.

Leguminosae

Chamaecrista nictitans (L.) Moench.Desmanthus virgatus (L.) Willd.Desmodium tortuosum (Sw.) DC.Indigofera suffruticosa Mill.Leucaena leucocephala (Lam.) deWitPhaseolus sp.Prosopis pallida (Humb. and Bonpl. ex Willd.) HBKSenna gaudichaudii (H. & A.) Irwin & Barneby

Malvaceae

Sida fallax Walp.COMMON NAMESTATUS

spider flower

X?

chenopodium

X

'aheahea, 'aweoweo

E

ageratum

X

beggars' ticks

X

Spanish needle

X

Canada thistle

X

nehe

E

pluchea

X

sowthistle

X

wild zinnia

X

X

pa'u-o'hii'aka

E

hairy merremia

I?

peppergrass

X

COMMON NAMESTATUS

bittermelon

X

hairy spurge

X

castorbean

X

centaurium

X

comb hyptis

X

partridge pea, lau-ki

X

desmanthus

X

beggars' ticks

X

indigo

X

koa-haole

X

bean

X

kawe, mesquite

X

uhiuhi, kolomona

I

'ilima

I

<u>SCIENTIFIC NAME</u>	<u>COMMON NAME</u>	<u>STATUS</u>
Molluginaceae		
<u>Mollugo cerviana</u> (L.) Ser.	threadstem carpetweed	X
Nyctaginaceae		
<u>Boerhavia diffusa</u> L.	alena	I
Papaveraceae		
<u>Argemone glauca</u> Pope	pua-kala	E
Portulacaceae		
<u>Portulaca pilosa</u> L.	'ihi	X
Solanaceae		
<u>Datura stramonium</u> L.	Jamestown (Jimson) weed	X
<u>Solanum americanum</u> Mill.	popolo	I?
Sterculiaceae		
<u>Waltheria indica</u> L. var. <u>americana</u> (L.) R. Br. ex Hosaka	'uhaloa, hi'aloa	I?
Verbenaceae		
<u>Lantana camara</u> L.	lantana	X

APPENDIX B

Survey of Avifauna and Feral Animals by Phillip Bruner

SURVEY OF THE AVIFAUNA AND FERAL MAMMALS AT
WAIKOLOA VILLAGE PROPERTY, WAIKOLOA, HAWAII

Prepared for
Belt Collins & Associates

APPENDIX B

Survey of the Avifauna and Feral Mammals at
Waikoloa Village Property, Waikoloa, Hawaii

Prepared By:
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SURVEY OF THE AVIFAUNA AND FERAL MAMMALS AT
WAIKOLOA VILLAGE PROPERTY, WAIKOLOA, HAWAII

GENERAL SITE DESCRIPTION

The project property is located in the Waikoloa Village area of the district of South Kohala, Hawaii. The property consists of approximately 580 acres (Fig.1). The general appearance of the habitat is one of a dry parkland. Vegetation consists of mostly exotic (introduced) trees with an understory of dry weeds and grasses. Kiawe (Prosopis pallida) and Koa Haole (Leucaena glauca) are the most abundant tree species. The site has a rolling topography but patches of more open, flat grassland occur on the north sections of the property.

Weather during the field survey was clear and hot. Winds were from the NE and were particularly gusty in the late afternoon and early evening periods.

STUDY METHODS

Field observations were made with the aid of binoculars and by listening for vocalizations. These observations were concentrated during the peak bird activity periods of early morning and late afternoon. Attention was also paid to the presence of tracks and scats as indicators of bird and mammal activity.

At various locations (see Fig.1) eight minute counts were made of all birds seen or heard. Between these count stations walking tallies of birds seen or heard were also kept. These

INTRODUCTION

The purpose of this report is to summarize the findings of a three day (22-24 August 1988) bird and mammal field survey of property proposed for development at Waikoloa Village, Hawaii (see Fig. 1). Also included are references to pertinent literature as well as unpublished reports.

The objectives of the field survey were to:

- 1- Document what bird and mammal species occur on the property or may likely occur given the range of habitats available.
- 2- Provide some baseline data on the relative density of each species.
- 3- Determine the presence or likely occurrence of any native fauna particularly any that are considered "endangered" or "threatened". If such occur or are likely to occur on the property identify what features of the habitat may be essential for these species and suggest how those resources may be protected.

counts provide the basis for the population estimates given in this report. Unpublished reports of birds known from similar habitat on adjacent lands were also consulted in order to acquire a more complete picture of possible avifaunal activity (Bruner 1979, 1980, 1984a, 1984b, 1984c, 1985b). Observations of feral mammals were limited to visual sightings and evidence in the form of scats and tracks. No attempts were made to trap mammals in order to obtain data on their relative density and distribution. Two nights were devoted to searching for the presence of owls and the Hawaiian Hoary Bat (Lasiorus cinereus semotus).

Scientific names used herein follow those given in the most recent American Ornithologist's Union Checklist (A.O.U. 1983), Hawaii's Birds (Hawaii Audubon Society 1984), Birds of Hawaii and the Tropical Pacific (Pratt et al. 1987) and Mammal species of the World (Honacki et al. 1982).

RESULTS AND DISCUSSION

Resident Endemic (Native) Land and Water Birds:

No endemic birds were recorded during the course of the field survey. The Short-eared Owl or Pueo (Asio flammeus sandwichensis) is relatively common on Hawaii and potentially

could occur on the site (Berger 1972, Hawaii Audubon Society 1984, Pratt et al. 1987). This endemic subspecies is listed as endangered on Oahu by the State of Hawaii Department of Land and Natural Resources Division of Forestry and Wildlife but not elsewhere in Hawaii. No other endemic birds would be expected given the location and type of habitat.

Migratory Indigenous (Native) Birds:

Migratory shorebirds winter in Hawaii between the months of August and May. Some juveniles will stay through the summer months (Johnson et al. 1981, in press). Of all the shorebird species which winter in Hawaii the Pacific Golden Plover (Pluvialis fulva) is the most abundant. Plovers prefer open areas such as mud flats, lawns and grazed pasture land. They arrive in Hawaii in early August and depart to their arctic breeding grounds during the last week of April (Johnson et al. 1981). Johnson et al. (1981) and Bruner (1983) have also shown plover are extremely site-faithful on their wintering grounds and many establish foraging territories which they defend vigorously. Such behavior makes it possible to acquire a fairly good estimate of the abundance of plover in any one area. These populations likewise remain relatively stable over many years (Johnson et al. in press). A total of only two plover were counted during the survey. These plover were seen flying over the property. No plover were actually seen on the ground. Both plover observed

had some remaining breeding plumage which would indicate they had recently returned from the artic and were not birds which had "over-summered" (Johnson et al. 1983, Johnson et al. in press).

No other migratory shorebirds were observed and none would really be expected in this particular habitat. The grassland is too dense and high to be attractive to shorebirds such as plover and Ruddy Turnstone (Arenaria interpres).

Resident Indigenous (Native) Birds:

None were recorded nor expected in this habitat at this site.

Resident Indigenous (Native) Seabirds:

None were observed on the property.

Exotic (Introduced) Birds:

A total of only nine species of exotic birds were recorded during the field survey. Table One shows the total number of each species by day. No species were abundant. In fact populations of all species were smaller than I would have predicted on first examination of the site. Given the type of habitat and its location and based on earlier studies (Bruner 1979, 1980, 1984a, 1984b, 1984c, 1985a, 1985b), and information provided in Berger (1972), Hawaii Audubon Society (1984) and Pratt et al. (1987) the following exotic species might also be expected to occur on the property: Ring-necked Pheasant (Phasianus colchicus),

Erckel's Francolin (Francolinus erckelii), California Quail (Callipepla californica), Japanese Quail (Coturnix japonica), Barn Owl (Tyto alba), Yellow-billed Cardinal (Paroaria capitata), Northern Mockingbird (Mimus polyglottos), Saffron Finch (Sicalis flaveola), Lavender Waxbill (Estrilda caerulescens), House Finch (Carpodacus mexicanus) and House Sparrow (Passer domesticus).

Feral Mammals:

The only feral mammals observed during the survey were the Small Indian Mongoose (Herpestes auropunctatus), dogs and goats. No rats, mice or cats were recorded but it would be highly unusual if these ubiquitous mammals did not occur on the property. Without a trapping program it is difficult to conclude much about the relative abundance of rats, mice, mongooses, dogs, cats and goats. However, it is likely that their numbers are typical of what one would find elsewhere in similar habitat on Hawaii.

Records of the endemic and endangered Hawaiian Hoary Bat (Lasiurus cinereus semotus) are sketchy but the species has been reported from Hawaii (Tomich 1986). None were observed on this field survey despite two nights of observations. This species roosts solitarily in trees. So it is not unreasonable to assume that it might occasionally occur on the property. Much remains to be known about the natural history of this species and its requirements here in Hawaii. Bruner (1984d) found bats at locations makai of the Maikoloa Village property.

CONCLUSION

A brief field survey can at best provide a limited perspective of the wildlife present in any given area. Not all species will necessarily be observed and information on their use of the site must be sketched together from brief observations and the available literature. The number of species and the relative density of each species may vary throughout the year due to available resources and reproductive success. Species which are migratory will quite obviously be a part of the ecological picture only at certain times during the year. Exotic species sometimes prosper for a time only to later disappear or become a less significant part of the ecosystem (Williams 1987). Thus only long term studies can provide an in depth view of the bird and mammal populations in a particular area. However, when brief field studies are coupled with data gathered from other similar habitats the value of the conclusions drawn are significantly increased.

The following are broad conclusions related to bird and mammal activity on the property:

- 1- The present habitat provides a limited range of habitats which are utilized by the typical array of exotic species of birds one would expect at this elevation and in this type of environment on Hawaii. Some species typically found on Hawaii in this habitat were not recorded. This may be due to the very dry conditions. No endemic birds or seabirds were recorded nor were they expected.

- 2- The proposed development would create a more diversified habitat than presently exists and would likely result in the following changes in the avifauna and feral mammals on this property:
 - a- Some species might experience a decline in numbers of individuals. Species in this situation could be:
 - Gray Francolin, and perhaps Spotted Dove.
 - b- Populations of all exotic species, with the exception of Gray Francolin and Spotted Dove, will likely increase dramatically following the proposed development. Residential property to the east of the site clearly demonstrates this effect. A brief drive/walk through census of birds in the residential area revealed more total species and greater numbers of individuals of all species.

- 3- In order to obtain more data on mammals, a trapping program would be required. The brief observations of this survey did not reveal any unusual mammal activity. No endangered species were observed.

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30 August 1988

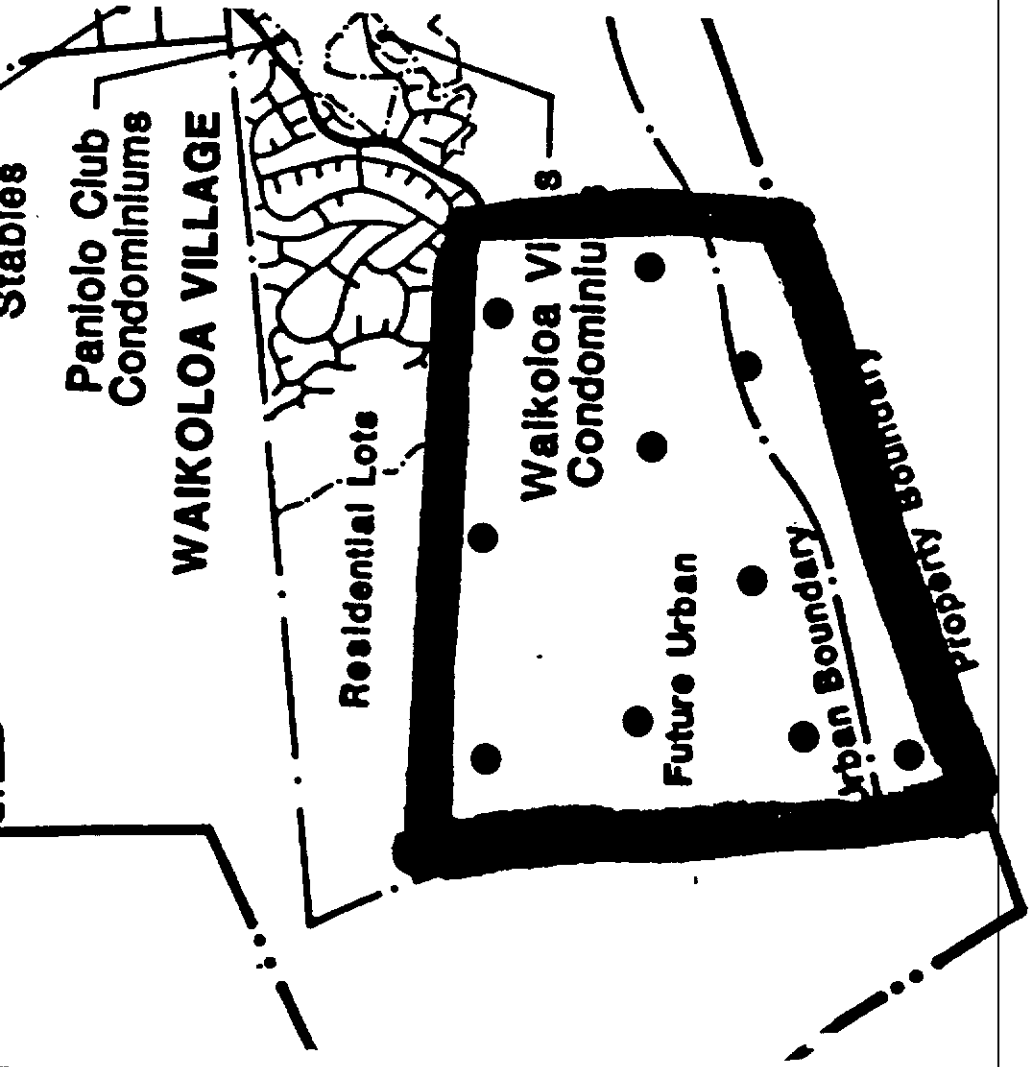


Fig. 1. Project property with eight minute count stations marked by a ●.

Exotic species of birds recorded on Waikoloa Village, Property, Hawaii.

COMMON NAME SCIENTIFIC NAME TOTAL NUMBER (For each day of Survey)

COMMON NAME	SCIENTIFIC NAME	Day 1	Day 2	Day 3
Gray Francolin	<i>Francolinus pondicerianus</i>	6	10	11
Spotted Dove	<i>Streptopelia chinensis</i>	9	8	12
Zebra Dove	<i>Geopelia striata</i>	9	6	5
Common Myna	<i>Acridotheres tristis</i>	0	2	3
Northern Cardinal	<i>Cardinalis cardinalis</i>	0	0	2
Japanese White-eye	<i>Zosterops japonicus</i>	8	10	6
Eurasian Skylark	<i>Alauda arvensis</i>	0	3	7
Nutmeg Mannikin	<i>Lonchura punctulata</i>	6	5	3
Warbling Silverbill	<i>Lonchura malabarica</i>	5	8	11

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APPENDIX C

Air Quality Impact Analysis by Barry D. Neal & Associates

DRAFT

AIR QUALITY STUDY FOR THE PROPOSED WAIKOLOA AFFORDABLE HOUSING PROJECT

WAIKOLOA, SOUTH KOHALA, HAWAII

Prepared for:
R. M. Towill Corporation

October 29, 1990



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2	Annual Summary of Air Quality Measurements for Monitoring Stations Nearest Waikoloa Affordable Housing Project
3	Estimated Worst-Case 1-Hour Carbon Monoxide Concentrations Along Roadways Near Waikoloa Affordable Housing Project

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- 4 Estimated Worst-Case 8-Hour Carbon Monoxide Concentrations Along Roadways Near Waikoloa Affordable Housing Project
- 5 Estimated Indirect Air Pollutant Emissions from Waikoloa Affordable Housing Project Electrical Demand
- 6 Uncontrolled Air Pollution Emission Factors for Municipal Refuse Incinerators

1.0 INTRODUCTION AND PROJECT DESCRIPTION

The Hawaii County Office of Housing and Community Development is proposing for development an affordable residential housing project at Waikoloa Village in the South Kohala District on the island of Hawaii. (Figure 1 is a project location map.) When fully developed, the proposed project will provide approximately 1200 single- and multi-family housing units plus associated community facilities and infrastructure. Currently, the 340 acres of land the project will occupy is vacant. Construction of the proposed project is scheduled to begin during the latter part of 1991. Full development is projected to be achieved by 1997.

The purpose of this study is to describe existing air quality in the project area and to assess the potential short-term and long-term direct and indirect air quality impacts that could result from construction and use of the proposed facilities as planned. Measures to mitigate these impacts are suggested where possible and appropriate.

2.0 AMBIENT AIR QUALITY STANDARDS

Ambient concentrations of air pollution are regulated by both national and state ambient air quality standards (AAQS). National AAQS are specified in Section 40, Part 50 of the Code of Federal Regulations (CFR), while State of Hawaii AAQS are defined in Chapter 11-59 of the Hawaii Administrative Rules. Table 1 summarizes both the national and the state AAQS that are specified in the cited documents. As indicated in the table, AAQS have been established for six air pollutants. These regulated air pollutants include: particulate matter, sulfur dioxide, nitrogen dioxide, carbon monoxide, ozone and lead. National AAQS are stated in terms

of primary and secondary standards. National primary standards are designed to protect the public health with an "adequate margin of safety". National secondary standards, on the other hand, define levels of air quality necessary to protect the public welfare from "any known or anticipated adverse effects of a pollutant". Secondary public welfare impacts may include such effects as decreased visibility, diminished comfort levels, or other potential injury to the natural or man-made environment, e.g., soiling of materials, damage to vegetation or other economic damage. In contrast to the national AAQS, Hawaii State AAQS are given in terms of a single standard that is designed "to protect public health and welfare and to prevent the significant deterioration of air quality".

Each of the regulated air pollutants has the potential to create or exacerbate some form of adverse health effect or to produce environmental degradation when present in sufficiently high concentration for prolonged periods of time. The AAQS specify a maximum allowable concentration for a given air pollutant for one or more averaging times to prevent harmful effects. Averaging times vary from one hour to one year depending on the pollutant and type of exposure necessary to cause adverse effects. In the case of the short-term (i.e., 1- to 24-hour) AAQS, both national and state standards allow one exceedance per year.

State of Hawaii AAQS are in some cases considerably more stringent than comparable national AAQS. In particular, the State of Hawaii 1-hour AAQS for carbon monoxide is four times more stringent than the comparable national limit.

Under the provisions of the Federal Clean Air Act [1], the U.S. Environmental Protection Agency (EPA) is required to periodically review and re-evaluate national AAQS in light of research findings more recent than those which were available at the time the standards were originally set. Occasionally new standards are created as well. Most recently, the national standard for particulate matter has been revised to include specific limits for particulates 10 microns or less in diameter (PM-10) [2]. The State of Hawaii has not explicitly addressed the question of whether to set limits for this category of air pollutant, but national AAQS prevail where states have not set their own more stringent levels.

Hawaii AAQS for sulfur dioxide were relaxed in 1986 to make them essentially the same as national limits. It has been proposed in various forums that the state also relax its carbon monoxide standards to the national levels, but at present there are no indications that such a change is being considered.

3.0 REGIONAL AND LOCAL CLIMATOLOGY

Regional and local climatology significantly affect the air quality of a given location. Wind, temperature, atmospheric turbulence, mixing height and rainfall all influence air quality. Although the climate of Hawaii is relatively moderate throughout most of the state and most of the year, significant differences in these parameters may occur from one location to another. Most differences in regional and local climates within the state are caused by the mountainous topography.

South Kohala, the site of the proposed project, is located on the northwestern side of the island of Hawaii. The topography of this

5.0 SHORT-TERM IMPACTS OF PROJECT

The State Department of Health operates a network of air quality monitoring stations at various locations around the state. Unfortunately, very little data are available for the island of Hawaii, and none are available for the South Kohala area specifically. As indicated in Table 2, the only existing monitoring data anywhere near the project site consist of sulfur dioxide and particulate measurements that were made about 30 miles to the south at Kealahou during 1985 and 1986. During this two-year period, measurements of 24-hour average sulfur dioxide concentration at this location were consistently low with daily mean values ranging from less than 5 to 12 $\mu\text{g}/\text{m}^3$. No exceedances of the state/national 24-hour AAQS for sulfur dioxide were recorded. Twenty-four hour average particulate concentrations ranged from 4 to 28 $\mu\text{g}/\text{m}^3$; no violations of the state AAQS were measured.

At this time, there are no reported measurements of lead, ozone, nitrogen dioxide or carbon monoxide in the project vicinity. These are primarily motor vehicle related air pollutants. Lead, ozone and nitrogen dioxide typically are regional scale problems; concentrations of these contaminants generally have not been found to exceed AAQS elsewhere in the state. Carbon monoxide air pollution, on the other hand, typically is a microscale problem caused by congested motor vehicular traffic. In traffic congested areas such as urban Honolulu, carbon monoxide concentrations have been found to occasionally exceed the state AAQS. Present concentrations of carbon monoxide in the project area are estimated later in this study based on mathematical modeling of motor vehicle emissions.

Short-term direct and indirect impacts on air quality could potentially occur due to project construction. For a project of this nature, there are two potential types of air pollution emissions which could directly result in short-term air quality impacts during the construction phase: (1) fugitive dust from vehicle movement and site excavation; and (2) exhaust emissions from on-site construction equipment. Indirectly, there could also be short-term impacts from slow-moving construction equipment traveling to and from the project site and from a temporary increase in local traffic caused by commuting construction workers.

Fugitive dust emissions may arise from the grading and dirt/rock-moving activities associated with site preparation once the area is cleared. The emission rate for fugitive dust emissions from construction activities is difficult to estimate accurately because of its elusive nature of emission and because the potential for its generation varies greatly depending upon the type of soil at the construction site, the amount and type of earth-disturbing activity taking place, the moisture content of exposed soil in work areas, and the wind speed. The EPA [5] has provided a rough estimate for uncontrolled fugitive dust emissions from construction activity of 1.2 tons per acre per month under conditions of "medium" activity, (P/E) index of 50. Uncontrolled fugitive dust emissions from project construction would probably be somewhere near this level. In any case, State of Hawaii Air Pollution Control Regulations [6] stipulate that emissions of fugitive dust from construction activities cannot be visible beyond the property line. Thus, an effective dust control plan for the project construction phase is essential.

potential short-term air quality impacts from project construction can be mitigated.

6.0 LONG-TERM IMPACTS OF PROJECT

6.1 Roadway Traffic

After construction is completed, use of the proposed facilities will result in increased motor vehicle traffic on nearby roadways, potentially causing long-term impacts on ambient air quality in the project vicinity. Motor vehicles with gasoline-powered engines are significant sources of carbon monoxide. They also emit nitrogen oxides, and those burning leaded gasoline contribute lead to the atmosphere. The use of leaded gasoline in new automobiles is now prohibited. As older vehicles continue to disappear from the numbers of those currently operating on the state's roadways, lead emissions are approaching zero. Nationally, so few vehicles now require leaded gasoline that the EPA is proposing a total ban on leaded gasoline to take effect immediately. Even without such a ban, reported quarterly averages of lead in air samples collected in urban Honolulu have been near zero since early 1986. Thus, lead in the atmosphere is not considered to be a problem anywhere in the state.

Federal air pollution control regulations also call for increased efficiency in removing carbon monoxide and nitrogen oxides from the exhausts of new motor vehicles. By the year 1995 carbon monoxide emissions are expected to be about 30 percent less than the amounts now emitted due to the replacement of older vehicles with newer models. Further reductions in vehicular emissions have recently been proposed by the President for areas of the country which do

Adequate fugitive dust control can usually be accomplished by the establishment of a frequent watering program to keep bare-earth surfaces in work areas from becoming significant dust generators. In dust-prone areas like South Kohala, other control measures such as limiting the area that can be disturbed at any given time, applying chemical soil stabilizers and/or using wind screens may be necessary. Control regulations also require that open-bodied trucks be covered at all times when in motion if they are transporting materials likely to give rise to airborne dust. Paving of parking areas and roads and establishing landscaping as early in the construction process as possible can also lower the potential for fugitive dust emissions.

On-site mobile and stationary construction equipment will also emit some air pollutants in the form of engine exhausts. The largest of this equipment is usually diesel-powered. Nitrogen oxides emissions from diesel engines can be relatively high compared to gasoline-powered equipment, but the standard for nitrogen dioxide is set on an annual basis and is not likely to be violated by short-term construction equipment emissions. Carbon monoxide emissions from diesel engines, on the other hand, are low and should be relatively insignificant compared to vehicular emissions on nearby roadways.

Indirectly, slow-moving construction vehicles on roadways leading to and from the project site could obstruct the normal flow of traffic to such an extent that overall vehicular emissions are increased, but this impact can be mitigated by moving heavy construction equipment during periods of low traffic volume. Likewise, the schedules of commuting construction workers can be adjusted to avoid peak hours in the project vicinity. Thus, most

not currently meet AAQS, mainly through the use of alternative fuels.

To evaluate the potential long-term indirect ambient air quality impact of increased roadway traffic associated with a project such as this, computerized emission and atmospheric dispersion models can be used to estimate ambient carbon monoxide concentrations along roadways leading to and from the project. Carbon monoxide is selected for modeling because it is both the most stable and the most abundant of the pollutants generated by motor vehicles. Furthermore, carbon monoxide air pollution is generally considered to be a microscale problem, whereas nitrogen oxides air pollution most often is a regional issue. This is reflected in the fact that the AAQS for carbon monoxide are specified on a short-term basis (1-hour and 8-hour averaging times) while the AAQS for nitrogen dioxide is set on an annual basis.

For this project, three scenarios were selected for the carbon monoxide modeling study: year 1990 with present conditions, year 1997 without the project, and year 1997 assuming the project is built and complete. To begin the modeling study, critical receptor areas in the vicinity of the project were identified for analysis. Generally speaking, roadway intersections are the primary concern because of traffic congestion and because of the increase in vehicular emissions associated with traffic queuing. For this study, the key intersections identified in the traffic study [7] were also selected for air quality analysis. These include: Queen Kaahumanu Highway at Waikoloa Road, Paniolo Drive/Pua Melia Street at Waikoloa Road and Mamalahoa Highway at Waikoloa Road. Modeling of the present scenario was performed assuming the existing roadway configurations. For the future air quality modeling scenarios, it was assumed that Queen Kaahumanu Highway will be signalized at

Waikoloa Road either with or without the project at least temporarily until a grade-separated interchange is constructed. In the with project case, it was further assumed that a second left-turn lane will be provided for westbound traffic at this intersection. The intersection of Waikoloa Road and Paniolo Drive/Pua Melia Street was also assumed to be signalized and improved in the with project case. More details concerning the present and future conditions and configurations of these intersections are provided in the traffic impact assessment report referenced above.

The main objectives of the modeling study were to estimate both current and projected levels of maximum 1-hour average carbon monoxide concentrations which could then be directly compared to the national and state AAQS. The traffic impact assessment report indicates that traffic volumes generally are or will be higher during the afternoon peak hour than during the morning peak period. Worst-case emission and meteorological dispersion conditions typically occur during the morning hours at many locations. Thus, even though traffic volumes may be higher in the afternoon than in the morning, worst-case air pollution concentrations may occur during the morning. To ensure that worst-case concentrations were identified, both morning and afternoon peak traffic periods were studied.

The EPA computer model MOBILE4 [8] was used to calculate vehicular carbon monoxide emissions for each of the years studied. One of the key inputs to MOBILE4 is vehicle mix. Based on recent vehicle registration figures, the present and projected vehicle mix in the project area is estimated to be 91.9% light-duty gasoline-powered vehicles, 5% light-duty gasoline-powered trucks and vans, 0.5% heavy-duty gasoline-powered vehicles, 0.6% light-duty diesel-

powered vehicles, 1½ heavy-duty diesel-powered trucks and buses, and 1½ motorcycles.

Other key inputs to the MOBILE4 emission model are the cold/hot start fractions. Motor vehicles operating in a cold- or hot-start mode emit excess air pollution. Typically, motor vehicles reach stabilized operating temperatures after about 4 miles of driving. For traffic operating through the Paniolo Drive/Waikoloa Road intersection, it was assumed that about 25 percent of all vehicles would be operating in the cold-start mode and that about 5 percent would be operating in the hot-start mode. Motor vehicles using the Waikoloa Road intersections with Mamalahoa Highway and Queen Kaahumanu Highway were assumed to be mostly stabilized due to the relatively isolated locations of these roadways. Cold- and hot-start fractions of 5 percent and 1 percent, respectively, were assumed for these analyses. These operational mode values were estimated based on a report from the California Department of Transportation [9] and taking into consideration the likely origin of morning and afternoon traffic in the project area. MOBILE4 idle emissions were adjusted to account for excess cold/hot-start emissions per a recent U.S. EPA memorandum [10].

An ambient temperature of 50 degrees F was used for morning peak-hour emission computations while a temperature of 59 degrees F was used for the afternoon case. These are conservative assumptions since morning/afternoon ambient temperatures will generally be warmer than this and emission estimates given by MOBILE4 are inversely proportional to the ambient temperature.

After computing vehicular carbon monoxide emissions through the use of MOBILE4, these data were then input to the latest version

of the computer model CALINE4 [11]. CALINE4 was developed by the California Transportation Department to simulate vehicular movement and atmospheric dispersion of vehicular emissions. It is designed to predict 1-hour average pollutant concentrations along roadways based on input traffic and emission data, roadway/receptor geometry and meteorological conditions.

Input peak-hour traffic data were obtained from the traffic study cited previously. The traffic volumes given in the traffic study for the future scenario include project traffic as well as traffic from other growth that is expected to occur in the area by the year 1997. Traffic queuing estimates were made based on the project traffic study, Transportation Research Board procedures [12], U.S. EPA guidelines [13], and traffic observations at the subject intersections. For the 1990 analyses, vehicles using the intersections of Queen Kaahumanu Highway and Mamalahoa Highway with Waikoloa Road were assumed to accelerate to 55 mph, while Waikoloa Road traffic near the village and Paniolo Drive traffic were assumed to move at 35 and 25 mph, respectively. These are the posted speed limits. Deceleration and acceleration times of 25 and 30 seconds, respectively, were assumed for vehicles traveling at 55 mph, whereas values of 16 and 18 seconds were assumed for those traveling at 35 mph. For vehicles moving at 25 mph, deceleration/acceleration times of 10 and 12 seconds were used. For the 1997 scenarios, the posted speed limits near the intersection of Queen Kaahumanu Highway and Waikoloa Road were assumed to be reduced to 45 mph.

Model roadways were set up to reflect actual roadway geometry, physical dimensions and operating characteristics. Presently, there are no pedestrian walkways along many of the roadways within the project area. Where walkways do exist or are likely to exist

In the future, model receptors were located between 2 and 4 meters from the edge of the roadway. At those locations where sidewalks do not and will likely not exist, model receptor sites were located near the edge of the road right-of-ways at distances of 10 meters from the traveled portions of the roadways near the intersections studied. All receptor heights were placed at 1.5 meters above ground to simulate levels within the normal human breathing zone.

Input meteorological conditions for this study were defined to provide "worst-case" results. One of the key meteorological inputs is atmospheric stability category. For these analyses, atmospheric stability category 6 was assumed for morning scenarios and stability category 4 was assumed for afternoon cases. These are the most conservative stability categories that can be used for estimating pollutant dispersion at suburban or undeveloped locations. A surface roughness length of 100 cm was assumed with a mixing height of 300 meters. Worst-case wind conditions were defined as a wind speed of 1 meter per second with a wind direction resulting in the highest predicted concentration.

Existing background concentrations of carbon monoxide in the project vicinity are believed to be at relatively low levels. Hence, background contributions of carbon monoxide from sources or distant roadways not directly considered in the analysis were accounted for by adding a background concentration of 0.1 ppm to all predicted concentrations for the 1990 scenarios. Due to the expected development that is predicted to occur in the project area within the next several years, a background value of 0.2 ppm was used for all 1997 scenarios.

Table 3 summarizes the final results of the modeling study in the form of the estimated worst-case 1-hour afternoon ambient carbon monoxide concentrations. These results can be compared directly to the state and the national AAQS. Estimated worst-case carbon monoxide concentrations are presented in the table for three scenarios: year 1990 with existing traffic, year 1997 without project traffic and year 1997 with project traffic. The locations of these estimated worst-case 1-hour concentrations all occurred at or very near the indicated intersections.

As indicated in the table, the estimated present worst-case 1-hour carbon monoxide concentration in the project area, 5.9 mg/m^3 , occurred near the intersection of Paniolo Drive and Waikoloa Road during the morning peak-traffic hour. Concentrations tend to be higher here due to excess cold-start emissions. The worst-case 1-hour concentrations at the other intersections studied were 5.5 mg/m^3 during the morning at Queen Kaahumanu Highway and Waikoloa Road and 2.3 mg/m^3 during the afternoon at Mamalahoa Highway and Waikoloa Road.

In the year 1997 without the proposed project, a worst-case 1-hour concentration of 16.2 mg/m^3 was predicted to occur during the morning near the intersection of Queen Kaahumanu Highway and Waikoloa Road. Concentrations were predicted to increase substantially at this location compared to the existing case due to the projected increase in traffic and the assumed signalization of this intersection. Worst-case concentrations at other locations and times in the study area were estimated to range from about 4 to 8 mg/m^3 .

Predicted 1-hour worst-case concentrations for the 1997 with project scenario range from 5.1 mg/m³ during the afternoon at the intersection of Mamalahoa Highway with Waikoloa Road to 15.2 mg/m³ during the morning at the Queen Kaahumanu Highway and Waikoloa Road intersection. As noted in the table, Waikoloa Road intersections both at Queen Kaahumanu Highway and at Paniolo Drive were assumed to be signalized and further improved. Compared to the without project case, predicted concentrations at the Queen Kaahumanu Highway/Waikoloa Road intersection were estimated to be about 5 percent lower in the morning and about 25 percent higher in the afternoon. Worst-case 1-hour concentrations near the Paniolo Drive/Waikoloa Road intersection will be significantly higher compared to the without project case due to the increase in traffic and the installation of a traffic signal, while concentrations near Mamalahoa Highway and Waikoloa Road will be marginally higher. Compared to the present case, worst-case concentrations in 1997 with the proposed project will be about two to three times higher at most locations.

All estimated worst-case 1-hour carbon monoxide levels for all scenarios are well within the national AAQS of 40 mg/m³. Present worst-case 1-hour values are also estimated to meet the more stringent state standard of 10 mg/m³. It appears likely, however, that future concentrations with or without the project may exceed the state 1-hour AAQS on occasion at the Queen Kaahumanu Highway/Waikoloa Road intersection. With the project, morning concentrations near Paniolo Drive at Waikoloa Road may also exceed the state 1-hour standard during worst-case conditions.

Worst-case 8-hour carbon monoxide concentrations were estimated by multiplying the worst-case 1-hour values by a persistence factor of 0.5. This accounts for two factors: (1) traffic volumes

averaged over eight hours are lower than peak 1-hour values, and (2) meteorological dispersion conditions are more variable (and hence more favorable) over an 8-hour period than they are for a single hour. Based on monitoring data, 1-hour to 8-hour persistence factors for most locations generally vary from 0.4 to 0.8 with 0.6 being the most typical. One recent study based on modeling [14] concluded that 1-hour to 8-hour persistence factors could typically be expected to range from 0.4 to 0.5. EPA guidelines [13] recommend using a value of 0.6 to 0.7 unless a locally derived persistence factor is available. Recent monitoring data for Honolulu reported by the Department of Health [15] suggests that this factor may range between about 0.35 and 0.55 depending on location and traffic variability. Considering the location of the project and the traffic pattern for the area, a 1-hour to 8-hour persistence factor of 0.5 is probably most appropriate for this application.

The resulting estimated worst-case 8-hour concentrations are indicated in Table 4. For the 1990 scenario, the estimated worst-case 8-hour carbon monoxide concentration was 3.0 mg/m³ at the intersection of Paniolo Drive and Waikoloa Road; other locations studied ranged from 1.2 mg/m³ near Mamalahoa Highway and Waikoloa Road to 2.8 mg/m³ near Queen Kaahumanu Highway and Waikoloa Road. The predicted maximum value for the 1997 without project scenario was 8.1 mg/m³ near Queen Kaahumanu Highway and Waikoloa Road. As mentioned above, concentrations are predicted to increase substantially at this location due to the installation of a traffic signal. The highest 8-hour concentrations elsewhere would range from about 2 to 4 mg/m³ without the project. In 1997 with the project, the estimated maximum worst-case 8-hour concentration was 7.6 mg/m³ near Queen Kaahumanu Highway and Waikoloa Road; other locations studied ranged from 3.1 mg/m³ at Mamalahoa Highway and Waikoloa Road to 6.6 mg/m³ at the intersection of Paniolo Drive and

Waikoloa Road. Either with or without the project, 1997 concentrations will be higher than existing concentrations at most locations. Comparing the predicted values for the existing case to the AAQS, it appears that both the state and the national 8-hour standards will be met during 1990. The same is true without the project in 1997 except at the intersection of Queen Kaahumanu Highway and Waikoloa Road. With the project, worst-case 8-hour concentrations will meet the national standard but may occasionally exceed the more stringent state standard along Waikoloa Road at Queen Kaahumanu Highway and at Paniolo Drive.

The results of this study reflect several assumptions that must be made concerning traffic movement and worst-case meteorological conditions. One such assumption concerning worst-case meteorological conditions is that a wind speed of 1 meter per second with a steady direction for 1 hour will occur. A steady wind of 1 meter per second blowing from a single direction for an hour is not very likely, and it may occur only once a year or less. With wind speeds of 2 meters per second, for example, computed carbon monoxide concentrations would be only about half the values given above.

6.2 Electrical Demand

The proposed project will also cause indirect emissions from power generating facilities as a consequence of electrical power usage.

Peak project power demand at full build-out is not expected to exceed about 3 megawatts. Present generating capacity on the Big Island is 161 megawatts with most of this power provided by oil-burning generating units. Island wide, peak power demand is currently about 120 megawatts. Average annual electrical demand of the project when fully developed is not expected to exceed about

15 million kilowatt-hours. This power demand will most probably be provided mainly by oil-fired generating facilities located on the island. In order to meet the electrical power needs of the proposed project, power generating facilities will have to be expanded and/or burn more fuel, and hence more air pollution will be emitted at these facilities. Given in Table 5 are estimates of the indirect air pollution emissions that will result from the project electrical demand assuming all power is provided by burning more fuel oil at Hawaii's oil-fired power plants. Based on the ratio of peak project power demand to total present peak power demand on Hawaii, the project power demand will result in about a 3 percent increase in emissions from the electric utility if all project power is derived from fuel oil.

6.3 Solid Waste Disposal

Solid waste generated by the project when fully completed is expected to amount to about 15 tons of refuse (about two to three 6-ton truckloads) per day. Presently, the refuse district handles about 100 tons per day. Most if not all project refuse will likely be hauled away and either landfilled or burned at another location. If all refuse is landfilled, the only air pollution emissions associated with solid waste disposal (assuming problems similar to those which currently exist at the Kailua Landfill are avoided) will be due to exhaust fumes and fugitive dust from trucks and heavy equipment used to place the refuse in the landfill. If, on the other hand, all or part of the refuse is burned at a municipal incinerator, disposal of solid waste from the project will also result in emissions of particulate, carbon monoxide and other contaminants from the incineration facility. Table 6 gives emission factors for municipal refuse incinerators (without controls) in terms of pounds of air pollution per ton of refuse material charged. Thus, uncontrolled air pollutant emission rates

in terms of pounds per year, for example, can be estimated by multiplying the emission factors given in the table by the number of tons per year of refuse that is burned. Use of emission filtration equipment will substantially reduce emissions of particulate.

7.0 SUMMARY OF IMPACTS AND MITIGATIVE CONSIDERATIONS

7.1 Impacts Summary

The major short-term air quality impact will be the potential emission of significant quantities of fugitive dust during project construction phases. Uncontrolled fugitive dust emissions from construction activities are estimated to amount to about 1.2 tons per acre per month. During the period of construction, emissions from engine exhausts (primarily consisting of carbon monoxide and nitrogen oxides) will also occur both from on-site construction equipment and from vehicles used by construction workers and from trucks traveling to and from the project.

The primary long-term air pollution impact from the project will arise from the increased motor vehicle traffic associated with the project. Potential increased levels of carbon monoxide concentrations along roadways leading to and from the proposed development will be the primary concern. Based on mathematical modeling of projected vehicular traffic and on atmospheric dispersion estimates of vehicular emissions, it is predicted that with the proposed project carbon monoxide concentrations along roadways in the project vicinity will unavoidably be higher at several locations compared to the without project case, but worst-case concentrations will remain within the national standards. The highest concentra-

tions will occur in the vicinity of Queen Kaahumanu Highway at Waikoioa Road.

The more stringent State of Hawaii ambient air quality standards for carbon monoxide should be achieved in the project vicinity during the current year but will likely be exceeded either with or without the project in the year 1997 at the Queen Kaahumanu Highway intersection with Waikoloa Road due to vehicular emissions. Concentrations near the intersection of Panilolo Drive and Waikoloa Road may also exceed the state standards in the with project case but will likely meet these standards without the project. It should be mentioned here, however, that the state standards are set so low that they are likely exceeded at many intersections in the state that have even moderate traffic volumes. It is also worth noting that, although the national AAQS allow higher levels of carbon monoxide, the national standards were developed after extensive research with the objective of defining levels of air quality that would protect the public health with an adequate margin of safety.

Some long-term impacts on air quality also could potentially occur due to indirect emissions from power generating facilities supplying the project with electricity and from the disposal of waste materials generated by the project. Quantitative estimates of these impacts were not made, but it appears likely that any impacts will be small due to the magnitude of the project electrical and solid waste demands compared to the present county demands.

7.2 Mitigative Considerations

Strict compliance with State of Hawaii Air Pollution Control Regulations regarding establishment of a regular dust-watering program and covering of dirt-hauling trucks will be required to effectively mitigate fugitive dust emissions from construction activities. Twice daily watering is estimated to reduce dust emissions by up to 50 percent. Using of wind screens, applying chemical soil stabilizers and/or limiting the area that is disturbed at any given time may be required in sensitive or dust-prone areas. Paving of parking areas and establishment of landscaping early in the construction schedule will also help to control dust. Increased vehicular emissions due to disruption of traffic by construction equipment and/or commuting construction workers can be alleviated by moving equipment and personnel to the site during off-peak traffic hours.

Options available to mitigate traffic-related air pollution are to improve roadways, reduce traffic or reduce individual vehicular emissions. Long-term projections of carbon monoxide emissions from vehicular traffic associated with the completed development are based on the traffic impact study findings. It has been assumed that the roadway improvements recommended in the traffic study will be implemented to move traffic efficiently through the project area and adjacent locations. Future air pollution concentrations in the vicinity of Queen Kaahumanu Highway and Waikoloa Road will be lower than predicted if and when a grade-separated interchange is constructed at this location. Also, air quality impacts near the intersection Paniolo Drive and Waikoloa Road will be diminished if the north-south collector road west of and parallel to Paniolo Drive is built in 1995 as planned.

Aside from further improving roadways, air pollution impacts from vehicular emissions can be mitigated by reducing traffic through the use of mass transit and car pooling and/or by adjusting local school and business hours to begin and end during off-peak times. Due to the extended completion date for the project, it is conceivable that the efficiency of motor vehicle engines and/or emission control equipment will be improved or that vehicles will be developed which burn cleaner fuels before the project reaches full build-out. If this occurs, then impacts will be less than predicted. With regard to cleaner burning fuels, vehicles burning methanol or compressed natural gas or powered by electrical motors are some of the possibilities for technological development that are currently being contemplated. Lastly, even without technological breakthroughs, it is also possible that at some point in the future the state may decide to adopt either a motor vehicle inspection and maintenance program, which would ensure that emission control devices are properly maintained and thereby reduce emissions, or more restrictive emission control standards.

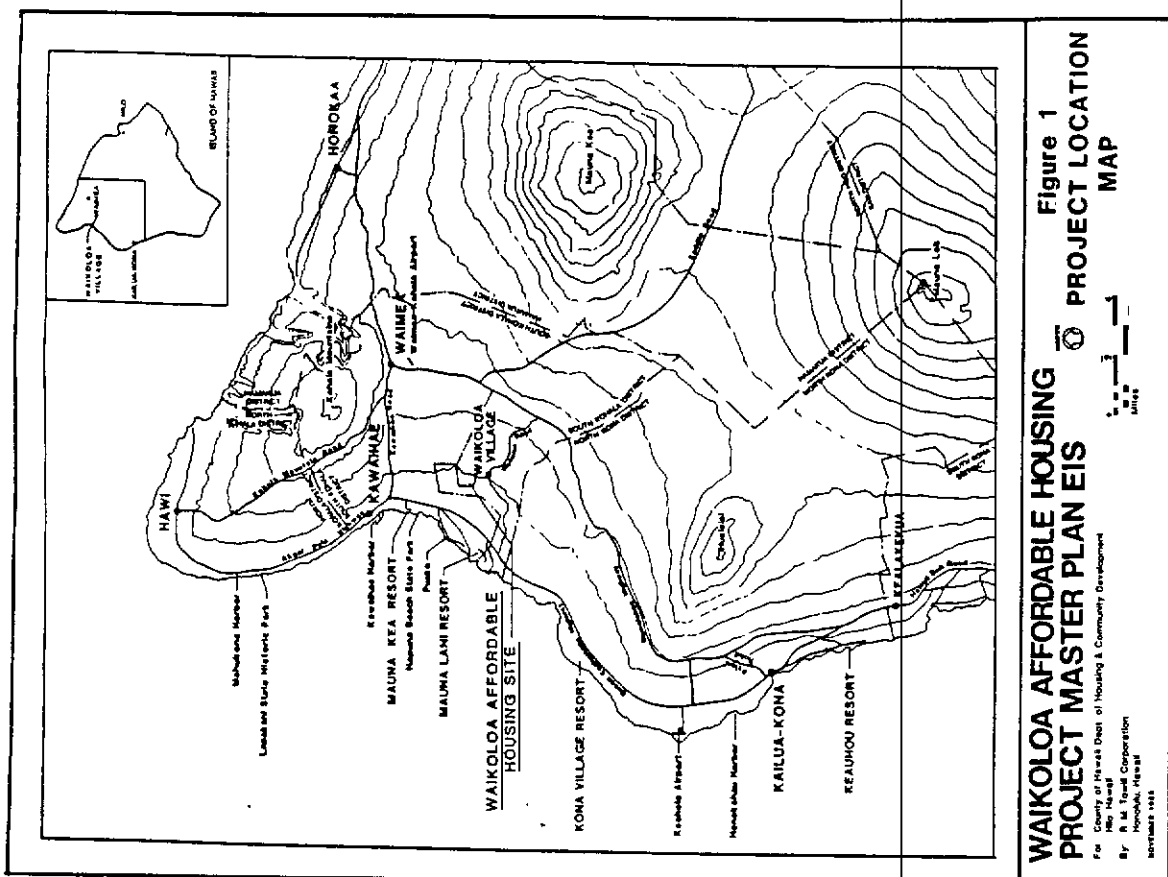
Indirect emissions from project electrical demand could be reduced somewhat by utilizing solar energy design features to the maximum extent possible. This might include installing solar water heaters, designing homes and building space so that window positions maximize indoor light without unduly increasing indoor heat, and using landscaping where feasible to provide afternoon shade to cut down on the use of air conditioning. Use of wind power generating units, solar energy, geothermal energy, ocean thermal energy conversion and/or other alternative energy sources by the utility instead of fuel-burning facilities also would lessen indirect emissions from project electrical demand.

Most probably solid waste from the project will be buried at a landfill, and any air pollution impacts will be minimal if the landfill is operated properly. If project refuse is burned instead at a municipal incinerator, air pollution impacts could be reduced substantially if the incinerator is fitted with pollution control equipment, i.e., electrostatic precipitators or fabric filters. Conservation and recycling programs also could reduce solid waste which would reduce any related air pollution emissions proportionately. Lastly, if the new H-Power garbage-to-energy facility located on Oahu proves successful, similar facilities on the other islands may be developed before project completion. Use of solid waste to generate power will offset emissions that would otherwise occur from fossil-fueled power plants if the waste would be simply incinerated instead.

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WAIKOLOA AFFORDABLE HOUSING PROJECT MASTER PLAN EIS **Figure 1**
PROJECT LOCATION MAP

For County of Hawaii Dept. of Housing & Community Development
 For the State of Hawaii
 By: A. M. Tread Corporation
 Honolulu, Hawaii
 November 1987

Table 1
 SUMMARY OF STATE OF HAWAII AND NATIONAL
 AMBIENT AIR QUALITY STANDARDS

Pollutant	Units	Averaging Time	Maximum Allowable Concentration		
			National Primary	National Secondary	State of Hawaii
Suspended Particulate Matter	$\mu\text{g}/\text{m}^3$	Annual	-	-	60 ^a
		24 Hours	-	-	150 ^b
Particulate Matter ^c	$\mu\text{g}/\text{m}^3$	Annual	50	50	-
		24 Hours	150 ^b	150 ^b	-
Sulfur Dioxide	$\mu\text{g}/\text{m}^3$	Annual	80	-	80
		24 Hours	365 ^b	-	365 ^b
		3 Hours	-	1300 ^b	1300 ^b
Nitrogen Dioxide	$\mu\text{g}/\text{m}^3$	Annual	100	100	70
Carbon Monoxide	mg/m^3	8 Hours	10 ^b	-	5 ^b
		1 Hour	40 ^b	-	10 ^b
Ozone	$\mu\text{g}/\text{m}^3$	1 Hour	235 ^b	235 ^b	100 ^b
Lead	$\mu\text{g}/\text{m}^3$	Calendar Quarter	1.5	1.5	1.5

^aGeometric mean

^bNot to be exceeded more than once per year

^cParticles less than or equal to 10 microns aerodynamic diameter

Table 2

ANNUAL SUMMARY OF AIR QUALITY MEASUREMENTS FOR
 MONITORING STATIONS NEAREST
 WAIKOLOA AFFORDABLE HOUSING PROJECT

Parameter / Location	1985	1986
Sulfur Dioxide / Kealahou, Kona		
Period of Sampling (months)	7	8
No. of 24-Hr Samples	31	40
Range of 24-Hr Values ($\mu\text{g}/\text{m}^3$)	<5-8	<5-12
Average Daily Value ($\mu\text{g}/\text{m}^3$)	<5	<5
No. of State AAQS Exceedances	0	0
Particulate / Kealahou, Kona		
Period of Sampling (months)	7	8
No. of 24-Hr Samples	34	40
Range of 24-Hr Values ($\mu\text{g}/\text{m}^3$)	6-22	4-28
Average Daily Value ($\mu\text{g}/\text{m}^3$)	12	16
No. of State AAQS Exceedances	0	0

Source: State of Hawaii Department of Health, "Hawaii Air Quality Data for the Period of January 1985 to December 1987"

Table 3

ESTIMATED WORST-CASE 1-HOUR CARBON MONOXIDE CONCENTRATIONS
ALONG ROADWAYS NEAR WAIKOLOA AFFORDABLE HOUSING PROJECT
(milligrams per cubic meter)

Roadway Intersection	Year/Scenario			
	1990/ Present AM PM	1997/ Without Project AM PM	1997/ With Project AM PM	1997/ With Project PM
Queen Kaahumanu Highway at Waikoloa Road	5.5 2.6	16.2 ^a 7.7 ^a	15.2 ^b 9.8 ^b	9.8 ^b
Paniolo Drive at Waikoloa Road	5.9 5.0	8.2 5.2	13.2 ^c 9.8 ^c	9.8 ^c
Mamalahoa Highway at Waikoloa Road	1.9 2.3	4.4 4.5	6.2 5.1	5.1

Hawaii State AAQS: 10
National AAQS: 40

- ^aAssumes intersection signalized and speed limits reduced to 45 mph.
- ^bAssumes intersection signalized and second left-turn lane added for westbound traffic; speed limits reduced to 45 mph.
- ^cAssumes intersection signalized and eastbound left-turn lane and westbound right-turn lane added.

Table 4

ESTIMATED WORST-CASE 8-HOUR CARBON MONOXIDE CONCENTRATIONS
ALONG ROADWAYS NEAR WAIKOLOA AFFORDABLE HOUSING PROJECT
(milligrams per cubic meter)

Roadway Intersection	Year/Scenario		
	1990/ Present	1997/ Without Project	1997/ With Project
Queen Kaahumanu Highway at Waikoloa Road	2.8	8.1 ^a	7.6 ^b
Paniolo Drive at Waikoloa Road	3.0	4.1	6.6 ^c
Mamalahoa Highway at Waikoloa Road	1.2	2.2	3.1

Hawaii State AAQS: 5
National AAQS: 10

- ^aAssumes intersection signalized and speed limits reduced to 45 mph.
- ^bAssumes intersection signalized and second left-turn lane added for westbound traffic; speed limits reduced to 45 mph.
- ^cAssumes intersection signalized and eastbound left-turn lane and westbound right-turn lane added.

Table 5
 ESTIMATED INDIRECT AIR POLLUTION EMISSIONS FROM
 WAIKOLOA AFFORDABLE HOUSING PROJECT ELECTRICAL DEMAND*

Air Pollutant	Emission Rate (tons/year)
Particulate	3
Sulfur Dioxide	38
Carbon Monoxide	8
Volatile Organics	3
Nitrogen Oxides	36

*Based on U.S. EPA emission factors for utility gas turbines [5]. Assumes net electrical demand of 15 million kw-hrs per year and low sulfur oil used to generate power.

Table 6

UNCONTROLLED AIR POLLUTION EMISSION FACTORS FOR
 MUNICIPAL REFUSE INCINERATORS (lb/ton).

Air Pollutant	Emission Factor
Particulate	14'
Sulfur Oxides	2.5
Carbon Monoxide	35
Organics	1.5
Nitrogen Oxides	3

'Emission factors are given in terms of weight of material emitted per unit weight of refuse material charged.
 *Assumes incinerator equipped with settling chamber and water spray.

Source: U.S. Environmental Protection Agency [5]

APPENDIX D

Archaeological Reconnaissance Survey by William Bonk

AN ARCHAEOLOGICAL RECONNAISSANCE SURVEY
AT WAIKOLOA VILLAGE, SOUTH KOHALA, HAWAI'I

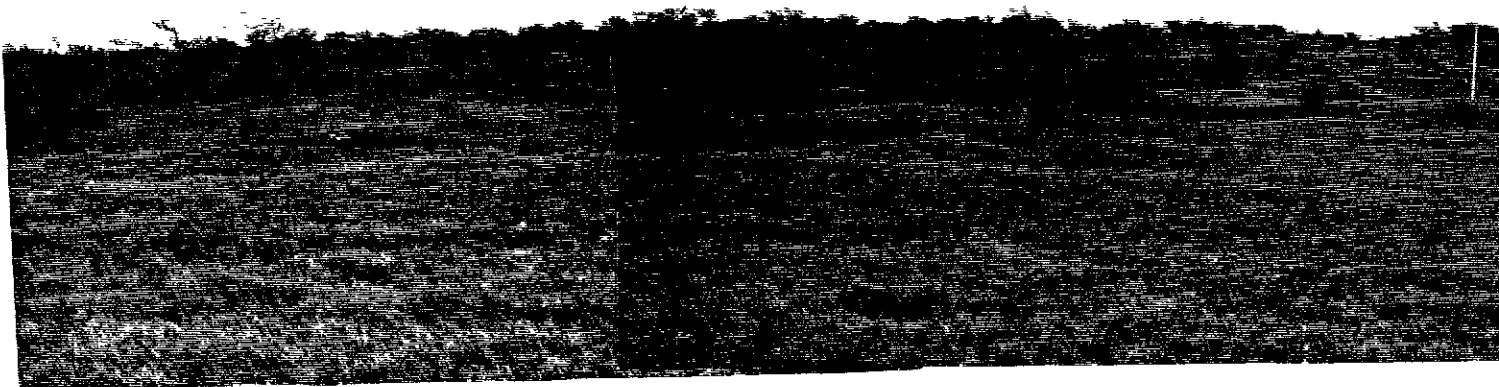
by

WILLIAM J. BONK

UNIVERSITY OF HAWAII AT HILO

prepared for

BELT, COLLINS & ASSOCIATES



Hilo, Hawaii
December, 1988.

INTRODUCTION

During the early part of May, 1968 this writer was contacted and asked to submit a proposal for an archaeological reconnaissance survey and report for a parcel of land in the Waikoloa area of Hawaii. After examining the particulars regarding area, access, etc. a proposal was drafted and sent to Belt, Collins and Associates of Honolulu. Early in July I received authorization to proceed with the project and the following pages of this report provide the results of the investigation and the recommendations that result from that research.

Prior to completion of this report a preliminary letter statement of my findings was communicated to Belt, Collins and Associates, to pertinent State and County offices, and to the Director of Planning at Waikoloa.

AREA

The area surveyed and reported on in this report is in the *ahupua'a* of Waikoloa, South Kohala District, on the island of Hawaii. It consists of a 580 acre parcel of land at the north end of Waikoloa Village (See Figure 1.) In addition, it may be further identified through its Tax Map Key: 6-8-02:26, which places its location to the north and west of Paniolo Drive (See Figure 2.)

The general shape of the project area is slightly longer in its north-south axis than in its east-west direction although there is a slight bulge in the center of its eastern margin. A rough dirt road extends northward from the end of Paniolo Drive and so forms the 6000± feet eastern boundary of the plot. The northern border follows the center of Kamakoa Gulch for approximately 4600 feet, whereas a smaller, unnamed gulch is at the southern perimeter. Here the study area is at its narrowest, with only about 4000 feet separating the southeast corner of the parcel from that of the southwest. The 5000 feet of the western borderline curves slightly in a northwest direction thereby allowing for a greater width in the northern portion of the parcel in comparison to that of the southern portion of the plot.

The surface gradient within the tract exhibits a general downward slope toward the west. In the north the terrain drops some 213 feet from east to west, with the lowest elevation, some 567 feet above sea level, recorded in the northwest corner of the project area. In contrast, a drop of only 135± feet was noted for the southern margin. The highest points within the tract are usually along or just within the eastern border. In the northeast we recorded 780± feet above sea level, in the southeast approximately 785 feet, and at a point roughly one-third of the distance north of the southeast corner we recorded the highest elevation in the parcel at 893 feet above sea level.

The region in and around Waikoloa Village is noted for its savanna-like quality of the physical environment. Rainfall is light, probably no more than 35 to 40 inches a year. As a result coarse grasses with scattered scrub tree growth, most often *keawe*, dominate within the ecosystem. In addition, there are numerous days during the year when the wind is quite strong and sometimes gusty. The project area is very typical of that just described for the broader region (See Title Page illustration and Figures 3-6.)

The ground surface varies somewhat from place to place

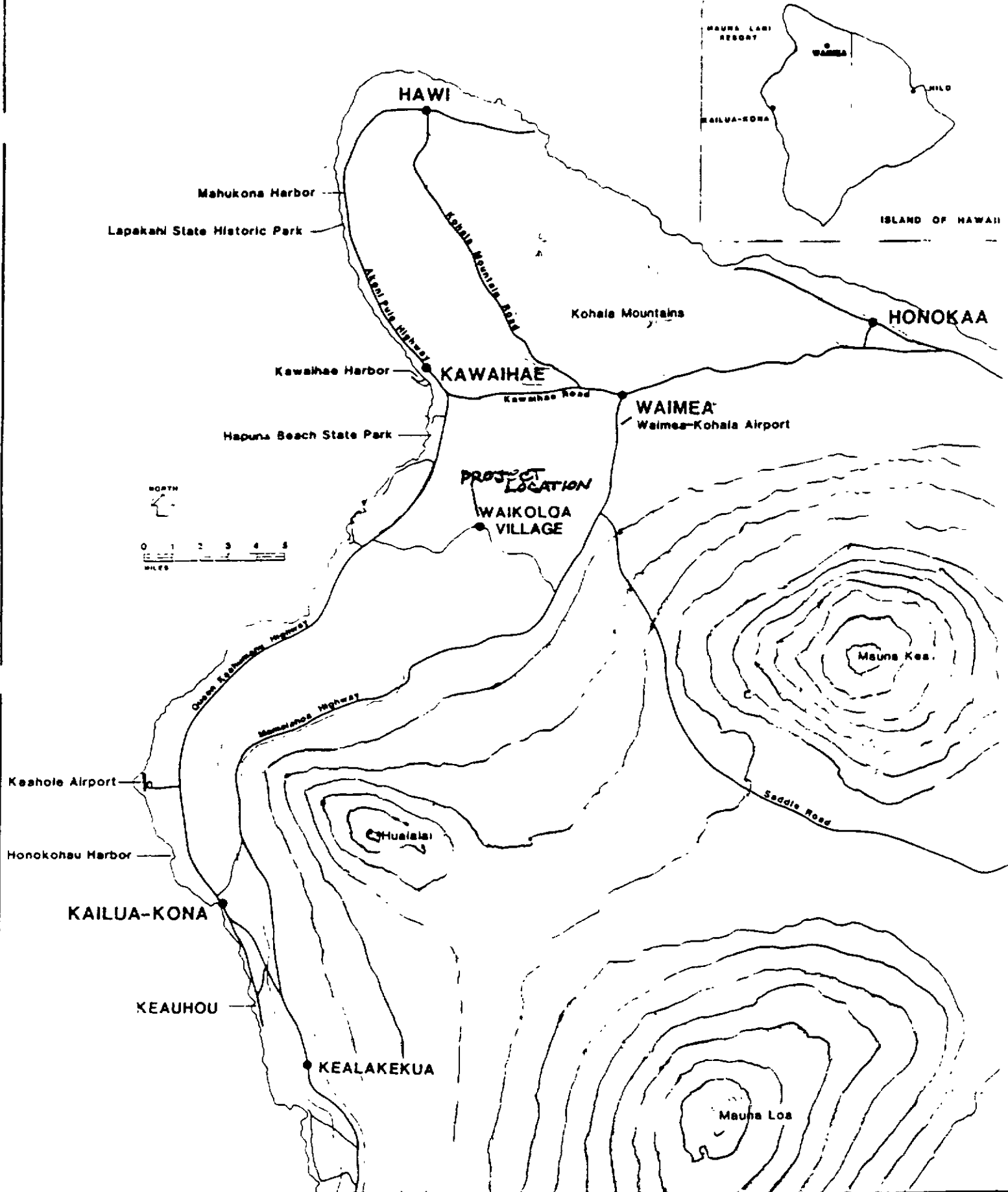


Figure 1
REGIONAL MAP

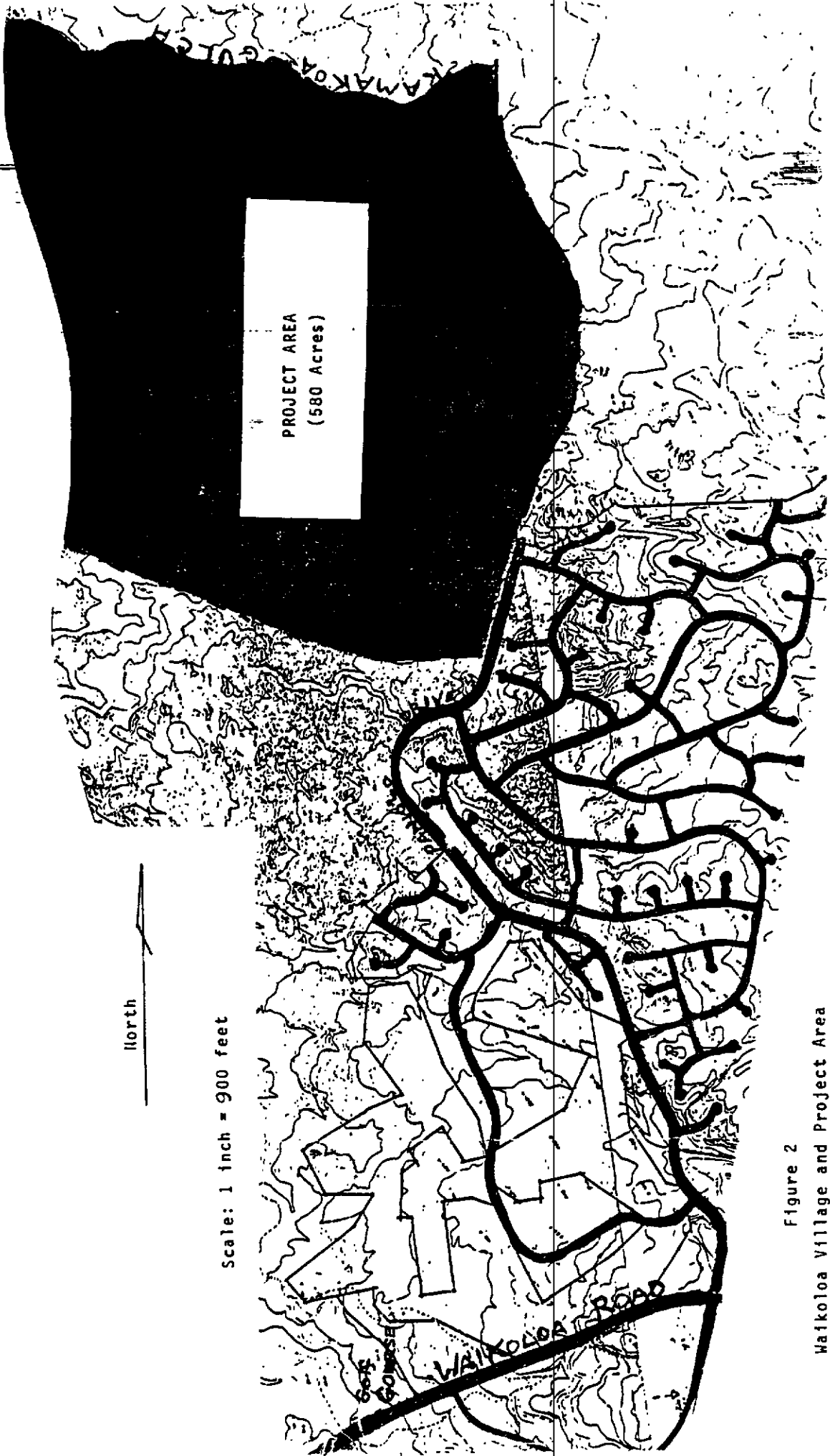


Figure 2
Maikoloa Village and Project Area

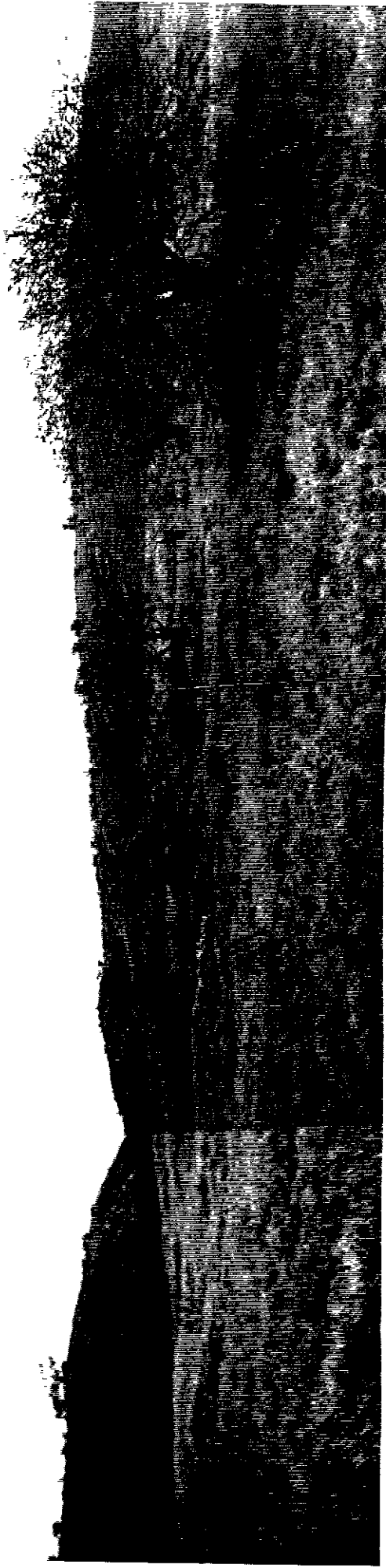


Figure 3
At Southeast of the Project Area (Looking westward)

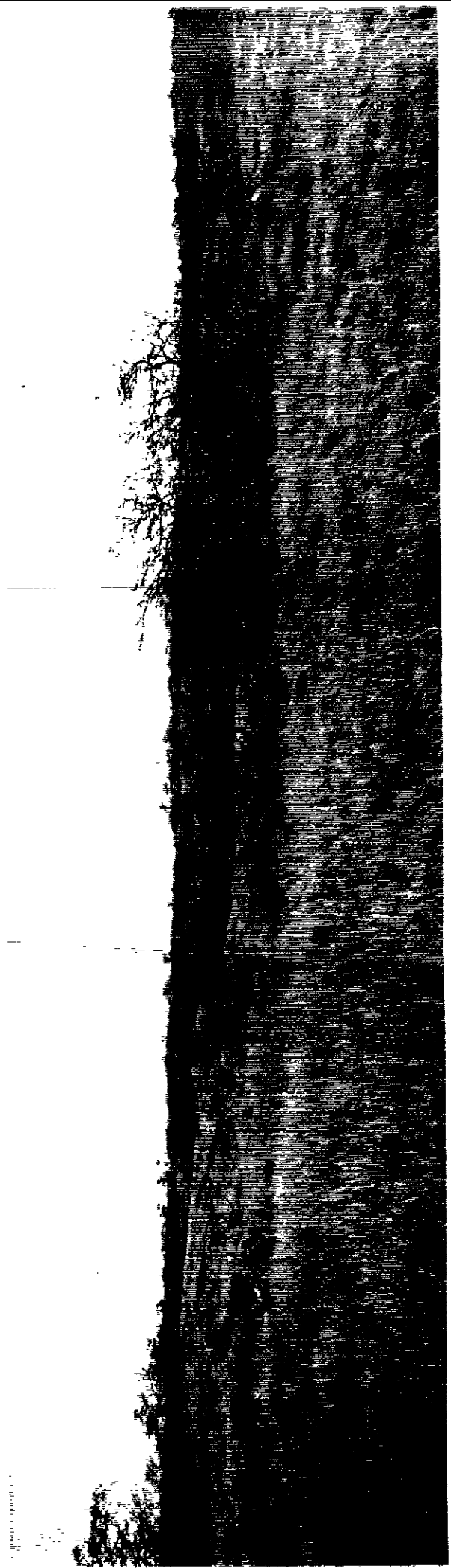


Figure 4
At Northeast of the Project Area (Looking westward)



Figure 5
At Southeast of the Project Area (View South and Southwestward)



Figure 6
At Northeast of the Project Area (View West and Northwestward)

within the study area but for most of the northern half of the tract it tends to effectuate a visual appearance of that best described as a rolling or slightly undulating expanse (See Figures 4 and 6.) This northern section was much more readily traversed, for the ground underfoot was more secure than that to the south. The southern half of the project area includes places where the ground surface drops more precipitously as well as where rock outcroppings hinder steady movement. Furthermore, localized tracts covered with 'a'ā resulted in difficulty of movement and a reasonable time for examination. More difficult yet were the 'a'ā tracts covered by grass. Here both footing as well as sight were limited. One result was the sharp increase in time required to examine a particular section of the study area. On numerous occasions while in the field this writer struggled and eventually fell or stumbled because of the terrain.

METHODOLOGY

This report is the end product of a field investigation commonly referred to as a reconnaissance survey. Visual observation and record keeping while walking through an area to be investigated is normally part of the methodology used in the field for this type of survey. In this case notes were recorded in a field book and photographs were taken in both black and white and color film. Many times when cultural data or material is encountered the survey leads to additional stages of investigation. When this takes place it usually is the result of recommendations included as part of the reconnaissance survey.

For this investigation the field survey was carried out by myself with the aid of my son, Ken, who quite often accompanies me in the field.

Approximately 115 hours went into the field portion of this survey. Eight transects in an east-west/west-east direction were first carried out, followed by four transects in a south-north/north-south direction. With this amount of detailed coverage of the area we feel quite confident that no portion of the study area was overlooked.

FINDINGS AND RECOMMENDATIONS

Throughout the field examination we found nothing to indicate past use of the project area other than some scattered shrapnel fragments indicative of use as a military target area in the recent past. However, these fragments were quite limited and therefore it is surmised that this use was of an accidental or sporadic nature rather than one of a regular occurrence. Perhaps the event that led to the presence of these metal fragments in this area dates to the period of World War II when large numbers of U.S. servicemen were based and trained at Waimea and used the surrounding region for training purposes.

In conclusion, and as a result that we found nothing of prehistoric or historic significance within the area investigated, we therefore must recommend that no further archaeological work be required. In addition, it is further recommended that, based on the above, any land transformation would not be archaeologically detrimental and therefore can proceed.

ADDENDUM

The following additional remarks to my report of December 1988 should be viewed as a form of clarification and addition. This is so as to add to what has originally been set down as well as to illuminate that which may have been questionable.

The first two figures (maps) are both descriptive and interrelated, in that the study area is to be found north of Waikoloa Village and west of the northernmost end of Paniolo Drive. This road is paved and completed for somewhat less than one-third the distance along the east border of the study area. Beyond that an unpaved "jeep" trail extends along the east border and beyond the northern limits of the study area.

An additional map, originally drafted by Engineers Surveyors Hawaii, Inc. is included in this supplement so as to illustrate the lay of the land. As one can see from a perusal of this map only two gullies are found and these delineate the southern and northern ends of the area examined. Nowhere were we restricted from examining the ground surface although the banks of the gullies are somewhat more difficult to view, as was a region in the south-west where thin slabs of clinker 'a'ā, partially covered by grass, produced unsure footing. This portion of the area examined also has the greatest incidence of surface declivity, hence the need for more time in coverage.

No recorded lava flows are within the area examined. A brownish patination on the rock surface also supports a minimal age of more than 200 years for the flow. How much beyond this time, however, is fathomless. The northern half of the tract was walked over more readily and with less difficulty, for all but the immediate locale of Kamakoa gulch. The northern portion of the area examined exhibits no steep slopes and very little rough ground surface.

In terms of climate and vegetation the land is quite arid. Mean annual temperature is about 24°C (75°F) and mean annual rainfall is a little over 250 mm (about 10 in.) If we use the Koeppen classification system we have to refer to this area as Hot Desert (BWh.)

The Waikoloa Village area is noted for its windy conditions. Land breezes tend to sweep across this open region, predominantly from the northeast, but occasionally during the winter months there is a shift and they then blow from the southwest.

With this reversal of wind pattern comes most of the moisture during the winter months.

The subject area falls within McEldowney's Vegetation Zone III (1983: 410). Grasses form the dominant vegetation interspersed with scattered stands of *kiawe*. Buffelgrass and *pili* predominate over other grasses, and shrubs are seen more often than in lower elevations. Fountain grass is seen here and there and seems to be gaining in significance over time.

In the northern half of the study area, soils are shallow aridsols of the Kawaihae series (KNC). Well drained, gritty, and stony, they tend to be moderately eroded by wind and water. Formation is from aeolian fine sand and silt, although weathering of volcanic ash is also part of the formative process. An upper horizon of very fine sandy loam overlays loam or silt loams with a weak medium and/or coarse prismatic structure. Calcium carbonate collections are seen as coatings on rocks (USDA Soil Conservation Service, 1973:26.) Hard *pahoehoe* bedrock is at a depth of between 20 to 40 inches, permeability is moderate and runoff is medium. Roots usually penetrate to bedrock. This soil is used mostly for pasture although no cattle were seen in the area during the field investigation.

The southern half of the area examined is classified as Very Stony Land (rVS.) It shows very shallow soil material and a high proportion of 'a'a lava outcroppings. Slope increases here with a range of between 10 and 15 percent. Between lava outcrops and in the cracks of the lava, the soil extends to a depth of 5 to 20 inches. Erosion here is slight. (USDA Soil Conservation Service, 1973:52.)

The prehistoric land use pattern in the Waimea-Waikoloa area was originally subsistence horticulture and a subsistence marine exploitation. By the later half of the 16th century, we see changes in this pattern with an increase, through time, of what I have called a "subsistence-support" economy. This reaches its peak in the late prehistoric of the second half of the 18th century (Bonk, 1985:6.) As foreign ships increased in numbers at Kawaihae, in the early historic period, we see a further development to a "subsistence-trade" economy for the environs of Waimea. Through the 19th century, cattle became a greater and more important part of the economic base, the transporting of products, and a money-based economic system gradually substituted for that of a subsistence base.

As was mentioned previously (Bonk, 1985:6) these cultural changes went hand in hand with a related environmental evolution in the form of botanical and zoological change. Subsequently, this had an effect on the land surface. Exotic animals

and plants substituted for endemic varieties, which furthermore set off a new ecological movement that changed the physical as well as the cultural environment.

The above cultural-ecological overview, although originally written with respect to the Waimea area, has implications as well for Waikoloa. It was Soehren (1980) who pointed out that:

"At the Mahele of 1848, the land, Waikoloa, was awarded to George Huen Davis, son of Isaac Davis, the English companion and advisor to Kamehameha I."

The viewing of a present day tax map tends to over state this award to Davis by the king. Because of the nature of the land many "commonly regarded" Waikoloa not "as an *ahupua'a* but as "an *'ili'aina* of Waimea." Soehren goes on to say that Waikoloa' gargantuan size is in inverse proportion to its value to the ancient Hawaiian economy." Because of the availability of water and the productive soils of the Waimea area, the development depicted previously (Bonk, 1985) allowed Waimea to become the "food-basket" of South Kohala. It became more significant as time passed and the surrounding areas became more subordinate to its power. This could well account for the interpretation of Waikoloa as an *'ili'aina*. It could also be the reason for its large size, for value is not necessarily based upon size alone, nor size of great value. In fact we might better evaluate on the basis of other criteria, such as the effectiveness of cultural and population support criteria. This discussion leads one to sum up by quoting Soehren (1984) who says, "In aboriginal times, before cattle, these lands (Waikoloa) were marginal to the Hawaiian economy, serving as a reservoir of material products such as *pili* grass and birds." Certainly, without an assured source of water, as the people of Waimea provided through the building of their extensive irrigation system, the midlands of Waikoloa were not able to support horticulture. A yearly rainfall of 10 inches and a soil base inherent with limitations of a cultural nature would not allow permanent settlement at the time. This can account for the paucity of archaeological remains in the midlands of Waikoloa and explains as well why we found nothing of prehistoric cultural significance in the region that we scrutinized. As cultural evolution proceeds, however, cultural transformation can substitute for the lack of use in the past. Today, the village of Waikoloa, is fast growing. However, only the cultural "umbilical cords" of piped water, financial support from elsewhere, speedy transportation, and a national-international economic/cultural base is this possible at this time.

Marine exploitation was more readily available for the coastal inhabitants of Waikoloa and its neighboring *ahupua'a*.

This is readily noted by a examination of the archaeological and historical literature. Starting with Reinecke in 1930 and extending to the present, we see an increasing number of reports covering the lowland regions. The summarization and analysis of this data shows the use of these coastal, inshore and offshore areas as of economic importance in the prehistoric period. If the midlands were marginal, the coastal regions were of import. This produced a drawing attraction for people and cultural development within the coastal region, but not in the midlands. Here, only off and on incursions were made for the gathering of *pili* grass for the thatching of homes and other structures, and the passage through these lands on travels elsewhere, hardly a reason for settlement, or even lingering long enough to leave their cultural marks on the surface of the ground. Only in recent years do we see the accumulation of : cultural debris. Prior to the development of the village of Waikoloa in the early 1970's only the military left their mark on the study area. There is no question that some military personnel were in the region, perhaps during WW II, for we found the remains of field communication wire as well as a fair number of examples of schrapnel fragments. The latter showed clumping about centers of dispersal, just what would be expected if shells were fired into the area

Finally, and with regard to methodology, we made use of aerial photos and walked the length of the gullies to examine for the presence of cultural transformation, but to no avail. Nothing of a cultural nature, other than recent fence-lines, showed on the aeriels.

As my son was with me in the field and aided in the transects, we were able to make eight passages each in a north-south, south-north direction. With these 16 north-south crossings combined with a larger number of east-west, west-east transects we were able to pass a given point on the landscape at no greater distance than approximately 80 to 90 feet. Even with this rather close proximity to previous passages we often times diverted if something caught our eye. In all cases what caught our attention proved to be nothing more than at best, an outcropping of rock.

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GLOSSARY OF HAWAIIAN WORDS

- 'a'ā Lava, stony, rough clinker type.
- āhupua'a A land division usually extending from the uplands to the sea. So called because the boundary was marked by a heap (āhu) of stones.
- kiawe The algaroba tree. (Prosopis Sp.)
- 'ili 'āina An 'ili land division whose chief pays tribute to the chief of the āhupua'a of which it is a part, rather than directly to the king.
- pānoehoe Smooth, unbroken type of lava, contrasting with 'a'a

APPENDIX E

Market Analysis by Real Estate Services, Inc.

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MARKET RESEARCH AND ANALYSIS
 WAIKOLOA AFFORDABLE HOUSING
 COUNTY OF HAWAII

PREPARED FOR:
 R. M. TOWILL CORPORATION
 DEPARTMENT OF PLANNING AND LAND DEVELOPMENT

PREPARED BY:
 REAL ESTATE SERVICES, INC.
 PETER T. YOUNG, CREA CRB CRA SCV

JUNE 1990

WAIKOLOA AFFORDABLE HOUSING

This report reviews and addresses the anticipated housing demands created by resort development at Waikoloa, outlines affordable housing alternatives for the County's designated property there and identifies the market for such housing.

The recommendations for the number and type of housing units are based on a review of available data of existing and future market demand for housing in the West Hawaii region.

Population studies and projections, income data, and employee surveys have been reviewed and evaluated along with proposed and potential housing development projects in West Hawaii. A listing of these resources is provided.

The ultimate mix, number of units and project layout and design will be determined by developer(s) of the site. The findings and recommendations found in this report are subject to adjustment.

In summary, with regard to the County's affordable housing project at Waikoloa, it is recommended:

- 1) Number of units - The overall number of residential units be 1,200 to 1,500.
- 2) Price/Rental Range - The units should fall within a price or rental range to accommodate households within the 50 to 140 percent of median income.
- 3) Housing Mix - A variety of housing "models" is appropriate.

"Traditional" single-family and multi-family development, "cluster" development, "self-help" construction, zero lot line construction, vacant lot sales with conditions to built homes within a specified period and possibly the "dormitory" model should be considered.

Single family vs. multi-family of all types should be 40/60, 40 percent single family, 60 percent multi-family (multi-family uses include the multi-plex, shared house and traditional apartment buildings).

Within conventional apartments the unit mix should be as follows: 10 percent studios, 40 percent one bedroom, 40 percent two bedroom and 10 percent three bedroom.

Many of the single-family units would likely be in the 1-bedroom/1.5- to 2-bathroom range, but a substantial number of studios, 1- and 2-bedroom units are also appropriate.

It is reasonable to "copy" some of the apparently "successful" existing housing models including:

- The "duplex" subdivision at Kinohou in Waimea (duplexes built on 10,000 SF lots)
- The Pines condominium in Kailua-Kona (individual units with adjoining "limited common element" land area that serves as small front and back yards)
- La'ilani apartments at Kealahou

4) Unit Summary - It is recommended that the project include 700 single family units and 800 multi-family units. Single family units could include 200 conventional single family units with a land area of 7,500 square feet and 500 Zero Lot-line units with a land area of 4,500 square feet.

The multi-family units could include 100 shared units, 400 multi-plex units and 300 conventional units. The conventional units could include 10% studios, 40% 1-bedrooms, 40% 2-bedrooms, and 10% 3-bedrooms.

5) The diversity of housing types is important as well as the diversity of the appearance within any specific area of the 300 acres. While the pines is illustrated as a model to follow, it is not specifically something to duplicate. With a variety of roof styles, exterior coloration and setback from the road, the same product can be shown significantly differently than the "sameness" and routine seen in the Pines project. The ultimate goal is to produce a product that is affordable but does not necessarily look like "affordable housing".

6) Other potential market responses: In addition to traditional single-family and multi-family product, non-traditional housing may be expected to absorb a small percentage of the market. One form already used in the market is the "Shared house". Here rooms are made available at modest rents to mostly transient workers. Self-help or "sweat-equity" housing may also find a small market among resort workers if reasonably

priced lots are made available. A third form, already popular and ready to grow, is the ohana unit in existing residence, both legal and illegal.

7) Sale vs. Rent Ratio - A 50/50 ratio (or close to it) of "for rent" vs. "for sale" is an appropriate housing tenure mix. The ratio is consistent with the existing mix of South Kohala employees.

It should be noted that survey results show a higher percentage of management positions are in rentals rather than owned units. As such, it is reasonable to provide single family rental housing in addition to the single family sales. Many of these management positions involve transient personnel "climbing the corporate ladder" who are relatively mobile and not tied down with home ownership.

8) Lot Size - Lot sizes for the single family property should be varied with a minimum of approximately 4,000 square feet (in a formation similar to the Pines project in North Kona) to approximately 7,500 square feet. A typical multiplex and shared housing is recommended to have a combined land area of 4,000 to 10,000 square feet.

9) Buy-Back - To maintain the "affordability" of housing developed on the County's site, it is reasonable to consider a "buy-back" condition similar to HFDC's buy-back. A 10-year buy-back term appears reasonable to help eliminate speculation, maintain an affordable housing stock and it does not unreasonably restrict the homeowner.

10) Financing Alternatives - Two alternatives to the 'buy-back' include a 'sleeping second mortgage' or the 'shared equity' approach. These alternatives offer the opportunity to reduce selling prices while maintaining cost recovery to the County.

11) Projected Market - The demographics of consumers for affordable housing market at Waikoloa include:

- Construction workers for continued resort development along the North Kona/South Kohala coast;
- Permanent work force at completed hotels;
- General population growth resulting from continued economic growth.

While we can not "reserve" or "limit" the housing opportunities only to employees of the developments in Waikoloa, primary emphasis should be placed on their apparent needs. These needs are further discussed in the report.

These recommendations are made with consideration to increased economic and population growth in the Waikoloa area, to the varied demographics and needs of the potential consumer market, and to the maximum efficiency of construction and land use while incorporating traditional with innovative housing alternatives.

This report incorporates data from existing public documents as well as studies, surveys and prospectus done by the private sector. They include:

- County of Hawaii General Plan
- County of Hawaii Infrastructure Needs Assessment
- County of Hawaii Office of Housing and Community Development 1983 Survey
- Office of State Planning West Hawaii Regional Plan
- State of Hawaii Housing Finance and Development Corporation
- Office of Housing and Urban Development Housing Market Analysis
- Keahole to Kailua Development Plan
- DBED Statistical & Economic Report
- Kealahoe Planned Community Concept Feasibility Study by Belt Collins (and Peat Marwick Mitchell Progress Presentation for Kealahoe Planned Community Development Housing Market Assessment)
- La'ilani Housing Project Environmental Assessment
- Bank of Hawaii "Construction in Hawaii 1989" and a 1988 report prepared by Donnelly Demographics of New York
- First Hawaiian Bank "Economic Indicators," September 1989
- Mauna Kea/Mauna Lani employee survey, January 1987
- Environmental Impact Statement, Ritz-Carlton/Mauna Lani, May 1987
- A 1986 executive summary, "West Hawaii Housing: Actions to Improve Affordability and Requirements for Employee Housing."
- The Plines at Kailua-Kona
- The Sunday Star-Bulletin & Advertiser, 8/20/89
- The Sunday Star-Bulletin & Advertiser, 10/15/89
- Population Projections:
 - District by district breakdown for 1970 & 1980 from US Census
 - District by district breakdown for 1987 from State Department of Business and Economic Development
 - Parker Ranch 2020
 - Queens Medical Center Population Projection Analysis
 - Puako Mauka
 - Signal Puako

POPULATION ESTIMATES - STATE AND COUNTY

The County of Hawaii encompasses the Island of Hawaii, which is the Southernmost and largest of the Hawaiian Archipelago. The land area of the County is approximately twice that of all the other islands of the State.

Within the past twenty-five years, tourism has emerged as the primary economic activity on the island. Much of the economic growth experienced during this period can be linked with the expansion of the visitor industry.

In 1970, just prior to the adoption of the General Plan, the population in the county of Hawaii numbered 63,468. The 1970 census count was the first to show an increase, albeit small, since 1930. Population in modern history peaked at 73,325 during that year, largely as a result as the importation of labor for the sugar industry. The population decline between 1930 and the 1960s was primarily due to the increasing mechanization of the sugar plantation, limited job opportunities in other economic sectors, and the out migration of residents. This decline was reversed during the 1960s with the modest growth of 2,140 residents between the 1960 and 1970 census.

Since 1970, the county's population has continued to grow. The 1980 census registered an island-wide population of 92,053 people representing a growth of 28,585 residents for a 45% increase over the 1970 census. Estimates prepared in the 1989 Hawaii County Data Book suggests a population of 117,500 in 1988. This estimate represents the county's approaching the island's native population in 1779 estimated to have between 100,000 to 150,000.

Three sets of population projections were developed for the County's comprehensive planning review program, series A, B, and C. The major variable in each of these projections was the rate of growth of the visitor industry. Plans for resort complexes and other factors were considered in the forecast of hotel rooms.

Series A is the most conservative projection. It assumes the demise of the sugar industry and modest expansion in the visitor industry. The overall 1985-2005 rate of growth for series A of 2.0% per annum is less than the 2.9% rate of growth of employment in the County during the last five years.

Series B projections were developed as a medium series. These projections lie between series A and C. Sugar employment is maintained and the overall per annum employment growth rate anticipated in Series B is approximately 3.7%.

existing in 1987. Projections for 2010 show an additional 2430 single family and 1000 multi-family units. Projected total units by 2010 are 3921 with a population of 11,760.

POPULATION PROJECTIONS

The following is a summary of population estimates from various reports including the County of Hawaii General Plan, the Office of State Planning West Hawaii Regional Plan, and the County of Hawaii Infrastructure Needs Assessment and a preliminary plan prepared by Peat Marwick and Mitchell for the Housing and Finance Development Corporation (HFDC) for Kealakehe.

SOURCE	WEST HAWAII	NO. KONA	SO. KOHALA
County General Plan			
-A		43,250	19,203
-B		54,250	24,087
-C		64,500	28,638
State West Hawaii Regional Plan			
Planning	79,000		
Max. bld	99,000		
(2005)			
County Infrastructure Needs			
A	59,200		
B	63,500		
C	71,700		
(1995)			
		43,200	19,200
		54,300	24,100
		64,600	28,600
(2005)			
Kealakehe Plan			
(Peat Marwick)	102,000		
(2005)			

Series C is an optimistic outlook of the County's future. It is assumed that 17,800 hotel rooms plus additional condominium units will be built in the County by 2005. The average annual growth rate of employment in series C is 4.7%

From the estimates of the island-wide resident population, other estimates have been made which attempt to project the distribution of population over the various districts of the island. They are based on assumptions of potential employment and growth rates described in the previous island employment and population estimates, past district growth trends, and trends in the distribution of population over the islands.

District	Series A	Series B	Series C
Puna	39,790	49,910	58,340
S. Hilo	44,115	55,335	65,790
N. Hilo	1,211	1,519	1,806
Hamakua	5,363	6,721	7,896
N. Kohala	5,363	6,721	7,896
S. Kohala	19,203	24,087	28,638
N. Kona	43,250	54,250	64,500
S. Kona	10,899	13,671	16,254
Kau	3,806	4,774	5,676
Total	170,000	216,988	256,796

The proportion of 1980 residential population in East Hawaii to West Hawaii was 67 percent to 33 percent, respectively. County projections for the year 2005 indicate a shift in population from East Hawaii to West Hawaii. The county projects that by the year 2005, 45.5 percent of the residential population will be living in West Hawaii.

Patterns and population settlement and growth are defined for the most part by an area's economic opportunities and its energy resources. In this respect, the West Hawaii region already has the foundations for providing an economic base as diverse as the island's environmental and climatic conditions. The region has many opportunities to sustain a stable and diversified economy supported by energy resources, high technology research and development, aquaculture, diversified agriculture, commercial and sport fishing, seafood marketing and ocean research. Expansion in these areas will increase job choice and the availability of higher paying jobs.

Unpublished population estimates from a Department of Transportation study show, within Waikoloa Village, 314 single family units, 226 multi-family units and 69 resort condos

Units authorized by building permit
County of Hawaii
1980 to 1989

Year	Single family Units	Multi family Units(1)	Total units
1980	1,192	739	1,931
1981	1,033	285	1,318
1982	809	245	1,054
1983	880	96	976
1984	910	181	1,091
1985	988	190	1,178
1986	1,129	39	1,168
1987	1,367	361	1,728
1988	1,715	474	2,189
1989(2)	1,929	576	2,505
average	1,200	320	1,520

(1) Duplexes counted as multi-family units.
(2) Projected from January-July date.

Sources: Bank of Hawaii, "Construction in Hawaii 1989", and
First Hawaiian Bank, "Economic Indicators", September 1989.

Hawaii County's housing supply by district from 1980 to 1987 is
charted below.

District	Total housing units 1980	1987	Change 1980-1987	Annual growth rate 1980-1987
N Kohala	1,122	1,263	141	1.7%
S Kohala	2,218	2,938	720	4.1%
N Kona	7,540	9,717	2,177	3.7%
S Kona	1,722	2,097	375	2.9%
Hanalei	1,741	1,804	63	0.5%
Subtotal	14,343	17,819	3,476	3.1%
Other				
N Hilo	581	639	58	1.4%
S Hilo	14,301	16,220	1,919	1.8%
Puna	4,126	6,463	2,337	6.6%
KA-U	1,441	1,733	292	2.7%
Subtotal	20,449	25,055	4,606	2.9%
Total	34,792	42,874	8,082	3.0%

Sources: Hawaii County Planning Department, "Hawaii County
General Plan" 1987 counts estimated by Planning Department from
unpublished sources as of December 5, 1989.

The following is a list of the major proposed projects in the
West Hawaii area. They are described in terms of location,
and number of units. There is no indication as to the planned
price range of these units. The numbers involved, however,
suggest that a majority will need to be priced to the bulk of
the residential market in order to assure their marketability.

Major Proposed Residential Projects in West Hawaii

Project	Location	Total units
Ainakea Unit II	N. Kohala	70
Kohala Ranch	N. Kohala	1,800
Kohala by the Sea	N. Kohala	73
Waiwilani	N. Kohala	89
Kapaanui	N. Kohala	170
Calif-Kohala	S. Kohala	2,000
Puako Heights	S. Kohala	3,000
Signal Puako	S. Kohala	2,700
Puako Mauka	S. Kohala	2,000
Parker 2020	S. Kohala	800
Waikoloa	S. Kohala	3,450
Estates at Waimea	S. Kohala	45
Taiyo Fudasan	N. Kona	300
Hi, Kona Coast Assoc.	N. Kona	950
Waiki'i Ranch	N. Kona	200
Y-O Ltd.	N. Kona	1,433
Gamlon	N. Kona	690
Keahou View	N. Kona	275
Kona Coast	N. Kona	512
Ianihau	N. Kona	3,000
Kealakehe	N. Kona	4,100
Alili Village	N. Kona	368
Kaulana at Kona	N. Kona	276
Pualani	N. Kona	364
Kona Woods	N. Kona	110
Fu'uhonua	N. Kona	479
Kau-Kona	N. Kona	3,000
Kamehameha Garden	N. Kona	336

The above list represents proposed projects in various levels
of approval and development. Some of the projects may be
developed in the near future, others may never occur. The
ultimate number of units, and actual development, may change as
time passes.

living farthest from their jobs are somewhat more likely to want to live somewhere else, and the "somewhere else" is usually in South Kohala (usually makai South Kohala, although dissatisfied Hamakua residents just want to move to Waimea).

Employee Survey results indicate that 71-percent of current workers live in single-family housing and 21 percent in multi-family units, although a higher proportion (31 percent) of recent in-migrants live in multi-family units. The average number of rooms per unit reported in the survey was six, indicating a typical unit size of two to three bedrooms. It is therefore concluded that the housing in demand by resort workers will be two to three bedroom units-- primarily single-family homes, but with increasing willingness to reside in apartment units as more in-migrants enter the West Hawaii work force.

Responses could indicate something about where future in-migrant hotel workers would choose to live if not constrained by housing supply. There is an even clearer preference among dissatisfied Newcomers for moving to makai (as opposed to mauka) South Kohala. But the general picture is still that most Newcomers would remain where they already are.

In-migrants originally from other Hawaiian islands (ignoring recency of move) were relatively more likely to settle in South Kohala, while in-migrants originally from the Mainland were relatively more likely to end up in Kona or makai South Kohala.

COUNTY HOUSING SURVEY - 1983

The County Office of Housing and Community Development undertook the development of a comprehensive housing plan in early 1983. One of those sources was determined to be an in-person survey of Big Island residents.

In June, 1983, the County commissioned Hawaii Opinion, Inc. to compete 1,055 interviews with the Big Island residents concerning planning and housing issues. The interviews were completed in the respondents' homes over an eight week period. The 1,055 completed interviews were distributed among the County's six major regions in the following manner:

Hilo - 356 interviews
 Hamakua - 80 interviews
 Kona - 378 interviews
 Puna - 117 interviews
 Kohala - 90 interviews
 Kau - 74 interviews

The following are relative questions and responses to the 1983 County survey.

Important Housing Features

Which three or four of the following housing features do you consider to be most important in selecting a home?

	total %	Kona %	Kohala %
cost	67	65	56
privacy	54	59	56
security and safety	45	35	39
type of building	40	38	36
people in neighborhood	36	33	27
design, floor plan, and layout of unit	24	33	28
tenure, own vs. rent	23	16	19
location with respect to stores/services/leisure activities	22	25	19
number of rooms	22	20	32
size of rooms	14	17	22
location with respect to jobs	14	16	9
relations with land-lord/management/owner	5	8	3
location with respect to public transportation	5	3	4
amenities available	3	5	2

These represent the percentages of respondents who mentioned these features as important in selecting a home. note: the percentages may exceed 100 percent because of multiple responses.

Rent Or Own Housing Unit.

Do you rent or own this housing unit?

	total %	Kona %	Kohala %
own	65	51	61
rent	31	42	34
other	4	6	4
Type of Building	total %	Kona %	Kohala %
single family	87	71	93
duplex	1	1	--
townhouse	1	2	--
low rise apartment (1-4 stories)	10	24	7
high rise apartment (5 or more stories)	1	2	--

Prefer A Complete Home Or One With Just Basics

If you had to choose between a home that was complete with all the features you want or a home that had just the basic requirements but was half the cost, which would you choose?

	total %	Kona %	Kohala %
all features	22	31	33
basic requirements	75	64	67
don't know/refused	3	5	--

Preference: Type of Unit

If you were to move, which of the following housing units would you prefer?

	total %	Kona %	Kohala %
single family house on lot larger than 10,000 sq. ft.	65	63	66
single family house on a 7,500 to 10,000 sq. ft. lot	13	12	13
single family house on a 5,000 sq. ft. lot	5	5	4
duplex	1	1	--
townhouse	5	8	3
low rise apartment (1-4 stories)	6	7	6
high rise apartment (5 or more stories)	1	1	3
don't know/refused	2	3	4

Preference: Number of Bedrooms

How many bedrooms would you like to have in this house?

	total %	Kona %	Kohala %
one	5	4	2
two	27	34	13
three	46	42	54
four or more	19	17	19
don't know	4	4	11

Preference: Number of Bathrooms

How many bathrooms would you like to have in this house?

	total %	Kona %	Kohala %
one	18	15	12
two	69	71	66
three	11	11	12
four or more	1	1	--
don't know	2	2	10

RENTAL PROFILE - LA'ILANI

La'ilani is a rental project in North Kona. It is further described in this document. The demographics of La'ilani residents are summarized below:

Marital Status:	Percent
Single with Children	36.25
Single without Children	23.75
Married with Children	35.00
Married without Children	<u>5.00</u>
Total	100.00

Monthly Household Income:	Percent
less than \$1,500	61.25
\$1,500 - \$1,799	14.38
\$1,800 - \$2,099	5.63
\$2,100 - \$2,399	7.50
\$2,400 - \$2,699	3.13
\$2,700 - \$2,999	5.00
\$3,000 - \$3,299	0.63
\$3,300 and more	<u>2.50</u>
Total	100.00

Median Monthly Income:	\$1,320
Median Annual Income:	\$15,840
Average Monthly Income:	\$1,422
Average Annual Income:	\$17,064

Reason for Moving:

Closer to Job	8.13
Need Rental that Accepts Children	4.38
Affordability	11.88
Family Problems	5.00
Want Independence from Parents	14.38
Need Larger Place	9.38
Personal Reasons	10.00
Other	24.38
No Reason Given	<u>12.50</u>
Total	100.00

Note: Information based on data available prior to the full occupancy of the Project. Information based upon 184 tenants residing at the Project at the time of this survey.

INCOME ESTIMATES

Income limits are calculated for family size for each metropolitan area and non-metropolitan county in the United States and its territories. They are based on the Department of Housing and Urban Development's (HUD) estimates of median family income, with adjustments for areas which have unusually high or low income to housing costs relationships.

The statutory basis for HUD's income limit policies is found in the U.S. Housing Act of 1937, as amended, which contains the following provisions related to income limits:

- "Lower income families" are defined as families whose incomes do not exceed 80 percent of the median family income in the area.
- "Very low-income families" are defined as families whose incomes do not exceed 50 percent of the median family income for the area.
- Income limits must be adjusted for family size.

Income Limit Calculations:

The process of developing limits involves a number of calculations, starting with the development of estimates of median family income.

Median family income estimates are based on decennial Census data updated with Bureau of the Census p-60 income data and Department of Commerce County Business Patterns employment and earnings data.

A 35 percent rent-to-income ratio was selected for use in setting minimum income limits because many non-subsidized low-income families pay this amount or more for housing, and because households tend not to participate in assisted housing programs unless they are eligible for a significant subsidy. Eighty five percent of the fair market rent standard represents the lowest rent range at which a supply of standard quality units is normally available.

The following Bank of Hawaii data summarizes income groups based on household income for 1987 and projected for 1992 in Hawaii County. The summary lists the percentage of total population that was (1987) and is expected to be (1992) in various income groups.

A Report from Bank of Hawaii Economic Department February 1988 by Donnelly Demographics of New York

Income Group	Household Annual Income	% total	Year
0 - \$7,499		15.3	1987
		12.8	1992
\$7,500 - \$9,999		5.5	1987
		4.4	1992
\$10,000 - \$14,999		11.6	1987
		9.5	1992
\$15,000 - \$24,999		21.8	1987
		18.7	1992
\$25,000 - \$34,999		18.0	1987
		16.6	1992
\$35,000 - \$49,999		14.7	1987
		16.8	1992
\$50,000 - \$74,999		8.6	1987
		12.3	1992
\$75,000 +		4.6	1987
		8.8	1992

Households

37,321 - 1987
43,313 - 1992

Loan Underwriting for Typical Savings and Loan:

housing debt = 28% of gross monthly income
 total debt = 36% of gross monthly income

Current 30 year fixed loans have rates at 10.50%

Loan to value ratios are typically 80% to 90%

SALES PRICE RANGES

The various selling prices for houses within the income groups (ie, low, low/moderate and moderate) can be computed based on the underwriting policies of the lenders and the current home mortgage terms.

Category	Sales Price Range
Very Low Income (up to 50%)	(Assume Rentals Only) up to \$ 77,800
Low Income (50% to 80%)	\$ 77,800 - \$117,900
Low/Moderate (80% to 120%)	\$117,900 - \$140,200
Moderate (120% to 140%)	

RENTAL RANGES

Based on HUD evaluation standards, a projected rent to income ratio of 15% is used. Based on this policy, the following are indicated rental ranges for each income group.

Assume:	Rent is 15% of gross monthly income	Monthly Income	Rent Range
Very Low	up to \$16,000	up to \$ 1,330	up to \$ 470
Low	\$16,000 to \$25,600	\$ 1,330 - \$ 2,130	\$ 470 to \$ 745
Low/Mod.	\$25,600 to \$38,400	\$ 2,130 - \$ 3,200	\$ 745 to \$1120
Moderate	\$38,400 to \$44,800	\$ 3,200 - \$ 3,730	\$1120 to \$1300

NOTE: The above projections are based strictly on a family of four household. For varying family sizes the estimated median income is adjusted; therefore the selling price and rental ranges must be adjusted.

There is a HUD statutory requirement that income limits be adjusted for family size. The starting point for all adjustments is the four-person family income limit. Once the four-person income limit is established standard factors are applied as follows:

Number of Persons in Family	1	2	3	4	5	6	7	8
70%	80%	90%	100%	106.25%	112.5%	118.75%	125%	

HUD periodically estimates and computes the base 'median income' for a family of four within certain regions. According to the Office of Housing and Community Development (OHCD), the 1990 HUD median income estimate for Hawaii County is \$ 32,000. (This assumes a household size of four persons.)

Lately it has been customary to separate affordable units into family income categories as follows:

- VERY LOW - families earning less than 50% of median income (under \$16,000).
- LOW - families earning between 50% and 80% of median income (between \$16,000 and \$25,600).
- LOW/MODERATE - families earning between 80% and 120% of median income (between \$25,600 and \$38,400).
- MODERATE - families earning between 120% and 140% of median income (between \$38,400 and \$44,800).

These income limits can be converted to selling price ranges. A bank and savings and loan were contacted for current loan underwriting policies and they are as follows:

Loan Underwriting for Typical Bank:	3.6 to 1
gross monthly income/mortgage payment	2.8 to 1
gross monthly income/mortgage and all debt	

Current 30 year loans (amortization and term) have rates at approximately 10.58% per annum.

Loan to value ratios are typically 80% to 90%.

ALTERNATIVE HOUSING OPPORTUNITIES

The following are various housing alternatives that should be considered for the County's 300 acre site at Waikoloa. Several of these alternatives exist in the West Hawaii market place today. Others are included for consideration though no specific models exist.

LA'IIANI

Mauna Lani Resort Inc. collaborated with the Office of Housing and Community Development, County of Hawaii and the Hawaii Housing Authority, State of Hawaii in the development of this multi-family rental housing project encompassing an area of approximately 15.5 acres.

The 200 multi-family rentals units were constructed according to the following mix:

Unit Type	Living Area	Number of Units
1 BDR	509 SF	32
2 BDR	682 SF	144
3 BDR	903 SF	24

Twenty-five detached manor-type structures are plotted in four clusters across the site. Buildings do not exceed two floors in height and units are allocated four per floor. Each cluster was designed with its own entry, uncovered parking area and laundry facility.

Mauna Lani developed the project, turnkey to the Hawaii Housing Authority. Project density is approximately 12.9 units/acre. A 10,000 square foot lot has been set aside for a multi-purpose building. All roads and improvements are constructed to County standards.

Rental rates started from \$450.00 per month for the 1-bedroom units, \$650.00 per month for the 2-bedroom units and approximately \$775.00 per month for the 3-bedroom units. Rents are subsidized up to \$175.00 per month and approximately 60% of the units are provided some form of subsidy.

THE PINES AT KAILUA-KONA

The Pines at Kailua-Kona is a Taiyo Hawaii Company, Ltd. development of 91 fee simple condominium homes on approximately 12+ acres with an additional 98 units planned in Phase 2 on an adjacent 15+ acres. The project has a density of approximately seven units per acre.

When both phases are complete, the neighborhood will include

landscaped common areas, two 20,000 square foot parks and a 40,000 square foot commercial center.

The one-story single family detached condo units are designed with four floor plans, offering two and three bedroom/two bath options, ranging from 924 to 1,162 square feet of living area. There are 28 three-bedroom units and 63 two-bedrooms. Each unit has two parking spaces and all share common areas. The project has variance approval for 10-foot building separation. All other uses, structures and lots are conforming. The project, built under the condominium form of ownership, has private interior roads not built to subdivision code standards.

Original pricing in The Pines (September 1988) ranged from approximately \$120,000 to \$142,000. Resales in the project have been marketed (early 1990) for \$175,000 to just under \$200,000.

KINOHOU

Total land area for Kinohou in Waimea is 10 acres, 2.5 acres are zoned commercial and seven are RS10. The commercial parcel was broken into five lots ranging from 14,000 to 22,000 SF. The RS10 area was broken into 22 parcels of a minimum of 10,000 SF. Twenty-one of the lots were approved ohana and 2 bedroom, 2 bath duplexes were constructed (1,100 SF under roof with single car garage) sharing a common wall. The additional RS10 parcel (with a drainage easement) was constructed as a single family home. The 1987 project took one year to complete.

OHANA

According to the Sunday Star-Bulletin & Advertiser August 20, 1989 article, "Homeowners are adding 'apartments' to meet housing shortage," accessory apartments - living quarters within a house that have a separate entrance, kitchen, bathroom and one or more bedrooms - have shown up in metropolitan areas across the country where housing prices have soared and where many older homeowners now have more space than they need or can afford to maintain.

The unique concept of ohana, as reflected in this article, is in effect in Hawaii County.

Housing experts say that spread of accessory apartments reflects a wider housing problem caused by changing demographics in the suburbs.

"We have a housing shortage and a bedroom surplus," said the

Westchester County commissioner of planning, Peter Q. Eschweiler.

Today, 56 percent of all households in the country are composed of one or two people, according to the federal Census Bureau. And while many young couples cannot afford the high cost of new housing, many old people who bought large houses in the 1950s and 1960s now have grown children, too much space and not enough cash to pay rising property taxes.

While acknowledging that accessory apartments exist, communities around the region have taken starkly different steps to control their rising numbers.

Legalizing accessory apartments, advocates contend, creates new housing stock at no cost to taxpayers, generates new property tax revenue for municipalities and offers social benefits by providing affordable rental housing to young couples and renters for elderly homeowners.

"Accessory apartments fit the new generation lifestyle into the older generation housing pattern," said William B. Shore, senior vice president of the Regional Plan Association, a non-profit group in New York.

"It's a lot cheaper than creating new housing," said Jeffrey Osterman, director of planning for Bedford, N.Y., a Westchester town that recently relaxed its two-family zoning code.

Planners say that many of the towns and villages that have kept single-family codes on the books but have neither the resources nor the inclination to enforce them are inviting trouble.

"Unchecked, accessory apartments increase traffic and garbage, and place strains on municipal services that contribute to the deterioration of the suburbs' attractive qualities," said Philip V. Nicholson, a history professor at Nassau Community College who studies suburban problems.

Communities that first ignored the situation and then cracked down are now searching for a compromise. Fourteen months ago, Long Beach began sending inspectors door to door to eliminate some of the city's estimated 1,200 illegal accessory apartments. The experiment has yielded painful results, city officials said.

"We're supposed to be protecting the community for the common good," said the City Manager, Edwin L. Eaton, in recounting the story of a long-time resident, a woman in her 80s, who was evicted from her apartment.

Several years ago the Hawaii State Legislature acknowledged the Ohana concept and created the opportunity for the various Counties to adopt their own Ohana ordinances. While different in implementation, the Ohana concept has produced a wide variety of housing opportunities, including apartments in existing single-family dwellings (as illustrated in the above article), more elaborate duplex configurations and separate single family dwellings on the same lot.

SINGLE ROOM OCCUPANCY (SRO)

On October 15, 1989, the Sunday Star-Bulletin & Advertiser ran the article, "Residential hotels seen as solution to housing," which discusses single-room hotels. According to the article, the hotels, which offer guests an inexpensive room on a nightly, weekly or monthly basis, have been around for years in most cities. They often are better known as sleazy hotels or flop houses.

As far as San Diego City Planner Judy Lenthall is concerned, SROs could play a major role in solving Hawaii's housing shortage. She envisions building SROs near luxury resorts to house hotel workers and in urban areas to shelter minimum wage workers and those now living on the street.

"Any place that has low wages, expensive housing and single people can benefit from SROs," she said.

Most of the SRO hotels in San Diego offer guests about 80 square feet of living space at rents averaging \$220 a month, she said. Slightly larger rooms may include a private bathroom and cooking facilities. The SROs are run like a hotel, with a front desk, check-out times and 24-hour managers and security.

"The differences between a sleaze-bag hotel and a non-sleaze bag hotel are security and good management," Lenthall said.

SHARED HOME

The "shared home" concept is an alternative to dormitories or SROs at Waikoloa.

Shared housing should be built in mini-neighborhoods using a cul-de-sac formation with approximately 10 houses on each cul-de-sac and each of the shared houses would accommodate between two and four households. This would be set up like a single dorm, a minuscule scale of SRO, but would look like a single family dwelling from the outside. There would be a higher density of households per cul-de-sac than for the same number of single-family dwellings.

BUY-BACK PROVISIONS

It is recommended that buy-back provisions, similar to those of the Housing Finance Development Corp., listed below, be adapted to maintain the housing inventory as 'affordable' housing.

201E-221 Dwelling units; restrictions on transfer, waiver or restrictions.

(a) Except for dwelling units which are financed under a federally subsidized mortgage program, the following restrictions shall apply to the transfer of dwelling units purchased from the corporation, whether on fee simple or leasehold property:

(1) For a period of ten years after the purchase, whether by lease, assignment of lease, deed, or agreement of sale, if the purchaser wishes to transfer title to the dwelling unit and the property or the lease, the corporation shall have the first option to purchase the unit and property or lease at a price which shall not exceed the sum of:

- (A) The original cost to the purchaser;
- (B) The cost of any improvements added by the purchaser; and

(C) Simple interest on the purchaser's equity in the property at the rate of seven per cent a year. The corporation may purchase the unit either outright, free and clear of all liens and encumbrances, or by transfer subject to an existing mortgage.

(2) After the end of the tenth year from the date of purchase, or execution of an agreement of sale, the purchaser may sell the unit and sell or assign the property to any person free from any price restrictions;

201E-222 Dwelling units; restrictions on use.

(a) A dwelling unit purchased from the corporation shall be occupied by the purchaser at all times during the ten-year restriction period set forth in section 201E-221.

SLEEPING SECOND MORTGAGES

In addition, consideration should be placed on the possibility of offering a 'sleeping second mortgage' or 'shared equity' as a means of reducing sales prices and maintaining the affordable inventory.

A sleeping second mortgage provides a means for the County to recover the costs involved with the affordable housing development, while maintaining a lower initial price for the housing and a lower qualifying price for the buyer.

The sleeping second mortgage can be without an interest rate applied and typically has no specific due date. Typically the outstanding principal balance is due upon the resale of the property, or when there is a refinancing of the property.

SHARED EQUITY

The shared equity concept can take many forms. The theory behind shared equity assumes that upon resale the County would have the ability to recover the subsidy (difference between actual cost and sales price for the property). The actual interest of the County would be based on the amount subsidized.

BUY-BACK PROVISIONS

It is recommended that buy-back provisions, similar to those of the Housing Finance Development Corp. listed below, be adapted to maintain the housing inventory as 'affordable' housing.

201E-221 Dwelling units; restrictions on transfer, waiver or restrictions.

(a) Except for dwelling units which are financed under a federally subsidized mortgage program, the following restrictions shall apply to the transfer of dwelling units purchased from the corporation, whether on fee simple or leasehold property:

(1) For a period of ten years after the purchase, whether by lease, assignment of lease, deed, or agreement of sale, if the purchaser wishes to transfer title to the dwelling unit and the property or the lease, the corporation shall have the first option to purchase the unit and property or lease at a price which shall not exceed the sum of:

- (A) The original cost to the purchaser;
- (B) The cost of any improvements added by the purchaser; and

(C) Simple interest on the purchaser's equity in the property at the rate of seven per cent a year. The corporation may purchase the unit either outright, free and clear of all liens and encumbrances, or by transfer subject to an existing mortgage.

(2) After the end of the tenth year from the date of purchase, or execution of an agreement of sale, the purchaser may sell the unit and sell or assign the property to any person free from any price restrictions:

201E-222 Dwelling units; restrictions on use.

(a) A dwelling unit purchased from the corporation shall be occupied by the purchaser at all times during the ten-year restriction period set forth in section 201E-221.

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APPENDIX F

Traffic Impact Analysis by Parsons Brinckerhoff

**TRAFFIC
IMPACT
STUDY**

TRAFFIC IMPACT STUDY

**WAIKOLOA
AFFORDABLE
HOUSING PROJECT**

WAIKOLOA AFFORDABLE HOUSING PROJECT

South Kohala, Hawaii

South Kohala, Hawaii

R.M. Towill Corporation

Prepared for:
R.M. Towill Corporation

October 1990

Prepared by:
**Parsons Brinckerhoff
Quade & Douglas, Inc.**

October 1990

**Parsons
Brinckerhoff**

Waikoloa Road is a two-lane east-west collector road that widens to four lanes in the vicinity of Waikoloa Village. The posted speed limit is 55 mph, which decreases to 35 miles per hour near Waikoloa Village. At its eastern terminus, Waikoloa Road forms the stop controlled stem of a T-intersection with Mamalahoa Highway. At the western end it forms the stop controlled stem of a T-intersection with Queen Kaahumanu Highway.

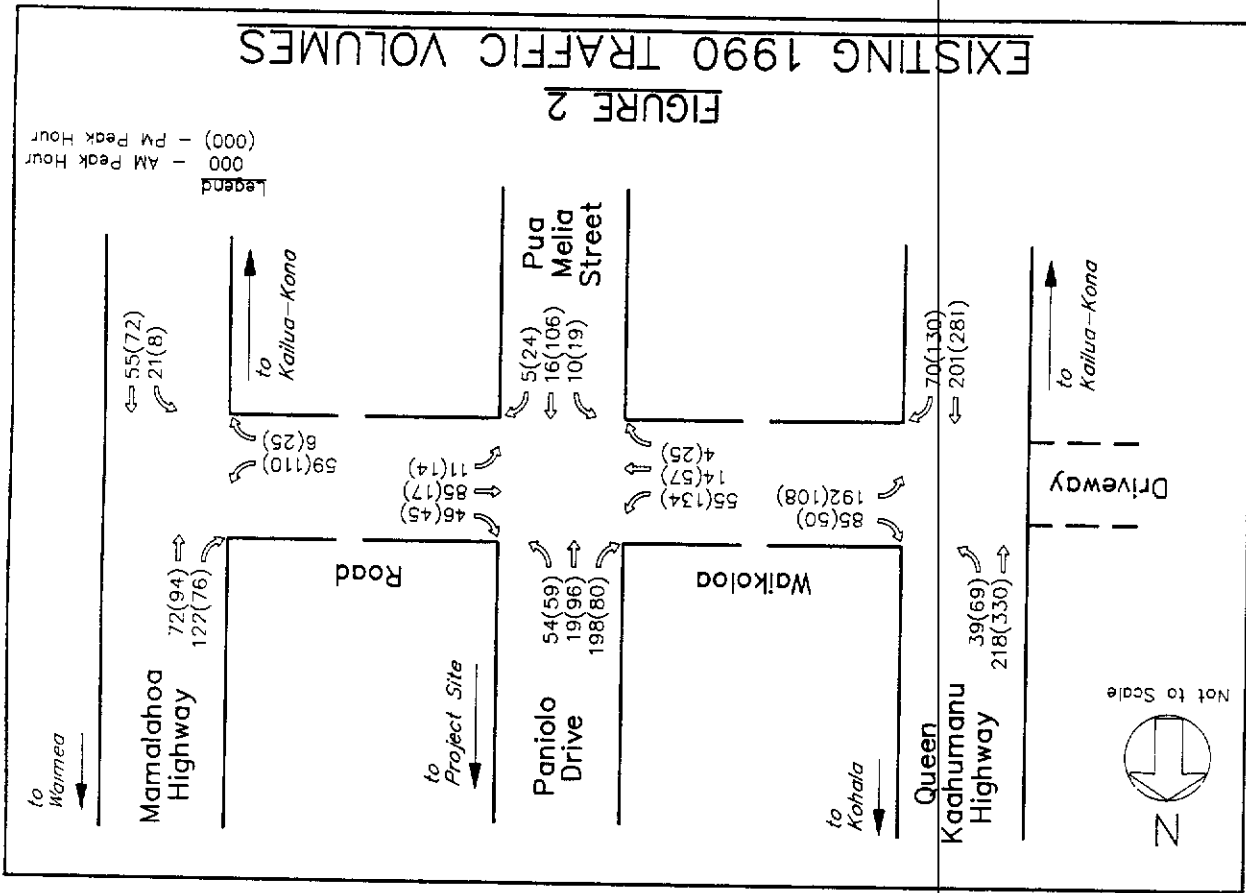
Paniolo Drive serves as a collector road for Waikoloa Village. Paniolo Drive has an 80-foot right-of-way and its southern terminus intersects Waikoloa Road and Pua Melia Street forming a cross intersection. The posted speed limit of Paniolo Drive is 35 miles per hour.

Existing Traffic Conditions

Manual traffic counts were taken on August 7 and 8, 1990, at the intersections of Queen Kaahumanu Highway/Waikoloa Road, Waikoloa Road/Pua Melia Street/Paniolo Drive, and Mamalahoa Highway/Waikoloa Road. The morning peak hour occurs from 6:30 to 7:30 a.m., and the afternoon peak was from 3:30 to 4:30 p.m. Summaries of the manual traffic counts are attached in Appendix A. Existing peak-hour volumes are shown in Figure 2.

The unsignalized intersection methodology specified in the 1985 Highway Capacity Manual¹ evaluates gaps in the major street traffic flow and calculates capacities available for left turns from the major street to cross oncoming traffic. It also calculates capacities available for left turns from the minor street onto the major street and for right turns from the minor street onto the major street. Operating conditions at unsignalized intersections are expressed as a qualitative measure known as level of service. These levels of service are designated from A to F, with level of service (LOS) A representing the best operating conditions and LOS F the worst. A level of service D or better at an intersection is good. Level of service criteria for unsignalized intersections are identified in Appendix B.

At the Queen Kaahumanu Highway/Waikoloa Road intersection, westbound traffic on Waikoloa Road making a left turn onto Queen Kaahumanu Highway operates at LOS D during the a.m. and p.m. peak hours. All other turning movements operate at LOS A during both peak hours.



At the intersection of Mamalahoa Highway/Waikoloa Road, all turning movements experience LOS A during both peak hours.

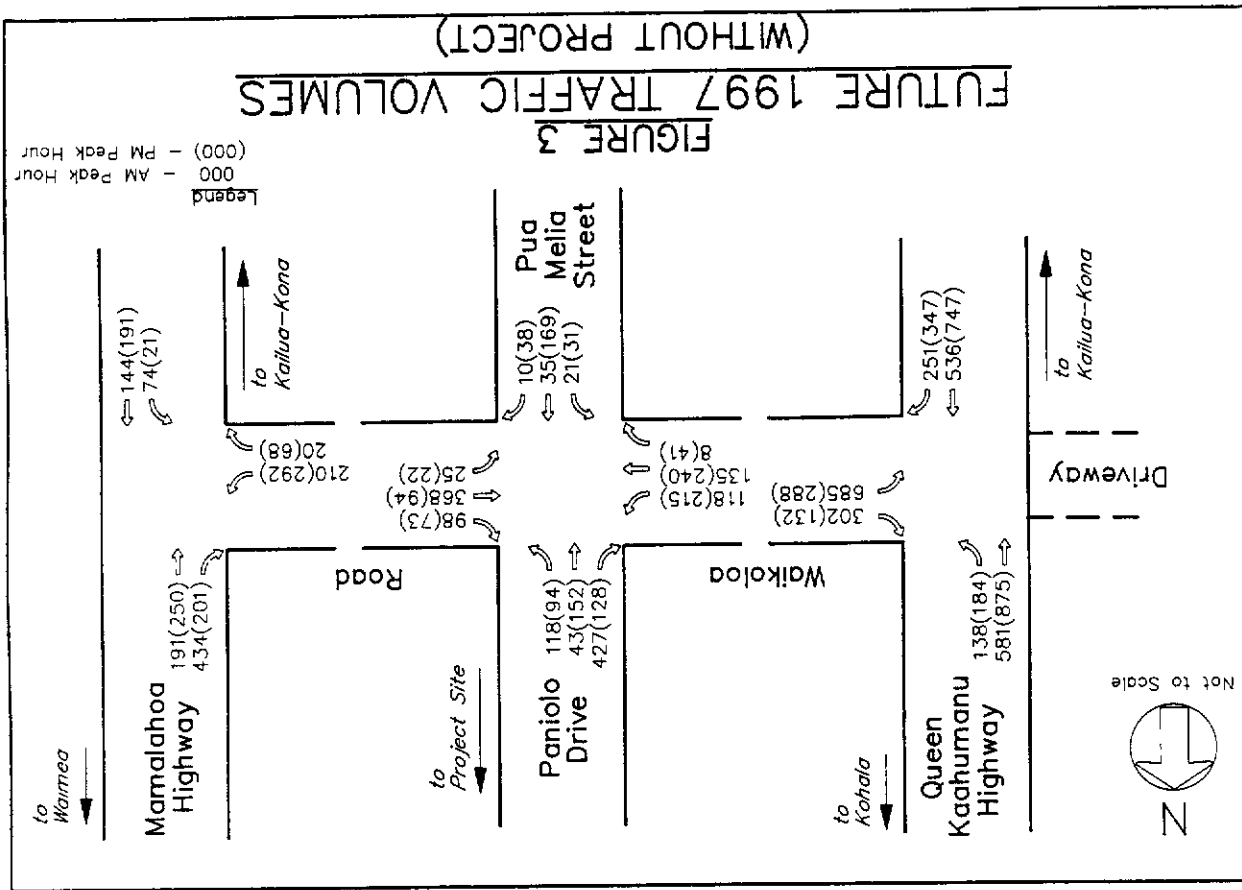
At the Waikoloa Road/Pua Melia Street/Paniolo Drive intersection, northbound traffic on Pua Melia Street executing a left turn experiences LOS B during the a.m. and p.m. peak hours. Southbound traffic on Paniolo Drive executing a left turn onto Waikoloa Road experiences LOS B during the p.m. peak hour and LOS A during the a.m. peak hour. The analysis indicates that all other movements at this intersection operate at LOS A during both the a.m. and p.m. peak hours.

Two-lane highway analysis reveals that traffic on Queen Kaahumanu Highway is experiencing LOS C during the a.m. and p.m. peak hours. Capacity analysis also reveals that traffic on Mamalahoa Highway south of Waikoloa Road experiences LOS B during both peak hours. North of Waikoloa Road, Mamalahoa Highway operates at LOS C conditions during both peak hours.

FUTURE CONDITIONS WITHOUT PROJECT

Future conditions refer to the year 1997, when the proposed project is expected to be completed. The traffic impact study for Mauna Lani Cove² indicated an increase of 15 percent per year in traffic volume on Queen Kaahumanu Highway without the project. Further, the Draft Report of Island of Hawaii Long-Range Highway Plan³ also projects a 15 percent annual increase in traffic in the vicinity of Waikoloa. Existing traffic volumes were increased by 15 percent per year to account for increases in regional traffic volumes. Figure 3 shows the traffic assignment for future conditions without the proposed housing project.

The Queen Kaahumanu Highway/Waikoloa Road intersection would experience overcapacity, or LOS F, conditions for southbound left turns from Waikoloa Road because of the increase in traffic volumes. Analysis revealed LOS D conditions during both peak hours for northbound right turn movements from Waikoloa Road. The eastbound left turn movements from Queen Kaahumanu Highway would continue to experience LOS A conditions during the a.m. peak hour and LOS C conditions during the p.m. peak hour.



Capacity analysis conducted at similar unsignalized locations indicate that the methodology outlined in the 1985 Highway Capacity Manual is conservative in nature. It is not uncommon for the left turn movements out of minor street locations onto major streets to create LOS E or LOS F conditions, since they are the hardest movements to make, requiring gaps in both directions of traffic on the major street.

Traffic signals can improve the operation of unsignalized intersections with high minor street approach volumes; however, traffic signals should only be provided at locations that meet nationally accepted warrants, as outlined in the Federal Highway Administration's Manual on Uniform Traffic Control Devices 4 (MUTCD). A review of the Queen Kaahumanu Highway/Waikoloa Road intersection reveals that the unsignalized intersection meets the Peak Hour Volume Warrants, Warrant 11, as outlined in the MUTCD. Peak hour volume warrants computations are shown in Appendix C. With signalization, the Queen Kaahumanu Highway/Waikoloa Road intersection is projected to operate near or under capacity.

With the increase in traffic volumes, the Mamalahoa Highway/Waikoloa Road intersection would experience LOS D conditions during the a.m. peak hour for the northbound left turn movements from Waikoloa Road and LOS E conditions during the p.m. peak hour. The westbound left turns from Mamalahoa Highway and southbound right turns from Waikoloa Road would continue to experience LOS A conditions during both peak hours.

At the Waikoloa Road/Paniolo Drive/Pua Melia Street intersection, near-capacity, or LOS E, conditions would result for the northbound approach during the a.m. and p.m. peak hours. The southbound left turn movements from Paniolo Drive will function at LOS D during the a.m. peak hour and LOS E during the p.m. peak hour. The southbound through movements will operate at LOS B and LOS D conditions during the a.m. and p.m. peak hours, respectively. The southbound right turns on Paniolo Drive will experience LOS C during the a.m. peak hour and LOS A during the p.m. peak hour. The westbound and eastbound left turns from Waikoloa Road will operate at LOS A during both peak hours.

Two-lane highway analysis reveals that traffic conditions on Queen Kaahumanu Highway would increase to LOS E during the a.m. and p.m. peak hours. Traffic on Mamalahoa Highway south of Waikoloa Road will experience LOS C during the a.m. peak hour and LOS D during the p.m. peak hour. North of Waikoloa Road, LOS E conditions during both peak hours can be expected on Mamalahoa Highway.

FUTURE WITH PROJECT TRAFFIC

With project traffic, conditions are composed of trip generation, trip distribution, and traffic assignment. Trip generation estimates the number of trips produced and attracted by the proposed project. Trip distribution determines the origins and destinations of the project trips, and traffic assignment places these trips onto the existing roadway network.

Trip generation for the proposed project is based on 560 single-family dwelling units, 840 multifamily dwelling units, a 9.2-acre park, a 5,000 square-foot commercial building, and several churches with a total area of 75,000 square feet.

Trip Generation

Trip generation was estimated using the trip rates or equations for land use categories from the Institute of Transportation Engineers' Trip Generation, Fourth Edition⁵. Table 1 shows the trip generation rates used, while Table 2 summarizes the trips generated by the Waikoloa Affordable Housing Project.

Table 1
TRIP RATES

Land Use (Parameter)	A.M. Peak Hour		P.M. Peak Hour		
	Daily	Trip Rate % In	Trip Rate % In	Trip Rate % In	
Single-family dwelling units	6.507	0.691	27%	0.980	63%
Multifamily dwelling units	5.981	0.505	18%	0.461	68%
Park in acres	36.548	2.391	27%	3.370	26%
Commercial (1,000 square feet)	887.056	67.600	50%	71.200	51%
Church (1,000 square feet)	7.699	0.067	80%	0.520	54%

Table 2

PROJECT TRAFFIC

Land Use (Parameter)	A.M. Peak Hour		P.M. Peak Hour		
	Daily (vpd)	Enter (vph)	Exit (vph)	Enter (vph)	Exit (vph)
Single-family (560 dwelling units)	3644	104	283	346	203
Multifamily (840 dwelling units)	5024	76	348	263	124
Park (9.2 acres)	336	6	16	8	23
Commercial (5,000 square feet)	4435	169	169	182	174
Church (75,000 square feet)	577	4	1	21	18
Total:	14,016	359	817	820	542

Note:

vpd = vehicles per day

vph = vehicles per hour

Trip Distribution/Traffic Assignment

Various land uses would encourage internal trips within Waikoloa Village. Internal trips include trips between residential areas and nonresidential areas such as industrial/shopping centers, parks, and churches. The internal trips ranged from 25 percent for residential generated trips to 90 percent for trips generated by the park, commercial and church land uses. These internal trips were deducted from the total project trips to determine the number of external trips that would take place on the regional roadway system. Table 3 shows the external trips generated by the affordable housing project.

The trip distribution factors are based on information from the Preparation Notice for an Environmental Impact Study (EIS) for Waikoloa Affordable Housing Master Plan⁶. The project traffic was distributed to and from two directions: north and south via Mamalahoa Highway and Queen Kaahumanu Highway. Table 3 shows the trip distribution of the generated trips for the affordable housing project. Figure 4 shows the traffic assignment for the generated trips for the affordable housing project.

FIGURE 4 PROJECT GENERATED TRAFFIC

Legend
 000 - AM Peak Hour
 (000) - PM Peak Hour

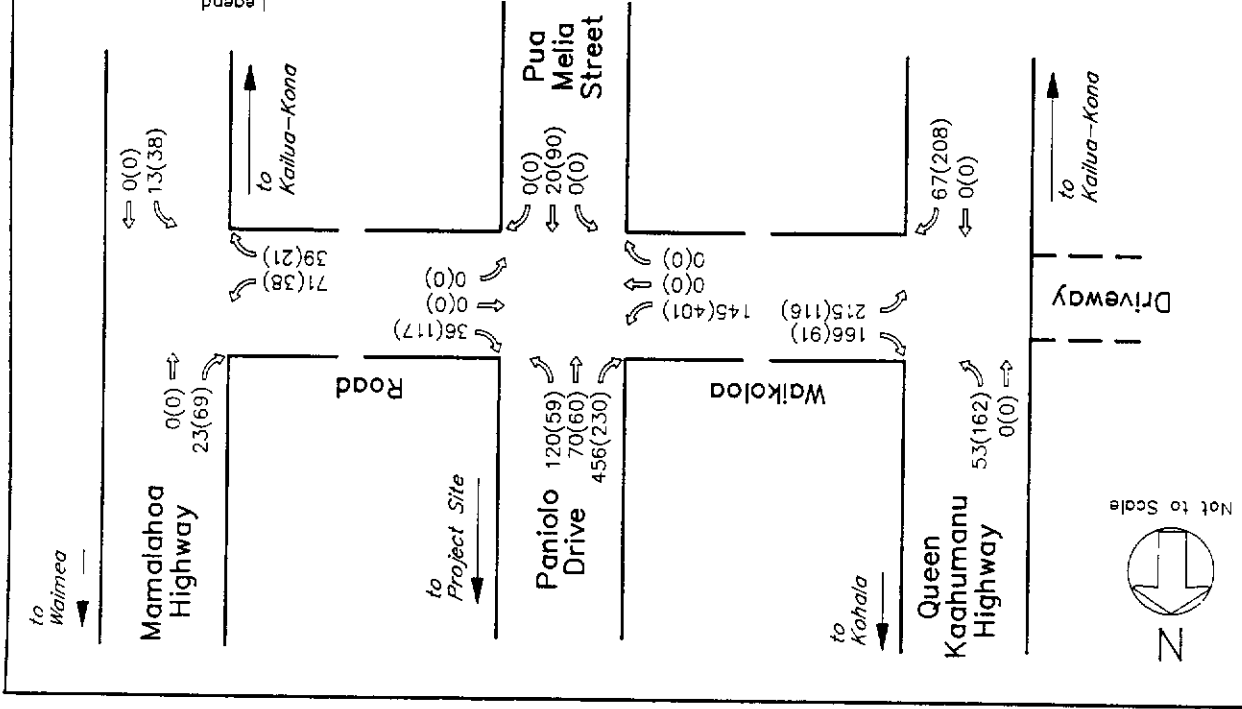


Table 3

TRIP DISTRIBUTION
(Location of Other Trip Ends)

	EXTERNAL	SOUTH	NORTH
A.M. IN	43% 156	51% 80	49% 76
A.M. OUT	60% 491	52% 254	48% 237
P.M. IN	58% 477	52% 246	48% 231
P.M. OUT	42% 266	52% 197	48% 129

PROJECT IMPACTS

Project generated traffic volumes for the affordable housing project were added to the 1997 future traffic volumes (without project), and the assignment is shown in Figure 5. Tables 4 and 5 summarize the levels of service for future traffic conditions with the project.

The intersection of Queen Kaahumanu Highway/Waikoloa Road would function at overcapacity, or LOS F, conditions for westbound left turns from Waikoloa Road during both peak hours. The westbound right turns would experience LOS F during the a.m. peak hour and LOS E during the p.m. peak hour. The southbound left turns from Queen Kaahumanu Highway would experience LOS B during the a.m. peak hour and LOS E in the p.m. peak hour. Should this intersection be signalized as described earlier, without project, the intersection would still operate at LOS F conditions because of the high number of westbound left turn movements on Waikoloa Road.

The Mamalahoa Highway/Waikoloa Road intersection would experience LOS E during the a.m. peak hour and LOS F during the p.m. peak hour for eastbound left turns from Waikoloa Road. The eastbound right turns from Waikoloa Road and the northbound left turns from Mamalahoa Highway will continue to experience LOS A during both peak hours.

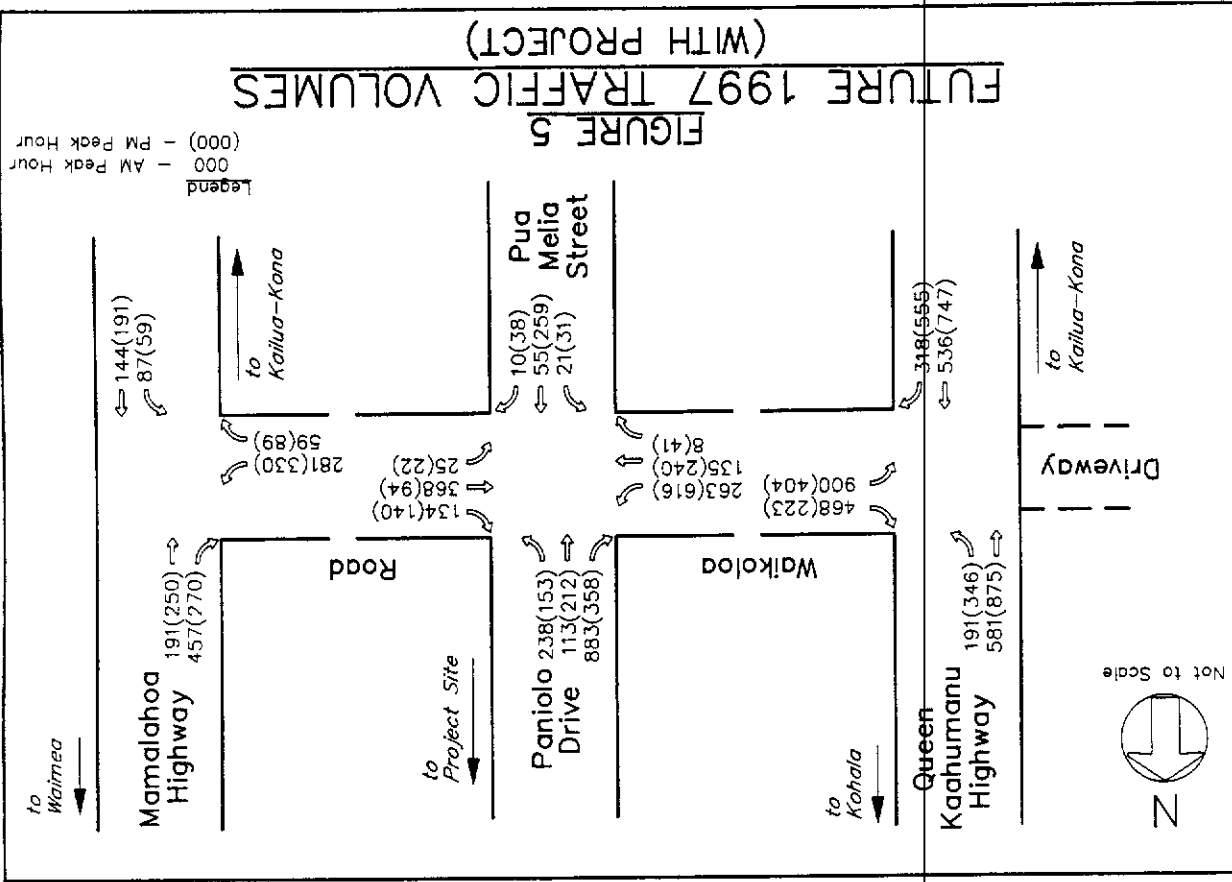


Table 4

LEVELS OF SERVICE
(Unsignalized Intersection)

	Existing		Future Conditions (Year 1997)			
	A.M.	P.M.	w/o Project	w/ Project	A.M.	P.M.

Queen Kaahumanu/Waikoloa Rd.

Westbound Left	D	D	F	F	F	F
Right	A	A	D	D	F	E
Southbound Left	A	A	A	C	B	E

Waikoloa Rd./Paniolo Dr./
Pua Melia St.

Eastbound Left	A	A	A	A	A	C
Westbound Left	A	A	A	A	A	A

Pua Melia St. Approach

Left	B	B	E	E	F	F
Through	A	A	E	E	F	F
Right	A	A	E	E	F	F

Paniolo Dr. Approach

Left	A	B	D	E	F	F
Through	A	A	B	D	E	F
Right	A	A	C	A	F	A

Mamalahoa Hwy./Waikoloa Rd

Eastbound Left	A	A	D	E	E	F
Right	A	A	A	A	A	A
Northbound Left	A	A	A	A	A	A

Table 5

LEVELS OF SERVICE
(Two-Lane Highways)

	Existing		Future Conditions (Year 1997)			
	A.M.	P.M.	w/o Project	w/ Project	A.M.	P.M.

Queen Kaahumanu Highway

North of Waikoloa Rd.	C	C	E	E	E	E
South of Waikoloa Rd.	C	C	E	E	E	E

Mamalahoa Highway

North of Waikoloa Rd.	C	C	E	E	E	E
South of Waikoloa Rd.	B	B	C	D	C	D

The unsignalized intersection of Waikoloa Road/Paniolo Drive/Pua Melia would experience overcapacity conditions, or LOS F, during the a.m. and p.m. peak hours for all northbound movements on Pua Melia Street. Southbound left turns from Paniolo Drive will also experience LOS F conditions during both peak hours. The southbound through movements from Waikoloa Road would experience LOS E during the a.m. peak hour and LOS F during the p.m. peak hour. The southbound right turns would experience overcapacity, or LOS F, conditions during the a.m. peak hour and LOS A conditions during the p.m. peak hour. The eastbound left turn movement will experience LOS C during the p.m. peak hour while the a.m. peak hour will remain at LOS A. The westbound left turns will continue to experience LOS A during both peak hours

Two-lane highway capacity analysis reveals that Queen Kaahumanu Highway will experience LOS E during both peak hours. Traffic on Mamalahoa Highway south of Waikoloa Road will experience LOS C during the a.m. peak hour and LOS D during the p.m. peak hour, while north of Waikoloa Road will experience LOS E during both peak hours.

MITIGATION MEASURES

For 1997 with project condition, the capacity of the westbound left turn movements at the unsignalized intersection of Queen Kaahumanu Highway and

Waikoloa Road would be exceeded even without the affordable housing project traffic. There are two alternatives that could improve operating conditions at this intersection:

Alternative A: Signalization of this intersection would be warranted according to Warrant 11 (Peak-Hour Volume) of the Manual on Uniform Traffic Control Devices⁶ even without the project traffic. Reconstruction of the Queen Kaahumanu Highway and Waikoloa Road intersection would be needed with project traffic to include double left turn bays and a single right turn lane for westbound traffic on Waikoloa Road. A two-phase traffic signal at the Queen Kaahumanu Highway/Waikoloa Road intersection, with these improvements is projected to operate at LOS D or better during the a.m. and p.m. peak hours for 1997 with the proposed project.

Alternative B: Realignment of Waikoloa Road to intersect Queen Kaahumanu at the existing intersection of Queen Kaahumanu Highway with the Waikoloa Resort access road and construction of a grade-separated interchange at this new cross intersection. This alternative involves constructing Waikoloa Road over or under Queen Kaahumanu Highway with on-ramps and off-ramps.

The Waikoloa Road/Paniolo Drive/Pua Melia Street intersection will experience capacity constraint conditions in 1997 with project traffic. Signalization would also be warranted under Warrant 11 (Peak-Hour Volumes). Reconstruction and signalization of this intersection would be needed to provide sufficient capacity at this intersection. The provision of a separate eastbound left turn lane and use of a westbound through lane for traffic on Waikoloa Road would be adequate to serve the projected volumes. A three-phase traffic signal, with improvements, at this intersection would operate at LOS D or better for both a.m. and p.m. peak hours.

RECOMMENDATIONS AND CONCLUSIONS

Capacity analysis conducted at the Queen Kaahumanu Highway/Waikoloa Road intersection analysis reveals overcapacity conditions for southbound left turns in the future year 1997 even without the affordable housing project. A grade-separated interchange would provide sufficient additional capacity to accommodate all turning movements at this intersection.

The intersection of Queen Kaahumanu with Waikoloa Road is projected to experience LOS F conditions for southbound left turns from Waikoloa Road as early as 1991; however, completion of a grade-separated interchange is not anticipated to be completed before 1995. Interim improvements, such as signalization, would provide additional capacity until an interchange is constructed.

The Mamalahoa Highway/Waikoloa Road intersection may not need to be signalized with the project traffic if the grade-separated interchange is constructed. Construction of the interchange at Queen Kaahumanu Highway may divert traffic away from the Mamalahoa Highway/Waikoloa Road intersection and lower volumes by providing easier access to Queen Kaahumanu Highway, where signalization of the intersection may not be warranted.

Traffic volumes are expected to increase with or without the proposed project. Analysis of the Waikoloa Road/Paniolo Drive/Pua Melia Street intersection indicates that the intersection would experience overcapacity conditions with project traffic and that improvements with signalization would be needed. However, a planned north/south collector road west of and parallel to Paniolo Drive is proposed. This north-south collector road which will connect Paniolo Drive with Waikoloa Road west of Paniolo Drive should divert some traffic away from the Waikoloa Road/Paniolo Drive/Pua Melia Street intersection; completion of the intersection is estimated to be in 1995. The Waikoloa Road/Paniolo Drive/Pua Melia Street intersection should be monitored to determine if signalization would still be needed with the new collector road.

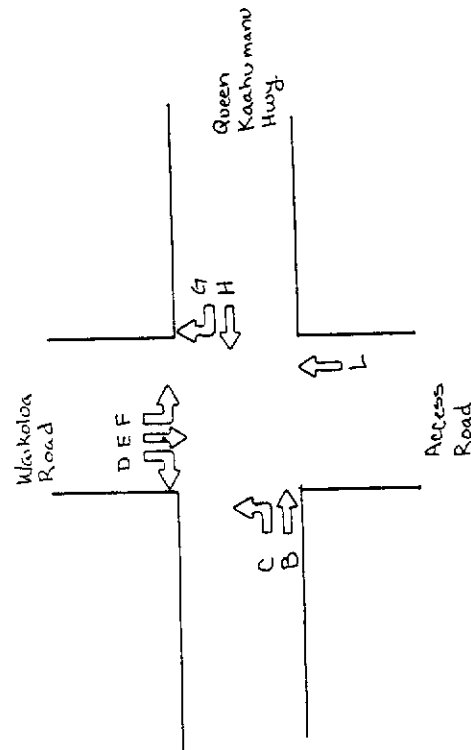
With the proposed improvements described above, the roadway system would have sufficient capacity to serve the project traffic.

REFERENCES

- 1 Transportation Research Board, National Research Council, Highway Capacity Manual, Special Report 209, Washington, D.C., 1985.
- 2 Belt Collins & Associates, Traffic Impact Study--Mauna Lani Cove, October 1989.
- 3 Parsons Brinckerhoff Quade & Douglas Inc., Draft Report--Island of Hawaii--Long-Range Highway Plan. September 7, 1990
- 4 U.S. Department of Transportation, Federal Highway Administration, Manual on Uniform Traffic Control Devices For Streets and Highways. 1988, as amended.
- 5 Institute of Transportation Engineers, Trip Generation, Fourth Edition, Washington, D.C., 1987.
- 6 R.M. Towill Corporation, Preparation Notice for an Environmental Impact Statement for the Waikoloa Affordable Housing Master Plan. July 1990.

APPENDIX A MANUAL TRAFFIC COUNTS

File Name: DMHR_AM
 MAIKOLO AFFORDABLE HOUSING
 QUEEN KAACHU MANU PH/MAIKOLOA RD
 AUGUST 8, 1990
 BY JXT



COUNT READINGS

TIME	A	B	C	D	E	F	J	H	G	M	L	K
6:00-6:15 AM	29	7	14	2	30	2	23	4	2	2	2	2
-6:30	99	12	33	2	86	2	65	13	2	2	2	2
-6:45	163	22	58	2	139	29	139	29	2	2	2	2
-7:00	213	31	86	2	159	44	191	44	2	2	2	2
-7:15	253	45	103	2	201	61	228	61	2	2	2	2
-7:30	317	51	118	2	258	83	266	83	2	2	2	2
-7:45	373	57	132	2	301	104	302	104	2	2	2	2
-8:00	412	65	149	2	354	123	349	123	2	2	2	2
-8:15	443	71	166	2	392	137	387	137	2	2	2	2
-8:30	476	76	173	2	418	150	428	150	2	2	2	2
-8:45	518	91	181	2	451	163	466	163	2	2	2	2
-9:00 AM	562	94	198	2	482	180	510	180	2	2	2	2

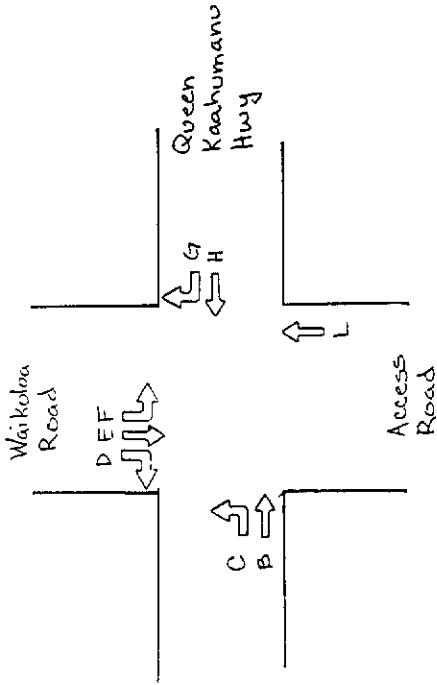
COUNT VOLUMES

TIME	A	B	C	D	E	F	J	H	G	M	L	K	TOTAL
6:00-9:00 TOTAL	0	562	94	198	2	482	0	510	180	0	2	0	2038
6:30-7:30 HOUR	0	218	39	85	0	192	0	201	70	0	0	0	805

APPROACH/BEFORE VOLUMES

TIME	ABC	DEF	GHI	KLM	A&E	B&F	C&G	D&H	TOTAL
6:00-6:15 AM	36	46	27	2	2	59	13	37	111
-6:30	75	55	51	0	0	106	14	61	181
-6:45	74	65	90	0	0	104	26	99	229
-7:00	59	81	67	0	0	103	24	80	207
-7:15	54	59	54	0	0	82	31	54	167
-7:30	70	72	60	0	0	121	28	53	175
-7:45	67	57	57	0	0	99	27	50	183
-8:00	47	70	66	0	0	92	27	64	144
-8:15	37	55	52	0	0	69	20	55	125
-8:30	38	33	54	0	0	53	18	48	149
-8:45	57	41	51	0	0	75	28	46	156
-9:00 AM	47	48	61	0	0	75	20	51	156
6:00-9:00 TOTAL	556	562	572	0	0	1044	276	708	2038

NAME MAIKOLO AFFORDABLE HOUSING File Name: CHHR.PM
 LOCATION QUEEN KAAHUMANU HWY/MAIKOLO RD
 DATE AUGUST 7, 1990
 BY: JXT



COUNT READINGS

TIME	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	TOTAL
3:00-3:15 PM	73	17	9	0	19	0	61	27	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	206
-3:30	141	30	20	0	46	0	153	55	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	239
-3:45	252	54	30	0	81	0	227	89	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	282
-4:00	327	68	45	3	104	0	265	113	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	188
-4:15	403	86	59	3	127	0	342	157	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	253
-4:30	482	103	65	3	151	0	407	193	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	188
-4:45	532	112	73	3	175	0	473	220	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	227
-5:00	588	128	81	3	198	0	533	251	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	184
-5:15	649	138	91	3	215	0	590	273	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	210
-5:30	699	145	99	3	225	0	649	299	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	161
-5:45	750	154	104	3	238	0	701	329	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	159
-6:00 PM	797	165	112	3	260	0	749	355	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	162

COUNT VOLUMES

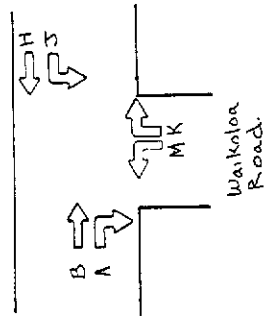
TIME	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	TOTAL
3:00-3:15 PM	0	73	17	9	0	19	0	61	27	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	206
-3:30	0	68	13	11	0	27	0	92	28	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	239
-3:45	0	111	24	10	0	35	0	68	34	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	282
-4:00	0	75	14	15	3	23	0	44	24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	188
-4:15	0	76	18	14	0	23	0	77	44	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	253
-4:30	0	79	17	6	0	24	0	65	36	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	227
-4:45	0	50	9	8	0	24	0	66	27	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	184
-5:00	0	66	16	8	0	23	0	60	37	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	210
-5:15	0	51	10	10	0	17	0	57	16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	161
-5:30	0	50	8	8	0	10	0	59	26	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	161
-5:45	0	51	8	5	0	13	0	52	30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	159
-6:00 PM	0	47	11	8	0	22	0	48	26	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	162
3:00-6:00 TOTAL	0	797	165	112	3	260	0	749	355	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2442
3:15-4:15 HOUR	0	330	69	50	3	108	0	281	130	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	972

APPROACH/DEPARTURE VOLUMES

TIME	ABC	DEF	GHI	JKL	MNO	AEJ	BFK	CGL	DHM
3:00-3:15 PM	90	28	88	0	0	0	92	44	70
-3:30	81	38	120	0	0	0	95	41	103
-3:45	135	45	102	0	0	0	146	58	78
-4:00	89	41	68	0	0	0	98	38	59
-4:15	94	37	121	1	0	0	99	63	91
-4:30	96	30	101	0	0	0	103	53	71
-4:45	59	32	53	0	0	0	74	36	74
-5:00	82	31	97	0	0	0	85	53	68
-5:15	61	27	73	0	0	0	68	26	67
-5:30	58	18	85	0	0	0	60	34	67
-5:45	59	18	82	0	0	0	64	32	57
-6:00 PM	58	30	74	0	0	0	69	37	56
3:00-6:00 TOTAL	962	375	1704	0	0	0	1071	412	861

NAME MAIKOOLA AFFORDABLE HOUSING
 LOCATION KAMALAHIA HWY/MAIKOOLA RD
 DATE AUGUST 8, 1990
 BY KKN

Mamalahoa Highway



COUNT READINGS

TIME	A	B	J	H	M	K
6:00-6:15 AM	14	13	0	6	3	0
-6:30	38	33	1	17	10	1
-6:45	82	48	7	30	24	2
-7:00	114	69	13	39	35	5
-7:15	141	89	16	52	55	6
-7:30	168	105	22	72	69	7
-7:45	183	126	23	90	92	9
-8:00	200	138	30	109	110	13
-8:15	212	148	31	136	124	13
-8:30	222	156	33	153	148	13
-8:45	235	178	33	170	166	16
-9:00 AM	247	204	34	187	195	17

COUNT VOLUMES

TIME	A	B	J	H	M	K	TOTAL	TOTL
6:00-6:15 AM	14	13	0	6	3	0	36	6:00-6:15 AM
-6:30	24	28	1	11	7	1	64	-6:30
-6:45	44	15	6	13	14	1	93	-6:45
-7:00	32	21	6	9	11	3	82	-7:00
-7:15	27	20	3	13	20	1	84	-7:15
-7:30	19	16	6	20	14	1	76	-7:30
-7:45	23	21	1	18	23	2	88	-7:45
-8:00	17	12	7	19	18	4	77	-8:00
-8:15	12	10	1	27	14	0	64	-8:15
-8:30	10	8	2	17	24	0	61	-8:30
-8:45	8	22	0	17	18	3	68	-8:45
-9:00 AM	17	26	1	17	29	1	91	-9:00 AM
6:00-9:00 TOTAL	247	204	34	187	195	17	884	
6:30-7:30 HOUR	122	72	21	55	59	6	335	

APPROACH / DEPARTURE

TIME	AB	JH	MK	AJ	BK	HM
6:00-6:15 AM	27	6	3	14	13	9
-6:30	44	12	8	25	21	18
-6:45	59	19	15	50	16	27
-7:00	53	15	14	38	24	20
-7:15	47	16	21	30	21	33
-7:30	35	26	15	25	17	34
-7:45	44	19	25	24	23	41
-8:00	29	26	22	24	16	37
-8:15	22	28	14	13	10	41
-8:30	18	19	24	7	8	41
-8:45	30	17	21	8	25	35
-9:00 AM	43	18	30	18	27	46
6:00-9:00 TOTAL	451	221	212	281	221	382
6:30-7:30 HOUR	154	76	55	143	18	114

NAME: KATIKOHA AFFORDABLE HOUSING
 LOCATION: MAMALAOHA HWY/MAMALAOHA RD
 DATE: AUGUST 7, 1990
 BY: KKK

COUNT READINGS

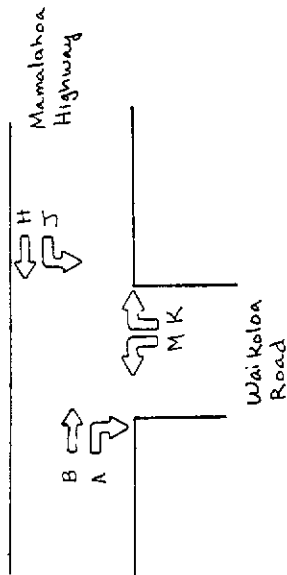
TIME	A	B	J	H	M	K
3:00-3:15 PM	20	22	3	20	15	0
-3:30	38	31	5	36	38	2
-3:45	55	63	9	51	61	10
-4:00	74	84	9	70	92	19
-4:15	86	109	12	89	123	23
-4:30	114	131	13	108	148	27
-4:45	133	159	16	123	167	32
-5:00	151	169	16	145	193	33
-5:15	169	192	16	167	213	36
-5:30	187	212	17	179	227	40
-5:45	216	237	19	204	239	41
-6:00 PM	231	259	22	218	253	43

COUNT VOLUMES

TIME	A	B	J	H	M	K	TOTAL
3:00-3:15 PM	20	22	3	20	15	0	80
-3:30	18	15	2	16	23	2	76
-3:45	17	26	4	15	25	8	95
-4:00	19	21	0	19	29	9	97
-4:15	12	25	3	19	31	4	94
-4:30	28	22	1	19	25	4	99
-4:45	19	22	3	15	19	5	83
-5:00	18	16	0	22	26	1	83
-5:15	18	23	6	22	20	3	86
-5:30	18	20	1	12	14	4	69
-5:45	29	25	2	25	12	1	94
-6:00 PM	15	22	3	14	14	2	70
3:00-6:00 TOTAL	231	259	22	218	253	43	1026

APPROACH / DEPARTURE

TIME	AB	JH	MK	AJ	BK	HM
3:00-3:15 PM	42	23	15	23	22	35
-3:30	33	18	25	20	17	39
-3:45	43	19	33	21	34	40
-4:00	40	19	38	19	30	48
-4:15	37	22	35	15	29	50
-4:30	50	20	29	29	26	44
-4:45	41	18	24	22	21	34
-5:00	34	22	27	18	17	48
-5:15	41	22	23	18	26	42
-5:30	38	13	18	19	24	26
-5:45	54	21	13	31	26	37
-6:00 PM	37	17	16	18	24	28
3:00-6:00 TOTAL	490	240	296	253	302	471
3:30-4:30 HOUR	110	80	135	84	115	122



NAME: WAIYOLA AFFINABLE INDUSTRIES
 LOCATION: WAIYOLA RD/PANILO DR/PWA MELIA S
 DATE: AUGUST 8, 1990
 BY: PF

Count Readings

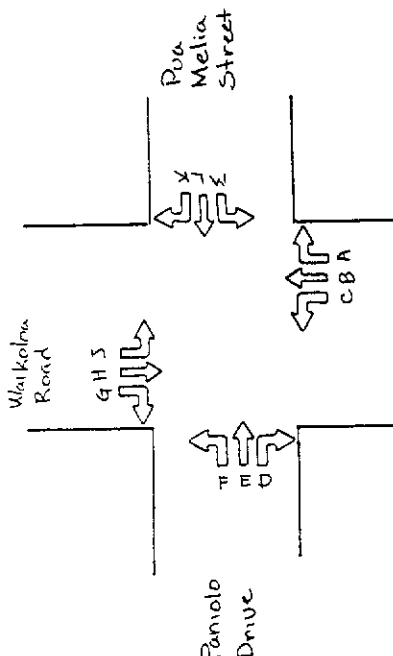
TIME	A	B	C	D	E	F	J	H	G	M	L	K	TOTAL
6:00-6:15 AM	0	3	1	39	4	3	0	7	7	0	0	1	65
-6:30	0	6	7	90	8	14	1	22	10	0	3	1	97
-6:45	2	8	14	151	12	31	3	47	23	4	5	5	143
-7:00	2	11	34	199	17	43	7	70	40	5	8	6	134
-7:15	3	15	46	240	22	56	11	89	50	8	11	6	118
-7:30	4	20	62	288	27	68	12	107	56	10	19	8	122
-7:45	5	26	81	331	32	91	16	117	66	14	23	7	130
-8:00	5	27	99	378	41	104	17	128	85	16	30	8	130
-8:15	7	34	116	411	47	119	18	132	94	19	37	8	130
-8:30	10	38	125	444	52	133	19	137	100	21	41	9	130
-8:45	12	48	135	477	57	152	20	143	106	23	43	12	130
-9:00 AM	16	51	145	495	62	165	22	148	112	26	49	17	1308

Count Volumes

TIME	A	B	C	D	E	F	J	H	G	M	L	K	TOTAL
6:00-6:15 AM	0	3	1	39	4	3	0	7	7	0	0	1	65
-6:30	0	3	6	51	4	11	1	15	3	0	3	0	97
-6:45	2	2	7	61	4	17	2	25	13	4	2	4	143
-7:00	0	3	20	48	5	9	4	23	17	1	3	1	134
-7:15	1	4	12	41	5	16	4	19	10	3	3	0	118
-7:30	1	5	16	48	5	12	1	18	6	2	8	0	122
-7:45	1	6	19	43	5	23	4	10	10	4	4	1	130
-8:00	1	1	18	47	9	13	1	11	19	2	7	1	130
-8:15	1	7	15	33	6	15	1	4	9	3	7	0	101
-8:30	3	4	11	33	5	14	1	5	6	2	4	1	89
-8:45	2	10	10	33	5	19	1	6	6	2	2	3	99
-9:00 AM	4	3	10	18	5	13	2	5	6	3	6	5	80
6:00-9:00 TOTAL	16	51	145	495	62	165	22	148	112	26	49	17	1308
6:30-7:30 HOUR	4	14	55	198	19	54	11	85	46	10	16	5	517

APPROACH/DEPARTURE VOLUMES

TIME	ABC	DEF	GHI	KLM	AEJ	BFK	CSL	DHW	TOTAL
6:00-6:15 AM	4	46	14	1	4	7	8	45	65
-6:30	9	66	19	3	5	14	12	66	97
-6:45	11	82	40	10	8	23	22	90	143
-7:00	23	62	44	5	9	13	40	72	134
-7:15	17	62	33	5	10	20	25	63	118
-7:30	22	65	25	10	7	17	30	68	122
-7:45	26	71	24	9	10	30	33	57	130
-8:00	20	69	31	10	11	15	44	60	130
-8:15	23	54	14	10	8	22	31	40	101
-8:30	18	52	12	7	9	19	21	40	89
-8:45	22	57	13	7	8	32	18	41	99
-9:00 AM	17	36	13	14	11	21	22	28	80
6:00-9:00 TOTAL	212	722	282	92	100	233	306	659	1308



NAME: MATICOLA AFFORDABLE HOUSINGS
 LOCATION: MATICOLA RD/PANITULO DR/PUA MELIA RD
 DATE: AUGUST 7, 1980
 BY: PF

File Name: MRPD.PM

COUNT READINGS

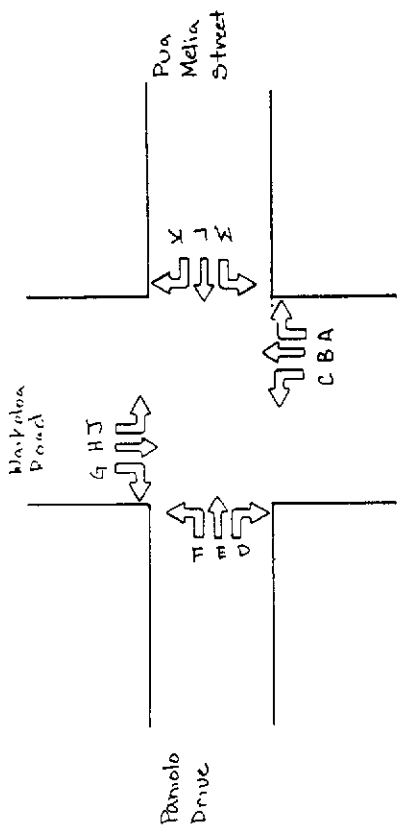
TIME	A	B	C	D	E	F	G	H	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	TOTAL
3:00-3:15 PM	2	7	16	23	19	11	4	5	10	3	26	3														129
-3:30	7	18	39	48	42	21	11	12	18	7	53	5														153
-3:45	14	35	76	72	61	41	14	15	28	13	78	10														175
-4:00	20	44	106	89	88	51	17	20	40	17	107	20														162
-4:15	25	63	139	101	112	62	23	23	52	22	128	25														156
-4:30	32	75	173	128	138	89	29	63	26	159	30															183
-4:45	36	84	215	142	146	89	30	34	75	29	175	34														131
-5:00	40	95	240	152	180	105	34	37	90	33	192	36														125
-5:15	45	96	276	173	176	116	37	38	104	36	214	37														134
-5:30	46	101	306	181	187	128	40	41	120	39	231	42														114
-5:45	48	104	335	197	197	133	41	44	135	40	247	42														99
-6:00 PM	52	107	360	219	208	139	43	48	159	42	262	46														124

COUNT VOLUMES

TIME	A	B	C	D	E	F	G	H	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	TOTAL
3:00-3:15 PM	2	7	16	23	19	11	4	5	10	3	26	3														129
-3:30	5	11	23	25	23	10	7	7	8	4	27	3														153
-3:45	7	17	37	24	19	20	3	3	10	6	25	4														175
-4:00	6	9	30	17	27	10	3	5	12	4	29	10														162
-4:15	5	19	33	12	24	11	6	3	12	5	21	5														156
-4:30	7	12	34	27	26	18	2	6	11	4	31	5														183
-4:45	4	9	42	14	8	9	5	5	12	3	16	4														131
-5:00	4	11	25	10	14	16	4	3	15	4	17	2														125
-5:15	5	11	36	21	16	11	3	1	14	3	22	1														134
-5:30	1	5	30	8	11	12	3	3	16	3	17	5														114
-5:45	0	3	29	16	10	5	1	2	15	1	16	0														99
-6:00 PM	6	3	29	22	11	6	2	4	24	2	15	4														124
3:00-6:00 TOTAL	52	107	360	219	208	139	43	48	159	42	262	46														1685
3:30-4:30 HOUR	25	57	134	80	96	59	14	17	45	18	106	24														676

APPROACH/DEPARTURE VOLUMES

TIME	ABC	DEF	GHI	JKL	MNO	PQR	STU	VWX	YZ	TOTAL
3:00-3:15 PM	25	53	19	32	25	21	52	31		188
-3:30	39	58	22	34	35	24	58	36		216
-3:45	61	63	16	35	29	41	72	33		249
-4:00	45	54	20	43	36	29	71	26		224
-4:15	57	47	21	31	35	35	66	20		207
-4:30	53	71	19	40	35	35	76	37		232
-4:45	55	3	27	23	17	22	70	22		147
-5:00	40	42	22	27	22	29	57	17		150
-5:15	42	49	18	26	24	13	72	25		167
-5:30	36	31	22	25	15	22	63	14		123
-5:45	32	21	15	17	11	8	60	20		104
-6:00 PM	72	71	21	2	19	13	64	28		175
3:00-6:00 TOTAL	333	343	155	257	203	192	573	306		1822



APPENDIX B

Six levels of service, A through F, from the best to worst conditions, are defined in the *Highway Capacity Manual*. Characteristics of each level of service for signalized and unsignalized intersections and two-lane highways are described below.

Signalized Intersections

Levels of Service for signalized intersections is measured in terms of delay. Delay is a measure of driver discomfort, frustration, fuel consumption, and lost travel time.

- Level of Service A: Drivers operate in a free-flow situation with easy turning movements and no delays.
- Level of Service B: This level represents stable conditions; drivers may be restricted slightly in movements; however, no delays exceed one cycle.
- Level of Service C: Short backups may occur behind turning vehicles, and drivers may experience delays of more than one cycle. Although movements may be restricted somewhat, the situation is not objectionable as stable operation continues.
- Level of Service D: Drivers experience restrictions approaching instability. Delays may occur during short peaks; however, periodic queues prevent excessive backups.
- Level of Service E: This level represents conditions at full capacity, serving the most vehicles the intersection is able to accommodate. Long queues and substantial delays occur.
- Level of Service F: The capacity of the intersection has been exceeded. Conditions are jammed, and the volumes of traffic that can be handled are unpredictable. Congestion, excessive delays, and very long queues are typical of this service level.

Unsignalized Intersection

For unsignalized intersections, the Highway Capacity Manual evaluates gaps in the major street traffic flow and calculates capacities available for left turns across oncoming traffic and for left and right turns onto the highway from the minor street

- Level of Service A: Few or no delays
- Level of Service B: Short traffic delays
- Level of Service C: Average traffic delays
- Level of Service D: Long traffic delays

Level of Service E: Very long traffic delays

Level of Service F: Capacity exceeded by demand

Two-Lane Highways

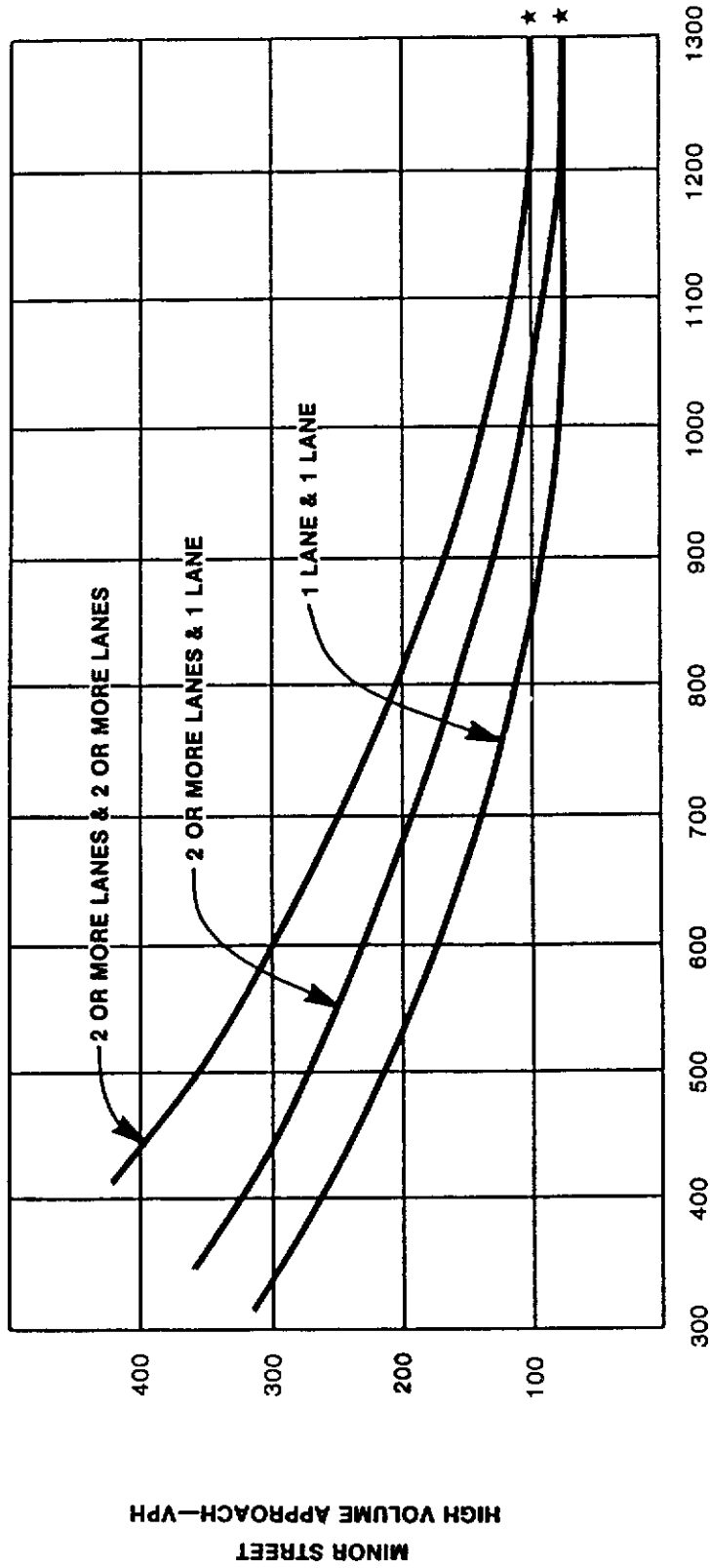
The analysis of two-lane highways evaluates percent time delay with speed and capacity utilization serving as secondary measures

- Level of Service A: Motorists are able to drive desired speeds. Passing demand is well below capacity, and almost no platoons of three or more vehicles are observed. Drivers would be delayed no more than 30 percent of the time by slow-moving vehicles.
- Level of Service B: Passing demand approximately equals passing capacity. Drivers may be delayed up to 45 percent of the time, and the number of platoons forming in the traffic stream begins to increase dramatically.
- Level of Service C: Traffic flows increase, resulting in noticeable increases of platoon formation, platoon size, and frequency of passing impediment; chaining of platoon and significant reductions of passing capacity begin to occur. Traffic flows are stable, but is susceptible to congestion caused by turning movements and slow-moving vehicles. Motorists may be delayed up to 60 percent of the time.
- Level of Service D: Traffic flows become unstable. The two opposing traffic streams essentially begin to operated separately as passing becomes extremely difficult. Passing demand is high, while passing capacity approaches zero. Average platoon sizes of 5 to 10 vehicles are common. Turning vehicles and/or roadside distractions causes major shock waves in the traffic stream. Delays for motorists may approach 75 percent of the time. This is the highest flow rate that can be maintained without a high probability of breakdown.
- Level of Service E: Traffic flows experience delays more than 75 percent of the time. Passing is virtually impossible and platooning becomes intense when slower vehicles or other interruptions are encountered. Traffic volumes may reach capacity of the highway. Operating conditions at capacity are unstable and difficult to predict or maintain; Level of Service E is a transient condition and perturbations in traffic flows would cause a rapid transition to Level of Service F.
- Level of Service F: Heavily congested flow with traffic demand exceeding capacity. Volumes are lower than capacity, and speeds are below capacity.

APPENDIX C

PEAK HOUR VOLUME WARRANT

PEAK HOUR VOLUME WARRANT (RURAL AREAS)



MAJOR STREET—TOTAL OF BOTH APPROACHES—VPH

★ NOTE: 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 75 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

APPENDIX B

List of Preemptions Granted by Hawai'i County Resolutions

(pursuant to HRS § 46-15)

Kamakoia Nui Housing (Waikoloa Employee Housing Project)

List of Preemptions Granted by Hawai'i County Resolutions (pursuant to HRS § 46-15)

Resolution No.	Item No.	Item	Hawai'i County Code - Chapter, Article, Division	Hawai'i County Code - Section	Preemption Granted	Notes:
328-91	1	Lot Size, RS-10 Zone	Ch. 25 (Zoning), Art. 4	Section 25-119 – lot size	Minimum 7,500 square foot lot size in place of 10,000 square foot minimum.	
328-91	1	Lot Size, RS-10 Zone	Ch. 25 (Zoning), Art. 4	Section 25-124 – minimum yards – setbacks	Minimum 15' front and rear, 8' sides in place of 20' front and rear, 10' sides.	
328-91	1	Lot Size, RS-10 Zone	Ch. 25 (Zoning), Art. 4	Section 25-123 – minimum building site average width	Minimum of 60' in place of 70'.	
328-91	2	Temporary Sales Office	Ch. 25 (Zoning), Art. 1, Div. 7	Section 25-46 (e)	Waiving of Parking requirement	
328-91	2	Temporary Sales Office	Ch. 25 (Zoning), Art. 1, Div. 7	Section 25-46 (g)	Waiving of Final Subdivision approval requirement prior to establishment of temporary real estate office.	
328-91	3	Construction of Homes	Ch. 25 (Zoning), Art. 1, Div. 7	Section 25-39 (A)	Waiving the requirement that subdivision construction drawings be submitted and approved and final plat map be submitted and reviewed prior to the issuance of building permits.	
328-91	4	Subdivision	Ch. 23 (Subdivision), Div. 4	Section 23-41 (a) – Minimum right-of-way width	Collector 60' right-of-way, 24' pavement and Minor 50' right-of-way, 20' pavement amended as per plan.	
328-91	4	Subdivision	Ch. 23 (Subdivision), Div. 4	Section 23-41 (b) – Minimum right-of-way width	Collector 36' pavement and Minor 32' pavement amended as per plan.	
328-91	4	Subdivision	Ch. 23 (Subdivision), Div. 4	Section 23-48 (a)	Cul-de-sacs not more than 600' in length nor serve more than 18 lots amended as per plan.	
439-06	1.0	CHAPTER 10: EROSION AND SEDIMENTATION CONTROL				
439-06	1.1	Fees	Ch. 10 (Erosion and Sedimentation Control), Art. 2	Section 10-11	Waiving the requirement for grading permit fees. Grading inspection shall be provided by a Project inspector approved by the Department of Public Works.	Amended by Resolution 416-07, Item No. 3.1
439-06	1.2	Conditions of Permit	Ch. 10 (Erosion and Sedimentation Control), Art. 3	Section 10-18 (a) (1), (2), and (3)	Waiving the requirements of Section 10-18 (a) pertaining to the cut and fill heights and slopes. Cut and fill heights and slopes shall be determined by the Project's licensed geotechnical engineer.	Amended by Resolution 416-07, Item No. 3.2
439-06	1.3	Distance from property line for cut or fill slopes	Ch. 10 (Erosion and Sedimentation Control), Art. 3	Section 10-19	Waiving the requirements of Section 10-19 pertaining to the distance from the property line for cut or fill slopes. Distances shall be determined by the Project's licensed geotechnical engineer.	Amended by Resolution 416-07, Item No. 3.3
439-06	1.4	Maximum cleared area	Ch. 10 (Erosion and Sedimentation Control), Art. 3	Section 10-20	Waiving the requirements of Section 10-20 (HCC) that limits the maximum area to be cleared to twenty acres. Erosion and sedimentation controls shall be per a Department of Public Works approved Erosion and Sedimentation Control Plan.	Amended by Resolution 416-07, Item No. 3.4
439-06	2.0	CHAPTER 23: SUBDIVISION CODE				
439-06	2.1	Compliance with design standards required	Ch. 23 (Subdivision), Art. 3, Div. 1	Section 23-22	Waiving the requirements that each subdivision and the plat thereof conform to the standards set forth in this article (Article 3. Design Standards). The subdivision will vary from the design standards pertaining to park area dedication, block sizes, pedestrian ways, lot size, shape and setbacks, and street design; and waivers from Sections 23-26, 23-29, 23-31, 23-32, 23-	Amended by Resolution 416-07, Item No. 2.1

Resolution No.	Item No.	Item	Hawai'i County Code - Chapter, Article, Division	Hawai'i County Code - Section	Preemption Granted	Notes:
					33, 23-41 and 23-48 of the Subdivision Code are sought, as detailed below. The design and construction of the subdivision will conform to project construction plans approved by the appropriate County departments.	
439-06	2.2	Reservation for parks, playgrounds, and public buildings	Ch. 23 (Subdivision), Art. 3, Div. 1	Section 23-26	Waiving the requirement that five to ten percent of land area, exclusive of streets, shall be reserved for a period of two years for acquisition by a public agency. Although the Project will be reserving more than 10% of suitable areas for parks, playgrounds, schools, and other public buildings sites, some of the community facilities may be funded by the project for use by the project residents. The area for such uses, therefore, would not be reserved exclusively for acquisition by a public agency,	
439-06	2.3	Block sizes	Ch. 23 (Subdivision), Art. 3, Div. 2	Section 23-29 (c)	Waiving the recommended minimum distance between intersections on arterial streets. The minimum distance between intersections on arterial streets will be less than the recommended eighteen hundred feet to accommodate the two main Project intersections with the planned extension of Paniolo Drive (designated as a secondary arterial street on the County General Plan.) Intersection locations are generally indicated on the attached Exhibit A, Waikoloa Employee Housing Preliminary Site Plan. The location of intersections with the extension of Paniolo Drive will also be reflected on construction plans for the extension of Paniolo Drive being prepared by Waikoloa Heights, developers of the adjoining subdivision. Such plans will be reviewed and approved by the Director of Public Works.	Amended by Resolution 416-07, Item No. 1.1
439-06	2.4	Pedestrian ways	Ch. 23 (Subdivision), Art. 3, Div. 2	Section 23-31	Waiving the requirement that, for any block over seven hundred fifty feet in length, the director may require creation of a pedestrian way to be constructed to conform to standards adopted by the Department of Public Works. Sidewalks will be incorporated with roadways designs that will conform to construction plans approved by the Department of Public Works.	Amended by Resolution 416-07, Item No. 4.1
439-06	2.5	Lot size, shape, and setback line	Ch. 23 (Subdivision), Art. 3, Div. 3	Section 23-32	Waiving the requirement of Section 23-32 that the lot size, width, and minimum building setback lines be in conformance with the provisions of Chapter 25, Zoning Code. Lot sizes, average minimum width, and setbacks will vary from that specified within the County Code to accommodate a mix of product type, increase the efficiency of the land use, and thus yield a more compact and pedestrian oriented development. The sizes, widths, and setback lines for such lots will conform to specific standards approved by the County Council for the Waikoloa Employee Housing Project (Project), as detailed below pertaining to Sections 23-33 (Item 2.6); and 25-5-5, 25-5-6, and 25-5-7 (Items 3.8, 3.9, and 3.10, respectively).	Amended by Resolution 416-07, Item No. 1.2
439-06	2.6	Minimum Lot Sizes	Ch. 23 (Subdivision), Art. 3, Div. 3	Section 23-33	Waiving the requirement of section 23-33 that the minimum sizes of various types of lots shall be in conformance with the provisions of Chapter 25, Zoning Code. The minimum lot size for the Waikoloa Employee Housing project shall be two thousand (2,000) square feet.	Amended by Resolution 416-07, Item No. 1.3
439-06	2.7	Minimum right-of-way and pavement widths	Ch. 23 (Subdivision), Art. 3, Div. 4	Section 23-41	Waiving the requirements of Section 23-41 for streets with curbs and gutters in urban areas, and replacing these with the following minimum requirements: <ul style="list-style-type: none"> (1) Collector street minimum requirement 60' right-of-way, 36' pavement is replaced with a 50' right-of-way, 28' pavement. (2) Minor street minimum requirement 50' right-of-way, 32' pavement is replaced with a 50' right-of-way, 20' pavement. (3) Cul-de-sac minimum requirement 50' right-of-way, 32' pavement is replaced with a 46' right-of-way, 26' pavement. 	Amended by Resolution 416-07, Item No. 4.2

Resolution No.	Item No.	Item	Hawai'i County Code - Chapter, Article, Division	Hawai'i County Code - Section	Preemption Granted	Notes:	
439-06	2.8	Cul-de-sacs	Ch. 23 (Subdivision), Art. 3, Div. 4	Section 23-48 (a)	Waiving the requirements of Section 23-48 (a), which states: "(a) A cul-de-sac shall be as short as possible and shall not be more than six hundred feet in length nor serve more than eighteen lots: provided that longer streets may be approved by the director when unusual conditions exist." Due to the relative smaller lot sizes and topographic constraints of the site, the number of lots on a cul-de-sac shall be twenty six (26) lots and cul-de-sac lengths shall not be more than eight hundred (800) feet in length.	Amended by Resolution 416-07, Item No. 4.3	
439-06	2.9	Application fees for subdivision plans	Ch. 23 (Subdivision), Art. 4, Div. 1	Section 23-60	Waiving the requirements of Section 23-60 pertaining to the payment of application fees (\$250 plus \$25 per lot) for subdivision applications pertaining to the development of the Waikoloa Employee Housing Project.	Amended by Resolution 416-07, Item No. 2.4	
439-06	2.10	(Requirements for Bonding)	Ch. 23 (Subdivision), Art. 6, Div. 1	Sections 23-81, 82, and 83	Waiving the requirements to either complete subdivision improvements or provide a bond and agreement with the County as a condition of final subdivision approval and offering of sale. The Project infrastructure will be financed with the County by means of a Community Facilities District (CFD) bond ordinance approved by the County Council. The approval of the CFD Bond by the County Council insures that adequate funding is in place for the construction of all subdivision related infrastructure. Final subdivision approval shall not be issued prior to Council approval of the CFD bond for the subdivision related improvements for the corresponding subdivision increment.	Amended by Resolution 416-07, Item No. 2.6	
439-06	2.11	Improvements Required	Ch. 23 (Subdivision), Art. 6, Div. 2	Section 23-86 – Requirements for dedicable streets; Section 23-89 – Sidewalks; Section 23-90 – Pedestrian way; Section 23-91 – Curbs and gutters; Section 23-93 – Street lights; Section 23-94 – Street name and traffic signs	Waiving the requirements of the above sections that dedicable streets be designed in accordance with "specifications on file with the department of public works." Dedicable streets will be designed in accordance with construction plans approved by the County Department of Public Works. Plans and dimensions for typical Project roads are shown the attached Exhibit B, Waikoloa Employee Housing - Typical Roadway Sections.	Amended by Resolution 416-07, Item No. 4.6	
439-06	2.12	Inspection by director of public works and manager	Ch. 23 (Subdivision), Art. 7	Section 23-96	Waiving the requirements of Section 23-96 pertaining to inspection by Director of Public Works and Manager of the Department of Water Supply. Inspection will be conducted by a Project inspector approved by the Director of Public Works and Manager of the Department of Water Supply.	Amended by Resolution 416-07, Item No. 2.7	
439-06	2.13	Inspection fee	Ch. 23 (Subdivision), Art. 7	Section 23-97	Waiving the requirement for inspection fee for inspections of subdivision improvements. Inspections will [be] conducted by a Project inspector approved by the Director of Public Works.	Amended by Resolution 416-07, Item No. 2.8	
439-06	3.0	CHAPTER 25: ZONING CODE					
439-06	3.1	Applicability; use permit required	Ch. 25 (Zoning), Art. 2, Div. 6	Section 25-2-61 (a)	Waiving the provisions within Section 25-2-61 (a) requiring a use permit for meeting facilities, day care facilities, and schools.	Amended by Resolution 416-07, Item No. 1.4	

Resolution No.	Item No.	Item	Hawai'i County Code - Chapter, Article, Division	Hawai'i County Code - Section	Preemption Granted	Notes:
					Meeting facilities, a day care facility, and a public elementary school are uses specifically proposed for the Project as detailed below with regards to Section 25-5-3, Permitted Uses (Item 3.6), and therefore use permits would not be required for such uses.	
439-06	3.2	Application of district regulations	Ch. 25 (Zoning), Art. 3	Section 25-3-5	<p>Waiving the requirement of Section 25-3-5 that any land use shall comply with all of the regulations specified in this chapter for the district in which it is located.</p> <p>The land use will be in accordance with the specific regulations for the existing Residential Single-Family (RS-10) District approved by the County Council for the Project, as detailed below pertaining to Sections 25-5-3 through 25-5-8 (Items 3.6 through 3.11, respectively).</p>	Amended by Resolution 416-07, Item No. 1.5
439-06	3.3	Conditions for construction of buildings designed for human occupancy	Ch. 25 (Zoning), Art. 4, Div. 1	Section 25-4-2	<p>Waiving the requirements of Section 25-4-2 which states:</p> <p>(a) "On any building site, no building designed or intended for human occupancy shall be constructed and no permit therefore shall be issued unless:</p> <ol style="list-style-type: none"> (1) the building site is served by a County water system or privately owned and operated water system, or other private, individual means of providing water to the building site is demonstrated; and (2) a wastewater treatment system for the proposed building has been approved by the State department of health. <p>(b) On any building site in any subdivision approved by the director under chapter 23 of this code, no building designed or intended for human occupancy shall be constructed and no permit issued therefore until either:</p> <ol style="list-style-type: none"> (1) The streets, drainage improvements, water supply system, if any, and sewage disposal system, if any, have been constructed, inspected and approved by the appropriate County agencies; or (2) Final subdivision approval has been secured by the subdivider in accordance with chapter 23, by posting a surety bond or other security guaranteeing the construction of all of the subdivision improvements as shown on approved construction drawings and specifications, provided that final occupancy of any dwelling unit shall not be granted until the subdivision improvements for the particular increment in which such dwelling unit is situated have been constructed, inspected and approved by the appropriate County agencies." <p>Construction of the Project water, streets, drainage improvements, and sewage disposal system will be constructed concurrent with the building construction. Therefore, building permits shall be issued prior to such systems having been inspected and approved by the appropriate County agencies. Provided, however, final occupancy of any dwelling unit shall not be granted until the subdivision improvements for the particular increment in which such dwelling unit is situated have been constructed, inspected, and approved by the appropriate County agencies; and a wastewater treatment system for the proposed building has been approved by the State department of health.</p> <p>Additionally, as detailed above pertaining to Sections 23-81 through 83 (item 2.10), posting of a surety bond or other security will not be required as a condition of final subdivision approval for the Waikoloa Employee Housing Project. The Project infrastructure will be financed with the County by means of a Community Facilities District (CFD) bond ordinance approved by the County Council. The approval of the CFD Bond by the County Council will insure that adequate funding is in place for the construction of the required subdivision related infrastructure. Final subdivision approval, however, shall not be issued prior Council approval of the CFD Bond funding the construction of the subdivision related infrastructure of the corresponding subdivision increment.</p> 	Amended by Resolution 416-07, Item No. 5.2

Resolution No.	Item No.	Item	Hawai'i County Code - Chapter, Article, Division	Hawai'i County Code - Section	Preemption Granted	Notes:
439-06	3.4	Temporary real estate offices and model homes	Ch. 25 (Zoning), Art. 4, Div. 1	Section 25-4-8	<p>Waiving the requirements of Sections 25-4-8 (b) (2), (4), and (6) that state:</p> <p>"(2) The temporary real estate office and/or model home shall not be used for a period longer than twenty-four months from the date of plan approval by the director; provided that extensions may be granted by the director."</p> <p>"(4) The temporary real estate office [and]/or model home shall be used exclusively for marketing of lots and/or units located within the development in which it is to be located. In multi-phased developments, a temporary real estate office or model home may be allowed for each development phase for a period not to exceed twenty-four months. Time extensions may be granted by the director."</p> <p>"(6) The temporary real estate office and/or model home shall comply with the minimum set-back and height requirements of the particular zoning district."</p> <p>In that units and homes, if sold by the first and subsequent owners, are to be sold back to the property owner, Waikoloa Workforce Housing, LLC, marketing and sales of homes within the Waikoloa Employee Housing Project will be an ongoing activity of the Project. Therefore real estate office and/or model homes shall be a permitted use in the Waikoloa Employee Housing Project, as specified below pertaining to Section 25-5-3 (Item 3.6), and there shall be no time limit as to their use. Furthermore, the minimum setback and height requirements for a real estate office and/or model home shall be as specified below pertaining to Sections 25-5-4 and 25-5-7 (Items 3.7 and 3.10, respectively).</p>	Amended by Resolution 416-07, Item No. 1.6
439-06	3.5	Designation of RS districts	Ch. 25 (Zoning), Art. 5, Div. 1	Section 25-5-2	<p>Waiving the requirements of Section 25-5-2 that establishes the maximum density in the RS district.</p> <p>The maximum density in the Waikoloa Employee Housing Project shall be no greater than one dwelling unit or separate rental unit per two thousand (2,000) square feet of land.</p>	
439-06	3.6	Permitted uses	Ch. 25 (Zoning), Art. 5, Div. 1	Section 25-5-3 (a)	<p>Waiving the requirements of Section 25-5-3 (a). The permitted uses within the Waikoloa Employee Housing Project shall be as follows:</p> <ol style="list-style-type: none"> 1. Adult day care homes 2. Churches, temples and synagogues 3. Commercial or personal service uses on a small scale 4. Community buildings 5. Community parks, playgrounds, tennis courts, swimming pools, or similar community neighborhood recreational areas and uses 6. Convenience and community retail stores 7. Day care centers 8. Dwellings, double-family or duplex 9. Dwellings, multiple-family 10. Dwellings, single-family 11. Family child care homes 12. Home occupations 13. Medical clinics 14. Meeting facilities 15. Model homes 16. Public uses and structures 17. Restaurants 18. Schools 	Amended by Resolution 416-07, Item No. 1.9

Resolution No.	Item No.	Item	Hawai'i County Code - Chapter, Article, Division	Hawai'i County Code - Section	Preemption Granted	Notes:	
					19. Temporary real estate offices 20. Utility substations 21. Mixed use residential		
439-06	3.7	Height Limit	Ch. 25 (Zoning), Art. 5, Div. 1	Section 25-5-4	Waiving the requirements of Section 25-5-4. The height limit within the Waikoloa Employee Housing Project shall be fifty (50) feet. Additionally, the Planning Director may permit by plan approval any non-residential structure to be constructed to a height above forty-five feet if the director determines that additional height above the fifty (50) foot limit is necessary.	Amended by Resolution 416-07, Item No. 1.10	
439-06	3.8	Minimum building area	Ch. 25 (Zoning), Art. 5, Div. 1	Section 25-5-5	Waiving the requirements of Section 25-5-5 pertaining to minimum building site area. The minimum building site area in the Waikoloa Employee Housing Project shall be two thousand (2,000) square feet.	Amended by Resolution 416-07, Item No. 1.11	
439-06	3.9	Minimum building site average width	Ch. 25 (Zoning), Art. 5, Div. 1	Section 25-5-6	Waiving the requirements of Section 25-5-6 pertaining to minimum building site average width. The minimum building site average width within the Waikoloa Employee Housing Project shall be forty (40) feet.	Amended by Resolution 416-07, Item No. 1.12	
439-06	3.10	Minimum yards	Ch. 25 (Zoning), Art. 5, Div. 1	Section 25-5-7	Waiving the requirements of Section 25-5-7 pertaining to minimum yards. The minimum yards in the Waikoloa Employee Housing Project shall be ten (10) feet for front and rear yards and five (5) feet for side yards; except for building sites gaining access from an alley, in which case the minimum yards shall be five (5) feet for the front yard facing the alley, ten (10) feet for rear yards, and five (5) feet for side yards.	Amended by Resolution 416-07, Item No. 1.13	
439-06	3.11	Other regulations	Ch. 25 (Zoning), Art. 5, Div. 1	Section 25-5-8	Waiving the requirements of Section 25-5-8. Other regulations for the Waikoloa Employee Housing Project shall be as follows: a) There may be more than one main building on any building site. b) The distance between the main buildings on the same building site shall be as allowed by the County Building Code. d) Exceptions to the standards regarding heights, building site areas, building site average widths, and yards may be approved by the Planning Director with Plan Approval.	Amended by Resolution 416-07, Item No. 1.14	
416-07	1.0	SITE PLAN					
416-07	1.1	Block sizes	Ch. 23 (Subdivision), Art. 3, Div. 2	Section 23-29 (c)	Waiving the recommended minimum distance between intersections on arterial streets. The minimum distance between intersections on arterial streets will be less than the recommended eighteen hundred feet to accommodate the two main Project intersections with the planned extension of Paniolo Avenue (designated as a secondary arterial street on the County General Plan.) Intersection locations are reflected on construction plans for the extension of Paniolo Avenue being prepared by Waikoloa Heights, developers of the adjoining subdivision, which will be reviewed and approved by the Director of Public Works.	Amends Resolution 439-06, Item No. 2.3	
416-07	1.2	Lot size, shape, and setback line	Ch. 23 (Subdivision), Art. 3, Div. 3	Section 23-32	Waiving the requirement of Section 23-32 that the lot size, width, shape, and orientation and minimum building setback lines be in conformance with the provisions of Chapter 25, Zoning Code. Lot sizes, shapes, setbacks will vary from that specified within the County Code to accommodate a mix of product type, increase the efficiency of the land use, and thus yield a more compact and pedestrian oriented development. The widths, shape and setback lines for such lots will conform to specific standards approved by the County Council for the Waikoloa Employee Housing Project (Project), as detailed below.	Amends Resolution 439-06, Item No. 2.5	
416-07	1.3	Minimum Lot Sizes	Ch. 23 (Subdivision), Art. 3, Div. 3	Section 23-33	Waiving the requirement of Section 23-33 (a) that the minimum sizes of various types of lots shall be in conformance with the provisions of Chapter 25, Zoning Code.	Amends	

Resolution No.	Item No.	Item	Hawai'i County Code - Chapter, Article, Division	Hawai'i County Code - Section	Preemption Granted	Notes:
					The minimum lot size for the Waikoloa Employee Housing project will be twenty-five hundred (2,500) square feet, except for Town Home lots indicated in Exhibit "A-1", which shall have a minimum lot size of fifteen hundred (1,500) square feet.	Resolution 439-06, Item No. 2.6
416-07	1.4	Applicability; use permit required	Ch. 25 (Zoning), Art. 2, Div. 6	Section 25-2-61 (a)	Waiving the provisions within Section 25-2-61 (a) requiring a use permit for meeting facilities, day care facilities, and schools. Meeting facilities, a day care facility, and a public elementary school are uses specifically proposed for the Project as detailed below with regards to Section 25-5-3, Permitted Uses, (Item 1.9) and, therefore, use permits are not required for such uses.	Amends Resolution 439-06, Item No. 3.1
416-07	1.5	Application of district regulations	Ch. 25 (Zoning), Art. 3	Section 25-3-5	Waiving the requirement of Section 25-3-5 that any building, structure, or land use shall comply with all of the regulations specified in this chapter for the district in which it is located. The building, structure, and land use will be in accordance with the specific regulations for the existing Residential Single-Family (RS-10) District approved by the County Council for the Project, as detailed below pertaining to Sections 25-5-2 through Section 2-5-8 (Items 1.8 to 1.14).	Amends Resolution 439-06, Item No. 3.2
416-07	1.6	Temporary real estate offices and model homes	Ch. 25 (Zoning), Art. 4, Div. 1	Section 25-4-8	Waiving the requirements of Sections 25-4-8 (b) (2), (4), and (6) that state: "(2) The temporary real estate office and/or model home shall not be used for a period longer than twenty-four months from the date of plan approval by the director; provided that extensions may be granted by the director." "(4) The temporary real estate office [and]/or model home shall be used exclusively for marketing of lots and/or units located within the development in which it is to be located. In multi-phased developments, a temporary real estate office or model home may be allowed for each development phase for a period not to exceed twenty-four months. Time extensions may be granted by the director. " "(6) The temporary real estate office and/or model home shall comply with the minimum set-back and height requirements of the particular zoning district." In that units and homes, if sold by the first and subsequent owners, are to be sold back to the property leaseholder and developer, Waikoloa Workforce Housing, LLC; marketing and sales of homes within the Waikoloa Employee Housing Project will be an ongoing activity of the Project. Therefore, real estate offices and/or model homes shall be a permitted use in the Waikoloa Employee Housing Project, as specified below pertaining to Section 25-5-3 (Item 1.9) and there shall be no time limit as to their use. Furthermore, the maximum height limit and minimum yard requirements for a real estate office and/or model home shall be as specified below pertaining to Sections 25-5-4 and 25-5-7 (Items 1.10 and 1.13, respectively).	Amends Resolution 439-06, Item No. 3.4
416-07	1.7	Corner Building Sites	Ch. 25 (Zoning), Art. 4, Div. 4	Section 25-4-42	Waiving the requirements of Section 25-4-42 that states: a) On any corner building site, the interior lines shall be side lot lines and all rear yard regulations shall be inapplicable. b) On any corner building site in all zoning districts except in the CN district, within the area of a triangle formed by the street lines and such building site (ignoring any corner radius), and a line drawn between points on such street lines twenty-five feet from the intersection thereof, no fence, wall, hedge, or building shall be higher than three feet nor shall there be any obstruction to vision other than a post,	

Resolution No.	Item No.	Item	Hawai'i County Code - Chapter, Article, Division	Hawai'i County Code - Section	Preemption Granted	Notes:
					<p>column, tree trunk clear of branches or foliage, between the height of three feet and eight feet above the level of the street or the level of the point of intersection if the streets are sloping."</p> <p><u>PROPOSED STANDARD</u> For all corner building sites within the Project, there shall be one front and one side yard facing the intersecting streets and interior lot lines shall be considered side yards. All rear yard regulations shall inapplicable.</p> <p>Additionally, for all corner building sites within the Project, the area of a triangle formed by the street lines and such corner building site (ignoring any corner radius), and a line drawn between points on such street lines fifteen (15) feet from the intersection thereof, no fence, wall, hedge, or building shall be higher than three feet; nor shall be any obstruction to vision other than a post, column, tree trunk clear of branches or foliage, between the height of three feet and eight feet above the level of the street or the level of the point of intersection if the streets are sloping. For the purpose of traffic safety, all intersections will meet or exceed the American Association of State Highway and Transportation Officials (AASHTO) standards for intersection sight distances, as set forth AASHTO Policy of Geometric Design of Highways and Streets and as verified by the project engineer registered with the State of Hawai'i.</p>	
416-07	1.8	Intersection sight distance	Ch. 22 (County Streets), Art. 2	Section 22-2.2	<p>Waiving the requirements of Section 22-2.2 that establishes a setback from intersections of County streets.</p> <p><u>PROPOSED STANDARD</u> To preserve adequately vehicular sight distances at intersections of two or more County streets, no object with a height between three (3) feet and eight (8) shall be allowed within the area defined by the chord of an arc having a radius of fifteen (15) feet from the intersection of property lines or their extensions that form the intersection. All intersections will meet or exceed the American Association of State Highway and Transportation Officials (AASHTO) standards for intersection sight distances, as set forth AASHTO Policy of Geometric Design of Highways and Streets and as verified by the project engineer registered with the State of Hawai'i.</p>	
416-07	1.9	Permitted uses	Ch. 25 (Zoning), Art. 5, Div. 1	Section 25-5-3 (a)	<p>Waiving the requirements of Section 25-5-3 (a). The permitted uses within the Waikoloa Employee Housing Project shall be as follows:</p> <ol style="list-style-type: none"> 1. Adult day care homes 2. Churches, temples and synagogues 3. Commercial or personal service uses on a small scale 4. Community buildings 5. Community parks, playgrounds, tennis courts, swimming pools, or similar community neighborhood recreational areas and uses 6. Convenience stores 7. Day care centers 8. Dwellings, double-family or duplex 9. Dwellings, multiple-family 10. Dwellings, single-family 11. Family child care homes 12. Home occupations 13. Medical clinics 14. Meeting facilities 15. Model homes 16. Public uses and structures 17. Restaurants 18. Schools 	Amends Resolution 439-06, Item No. 3.6

Resolution No.	Item No.	Item	Hawai'i County Code - Chapter, Article, Division	Hawai'i County Code - Section	Preemption Granted	Notes:	
					19. Temporary real estate offices 20. Utility substations 21. Mixed use residential		
416-07	1.10	Height Limit	Ch. 25 (Zoning), Art. 5, Div. 1	Section 25-5-4	Waiving the requirements of Section 25-5-4. The height limit within the Waikoloa Employee Housing Project shall be forty-five (45) feet. Additionally, the Planning Director may permit by plan approval any non-residential structure to be constructed to a height above forty-five feet if the director determines that additional height above the forty-five foot limit is necessary.	Amends Resolution 439-06, Item No. 3.7	
416-07	1.11	Minimum building area	Ch. 25 (Zoning), Art. 5, Div. 1	Section 25-5-5	Waiving the requirements of Section 25-5-5 pertaining to minimum building site area. The minimum building site area in the Waikoloa Employee Housing Project shall be fifteen hundred (1,500) for town home units, and twenty thousand five hundred (2,500) square feet for all other uses.	Amends Resolution 439-06, Item No. 3.8	
416-07	1.12	Minimum building site average width	Ch. 25 (Zoning), Art. 5, Div. 1	Section 25-5-6	Waiving the requirements of Section 25-5-6 pertaining to minimum building site average width. The minimum building site average width within the Waikoloa Employee Housing Project shall be twenty (20) feet for town home units, thirty (30) feet for duplex units, and fifty (50) feet for all other uses.	Amends Resolution 439-06, Item No. 3.9	
416-07	1.13	Minimum yards	Ch. 25 (Zoning), Art. 5, Div. 1	Section 25-5-7	Waiving the requirements of Section 25-5-7 pertaining to minimum yards. The minimum yards in the Waikoloa Employee Housing Project shall be eight (8) feet for front and rear yards and five (5) feet for side yards, except for town home units, which shall have no side yard requirements.	Amends Resolution 439-06, Item No. 3.10; and Amended by Resolution 353-14, Item No. 1.13	
416-07	1.14	Other regulations	Ch. 25 (Zoning), Art. 5, Div. 1	Section 25-5-8	Waiving the requirements of Section 25-5-8. Other regulations for the Waikoloa Employee Housing Project shall be as follows: a) There may be more than one main building on any building site. b) The distance between the main buildings on the same building site shall be at least fifteen (15) feet c) One guest house, in addition to a single-family dwelling, may be located on any building site. d) Exceptions to the standards regarding heights, building site areas, building site average widths, and yards may be approved by the Planning Director with Plan Approval.	Amends Resolution 439-06, Item No. 3.11	
416-07	2.0	SUBDIVISION					
416-07	2.1	Compliance with design standards required	Ch. 23 (Subdivision), Art. 3, Div. 1	Section 23-22	Waiving the requirements that each subdivision and the plat thereof conform to the standards set forth in this article (Article 3. Design Standards). The subdivision will vary from the design standards pertaining to park area dedication, block sizes, pedestrian ways, lot size, shape and setbacks, and street design; and waivers from these sections of the Subdivision Code are sought, as detailed below. The design and construction of the subdivision will conform to project construction plans approved by the appropriate County departments.	Amends Resolution 439-06, Item No. 2.1	
416-07	2.2	Access to lot from street	Ch. 23 (Subdivision), Art. 3, Div. 3	Section 23-34	Waiving the requirements of Section 23-34 for town home units. Section 23-34 requires that each subdivided shall abut upon a public or approved private street. Town home units within the Waikoloa Employee Housing project shall access onto a public street, via an easement over a private drive maintained by the Project.		
416-07	2.3	Lot side lines	Ch. 23 (Subdivision), Art. 3, Div. 3	Section 23-35	Waiving the requirements of Section 23-35 that states that the side lines of a lot shall run a tight angles [sic] to the street upon which the lot faces.		

Resolution No.	Item No.	Item	Hawai'i County Code - Chapter, Article, Division	Hawai'i County Code - Section	Preemption Granted	Notes:	
					While lot lines within the Project shall generally run perpendicular to the street that the lot abuts, there will [be] variation to the angle of the lot line to the street to accommodate irregular shaped lots and to maximize the lot layout in relation to the site topography.		
416-07	2.4	Application fees for subdivision plans	Ch. 23 (Subdivision), Art. 4, Div. 1	Section 23-60	Waiving the requirements of Section 23-60 for payment of filing fees for Project subdivisions. In the interest of minimizing the cost to the developer, Waikoloa Workforce Housing, in providing affordable housing, filing fees for Project subdivision applications will not be required for the Project.	Amends Resolution 439-06, Item No. 2.9	
416-07	2.5	No conveyance of land prior to approval for recordation	Ch. 23 (Subdivision), Art. 5	Section 23-76	Waiving the requirements of Section 23-76 that states that "(l)and shall not be offered for sale, lease or rent in any subdivision, nor shall options or agreements for the purchase, sale leasing or rental of the land be made until approval for recordation of the final plat is granted by the director." In order to assure the greatest exposure possible to the intended workforce market, the developer, Waikoloa Workforce Housing, LLC, (WWH) intends to utilize many forms of advertisement, including, but not limited to, the use of the internet, publications, mailings, public announcements, or publicizing through other agencies and organizations with common goals; any one of which could be construed as an offering for sale, lease or rent. A waiver from the requirements of Chapter Section 23-76 is needed to provide WWH with greater latitude to more immediately market and test consumer interest in the proposed leasehold product prior to receipt of final subdivision approval.		
416-07	2.6	(Requirements for Bonding)	Ch. 23 (Subdivision), Art. 6, Div. 1	Sections 23-81, 82, and 83	Waiving the requirements of Sections 23-81, 82, and 83 to either complete subdivision improvements or provide a bond and agreement with the County as a condition of final subdivision approval and offering of sale. The Project infrastructure will be financed with the County by means of a Community Facilities District (CFD) bond and/or County funding, as approved by the County Council. The approval of the CFD Bond or County funding by the County Council insures that adequate funding will in place for the construction of all subdivision related infrastructure, therefore, a bond and agreement for the completion of the required improvements and utilities shall not be a requirement of final subdivision approval and offering of sale.	Amends Resolution 439-06, Item No. 2.10	
416-07	2.7	Inspection by director of public works and [manager]	Ch. 23 (Subdivision), Art. 7	Sections 23-96	Waiving the requirements of Section 23-96 pertaining to inspection by Director of Public Works and [Manager]. Inspection will be conducted by the director of public works and manager or by Project inspectors approved by the Director of Public Works and [Manager].	Amends Resolution 439-06, Item No. 2.12	
416-07	2.8	Inspection fee	Ch. 23 (Subdivision), Art. 7	Sections 23-97	Waiving the requirement for inspection fee for inspections of subdivision improvements. In the interest of minimizing the cost to the developer, Waikoloa Workforce Housing, in providing affordable housing, inspection fees will not [be] required for Project related grading permit applications.	Amends Resolution 439-06, Item No. 2.13	
416-07	3.0	GRADING AND DRAINAGE					
416-07	3.1	Fees	Ch. 10 (Erosion and Sedimentation Control), Art. 2	Section 10-11	Waiving the requirement for grading permit fees. In the interest of minimizing the cost to the developer, Waikoloa Workforce Housing, in providing affordable housing, grading permit fees will not [be] required for Project related grading permit applications.	Amends Resolution 439-06, Item No. 1.1	
416-07	3.2	Conditions of Permit	Ch. 10 (Erosion and Sedimentation Control), Art. 3	Section 10-18 (a) (1), (2), and (3)	Waiving the requirements of Section 10-18 (a) pertaining to the cut and fill heights and slopes. Cut and fill heights and slopes for grading within the Project will be determined by the Project's licensed geotechnical engineer.	Amends Resolution 439-06, Item No. 1.2	

Resolution No.	Item No.	Item	Hawai'i County Code - Chapter, Article, Division	Hawai'i County Code - Section	Preemption Granted	Notes:	
416-07	3.3	Distance from property line for cut or fill slopes	Ch. 10 (Erosion and Sedimentation Control), Art. 3	Section 10-19	Waiving the requirements of Section 10-19 pertaining to the distance from the property line for cut or fill slopes. Distances to the property line for cut or fill slopes within the Project will be determined by the Project's licensed geotechnical engineer.	Amends Resolution 439-06, Item No. 1.3	
416-07	3.4	Maximum cleared area	Ch. 10 (Erosion and Sedimentation Control), Art. 3	Section 10-20	Waiving the requirements of Section 10-20 (HCC) that limits the maximum area to be cleared to twenty acres. Erosion and sedimentation controls will be per a Department of Public Works approved Erosion and Sedimentation Control Plan for the Project or each subdivision increment of the Project.	Amends Resolution 439-06, Item No. 1.4	
416-07	4.0	ROADS AND PEDESTRIAN WAYS					
416-07	4.1	Pedestrian ways	Ch. 23 (Subdivision), Art. 3, Div. 2	Section 23-31	Waiving the requirement that, for any block over seven hundred fifty feet in length, the director may require creation of a pedestrian way to be constructed to conform to standards adopted by the Department of Public Works. Sidewalks will be incorporated with roadway designs that will conform to construction plans approved by the Department of Public Works.	Amends Resolution 439-06, Item No. 2.4	
416-07	4.2	Minimum right-of-way and pavement widths	Ch. 23 (Subdivision), Art. 3, Div. 4	Section 23-41	Waiving the requirements of Section 23-41 for minimum right-of-way and pavement widths. Rights-of-ways and pavement widths will be in accordance with construction plans approved by the County Department of Public Works. Plans and dimensions for typical Project roadways are shown on the attached Exhibits B-1 to B-5, Waikoloa Housing Typical Road Sections.	Amends Resolution 439-06, Item No. 2.7	
416-07	4.3	Cul-de-sacs	Ch. 23 (Subdivision), Art. 3, Div. 4	Section 23-48 (a)	Waiving the requirements of Section 23-48 (a), which states: "(a) A cul-de-sac shall be as short as possible and shall not be more than six hundred feet in length nor serve more than eighteen lots: provided that longer streets may be approved by the director when unusual conditions exist." Due to the relative smaller lot sizes and topographic constraints of the site, the maximum number of lots on a cul-de-sac will be twenty-six (26) lots and the maximum length of a cul-de-sac will be eight hundred (800) feet.	Amends Resolution 439-06, Item No. 2.8	
416-07	4.4	Alleys	Ch. 23 (Subdivision), Art. 3, Div. 4	Section 23-52	Waiving the requirements of Section 23-52 that requires that "(a)t the street and alley intersections, ten feet corner radii shall be required. The requirements for alleys shall be in accordance with construction plans approved by the County Department of Public Works. Plans and dimensions for typical Project roadways, including alleys, are shown on the attached Exhibits B1 to BS, Waikoloa Housing Typical Road Sections.		
416-07	4.5	Private streets	Ch. 23 (Subdivision), Art. 3, Div. 4	Section 23-53	Waiving the requirement of Section 23-53 that states; "No private street or alley shall be approved unless they are improved as specified under article 6, division 2 of this chapter. The requirements for private streets within the Project shall be in accordance with construction plans approved by the County Department of Public Works. Plans and dimensions for typical Project roadways are shown on the attached Exhibits B1 to BS, Waikoloa Housing Typical Road Sections.		
416-07	4.6	Improvements Required	Ch. 23 (Subdivision), Art. 6, Div. 2	Section 23-86 – Requirements for dedicable streets; Section 23-89 – Sidewalks;	Waiving the requirements of the above sections which state that dedicable streets be designed in accordance with "specifications on file with the department of public works."	Amends Resolution 439-06, Item No. 2.11	

Resolution No.	Item No.	Item	Hawai'i County Code - Chapter, Article, Division	Hawai'i County Code - Section	Preemption Granted	Notes:
				Section 23-90 – Pedestrian way; Section 23-91 – Curbs and gutters; Section 23-93 – Street lights; Section 23-94 – Street name and traffic signs Section 23-95 – Right-of-way improvement	Dedicable streets will be designed in accordance with construction plans approved by the County Department of Public Works. Plans and dimensions for typical Project roads are shown on the attached Exhibits B1 to BS, Waikoloa Housing Typical Road Sections.	
416-07	5.0	BUILDINGS				
416-07	5.1	License Fees	Ch. 26 (Fire)	Section 26-17	Waiving the requirements of section 26-17 requiring licensing fees for the testing and inspection of fire extinguishing systems and portable fire extinguishers. In the interest of minimizing the cost to the developer, Waikoloa Workforce Housing, in providing affordable housing, licensing fees will not [be] required for the testing and inspection of fire extinguishing systems and portable fire extinguishers within the Project.	
416-07	5.2	Conditions for construction of buildings designed for human occupancy	Ch. 25 (Zoning), Art. 4, Div. 1	Section 25-4-2	Waiving the requirements of Section 25-4-2 which states: (a) "On any building site, no building designed or intended for human occupancy shall be constructed and no permit therefore shall be issued unless: (1) the building site is served by a County water system or privately owned and operated water system, or other private, individual means of providing water to the building site is demonstrated; and (2) a wastewater treatment system for the proposed building has been approved by the State department of health. (b) On any building site in any subdivision approved by the director under chapter 23 of this code, no building designed or intended for human occupancy shall be constructed and no permit issued therefore until either: (1) The streets, drainage improvements, water supply system, if any, and sewage disposal system, if any, have been constructed, inspected and approved by the appropriate County agencies; or (2) Final subdivision approval has been secured by the subdivider in accordance with chapter 23, by posting a surety bond or other security guaranteeing the construction of all of the subdivision improvements as shown on approved construction drawings and specifications, provided that final occupancy of any dwelling unit shall not be granted until the subdivision improvements for the particular increment in which such dwelling unit is situated have been constructed, inspected and approved by the appropriate County agencies." Construction of the Project water, streets, drainage improvements, and sewage disposal system will be constructed concurrent with the building construction. Therefore, building permits shall be issued prior to such systems having been inspected and approved by the appropriate County agencies. Provided, however, final occupancy of any dwelling unit shall not be granted until the subdivision improvements for the particular increment in which such dwelling unit is situated have been constructed, inspected, and approved by the	Amends Resolution 439-06, Item No. 3.3

Resolution No.	Item No.	Item	Hawai'i County Code - Chapter, Article, Division	Hawai'i County Code - Section	Preemption Granted	Notes:	
					<p>appropriate County agencies; and a wastewater treatment system for the proposed building has been approved by the State department of health.</p> <p>Additionally, as detailed above pertaining to Sections 23-81 through 83 (Item 2.6), posting of a surety bond or other security will not be required as a condition of final subdivision approval for the Waikoloa Employee Housing Project. The Project infrastructure will be financed with the County by means of a Community Facilities District (CFD) or other County financing approved by the County Council. The approval of the CFD or other County financing by the County Council will insure that adequate funding is in place for the construction of the required subdivision related infrastructure. Final subdivision approval, however, shall not be issued prior Council approval of the CFD Bond financing or other County funding for the construction of the subdivision related infrastructure of the corresponding subdivision increment.</p>		
416-07	6.0	SALES – PREEMPTIONS FROM STATE STATUTES					
416-07	6.1	Uniform Land Sales Practices Act	Ch. 484, HRS		<p>Waiving the registration requirements of Chapter 484, Hawaii Revised Statutes (HRS) that provides that land "(n)o person may offer or dispose of any interest in subdivided lands located in this State before a preliminary or final order registering the subdivided land is entered."</p> <p>In order to assure the greatest exposure possible to the intended workforce market, the developer, Waikoloa Workforce Housing, LLC, may utilize many forms of advertisement, including, but not limited to, the use of the internet, publications, mailings, public announcements, or publicizing through other agencies and organizations with common goals; any one of which could be construed as an offering for sale, lease or rent. A waiver from the registration requirements of Chapter 484 is needed to provide WWH with greater latitude to more immediately market and test consumer interest in the proposed leasehold product prior to the final order registering the subdivision with the State.</p>		
416-07	6.2	Condominium Registration	Ch. 515B, HRS		<p>Waiving the requirements of Chapter 515B, Hawaii Revised Statutes pertaining to condominium registration.</p> <p>While there will be no condominium development within the Project, there may be some concern that the for-sale town home product may be construed as a condominium property regime as it is similar to other condominium developments in its configuration. The town home product is unique as attached for-sale product, as each unit will stand on and be physically connected to its own subdivided parcel that will be made available to the buyer through a long term lease agreement. The waiver from the requirements of Chapter 515B is required to remove any possible condition whereby the requirements of condominium registration would apply to the sale of the town home product.</p>		
416-07	6.3	Real Estate Brokers and Salespersons	Ch. 467, HRS		<p>Waiving the requirements of Chapter 467, Hawaii Revised Statutes, pertaining to the licensing requirements for brokers and sales persons.</p> <p>The Waikoloa Workforce Housing Project will be unique in that, in an effort to maintain the affordability of the homes and avoid large brokerage fees, the Project plans to use its own sales staff. A waiver from the requirements of Chapter 467 is needed to provide greater flexibility in the hiring of sales staff and to help curtail the cost of maintaining an in-house sales staff.</p>		
353-14	1.13	Minimum yards	Ch. 25 (Zoning), Art. 5, Div. 1	Section 25-5-7	<p>Waiving the requirements of Section 25-5-7 pertaining to minimum yards.</p> <p>The minimum yards in the Waikoloa Employee Housing Project shall be eight (8) feet for front and rear yards and five (5) feet for side yards, except for town home units, which shall have no side yard requirements. <u>building sites gaining access from an alley, in which case the minimum yards shall be five (5) feet for the front yard facing the</u></p>	Amends Resolution 416-07, Item No. 1.13	

Resolution No.	Item No.	Item	Hawai'i County Code - Chapter, Article, Division	Hawai'i County Code - Section	Preemption Granted	Notes:
					alley, ten (10) feet for the front yard facing the street, and five (5) feet for side yards. Town home units shall have no side yard requirements.	

APPENDIX C

Kamakoa Gulch Flood Determination Study

Kamakoia Gulch Flood Determination Study



September
2022

Draft Report

Prepared for:

County of Hawai'i and
PBR Hawaii & Associates, Inc.

Prepared by:



In association with:



Kamakoa Gulch Flood Determination Study

Study Report

September 2022

Prepared for

County of Hawai'i
&
PBR Hawaii & Associates, Inc.

In association with

Sam O. Hirota, Inc.

Prepared by

River Focus, Inc.
www.riverfocus.com

A. Jake Gusman, P.E.
Project Manager



This work was prepared by me or under my supervision.


Signature

April 30, 2024

Expiration Date

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Appendices

Appendix A. HEC-SSP Flood-Frequency Results and Input Data

1 INTRODUCTION

1.1 Study Purpose and Location

River Focus performed a detailed flood study—including hydrology, hydraulic modeling, and floodplain mapping—for existing conditions of the project site (Site) (TMK: 6-8-041: 001 through 011), located adjacent to Kamakoa Gulch on the Island of Hawai'i. There are two tributary streams makai of Paniolo Avenue as shown in Figure 1-1. Historically, the tributaries flowed through the project site; however, the construction of Paniolo Avenue and upstream development appears to have diverted most of the flow around the Site to Kamakoa Gulch.

The purpose of this analysis is to support the master planning being performed by PBR Hawaii & Associates for the County of Hawai'i. Hydrologic and hydraulic analyses were performed to determine the 100-year (1-percent annual exceedance probability, AEP) peak flow for Kamakoa Gulch and to define the 100-year flood boundary under existing site conditions. River Focus, Inc. performed this study in association with Sam O. Hirota, Inc. (SOH) at the request PBR Hawaii & Associates and the County of Hawai'i. Kamakoa Gulch is the major watercourse that flows through project site with two previously identified tributaries running through the center and south portions of the project site.

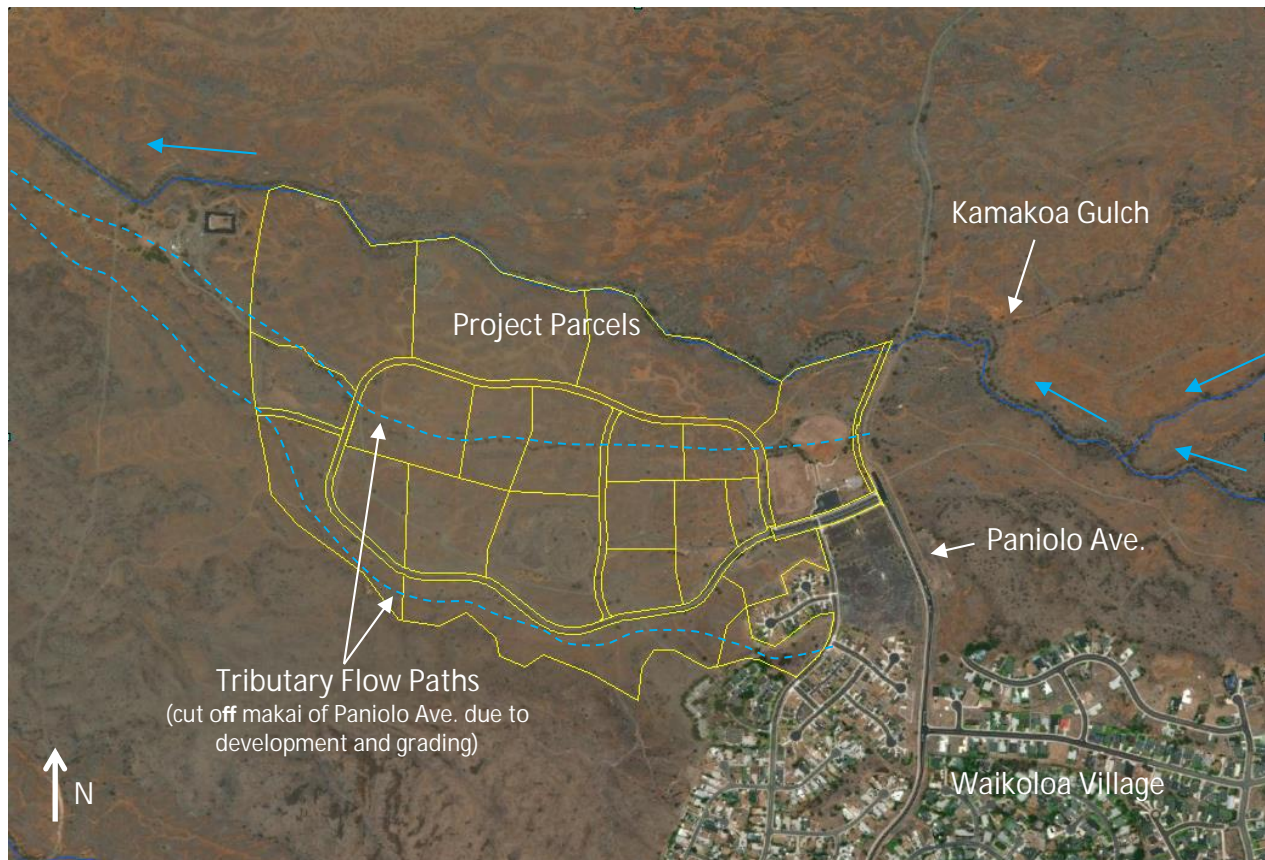


Figure 1-1. Project Location

1.2 Data Collection

Data used for this study was obtained from the Federal Emergency Management Agency (FEMA), National Oceanic and Atmospheric Administration (NOAA), U.S. Geological Survey (USGS), Natural Resources Conservation Service (NRCS), and Sam O. Hirota, Inc.

River Focus personnel conducted a detailed field reconnaissance visit on March 30, 2022, to evaluate hydrologic and hydraulic model parameters and expected flow patterns.

1.3 FEMA Mapping

As shown in Figure 1-2, the Site is located in an area where FEMA has not published a Flood Insurance Rate Map (FIRM) because neither an approximate nor detailed flood study has been performed for the study area.



Figure 1-2. FEMA Flood Insurance Rate Map

2 HYDROLOGIC ANALYSIS

The drainage basin for the Site was delineated for Kamakoa Gulch as well as for the tributary flow just south of Kamakoa Gulch. The 1% annual chance exceedance (100-year) flow was then computed for both contributing areas using the County of Hawai'i drainage design curves, USGS regression equations, and a flood frequency analysis based on an upstream USGS stream gage.

Data from the USGS streamflow gage, located approximately eight miles upstream of the Site on Kamakoa Gulch (USGS #16759060), was used to perform a Bulletin 17C flood-frequency analysis (England et al. 2019) using HEC-SSP (Statistical Software Package). Standard USGS basin transfer equations were then used to determine the 100-year peak flow at the Site based on the computed peak flow at the USGS gage. The computed 100-year peak flow, based on the flood-frequency analysis, was compared with the design curve and regional regression at the gage location to validate the computed flows at the Site.

The computed peak discharges and hydrographs, developed as part of the hydrology analysis, were then used for the hydraulic modeling described in Section 3.

2.1 Watershed Summary

The Kamakoa Gulch watershed, a basin of approximately 90 square miles, at the Site, is located in the South Kohala district of Hawai'i (Figure 2-1). The watershed stretches from Mauna Kea down towards Puako Bay.

The watershed is mostly barren land with sparse shrubs and scrubs. About two percent of the watershed area is developed. The mauka boundary of the watershed has an elevation of over 13,000 feet while the makai boundary of the watershed has an elevation of 500 feet. Mean annual precipitation for the watershed contributing to the Site is 18.3 inches (USGS StreamStats, 2022).

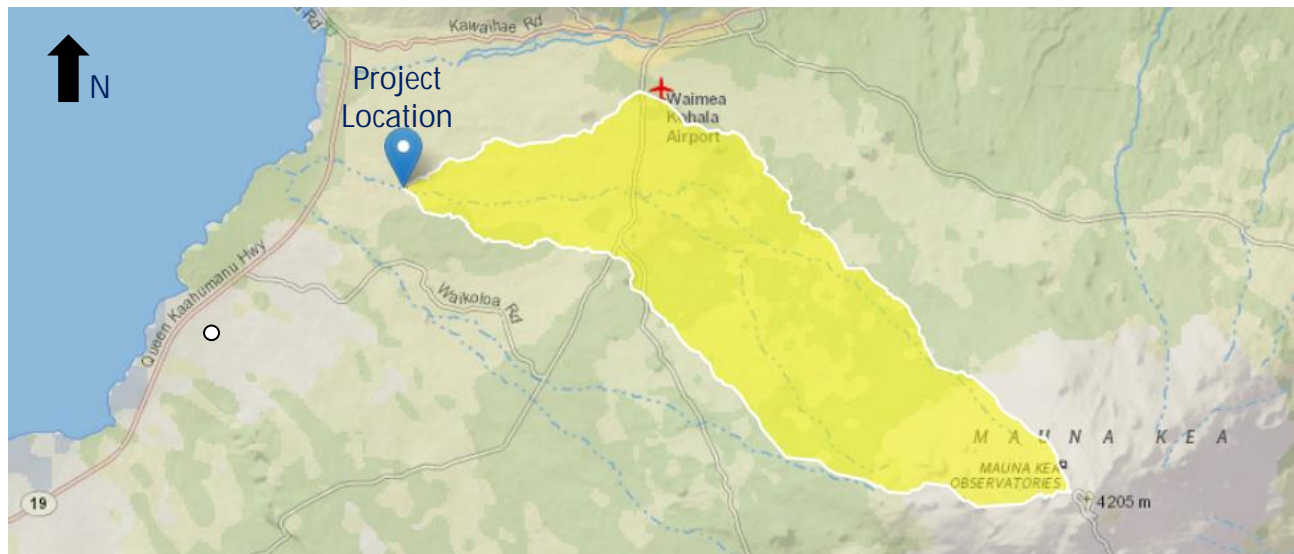


Figure 2-1. Watershed Boundary and Project Location (USGS StreamStats, 2022)

2.2 Flood-Frequency Analysis

The USGS stream gage #16759060, located on Kamakoa Gulch, was used to complete a flood-frequency analysis. The gage is located approximately 8 miles mauka of the Site and includes 40 years of peak flow data. USGS stream gage characteristics are summarized in Table 2-1.

Table 2-1. USGS Streamgage Data

USGS Gage #	Stream gage Location	Drainage Area (mi ²)	Years of Record
16759060	Kamakoa Gulch near Waimea, HI	49.5	40

Source: USGS Pacific Islands Water Science Center (<http://hi.water.usgs.gov/>)

River Focus performed a statistical analysis of annual peak flows using the U.S. Army Corps of Engineers' HEC-SSP (Statistical Software Package) software (HEC-SSP, 2019). The HEC-SSP analysis was based on the standard Bulletin 17C methodology (Interagency Advisory Committee on Water Data, 1982). The analysis used 40 years of annual peak discharge data from the Kamakoa Gulch stream gage #16759060. HEC-SSP input data and results are provided in Appendix A.

The standard USGS equation (given below) for transferring gaged flows to an ungaged basin was used to transfer the Bulletin 17C analysis results of stream gage #16759060 to the ungaged Site.

$$Q_u = Q_g * (A_u/A_g)^b * (P_u/P_g)^c$$

where:

Q_u is the ungaged peak discharge (cfs)

Q_g is the gaged peak discharge (cfs)

A_u is the ungaged watershed area (mi²)

A_g is the gaged watershed area (mi²)

P_u is the ungaged mean annual precipitation (in)

P_g is the gaged mean annual precipitation (in)

b is the drainage area coefficient

c is the precipitation coefficient

The drainage area coefficient " b " and coefficient " c " are based on the regional regression equation coefficients for Region 9 Hawai'i (Northern) (USGS 2010). For the 100-year peak discharge coefficient b equals 0.788 and c is equal to 0.845.

Shown in Figure 2-2 below are the watersheds delineated at the Site and at the stream gage #16759060 location. The watershed draining to the stream gage is 49.5 square miles, while the drainage area for the Site is 90 square miles. The resulting 1% annual chance exceedance (100-year) peak flow at the Site is 6,700 cubic feet per second (cfs).

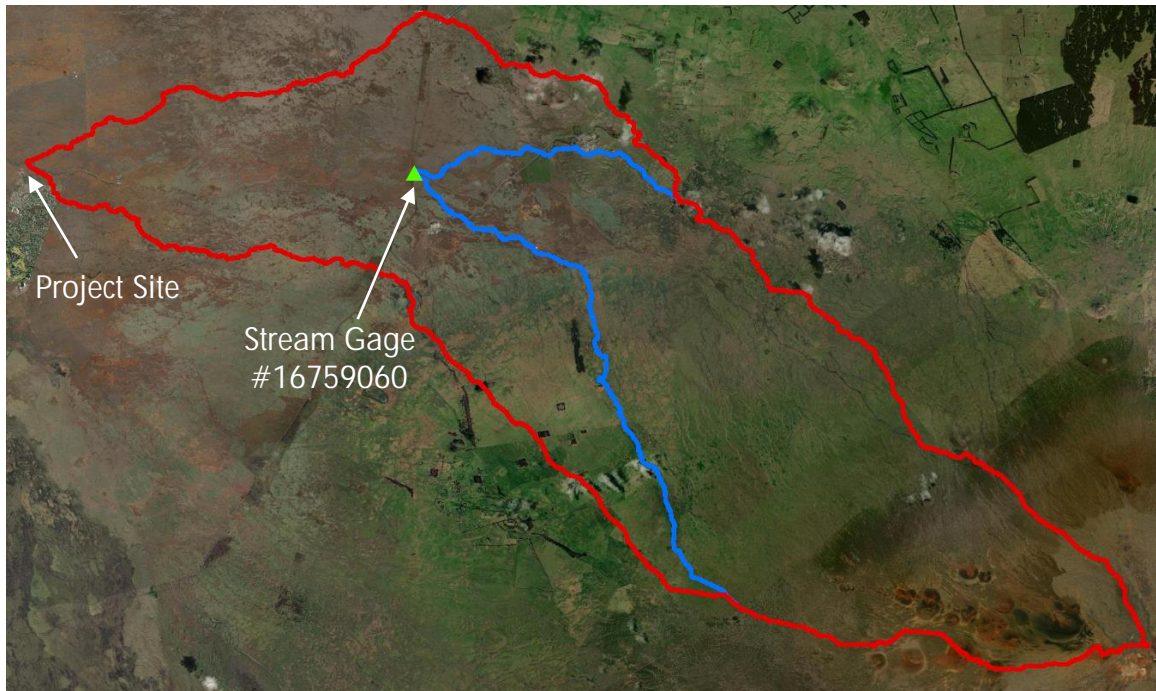


Figure 2-2. Watersheds delineated at Project Site and at Stream Gage #16759060

2.3 Regional Regression Flows

Peak flows for the proposed project area were also estimated using StreamStats based on USGS regression equations for Region 9 (Hawai'i Northern) (USGS 2010). The regression equation used in the StreamStats online program for determining for the 100-year peak discharge is given below. The 1% annual chance exceedance peak flow was determined to be 14,200 cfs based on a drainage area of 90 square-miles.

$$Q_{100} = 36.3 * (\text{Drainage Area}^{0.788}) * (\text{Precipitation}^{0.845})$$

2.4 Hawai'i County Design Flow

For comparison, the Hawai'i County Storm Drainage Standard (1970) Plate 6 was also used to compute the 100-year peak discharge for the project area. The proposed project location is in Zone D and Zone A on Plate 6A (Figure 2-3).

As shown in Figure 2-4, 37% of drainage area, approximately 21,056 acres (32.9 sq. mi.) is in the Zone A runoff zone, resulting in a weighted 100-year peak discharge of 65,000 cfs; and 63% of the drainage area, approximately 36,301 acres (56.7 sq mi) in the Zone D runoff zone, resulting in a weighted 100-year peak discharge of 14,000 cfs. Based on the weighted average, a total 100-year peak discharge for the contributing watershed in a 32,870 cfs as summarized in Table 2-2.

Table 2-2. Hawai'i County Storm Drainage Standard, Plate 6 – 100-year Peak Flow

Zone	Area (sq. mile)	Area (acres)	Area %	Plate 6 Zone Flow (cfs)	% of Plate 6 Zone Flow (cfs)
Zone D	56.7	36,301	63	14,000	8,820
Zone A	32.9	21,056	37	65,000	24,050
Total Area:	89.6			Total Flow:	32,870

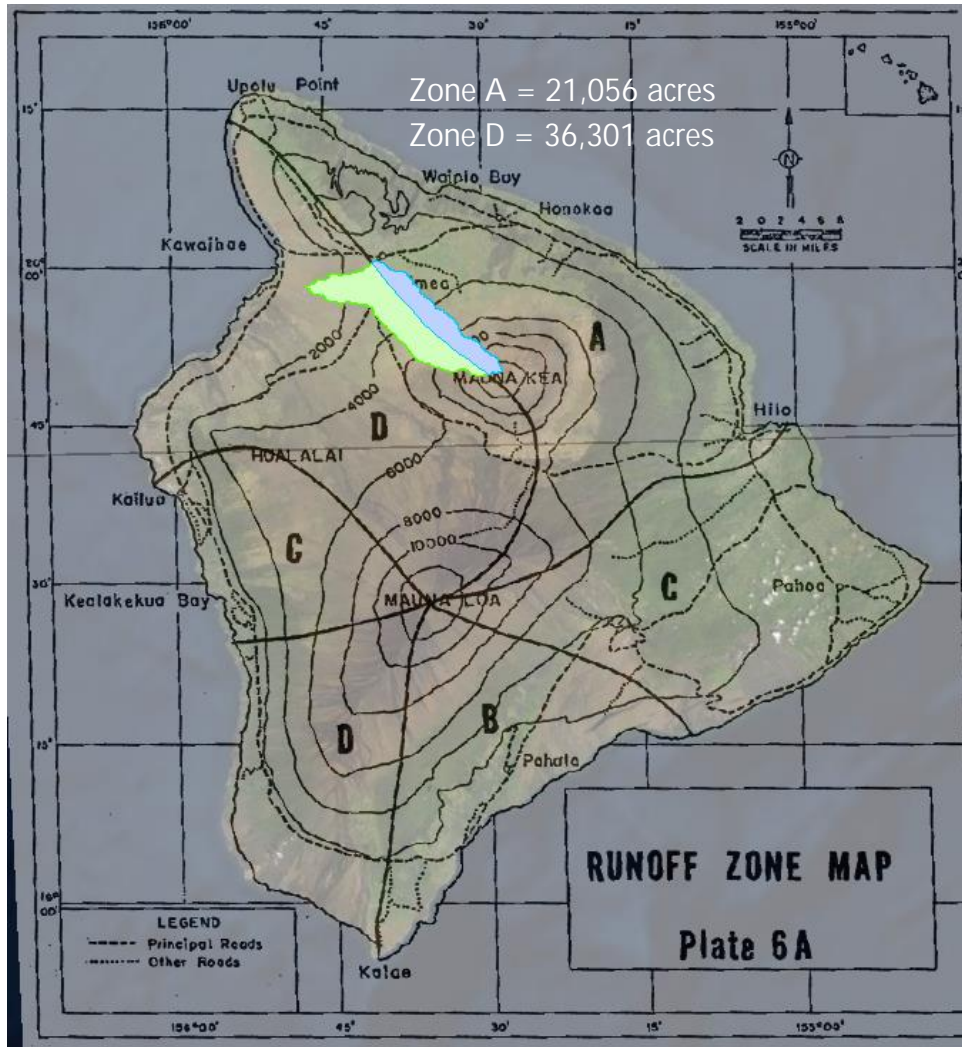


Figure 2-3. Kamakoa Gulch Project Watershed Runoff Zones based on Plate 6 (Hawai'i County, 1970)

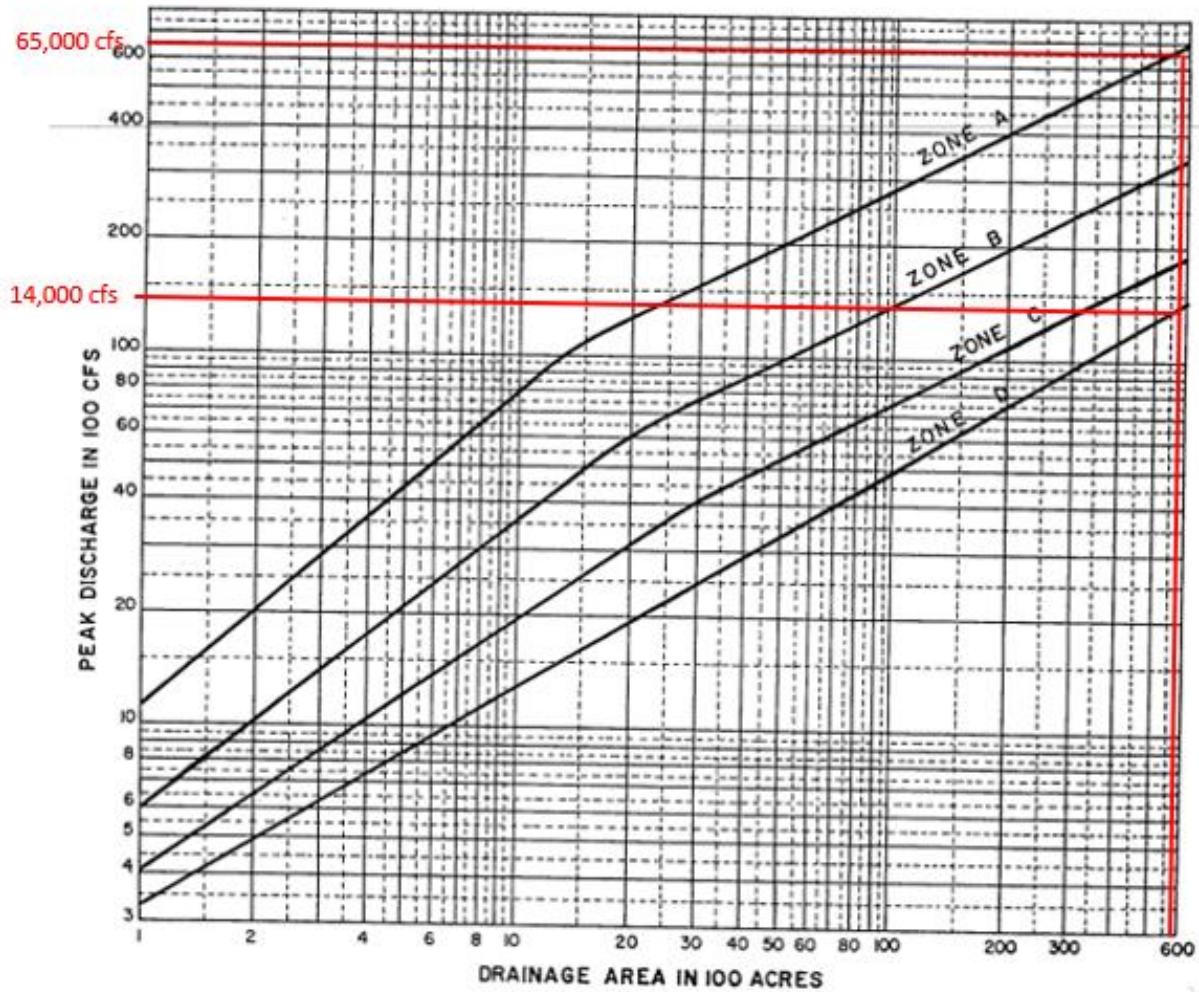
Plate 6



**DESIGN CURVE FOR
PEAK DISCHARGE
VS. DRAINAGE AREA
(more than 100 acres)**

CURVES ARE FOR STREAM CHANNELS
AND DRAINAGE STRUCTURES

APPROXIMATE 100 YEAR RECURRENCE
INTERVAL



Total Area: 57,600 acres
 Zone A area: 21,056 acres (37% of total)
 Zone D area: 36,301 acres (63% of total)

37% of 65,000 cfs = 24,050 cfs
 63% of 14,000 cfs = 8,820 cfs
 Total 100yr flow = 32,870 cfs

Figure 2-4. 100 Year Design Curve for Peak Discharge vs. Drainage Area (Hawai'i County, 1970)

2.5 Peak Flow Comparison

A comparison of the 100-year flows from the flood-frequency analysis, regional regression, and Plate 6 design curves is shown in Table 2-3. These results are for the Site drainage area (90 square miles).

According to FEMA guidance, a flood-frequency analysis of observed USGS streamgage data should be used if at least 10 years of data are available for the study stream (FEMA, 2019); in this case, 40 years of data are available. Regression equations would only apply if sufficient gage data were not available.

The peak flows computed using regional regression and Plate 6 (also based on regional regression) are much less reliable than flows from the streamgage analysis. The regional regression equations are largely based on historical data from gages not located in the South Kohala district, which means that these gages are in watersheds with very different rainfall-runoff characteristics than the study watershed. In addition, the highest recorded flow in 40 years at the USGS stream gage with basin transfer applied to the project watershed is only 2,720 cfs, which contrasts with the significantly overestimated flows from regional regression and Plate 6.

Based on these findings, the 6,700 cfs peak flow from the USGS streamgage analysis was selected for use in the hydraulic modeling and floodplain mapping.

Table 2-3. Peak Flow Comparison for the Project Watershed

Annual Chance Exceedance	Return Period (years)	USGS Streamgage Analysis Basin Transfer Flow (cfs)	Regional Regression Analysis Flow (cfs)	Plate 6 Zone A & D Design Flow (cfs)
1%	100	6,700 cfs (used for study)	14,200	32,870

2.6 Tributary Inflow Discussion

As mentioned previously, there are two tributary channels that run through the project site which appear to have been either completely cut off or diverted to Kamakoa Gulch based on local development and the construction of Paniolo Ave (Figure 1-1).

Based on information collected during the field reconnaissance visit, topography, grading plans for the upstream development, and aerial imagery, it appears that the tributary flow on the south side of the project site has been completely cut off. The grading plans for the upstream development, with earthwork that was taking place during the field reconnaissance—it appears that the small contributing area for the tributary that used to flow through the central portion of the project site will be blocked at Paniolo Avenue and captured in a detention basin (see Figure 2-5). For this reason, no inflow was calculated or input into the hydraulic model for these tributaries.

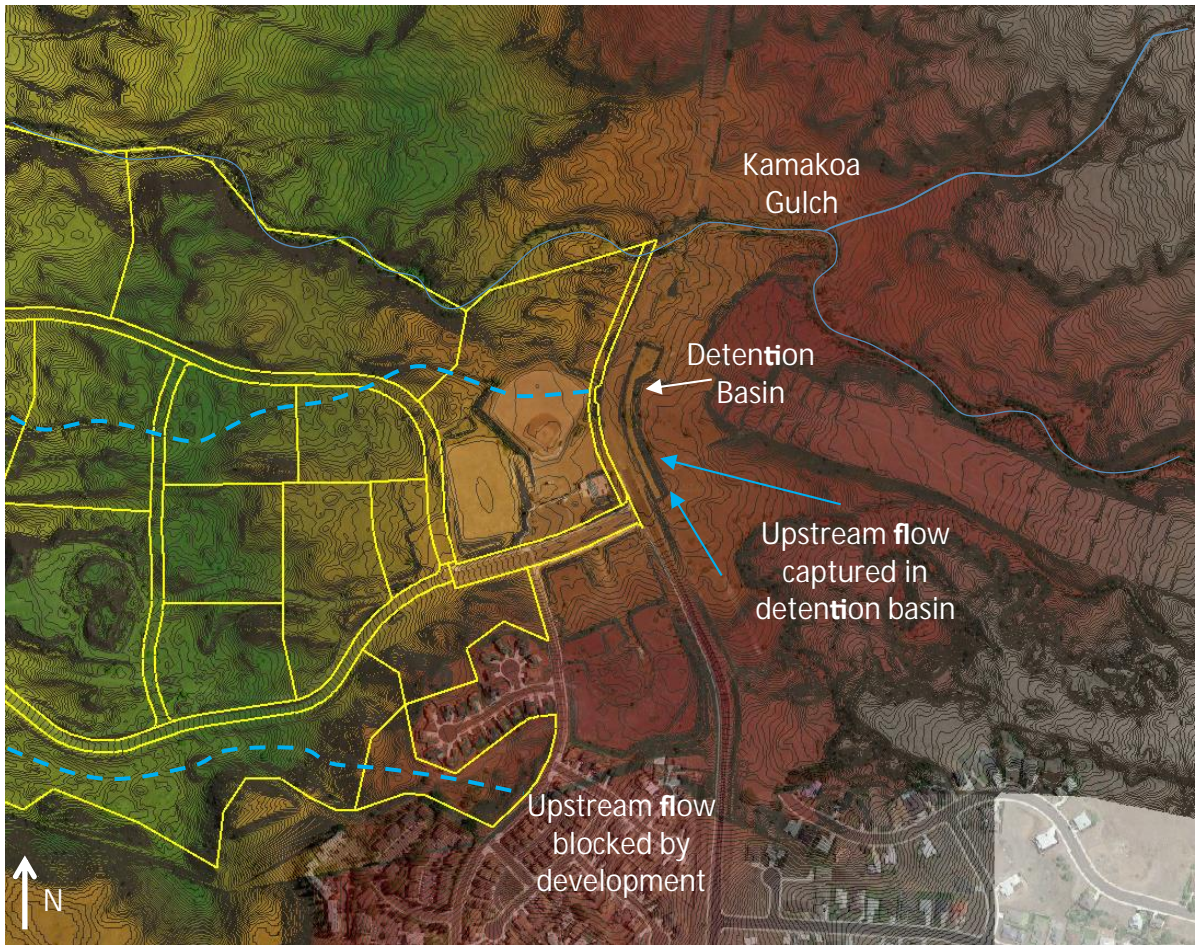


Figure 2-5. Tributary Inflow and Detention Basin Location

3 HEC-RAS HYDRAULIC MODELING

Hydraulic modeling was performed using HEC-RAS (River Analysis System), Version 6.2 (HEC, 2022). A two-dimensional (2-D) hydraulic model was used to compute flood inundation boundaries and water surface profiles for the 100-year flood within the study area. This section describes the HEC-RAS model development.

3.1 Hydraulic Model Development (2-D)

3.1.1 2-D Model Mesh

The 2-D model mesh that encompasses the study area was defined with an average grid cell size of 25 ft x 25 ft (Figure 3-1). Breaklines and refinement regions were drawn, as needed, to increase model definition and to align mesh faces along high ground, using smaller sized grid cells as small as 10 ft x 10 ft.

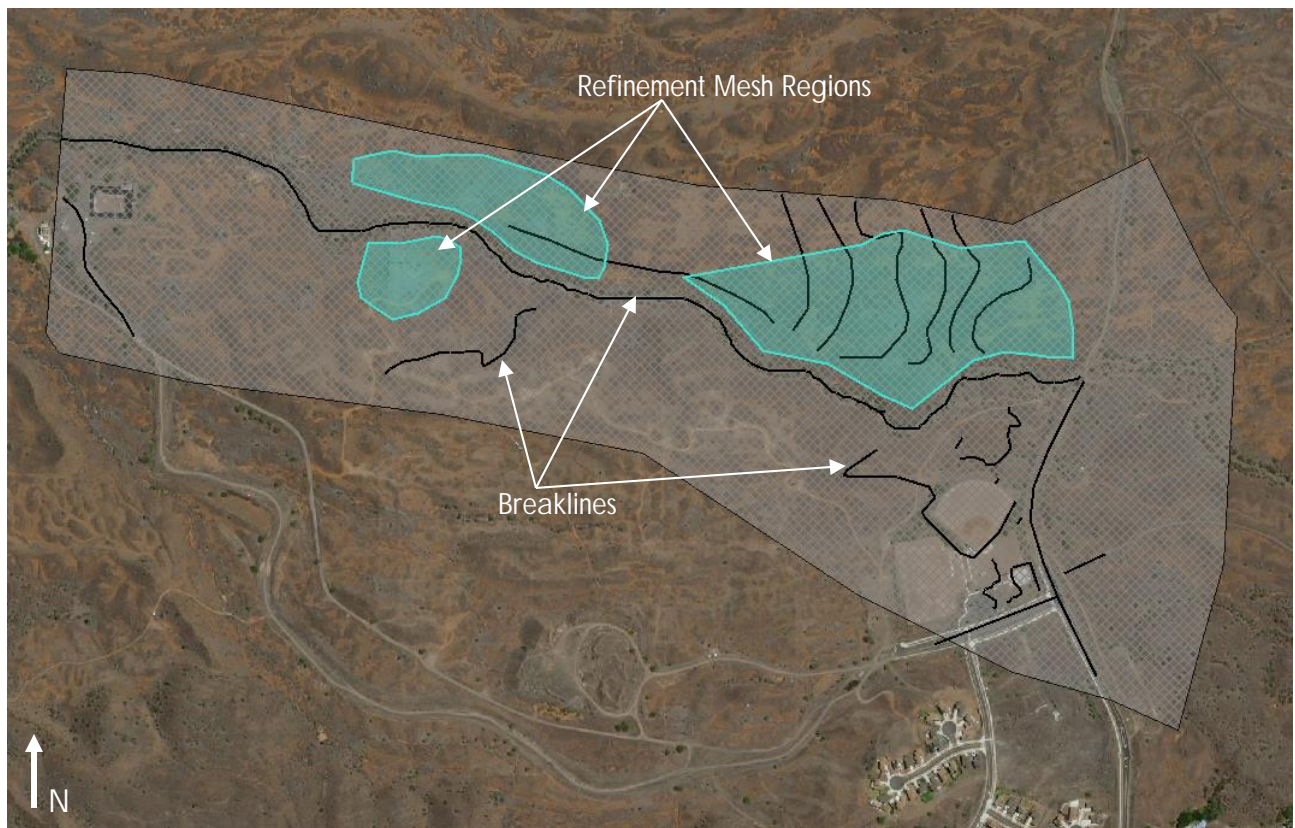


Figure 3-1. HEC-RAS Model Mesh

3.1.2 Boundary Conditions

The 2-D mesh includes one external outflow boundary, set to a normal depth condition with a slope of 0.06. For Kamakoa Gulch and the tributary inflow hydrographs, two internal upstream boundary conditions drawn into the 2-D mesh. The 100-year flood event hydrographs were obtained from the hydrology analysis as described in Section 2.2. The locations of the boundary conditions are shown in Figure 3-2.



Figure 3-2. HEC-RAS Model Boundary Conditions

3.1.3 Model Terrain

The 2-D model terrain was developed from project site LiDAR data that was collected by NV5 Geospatial on March 5–6, 2022, and 1/9 arc-second (approximately 3-meter resolution) DEM (digital elevation model) obtained from NOAA. The two data sets were combined with the NV5 Geospatial data taking priority over the coarser resolution NOAA data. The mosaicked DEM corresponds to the mean sea level vertical datum in feet and the horizontal projection is Hawai'i State Plane 1, North American Datum of 1983, U.S. feet.

3.1.4 Manning's Roughness

The channel and overbank roughness (Manning's n) values used in the hydraulic simulations are described in Table 3-1. The selected n values were based on field observations, standard engineering references (e.g., Chow, 1959), a USDA Forest Service study of high-gradient streams (Yochum et al., 2014), the County of Hawai'i Storm Drainage Standards, and engineering judgment. Yochum et al. (2014) found that Manning's n values for high-gradient streams were significantly higher than values that were traditionally used for modeling.

A Manning's n of 0.035 was selected for Kamakoa Gulch and the tributary. The channels consist of sparse areas of volcanic rock, some stones and pebbles with sand and light grass as shown in Figure 3-3. This value was adopted from the County of Hawai'i Storm Drainage Standards (County of Hawai'i, 1970) for unlined channels with smooth and uniform rock. For the overbanks, a range between 0.030 (barren land) to 0.150 (evergreen forest) were used. The channel banks were lined with trees, grass, brush, and some rock as shown in Figure 3-4.

Table 3-1. Manning's Roughness Values

Manning's n Value	Description / Notes
Channel	
0.035	Stream Channel (unlined channel with smooth & uniform rock)
Overbanks	
0.030	Barren Land
0.035	Developed, Open Space
0.150	Developed, High Intensity
0.035	Open Water
0.040	Grassland/Herbaceous
0.045	Pasture/Hay
0.080	Scrub/Shrub
0.150	Evergreen Forest



Figure 3-3. Kamakoa Gulch looking downstream



Figure 3-4. Kamakoa Gulch channel and overbanks - looking downstream

4 HEC-RAS MODEL RESULTS

The HEC-RAS hydraulic model was run to determine the existing floodplain limits and water surface elevations (WSEs) for the 100-year flood event.

4.1 100-year Existing Conditions Model Results

4.1.1 Maximum Water Surface Elevations (WSEs) and Floodplain Limits

The maximum 100-year WSEs range from 541 to 772 feet within the main channel of Kamakoa Gulch with an average WSE of 642 feet. Tributary flow was primarily blocked at Paniolo Avenue and will routed to a detention basin as well as diverted towards the main reach of Kamakoa Gulch. The 100-year floodplain limits and WSEs for existing conditions are shown in Figure 4-1.

Note: Unedited floodplain shown

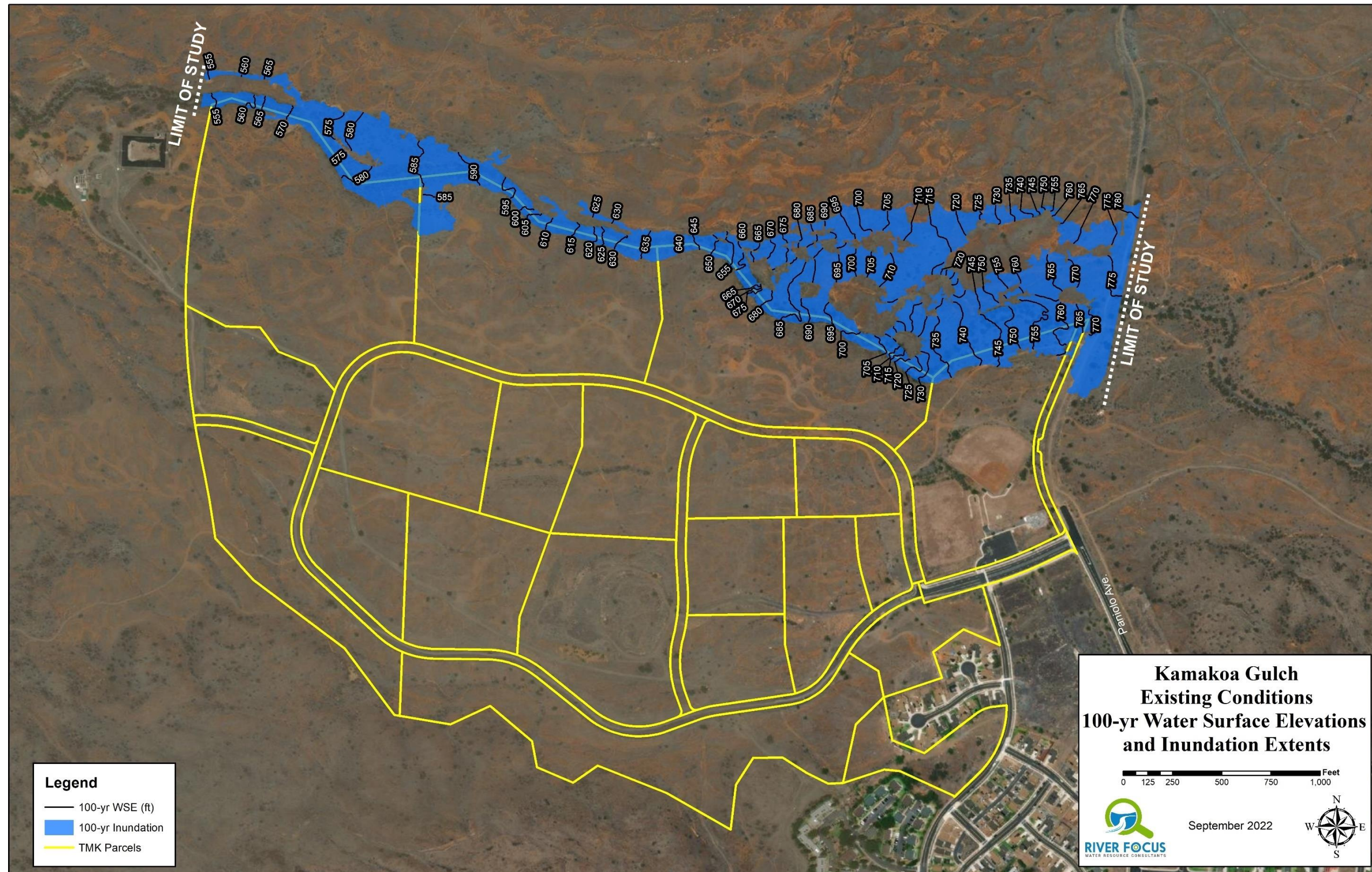


Figure 4-1. Kamakoa Gulch 100-yr Water Surface Elevations and Flood Inundation Extents

5 SUMMARY AND CONCLUSION

The hydrology used in this analysis was developed based on USGS stream gage data for the Kamakoa Gulch near Waimea, Hawai'i gage (#16759060), which includes 40 years of annual peak flow data. The standard USGS equation used for transferring gaged flows to an ungaged basin was used to transfer the Bulletin 17C analysis results to the ungaged Site.

Tributary flow towards the middle of the study area is diverted towards Kamakoa Gulch along the mauka side of Paniolo Avenue or will be contained in a new detention basin. Inflow for the tributary flow in the southern portion of the study was not used in the hydraulic model because an analysis showed that flow from the tributary into the study area is negligible.

Using the HEC-RAS (River Analysis System), a two-dimensional (2-D) hydraulic model of the existing conditions was developed for the project area. WSEs were computed for the 100-year flood event, and flood inundation mapping for the study area was developed in support of planning for the proposed development.

6 REFERENCES

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7 ACKNOWLEDGMENTS

This study was performed by River Focus, Inc. in support of the master planning being performed by PBR Hawaii & Associates for the County of Hawai'i, in coordination with Steve Tomei, P.E., at Sam O. Hirota, Inc. The River Focus study team included Jake Gusman, P.E. (Project Manager), Darren Bertrand, CFM (Senior Hydraulic Modeler), Rumana Reaz Arifin, Ph.D. (Senior Water Resources Engineer), and Ye Bai (Hydraulic Engineer).

APPENDIX A

HEC-SSP Flood-Frequency Results and Input Data

USGS Gage 16759060 – Kamakoa Gulch nr Waimea, H

Bulletin 17 Editor - Kamakoa_Gulch_Gage_17C

Name: Kamakoa_Gulch_Gage_17C

Description: 16759060

Flow Data Set: Kamakoa Gulch-Waimea, HI-FLOW-ANNUAL PEAK

DSS File Name: P:\Sam O. Hirota\Kamakoa Master Planning\Hydrology\Kamakoa_Hawaii_HEC-SSPI\Kamakoa_Hawaii_HEC-SSPI\Kamakoa_Hawaii_HEC-SSPI\Kamakoa_Hawaii.dss

Report File: m O. Hirota\Kamakoa Master Planning\Hydrology\Kamakoa_Hawaii_HEC-SSPI\Kamakoa_Hawaii_HEC-SSPI\Kamakoa_Hawaii_HEC-SSPI\Bulletin17Results\Kamakoa_Gulch_Gage_17C\Kamakoa_Gulch_Gage_17C.rpt

General Options EMA Data Tabular Results

Frequency Curve for: Kamakoa Gulch-Waimea, HI-FLOW-ANNUAL PEAK

Percent Chance Exceedance	Computed Curve Flow in cfs	Variance Log (EMA)	Confidence Limits Flow in cfs	
			0.86	0.14
0.2	12517.8	0.32857	3571.8	67847.3
0.5	6946.3	0.21275	2511.6	26736.3
1.0	4300.6	0.14421	1853.3	12963.3
2.0	2564.0	0.09149	1308.2	6151.5
4.0	1454.7	0.05380	866.6	2839.7
10.0	615.3	0.02512	426.8	962.1
20.0	279.7	0.01705	201.3	393.8
50.0	65.1	0.01802	45.4	90.2
80.0	16.1	0.02364	9.7	22.5
90.0	8.0	0.03563	4.1	11.6
95.0	4.5	0.05800	2.0	7.2
99.0	1.6	0.15639	0.4	3.6

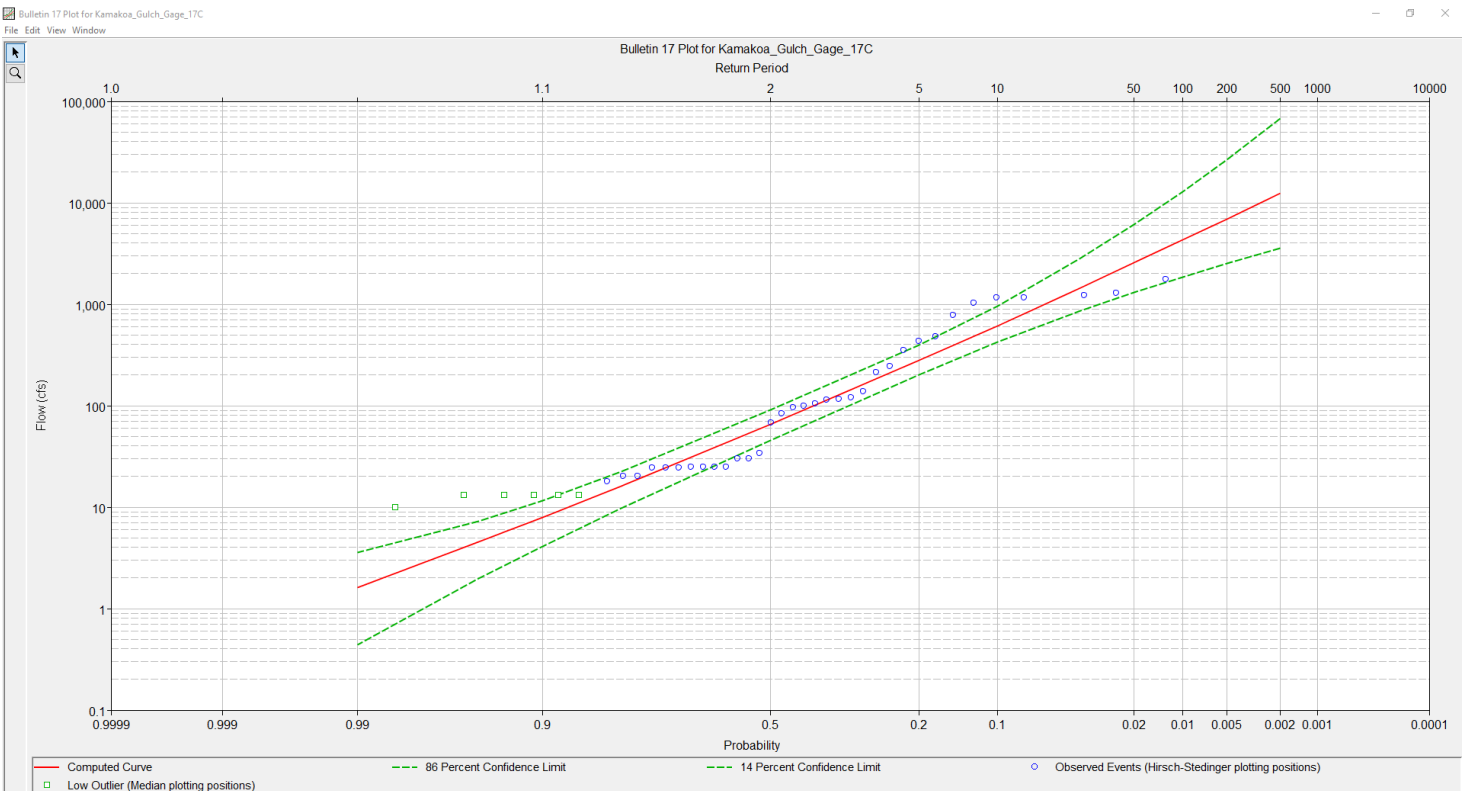
Distribution Parameters

Parameter	Value
Mean	1.833
Standard Dev	0.737
Station Skew	0.101
Regional Skew	0.160
Weighted Skew	0.160
Adopted Skew	0.160
EMA Estimate of MSE (G at-site)	0.224
Grubbs-Beck Critical Value	14.000

Events

Event	Number
Historic Events	0
High Outliers	
Low Outliers and Zero Flows	6
Missing Flows	19
Systematic Events	40
Historic Period	59
Equivalent Record Length (years)	34,000

Buttons: Compute Plot Curve View Report Print OK Cancel Apply



Bulletin 17C (Java) Frequency Analysis
29 Jul 2022 11:32 AM

--- Input Data ---

Analysis Name: Kamakoa_Gulch_Gage_17C
Description:

Data Set Name: Kamakoa Gulch-Waimea, HI-FLOW-ANNUAL PEAK
DSS File Name: C:\Users\YeBai\OneDrive - River Focus Inc\Desktop\Kamakoa Master
Planning\Hydrology\Kamakoa_Hawaii_HEC-SSP\Kamakoa_Hawaii_HEC-SSP\Kamakoa_Hawaii.dss
DSS Pathname: /Kamakoa Gulch/Waimea, HI/FLOW-ANNUAL PEAK/01jan1900/IR-CENTURY/USGS/

Report File Name: C:\Users\YeBai\OneDrive - River Focus Inc\Desktop\Kamakoa Master
Planning\Hydrology\Kamakoa_Hawaii_HEC-SSP\Kamakoa_Hawaii_HEC-SSP\Bulletin17Results\K
amakoa_Gulch_Gage_17C\Kamakoa_Gulch_Gage_17C.rpt
XML File Name: C:\Users\YeBai\OneDrive - River Focus Inc\Desktop\Kamakoa Master
Planning\Hydrology\Kamakoa_Hawaii_HEC-SSP\Kamakoa_Hawaii_HEC-SSP\Bulletin17Results\K
amakoa_Gulch_Gage_17C\Kamakoa_Gulch_Gage_17C.xml

Start Date:
End Date:

Skew Option: Use Regional Skew
Regional Skew: 0.16
Regional Skew MSE: 0.3

Plotting Position Type: Hirsch-Stedinger

Upper Confidence Level: 0.86
Lower Confidence Level: 0.14
Use Low Outlier Threshold
Low Outlier Threshold: 14.0

Use non-standard frequencies

Frequency: 0.2
Frequency: 0.5
Frequency: 1.0
Frequency: 2.0
Frequency: 4.0
Frequency: 10.0
Frequency: 20.0
Frequency: 50.0
Frequency: 80.0
Frequency: 90.0
Frequency: 95.0
Frequency: 99.0

Display ordinate values using 1 digits in fraction part of value

--- End of Input Data ---

<< EMA Representation of Data >>

Kamakoa Gulch-Waimea, HI-FLOW-ANNUAL PEAK

Year	Peak	Value		Threshold		Type
		Low	High	Low	High	
1963	1,290.0	1,290.0	1,290.0	14.0	1.0E99	Syst
1964	100.0	100.0	100.0	14.0	1.0E99	Syst
1965	25.0	25.0	25.0	14.0	1.0E99	Syst
1966	34.0	34.0	34.0	14.0	1.0E99	Syst
1967	10.0	1.0E-6	14.0	14.0	1.0E99	Syst
1968	1,210.0	1,210.0	1,210.0	14.0	1.0E99	Syst
1969	---	1.0E-99	1,200.0	1,200.0	1.0E99	Cens
1970	---	1.0E-99	1,200.0	1,200.0	1.0E99	Cens
1971	---	1.0E-99	1,200.0	1,200.0	1.0E99	Cens
1972	68.0	68.0	68.0	14.0	1.0E99	Syst
1973	30.0	30.0	30.0	14.0	1.0E99	Syst
1974	1,150.0	1,150.0	1,150.0	14.0	1.0E99	Syst
1975	---	1.0E-99	1,200.0	1,200.0	1.0E99	Cens
1976	---	1.0E-99	1,200.0	1,200.0	1.0E99	Cens
1977	---	1.0E-99	1,200.0	1,200.0	1.0E99	Cens
1978	---	1.0E-99	1,200.0	1,200.0	1.0E99	Cens
1979	1,150.0	1,150.0	1,150.0	14.0	1.0E99	Syst
1980	---	1.0E-99	1,200.0	1,200.0	1.0E99	Cens
1981	---	1.0E-99	1,200.0	1,200.0	1.0E99	Cens
1982	113.0	113.0	113.0	14.0	1.0E99	Syst
1983	432.0	432.0	432.0	14.0	1.0E99	Syst
1984	---	1.0E-99	1,200.0	1,200.0	1.0E99	Cens
1985	---	1.0E-99	1,200.0	1,200.0	1.0E99	Cens
1986	---	1.0E-99	1,200.0	1,200.0	1.0E99	Cens
1987	---	1.0E-99	1,200.0	1,200.0	1.0E99	Cens
1988	---	1.0E-99	1,200.0	1,200.0	1.0E99	Cens
1989	---	1.0E-99	1,200.0	1,200.0	1.0E99	Cens
1990	---	1.0E-99	1,200.0	1,200.0	1.0E99	Cens
1991	---	1.0E-99	1,200.0	1,200.0	1.0E99	Cens
1992	---	1.0E-99	1,200.0	1,200.0	1.0E99	Cens
1993	---	1.0E-99	1,200.0	1,200.0	1.0E99	Cens
1994	138.0	138.0	138.0	14.0	1.0E99	Syst
1995	246.0	246.0	246.0	14.0	1.0E99	Syst
1996	13.0	1.0E-6	14.0	14.0	1.0E99	Syst
1997	13.0	1.0E-6	14.0	14.0	1.0E99	Syst
1998	13.0	1.0E-6	14.0	14.0	1.0E99	Syst
1999	18.0	18.0	18.0	14.0	1.0E99	Syst

2000	13.0	1.0E-6	14.0	14.0	1.0E99	Syst
2001	120.0	120.0	120.0	14.0	1.0E99	Syst
2002	13.0	1.0E-6	14.0	14.0	1.0E99	Syst
2003	1,020.0	1,020.0	1,020.0	14.0	1.0E99	Syst
2004	83.0	83.0	83.0	14.0	1.0E99	Syst
2005	95.0	95.0	95.0	14.0	1.0E99	Syst
2006	30.0	30.0	30.0	14.0	1.0E99	Syst
2007	115.0	115.0	115.0	14.0	1.0E99	Syst
2008	20.0	20.0	20.0	14.0	1.0E99	Syst
2009	20.0	20.0	20.0	14.0	1.0E99	Syst
2010	351.0	351.0	351.0	14.0	1.0E99	Syst
2011	784.0	784.0	784.0	14.0	1.0E99	Syst
2012	25.0	25.0	25.0	14.0	1.0E99	Syst
2013	477.0	477.0	477.0	14.0	1.0E99	Syst
2014	212.0	212.0	212.0	14.0	1.0E99	Syst
2015	105.0	105.0	105.0	14.0	1.0E99	Syst
2016	25.0	25.0	25.0	14.0	1.0E99	Syst
2017	25.0	25.0	25.0	14.0	1.0E99	Syst
2018	1,760.0	1,760.0	1,760.0	14.0	1.0E99	Syst
2019	24.6	24.6	24.6	14.0	1.0E99	Syst
2020	24.6	24.6	24.6	14.0	1.0E99	Syst
2021	24.6	24.6	24.6	14.0	1.0E99	Syst

Fitted log10 Moments Skew	Mean	Variance	Std Dev
EMA at-site data w/o regional info 0.100995	1.831401	0.551067	0.742339
EMA w/ regional info and B17b MSE(G) 0.160000	1.832954	0.543095	0.736950
EMA w/ regional info and specified MSE(G) 0.160000	1.832954	0.543095	0.736950

EMA Estimate of MSE[G at-site]	0.223826
MSE[G at-site systematic]	0.134262
Equivalent Record Length [G at-site]	23.993997
Equivalent Record Length [Syst+Hist-LowOutl]	34.000000
Grubbs-Beck Critical Value	14.000000

--- Final Results ---

<< Plotting Positions >>

Kamakoa Gulch-Waimea, HI-FLOW-ANNUAL PEAK

Events Analyzed				Ordered Events			
Day	Mon	Year	FLOW CFS	Rank	Water Year	FLOW CFS	H-S Plot Pos
16	Jan	1963	1,290.0	1	2018	1,760.0	1.27
22	Feb	1964	100.0	2	1963	1,290.0	2.54
12	Jul	1965	25.0	3	1968	1,210.0	3.81
07	Oct	1965	34.0	4	1979	1,150.0	7.57
30	Nov	1966	10.0	5	1974	1,150.0	10.05
20	Apr	1968	1,210.0	6	2003	1,020.0	12.54
01	Jan	1969	---	7	2011	784.0	15.03
01	Jan	1970	---	8	2013	477.0	17.51
01	Jan	1971	---	9	1983	432.0	20.00
31	Aug	1972	68.0	10	2010	351.0	22.48
30	Nov	1972	30.0	11	1995	246.0	24.97
28	Nov	1973	1,150.0	12	2014	212.0	27.45
01	Jan	1975	---	13	1994	138.0	29.94
01	Jan	1976	---	14	2001	120.0	32.42
01	Jan	1977	---	15	2007	115.0	34.91
01	Jan	1978	---	16	1982	113.0	37.39
14	Jan	1979	1,150.0	17	2015	105.0	39.88
01	Jan	1980	---	18	1964	100.0	42.36
01	Jan	1981	---	19	2005	95.0	44.85
09	Jan	1982	113.0	20	2004	83.0	47.33
07	Jul	1983	432.0	21	1972	68.0	49.82
01	Jan	1984	---	22	1966	34.0	52.30
01	Jan	1985	---	23	2006	30.0	54.79
01	Jan	1986	---	24	1973	30.0	57.27
01	Jan	1987	---	25	2017	25.0	59.76
01	Jan	1988	---	26	2016	25.0	62.24
01	Jan	1989	---	27	2012	25.0	64.73
01	Jan	1990	---	28	1965	25.0	67.21
01	Jan	1991	---	29	2021	24.6	69.70
01	Jan	1992	---	30	2020	24.6	72.18
01	Jan	1993	---	31	2019	24.6	74.67
26	Oct	1993	138.0	32	2009	20.0	77.15
10	Nov	1994	246.0	33	2008	20.0	79.64
30	Nov	1995	13.0	34	1999	18.0	82.12
30	Nov	1996	13.0	35	2002	13.0*	85.89
30	Nov	1997	13.0	36	2000	13.0*	88.37
29	Jan	1999	18.0	37	1998	13.0*	90.84
30	Nov	1999	13.0	38	1997	13.0*	93.32
14	Feb	2001	120.0	39	1996	13.0*	95.79
30	Nov	2001	13.0	40	1967	10.0*	98.27
24	Feb	2003	1,020.0	41	1993	---	---
14	Mar	2004	83.0	42	1992	---	---

08 Aug 2005	95.0	43	1991	---	---
30 Nov 2005	30.0	44	1990	---	---
01 Dec 2006	115.0	45	1989	---	---
05 Dec 2007	20.0	46	1988	---	---
19 Nov 2008	20.0	47	1987	---	---
28 Feb 2010	351.0	48	1986	---	---
24 Mar 2011	784.0	49	1985	---	---
08 Sep 2012	25.0	50	1984	---	---
12 May 2013	477.0	51	1981	---	---
29 Dec 2013	212.0	52	1980	---	---
03 Jan 2015	105.0	53	1978	---	---
31 Aug 2016	25.0	54	1977	---	---
30 Nov 2016	25.0	55	1976	---	---
11 Apr 2018	1,760.0	56	1975	---	---
23 Feb 2019	24.6	57	1971	---	---
01 Mar 2020	24.6	58	1970	---	---
26 Dec 2020	24.6	59	1969	---	---

* Outlier

* Low outlier plotting positions are computed using Median parameters.

<< Frequency Curve >>

Kamakoa Gulch-Waimea, HI-FLOW-ANNUAL PEAK

Computed Curve FLOW, CFS	Variance Log(EMA) CFS	Percent Chance Exceedance	Confidence Limits	
			0.86 FLOW, CFS	0.14 FLOW, CFS
12,517.8	0.32857	0.200	3,571.8	67,847.3
6,946.3	0.21275	0.500	2,511.6	26,736.3
4,300.6	0.14421	1.000	1,853.3	12,963.3
2,564.0	0.09149	2.000	1,308.2	6,151.5
1,454.7	0.05380	4.000	866.6	2,839.7
615.3	0.02512	10.000	426.8	962.1
279.7	0.01705	20.000	201.3	393.8
65.1	0.01802	50.000	45.4	90.2
16.1	0.02364	80.000	9.7	22.5
8.0	0.03563	90.000	4.1	11.6
4.5	0.05800	95.000	2.0	7.2
1.6	0.15639	99.000	0.4	3.6

<< Systematic Statistics >>

Kamakoa Gulch-Waimea, HI-FLOW-ANNUAL PEAK

Log Transform: FLOW, CFS	Number of Events
-----------------------------	------------------

Mean	1.833	Historic Events	0
Standard Dev	0.737	High Outliers	0
Station Skew	0.101	Low Outliers	6
Regional Skew	0.160	Zero Events	0
Weighted Skew	0.160	Missing Events	19
Adopted Skew	0.160	Systematic Events	40
		Historic Period	59

--- End of Analytical Frequency Curve ---

APPENDIX D

Market Assessment Report for Kamakoa Nui

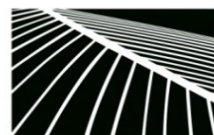
Market Assessment for Kamakoa Nui

SOUTH KOHALA, ISLAND OF HAWAI‘I

Final Draft Report

Prepared for:
County of Hawai‘i
Office of Housing and Community Development

Prepared by:



PBR HAWAII
& ASSOCIATES, INC.

1001 Bishop Street, Suite 650
Honolulu, HI 96813

March 2022

Note on Study Conditions

This study was drafted in the first quarter of 2022, considering information collected in preceding months, some of which reference 2019 or earlier data. Beginning in March 2020, the COVID-19 pandemic caused major economic, social and business disruptions throughout the state of Hawai'i as it did throughout most of the world. The timing and nature of recovery from these disruptions remains uncertain.

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1. EXECUTIVE SUMMARY

1.1. Study Background and Purposes

The County of Hawai'i, Office of Housing and Community Development (OHCD) owns an approximately 268-acre tract of land in Waikoloa Village (the Property) that was donated by Waikoloa Land Company in 1991, in satisfaction of its affordable housing requirements for Waikoloa Beach Resort.

The Property is designated for workforce housing to serve West Hawai'i communities, with approvals granted by the County Council pursuant to Resolutions 328-91, 439-06, 416-07, and 353-14. The Property was entitled and master planned for approximately 1,200 residential units, of which 185 have been built, and 140 are in development.

The existing masterplan is now over 15 years old, and thus OHCD sought to review and update it, including its land use, infrastructure, and housing plans, in anticipation of preparing requests for proposals (RFPs) for private developers to implement neighborhood developments. In this context, PBR HAWAII was engaged to update the Kamakoa Nui Community Master Plan for the ±240 acres that remain undeveloped, and to assess market conditions for its remaining entitled ±875 residential units.

This report addresses the market assessment.

1.2. Locational Attributes

Located about 6 miles upland from the South Kohala shoreline, Waikoloa Village is a well-established residential community that dates from the 1960s. It offers Waikoloa Elementary & Middle School, a public K-8 school; Ho'okō Park, a public park improved with playing fields and a comfort station; The Village Course at Waikoloa, an 18-hole golf course and club; a U.S. post office; several churches and other faith-based centers; and two shopping areas including Waikoloa Highlands Shopping Center and Waikoloa Plaza (under construction). Waikoloa Village is also a census-designated place (CDP), as defined by the U.S. Census Bureau (Census). It was estimated to have 7,104 residents in 2020.

Waikoloa Village is an attractive residential community due to its ocean and mountain views, its cool climate, and its proximity to a myriad of employment centers in West Hawai'i. Within a 10-mile radius of the site, encompassing the Village itself, the South Kohala resorts, Kawaihae Harbor and parts of Waimea town, there are an estimated 740 businesses with over 10,000 employees, as shown in Appendix 1 (ESRI and Data Axle, 2022). Due to its location in the saddle of the Mauna Kea and Kohala mountains, the area is also known to be windy.

Build out of Kamakoa Nui will extend the existing Village developments towards the northwest and will include another DOE school believed to serve K-8, a State library site, and completion of a public park.

1.3. Market Context

1.3.1. Housing Demand

This study documents demand for 13,000 to 21,000 additional primary resident homes throughout the County in the 2021 to 2040 period. The assessment does not consider additional residential units for visitor or other uses, such as for second homes or vacation rental purposes. Meeting the primary housing need benchmarks identified above would require the delivery of 680 to 1,100 new homes every year, including the past year (2021).

Within this County-wide assessment, survey data suggest demand for housing in Waikoloa Village may represent 1,460 to 2,360 more units for purchase, and 1,280 to 2,070 more units for rent over the period. However, surveys also indicate a very strong aspiration of County residents to access the ownership market, and suggest that given affordable ownership options, much of the apparent need for rental housing could alternatively manifest as demand for opportunities to buy.

1.3.2. Unplanned Demand

After accounting for projects that are currently planned or under construction, the currently unplanned demand in the Village is estimated between 1,300 and 3,070 units.

Table 1: Waikoloa Village - Potential Unserved Demand for Housing

	Low scenario	High scenario	Notes
Ownership units			
Demand	1,460+	2,360+	Table 6
Potential supply	(913)	(913)	Primarily at Wehilani and Keolalani
Unplanned (rounded)	550	1,450	Or more depending on product affordability
Rental units			
Demand	1,280	2,070	Table 7
Potential supply	(679)	(679)	
Unplanned (rounded)	750	1,620	Or less if more served by ownership units
Total unplanned	1,300	3,070	

Source: PBR HAWAII, 2022. See Section 6.1 for further details

1.4. Market Assessment for Kamakoa Nui

Kamakoa Nui represents a critical opportunity to address the anticipated demand for 1,300 to 3,070 more affordable, primary residential units in Waikoloa Village. In addition, to the extent it allows workers that now must endure long commutes to work in the West Hawai'i region, Kamakoa Nui could contribute to healthier lifestyles and families, and to a reduction in long-haul traffic on Queen Ka'ahumanu Highway and other regional throughfares.

1.4.1. Proposed Product Mix

Given the evidently strong resident aspirations for ownership opportunities and single-family homes, along with the ability to convey property in fee simple, a suggested unit mix is as follows:

Table 2: Summary of Kamakoa Nui Product Recommendations

	Units	Mix	Average unit density ¹	Typical lot size (sq. ft.)	Bedroom mix	AMI emphasis
Ownership units						
Single-family	480	53%	4.0	7,500	2s to 4s	80% to 140%
SF cluster/condo	40	4%	5.5	4,500	2s to 3s	60% to 120%
Multifamily	60	7%	11.0	n/a	2s to 3s	60% to 120%
Subtotal	580	64%	4.4			
Rental units						
Multifamily	320	36%	16.0	n/a	1s to 3s	30% to 60%; up to 120%
Total	900	100%	5.9			

Source: PBR HAWAII, 2022. See Sections 6.2 and 6.3 for further details.

1.4.2. Pricing, Absorption and Project Timing

Given the recommended product characteristics, analysis of comparison projects suggests the unit mix proposed at Kamakoa Nui could achieve pricing and absorption over the 2021-2040 period approximately as follows:

Table 3: Representative Kamakoa Pricing and Absorption Rates

	Units	Representative pricing (2021\$)	Average annual absorption	Notes on absorption
Ownership units				
Single-family	480	\$350,000 - \$650,000	45	11+ years
SF cluster/condo	40	\$325,000- \$500,000	20	2+ years
Town home	60	\$275,000 - \$450,000	25	2+ years
Subtotal	580			
Rental units				
Multifamily	320	HHFDC rental guidelines	40	Pace constrained by competition for financing
Total	900			

Source: PBR HAWAII, 2022.

¹ Net developable area within bulk lots, not including major connector roads that may connect to or traverse a parcel, necessary land set-asides for historical, cultural or environmental features, etc.

It is OHCD's intent that initial RFP processes be concluded with awards before mid-year 2023, with the goal that first unit closings and occupancies could be realized in 2026. Assuming appropriate parcels may be sited within the property and development interest is identified, the majority of units, including all rental and multifamily or cluster products might be available by about 2033. It is anticipated that the remaining inventory could be completed and absorbed by 2040.

1.4.3. Bulk Lot and Other Recommendations

Interviews with executives of seven private companies experienced with Waikoloa Village and/or West Hawai'i primary residential development suggest land be offered in fee simple for development of ownership properties with bulk lots in the range of 20 to 50 acres for the proposed single-family products, 5 to 10 acres for the single-family cluster or condominium products, and 4 to 8 acres for the town home products. Leasehold sites for affordable multifamily rental development were suggested to offer a minimum 65-year ground lease term and sites ranging from 3 to 10 acres.

Other suggestions for structuring of the community and RFP offerings are presented in Section 6.6.

2. ECONOMIC AND DEMOGRAPHIC SETTING

This section describes the economic and demographic setting of the County, which is co-terminus with and may also be referred to as the Island of Hawai'i (Island).

2.1. Population Trends and Prior Studies

Hawai'i County is the second most populous among the State's counties, following the City and County of Honolulu. According to the 2020 Census enumeration, the County had 200,629 residents, while the Waikoloa Village CDP was home to 7,104 persons.

Since at least 1970, the County's resident population growth exceeded the statewide average, generally at a pace second only to Maui County. Average annual growth rates in each 5-year period between 1970 and 2010 ranged from 1.2% to 3.9%.

With the Island's extensive land and other resources, State and other planners have long assumed that the County would continue to grow rapidly, exceeding growth rates of other counties. The State Department of Business, Economic Development, and Tourism (DBEDT), in its most recent long-range projections (DBEDT, Research Economic Analysis Division, 2018) anticipated annual resident population growth of 1.0% to 1.3% over the 2016 to 2040 period. Likewise, in its annual population estimates, the Census estimated relatively robust growth, ranging from 1.7% to 2.3% per annum between 2010 and 2017. However, the Census' estimated rates of increase were subsequently reduced as evidence of out-migration was revealed. The Census' American Community Survey (ACS) 2019 estimate of the Island's population came in lower than the Census' 2018 estimate.

Based on the 2020 Census, the County population is now understood to have grown at an average 0.6% per annum between 2010 and 2020². While 2021 Census estimates are not yet available by county, the statewide estimate reflects a loss of over 10,000 residents, or 0.7% of the population enumerated in 2020.

A March 2022 set of forecasts by the University of Hawai'i, Economic Research Organization (UHERO) addressed the economic and demographic impacts of the pandemic, with a two-year forecast to 2024. The outlook sees gradual recovery as the virus appears to be transitioning to an endemic disease and travel restrictions ease, permitting the return of international visitors. While optimistic, the report notes that "[c]onsiderable risks remain, including COVID-19 surprises, Fed tightening, and economic fallout from the Russian invasion of Ukraine" (University of Hawai'i, Economic Research Organization, 2022).

² While it is understood that the State of Hawai'i lost population in 2020 and 2021 due to the economic and other impacts of COVID-19 in Hawai'i, those impacts should have been relatively limited at the time of the April 2020 Census enumeration, and thus may not be reflected in the 2020 Census. On the other hand, the 2020 Census enumeration is potentially low due to COVID-related conditions that discouraged more active in-person solicitation of responses at the time.

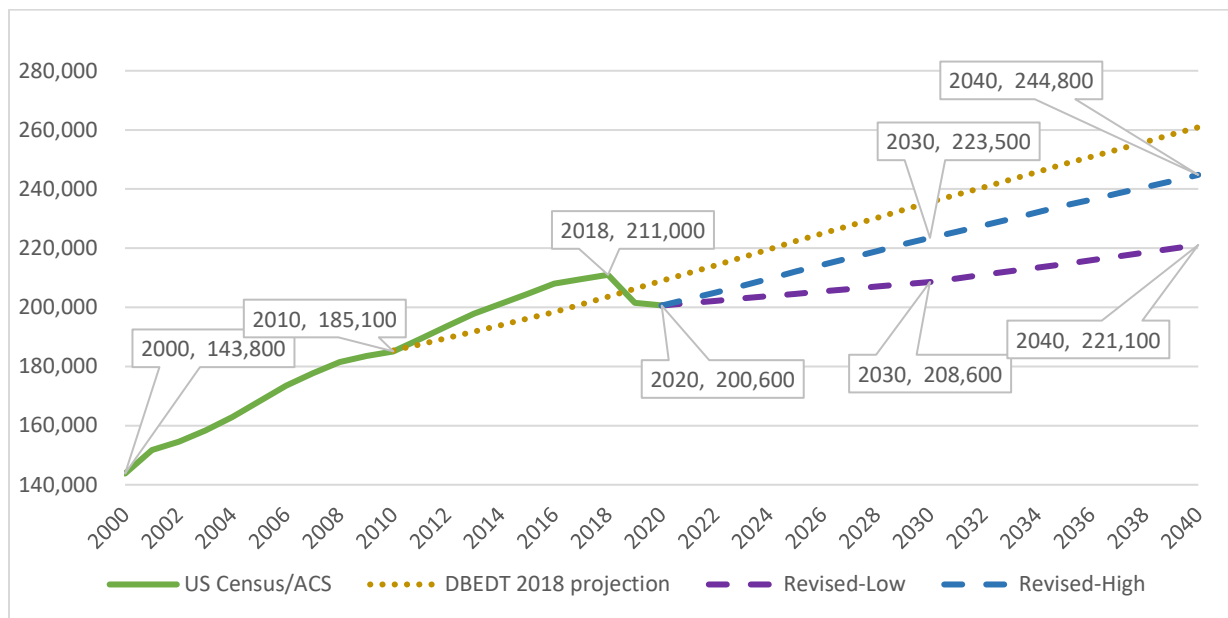
For Hawai'i County, UHERO forecasts population recovering to about the 2020 level by 2023, and 0.3% growth from 2023 to 2024.

2.2. Projected County Population

Current indicators and prior studies are accounted for in the County population projections for 2021 to 2040. Future uncertainties are expressed as low and high scenarios in the projections used in this study.

- Low range** – A low range estimate considers that County population stabilizes in 2022, recovering its growth in coming years as tourism and other sectors regain traction. On average, population change in the 2021 to 2030 period is forecast at 0.4% per annum, slower than the rate experienced between 2010 and 2020. From 2031 to 2040, growth is projected to return to the recent historical rate of 0.6% per annum.
- High range** – A high range estimate anticipates continued population growth, but at an average 1.1% per annum through 2030, and 0.9% per annum thereafter. Both these rates are less than the 1.2% and 1.0% to 1.1% annual rates anticipated by DBEDT in its 2018 study. This outlook recognizes the ongoing recovery from COVID-19 setbacks, as noted in the UHERO study and anticipates robust growth thereafter.³

Figure 1: Historical and Projected County Resident Population, 2010-2040



Sources: (DBEDT, 2020); (DBEDT, Research Economic Analysis Division, 2020); (DBEDT, Research and Economic Analysis Division, 2019); (DBEDT, 2018); (UHERO, (downloaded data, 2022)); (DBEDT, Research and Economic Analysis Division, 2021), (American Community Survey, U.S. Census Bureau, 2021) PBR HAWAII, 2022.

³ The March 2022 UHERO forecast begins with a higher estimated 2020 population than the current analysis (210,300 vs. the 200,600 assumed herein). Thus, while the current assessment implies a higher rate of growth than UHERO in the coming years, by 2024, this assessment results in a population forecast that is 99% of the UHERO forecast for that year.

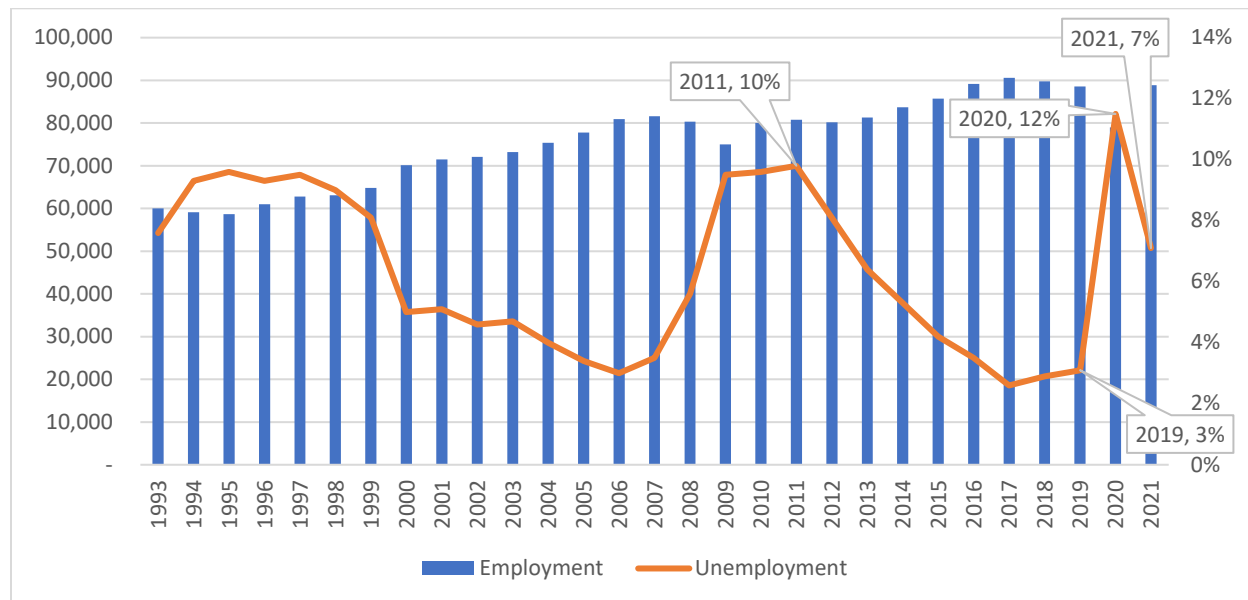
The two scenarios suggest the Island needs to accommodate 19,700 to 42,000 new residents between 2021 and 2040.

2.3. County Employment Trends

Employment trends in the County have historically followed seven- to ten-year business cycles, with the length extended in recent cycles.

However, due to the County’s strong dependence on the visitor and other service industries, unemployment after the onset of COVID-19 and its various quarantine and other implications, DBEDT estimates that the Island’s civilian labor force declined by about 9,600 people between 2019 and 2020, while unemployment spiked to 12%. Civilian unemployment was estimated at 7% in 2021, or 4 points higher than the 3% rate enjoyed from 2017 to 2019.

Figure 2: Hawai’i County Employment Trends



Sources: U.S. Department of Labor, Bureau of Labor Statistics, and State of Hawai’i, Department of Labor and Industrial Relations as reported by UHERO. (UHERO, (downloaded data, 2022)); (DBEDT, 2022)

2.4. Area Jobs and Commuting

While the region surrounding Kamakoa Nui supports a significant share of the Island’s jobs and much of its resort base, many of its employees live far from their places of work and endure long commutes due to an insufficiency of affordable housing options in the region.

2.4.1. Jobs Distribution

Like Waikoloa Village generally, Kamakoa Nui will offer proximity to major employment centers, with six of the Island’s ten largest employers located in South Kohala (State of Hawai’i, 2022). As of 2021, an estimated 740 businesses with more than 10,000 employees were reported within 10 miles of the Property. The original land conveyance to the County made reference to providing housing options for persons who work within 45 miles of the Property. Today, that radius is

believed to be home to nearly 3,000 businesses that support more than 36,000 employees (ESRI/Data Axle, 2021); see Appendix 1.

2.4.2. Resort Employee Residences

In 2016, SMS Research and Marketing Services, Inc. conducted an analysis of the economic impacts of the Kohala Coast area resorts for the Kohala Coast Resort Association (KRCA) that includes survey of employee housing locations. The study found that nearly 60 percent of employees live in the same zip code as their place of work; but conversely some 40% lived significantly farther away, including approximately 17% of employees who lived “Hilo side” (SMS Research and Marketing Services, Inc., 2016).

In fall 2020, KCRA participated in a Federally assisted food distribution for employees of the area resorts (Kohala Coast Resort Association, 2020). Between September and December, KCRA distributed food boxes to some 19,500 households that include at least one Kohala Coast resort employee. Recipients were required to provide their zip code of residence for Federal reporting, yielding another glimpse to where area employees live, although with a likely bias towards those who were feeling food insecure. So as to avoid data duplication due to employees receiving assistance in more than one drive, places of residence are evaluated for October 2020 only, when 6,778 food boxes were distributed, the greatest monthly distribution of the program. Among these recipients:

- 57% lived in Waikoloa Village or the same zip code as the resorts themselves, but this area ranges broadly from Keauhou in the south to Waimea Town in the north;
- 29% or 1,954 recipients lived as far away as Hawi or Laupāhoehoe; and
- 10% or 662 recipients resided even further away, in the Hilo, Kea’au, or Kurtistown areas.

2.4.3. Commuter Bus Service

The County’s Hele-On Bus service offers four commuter routes, generally focused on providing access to South Kohala Resorts, Kailua-Kona, and the surrounding area. In October 2021, Hele On hosted over 8,905 passenger trips on these four routes, with 69% originating in Hilo (Route 80), and 24% in Pāhala (Route 90).

Hele-On offers a vital service in providing such access to West Hawai’i jobs, although travel times are extensive and there are significant time gaps in service. For instance, Route 80 offers eight transportation time slots from Hilo to and from various locations within the South Kohala Resort district.

- **For travel from the Hilo area to West Hawai’i**, several departures under the current schedule occur between approximately 3:00 am and 5:00 am, 11:00 am and 12:00 pm, and at 7:15 pm daily. Trips range from approximately two to two-and-a-half hours each way, depending on the pick-up and drop-off location. Riders who board the Hele-On bus at 3:15 am in Hilo can expect to arrive in the South Kohala resort area between 5:15 am and 5:50 am.

- **For the return trip to Hilo and other points east**, departures from the South Kohala area resorts are currently scheduled at approximately 7:45 am, between 2:30 pm and 4:30 pm, and at 11:00 pm.

2.5. Family Income Trends

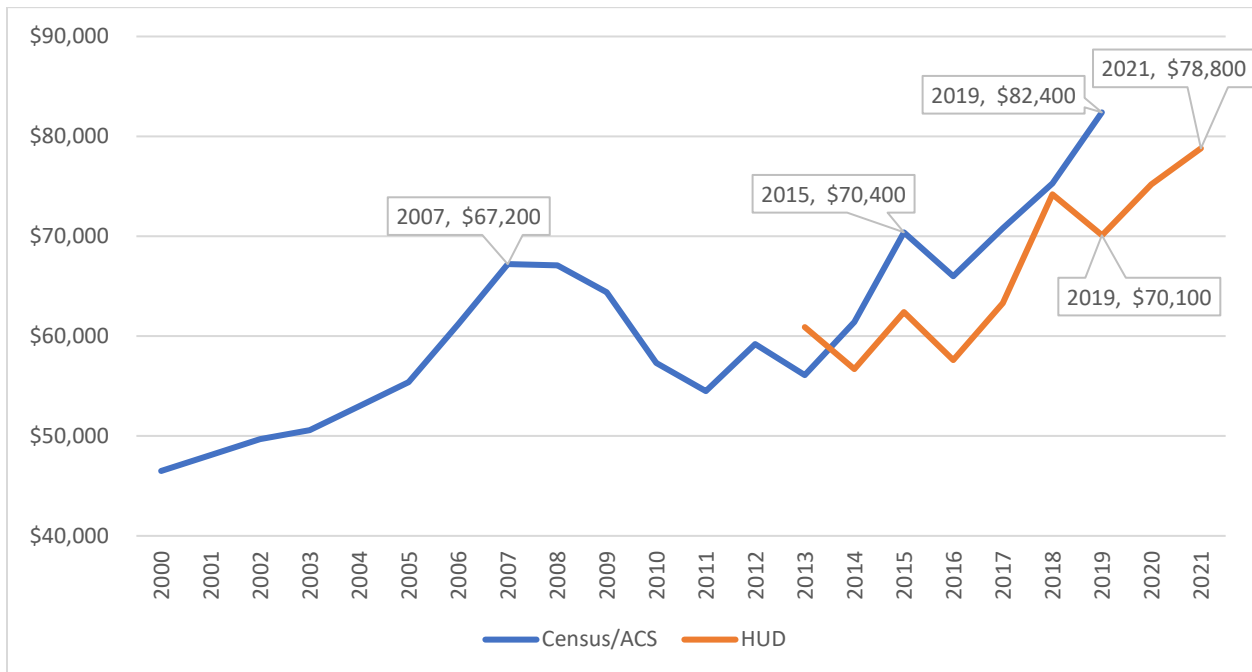
Estimates of median family income are tracked by ACS and decennial Census data, as well as by the U.S. Department of Housing and Urban Development (HUD). HUD uses its data to set affordable housing and other entitlement thresholds.

Median family income in the County exhibits variation from year to year, based on economic and employment cycles, and potentially on sampling sizes. However, some general trends are observed.

- **Census/ACS** estimates show a long-term upward trend since 2011, with a 2019 median of \$82,400.
- **HUD** median income estimates are lower than the Census/ACS estimate but generally follow the overall upward trend after 2016. The HUD figures also suggest a significant rise in median family income since the pandemic onset.

The most recent published estimates of County median income are \$82,400 from the Census in 2019, and \$78,800 from HUD in 2021.

Figure 3: County Median Family Income Trends



Sources: U.S. Housing and Urban Development (HUD); UHERO, 2022 based on U.S. Decennial Census and American Community Survey periodic data with interpolation for missing data.

2.6. Households and Characteristics by Sub-Area

In addition to its annual surveys, the ACS conducts rolling five-year surveys that collect information on smaller geographic areas. The latest such survey occurred between 2015 and 2019, therefore it misses the economic and demographic effects of COVID-19 and its associated restrictions. Nonetheless, this survey offers insights to population, employment, and household characteristics for smaller areas of interest, including:

- **Census Tract 217.04⁴** - Waikoloa Village was situated in census tract (CT) 217.04, which extends from Māmalahoa Highway in the east to the shoreline in the west, and from the South Kohala/North Kohala district boundary in the south through the Kawaihae Harbor area in the north. As such, this CT combines the primary resident community characteristics of Waikoloa Village and the Kawaihae area with the amenitized visitor areas of Waikoloa Beach, Mauna Lani, Hāpuna and Mauna Kea resorts.
- **Census-Designated Place** - Economic and demographic data is also available for the Waikoloa Village CDP area, which has the advantage for these study purposes of excluding the makai, predominantly resort areas that are included within CT 217.04.³

Recent estimates for the County and the two sub-areas are presented in Table 3. Observations of most relevance to Kamakoa Nui are generally derived from CDP data where available:

- **Population** - Waikoloa Village is estimated to include 7,100 residents.
- **Age** - Median age is lower than for the County as a whole, at 38.5 for the CDP vs. the County's 42.7 median.
- **Households** – In the 2014-2019 period, the Waikoloa CDP housed a small share of the County's population, with about 2,500 households, at an average size of 2.62 persons. Average household size appears to be smaller than the County average of 2.82 persons per household. Rental households are larger than owner-occupant households, and households organized as families tend to be larger than households in general.
- **Income** - Median household income in Waikoloa Village was about \$74,100, nearly 20% higher than that for the County. This is consistent with the concentration of employment opportunities in the subject area.
- **Economic characteristics** - Waikoloa Village showed a significantly lower share of households living below the poverty line, and lower civilian unemployment than the surrounding CT or the County as a whole. These observations are again consistent with the workforce nature of the community, and the many employment opportunities surrounding it.

⁴ CT 217.04 was applicable for the 2015-2019 ACS survey, as shown in this map produced by the State of Hawai'i, Department of Business and Economic Development, Research & Economic Analysis Division: <https://histategis.maps.arcgis.com/apps/MapSeries/index.html?appid=feb19b4cef564ed1ab7067f7956a83f2>. However, census tracts were redrawn by the time of the 2020 U.S. Census, and the site is now located in CT 217.07.

Table 4: Population, Households, and Employment for Sub-Areas and County
2015-2019

	CT 217.04³ Waikoloa- Kawaihae	Waikoloa Village CDP	County of Hawai'i
Number of persons	8,240	7,104 ⁵	199,459
Median age	40.2	38.5	42.7
Number of households ⁶	3,206	2,494	69,453
Average household size	2.57	2.62	2.82
-Av. for owner-occupied units	2.50	2.57	2.76
-Av. for renter-occupied units	2.73	2.77	2.95
% family households	66%	INA	67%
% living alone	28%	INA	27%
Median household Income	\$75,727	\$74,104	\$62,409
Civilian labor force participation (16+)	64%	66%	58%
% families earning below poverty level	9%	7%	12%
Civilian unemployment	4%	4%	6%

Sources: (U.S. Census Bureau, American Community Survey, 2020); (U.S. Census Bureau, n.d.)

INA – information not available

⁵ Based on U.S. Census for April 1, 2020; the ACS 2015-19 reported 6,549 persons.

⁶ The Census defines the number of households as equivalent to the number of occupied housing units.

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3. HOUSING MARKET CONTEXT: DEMAND

3.1. Projected Demand

3.1.1. Prior Studies

Analysts have long acknowledged a sizeable pent-up demand for primary resident housing units on the Island, as elsewhere in the State. For instance, a December 2019 study by estimated that the County would require between 7,816 and 13,527 new housing units between 2020 and 2030 (DBEDT, Research and Economic Analysis Division, 2019). This study accounted for then-recognized population losses on O’ahu, and adjusted housing projections to the DBEDT 2045 series, which anticipated slower population growth than DBEDT’s prior long-range forecast. It also accounted for primary resident market competition with visitor market demand, although it did not account for pent-up demand.

In contrast, the Hawai’i Housing Planning Study prepared in 2019 by SMS Research for HHFDC estimated even higher housing need, at up to 13,303 new primary resident units on the Island in the 2020 to 2025 period alone. This study accounted for pent-up demand, including the needs of homeless and special needs populations, but did not consider visitor impacts on housing need.

Neither of the recent cited studies had access to 2020 Census information, nor could either have anticipated the COVID-19 pandemic. The current study reviews housing demand estimates, with focus on the 2021 to 2040 period, to capture updated conditions as relevant to the anticipated buildout of Kamakoa Nui. Demand for primary resident housing is estimated based on two main components: new household formation and pent-up demand. This study is not concerned with potential demand for residences to support visitor and part-time resident populations.

3.1.2. Household Formation

County population is anticipated to increase by 19,700 to 42,000 residents between 2021 and 2040. This suggests the County could demand 7,400 to 15,800 new housing units to accommodate resident population increases. The projection is based on an average size for new households of 2.8 persons, equivalent to the ACS 2015-19 County estimate, and a targeted 5% residential vacancy rate.

3.1.3. Pent-up Demand

Under both the low and high population growth scenarios, an estimate of 12,070 crowded and/or doubled-up households is derived from the SMS 2019 survey, and this figure is adopted as a proxy for pent-up demand. However, in contrast to some other analyses that count all pent-up demand as immediately actionable, this analysis considers how much could be expected to be manifested as demand over the projection period, should appropriate housing be provided. It is assumed that by 2040, appropriate additional residential supply on the Island could motivate demand and generate solutions for 50% of the group of households estimated to have been crowded and/or doubled up in 2021. This adds another 6,000 units to the demand calculations for both the low and high population growth scenarios by 2040.

Addressing pent-up demand may have a feedback effect to population trends, and in the longer-term could be an important factor in generating the growth that has been projected in both population scenarios.

3.1.4. Concluded Housing Needs

The two scenarios result in a projected demand for 13,000 to 21,000 additional primary resident homes County-wide in the 2021 to 2040 period. This assessment addresses local primary housing demands, without consideration of additional residential units that may be built and acquired for visitor or other uses, such as second homes or vacation rental purposes. Meeting the primary housing need benchmarks identified above would require the delivery of 680 to 1,100 new homes every year, including the past year (2021).

Table 5: Projected Resident Demand for New Primary Housing in the County, 2021-2040

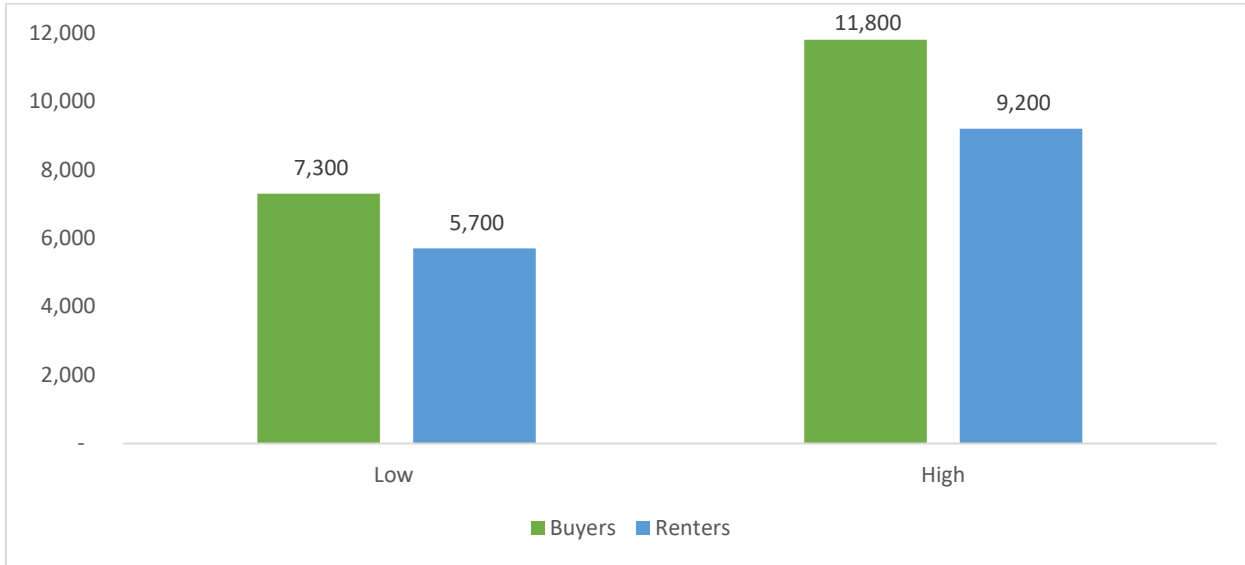
	Reference	Low range	High range
Projected population change			
Population change	Figure 1	19,700	42,000
Projected housing demand			
Household growth	Average 2.8 persons per household	7,000	15,000
Residential vacancy	5%	400	800
Pent-up demand	50% of 2019 estimate	6,000	6,000
Total		13,000	21,000

Source: PBR HAWAII, 2022

3.2. Demand by Tenancy

SMS’ 2019 statewide survey provides useful insights to housing needs in the context of housing tenure. The study methodology considered intent to move and survey respondents’ preferences to rent vs. to buy, compared to their financial qualifications to achieve their preferred tenancy. Considering financial qualifications, it is concluded that the “effective” future demand in the County was 56% for units to be purchased, and 44% for units to be rented. This suggests an “effective” demand for 7,300 to 11,800 units for purchase, and 5,700 to 9,200 units for rent, over the projection period.

Figure 4: County “Effective” Housing Demand by Tenancy, 2021-2040



Sources: (HHFDC, 2019); PBR HAWAII, 2022

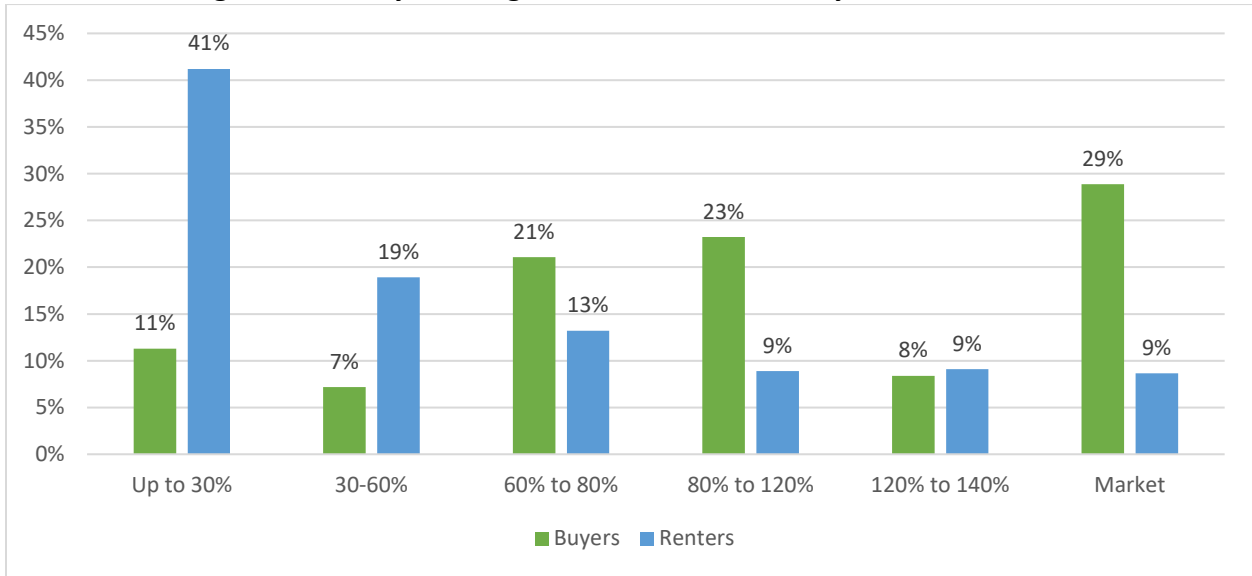
The chart and figures above reflect what was considered in the SMS study to be the “effective” demand by housing tenure, given household financial and other conditions. However, the same study also found that if more affordable options were available, 71% of residents, significantly more than depicted above, would prefer to buy rather than to rent.

3.3. Demand by AMI and Tenancy

SMS’s 2019 statewide survey also provides useful insights to housing needs in the context of AMI. Based on the Island income distributions observed in the survey and SMS’s projections of housing need, some 39% of the County-wide need for additional housing could fall in the less than 60% AMI group. However, an estimated 60% of rental housing need is in this group, compared to just 18% of the need for ownership units. Conversely, 44% of demand for new ownership units is attributed to households in the 60% to 120% AMI range, while only 22% of the demand for new rental units is attributed to this income group.

About 19% of the potential demand for new rental and for-sale housing fall in the 140% or higher AMI groups, which are assumed to be served by market housing. In other words, nearly 80% of the demand for new homes can be expected to originate from households that fall in income categories typically served by State and County affordable housing programs, those earning 140% or less of the AMI.

Figure 5: County Housing Demand Distribution by AMI and Tenure



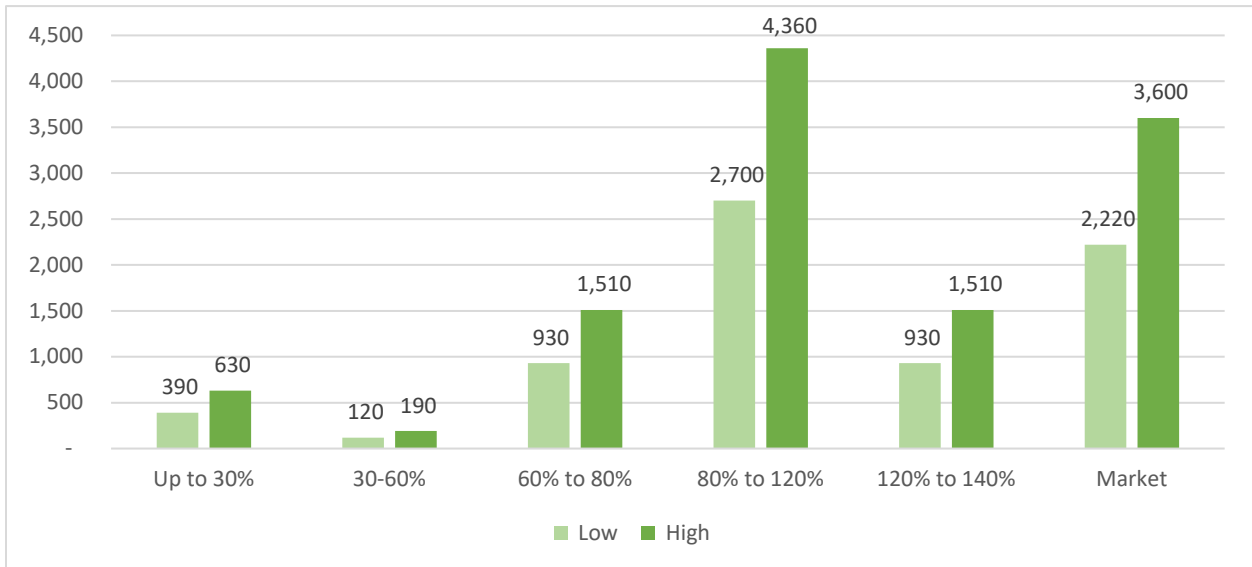
Source: (HHFDC, 2019).

3.3.1. Ownership Units by AMI

Focusing on the 7,300 to 11,800 estimated demand for new ownership units by 2040, the distribution by AMI group can be seen to range as shown below. Among AMI groups that would qualify for affordable housing programs, the bulk of demand falls in the 80% to 120% AMI group, but the 60% to 80% and 120% to 140% AMI groups also contribute significantly.

Together, the 60% to 140% AMI groups could demand some 4,560 to 7,380 additional homes for purchase in this period.

Figure 6: Projected County Ownership Demand by AMI, 2021-2040

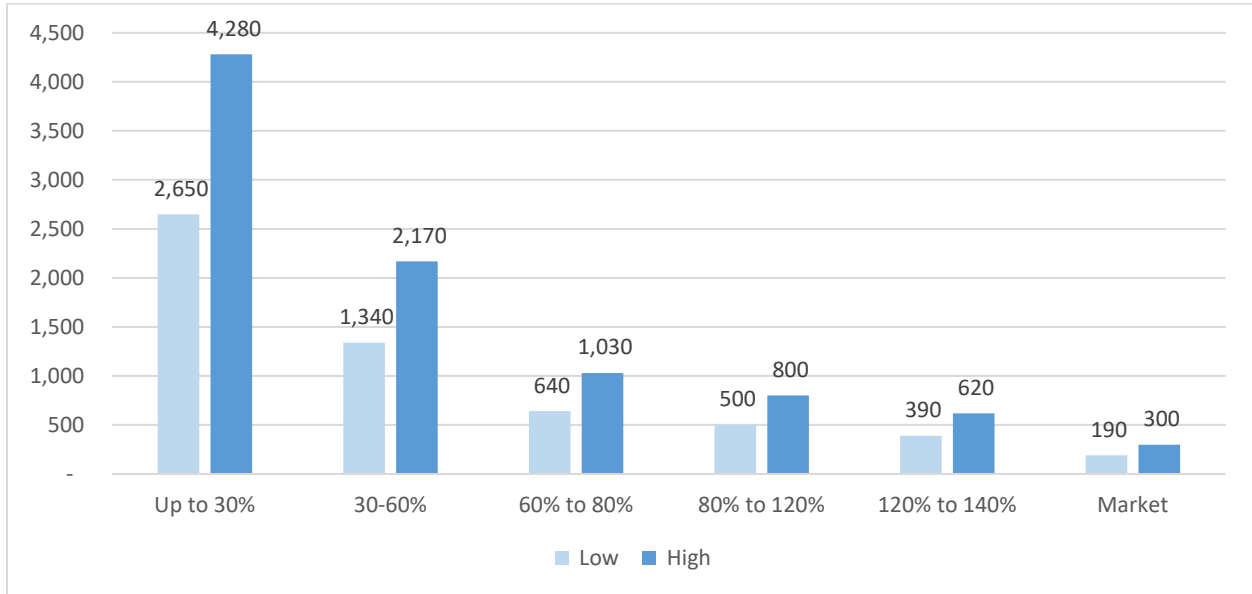


Source: PBR HAWAII, 2022

3.3.2. Rental Units by AMI

The anticipated demand for 5,700 to 9,200 additional units for rent by 2040 may be distributed as shown below, with the greatest needs falling in the up to 60% AMI groups.

Figure 7: Projected Hawai'i County Rental Demand by AMI, 2021-2040



Source: PBR HAWAII, 2022

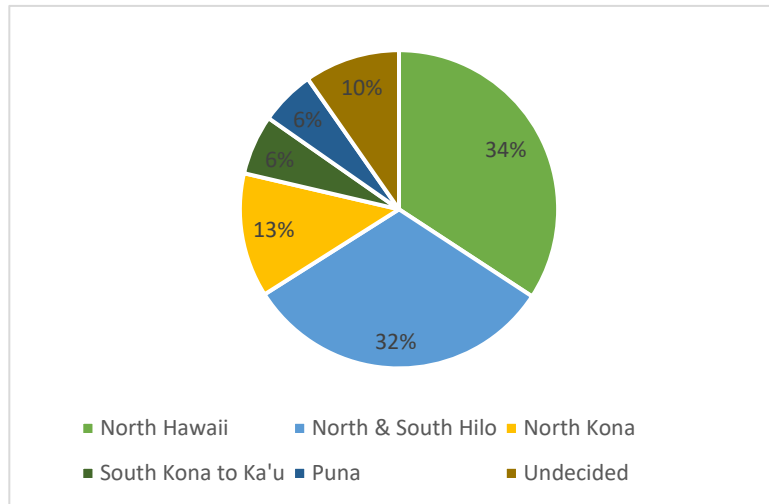
3.4. Demand by Location

North Hawai'i, as defined to include the Hamākua, North Kohala and South Kohala districts, is the preferred location for Island residents who expect to move within the Island and to rent their next home (HHFDC, 2019).

3.4.1. Buyers

Based on survey results, this region was preferred by 34% of intended movers who expect to stay on-Island and to buy their next house. The North and South Hilo districts, were almost as popular, showing a 32% preference among intended buyers.⁷

Figure 8: Preferred Area of Next Home Purchase for Movers Staying On-Island



Source: PBR HAWAII 2022, based on SMS 2019 survey (in (HHFDC, 2019)).

⁷ North Hawai'i residents interested in moving off-Island to rent were most often considering an O'ahu location.

The North Hawai'i area covers a large geographic area, with significant primary residential centers in Kawaihae and Waimea Town, as well as Waikoloa Village. Therefore, this preference ranking is reviewed again with consideration of capture rates within North Hawai'i over the 2021 to 2040 period. In this respect, given its proximity to employment centers, its entitled land areas, relatively dense village-style development and the ability to offer subsidized lands at Kamakoa Nui, Waikoloa Village could be poised to serve somewhat more than half of the North Hawai'i demand over this period.

Applying this assessment to the projected demand for ownership units over this period suggests that Waikoloa Village could support purchases of 1,460 to 2,360 new homes, representing about 20% of the total Island demand over the 2021 to 2040 period. Only North and South Hilo appear more popular for future ownership opportunities.

Table 6: Potential Demand for New Ownership Units in Waikoloa Village, 2021-2040

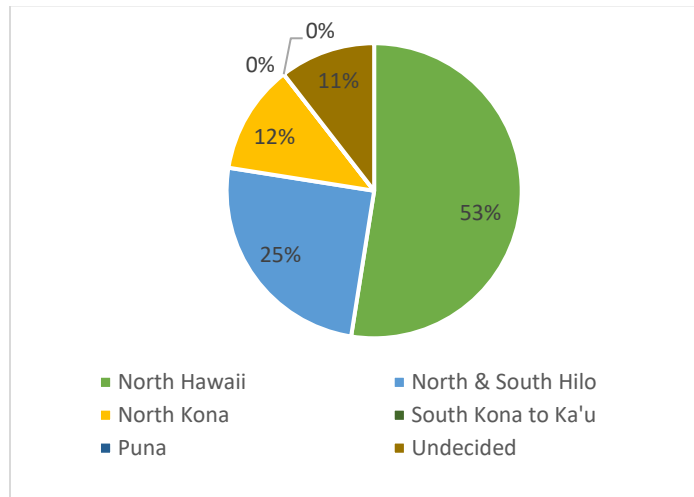
	Low range	High range	Note
North Hawai'i regional demand	2,500	4,040	Based on 34% preference for North Hawai'i
Share of North Hawai'i demand	58%	58%	
Percent of County demand	20%	20%	
Potential units demanded in Waikoloa Village	1,460	2,360	

Source: PBR HAWAII 2022

3.4.2. Renters

A similar analysis was undertaken for Island residents who reported in 2019 that they intended to move within the Island, and to rent. Among intended renters, the North Hawai'i region was even more strongly preferred than among buyers, with 53% indicating they would like to stay or relocate there. In fact, among the sample of those already living in North Hawai'i and intending to stay on-Island, 100% of survey respondents were reported to choose to stay in North Hawai'i.⁸

Figure 9: Preferred Area of Next Rental Residence for Movers Staying On-Island



Source: PBR HAWAII 2022, based on SMS 2019 survey (in (HHFDC, 2019))

⁸ Like among expected buyers, North Hawai'i residents interested in moving off-Island to rent were most often considering an O'ahu location.

Separating the North Hawai'i demand into Waikoloa Village and other areas, it again appears that Waikoloa Village might serve a substantial share of the strong demand for units in North Hawai'i. However, in this case, it seems unlikely that North Hawai'i alone could meet 53% of Island-wide rental need, and a greater share of future rental housing is assumed to be served elsewhere on the Island than prompted by the survey response. In summary, demand is foreseen for 1,280 to 2,070 new rental units in Waikoloa Village over the projection period, representing about 22% of Island demand.

Table 7: Potential Demand for New Rental Units in Waikoloa Village, 2021-2040

	Low range	High range	Note
North Hawai'i regional demand	2,560	4,140	Adjusted to 45% of County need
Share of North Hawai'i demand	50%	50%	
Percent of County demand	22%	22%	
Potential units demanded in Waikoloa Village	1,280	2,070	

Source: PBR HAWAII 2022

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4. HOUSING MARKET CONTEXT: SUPPLY

4.1. Area Housing Supply and Costs

The Census estimated the County had 90,258 housing units in 2020 (U.S. Census Bureau, Population Division, 2021). More detail on housing characteristics by small area is available from the ACS 2015-19 survey data. This older source found some 87,800 housing units in the County, about 3% less than the 2020 Census estimate.

Based on the 2015-19 survey data, 79% of County housing units were occupied and 21% vacant. Vacant units could include units empty due to transitions between primary residential occupants, but they also include units held for occasional or seasonal use, and for other non-primary resident-oriented purposes. CT 217.04, which was defined at the time of these surveys to encompass the Waikoloa-Kawaihae area, included some 6,260 housing units, representing 7% of the County inventory. Nearly half of the Waikoloa-Kawaihae housing units were estimated to be vacant in this period, reflecting the resort-orientation of much of the area.

For the County as a whole, homeowner units showed a vacancy rate of just 2.6%, while 9.6% of units in the rental market were estimated to be vacant. The high vacancy of rental units likely reflects inventories held for vacation-related uses.

The Waikoloa-Kawaihae area reflects higher housing costs than the County as a whole, with a median rent of \$1,604, compared to \$1,180.

Table 8: Housing Inventory and Characteristics for Sub-Areas and County, 2015-2019

	CT 217.04 ³ Waikoloa-Kawaihae	Waikoloa Village CDP	County of Hawai'i
Housing inventory			
Number of housing units	6,260	3,283	90,258 ⁹
Housing utilization			
Occupied units ¹⁰	3,206	2,494	69,453
- Owner-occupied	2,329 (73%)	1,832 (73%)	47,047 (68%)
- Renter-occupied	877 (27%)	662 (27%)	22,406 (32%)
- % occupied	51%	76%	79%
- % vacant	49%	24%	21%
Homeowner vacancy	4%	2%	3%
Rental vacancy	38%	12%	10%

⁹ Reflects U.S. Census estimate for 2020 see: <https://www.census.gov/programs-surveys/popest/technical-documentation/research/evaluation-estimates/2020-evaluation-estimates/2010s-totals-housing-units.html>.

¹⁰ The Census defines the number of households as equivalent to the number of occupied housing units.

	CT 217.04 ³ Waikoloa-Kawaihae	Waikoloa Village CDP	County of Hawai'i
Value/cost indicators and affordability			
Median value of owner-occupied units	\$481,300	\$433,400	\$350,000
Median owner costs (SMOC) ¹¹	\$2,099	\$1,977	\$1,689
SMOC=>30% of household income	45% of owners with a mortgage	42% of owners with a mortgage	38% of owners with a mortgage
Median gross rent for units paying rent	\$1,604	\$1,500	\$1,180
Gross rent=>30% of household income	54% of renters	50% of renters	49% of renters

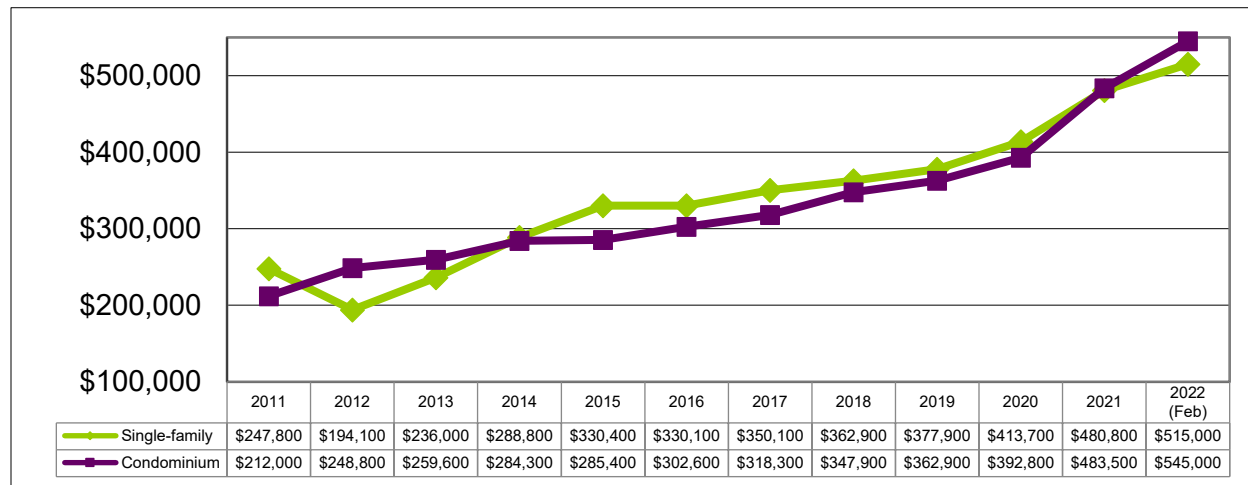
Sources: U.S. Census Bureau, 2015-2019 American Community Survey 5-Year Estimates, retrieved from: (DEBDT Research and Economic Analysis Division, 2019) 2020 State of Hawai'i Construction and Housing, retrieved from: (DEBDT Research and Economic Analysis Division, 2020)

4.2. Residential Sales Trends

4.2.1. County-wide Sales

For the Island as a whole, single-family home sales have generally shown price appreciation since 2012, with a spike in 2021. Median prices increased from \$194,100 in 2012, to \$480,800 in 2021, a 6.9% average annual rate of increase. Condominium units appreciated even faster, at an average 8.6% per annum over the period, rising to a median sales price of \$483,500 in 2021, on par with the median single family home price.

Figure 10: Median Sales Price: County

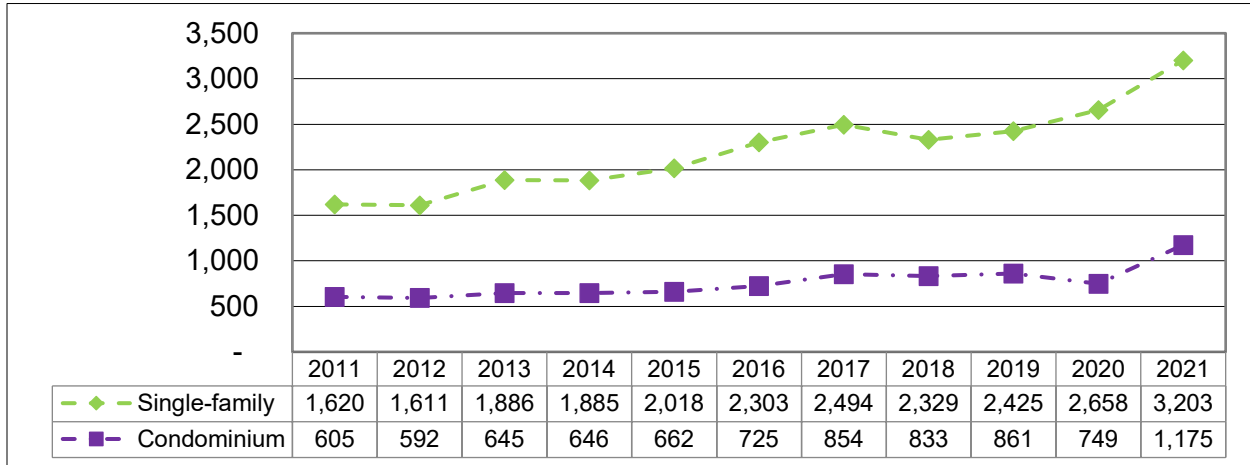


Source: UHERO [download, 2022]

¹¹ Selected monthly owner costs (SMOC) for households that own units and are paying a mortgage.

The ownership market is dominated by single-family homes, which represent nearly three times the number of condominium sales in any given year. The number of transactions recorded increased over the decade for both product types, however, at about 7% per year.

Figure 11: Number of Sales: County



Source: UHERO [download, 2022]

4.2.2. West Hawai'i Area Sales

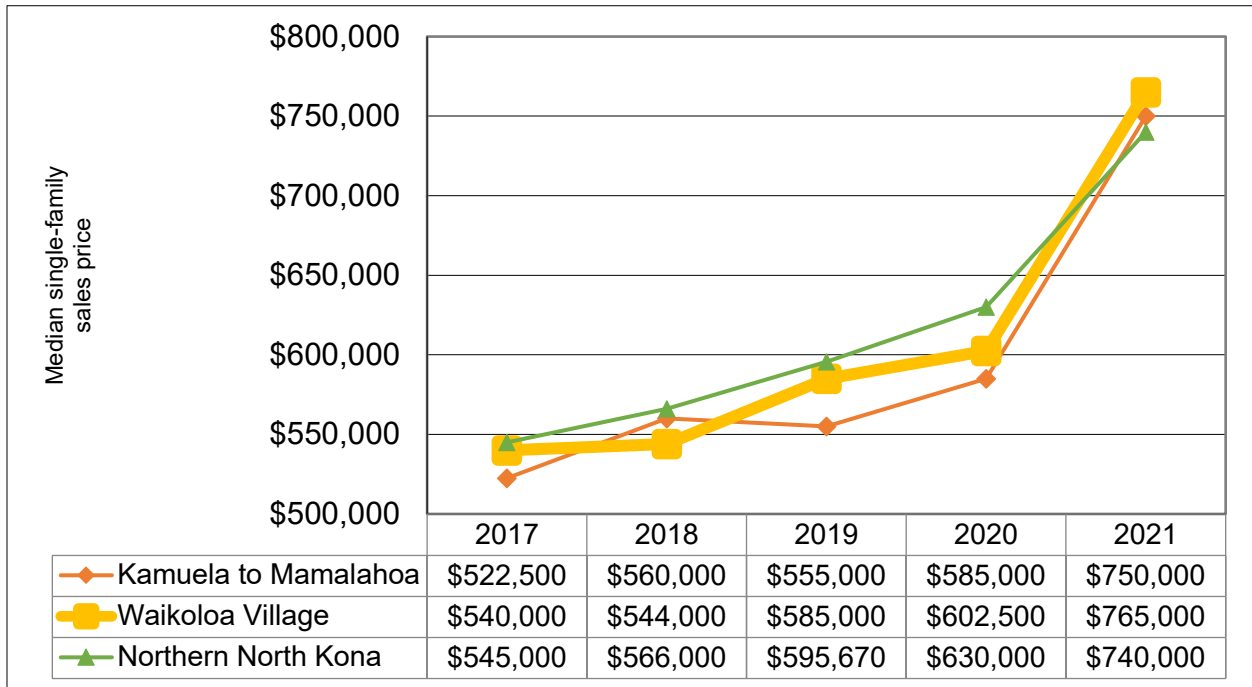
For a closer look at West Hawai'i primary residential trends, MLS data on recent residential sales were also obtained and analyzed for three areas:

- **Kamuela to Māmalahoa** – An area encompassing TMK Zone 6, Sections 2 through 7, which includes Waimea Town and its surroundings, Kawaihae, and areas mauka of Māmalahoa Highway.
- **Waikoloa Village** – The area defined by TMK Zone 6, Section 8, which extends from Queen Ka'ahumanu Highway mauka to Māmalahoa Highway.
- **Northern North Kona** – A portion of the North Kona district, defined by TMK Zone 7, Sections 2 through 5. The area includes Kailua-Kona Town but not Hōlualoa or the Keauhou area.

This sample was refined to focus on properties most appropriate to primary residential use. Thus, the data excludes TMK Zone 6, Section 8, with South Kohala resort areas; homes on lands with resort or agricultural zoning; homes on Ali'i Drive; and homes that advertised the ability to rent on a short-term basis.

Among single-family sales, the three areas show similar pricing and trends, with large appreciation in 2021. In Waikoloa Village, the median price advanced from \$540,000 in 2017 to \$765,000 in 2021, an average annual increase of 9.1%.

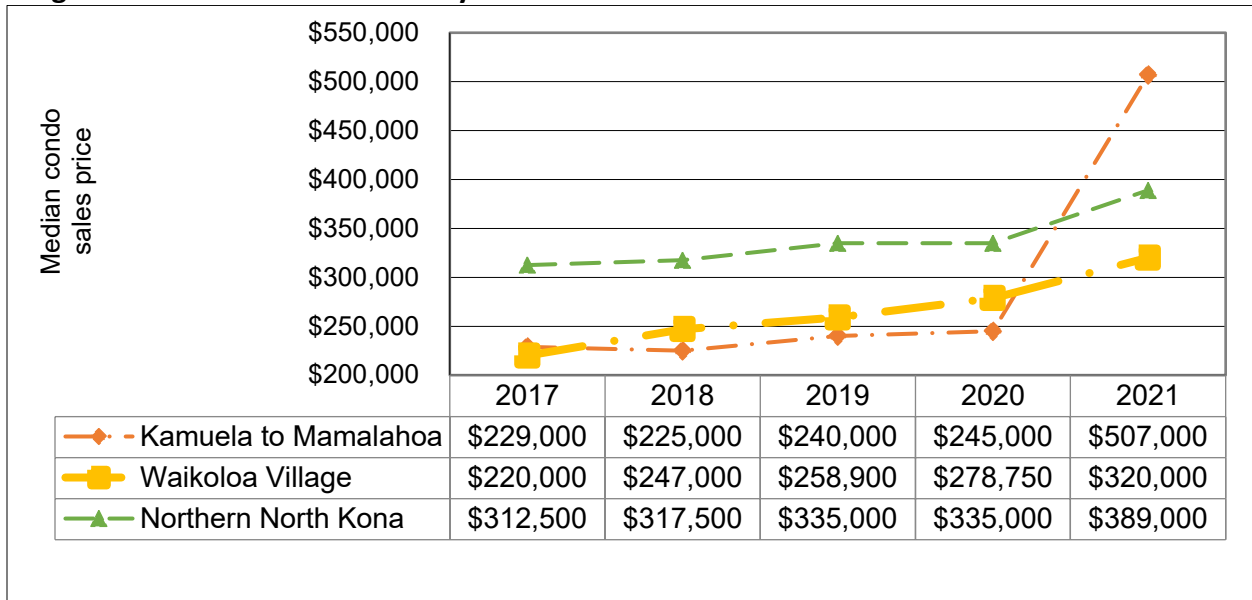
Figure 12: Median Price - Primary Resident-Oriented Single-Family Homes in West Hawai'i



Source: PBR HAWAII, based on Hawai'i MLS database, February 2022.

In contrast, condominium sales in the sample tended to be highest priced in Northern North Kona, with Waikoloa Village and the Kamuela to Māmalahoa region (mostly reflecting Waimea Town) being similarly priced. However, in 2021, the Kamuela to Māmalahoa region saw a very large median price increase. The median condominium unit in Waikoloa Village sold for \$320,000 in 2021.

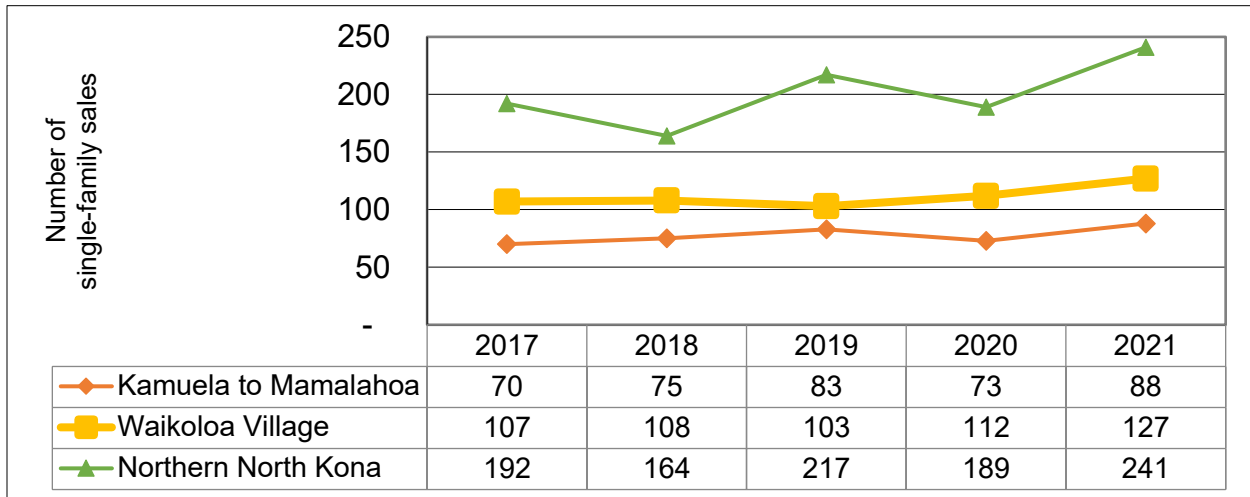
Figure 13: Median Price - Primary Resident-Oriented Condominium Homes in West Hawai'i



Source: PBR HAWAII, based on Hawai'i MLS database, February 2022.

In terms of number of sales, Waikoloa Village evidenced a relatively stable market with about 110 single-family sales transacting each year until 2021, when sales increased to 127. The other two areas showed slightly more variability, with the greatest number of sales recordings in Northern North Kona.

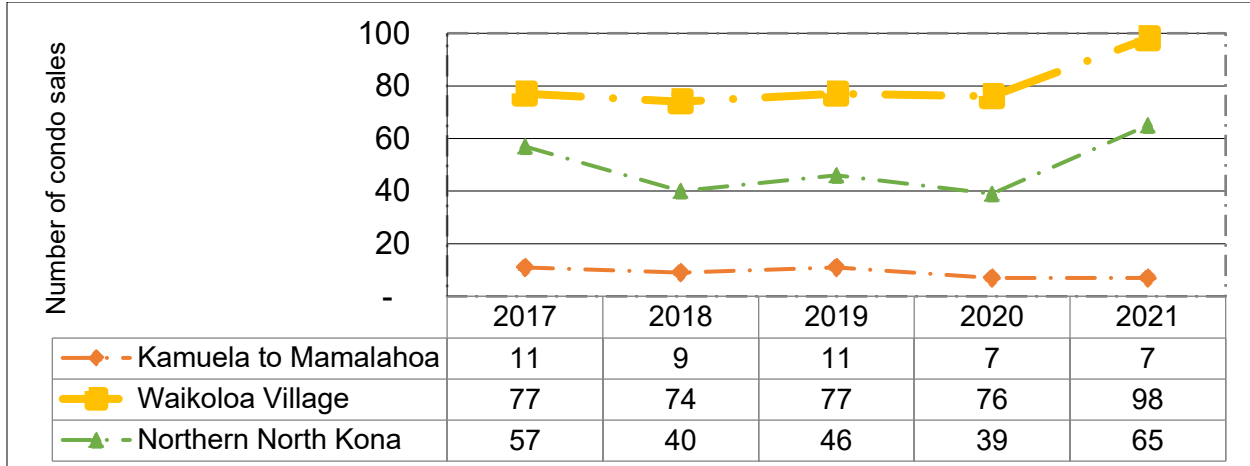
Figure 14: Number of Sales - Primary Resident-Oriented Single-Family Homes in West Hawai'i



Source: PBR HAWAII, based on Hawai'i MLS database, February 2022

For condominiums, Waikoloa Village shows far more primary-resident oriented sales than the other two areas defined, with around 80 units transacting in a typical recent year, increasing to 98 in 2021.

Figure 15: Number of Sales - Primary Resident-Oriented Condominium Homes in West Hawai'i



Source: PBR HAWAII, based on Hawai'i MLS database, February 2022

4.2.3. HHFDC Sales Price Guidelines

HHFDC publishes affordable sales price guidelines annually based on figures produced by HUD. Figures vary with family size and the AMI classification of a potential buyer household. They assume principal and interest payments account for no more than 28% of gross family income, and the availability of down payment funds representing 5% of the purchase price.

Representative price guidelines shown below assume a 30-year fixed rate mortgage at 4.0% interest.

Table 9: HHFDC 2021 Affordable Sales Price Guidelines¹²

	2-persons	3-persons	4-persons
60% AMI	\$211,400	\$238,000	\$264,200
80% AMI	\$281,900	\$317,300	\$352,300
100% AMI	\$352,400	\$396,700	\$440,400
120% AMI	\$422,900	\$476,000	\$528,500
140% AMI	\$493,400	\$555,300	\$616,500

Source: HHFDC, "Hawaii County Affordable Sale Price Guidelines," 2021.

4.3. Residential Rent Trends

4.3.1. Area Asking Rents

Comparison median asking rents in a broad region surrounding the subject have been generally stagnant in recent years, based on data collected from market listings by the national firm Zumper.¹³ This source does not distinguish between multifamily and single-family offerings, but most of the studio, one- and two-bedroom units listed appear to be multifamily. In 2021, median asking rents ranged as follows:

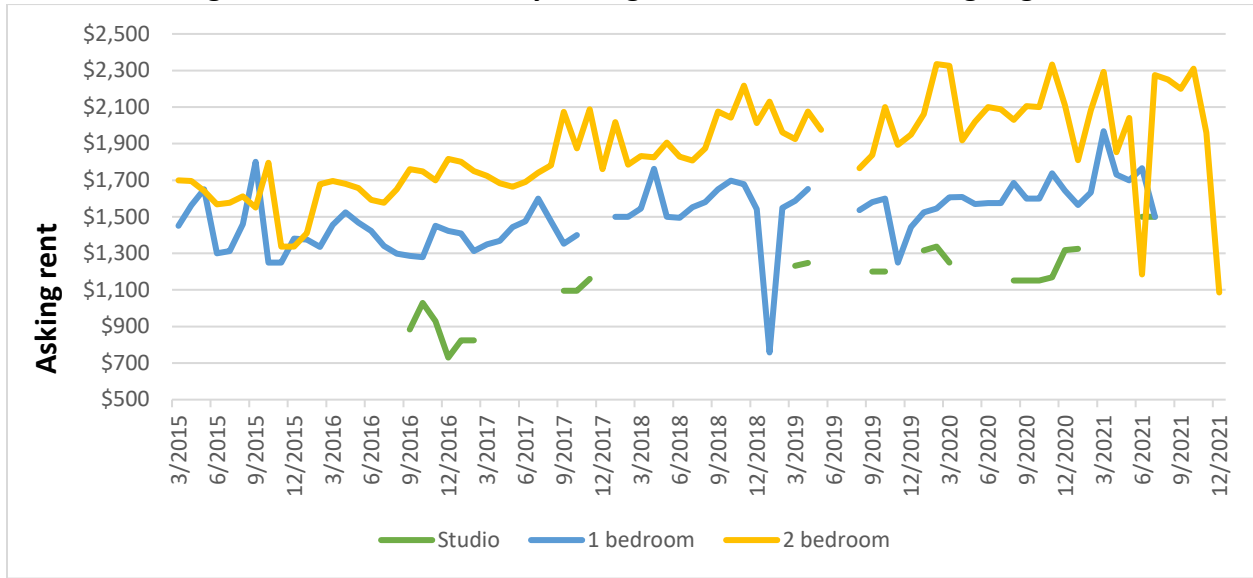
- **Studios** - \$1,325 to \$1,500 (mean \$1,442)
- **One-bedroom units** - \$1,500 to \$1,968 (mean \$1,694)
- **Two-bedroom units** - \$1,086 to \$2,310 (mean \$1,945)

Zumper does not disclose sample size, but samples may be scarce in some months, and breaks are shown in available listings. The occasionally sudden drops or rises from month to month, as charted below, may be attributed to both these survey conditions and a tight market.

¹² Applicable price guidelines will be established based on anticipated interest rates and family at the time of unit sales closings. Pricing reflects occupancy guidelines set forth in section 15-307-76 HAR.

¹³ Zumper labels the reporting area that includes Waikoloa Village "Kailua-Kona", but the area extends throughout most of North Kona and South Kohala, excluding Kawaihae and Waimea Town. Most three-bedroom offerings that were researched appeared to be single-family units, and therefore their reported rental data are not included here.

Figure 16: Median Monthly Asking Rents in the Surrounding Region



Source: (Zumper, 2021).

4.3.2. HHFDC Rental Guidelines

HHFDC publishes affordable rent guidelines annually based on figures produced by HUD. These figures indicate the maximum rent that should be charged per month based on the unit type and renter household AMI, and do not necessarily reflect market conditions. The guidelines are intended to support housing expenditures, including of gas (as applicable), electric, water, and sewer utilities, that do not exceed 30% of gross family income.

Since most private listings are advertised net of utilities, comparison is made to the HHFDC guidelines after adjustment for utilities¹⁴ (U.S. Department of Housing and Urban Development (HUD), 2021). Based on this analysis, the mid-range listings in 2021, as surveyed by Zumper in the subject area, could generally be affordable only to households earning 100% to 120% or more of area AMI. This would suggest that a potential renter household earning less than the median income would be able to afford fewer than half of any available listings. Such availability could be further constrained since the number and nature of market listings is not published in the Zumper reports.

¹⁴ Considering all electric utilities, HUD’s current Utility Allowance Schedule for apartment buildings with LEED certification in the County amounts to \$83 per month for studio units, \$97 for one-bedroom units, \$132 for two-bedroom units, \$167 for three-bedroom units, and \$202 for four-bedroom units. This schedule is effective through July 31, 2022.

Table 10: HHFDC Affordable Rent Guidelines, 2021 and Market Indicators¹⁵

	Studio	1-Bedroom	2-Bedroom	3-Bedroom
HHFDC guidelines				
30% AMI	\$450	\$481	\$578	\$667
60% AMI	\$900	\$963	\$1,156	\$1,335
80% AMI	\$1,200	\$1,285	\$1,542	\$1,781
100% AMI	\$1,500	\$1,606	\$1,927	\$2,226
120% AMI	\$1,800	\$1,927	\$2,313	\$2,672
140% AMI	\$2,100	\$2,248	\$2,698	\$3,116
HHFDC guidelines net of utility allowances				
30% AMI	\$367	\$384	\$446	\$500
60% AMI	\$817	\$866	\$1,024	\$1,168
80% AMI	\$1,117	\$1,188	\$1,410	\$1,614
100% AMI	\$1,417	\$1,509	\$1,795	\$2,059
120% AMI	\$1,717	\$1,830	\$2,181	\$2,505
140% AMI	\$2,017	\$2,151	\$2,566	\$2,949
Market indicators (mean for monthly medians)				
Zumper (mean of monthly medians)	\$1,442	\$1,694	\$1,945	INA

Source: (HHFDC, 2021); (U.S. Department of Housing and Urban Development (HUD), 2022)¹⁶; (Zumper, 2021)
 INA - Relevant information not available from Zumper.

4.4. Housing Production Trends

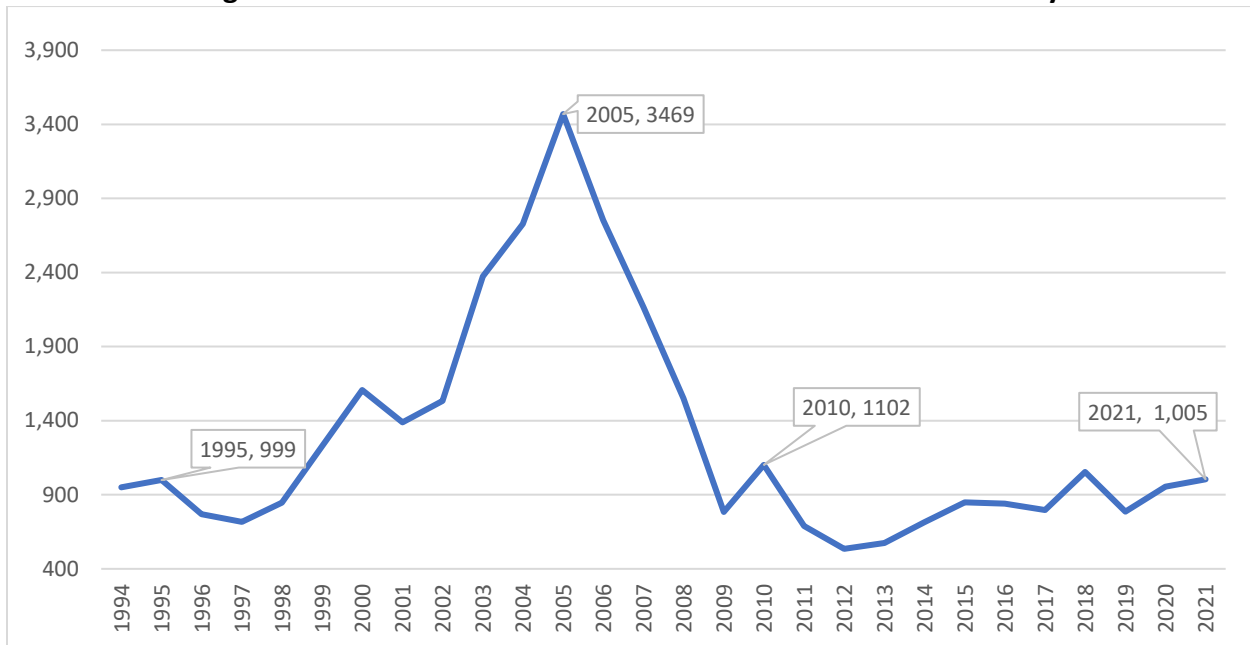
Despite strong indicators of housing need, housing production is highly variable. And like elsewhere in the State, County production, as reflected in private residential permitting, has settled at a substantially lower level in recent compared to prior years.¹⁷ The trend since 2009 has generally been in the range of 500 to 1,000 starts per year, compared to an approximate range of 1,200 to 3,500 starts between 1999 and 2008.

¹⁵ Differences between data sets make direct comparison difficult. First, HUD’s guidelines apply to Hawai’i Island as a whole, whereas the market surveys are drawn from listings for a region around Waikoloa Village. Additionally, the Zumper survey does not segregate apartment and single-family listings; studio-, one-, and two-bedroom listings are reported because based on current availability, these were typically apartments, whereas three-bedroom and larger listings were typically single-family.

¹⁶ The HUD utility allowance schedule was published in July 2019 and is set to expire July 31st, 2022. Electric allowances were used under all service categories, water and sewer allowances are also included.

¹⁷ Private authorizations include government-assisted housing developments.

Figure 17: Private Residential Units Authorized in Hawai'i County



Source: (UHERO, (downloaded data, 2022))

Adding to the housing deficit, not all permitted units get built; and the built inventory often favors the more easily underwritten vacation/second home condominium market rather than primary resident markets.

- **Permitted versus completed units** – Production of housing units typically lags permitting by a year or two and is less than authorizations. Completed units have been as much as 68% less than permitted units, as was seen in 2008 when market conditions changed rapidly.
- **Visitor-oriented versus primary housing development** – The 2019 statewide housing study by SMS found that 16.5% of the County’s housing units were vacant and unavailable for primary residential use in 2017. The majority of these were held for seasonal use, generally by persons who habitually lived out-of-State. (HHFDC, 2019).

Recently, this trend has been exacerbated. Between 2009 and 2018, the share of visitors staying in individually owned units increased 1.5 times, while hotel inventories remained relatively stagnant and, in some cases, declined.

In the for-sale market, SMS found that 24% of residential home sales in the state in 2018 were purchased by out-of-State residents. Hawai'i County exhibited the highest share of out-of-State buyers, at 41%.

4.5. Waikoloa Village Overview

4.5.1. Completed Developments

Residential development in the Village was initiated as early as the 1960s, with a major surge of development in the late 1980s through 1990s. Thereafter, Castle & Cooke Waikoloa undertook

the approximately 248-acre Wehilani community at the southwestern edge of the community. Castle & Cooke completed Makana Kai, a 92-unit townhouse development, and Kikaha, a 54-unit single-family home/lot development before pausing development at Wehilani in 2008/2009. Some 3,426 homes are identified in Waikoloa Village and its immediate vicinity.

Until very recently, nearly all homes in Waikoloa Village have been offered for sale, and among those, about two-thirds are single-family and one-third are multifamily. Three public housing projects with a total of 94 multifamily rental units operated by the Hawai'i Public Housing Authority (HPHA), round out the existing total. For its time, the one-third share of for-sale multifamily homes was relatively large. The existing single-family homes were developed at an average of about 3 units per acre, while existing multifamily homes were developed at an average of about 14 and 8 units per acre for rental and ownership units, respectively.

Table 11: Overview of Waikoloa Village Area Residential Developments

	Number of units			Existing unit characteristics		Comment
	Existing	Planned	Total	Mix by type	Units/acre	
Ownership Units						
Single-family	2,201	TBD	2,201+	64%	2.7	Undetermined future developments at balance of Wehilani community and Keolalani
Multifamily	1,107	TBD	1,107+	32%	14.2	
<i>Subtotal</i>	<i>3,308</i>	<i>925</i>	<i>4,233</i>	<i>97%</i>	<i>3.7</i>	
Rental Units						
Multifamily	118	679	797	3%	8.4	Planned units generally exceed 11 units/acre
Totals	3,426	1,604	5,030	100%	3.8	

Note: Excludes the Subject Kamakoa Nui Master Plan and certain other entitled areas, as noted.

Source: PBR HAWAII, 2022. See Appendix 2 and Appendix 3 for map and details by project.

4.5.2. Ongoing Developments

Four of the planned residential rental projects noted above were under construction in Waikoloa Village as of January 2022, all multifamily rentals. These projects will offer 237 units at completion, of which 170 will be operated as affordable housing. Three other multifamily projects are planned but still pending various permits and financing. Additionally, the first phase of 87 single-family homes of a proposed 253 were undergoing grading at the adjacent property, Keolalani.

At completion, if developed as proposed, these projects could offer 510 additional affordable units in Waikoloa Village, all rentals, and 766 new homes in total, including the unrestricted market units.

Table 12: Projects Under Construction or Planned in Waikoloa Village

Project	Developer	Site area (acres)	Estimated completion	AMI range	Affordable units ¹⁸	Total units
Under construction: single-family ownership units						
Keolalani at Waikoloa (active phase only)	Waikoloa Heights Land Investors LP	130	INA	Market	0	87
Subtotal, ownership units under construction					0	87
Under construction: rental units						
Kaiāulu O Waikoloa	A0674 Waikoloa, LP (David Bigley)	4.6	2022	30% – 60%	60	60
The Lofts at Waikoloa	Meridian Pacific, Ltd.	0.75 (approx.)	2022	Market	0	33
The Lofts at Waikoloa East	Meridian Pacific, Ltd.	0.75 (approx.)	2022	Market	0	33
Waikoloa Family Affordable Rentals	GSF Inc. (Gary S. Furuta)	8.0	2023	30% – 60%	110	111
Subtotal, rentals under construction					170	237
Planned/pending: rental units						
Na Hale Mākoa	Pacific Housing Assistance Corporation	10.3	2024	Up to 140%	140	140
Waikoloa Village Center	Brown Development	INA ¹⁹	2025	80% – 140%	200	200
The Lofts West	Meridian Pacific, Ltd.	3.65	2023	Market	0	102
Subtotal, rentals planned/pending					340	442
Total					510	766

INA – information not available

Source: (PBR HAWAII, 2022). See Appendix 2 for map of planned rental projects.

4.5.3. Additional Capacity

In addition to Kamakoa Nui, the Waikoloa Village area could accommodate future growth at the approximately 214-acre undeveloped balance of the Wehilani community, and at the balance of the Keolalani at Waikoloa project to its north, where the 87 units now underway are located. In

¹⁸ Some data may include manager’s unit(s) that will not be rented; where disclosed, these are counted in the total but not the affordable inventory.

¹⁹ Some housing is proposed within mixed use settings that combine commercial, or other uses; the overall site is ±57.4 acres.

addition, a the 3.9-acre “Lot 178,” which is within Paniolo Estates and owned by the County of Hawai‘i, could theoretically accommodate more residential units, but due to its location within an existing community and the site configuration, it is assumed for current purposes to yield just two single-family homes. Development assumptions for these three areas are included in the planned inventories noted above.

4.5.4. Community Amenities

Waikoloa Village is a mature community with well-established community amenities. These include three community parks, a golf course, places of worship, and a variety of retail shops, restaurants, and services within the Waikoloa Highlands Shopping Center. More offerings are underway at the emerging Waikoloa Plaza, across Waikoloa Road, including the community’s second grocery store. Waikoloa Village also includes the public Waikoloa Elementary and Middle School, the Waikoloa Fire Station, and a United States Post Office. Appendix 4 shows the location of area amenities as centered on the edge between Kamakoa Nui and the existing areas of the Village.

5. KAMAKOIA NUI MARKET COMPARISONS

This section presents an analysis of unit types and market performance of specific housing projects selected for comparison to Kamakoa Nui.

5.1. Ownership Market Comparisons

5.1.1. Selected Projects

Eight South Kohala and North Kona projects representing 1,066 units, were evaluated for insights to the ownership products considered at Kamakoa Nui, including single-family homes, single-family cluster homes (represented by small lot single-family and single-family condominiums), and town homes.

South Kohala and North Kona have seen little new development initiated since 2008, and single-family condominium homes are a relatively new product type for the Island. Thus, the sample includes some projects that are relatively old. The projects are introduced below and discussed in the following sections. Detailed data on the projects can be found in Appendix 5.

- **Single-family:**
 - **Paniolo Estates** - This 178-unit development was developed by the County of Hawai'i and Schuler Homes, initiated in 1992.
 - **Kamakoa Ph 1A: Conventional** – Kamakoa Ph 1A, also sometimes referred to as experimental housing, was developed by the County of Hawai'i and Habitat for Humanity over a period extending from 2012 to 2018. Developed as 100% affordable units, homes in Ph 1A are still subject to resale restrictions and shared equity. The project includes 74 conventional style single-family homes and 17 bungalow-style homes; the conventional homes are considered in this category and the bungalow homes in the next.
 - **Pualani Estates** – D.R. Horton developed and sold this 362-home community just south of Kailua-Kona Town over an extended period that encompassed the 2008 to 2011 recessionary period. The site was not encumbered with an affordable housing requirement, however the product design and company business plan facilitated marketing at price ranges that spanned workforce housing affordable ranges.

- **Single-family cluster (two condominiumized):**
 - **Kamakoa Ph 1A: Bungalows** – The 17 bungalow-style homes of the project described above are evaluated separately from the 74 more conventional products, to capture their unique market performance. Like the rest of Ph 1A, these bungalow homes are still subject to resale restrictions, and are located on small lots but have no common elements and thus are not subject to a condominium regime.

- **Holo Holo Ku at Parker Ranch** – This 2002 project in Waimea Town features single-family detached homes on relatively small lots. These homes are condominiumized and share certain common elements. It was developed by Rainalter and Alexander & Baldwin.
- **Pines I and II** – Like Holo Holo Ku, this project features detached single-family homes on small lots with certain common elements subject to a condominium regime. The 191 homes were developed near to Kailua-Kona by Taiyo Hawaii Co. in 1988 and 1990.
- **Town home** (all condominiumized):
 - **Makana Kai** – Makana Kai was the initial multifamily component of Castle & Cooke’s Wehilani community. Makana Kai included 92 units located in 4- and 6-plex buildings. The project was envisioned to have a second phase, but the adjacent site was recently sold for development as an affordable rental project instead (see Waikoloa Family Affordable, discussed below.)
 - **Seascape Condominium** – This 2007 to 2011 project by Kona Seascape Development includes 108 units in multiplex buildings. Sales were initially restricted to qualified buyers in the 120% to 140% AMI range, but the County allowed the developer to complete its last sales without qualification as market conditions deteriorated with recessionary conditions.

5.1.2. Density, Lot Size, and Unit Mix

Central tendencies with respect to density, unit mix, and sizes for the eight comparison projects are summarized as follows:

Table 13: Comparison Ownership Projects: Density, Lot Size, and Unit Mix

	Development density (units/acre)	Typical lot size (sq. feet)	Unit mix (bedrooms)	Notes
Single-family	3.2 to 4.1	7,000 to 7,800	Most 3s & 4s	Kamakoa Ph 1A is exclusively 3-bedrooms
SF cluster				
- Small lot	6.3	4,575	All 2s	1 sample: Kamakoa Ph 1A
- Condo	5.2 to 6.6	n/a	All 2s & 3s	
Town home	10.8 to 12.4	n/a	Most 2s & 3s	Makana Kai includes 1- to 3-Bs; Seascape is exclusively 2-Bs

Source: PBR HAWAII, 2022. See Appendix 5 for detailed information by project.

5.1.3. Typical Unit Sizes

Typical unit sizes for comparison ownership projects are measured in terms of net interior square feet, where available. Central tendencies for unit sizes among the sampled projects are summarized as follows:

Table 14: Comparison Ownership Projects: Typical Unit Sizes

	1-bed	2-bed	3-bed	4+bed	Notes
Single-family	n/a	860 – 1,050	1,100-1,350	1,650-1,800	Kamakoa Ph 1A is exclusively 3-bedrooms
SF cluster					
- Small lot	n/a	1,200	n/a	n/a	1 sample: Kamakoa Ph 1A
- Condo	n/a	1,050-1,300	1,200-1,400	n/a	
Town home	510	900-1,000	1,250	n/a	

Source: PBR HAWAII, 2022. See Appendix 5 for detailed information by project.

5.1.4. Sales Price Trends

Recent sales were evaluated for the eight ownership projects where available and are summarized by sample type below. Additionally, the initial pace of developer sales at the time of original product marketing is shown.

Table 15: Comparison Ownership Projects: Sales Prices and Pace

	2020-2021 median prices		Developer sales absorption ²⁰	Notes
	Low	High		
Single-family detached	\$337,500	\$712,500	30-100/year	Lowest price points reflect Kamakoa Ph 1A which is still in restricted sales period.
SF cluster				
- Small lot ²¹	n/a	\$325,000	7+/year	Reflects Kamakoa Ph 1A only
- Condo	\$501,000	\$534,500	20/year	Absorption reflects Holo Holo Ku only
Town home	\$345,000	\$349,025	30-35/year	Developer sales for both projects were affected by recession

Source: PBR HAWAII, 2022. See Appendix 5 for detailed information by project.

²⁰ Approximate number of home sales per year during years of substantial developer inventory.

²¹ Information reflects Kamakoa Nui Ph 1A only. Project is still in restricted resale period. No sales recorded in 2020 or 2021; price shown reflects most recent sale, in May 2019. Development period absorption affected by slow pace of construction as well as market acceptance.

5.2. Rental Market Comparisons

5.2.1. Selected Projects

Seven multifamily projects, representing 796 existing or planned units in affordable rental projects, were selected for comparison. These include three in Waikoloa Village, and four in the Kailua-Kona area. Two of the Kailua-Kona area projects, Lei ‘Ohana, in Kamakana Villages, and Kama‘āina Hale (in the Kealakehe area) are already tenant-occupied.

Table 16: Selected Comparison Rental Projects

Project/location	Developer	Est. site area (ac)	Est./ actual completion	AMI range	Number of units	Units per acre
Kama‘āina Hale	State HHFDC	6.9	2014	30%-80%	128	18.3
Lei ‘Ohana	Michaels Organization	2.9	2017	30%-60%	85	28.9
Na Hale Mākoa	Pacific Housing Assistance Corp.	10.3	2024	Up to 140%	140	13.2
Kaiāulu O Waikoloa	A0674 Waikoloa, LP (David Bigley)	4.6	2022	30%-60%	60	13.0
Kama‘āina Hale	Kama‘āina Hale, Inc.	6.9	2014	30%-80%	128	18.5
Honua‘ula Living Community	Honua‘ula LLC (Tango Development)	4.0	2023	30%-60%	112	28.0
Kaloko Heights	Hawai‘i Island Community Development Corporation	10.8	2024	30%-60%	100	9.3

Source: PBR HAWAII, 2022

5.2.2. Unit Mix by Number of Bedrooms

Affordable rental projects tend to focus on one-, two- and three-bedroom units. However, the two existing affordable rental projects surveyed, both in Kailua-Kona, offer one- and two-bedroom units only, while affordable projects that are under construction or planned will offer a broader range of units up to four bedrooms.

Table 17: Comparison Rental Projects: Unit Mix by Bedrooms

	1-bed	2-bed	3-bed	4-bed	Total
Operating - Kailua-Kona	30%	70%	0%	0%	100%
Under construction/planned – Waikoloa Village	25%	53%	17%	4%	100%
Under construction/planned – Kailua-Kona	5%	30%	49%	16%	100%

Source: PBR HAWAII, 2022. See Appendix 6 for detailed information by project.

5.2.3. Typical Unit Sizes

Typical unit sizes within the selected comparison projects are measured in terms of net interior square feet, where available. This assessment and the discussion below exclude Waikoloa Family Affordable Rentals because it is being built based on plans that had been prepared for market condominium units.

- **One-bedroom units** - Both existing and planned affordable multifamily units show one-bedroom units in the mid- to high-500 square foot range.
- **Two-bedroom units** – Those affordable units that are currently under construction or planned are somewhat smaller than reflected in the sample of such units already in operations, at an average 757 to 773 square feet, as opposed to 852 for the existing units.
- **Three- and four-bedroom units** - Only two of the comparison projects include three-bedroom units, and only one includes four-bedroom units. All of these are among the affordable projects now under construction or planned. Averages at these three projects range from 866 to 1,004 square feet for three-bedrooms at the proposed Waikoloa Village Center and Honua’ula Living Community, and 1,193 square feet for four-bedroom units at Honua’ula Living Community.

**Table 18: Comparison Rental Projects: Average Unit Sizes
In net interior square feet**

	1-bed	2-bed	3-bed	4-bed	Note
Operating - Kailua-Kona	555	852	n/a	n/a	
Under construction/planned – Waikoloa Village	562	773	866	n/a	
Under construction/planned – Kailua-Kona	585	757	1,004	1,193	Excludes Waikoloa Affordable Rentals

n/a – not applicable

Source: PBR HAWAII, 2022. See Appendix 6 for detailed information by project.

5.2.4. Rents, Vacancy, and Turnover Rates

In late 2021 and early 2022, area operators reported low vacancy and turnover rates of 9% or less per year. These findings are consistent with 2020 data for a private portfolio of nine Low Income Housing Tax Credits (LIHTC)-funded properties in the County with a median property age

of 3 years, and median size of 74 units²². This survey reported a mean physical occupancy rate of 98.6% (CohnReznick, 2022).

Since new listings were minimal, rent indicators from the comparison sample are derived from projections or asking rents from projects now under construction or planned. All those for which such data were available were targeted at the 30% to 60% AMI income groups. While reported rates are intended to be net of utilities, their range can be distorted from expectations of Section 8 or other rental subsidies for certain units. Nevertheless, the average of projected rents at comparison projects that are planned or under construction ranges as follows.

Table 19: Average Asking Rents for Selected Comparison Projects²³

	Low	Typical	High
1-bedroom units	\$296	\$543	\$588
2-bedroom units	\$598	\$901	\$1,164
3-bedroom units	\$1,196	\$1,357	\$1,974
4-bedroom units	\$1,321	\$1,533	\$2,062

²² The CohnReznick Hawaii County sample is further defined to include 71% family rentals, and 29% senior rentals, with 50% receiving project-based rental assistance. 67.5% of the sample had received 9% credit funding, and 32.5% had received 4% credit funding.

²³ Asking rents as shown are based on reports prepared at time of LIHTC application and can be expected to update to approach HHFDC rental market guidelines at time of leasing.

6. KAMAKOIA NUI MARKET ASSESSMENT

6.1. Unmet Housing Demand

As set forth in Section 3.4, the potential demand for additional housing in Waikoloa Village over the 2021 to 2040 period is estimated at 1,460 to 2,360 ownership units, and 1,280 to 2,070 rental units. After accounting for projects that are currently planned or under construction, potential unmet demand in the Village is estimated between 1,300 and 3,070 units.

Table 20: Waikoloa Village - Potential Unserved Demand for Housing

	Low scenario	High scenario	AMI Targets	Notes
Ownership units				
Demand	1,460+	2,360+		Table 6
Potential supply				
- Wehilani	(658)	(658)	No requirement	Based on former master plan
- Lot 178	(2)	(2)	Up to 140%	Undetermined use
- Keolalani	(253)	(253)	No requirement	Current planning area
Unplanned demand (rounded)	550	1,450		Or more depending on product affordability
Rental units				
Demand	1,280	2,070		Table 7
Potential supply				
- Projects under construction	(339)	(339)	30%-60%, and up to 140%	Table 7
- Proposed projects	(340)	(340)	Up to 140%	Table 7
Unplanned demand (rounded)	750	1,620		Or less if more served by ownership units
Total unplanned	1,300	3,070		

Source: PBR HAWAII, 2022

6.2. Product Mix by Tenure and AMI

Kamakoa Nui is planned as a 100% workforce affordable community. The Property was entitled and master planned for approximately 1,200 residential units, of which 185 have been built, and 140 are in development. With its remaining ±875 residential units, Kamakoa Nui cannot serve all the potential unmet demand for new housing in Waikoloa Village. Therefore, the attributes of demand and the project's unique circumstances are considered in recommending its mix by tenure and AMI.

Key factors in this assessment include:

- **The demand for ownership units is considerably higher** than suggested by the survey results reported elsewhere in this study. While the SMS survey suggests 56% of Island

residents who have specific plans to move and indicate the financial resources to do so, (“effective demand”), the survey found that 71% would prefer to buy should affordable options be available to do so.

- **The Property is not encumbered with restrictions on its resale for affordable housing purposes.** Unlike some lands that may have originated from State or County ownership, the Kamakoa Nui land does not carry restrictions that would impair its fee simple sale. Thus, Kamakoa Nui represents a somewhat unique opportunity to satisfy residents’ demands to access the ownership market, with its additional opportunities for capital accumulation.
- **Major entitled properties targeted for ownership units have no affordable housing requirements.** Despite the potential of substantial additional units to be sold at Wehilani and Keolalani, neither of these properties currently carry affordable housing requirements.
- **In the ownership market, single-family is preferred.** According to the SMS survey, 81% of intended buyers in the County would prefer a single-family home. Among buyers, the conventional single-family development model is still the goal for many (SMS Research and Marketing Services, Inc., 2016).
- **Waikoloa Village is a predominantly single-family community.**

Based on these considerations, it is recommended that Kamakoa Nui target fulfillment of a substantial share of the evidently strong resident aspirations for ownership opportunities and single-family homes. A suggested unit mix is as follows:

Table 21: Recommended Unit Mix, Density, and AMI

	Units	Mix	Average unit density ²⁴	AMI emphasis
Ownership units				
Single-family	480	53%	4.0	80% to 140%
SF cluster or condo	40	4%	5.5	60% to 120%
Multifamily	60	7%	11.0	60% to 120%
Subtotal	580	64%	4.4	
Rental units				
Multifamily	320	36%	16.0	30% to 60%; up to 120%
Total	900	100%	5.9	

Source: PBR HAWAII, 2022.

²⁴ Net developable area within bulk lots, not including major connector roads that may traverse a parcel, necessary set asides for historical, cultural or environmental features, etc.

While the small lot or single-family condominium developments appear to have offered satisfactory opportunities for affordable buyers to attain affordable product on O’ahu, it is a relatively new product on Hawai’i Island. OHCD representatives also indicate that the bungalow type units at Kamakoa Ph 1A were more difficult to sell than the conventional single-family homes on larger lots within the same development. Therefore, it is suggested that a relatively small area be offered for further experimentation with single-family cluster or detached horizontal condominium uses in the affordable housing market before committing to the full allocation for such use. Allocated areas could alternatively become more conventional single-family or multifamily for-sale product depending on market conditions and land availability.

6.3. Unit Mix and Sizes

Suggested unit mix and sizes would vary by site and business plan, but potential guidance is summarized as follows:

Table 22: Recommended Unit Mix and Sizes

	Unit mix	Typical unit sizes (net interior square feet)				Notes
		1-bed	2-bed	3-bed	4-bed	
Ownership units						
Single-family	Most 3s and 4s	n/a	1,200	1,300	1,500	May include 2s
SF cluster/condo	Most 2s and 3s	n/a	1,150	1,300	n/a	
Town home	Most 2s and 3s	700	1,000	1,200	n/a	
Rental units						
Multifamily	Most 2s and 3s	600	800	1,000	n/a	May include 1s

Source: PBR HAWAII, 2022.

With resale and shared equity rules expected to span 5 or 10 years from purchase date, some developers discourage affordable studio and one-bedroom units in the ownership market. They have experienced difficulty marketing such units, especially to entry level buyers who may be looking forward to marriage, having children or other changes that could increase their housing space needs within the resale period.

6.4. Pricing and Absorption Rates

Given the above product characteristics, analysis of comparison projects suggests the unit mix proposed at Kamakoa Nui could achieve pricing and absorption over the projection period as follows:

Table 23: Projected Pricing and Absorption Rates

	Units	Representative pricing (2021\$)	Average annual absorption	Notes on absorption
Ownership units				
Single-family	480	\$350,000 - \$650,000	45	11+ years
SF cluster or condo	40	\$325,000- \$500,000	20	2+ years
Town home	60	\$275,000 - \$450,000	25	2+ years
Subtotal	580			
Rental units				
Multifamily	320	HHFDC rental guidelines	40	Pace constrained by competition for financing
Total	900			

Source: PBR HAWAII, 2022.

6.5. Projected Community Absorption

The master plan for Kamakoa Nui is currently being refined and OHCD is drafting and reviewing documents related to its intended bulk lot offerings. The goal is to issue initial RFPs by first quarter of 2023, with awards secured before mid-year. Subsequent planning, design, permitting, and construction by the initial developers is estimated within two to three years thereafter. This could allow the first unit closings and occupancies to occur in 2026. A conceptual timeline for absorption of the community is presented below.

Table 24: Conceptual Timeline for Residential Absorption

	Units	Annual absorption	Potential development phasing			
			2022-25	2026-33	2034-40	Total
Number of years in period			4	8	7	19
Ownership units						
Single-family	480	45	0	360	120	480
SF cluster	40	20	0	40		40
Town home	60	25	0	60		60
Rental Units						
Multifamily	320	40	0	320	0	320
Total	900		0	780	120	900

Source: PBR HAWAII, 2022.

Assuming appropriate parcels may be sited within the property and development interest is identified, the majority of units, including all rental and multifamily or cluster products could conceptually be available as primary housing by about 2033. The remaining inventory could be

completed before 2040. Actual production and absorption of units will depend on future finance, market, supply chain, and labor market conditions over the implementation period.

6.6. Bulk Lot and Other Recommendations

Interviews with executives of seven private companies experienced with Waikoloa Village and/or West Hawai'i primary residential development suggest RFPs may attract interest if land is offered such as noted below.

- **For ownership unit** development (fee simple):
 - Single-family – 20- to 50-acre parcels
 - Single-family cluster/condominium – 5- to 10-acre parcels
 - Town home – 4- to 8-acre parcels
- **For rental unit** development: 3- to 10-acre parcels (minimum 65-year ground lease)

When bidding on sites, some developers may prefer to commit to an area towards the lower range of these ranges, with options to take down additional property nearby that would cumulate towards the higher end of these ranges, for next phases of development.

Given the demands of exclusively affordable housing production and Waikoloa area conditions specifically, developers also offered the following comments:

- Prefer major connector roads and other regional infrastructure be completed by County.
- Seek utilities stubbed to the edge of bulk parcel offerings.
- Option to take down adjacent or other lot near to one that is committed to is attractive.
- Prefer RFPs minimize or eliminate any requirements for non-housing development or initiatives. Any funds spent on infrastructure, etc. is dollars that cannot support housing.
- Prefer no community association, or minimal common elements to be maintained if necessary.
- Prefer relaxed subdivision requirements such as to permit elimination of some planter strips, sidewalks on one side of road, etc. Wehilani standards suggested as a model.
- Specific to ownership product:
 - Why not forgo the public buyback option? It's rarely if ever exercised, and poses additional requirements that discourages some sales. So long as any resale during the restricted period continues to be within a price range appropriate to the intended AMIs, it will continue to maintain the affordable inventory and allow the affordable housing benefits to extend to more households.
 - Could targeted households be ensured by home pricing, design, owner-occupancy requirement, and shared appreciation rules during a restricted period, without requiring income qualification? Some Maui projects have allowed this. Would reduce marketing bureaucracy and market resistance.
 - Income benchmarks do not adequately account for household debt. For instance, a couple could fall in 100% AMI group, but have the disposable income of an 80% or lower AMI group due to student debt.

- Some very wary of condominium structures due to litigious environment.
- Specific to affordable rental development:
 - “Free” land granted by County is very meaningful in competing for State’s 9% LIHTC.
 - 65-year ground lease term is a minimum requirement because LIHTC applicants must demonstrate 61 years of operations.
 - 75- to 100-unit increments is the “sweet spot” for obtaining 9% LIHTC awards; additional increments may find funding with a simultaneous 4% LIHTC application, or phasing could alternate 9% and 4% applications for a larger development.
 - 3-story walk-ups have been built in West Hawai’i, but many find them too dense for market preferences.
 - Hope that County will utilize its allocated bond capacity to support affordable rentals.
 - There may be emerging demand for senior affordable rentals in Waikoloa Village, but some still seek to honor the workforce housing mission of the area.
- Other community amenities that would be attractive to future residents and hence developers: bike paths, community-based childcare facility.

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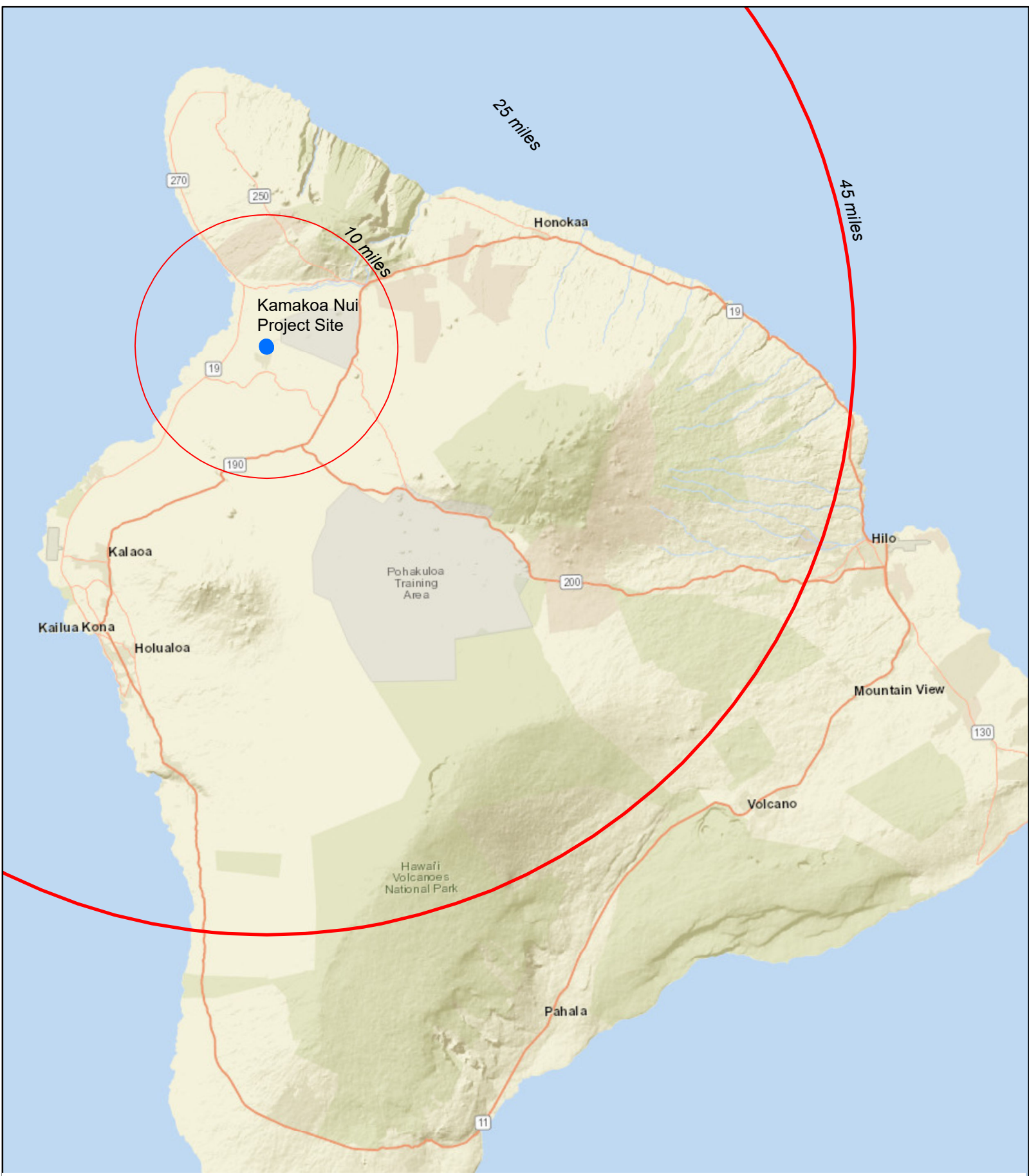
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Appendix 1: Employment Surrounding Project Site




	# BUSINESSES	# EMPLOYEES
0-10 MILE RADIUS	742	10,029
10-45 MILE RADIUS	2,956	26,569
TOTAL	3,698	36,598

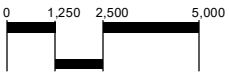

Source: ESRI/Data Axle, 2021

Appendix 1:
Estimated Businesses and Employees
Surrounding Kamakoa Nui

County of Hawai'i, Office of Housing and Community
 North
 Island of Hawai'i



Linear Scale (feet)
 0 1,250 2,500 5,000






**Appendix 2:
Waikoloa Village Area Subdivisions Map**

- | | | | |
|---------------------------------|---|---|--------------------------------|
| 1. Wehilani | 7. Waikōloa Village Unit 1A | 15. Fairway Terrace Apts. | 24. Keolalani at Waikoloa |
| 1A. Makana Kai at Wehilani Ph 1 | 8. Franklin Place | 16. The Pointe at Waikōloa | 25. Ke Kumu Ekahi, Elua, Ekolu |
| 1B. Kikaha at Wehilani | 9. Waikōloa Hills Condo | 17. Waikōloa Village Condos | 26. Nā Hale Mākoa |
| 1C. Wehilani-Balance of site | 10. Greens at Waikōloa | 18. Waikōloa Fairways | 27. Waikōloa Family Affordable |
| 2. Kipono Hills | 11. 17th Fairway Villas at Waikōloa | 19. Waikōloa Village Unit 1B+ | 28. Waikōloa Village Center |
| 3. Pheasant Ridge | 12A. Eilima Lani Condominiums | 20. Waikōloa Village / Kilohana Kai at Waikōloa | 29. The Lofts at Waikōloa |
| 4. Sunset Ridge III | 12B. Eilima Lani Condominiums | 21. Paniolo Estates | 30. Kaiāulu O Waikōloa |
| 5. Sunset Ridge II | 13. Paniolo Gardens / Paniolo Club I & II | 22. Lot 178 | 31. Waikōloa Gardens |
| 6. Sunset Ridge I | 14. Waikōloa Villas Ph I & II | 23. Kamakoa Ph 1A | |



LEGEND

- | | |
|--|--|
|  Kamakoa Nui Original Area |  For-Sale Projects: Under Construction/Planned/Future |
|  Kamakoa Nui Current Planning Area |  Existing Rental Housing Projects |
|  Existing For-Sale Projects |  Rental Projects: Under Construction/Planned/Future |

Source: PBR HAWAII, Based on County of Hawaii, 2020; HHFDC, 2021; State of Hawaii, 2021; ESRI, 2021

Appendix 2: Date: 3/16/2022
Waikoloa Village Area Subdivisions

County of Hawaii, Office of Housing & Community

North

Linear Scale (feet)

0 750 1500

Island of Hawaii

PBR HAWAII & ASSOCIATES, INC.

**Appendix 3:
Waikoloa Village Area Subdivisions**

Appendix 3:

Waikoloa Village Area Subdivisions

As of January 2022

Map reference	Project Name	Tenure	Development Type	Developer	Built by 01/2022	Potential Future Units*	Site area (acres)	Gross units per acre	Year(s) built
1A	Makana Kai at Wehilani, Ph 1	For Sale	MF	Castle and Cooke Waikoloa LLC	92	-	7.7	11.9	2007-2009
1B	Kikaha at Wehilani	For Sale	SF	Castle and Cooke Waikoloa LLC	54	-	26.3	2.1	2006-2009
1C	Wehilani -Balance of site (future density est)	For Sale	TBD	Castle and Cooke Waikoloa LLC	-	658	214.3	n/a	n/a
2	Kipono Hills	For Sale	SF	INA	67	-	33.8	2.0	1991
3	Pheasant Ridge at Waikoloa	For Sale	SF	Pheasant Ridge Corp	44	-	17.4	2.5	INA
4	Sunset Ridge, Phase 3	For Sale	SF	Towne Development	252	-	102.7	2.5	1991
5	Sunset Ridge, Phase 2	For Sale	SF	Towne Development	95	-	34.1	2.8	1991
6	Sunset Ridge, Phase 1	For Sale	SF	Towne Development	30	-	12.1	2.5	1987
7	Waikoloa Village Unit 1A	For Sale	SF	INA	88	-	31.8	2.8	INA
8	Frankolin Place	For Sale	SF	INA	17	-	6.8	2.5	1992
9	Waikoloa Hills Condo	For Sale	MF	Waikoloa Hills Association	78	-	5.3	14.7	1990s
10	Greens at Waikoloa	For Sale	MF	CJDPL HAWAII LLC	197	-	13.8	14.3	1990
11	17th Fairway Villas at Waikoloa	For Sale	MF	Towne Development	27	-	5.1	5.3	2005
12A	Elima Lani Condominiums	For Sale	MF	Towne Development/ Steadfast Ela LLC	89	-	4.3	20.7	1988
12B	Elima Lani Condominiums	For Sale	MF	Towne Development/ Steadfast Ela LLC	128	-	6.8	18.8	1988

Appendix 3:

Waikoloa Village Area Subdivisions

As of January 2022

Map reference	Project Name	Tenure	Development Type	Developer	Built by 01/2022	Potential Future Units*	Site area (acres)	Gross units per acre	Year(s) built
13A	Paniolo Club I & II	For Sale	MF	Paniolo Club LLC	60	-	4.6	13.0	1979
13B	Paniolo Gardens	For Sale	MF	Paniolo Gardens Condo LLC	17	-	1.2	14.5	2006
14	Waikoloa Villas Ph I & II	For Sale	MF	Schuler Homes	105	-	9.8	10.7	1980s
15	Fairway Terrace Apts.	For Sale	MF	Fairway Terrace Asscs HI	199	-	11.8	16.9	1989
16	The Pointe at Waikoloa	For Sale	MF	KVS Enterprises	26	-	2.3	11.3	2006
17	Waikoloa Village Condos	For Sale	MF	Mauna Kea South Pt LTD	38	-	1.4	27.1	INA
18	Waikoloa Fairways	For Sale	MF	Yotsuyaken Corp	51	-	3.7	13.8	1991
19	Waikoloa Village Unit 1B+	For Sale	SF	Boise Cascade	884	-	341.2	2.6	1960s
20	Waikoloa Village and Kilohana Kai at Waikoloa	For Sale	SF lots and homes	Hawaiian Island Dev. Co., Towne (31 homes)	401	-	141.1	2.8	2003-2010
21	Paniolo Estates	For Sale	SF	County of Hawai'i/ Schuler Homes	178	-	43.6	4.1	1992
22	Lot 178 (in Kamakoa Nui) (minimal development)	For Sale	TBD	County of Hawai'i	-	2	3.6	n/a	INA
23	Kamakoa Ph 1A (in Kamakoa Nui)	For Sale	SF	County of Hawai'i/ Habitat for Humanity/ UniDev	91	-	22.9	4.0	2014-2016
24	Keolalani at Waikoloa (initial phase)	For Sale	SF	Waikoloa Heights Land Investors LP	-	253	130.0	1.9	2023+
25	Ke Kumu Ekahi, Elua, Ekolu (in Kamakoa Nui)	For Rent	MF	Nansay/Hawaii Public Housing Authority	94	-	11.7	8.0	INA
26	Na Hale Makoa (in Kamakoa Nui)	For Rent	MF	Pacific Housing Assistance Corp.	-	140	10.6	13.2	2024

Appendix 3:

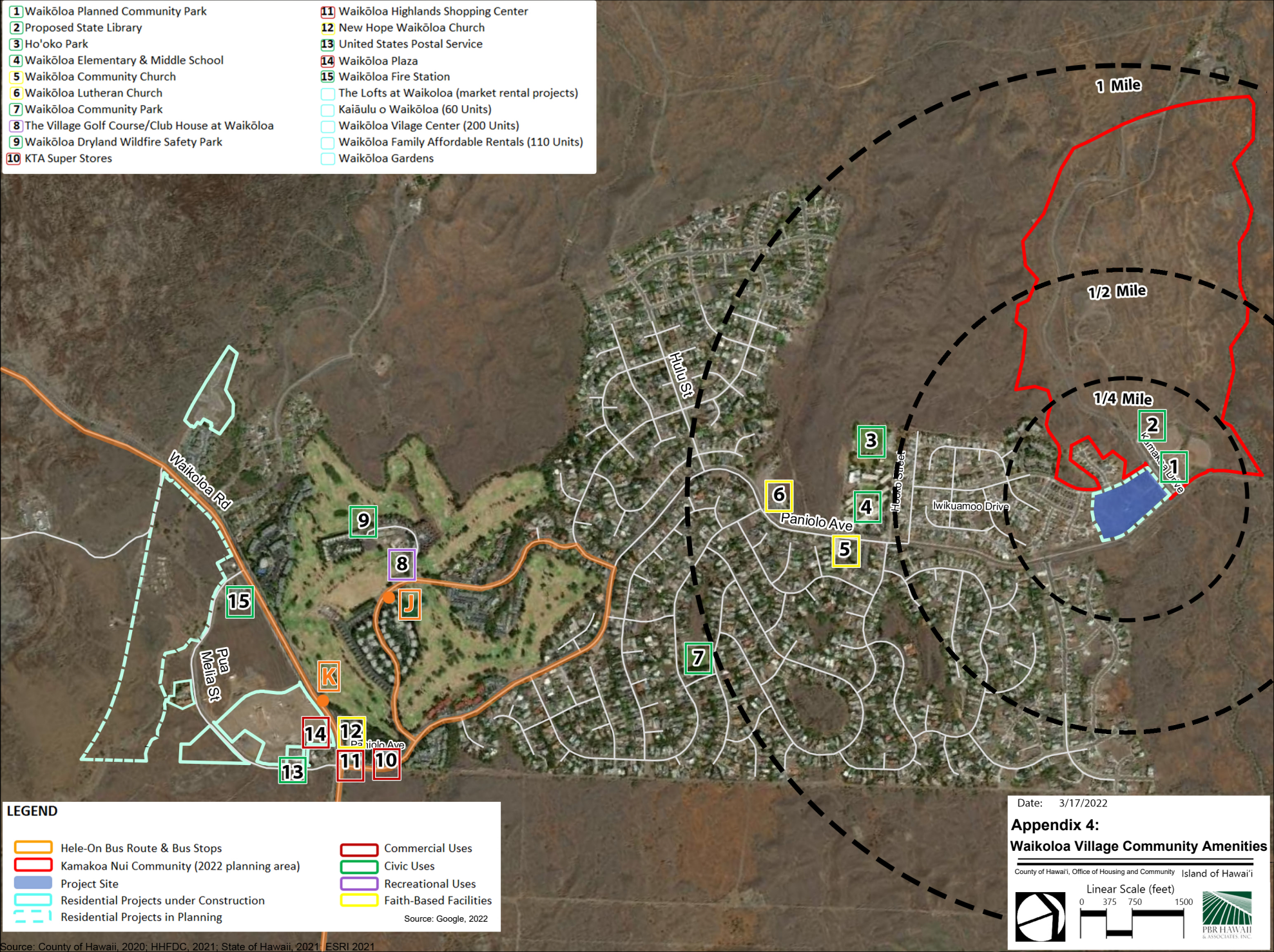
Waikoloa Village Area Subdivisions

As of January 2022

Map reference	Project Name	Tenure	Development Type	Developer	Built by 01/2022	Potential Future Units*	Site area (acres)	Gross units per acre	Year(s) built
27	Waikoloa Family Affordable	For Rent	MF	Gary S. Furuta	-	111	8.0	13.9	2023
28	Waikoloa Village Center	For Rent	MF	Brown Development	-	200	INA	INA	2025
29	The Lofts at Waikoloa (3 developments)	For Rent	MF	Meridian Pacific, Ltd.	-	168	18.1	9.3	2022
30	Kaiaulu O Waikoloa	For Rent	MF	A0674 Waikoloa, LP (David Bigley)	-	60	4.6	13.0	2022
31	Gilbert de Motta Waikoloa Gardens (Jack Hall Kona)	For Rent	MF	INA	24	-	2.3	10.4	1984
Totals					3,426	1,592	1,295	3.9	
For sale					3,308	913	1,240	3.4	
For rent					118	679	55	10.8	
Source: PBR HAWAII, 2022 based on County of Hawaii real property records, GIS information, interviews with developers and landowners, other sources.									

Appendix 4:
Waikoloa Village Community Amenities

- 1 Waikōloa Planned Community Park
- 2 Proposed State Library
- 3 Ho'oko Park
- 4 Waikōloa Elementary & Middle School
- 5 Waikōloa Community Church
- 6 Waikōloa Lutheran Church
- 7 Waikōloa Community Park
- 8 The Village Golf Course/Club House at Waikōloa
- 9 Waikōloa Dryland Wildfire Safety Park
- 10 KTA Super Stores
- 11 Waikōloa Highlands Shopping Center
- 12 New Hope Waikōloa Church
- 13 United States Postal Service
- 14 Waikōloa Plaza
- 15 Waikōloa Fire Station
- The Lofts at Waikoloa (market rental projects)
- Kaiāulu o Waikōloa (60 Units)
- Waikōloa Vilage Center (200 Units)
- Waikōloa Family Affordable Rentals (110 Units)
- Waikōloa Gardens



LEGEND

Hele-On Bus Route & Bus Stops	Commercial Uses
Kamakoa Nui Community (2022 planning area)	Civic Uses
Project Site	Recreational Uses
Residential Projects under Construction	Faith-Based Facilities
Residential Projects in Planning	

Source: Google, 2022

Date: 3/17/2022

Appendix 4:
Waikoloa Village Community Amenities

County of Hawaii, Office of Housing and Community Island of Hawai'i

Linear Scale (feet)
0 375 750 1500

**Appendix 5:
Performance Indicators for Comparison
For-Sale Rental Projects**

Appendix 5:

Performance Indicators for Comparison For-Sale Rental Projects

Project name, location, (developer)	Year(s) built/ sold	Total units	Site area (acres)	Density (gross units/acre)	Representative lot sizes (square feet)			Unit mix				
					Low	Typical	High	1-bed	2-bed	3-bed	4+ bed	
Single-family conventional												
Paniolo Estates, Kamakoa Nui (Co. of Hawaii and Schuler Homes)	1992	178	43.6	4.1	7,500	7,800	17,200	n/a	15%	76%	9%	
Kamakoa Ph 1A: Conventional, Kamakoa Nui (Co. of Hawaii and Habitat for Humanity)	2012-18	74	20.2	3.7	5,700	7,000	11,000	n/a	n/a	100%	n/a	
Pualani Estates, North Kona (D.R. Horton)	2004-2009	362	114.5	3.2	6,000	7,500	10,000	n/a	INA	INA	INA	
Single-family cluster												
- Small lot Kamakoa Ph 1A: Bungalows, Kamakoa Nui (Co. of Hawaii and Habitat for Humanity)	2014-2017	17	2.7	6.3	4,250	4,575	4,900	n/a	100%	n/a	n/a	
- Condos Holo Holo Ku at Parker Ranch, Waimea Town (Rainalter/A&B)	2002	44	8.5	5.2	n/a	n/a	n/a	n/a	52%	48%	n/a	
Pines I and II, North Kona (Taiyo Hawaii Co.)	1988-1990	191	28.8	6.6	n/a	n/a	n/a	n/a	INA	INA	n/a	
Town home (Condos)												
Makana Kai, Wehilani, Waikoloa Village (Castle & Cooke)	2006-2009	92	7.4	12.4	n/a	n/a	n/a	9%	50%	41%	n/a	
Seascape Condominium, Kalaoa, North Kona (Kona Seascape Development LLC)	2007-2011	108	10.0	10.8	n/a	n/a	n/a	0%	100%	0%	0%	

n/a - Information not applicable; NA - information not available.

Source: PBR HAWAII based on MLS Hawaii database; interviews ; project websites; published sources.

Appendix 5:

Performance Indicators for Comparison For-Sale Residential Projects, Con't.

Project name, location, (developer)	Representative unit sizes (net interior square feet)				2020-2021 sales price indicators			Developer sales pace ¹	Comments
	1-bed	2-bed	3-bed	4+ bed	Low	Median	High		
Single-family conventional									
Paniolo Estates , Kamakoa Nui (Co. of Hawaii and Schuler Homes)	n/a	860-1700, median 860	860-2,270, median 1,120	1,350-2,300, median 1,800	\$350,000	\$548,000	\$680,000	108	All sales closed between 7/1992 and 3/1994
Kamakoa Ph 1A: Conventional , Kamakoa Nui (Co. of Hawaii and Habitat for Humanity)	n/a	n/a	930-1,420, average 1,300	n/a	\$334,000	\$337,500	\$341,000	30+	³ Restricted resale period in place until ~2022/2029; only 2 to 30 completed in any year; see also "Bungalows" below
Pualani Estates , North Kona (D.R. Horton)	n/a	1,050	1,150-2,000, typical 1,350	1,350-2,650, typical, 1,650	\$500,000	\$712,500	\$903,000	50-70/year	⁴ Few 2- and 5-bedroom units, but nearly all 3 & 4
Single-family cluster									
- Small lot Kamakoa Ph 1A: Bungalows , Kamakoa Nui (Co. of Hawaii and Habitat for Humanity)	n/a	920-1,400, average 1,200	n/a	n/a	n/a	\$325,000 ²	n/a	7+	³ Alley-loaded homes; Restricted resale period in place until ~2024/2028; only 2 to 7 produced per year; see also "Conventional" above
- Condos Holo Holo Ku at Parker Ranch , Waimea Town (Rainalter/A&B)	n/a	1,150-1,650, typical 1,300	1,250-1,640, typical 1,400	n/a	\$440,000	\$501,000	\$685,000	20/year	Single-family detached "ranch home" condominiums
Pines I and II , North Kona (Taiyo Hawaii Co.)	n/a	950-1,100, typical 1,050	1,209	n/a	\$425,000	\$534,500	\$678,000	INA	Single-family detached condos/ZLL; 75% Island residents at original sales
Town home (Condos)									
Makana Kai , Wehilani, Waikoloa Village (Castle & Cooke)	514	825-1,000, typical 900	1,245	n/a	\$151,625	\$345,000	\$535,000	35/year	⁴ 4- and 6-plex THs; Ph II not undertaken; 80% primary residents at initial sales
Seascape Condominium , Kalaoa, North Kona (Kona Seascape Development LLC)	n/a	1,010	n/a	n/a	\$300,000	\$349,025	\$424,100	28/year	⁴ Multiplex TH flats; originally restricted to 120% to 140% AMI, but allowed to complete sales without qualification

n/a - Information not applicable; NA - information not available.

¹ Range of average annual sales during years of substantial developer inventory, where known.

² No sales recorded in 2020 and 2021. Median figure shown represents the most recent sale, in May 2019.

³ Absorption figures estimated based on product completion dates and absorption in periods with greater inventory; figures shown likely reflect slow production.

⁴ Developer sales period spanned effects of "great recession", or 2008-2011.

Source: PBR HAWAII based on MLS Hawaii database; interviews ; project websites; published sources.

**Appendix 6:
Waikoloa Village Area Rental Projects
Under Development**

Appendix 6: Waikoloa Village Area Rental Projects Under Development
As of January 2022

Project	Developer	Site area (ac)	Area	Total units	Affordable Units*	No. stories	As noted	Unit mix by income limit (AMI)						Est. Construction Start Date	Est. or Actual Completion/ Occupancy
								30-60%	60-80%	80-100%	100-120%	120-140%	Market		
Operating															
Kama'aina Hale	State of Hawaii, HHFDC	6.9	Kailua-Kona	128	126	2	30%-80%	42	84				2	128	2014
Lei Ohana	Michaels Organization	2.9	Kailua-Kona	85	85	3	30%-60%	84					1	85	2016
<i>Subtotal/average</i>		<i>4.9</i>		<i>213</i>	<i>211</i> <i>99%</i>	<i>3</i>		<i>126</i> <i>59%</i>	<i>84</i> <i>39%</i>	<i>0</i> <i>0%</i>	<i>0</i> <i>0%</i>	<i>0</i> <i>0%</i>	<i>3</i> <i>1%</i>	<i>213</i> <i>100%</i>	
Under construction or planned															
Waikoloa Family Affordable Rentals	GSF Inc. (Gary S Furuta)	8.0	Waikoloa Village	110	110	2	30%-60%	110					1	111	2021
Kaiāulu O Waikoloa	A0674 Waikoloa, L.P. (Ikaika Ohana)	4.6	Waikoloa Village	60	59	2	30%-60%	59					1	60	2021
Kamakoa Nui Multifamily Rentals	Pacific Housing Assistance Corporation	10.3	Waikoloa Village	140	139	2	30%-140%	66	47	11	8	7	1	140	2023
Waikoloa Village Center	Brown Development	ina	Waikoloa Village	200	200	1-3	80% - 140%			67	66	67		200	2023
Hōnua'ula Living Community	Hōnua'ula, LCC (Tango Development)	4.0	Kailua-Kona	112	112	4	30%-60%	24	88					112	2022
Kaloko Heights	Hawaii Island Community Development Corp.	10.8	Kailua-Kona	100	100	2-3	30%-60%	100						100	2022
<i>Subtotal/average</i>		<i>7.5</i>		<i>722</i>	<i>720</i> <i>100%</i>	<i>3</i>		<i>359</i> <i>50%</i>	<i>135</i> <i>19%</i>	<i>78</i> <i>11%</i>	<i>74</i> <i>10%</i>	<i>74</i> <i>10%</i>	<i>3</i> <i>0%</i>	<i>723</i> <i>100%</i>	
Total/average		6.8		935	931	2.5		485	219	78	74	74	6	936	

ina - information not available

*Counts exclude manager's unit(s), where data available.

Source: PBR HAWAII, 2022 based on County of Hawaii real property records, GIS information, interviews with developers and landowners, other sources.

APPENDIX E

Order of Magnitude Cost Estimate

KAMAKOIA MASTER PLANNING

6-Oct-22

Rough Order of Magnitude (ROM) Cost

ROM is based on the Conceptual Bulk Lot Plan Workforce Housing Project by PBR Hawaii, dated 5/19/22

MINI-LOOP ROM (Road encompassing Lots 1 thru 5 and 20)	
1. General Conditions - Mob/Demob, Const Survey, Dust Control, BMPs, Const Mgr	\$ 300,000.00
2. Earthwork - Clear & Grubb, excavation, embankment	\$ 750,000.00
3. Site Work - Curb, Gutter, sidewalks, base course, AC pavement	\$ 3,400,000.00
4. Sewer System - sewer mains, laterals, manholes	\$ 700,000.00
5. Water System - water mains, hydrants, valves	\$ 2,400,000.00
6. Electrical System - HELCO power, cable, tele	\$ 4,100,000.00
	Subtotal
	\$ 11,650,000.00
	15% Contingency
	\$ 1,747,500.00
	Total Mini Loop ROM
	\$ 13,397,500.00
	Rounded
	\$ 13,400,000.00

PARCEL 11 ROM (Internal Roadways)	
1. General Conditions - Mob/Demob, Const Survey, Dust Control, BMPs, Const Mgr	\$ 320,000.00
2. Earthwork - Clear & Grubb, excavation, embankment	\$ 500,000.00
3. Site Work - Curb, Gutter, sidewalks, base course, AC pavement	\$ 1,350,000.00
4. Sewer System - sewer mains, laterals, manholes	\$ 650,000.00
5. Water System - water mains, hydrants, valves	\$ 750,000.00
6. Electrical System - HELCO power, cable, tele	\$ 2,000,000.00
	Subtotal
	\$ 5,570,000.00
	15% Contingency
	\$ 835,500.00
	Total Parcel 11 ROM
	\$ 6,405,500.00
	Rounded
	\$ 6,400,000.00

BALANCE LARGE LOOP ROAD ROM (Road encompassing Lots 6 thru 10, and 14 & 15)	
1. General Conditions - Mob/Demob, Const Survey, Dust Control, BMPs, Const Mgr	\$ 350,000.00
2. Earthwork - Clear & Grubb, excavation, embankment	\$ 650,000.00
3. Site Work - Curb, Gutter, sidewalks, base course, AC pavement	\$ 3,000,000.00
4. Sewer System - sewer mains, laterals, manholes	\$ 700,000.00
5. Water System - water mains, hydrants, valves	\$ 2,000,000.00
6. Electrical System - HELCO power, cable, tele	\$ 3,100,000.00
	Subtotal
	\$ 9,800,000.00
	15% Contingency
	\$ 1,470,000.00
	Total Large Loop Road ROM
	\$ 11,270,000.00
	Rounded
	\$ 11,300,000.00

Appendix B:
Pre-Assessment Consultation
Comments and Responses



From: Adams, Douglass <Douglass.Adams@hawaiicounty.gov>
Sent: Tuesday, May 30, 2023 3:53 PM
To: Bradley Furuya
Cc: Hew Len Lee, Joelle; Cevallos, Frecia
Subject: FW: Pre-Assessment Consultation for EA- Public Library at Kamakoa, Waikoloa Village

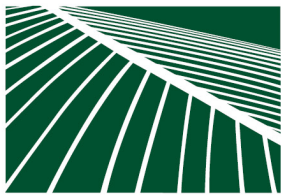
Aloha Bradley,

Thank you for the opportunity to provide input to PBRHawaii on the proposed project: a public library at Kamakoa, Waikoloa Village, County of Hawaii. We have some comments regarding the library and especially the child care portion of the facility.

- 1) The location of the library appears quite distant from the heart of the community.
- 2) If the library were to include a classroom, it would need to be single-use space, specifically for childcare and not available for other uses/meetings.
- 3) There are several locations for childcare opportunities within the local area: Cole Academy at Mauna Lani; 4 licensed family childcare facilities within the community; preschool at Waikoloa Baptist Church; and EOEL classroom to be opened Fall 2024 at Waikoloa ES. We wonder what the requirement for preschool childcare is in Waikoloa Village.

v/r Doug

Douglass S. Adams
Director
Dept of Research & Development
County of Hawai'i
W: (808) 961-8368
C: (808) 825-5195



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printed on recycled paper

December 29, 2023

Mr. Douglas S. Adams
Director
County of Hawai'i
Department of Research and Development
25 Aupuni Street Suite 1301
Hilo, HI 96720

SUBJECT: PRE-ASSESSMENT CONSULTATION FOR A HRS CHAPTER 343 ENVIRONMENTAL ASSESSMENT FOR A PUBLIC LIBRARY AT KAMAKOEA, WAIKOLOA VILLAGE, COUNTY OF HAWAI'I, HAWAI'I, TMK (3) 6-8-041:020

Dear Mr. Adams,

Thank you for your email dated May 30, 2023. As the planning sub-consultant for the State of Hawai'i Department of Accounting and General Services (DAGS) and the Hawai'i State Public Library System (HSPLS), we acknowledge the comments from the County of Hawai'i, Department of Research and Development and offer the following responses.

1. The proposed Project will be located within the Kamakoa Nui Master Plan area, which is planned for up to 1,250 residential units over the next 20 years. Although its location may appear quite distant from the majority of existing residential development in Waikoloa Village, the proposed public library and Early Learning Center (ELC) are anticipated to function as a central gathering place for future residents of the Kamakoa Nui Master Plan area and the greater Waikoloa Village community.
2. The proposed public library includes shelving for a minimum of 50,000 books, private meeting rooms, a program room, a work room, support space, and a librarian's office. The ELC, connected to the library, will have two classrooms dedicated to ELC students. No classrooms are planned to be located in the library itself.
3. Public Libraries have long been an educational resource for communities and young children. This has been supported by HRS Section 312-12, which allows for the building of Early Learning Centers (ELCs) on library-controlled properties focused on educational type setting/resources, thereby expanding The State Department of Education's reach beyond the K through 12 classroom to include 3-5 year old students. In the preliminary design of the Waikoloa Public Library, students of the Early Learning Center classrooms will have convenient access to the entire library via a secured passage when the library is open and a portion of the Children's Collection when the library is closed.

We value your participation in the environmental review process. Your letter will be reproduced in the forthcoming Draft EA.

Sincerely,

PBR HAWAII

Bradley Furuya, AICP
Associate

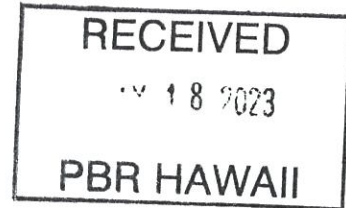
cc: Glenn Miura, CDS International
State of Hawai'i, Department of Accounting and General Services (DAGS)
Hawai'i State Public Library System



DEPARTMENT OF WATER SUPPLY • COUNTY OF HAWAII

345 KEKŪANAŌ'A STREET, SUITE 20 • HILO, HAWAII 96720
TELEPHONE (808) 961-8050 • FAX (808) 961-8657

May 15, 2023



Mr. Bradley Furuya
PBR Hawai'i & Associates, Inc.
1001 Bishop Street, Suite 650
Honolulu, HI 96813-3484

Dear Mr. Furuya:

**Subject: Pre-Environmental Assessment Consultation for a Public Library at
Kamakoa, Waikōloa Village
Tax Map Key (3) 6-8-041:020**

This is in response to your Pre-Environmental Assessment Consultation request dated April 28, 2023.

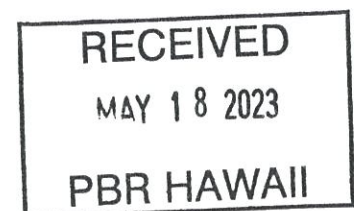
Please be informed that the water system in the area is privately owned and operated. We recommend that you contact the Hawai'i Water Service to determine any impacts the subject project will have on their water system.

Should there be any questions, please contact Mr. Ryan Quitoriano of our Water Resources and Planning Branch at (808) 961-8070, extension 256.

Sincerely yours,

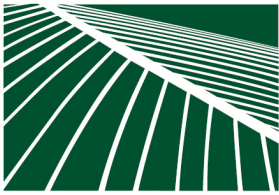
Keith K. Okamoto, P.E.
Manager-Chief Engineer

RQ:dfg



... Water, Our Most Precious Resource ... Ka Wai A Kāne ...

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Honolulu, Hawai'i 96813-3484
Tel: (808) 521-5631
Fax: (808) 523-1402
E-mail: sysadmin@pbrhawaii.com

December 29, 2023

Mr. Keith Okamoto
Director
County of Hawai'i
Department of Water Supply
345 Kekūanāo'a Street Suite 20
Hilo, HI 96720

SUBJECT: PRE-ASSESSMENT CONSULTATION FOR A HRS CHAPTER 343 ENVIRONMENTAL ASSESSMENT FOR A PUBLIC LIBRARY AT KAMAKOA, WAIKOLOA VILLAGE, COUNTY OF HAWAI'I, HAWAI'I, TMK (3) 6-8-041:020

Dear Mr. Okamoto,

Thank you for your letter dated May 15, 2023. As the planning sub-consultant for the State of Hawai'i Department of Accounting and General Services (DAGS) and the Hawai'i State Public Library System (HSPLS), we appreciate the referral to Hawai'i Water Service. We will contact them to determine any impacts the proposed Project may have on their water system.

We value your participation in the environmental review process. Your letter will be reproduced in the forthcoming Draft EA.

Sincerely,

PBR HAWAII

Bradley Furuya, AICP
Associate

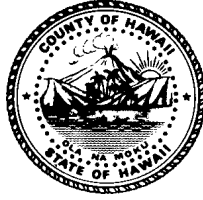
cc: Glenn Miura, CDS International
State of Hawai'i, Department of Accounting and General Services (DAGS)
Hawai'i State Public Library System

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Mitchell D. Roth
Mayor

Lee E. Lord
Managing Director

West Hawai'i Office
74-5044 Ane Keohokālole Hwy
Kailua-Kona, Hawai'i 96740
Phone (808) 323-4770
Fax (808) 327-3563



County of Hawai'i

PLANNING DEPARTMENT

Zendo Kern
Director

Jeffrey W. Darrow
Deputy Director

East Hawai'i Office
101 Pauahi Street, Suite 3
Hilo, Hawai'i 96720
Phone (808) 961-8288
Fax (808) 961-8742

June 14, 2023

PBR HAWAII & Associates, Inc.
Attn: Bradley Furuya
1001 Bishop Street, Suite 650
Honolulu, HI 96813-3484

Dear Bradley Furuya:

SUBJECT: Pre-Assessment Consultation for Environmental Assessment
Project: Kamakoa Public Library
TMK: (3) 6-8-041:020, Waikoloa Village, Hawai'i

Thank you for your letter dated April 28, 2023, requesting comments from this office regarding the preparation of a Draft Environmental Assessment (DEA) for the subject project.

The applicant is proposing the construction and operation of a Public Library in Waikoloa Village that would include an approximately 12,000 square foot public library, approximately 3,000 square foot Early Learning Center, 71-stall parking lot, and complimentary landscaping. The proposed library includes shelving for a minimum of 50,000 books, private meetings rooms, a program room, a work room, support space, and a librarian's office. The connected Early Learning Center will have two classrooms, each capable of accommodating roughly 20 students.

The subject parcel consists of 2.567 acres. The entire parcel is zoned Single-Family Residential (RS-10) by the County and designated as Urban by the State Land Use Commission. Hawai'i County Code, Chapter 25 (Zoning Code), Section 25-5-3 (a) notes community building as permitted uses within the RS district. In addition, Hawai'i County Code, Chapter 25 (Zoning Code), Section 25-4-11 (c) requires that public uses, structures, and buildings and community buildings are permitted uses in any district, provided that the director has issued plan approval for such use. Therefore, the proposed project will require a Plan Approval issued by this office.

According to the County of Hawai'i General Plan 2005, amended December 2006, the property is designated as Low Density Urban by the Land Use Pattern Allocation Guide (LUPAG) Map. Although the entire island of Hawai'i is within the Coastal Zone Management Area, the subject area is not located within the Special Management Area.

PBR HAWAII & Associates, Inc.
Attn: Bradley Furuya
June 14, 2023
Page 2

The project site is located in the South Kohala Community Development Plan (CDP) planning area. The South Kohala CDP was adopted by Ordinance No. 08-159, effective as of November 20, 2008. Strategy 1.3 of the South Kohala CDP is to *Plan, Fund, and Construct a Community Library*. More specifically, the strategy notes that *a modern library would be an important facility and amenity for Waikoloa Village, and would enhance the Village's sense of community and identity*. The proposed project would be consistent with the library priorities in the South Kohala CDP.

Based on the information provided, our recommendation is to include the following information in the DEA:

- Describe the proposed project's consistency with Hawai'i Revised Statutes (HRS), Chapter 205A, Coastal Zone Management.
- Describe how the proposed use is consistent with the policies, standards and courses of action of the County of Hawai'i General Plan, which can be found electronically at <https://www.planning.hawaiicounty.gov/general-plan-community-planning/gp/plan>.
- Describe how the proposed project is in alignment with the South Kohala Community Development Plan (CDP), which can be found electronically at <https://www.planning.hawaiicounty.gov/general-plan-community-planning/cdp/skohala>.

We have no further comments to offer, at this time. However, please provide our department with a copy of the Draft Environmental Assessment for our review and comment.

If you have any questions or if you need further assistance, please feel free to contact Maryam Palma at (808) 961-8139.

Sincerely,

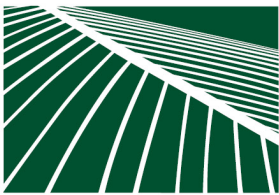
Zendo Kern

Zendo Kern (Jun 15, 2023 13:16 HST)

ZENDO KERN
Planning Director

MP:cv

\\coh01\planning\public\wpwin60\Courtney\Finalized Letters\Maryam\Drafts\2023-06-14_PreconsultdraftEAKamakoaLibrary_Furuya.doc



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Tel: (808) 521-5631
Fax: (808) 523-1402
E-mail: sysadmin@pbrhawaii.com

December 29, 2023

Mr. Zendo Kern
Director
County of Hawai'i
Department of Planning
Aupuni Center
101 Pauahi Street Suite 3
Hilo, HI 96720

SUBJECT: PRE-ASSESSMENT CONSULTATION FOR A HRS CHAPTER 343 ENVIRONMENTAL ASSESSMENT FOR A PUBLIC LIBRARY AT KAMAKOA, WAIKOLOA VILLAGE, COUNTY OF HAWAI'I, HAWAI'I, TMK (3) 6-8-041:020

Dear Mr. Kern,

Thank you for your letter dated June 14, 2023. As the planning sub-consultant for the State of Hawai'i Department of Accounting and General Services (DAGS) and the Hawai'i State Public Library System (HSPLS), we acknowledge the comments from the County of Hawai'i, Planning Department and offer the following responses.

We note that the Project parcel is zoned Single-Family Residential (RS-10) by the County and designated as Urban by the State Land Use Commission. We also acknowledge that as a public use, the proposed public library will require a Plan Approval by the County of Hawai'i Planning Department.

According to the County of Hawai'i General Plan 2005, amended December 2006, the property is designated as Low Density Urban by the Land Use Pattern Allocation Guide (LUPAG) Map. Although the entire island of Hawai'i is within the Coastal Zone Management Area, the subject area is not located within the Special Management Area.

As a public library, we concur that the proposed Project will be consistent with the library priorities outlined in the South Kohala Community Development Plan.

As recommended, the Draft EA will include:

- The Project's consistency with Hawai'i Revised Statutes (HRS), Chapter 205A, Coastal Zone Management.
- The Project's consistency with the policies, standards, and courses of action of the County of Hawai'i General Plan.
- The Project's consistency with the South Kohala Community Development Plan

We value your participation in the environmental review process. Your letter will be reproduced in the forthcoming Draft EA and a copy of the Draft EA will be provided to your office.

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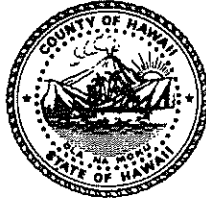
Sincerely,

PBR HAWAII

Bradley Furuya, AICP
Associate

cc: Glenn Miura, CDS International
State of Hawai'i, Department of Accounting and General Services (DAGS)
Hawai'i State Public Library System

Mitchell D. Roth
Mayor

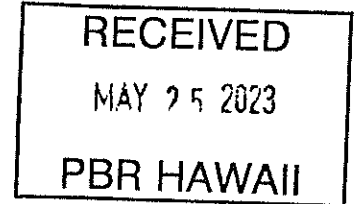


Benjamin T. Moszkowicz
Police Chief

County of Hawai`i

POLICE DEPARTMENT
349 Kapi`olani Street • Hilo, Hawai`i 96720-3998
(808) 935-3311 • Fax (808) 961-2389

May 5, 2023



Mr. Bradley Furuya
PBR HAWAII & Associates, Inc.
1001 Bishop Street, Suite 650
Honolulu, HI 96813-3484
bfuruya@pbrhawaii.com

Dear Mr. Furuya:

SUBJECT: PRE-ASSESSMENT CONSULTATION FOR A HRS *CHAPTER 343*
ENVIRONMENTAL ASSESSMENT FOR A PUBLIC LIBRARY AT KAMAKOA,
WAIKOLOA VILLAGE, COUNTY OF HAWAII, HAWAII, TMK (3) 6-8-041:020

With reference to your April 28, 2023 letter regarding the above-subject, staff has reviewed your communication and has no input or comments to offer at this time.

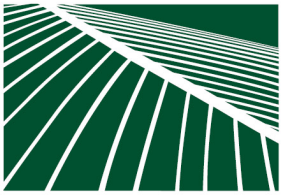
If you have any additional questions or concerns regarding this matter, please feel free to contact Captain Jeremie Evangelista, Commander of our South Kohala District, at (808)887-3080 or via email at jeremie.evangelista@hawaiicounty.gov.

Sincerely,

BENJAMIN T. MOSZKOWICZ
POLICE CHIEF


CHAD BASQUE
ASSISTANT POLICE CHIEF
AREA II OPERATIONS

JCE/jaj
23HQ0586



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Tel: (808) 521-5631
Fax: (808) 523-1402
E-mail: sysadmin@pbrhawaii.com

December 29, 2023

Chief Benjamin Moszkowicz
Chief of Police
County of Hawai'i
Police Department
349 Kapi'olani Street
Hilo, HI 96720

SUBJECT: PRE-ASSESSMENT CONSULTATION FOR A HRS CHAPTER 343 ENVIRONMENTAL ASSESSMENT FOR A PUBLIC LIBRARY AT KAMAKOA, WAIKOLOA VILLAGE, COUNTY OF HAWAI'I, HAWAI'I, TMK (3) 6-8-041:020

Dear Chief Moszkowicz,

Thank you for your letter dated May 5, 2023. As the planning sub-consultant for the State of Hawai'i Department of Accounting and General Services (DAGS) and the Hawai'i State Public Library System (HSPLS), we acknowledge that the County of Hawai'i Police Department has no input or comments at this time.

We value your participation in the environmental review process. Your letter will be reproduced in the forthcoming Draft EA.

Sincerely,

PBR HAWAII

Bradley Furuya, AICP
Associate

cc: Glenn Miura, CDS International
State of Hawai'i, Department of Accounting and General Services (DAGS)
Hawai'i State Public Library System

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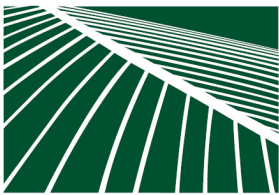
From: [DBEDT State Planning](#)
To: [Bradley Furuya](#)
Cc: [Balassiano, Katia](#)
Subject: Pre-Assessment Consultation for a Public Library at Kamakoa, Waikoloa Village TMK (3) 6-8-041:020
Date: Tuesday, May 23, 2023 10:14:18 AM

Aloha,

Thank you for providing the Office of Planning and Sustainable Development with the opportunity to review this project. We have no comments at this time.

Mahalo,

Megumi Nakayama
Secretary, Land Use Division
State of Hawai'i Office of Planning & Sustainable Development
Dept. of Business, Economic Development & Tourism
235 S. Beretania Street, 6th Floor
Honolulu, Hawaii 96813
(808) 587-2842



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

December 29, 2023

Mr. James Kunane Tokioka
Director
State of Hawai'i
Department of Business, Economic Development & Tourism
P O Box 2359
Honolulu, HI 96804

SUBJECT: PRE-ASSESSMENT CONSULTATION FOR A HRS CHAPTER 343 ENVIRONMENTAL ASSESSMENT FOR A PUBLIC LIBRARY AT KAMAKOEA, WAIKOLOA VILLAGE, COUNTY OF HAWAI'I, HAWAI'I, TMK (3) 6-8-041:020

Dear Mr. Tokioka,

Thank you for your email dated May 23, 2023. As the planning sub-consultant for the State of Hawai'i Department of Accounting and General Services (DAGS) and the Hawai'i State Public Library System (HSPLS), we note that the State of Hawai'i Department of Business, Economic Development, and Tourism has no comments at this time.

We value your participation in the environmental review process. Your letter will be reproduced in the forthcoming Draft EA.

Sincerely,

PBR HAWAII

Bradley Furuya, AICP
Associate

cc: Glenn Miura, CDS International
State of Hawai'i, Department of Accounting and General Services (DAGS)
Hawai'i State Public Library System

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JOSH GREEN, M.D.
GOVERNOR
KE KIA'ĀINA



CATHY BETTS
DIRECTOR
KA LUNA HO'OKELE

JOSEPH CAMPOS II
DEPUTY DIRECTOR
KA HOPE LUNA HO'OKELE



STATE OF HAWAII
KA MOKU'ĀINA O HAWAI'I
DEPARTMENT OF HUMAN SERVICES
KA 'OIHANA MĀLAMA LAWELAWÉ KANAKA
BENEFIT, EMPLOYMENT AND SUPPORT SERVICES DIVISION
1010 Richards Street, Suite 512
Honolulu, Hawaii 96813

Re: 23-00143

May 8, 2023

Mr. Bradley Furuya
PBR HAWAII & Associates, Inc.
1001 Bishop Street, Suite 650
Honolulu, Hawaii 96813

Dear Mr. Furuya:

Subject: Pre-Assessment Consultation for a HRS Chapter 343 Environmental Assessment for a Public Library for Kamakoa, Waikoloa Village, County of Hawaii, Hawaii, TMK (3) 6-8-041:020

This is in response to letter dated April 23, 2023, requesting the Department of Human Services (DHS) to comment on the above-named project.

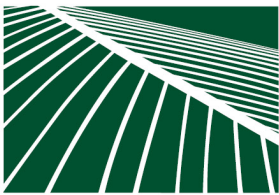
DHS has reviewed the proposed project site for the Public Library. At this time, DHS has no comments.

If you should have any questions regarding this matter, please contact Ms. Lisa Galino, Child Care Program Specialist at (808) 586-5712.

Sincerely,

Scott Nakasoné
Assistant Division Administrator

c: Cathy Betts, Director



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Honolulu, Hawai'i 96813-3484
Tel: (808) 521-5631
Fax: (808) 523-1402
E-mail: sysadmin@pbrhawaii.com

December 29, 2023

Ms. Cathy Betts
Director
State of Hawai'i
Department of Human Services
P O BOX 339
Honolulu, HI 96809

Attn: Scott Nakasone, Department of Human Services, Assistant Division Administrator

SUBJECT: PRE-ASSESSMENT CONSULTATION FOR A HRS CHAPTER 343 ENVIRONMENTAL ASSESSMENT FOR A PUBLIC LIBRARY AT KAMAKOA, WAIKOLOA VILLAGE, COUNTY OF HAWAI'I, HAWAI'I, TMK (3) 6-8-041:020

Dear Ms. Bates,

Thank you for your letter dated May 8, 2023. As the planning sub-consultant for the State of Hawai'i Department of Accounting and General Services (DAGS) and the Hawai'i State Public Library System (HSPLS), we note that the State of Hawai'i Department of Human Services has no comments at this time.

We value your participation in the environmental review process. Your letter will be reproduced in the forthcoming Draft EA.

Sincerely,

PBR HAWAII

Bradley Furuya, AICP
Associate

cc: Glenn Miura, CDS International
State of Hawai'i, Department of Accounting and General Services (DAGS)
Hawai'i State Public Library System

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GOVERNOR | KE KIA'ĀINA

SYLVIA LUKE
LIEUTENANT GOVERNOR | KA HOPE KIA'ĀINA



DAWN N. S. CHANG
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE
MANAGEMENT

STATE OF HAWAII | KA MOKU'ĀINA 'O HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
KA 'OIHANA KUMUWAIWAI 'ĀINA
LAND DIVISION

P.O. BOX 621
HONOLULU, HAWAII 96809

May 3, 2023

MEMORANDUM

FROM: **DLNR Agencies:**
 ___ Div. of Aquatic Resources
 ___ Div. of Boating & Ocean Recreation
 X Engineering Division (DLNR.ENGR@hawaii.gov)
 X Div. of Forestry & Wildlife (rubyrosa.t.terrago@hawaii.gov)
 ___ Div. of State Parks
 X Commission on Water Resource Management (DLNR.CWRM@hawaii.gov)
 ___ Office of Conservation & Coastal Lands
 X Land Division – Hawaii District (gordon.c.heit@hawaii.gov)
 X Aha Moku Advisory Committee (leimana.k.damate@hawaii.gov)

TO: Russell Y. Tsuji, Land Administrator *Russell Tsuji*

SUBJECT: Pre-Assessment Consultation for a HRS Chapter 343 Environmental Assessment for a **Public Library**

LOCATION: Kamakoa, **Waikoloa Village**, South Kohala, Island of Hawaii; TMK: (3) 6-8-041:020

APPLICANT: PBR Hawaii & Associates, Inc. on behalf of CDS International, State DAGS, and Hawaii State Public Library System

Transmitted for your review and comment is information on the above-referenced subject matter. Please submit comments by **May 25, 2023**.

If no response is received by the above date, we will assume your agency has no comments. Should you have any questions about this request, please contact Darlene Nakamura at darlene.k.nakamura@hawaii.gov. Thank you.

BRIEF COMMENTS:

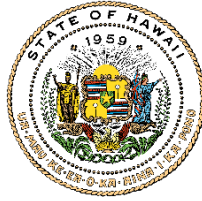
() We have no objections.
 () We have no comments.
 () We have no additional comments.
 Comments are included/attached.

Signed: *Lainie Berry*
 Print Name: LAINIE BERRY, Wildlife Program Mgr.
 Division: Division of Forestry and Wildlife
 Date: Jun 13, 2023

Attachments

JOSH GREEN, M.D.
GOVERNOR | KE KIA'ĀINA

SYLVIA LUKE
LIEUTENANT GOVERNOR | KA HOPE KIA'ĀINA



DAWN N.S. CHANG
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE
MANAGEMENT

LAURA H.E. KAAKUA
FIRST DEPUTY

M. KALEO MANUEL
DEPUTY DIRECTOR - WATER

AQUATIC RESOURCES
BOATING AND OCEAN RECREATION
BUREAU OF CONVEYANCES
COMMISSION ON WATER RESOURCE
MANAGEMENT
CONSERVATION AND COASTAL LANDS
CONSERVATION AND RESOURCES
ENFORCEMENT
ENGINEERING
FORESTRY AND WILDLIFE
HISTORIC PRESERVATION
KAHOOLAWE ISLAND RESERVE COMMISSION
LAND
STATE PARKS



STATE OF HAWAII | KA MOKU'ĀINA 'O HAWAII'
DEPARTMENT OF LAND AND NATURAL RESOURCES
KA 'OIHANA KUMUWAIWAI 'ĀINA

DIVISION OF FORESTRY AND WILDLIFE
1151 PUNCHBOWL STREET, ROOM 325
HONOLULU, HAWAII 96813

June 13, 2023

MEMORANDUM

Log no. 4096

TO: Russell Y. Tsuji, Administrator
Land Division

FROM: LAINIE BERRY, Wildlife Program Manager
Division of Forestry and Wildlife

SUBJECT: Division of Forestry and Wildlife Comments for the Kamakoa, Waikoloa Village, Public Library Project on Hawai'i Island

The Department of Land and Natural Resources, Division of Forestry and Wildlife (DOFAW) has received your request for comments for a Public Library at Kamakoa, Waikoloa Village, on the island of Hawai'i. TMK: (3) 6-8-041:020. The proposed project consists of construction of a new, approximately 12,000 square foot public library, an approximately 3,000 square foot Early Learning Center (ELC), a 71- stall surface parking lot, and complimentary landscaping.

The State listed 'Ōpe'ape'a or Hawaiian Hoary Bat (*Lasiurus cinereus semotus*) could potentially occur at or in the vicinity of the project and may roost in nearby trees. Any required site clearing should be timed to avoid disturbance to bats during their birthing and pup rearing season (June 1 through September 15). During this period woody plants greater than 15 feet (4.6 meters) tall should not be disturbed, removed, or trimmed. Barbed wire should also be avoided for any construction because bats can become ensnared and killed by such fencing material during flight.

Artificial lighting can adversely impact seabirds that may pass through the area at night by causing them to become disoriented. This disorientation can result in their collision with manmade structures or the grounding of birds. For nighttime work that might be required, DOFAW recommends that all lights used be fully shielded to minimize the attraction of seabirds. Nighttime work that requires outdoor lighting should be avoided during the seabird fledging season, from September 15 through December 15, when young seabirds make their maiden voyage to sea.

If nighttime construction is required during the seabird fledging season (September 15 to December 15), we recommend that a qualified biologist be present at the project site to monitor and assess the risk of seabirds being attracted or grounded due to the lighting. If

seabirds are seen circling around the area, lights should then be turned off. If a downed seabird is detected, please follow DOFAW's recommended response protocol by visiting <https://dlnr.hawaii.gov/wildlife/seabird-fallout-season/#response>.

Permanent lighting also poses a risk of seabird attraction, and as such should be minimized or eliminated to protect seabird flyways and preserve the night sky. For illustrations and guidance related to seabird-friendly light styles that also protect seabirds and the dark starry skies of Hawai'i please visit <https://dlnr.hawaii.gov/wildlife/files/2016/03/DOC439.pdf>.

The State listed Nēnē or Hawaiian Goose (*Branta sandvicensis*) could potentially occur in the vicinity of the proposed project site. It is against State law to harm or harass these species. If any are present during construction, all activities within 100 feet (30 meters) should cease and the bird or birds should not be approached. Work may continue after the bird or birds leave the area of their own accord. If a nest is discovered at any point, please contact the Hawai'i Island Branch DOFAW Office at (808) 974-4221.

The State listed 'Io or Hawaiian Hawk (*Buteo solitarius*) may occur in the project vicinity. Prior to undertaking vegetation clearing, DOFAW recommends that pre-construction surveys of the area be conducted by a qualified biologist following appropriate survey methods (Gorressen et al., 2008) to ensure no Hawaiian Hawk nests are present, which may occur during the breeding season from March to September. The survey should be conducted at least 10 days prior to the start of construction. If an 'Io nest is detected, a buffer zone of 100 meters (330 feet) should be established around it where no construction shall occur until the chick or chicks have fledged, or the nest is abandoned, and DOFAW staff should be immediately notified. If adult individuals are detected in the area during construction, all activities within 30 meters (100 feet) of the bird should cease. Work may continue when the bird has left the area on its own.

The project area is within the range of the State listed Blackburn's Sphinx Moth (*Manduca blackburni*) or BSM. Larvae of BSM feed on many nonnative hostplants, which includes tree tobacco (*Nicotiana glauca*), that grow in disturbed soil. We recommend contacting the Hawai'i Island Branch DOFAW office at (808) 974-4221 for further information about where BSM may be present and whether a vegetation survey should be conducted to determine the presence of plants preferred by BSM. DOFAW recommends removing plants less than one meter in height or during the dry season to avoid harm to BSM. If you intend to either remove tree tobacco over one meter in height or to disturb the ground around or within several meters of these plants, they must be thoroughly inspected by a qualified entomologist for the presence of BSM eggs and larvae.

DOFAW recommends using native plant species for landscaping that are appropriate for the area; i.e., plants for which climate conditions are suitable for them to thrive, plants that historically occurred there, etc. Please do not plant invasive species. DOFAW also recommends referring to www.plantpono.org for guidance on the selection and evaluation of landscaping plants and to determine the potential invasiveness of plants proposed for use in the project.

DOFAW recommends minimizing the movement of plant or soil material between worksites. Soil and plant material may contain detrimental fungal pathogens (e.g., Rapid 'Ōhi'a Death), vertebrate and invertebrate pests (e.g., Little Fire Ants, Coqui Frogs, etc.), or invasive plant parts (e.g., African Tulip, Octopus Tree, Trumpet Tree, etc.) that could harm our

native species and ecosystems. We recommend consulting the Big Island Invasive Species Committee (BIISC) at (808) 933-3340 to help plan, design, and construct the project, learn of any high-risk invasive species in the area, and ways to mitigate their spread. All equipment, materials, and personnel should be cleaned of excess soil and debris to minimize the risk of spreading invasive species.

To prevent the spread of Rapid 'Ōhi'a Death (ROD), DOFAW requests that the information and guidance at the following website be reviewed and followed if 'ōhi'a trees are present at the project site that will be removed, trimmed, or potentially injured: <https://cms.ctahr.hawaii.edu/rod>.

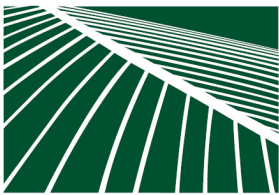
Due to the arid climate and risks of wildfire to listed species, we recommend coordinating with the Hawai'i Wildfire Management Organization at (808) 850-900 or admin@hawaiiwildfire.org, on how wildfire prevention can be addressed in the project area.

We appreciate your efforts to work with our office for the conservation of our native species. These comments are general guidelines and should not be considered comprehensive for this site or project. It is the responsibility of the applicant to do their own due diligence to avoid any negative environmental impacts. Should the scope of the project change significantly, or should it become apparent that threatened or endangered species may be impacted, please contact our staff as soon as possible. If you have any questions, please contact Myrna N. Giraldo Pérez, Protected Species Habitat Conservation Planning Coordinator at (808) 265-3276 or myrna.giraldo-perez@hawaii.gov.

Sincerely,

Lainie Berry

LAINIE BERRY
Wildlife Program Manager



PBR HAWAII
& ASSOCIATES, INC.

R. STAN DUNCAN, ASLA
President / Chairman

RUSSELL Y. J. CHUNG, FASLA
Executive Vice-President / Principal

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NATHALIE RAZO
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ANN MIKIKO BOUSLOG, PhD
Director of Land Economics & Real Estate

RAMSAY R. M. TAUM
Cultural Sustainability Planner

MICAH McMILLEN, ASLA, LEED® AP
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ETSUYO KILA
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GREG NAKAI
Senior Associate

NICOLE SWANSON, ASLA
Associate

BRADLEY FURUYA, AICP
Associate

THOMAS S. WITTEN, FASLA
Chairman Emeritus

W. FRANK BRANDT, FASLA
Founding Partner

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

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December 29, 2023

Russell Y. Tsuji
Land Administrator
State of Hawai'i
Department of Land and Natural Resources
Kalanimoku Building
1151 Punchbowl Street
Honolulu, HI 96809

Attn: Laine Berry, Wildlife Program Manager, Division of Forestry and Wildlife

SUBJECT: PRE-ASSESSMENT CONSULTATION FOR A HRS CHAPTER 343 ENVIRONMENTAL ASSESSMENT FOR A PUBLIC LIBRARY AT KAMAKOA, WAIKOLOA VILLAGE, COUNTY OF HAWAI'I, HAWAI'I, TMK (3) 6-8-041:020

Dear Mr. Tsuji,

Thank you for your letter dated June 13, 2023. As the planning sub-consultant for the State of Hawai'i Department of Accounting and General Services (DAGS) and the Hawai'i State Public Library System (HSPLS), we greatly appreciate the State of Hawai'i Department of Land and Natural Resources, Division of Forestry and Wildlife's comments on endangered species, the selection of Project landscaping plant materials, the potential impacts of the movement of plant or soil material between worksites, Rapid 'Ōhi'a Death, and the risk of wildfires.

We value your participation in the environmental review process. Your letter will be reproduced in the forthcoming Draft EA.

Sincerely,

PBR HAWAII

Bradley Furuya, AICP
Associate

cc: Glenn Miura, CDS International
State of Hawai'i, Department of Accounting and General Services (DAGS)
Hawai'i State Public Library System

JOSH GREEN, M.D.
GOVERNOR | KE KIA'AINA

SYLVIA LUKE
LIEUTENANT GOVERNOR | KA HOPE KIA'AINA



DAWN N. S. CHANG
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE
MANAGEMENT

STATE OF HAWAI'I | KA MOKU'AINA 'O HAWAI'I
DEPARTMENT OF LAND AND NATURAL RESOURCES
KA 'OIHANA KUMUWAIWAI 'AINA
LAND DIVISION

P.O. BOX 621
HONOLULU, HAWAII 96809

May 3, 2023

MEMORANDUM

FROM:

DLNR Agencies:

- _ Div. of Aquatic Resources
- _ Div. of Boating & Ocean Recreation
- X **Engineering Division** (DLNR.ENGR@hawaii.gov)
- X Div. of Forestry & Wildlife ([rubyrosa.t.terrago@hawaii.gov](mailto:rubbyrosa.t.terrago@hawaii.gov))
- _ Div. of State Parks
- X Commission on Water Resource Management (DLNR.CWRM@hawaii.gov)
- _ Office of Conservation & Coastal Lands
- X Land Division - Hawaii District (gordon.c.heit@hawaii.gov)
- X Aha Moku Advisory Committee (leimana.k.damate@hawaii.gov)

TO: **FROM:**

Russell Y. Tsuji, Land Administrator *ruy't*

SUBJECT:

Pre-Assessment Consultation for a HRS Chapter 343 Environmental Assessment for a **Public Library**

LOCATION:

Kamakea, **Waikoloa Village**, South Kohala, Island of Hawaii; TMK: (3) 6-8-041:020

APPLICANT:

PBR Hawaii & Associates, Inc. on behalf of CDS International, State DAGS, and Hawaii State Public Library System

Transmitted for your review and comment is information on the above-referenced subject matter. Please submit comments by **May 25, 2023**.

If no response is received by the *above* date, we will assume your agency has no comments. Should you have any questions about this request, please contact Darlene Nakamura at darlene.k.nakamura@hawaii.gov. Thank you.

BRIEF COMMENTS:

- () We have no objections.
- () We have no comments.
- () We have no additional comments.
- () **Comm** included/attached.

Signed: *VtJ/*
 Print Name: Carty S. Chang, Chief Engineer
 Division: Engineering Division
 Date: May 18, 2023

Attachments

**DEPARTMENT OF LAND AND NATURAL RESOURCES
ENGINEERING DIVISION**

LO/Russell Y. Tsuji

Ref: Pre-Assessment Consultation for a HRS Chapter 343 Environmental Assessment for a Public Library

Location: Kamakoa, Waikoloa Village, South Kohala, Island of Hawaii

TMK(s): (3) 6-8-041:020

Applicant: PBR Hawaii & Associates, Inc. on behalf of CDS International, State DAGS, and Hawaii State Public Library System

COMMENTS

The rules and regulations of the National Flood Insurance Program (NFIP), Title 44 of the Code of Federal Regulations (44CFR), are in effect when development falls within a Special Flood Hazard Area (high-risk areas). State projects are required to comply with 44CFR regulations as stipulated in Section 60.12. Be advised that 44CFR, Chapter 1, Subchapter B, part 60 reflects the minimum standards as set forth by the NFIP. Local community flood ordinances may stipulate higher standards that can be more restrictive and would take precedence over the minimum NFIP standards.

The owner of the project property and/or their representative is responsible to research the Flood Hazard Zone designation for the project. Flood Hazard Zones are designated on FEMA's Flood Insurance Rate Maps (FIRM). The official FIRMs can be accessed through FEMA's Map Service Center (msc.fema.gov). Our Flood Hazard Assessment Tool (FHAT) (<http://gis.hawaiiinfip.org/FHAT>) could also be used to research flood hazard information.

If there are questions regarding the local flood ordinances, please contact the applicable County NFIP coordinating agency below:

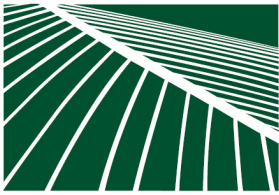
- o Oahu: City and County of Honolulu, Department of Planning and Permitting (808) 768-8098.
- o Hawaii Island: County of Hawaii, Department of Public Works (808) 961-8327.
- o Maui/Molokai/Lanai: County of Maui, Department of Planning (808) 270-7139.
- o Kauai: County of Kauai, Department of Public Works (808) 241-4896.

The applicant should include water demands and infrastructure required to meet project needs. Please note that all State projects requiring water service from their local Department/Board of Water Supply system will be required to pay a resource development charge, in addition to Water Facilities Charges for transmission and daily storage.

The applicant is required to provide water demands and calculations to the Engineering Division so it can be included in the State Water Projects Plan Update projections.

Signed: ti!fr
CARTY S. CHANG, CHIEF ENGINEER

Date: May 18, 2023



PBR HAWAII
& ASSOCIATES, INC.

R. STAN DUNCAN, ASLA
President / Chairman

RUSSELL Y. J. CHUNG, FASLA
Executive Vice-President / Principal

VINCENT SHIGEKUNI
Senior Vice-President / Principal

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Senior Vice-President / Principal

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Vice-President / Principal

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Vice-President / Principal

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Associate Principal

MARC SHIMATSU, ASLA
Associate Principal

DACHENG DONG, LEED® AP
Associate Principal

NATHALIE RAZO
Associate Principal

ANN MIKIKO BOUSLOG, PhD
Director of Land Economics & Real Estate

RAMSAY R. M. TAUM
Cultural Sustainability Planner

MICAH McMILLEN, ASLA, LEED® AP
Senior Associate

ETSUYO KILA
Senior Associate

GREG NAKAI
Senior Associate

NICOLE SWANSON, ASLA
Associate

BRADLEY FURUYA, AICP
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THOMAS S. WITTEN, FASLA
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1001 Bishop Street, Suite 650
Honolulu, Hawai'i 96813-3484
Tel: (808) 521-5631
Fax: (808) 523-1402
E-mail: sysadmin@pbrhawaii.com

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December 29, 2023

Russell Y. Tsuji
Land Administrator
State of Hawai'i
Department of Land and Natural Resources
Kalanimoku Building
1151 Punchbowl Street
Honolulu, HI 96809

Attn: Carty S. Chang, Chief Engineer

SUBJECT: PRE-ASSESSMENT CONSULTATION FOR A HRS CHAPTER 343 ENVIRONMENTAL ASSESSMENT FOR A PUBLIC LIBRARY AT KAMAKOA, WAIKOLOA VILLAGE, COUNTY OF HAWAI'I, HAWAI'I, TMK (3) 6-8-041:020

Dear Mr. Tsuji,

Thank you for your letter dated May 3, 2023. As the planning sub-consultant for the State of Hawai'i Department of Accounting and General Services (DAGS) and the Hawai'i State Public Library System (HSPLS), we acknowledge the State of Hawai'i Department of Land and Natural Resources (Engineering Division) recommendations. The Draft EA will address the following:

1. Flood Hazard Zone designation for the project.
2. Water demands and infrastructure required to meet the project needs.
3. Acknowledgement that the applicant is required to provide water demands and calculations to the Engineering Division so it can be included in the State Water Projects Plan Update projections.

We value your participation in the environmental review process. Your letter will be reproduced in the forthcoming Draft EA.

Sincerely,

PBR HAWAII

Bradley Furuya, AICP
Associate

cc: Glenn Miura, CDS International
State of Hawai'i, Department of Accounting and General Services (DAGS)
Hawai'i State Public Library System

JOSH GREEN, M.D.
GOVERNOR
KE KIA'ĀINA

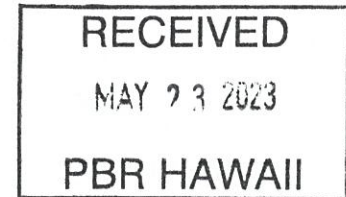


KENNETH S. HARA
MAJOR GENERAL
ADJUTANT GENERAL
KA 'AKUKANA KENELALA

STEPHEN F. LOGAN
BRIGADIER GENERAL
DEPUTY ADJUTANT GENERAL
KA HOPE 'AKUKANA KENELALA

STATE OF HAWAII
KA MOKU'ĀINA O HAWAII
DEPARTMENT OF DEFENSE
KA 'OIHANA PILI KAUA
OFFICE OF THE ADJUTANT GENERAL
3949 DIAMOND HEAD ROAD
HONOLULU, HAWAII 96816-4495

May 16, 2023



Mr. Bradley Furuya
PBR HAWAII & Associates, Inc.
1001 Bishop Street, Suite 650
Honolulu, HI 96813-3484

SUBJECT: Pre-Assessment Consultation Waikoloa Public Library, Waikoloa Village, Island of Hawaii, Hawaii, TMK (3) 6-8-041:020

Dear Mr. Furuya:

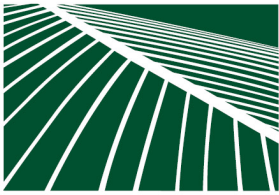
Thank you for the opportunity to comment on the above project. The State of Hawaii Department of Defense has no comments to offer relative to the project at this time.

Should there be any questions, please contact Mr. Tad T. Nakayama at 808-369-3490 or tad.t.nakayama@hawaii.gov.

Sincerely,

A handwritten signature in blue ink that reads "Wade T. Ishii".

Wade T. Ishii, P.E.
Acting Chief Engineering Officer



PBR HAWAII
& ASSOCIATES, INC.

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President / Chairman

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

December 29, 2023

Mr. Wade T. Ishii, P.E.
Acting Chief Engineering Officer
State of Hawai'i
Department of Defense
3949 Diamond Head Road
Honolulu, HI 96816

SUBJECT: PRE-ASSESSMENT CONSULTATION FOR A HRS CHAPTER 343 ENVIRONMENTAL ASSESSMENT FOR A PUBLIC LIBRARY AT KAMAKOEA, WAIKOLOA VILLAGE, COUNTY OF HAWAI'I, HAWAI'I, TMK (3) 6-8-041:020

Dear Mr. Ishii,

Thank you for your letter dated May 16, 2023. As the planning sub-consultant for the State of Hawai'i Department of Accounting and General Services (DAGS) and the Hawai'i State Public Library System (HSPLS), we note that the State of Hawai'i Department of Defense has no comments at this time.

We value your participation in the environmental review process. Your letter will be reproduced in the forthcoming Draft EA.

Sincerely,

PBR HAWAII

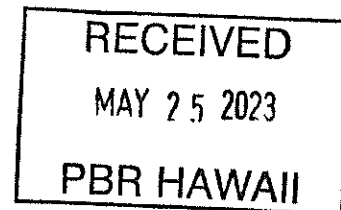
Bradley Furuya, AICP
Associate

cc: Glenn Miura, CDS International
State of Hawai'i, Department of Accounting and General Services (DAGS)
Hawai'i State Public Library System

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STATE OF HAWAII
DEPARTMENT OF EDUCATION
KA 'OIHANA HO'ONA'AUAO
P.O. BOX 2360
HONOLULU, HAWAII 96804



OFFICE OF FACILITIES AND OPERATIONS

May 22, 2023

Bradley Furuya
PBR Hawaii & Associates, Inc.
1001 Bishop Street, Suite 650
Honolulu, Hawaii 96813

Re: Pre-Assessment Consultation for a HRS Chapter 343 Environmental Assessment for a Public Library at Kamakoa, Waikoloa Village, County of Hawaii, Hawaii,
TMK: (3)6-8-041:020

Dear Mr. Furuya:

Thank you for your letter dated April 28, 2023. Based on the information provided, the proposed project will not impact Hawaii State Department of Education facilities.

Should you have any questions, please contact Cori China with the Facilities Development Branch, Planning Section, at (808) 784-5080, or via email at cori.china@k12.hi.us.

We appreciate the opportunity to comment.

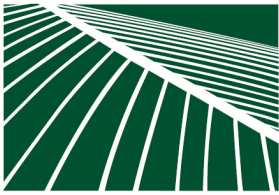
Sincerely,

A handwritten signature in black ink, appearing to read "Roy Ikeda".

Roy Ikeda
Interim Public Works Manager
Planning Section

RI:ctc

c: Facilities Development Branch



PBR HAWAII
& ASSOCIATES, INC.

R. STAN DUNCAN, ASLA
President / Chairman

RUSSELL Y. J. CHUNG, FASLA
Executive Vice-President / Principal

VINCENT SHIGEKUNI
Senior Vice-President / Principal

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BRADLEY FURUYA, AICP
Associate

THOMAS S. WITTEN, FASLA
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Founding Partner

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

December 29, 2023

Mr. Keith Hayashi
Superintendent
State of Hawai'i
Department of Education
1390 Miller Street
Honolulu, HI 96813

Attn: Roy Ikeda, Interim Public Works Manager, Planning Section

SUBJECT: PRE-ASSESSMENT CONSULTATION FOR A HRS CHAPTER 343 ENVIRONMENTAL ASSESSMENT FOR A PUBLIC LIBRARY AT KAMAKOEA, WAIKOLOA VILLAGE, COUNTY OF HAWAI'I, HAWAI'I, TMK (3) 6-8-041:020

Dear Mr. Hayashi,

Thank you for your letter dated May 22, 2023. As the planning sub-consultant for the State of Hawai'i Department of Accounting and General Services (DAGS) and the Hawai'i State Public Library System (HSPLS), we acknowledge that the proposed Project will not impact State of Hawai'i Department of Education facilities.

We value your participation in the environmental review process. Your letter will be reproduced in the forthcoming Draft EA.

Sincerely,

PBR HAWAII

Bradley Furuya, AICP
Associate

cc: Glenn Miura, CDS International
State of Hawai'i, Department of Accounting and General Services (DAGS)
Hawai'i State Public Library System

printed on recycled paper

Appendix C:
Draft EA Public Review
Comments and Responses



From: April Queja <april-q@hotmail.com>
Sent: Wednesday, January 10, 2024 7:34 PM
To: Isa, Brian S <brian.s.isa@hawaii.gov>
Subject: [EXTERNAL] Support for Waikoloa Public Library

Aloha Mr. Isa,

This letter is in support of the proposed location, scope and timeline for the Waikoloa Public Library per the draft Environmental Impact Assessment found online.

I appreciate the thorough effort to ensure the development will be done in a responsible way. I also support the timeline of completion within this decade.

We moved to the village in 2009 with a newborn and a two year old. Those kids are now in high school and have grown up without a public library in their neighborhood. Our youngest is 9 and an avid reader and I sincerely hope he will be able to access this facility while he is still attending school within the village. (High school is 30 miles away and kids are gone from 8am to 4:30 pm with the long bus ride).

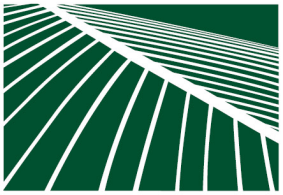
We appreciate the bookmobile and also utilize the Thelma Parker library, but it can not compare to having a real library within bicycle distance.

Please do everything in your power to continue bringing infrastructure and development to our growing neighborhood. Although I know it is very unlikely for my kids to benefit, I think a public high school to serve South Kohala would be a great project to be working towards! It is hard for Waimea and Waikoloa kids to have school spirit and 100% involvement when they have to be bussed to schools in other communities.

The families of Waikoloa thank you.

Mahalo,

April Queja
68-1864 Paniolo Place
Waikoloa, HI 96738



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TOM SCHNELL, AICP
Principal

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Associate Principal

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Associate Principal

NATHALIE RAZO
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ANN MIKIKO BOUSLOG, PhD
Director of Land Economics & Real Estate

RAMSAY R. M. TAUM
Cultural Sustainability Planner

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Associate

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Founding Partner

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

May 8, 2024

April Queja
68-1864 Paniolo Place
Waikōloa, HI 96738

**SUBJECT: HRS CHAPTER 343 DRAFT ENVIRONMENTAL ASSESSMENT FOR
THE PROPOSED WAIKŌLOA PUBLIC LIBRARY AT KAMAKOA,
WAIKŌLOA VILLAGE, COUNTY OF HAWAI'I, HAWAI'I, TMK (3) 6-8-
041:020**

Dear Ms. Queja,

Thank you for your email dated January 10, 2024. As the planning sub-consultant for the State of Hawai'i Department of Accounting and General Services (DAGS) and the Hawai'i State Public Library System (HSPLS), we acknowledge and appreciate your support of the proposed location, scope, and timeline of the proposed Waikōloa Public Library. We also acknowledge your support for a public high school in the South Kohala area and the increased convenience it would offer to many Waikōloa Village families.

We value your participation in the environmental review process. Your letter will be reproduced in the forthcoming Final EA.

Sincerely,

PBR HAWAII

Bradley Furuya, AICP
Associate

cc: Glenn Miura, CDS International
State of Hawai'i, Department of Accounting and General Services (DAGS)
Hawai'i State Public Library System

printed on recycled paper

Mitchell D. Roth
Mayor



Benjamin T. Moszkowicz
Police Chief

Reed K. Mahuna
Deputy Police Chief

County of Hawai`i

POLICE DEPARTMENT

349 Kapi`olani Street • Hilo, Hawai`i 96720-3998
(808) 935-3311 • Fax (808) 961-2389

January 24, 2024

Mr. Bradley Furuya, AICP
PBR HAWAII & Associates, Inc.
1001 Bishop Street, Suite 650
Honolulu, Hawai'i 96813

SUBJECT: DRAFT ENVIRONMENTAL ASSESSMENT (DEA)
NAME OF PROJECT: WAIKOLOA PUBLIC LIBRARY
LOCATION: WAIKOLOA VILLAGE
ISLAND: HAWAII
DISTRICT: SOUTH KOHALA
TAX MAP KEY: (3) 6-8-041:020

Dear Mr. Furuya:

We appreciate you allowing us the opportunity to review and provide commentary on the proposed Waikoloa Public Library located in the South Kohala District.

The Hawai'i Police Department has reviewed the proposal and does not have any comments or concerns at this time.

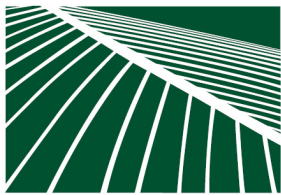
Should you have any questions or concerns, please contact Acting Captain Roylen Valera, Commander of our South Kohala District, at phone number (808) 887-3080 or via email at Roylen.Valera@hawaiicounty.gov.

Sincerely,

BENJAMIN T. MOSZKOWICZ
POLICE CHIEF


CHAD BASQUE
ASSISTANT POLICE CHIEF

RV/jaj
24HQ0029



PBR HAWAII
& ASSOCIATES, INC.

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President / Chairman

RUSSELL Y. J. CHUNG, FASLA
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Honolulu, Hawai'i 96813-3484
Tel: (808) 521-5631
Fax: (808) 523-1402
E-mail: sysadmin@pbrhawaii.com

printed on recycled paper

May 8, 2024

Chief Benjamin Moszkowicz
Chief of Police
County of Hawai'i
Police Department
349 Kapi'olani Street
Hilo Hi 96720

SUBJECT: HRS CHAPTER 343 DRAFT ENVIRONMENTAL ASSESSMENT FOR THE PROPOSED WAIKŌLOA PUBLIC LIBRARY AT KAMAKOA, WAIKŌLOA VILLAGE, COUNTY OF HAWAI'I, HAWAI'I, TMK (3) 6-8-041:020

Dear Chief Moszkowicz,

Thank you for your letter dated January 24, 2024. As the planning sub-consultant for the State of Hawai'i Department of Accounting and General Services (DAGS) and the Hawai'i State Public Library System (HSPLS), we acknowledge that the County of Hawai'i Police Department has reviewed the Project and does not have any comments or concerns at this time.

We value your participation in the environmental review process. Your letter will be reproduced in the forthcoming Final EA.

Sincerely,

PBR HAWAII

Bradley Furuya, AICP
Associate

cc: Glenn Miura, CDS International
State of Hawai'i, Department of Accounting and General Services (DAGS)
Hawai'i State Public Library System

JOSH GREEN, M.D.
GOVERNOR | KE KIA'ĀINA

SYLVIA LUKE
LIEUTENANT GOVERNOR | KA HOPE KIA'ĀINA



DAWN N. S. CHANG
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE
MANAGEMENT

STATE OF HAWAII | KA MOKU'ĀINA 'O HAWAII'
DEPARTMENT OF LAND AND NATURAL RESOURCES
KA 'OIHANA KUMUWAIWAI 'ĀINA
LAND DIVISION

P.O. BOX 621
HONOLULU, HAWAII 96809

February 6, 2024

PBR Hawaii & Associates, Inc.
Attention: Mr. Bradley Furuya
1001 Bishop Street, Suite 650
Honolulu, Hawaii 96813-3484

via email: bfuruya@pbrhawaii.com

Dear Mr. Furuya:

SUBJECT: Draft Environmental Assessment for **Waikoloa Public Library** located at Waikoloa Village, South Kohala, Island of Hawaii; TMK: (3) 6-8-041:020 on behalf of State DAGS and Hawaii Public Library System

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

At this time, enclosed are comments from the (a) Engineering Division and (b) Land Division-Hawaii District on the subject matter. Should you have any questions, please feel free to contact Darlene Nakamura at (808) 587-0417 or email: darlene.k.nakamura@hawaii.gov. Thank you.

Sincerely,

Russell Tsuji

Russell Y. Tsuji
Land Administrator

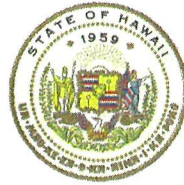
Enclosures

cc: Department of Accounting and General Services (w/copies)
Attn: Mr. Brian Isa (via email: brian.s.isa@hawaii.gov)
Central Files

1/30/24

JOSH GREEN, M.D.
GOVERNOR | KE KIA'ĀINA

SYLVIA LUKE
LIEUTENANT GOVERNOR | KA HOPE KIA'ĀINA



DAWN N. S. CHANG
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE
MANAGEMENT

STATE OF HAWAII | KA MOKU'ĀINA 'O HAWAII'
DEPARTMENT OF LAND AND NATURAL RESOURCES
KA 'OIHANA KUMUWAIWAI 'ĀINA
LAND DIVISION

P.O. BOX 621
HONOLULU, HAWAII 96809

January 11, 2024

MEMORANDUM

TO:

DLNR Agencies:

- Div. of Aquatic Resources
- Div. of Boating & Ocean Recreation
- Engineering Division (DLNR.ENGR@hawaii.gov)
- Div. of Forestry & Wildlife (rubyrosa.t.terrago@hawaii.gov)
- Div. of State Parks
- Commission on Water Resource Management (DLNR.CWRM@hawaii.gov)
- Office of Conservation & Coastal Lands
- Land Division – Hawaii District (gordon.c.heit@hawaii.gov)
- Aha Moku Advisory Committee (leimana.k.damate@hawaii.gov)

FROM:

Russell Y. Tsuji, Land Administrator

Russell Tsuji

SUBJECT:

Draft Environmental Assessment for **Waikoloa Public Library**

LOCATION:

Waikoloa Village, South Kohala, Island of Hawaii; TMK: (3) 6-8-041:020

APPLICANT:

PBR Hawaii & Associates, Inc. on behalf of State DAGS and Hawaii Public Library System

Transmitted for your review and comment is information on the above-referenced subject matter. The DEA was published on January 8, 2024, by the State Environmental Review Program (formerly the Office of Environmental Quality Control) at the Office of Planning and Sustainable Development in the periodic bulletin, The Environmental Notice, available at the following link:

https://files.hawaii.gov/dbedt/erp/The_Environmental_Notice/2024-01-08-TEN.pdf

Please submit any comments by **February 6, 2024**. If no response is received by this date, we will assume your agency has no comments. Should you have any questions, please contact Darlene Nakamura directly via email at darlene.k.nakamura@hawaii.gov. Thank you.

BRIEF COMMENTS:

- We have no objections.
- We have no comments.
- We have no additional comments.
- Comments are included/attached.

Signed:

Print Name:

Division:

Date:

[Signature]

 GORDON C. HEIT

 Land Division

 1/30/24

Attachments

JOSH GREEN, M.D.
GOVERNOR | KE KIA'ĀINA

SYLVIA LUKE
LIEUTENANT GOVERNOR | KA HOPE KIA'ĀINA



DAWN N. S. CHANG
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE
MANAGEMENT

STATE OF HAWAI'I | KA MOKU'ĀINA 'O HAWAI'I
DEPARTMENT OF LAND AND NATURAL RESOURCES
KA 'OIHANA KUMUWAIWAI 'ĀINA
LAND DIVISION

P.O. BOX 621
HONOLULU, HAWAII 96809

January 11, 2024

MEMORANDUM

FROM: ~~TO:~~

DLNR Agencies:

- Div. of Aquatic Resources
- Div. of Boating & Ocean Recreation
- Engineering Division (DLNR.ENGR@hawaii.gov)
- Div. of Forestry & Wildlife (rubyrosa.t.terrago@hawaii.gov)
- Div. of State Parks
- Commission on Water Resource Management (DLNR.CWRM@hawaii.gov)
- Office of Conservation & Coastal Lands
- Land Division – Hawaii District (gordon.c.heit@hawaii.gov)
- Aha Moku Advisory Committee (leimana.k.damate@hawaii.gov)

TO: ~~FROM:~~

Russell Y. Tsuji, Land Administrator

Russell Tsuji

SUBJECT:

Draft Environmental Assessment for **Waikoloa Public Library**

LOCATION:

Waikoloa Village, South Kohala, Island of Hawaii; TMK: (3) 6-8-041:020

APPLICANT:

PBR Hawaii & Associates, Inc. on behalf of State DAGS and Hawaii Public Library System

Transmitted for your review and comment is information on the above-referenced subject matter. The DEA was published on January 8, 2024, by the State Environmental Review Program (formerly the Office of Environmental Quality Control) at the Office of Planning and Sustainable Development in the periodic bulletin, The Environmental Notice, available at the following link:

https://files.hawaii.gov/dbedt/erp/The_Environmental_Notice/2024-01-08-TEN.pdf

Please submit any comments by **February 6, 2024**. If no response is received by this date, we will assume your agency has no comments. Should you have any questions, please contact Darlene Nakamura directly via email at darlene.k.nakamura@hawaii.gov. Thank you.

BRIEF COMMENTS:

- We have no objections.
- We have no comments.
- We have no additional comments.
- Comments are included/attached.

Signed:

CSC

Print Name:

Carty S. Chang, Chief Engineer

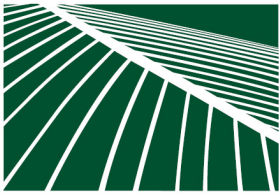
Division:

Engineering Division

Date:

Jan 26, 2024

Attachments



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& ASSOCIATES, INC.

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Chairman Emeritus

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Founding Partner

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

May 8, 2024

Mr. Russell Y. Tsuji
Land Administrator
State of Hawai'i
Department Of Land And Natural Resources
Kalanimoku Building
1151 Punchbowl Street
Honolulu HI 96809

SUBJECT: HRS CHAPTER 343 DRAFT ENVIRONMENTAL ASSESSMENT FOR THE PROPOSED WAIKŌLOA PUBLIC LIBRARY AT KAMAKOA, WAIKŌLOA VILLAGE, COUNTY OF HAWAI'I, HAWAI'I, TMK (3) 6-8-041:020

Dear Mr. Tsuji,

Thank you for your letter dated February 6, 2024. As the planning sub-consultant for the State of Hawai'i Department of Accounting and General Services (DAGS) and the Hawai'i State Public Library System (HSPLS), we appreciate the State Of Hawai'i Department of Land and Natural Resources' comments and offer the following responses.

We acknowledge that the Land Division (Hawai'i District) has no objections to the proposed Project. We also acknowledge that the Engineering Division has no additional comments.

We value your participation in the environmental review process. Your letter will be reproduced in the forthcoming Final EA.

Sincerely,

PBR HAWAII

Bradley Furuya, AICP
Associate

cc: Glenn Miura, CDS International
State of Hawai'i, Department of Accounting and General Services (DAGS)
Hawai'i State Public Library System

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GOVERNOR
KE KIA'ĀINA



KENNETH S. HARA
MAJOR GENERAL
ADJUTANT GENERAL
KA 'AKUKANA KENELALA

STEPHEN F. LOGAN
BRIGADIER GENERAL
DEPUTY ADJUTANT GENERAL
KA HOPE 'AKUKANA KENELALA

STATE OF HAWAII
KA MOKU'ĀINA O HAWAII
DEPARTMENT OF DEFENSE
KA 'OIHANA PILI KAUA
OFFICE OF THE ADJUTANT GENERAL
3949 DIAMOND HEAD ROAD
HONOLULU, HAWAII 96816-4495

Mr. Bradley Furuya
PBR HAWAII & Associates, Inc.
1001 Bishop Street, Suite 650
Honolulu, HI 96813-3484

SUBJECT: Draft Environmental Assessment Waikoloa Public Library,
Waikoloa Village, Island of Hawaii, Hawaii
TMK (3) 6-8-041:020

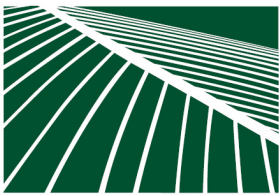
Dear Mr. Furuya:

Thank you for the opportunity to comment on the above project. The State of Hawaii Department of Defense has no comments to offer relative to the project at this time.

Should there be any questions, please contact Mr. Tad T. Nakayama at 808-369-3490 or tad.t.nakayama@hawaii.gov.

Sincerely,

Shao Yu L. Lee, R.A.
Major, Hawaii National Guard
Chief Engineering Officer



PBR HAWAII
& ASSOCIATES, INC.

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President / Chairman

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Tel: (808) 521-5631
Fax: (808) 523-1402
E-mail: sysadmin@pbrhawaii.com

May 8, 2024

Shao Yu L. Lee, R.A.
Major, Hawaii National Guard
Chief Engineering Officer
State Of Hawai'i
Department Of Defense
3949 Diamond Head Road
Honolulu Hi 96816

**SUBJECT: HRS CHAPTER 343 DRAFT ENVIRONMENTAL ASSESSMENT FOR
THE PROPOSED WAIKŌLOA PUBLIC LIBRARY AT KAMAKOA,
WAIKŌLOA VILLAGE, COUNTY OF HAWAI'I, HAWAI'I, TMK (3) 6-8-
041:020**

Dear Major Lee,

Thank you for your letter postmarked January 18, 2024. As the planning sub-consultant for the State of Hawai'i Department of Accounting and General Services (DAGS) and the Hawai'i State Public Library System (HSPLS), we acknowledge that the State Of Hawai'i Department of Defense has no comments to offer relative to the project at this time.

We value your participation in the environmental review process. Your letter will be reproduced in the forthcoming Final EA.

Sincerely,

PBR HAWAII

Bradley Furuya, AICP
Associate

cc: Glenn Miura, CDS International
State of Hawai'i, Department of Accounting and General Services (DAGS)
Hawai'i State Public Library System

printed on recycled paper

From: [DBEDT State Planning](#)
To: [Isa, Brian S](#); [Bradley Furuya](#)
Cc: [Balassiano, Katia](#)
Subject: Waikoloa Public Library Draft EA request for comments
Date: Wednesday, January 10, 2024 3:54:49 PM

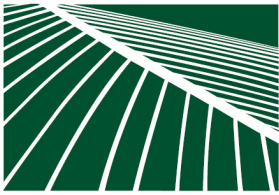
Aloha,

Thank you for the opportunity to comment. The Office of Planning and Sustainable Development has no comments at this time.

Mahalo,

Megumi Nakayama

Secretary, Land Use Division
State of Hawai'i Office of Planning & Sustainable Development
Dept. of Business, Economic Development & Tourism
235 S. Beretania Street, 6th Floor
Honolulu, Hawaii 96813
(808) 587-2842



PBR HAWAII
& ASSOCIATES, INC.

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President / Chairman

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Executive Vice-President / Principal

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Honolulu, Hawai'i 96813-3484
Tel: (808) 521-5631
Fax: (808) 523-1402
E-mail: sysadmin@pbrhawaii.com

May 8, 2024

Ms. Katia Balassiano
Planning Program Administrator
State of Hawai'i
Office of Planning And Sustainable Development
P O Box 2359
Honolulu Hi 96804

Attn: Megumi Nakayama, Secretary, Land Use Division

**SUBJECT: HRS CHAPTER 343 DRAFT ENVIRONMENTAL ASSESSMENT FOR
THE PROPOSED WAIKŌLOA PUBLIC LIBRARY AT KAMAKOA,
WAIKŌLOA VILLAGE, COUNTY OF HAWAI'I, HAWAI'I, TMK (3) 6-8-
041:020**

Dear Ms. Balassiano,

Thank you for your email dated January 10, 2024. As the planning sub-consultant for the State of Hawai'i Department of Accounting and General Services (DAGS) and the Hawai'i State Public Library System (HSPLS), we acknowledge that the Office of Planning And Sustainable Development has no comments at this time.

We value your participation in the environmental review process. Your letter will be reproduced in the forthcoming Final EA.

Sincerely,

PBR HAWAII

Bradley Furuya, AICP
Associate

cc: Glenn Miura, CDS International
State of Hawai'i, Department of Accounting and General Services (DAGS)
Hawai'i State Public Library System

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UNIVERSITY
of HAWAII[®]
MĀNOA

January 25, 2024

Via email: brian.s.isa@hawaii.gov

State of Hawai'i, Department of Accounting and General Services (DAGS)
1151 Punchbowl Street, Room 430
Honolulu, HI 96810

Attention: Mr. Brian Isa

Re: Waikoloa Public Library—Draft EA (AFNSI)
TMK: (3) 6-8-041:020
South Kohala District, Hawai'i Island

Dear Mr. Isa:

Thank you for the opportunity to comment on the draft environmental assessment (EA) for the Waikoloa Public Library project (published January 8, 2024), specifically with respect to issues and concerns regarding light pollution.

The University of Hawai'i Institute for Astronomy (IfA) conducts research in astronomy using telescopes located on Haleakalā and Maunakea and operated by IfA and our partner institutions. Both Haleakalā and Maunakea are among the best sites in the world for astronomical facilities because of their elevation, clear skies, favorable atmospheric conditions, and low levels of light pollution. Hawai'i-based observatories have played major roles in the advancement of astronomy and astrophysics for over 50 years and are well positioned to remain at the forefront of astronomical research for decades to come.

Because of the outstanding quality and productivity of these facilities, IfA is acutely concerned about negative impacts on astronomy from increased light pollution. Our work to combat light pollution has also brought us into contact with others concerned about light pollution for other reasons, including impacts on wildlife (particularly seabirds) and on human health. While IfA's comments focus on the impacts of light pollution on astronomy, appropriate mitigation measures also help to reduce non-astronomy impacts.

With that background, we offer the following comments:

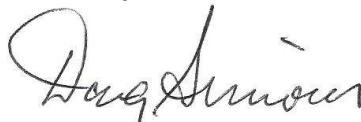
Any new or additional artificial light at night has an adverse effect on astronomical observations by increasing the night sky brightness. Nearly all observations performed by the telescopes on Maunakea are sky-background limited. This means that there is a natural sky brightness coming from airglow and zodiacal light. Artificial light increases the sky brightness, thereby decreasing the sensitivity of the telescopes and effectively making the telescope smaller and less sensitive.

IfA makes it a practice to comment on environmental review documents both to address issues with specific projects and to emphasize the importance of appropriate lighting standards and dark sky protection in any planning process. While the Draft EA notes that outdoor lighting installed for construction purposes will be fully shielded, and also notes the adverse impact that outdoor lighting may have on seabirds that may overfly the project area at night, a more robust discussion of dark sky protection would be welcome. Appropriate steps to keep the skies friendly to both seabirds and the observatories include:

1. Any outdoor lighting, including both construction and permanent lighting, must conform to the standards established by the Hawai'i County Outdoor Lighting Ordinance (Hawai'i County Code Chapter 14, Article 9: "Outdoor Lighting"). IfA encourages project planners to include references to the Outdoor Lighting Ordinance in planning documents to confirm to readers that its requirements are being considered and addressed in project planning.
2. The minimum possible amount of outdoor/exterior lighting should be used and should be turned off when not needed. Motion sensor activated lighting is strongly preferred wherever feasible. IfA appreciates the Draft EA's specific mention of the use of motion sensor activated outdoor lighting for the project.
3. All exterior lighting should be fully shielded. IfA appreciates the Draft EA's specific recognition of this mitigation measure.
4. Conformity to the Outdoor Lighting Ordinance also requires the use of blue-deficient exterior lighting. This means that exterior LED lighting must emit less than 2% of its total energy at wavelengths less than 500 nm. The best choices for this are either filtered LED lights or amber LED lights.
5. White light should be avoided in general because the blue component of white light significantly impacts astronomy. Any white light deemed essential should have a Correlated Color Temperature of 2700 K or below.

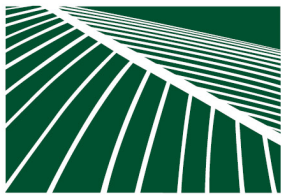
Thank you for your consideration of these comments and attention to IfA's concerns. If you have questions or need further detail regarding these comments, please do not hesitate to contact the undersigned or Richard Wainscoat (rjw@hawaii.edu).

Sincerely,



Doug Simons
Director, IfA

c: Mr. Bradley Furuya, PBR HAWAII (bfuruya@pbrhawaii.com)



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

printed on recycled paper

May 8, 2024

Doug Simons
Director
University of Hawai'i Institute for Astronomy
2680 Woodlawn Drive
Honolulu, HI 96822
Via email: dsimons@hawaii.edu

SUBJECT: HRS CHAPTER 343 DRAFT ENVIRONMENTAL ASSESSMENT FOR THE PROPOSED WAIKŌLOA PUBLIC LIBRARY AT KAMAKOA, WAIKŌLOA VILLAGE, COUNTY OF HAWAI'I, HAWAI'I, TMK (3) 6-8-041:020

Dear Mr. Simons,

Thank you for your letter dated January 25, 2024, transmitted via email. As the planning sub-consultant for the State of Hawai'i Department of Accounting and General Services (DAGS) and the Hawai'i State Public Library System (HSPLS), we appreciate the University of Hawai'i Institute for Astronomy's (IfA) comments.

In addition to the mitigation measures included in the Draft EA and cited in your letter, the Final EA will include IfA's recommendations to further mitigate impacts to astronomy and wildlife. Project lighting will conform to the standards established by the County of Hawai'i Outdoor Lighting Ordinance (Hawai'i County Code Chapter 14, Article 9: "Outdoor Lighting"). The Project will use the minimum amount of exterior lighting possible, and, as mentioned in Section 3.6 of the Draft EA, outdoor lighting will be motion activated and fully shielded. To comply with the County's Outdoor Lighting Ordinance, exterior LED lighting will emit less than 2% of its total energy at wavelengths less than 500 nanometers. Any white light used will have a correlated color temperature of 2,700 Kelvin or less.

We value your participation in the environmental review process. Your letter will be reproduced in the forthcoming Final EA.

Sincerely,

PBR HAWAII

Bradley Furuya, AICP
Associate

cc: Glenn Miura, CDS International
State of Hawai'i, Department of Accounting and General Services (DAGS)
Hawai'i State Public Library System

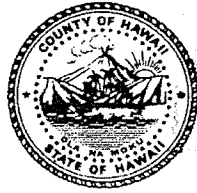
Appendix C-1:
Draft EA Public Review Comments
Received After 30-Day Public
Review Period and Responses



Mitchell D. Roth
Mayor

Deanna S. Sako
Managing Director

West Hawai'i Office
74-5044 Ane Keohokālole Hwy
Kailua-Kona, Hawai'i 96740
Phone (808) 323-4770
Fax (808) 327-3563



County of Hawai'i
PLANNING DEPARTMENT

Zendo Kern
Director

Jeffrey W. Darrow
Deputy Director

East Hawai'i Office
101 Pauahi Street, Suite 3
Hilo, Hawai'i 96720
Phone (808) 961-8288
Fax (808) 961-8742

February 8, 2024

PBR HAWAII & Associates, Inc.
Attn: Bradley Furuya
1001 Bishop Street, Suite 650
Honolulu, HI 96813-3484

Dear Bradley Furuya:

SUBJECT: Review of Draft Environmental Assessment
Project: Waikoloa Public Library
TMK: (3) 6-8-041:020, Waikoloa Village, Hawai'i

Thank you for your letter dated January 5, 2024, requesting comments from this office regarding the Draft Environmental Assessment (DEA) for the Waikoloa Public Library project, previously referenced as Kamakoa Public Library.

The applicant is proposing the construction and operation of a Public Library in Waikoloa Village that would include an approximately 12,000 square foot Public Library, approximately 3,000 square foot Early Learning Center, 71-stall parking lot, and complimentary landscaping. The proposed library includes shelving for a minimum of 50,000 books, private meetings rooms, a program room, a work room, support space, and a librarian's office. The connected Early Learning Center will have two classrooms, each capable of accommodating roughly 20 students.

The subject parcel consists of 2.567 acres. The entire parcel is zoned Single-Family Residential (RS-10) by the County and designated as Urban by the State Land Use Commission. Hawai'i County Code, Chapter 25 (Zoning Code), Section 25-5-3 (a) notes community building as permitted uses within the RS district. In addition, Hawai'i County Code, Chapter 25 (Zoning Code), Section 25-4-11 (c) requires that public uses, structures, and buildings and community buildings are permitted uses in any district, provided that the director has issued plan approval for such use. Therefore, the proposed project will require a Plan Approval issued by this office.

According to the County of Hawai'i General Plan 2005, amended December 2006, the property is designated as Low Density Urban by the Land Use Pattern Allocation Guide (LUPAG) Map. Although the entire island of Hawai'i is within the Coastal Zone Management Area, the subject area is not located within the Special Management Area.

PBR HAWAII & Associates, Inc.
Attn: Bradley Furuya
February 7, 2024
Page 2

The project site is located in the South Kohala Community Development Plan (CDP) planning area. The South Kohala CDP was adopted by Ordinance No. 08-159, effective as of November 20, 2008. Strategy 1.3 of the South Kohala CDP is to *Plan, Fund, and Construct a Community Library*. More specifically, the strategy notes that *a modern library would be an important facility and amenity for Waikoloa Village and would enhance the Village's sense of community and identity*. The proposed project would be consistent with the library priorities in the South Kohala CDP.

In addition, as discussed in the DEA, the proposed project is consistent with Hawai'i Revised Statutes (HRS), Chapter 205A, Coastal Zone Management, several Policies of the County of Hawai'i General Plan 2005 (amended December 2006) related to Public Facilities and Education, and in alignment with the South Kohala Community Development Plan.

We have no further comments to offer, at this time. However, please provide our department with a copy of the Final Environmental Assessment for our records.

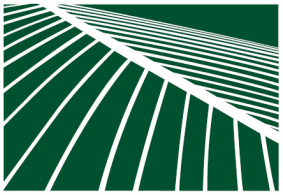
If you have any questions or if you need further assistance, please feel free to contact Maryam Palma at (808) 961-8139.

Sincerely,

Zendo Kern
Zendo Kern (Feb 8, 2024 11:57 HST)

ZENDO KERN
Planning Director

MP:tc
P:\wpwin60\Maryam\Letters\EA-EIS Review\DEA_KamakoaLibrary.doc



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President / Chairman

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May 8, 2024

Mr. Zendo Kern, Director
County of Hawai'i, Department of Planning
Aupuni Center
101 Pauahi Street Suite 3
Hilo, HI 96720

SUBJECT: HRS CHAPTER 343 DRAFT ENVIRONMENTAL ASSESSMENT FOR THE PROPOSED WAIKŌLOA PUBLIC LIBRARY AT KAMAKOA, WAIKŌLOA VILLAGE, COUNTY OF HAWAI'I, HAWAI'I, TMK (3) 6-8-041:020

Dear Mr. Kern,

Thank you for your letter dated February 8, 2024. As the planning sub-consultant for the State of Hawai'i Department of Accounting and General Services (DAGS) and the Hawai'i State Public Library System (HSPLS), we acknowledge the comments from the County of Hawai'i, Planning Department and offer the following responses.

We note that the Project parcel is zoned Single-Family Residential (RS-10) by the County and designated as Urban by the State Land Use Commission. We also acknowledge that as a public use, the proposed public library will require a Plan Approval by the County of Hawai'i Planning Department.

According to the County of Hawai'i General Plan 2005, amended December 2006, the property is designated as Low Density Urban by the Land Use Pattern Allocation Guide (LUPAG) Map. Although the entire island of Hawai'i is within the Coastal Zone Management Area, the subject area is not located within the Special Management Area.

As a public library, we concur that the proposed Project will be consistent with the library priorities outlined in the South Kohala Community Development Plan.

We also concur that the Project is consistent with:

- Hawai'i Revised Statutes (HRS), Chapter 205A, Coastal Zone Management;
- Several Policies of the County of Hawai'i General Plan related to Public Facilities and Education; and
- The South Kohala Community Development Plan.

We acknowledge that the Planning Department has no further comments at this time. A copy of the Final EA will be provided to your office upon publication. We value your participation in the environmental review process. Your letter will be reproduced in the forthcoming Final EA.

Sincerely,

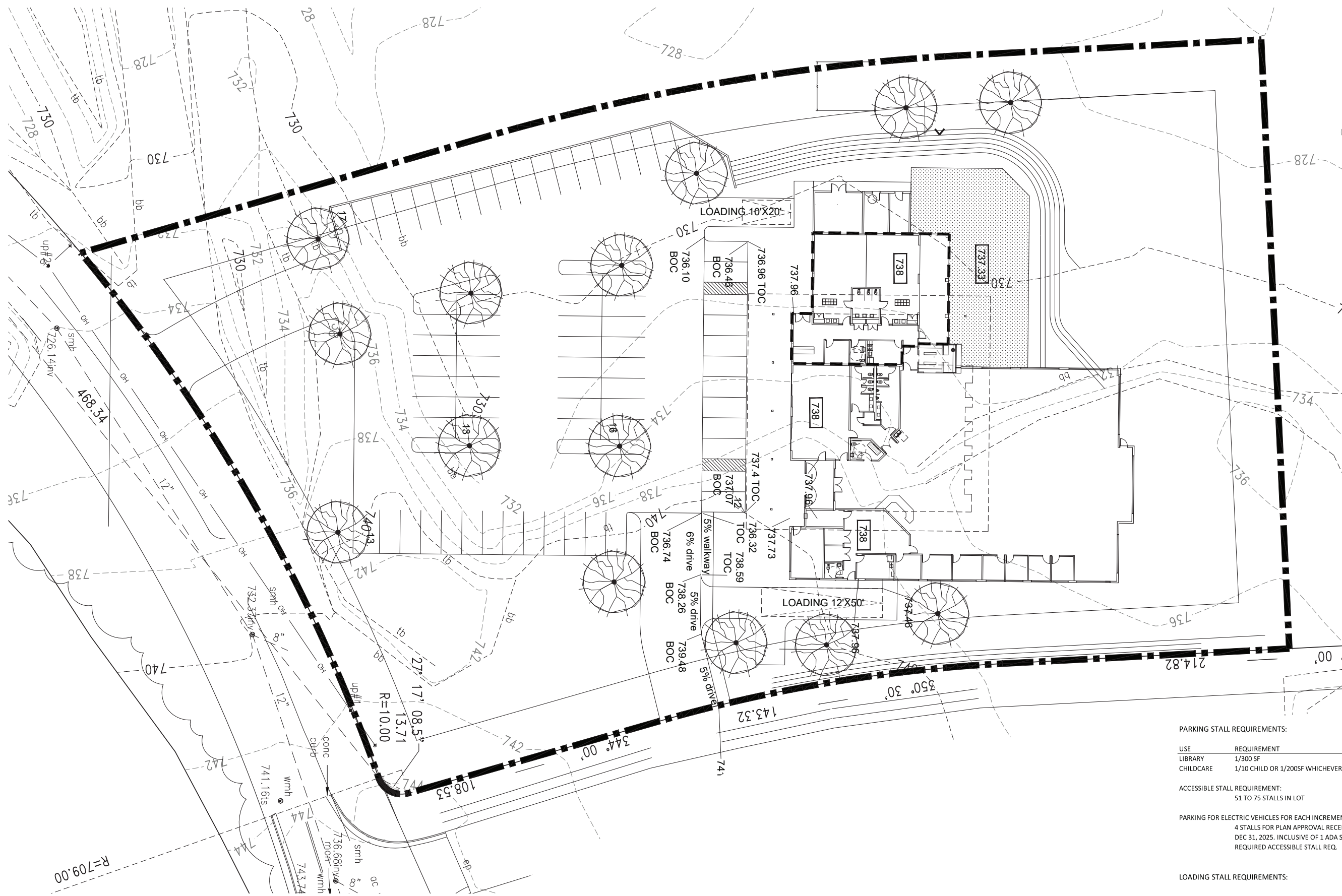
PBR HAWAII

Bradley Furuya, AICP
Associate

cc: Glenn Miura, CDS International
State of Hawai'i, Department of Accounting and General Services (DAGS)
Hawai'i State Public Library System

Appendix D: Concpetual Site Plan





PARKING STALL REQUIREMENTS:

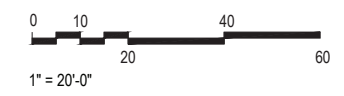
USE	REQUIREMENT	GROSS FLOOR AREA	REQ STALLS	PROVIDED STALLS
LIBRARY	1/300 SF	12,076 SF	40	49
CHILDCARE	1/10 CHILD OR 1/200SF WHICHEVER IS GREATER	3,029 SF	15	15
ACCESSIBLE STALL REQUIREMENT: 51 TO 75 STALLS IN LOT			3	3
PARKING FOR ELECTRIC VEHICLES FOR EACH INCREMENT OF FIFTY STALLS 4 STALLS FOR PLAN APPROVAL RECEIVED BY DEC 31, 2025. INCLUSIVE OF 1 ADA STALL SEPARATE FROM REQUIRED ACCESSIBLE STALL REQ.			4	4
TOTAL:			62 STALLS	71 STALLS

LOADING STALL REQUIREMENTS:

2 STALLS PROVIDED
12FT x 50FT x 14 FT VERT CLEARANCE
10FT x 22FT

WAIKOLOA PUBLIC LIBRARY

SCHEMATIC SITE PLAN



CDS INTERNATIONAL
Architecture • Planning • Interior Design
1003 Bishop Street • Pauahi Tower Suite 1400 • Honolulu, HI 96813-3499
Telephone: (808) 524-4200 • FAX: (808) 521-3766



Appendix E: Conceptual Rendering

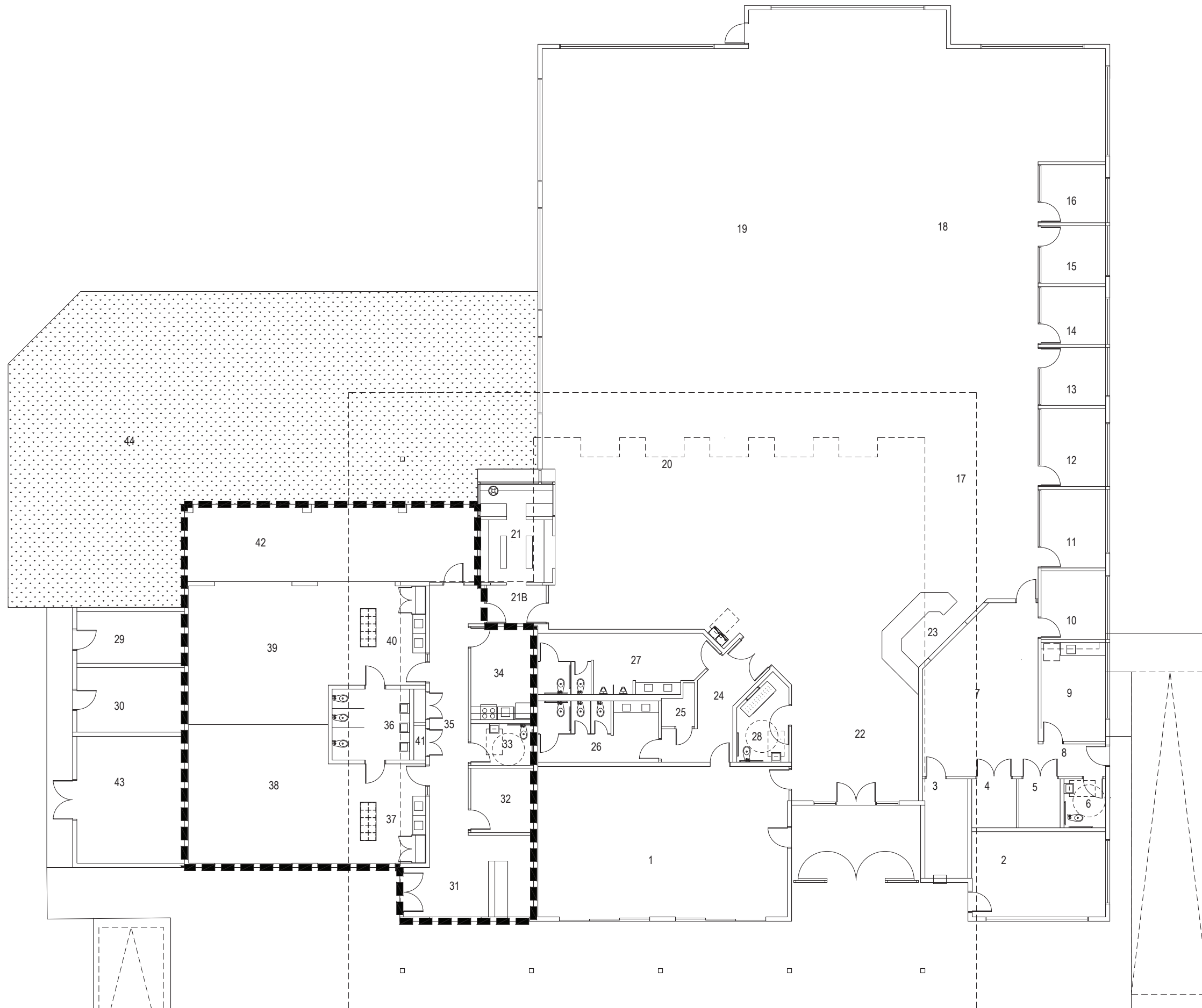




Appendix F:

Concpetual Floor Plan





ROOM LEGEND:

ROOM NO. ROOM NAME

LIBRARY:

- 1 PROGRAM ROOM
- 2 FRIENDS OF THE LIBRARY
- 3 BOOK DROP
- 4 COMM & SERVER
- 5 STORAGE
- 6 STAFF TOILET
- 7 WORK ROOM
- 8 CORRIDOR
- 9 STAFF LOUNGE
- 10 LIBRARIAN OFFICE
- 11 PRIVATE MEETING RM 1
- 12 PRIVATE MEETING RM 2
- 13 PRIVATE MEETING RM 3
- 14 PRIVATE MEETING RM 3
- 15 PRIVATE MEETING RM 3
- 16 PRIVATE MEETING RM 4

BOOK COLLECTION:

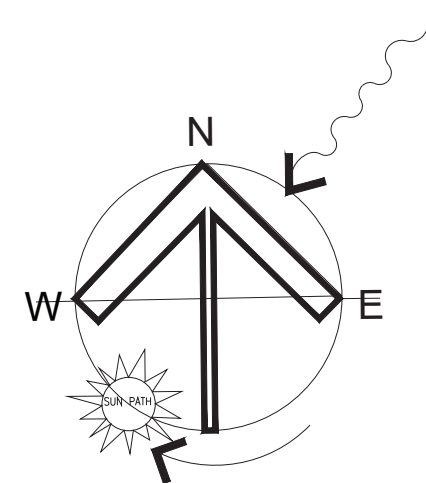
- 17 COMPUTER STATIONS
- 18 ADULT COLLECTIONS
- 19 YOUNG ADULT COLLECTIONS
- 20 JUVENILE COLLECTIONS
- 21 CHILDRENS "BOOK MOBILE"
- 21.1 CHILDRENS ACCESS TO "BOOK MOBIL

- 22 LOBBY
- 23 CIRCULATION
- 24 VESTIBULE
- 25 JANITOR
- 26 WOMEN
- 27 MEN
- 28 GENDER TOILET
- 29 MAINTENANCE STOR
- 30 ELECTRICAL

CHILD CARE:

- 31 RECEPTION
- 32 OFFICE
- 33 TOILET
- 34 KITCHEN/STAFF LOUNGE
- 35 CORRIDOR
- 36 CHILDRENS RESTROOM
- 37 CLASSRM SUPPORT
- 38 EARLY LEARNING CLASSRM 1
- 39 EARLY LEARNING CLASSRM 2
- 40 CLASSRM SUPPORT
- 41 STORAGE
- 42 COVERED LANAI

- 43 MECHANICAL YARD
- 44 PLAYGROUND



WAIKOLOA PUBLIC LIBRARY

SCHEMATIC FLOOR PLAN

0 8' 16' 24'
 SC: 1/8" = 1'-0"

CDS INTERNATIONAL
 Architecture • Planning • Interior Design
 1003 Bishop Street • Pauahi Tower Suite 1400 • Honolulu, HI 96813-3499
 Telephone: (808) 524-4200 • FAX: (808) 521-3766



Appendix G: Natural Resources Assessment



A natural resources assessment for the Waikoloa Library site, Waikoloa, Island of Hawai'i



AECOS Inc.
45-939 Kamehameha Highway
Suite 104
Kāneʻohe, Hawai'i 96744

May 16, 2023

A natural resources assessment for the Waikoloa Library site, Waikoloa, Island of Hawai'i

May 16, 2023

DRAFT

AECOS No. 1763

Reginald E. David

AECOS Inc.

45-939 Kamehameha Highway, Suite 104

Kāne'ohe, Hawai'i 96744

Phone: (808) 234-7770 Fax: (808) 234-7775 Email: reggie@aecos.com

Introduction

The State of Hawai'i, Department of Accounting and General Services, is proposing on behalf of the Hawaii State Public Library System to build an approximately 12,000 square foot public library, approximately 3,000 square foot Early Learning Center (ELC), 71-stall surface parking lot, and complimentary landscaping (the "Project"). The proposed library includes shelving for a minimum of 50,000 books, private meeting rooms, a program room, a work room, support space, and a librarian office. The ELC, connected to the library, will have two classrooms, each capable of accommodating roughly 20 students. The approximately 2.567-ac property, identified as TMK: (3) 6-8-041:020 is owned by the County of Hawai'i, Office of Housing and Community Development.

Site Description

The site is located north of Kamakoa Drive directly west of the Waikoloa soccer and baseball fields in the northern part of Waikoloa Village (Figure 1). The eastern half of the site has been previously graded and is a level pad, the western half has not been graded and slopes gently to the west (Figures 2 and 3).



C:\Hawaii\Waikoloa Public Library EAGIS

DATE: 4/18/2023

LEGEND






-  Project Site
-  TMK Parcels

Figure 4
Tax Map Key
Waikoloa Public Library

(Client's Name) Island of Hawai'i

North  Linear Scale (feet)  0 125 250

 PBR HAWAII & ASSOCIATES, INC.

Source: County of Hawai'i, 2022. USDA NRCS, 2020.
 Disclaimer: This graphic has been prepared for general planning purposes only and should not be used for boundary interpretations or other spatial analysis.

Figure 1. Waikoloa Public Library site, Waikoloa Village, Hawai'i.



Figure 2. Looking west across the eastern portion of previously graded site.



Figure 3. Looking south across the western part of site.

Methods

Botanical Survey

Reginald David surveyed the Project site on May 3, 2023. Plant species were identified as they were encountered around the proposed site improvements. Species names follow *Manual of the Flowering Plants of Hawai'i* (Wagner, Herbst, & Sohmer, 1990; Wagner & Herbst, 1999) for native and naturalized flowering plants. More recent name changes for naturalized plant species follow Imada (2019).

Terrestrial Vertebrates Survey

Avian Survey

A bird survey was conducted by the author on the morning hours of May 3, 2023. Birds were identified by visual observations aided by Leica 8 X 42 binoculars, and by listening for vocalizations. A single eight-minute avian point-count was made at the point count-station, located approximately in the middle of the site. Weather conditions were ideal with unlimited visibility, no precipitation, and winds between 4 and 8 kilometers per hour. The avian phylogenetic order and nomenclature used in this report follows the AOU *Check-List of North and Middle American Birds* 2021, and the 63rd supplement to the checklist (Chesser et al., 2021, 2022).

Mammalian Survey

A list was made of mammals encountered during the survey. Indicators of mammalian presence, such as tracks, scat, and other sign were noted. Mammalian phylogenetic order and nomenclature follow *Mammal Species of the World* (Wilson and Reeder, 2005).

Results

Vegetation

Vegetation within the project footprint is dominated by low growing herbaceous plants (cover image, Figs. 2 and 3).

Flora

The most abundant plants encountered were buffelgrass (*Cenchrus ciliaris*), fountain grass (*Cenchrus setaceus*), low stature koa haole (*Leucaena leucocephala*), 'uhaloa (*Waltheria indica*), garden spurge (*Euphorbia hirta*). Several kiawe trees (*Prosopis pallida*) grow on the west and south edges of the site.

Avian Fauna

A total of 26 individual birds of nine species, representing nine separate families, was recorded during the station count (Table 1). No additional species were recorded while transiting the site conducting the flora survey. All of the avian species recorded are alien to the Hawaiian Islands. Avian diversity and densities were in keeping with the location, the xeric conditions and the vegetation present within the site and vicinity.

Table 1. Avian species detected Waikoloa Library Site, May 2023

Common Name	Species	Order Family	Status	N =
GALLIFORMES				
PHASIANIDAE - Pheasants & Partridges				
Phasianinae - Pheasants & Allies				
Gray Francolin	<i>Ortygornis pondicerianus</i>		A	2
COLUMBIFORMES				
COLUMBIDAE - Pigeons & Doves				
Zebra Dove	<i>Geopelia striata</i>		A	1
PELECANIFORMES				
ARDEIDAE - Herons, Bitterns & Allies				
Cattle Egret	<i>Bubulcus ibis</i>		A	1

PSITTACIFORMES			
PSITTACULIDAE - Lories, Lovebirds, and Indomalayan and Papua-Australasian Parrots			
Rosy-faced Lovebird	<i>Agapornis roseicollis</i>	A	7
ALAUDIDAE - Larks			
Eurasian Skylark	<i>Alauda arvensis</i>	A	3
STURNIDAE - Starlings			
Common Myna	<i>Acridotheres tristis</i>	A	3
ESTRILDIDAE - Estrildid Finches			
African Silverbill	<i>Euodice cantans</i>	A	4
FRINGILLIDAE - Fringilline and Carduline Finches & Allies			
Carduelinae - Carduline Finches and Hawaiian Honeycreepers			
House Finch	<i>Haemorhous mexicanus</i>	A	1
THRAUPIDAE - Tanagers			
Thraupinae - Core Tanagers			
Yellow-billed Cardinal		A	3

Legend to Table 1

Status:

A = Naturalized, non-native species (introduced).

N = Number of individuals recorded

Mammalian Fauna

Two terrestrial mammalian species were detected during this survey. We saw and heard several dogs (*Canis lupus familiaris*), additionally a goat (*Capra hircus*) skeleton was also found on the site.

Discussion and Recommendations

Recommendations are partly based on U.S. Fish and Wildlife Service, Animal Avoidance and Minimization Measures (USFWS-PIFWO, 2022a,b). Implementation of the recommendations (provided below as bulleted items) by the Project contractor will minimize impacts to listed species to the maximum extent practicable.

Floral Resources

No protected botanical resources (DLNR, 1998; USFWS, nd-a) were detected on or adjacent to the Project site, nor were any expected given the current condition of the site. It is not expected that the development and construction of a library and ancillary support infrastructure will result in deleterious impacts to any sensitive botanical resources.

Avian Resources

All avian species detected are alien to the Hawaiian Islands. No native species were detected nor expected given the habitats present within and adjacent to the site.

Seabirds

It is possible that Hawaiian Petrel (*Puffinus sandwichis*), Band-rumped Storm-Petrel (*Hydrobates castro*), and Newell's Shearwater (*Puffinus newelli*) over-fly the Project area between April and the middle of December each year in small numbers. The primary cause of mortality in Hawaiian Petrels and Newell's Shearwaters in Hawai'i is thought to be predation by alien mammalian species at the nesting colonies (USFWS, 1983; Simons and Hodges, 1998; Ainley et al., 2001). Collision with man-made structures is considered the second most significant cause of mortality of these listed seabird species in Hawai'i. Nocturnally flying seabirds, especially fledglings on their way to sea in the summer and fall, can become disoriented by exterior lighting. Disoriented seabirds may collide with man-made structures and, if not killed outright, become easy targets of opportunity for feral mammals (Hadley, 1961; Telfer, 1979; Sincock, 1981; Reed et al., 1985; Telfer et al., 1987; Cooper and Day, 1998; Podolsky et al., 1998; Ainley et al., 2001; Hue et al., 2001; Day et al., 2003). No suitable nesting habitat exists within or close to the Project area for any of these three seabird species.

The principal potential impact that the Project poses to protected seabirds is an increased threat that birds will be downed after becoming disoriented by lights associated with the construction if undertaken during the nesting season and if it is deemed expedient or necessary to conduct night-time construction activities. As well, following build-out, security lighting operated during the seabird nesting season can pose a hazard.

- If night-time construction activity or equipment maintenance is proposed during the construction phases of the project, all associated lights should be shielded, and when large flood/work lights are used, they should be placed on poles that are high enough to allow the lights to be pointed directly at the ground (Reed et al., 1985; Teller et al., 1987). Deleterious impacts to transiting seabirds can be avoided if construction occurs during daylight hours and all outdoor lighting installed is fully “dark sky compliant” (HDLNR-DOFAW, 2016). DLNR recommends avoiding construction-related night-time lighting between September 15 and December 15 (DLNR, 2016).

Mammalian Resources

The findings of the mammalian survey are consistent with the location of the property and habitat present on the property. Although no rodents were recorded it is likely that some of the four established Muridae found on Hawai‘i Island—roof rat (*Rattus rattus*), brown rat (*Rattus norvegicus*), Polynesian rat (*Rattus exulans hawaiiensis*), and European house mouse (*Mus musculus domesticus*)—use resources within the general Project area on a seasonal basis. These introduced rodents are deleterious to native ecosystems and native faunal species.

With the exception of the Hawaiian hoary bat, no mammalian species currently protected or proposed for protection under either the federal or State of Hawai‘i endangered species programs were detected or expected during this survey (DLNR, 2015; USFWS, nd-a).

Hawaiian hoary bat

It is possible that the Hawaiian hoary bat or ‘ōpe‘ape‘a (*Lasiurus cinereus semotus*) overflies the Project area on a seasonal basis as they are regularly recorded in the greater Waikoloa/South Kohala areas (David, 2023). The removal of trees can temporarily displace individual bats using those trees for roosting. As bats use multiple roosts within their home territories, the potential disturbance resulting from the removal of vegetation is likely to be minimal. However, during the pupping season, females carrying their pups may be less able to vacate a roost

site if the tree is felled. Further, adult female bats sometimes leave their pups in the roost tree while they forage. Very small pups may be unable to flee a tree that is being felled. No suitable roost trees are present on the site and it is not expected that the Project will result in deleterious impacts to this endangered species.

Other Resources of Potential Concern

Critical Habitat

No federally delineated Critical Habitat for any species occurs within the Project area (USFWS, nd-b). There is no equivalent designation under State of Hawai'i endangered species statutes.

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Appendix H: Archeological Field Inspection Report



November 9, 2023

State of Hawai‘i
Department of Accounting and General Services
Public Works Division
ATTN: Brian Isa
1151 Punchbowl Street
Honolulu, HI 96813
Email: brian.s.isa@hawaii.gov

via email

Subject: Archaeological Field Inspection for the proposed Waikōloa Library Project, TMK: (3) 6-8-041: 020, Waikōloa Ahupua‘a, South Kohala District, Island of Hawai‘i

Dear Brian:

At the request of CDS International, on behalf of the Hawai‘i State Public Library System, ASM Affiliates (ASM) conducted an archaeological field inspection for the proposed Waikōloa Library Project on Tax Map Key (TMK): (3) 6-8-041:020 in Waikōloa Ahupua‘a, South Kohala District, Island of Hawai‘i (Figures 1, 2, and 3). Development activities proposed for the 2.5-acre subject parcel include the construction a 12,000 square foot building that will house a public library, two meeting spaces, and an Early Learning Center (ELC) along with parking and loading areas (Figure 4). The Waikōloa Library Project will be undertaken by an agency of the state and is subject to review under Hawai‘i Revised Statutes (HRS) Chapter 6E-8. The current field inspection was conducted pursuant to Hawai‘i Administrative Rules (HAR) §13-275 to determine if any undocumented historic properties exist within the project area. This letter report presents a description of the project area, a review of previous studies in the vicinity of the project area, and a description of the methods and results of the current field inspection. This is followed by a recommended determination of effect for the proposed project.

Project Area Description

The current project area consists of a 2.5-acre parcel (TMK: [3] 6-8-041:020) located in the northern portion of Waikōloa Village in Waikōloa Ahupua‘a, South Kohala District, Island of Hawai‘i. It is situated between 744 and 757 feet above sea level and is approximately 3 miles inland from the coast. The subject parcel is bound to the south by Kamakoa Drive, to the north and west by undeveloped land, and to the east by a road easement (Road A; Figure 5) that borders the western side of the Waikōloa soccer fields (see Figure 3). Minimal soil accumulation was observed within the project area consisting of Hapuna-Waikui-Lalamilo complex, an extremely cobbly medial silty loam developed from volcanic ash and medial fine sandy loam developed from alluvium over basic volcanic ash deposits (Soil Survey Staff 2022). These soils overly ‘a‘ā lava flows (Hamakua Volcanics series) that emanated from Mauna Kea 64,000 to 300,000 B.P. (Sherrod et al. 2007). This region is generally arid with temperatures ranging between 68 and 75 degrees Fahrenheit and annual rainfall less than 2 inches a year (Giambelluca et al. 2014). Low rainfall and minimal soil lend to a sparsely vegetated ground surface mostly consisting of buffel grass (*Cenchrus ciliaris*), and a few scattered *kiawe* (*Prosopis pallida*) trees with sporadic patches of the native morning glory *pā‘ūohi‘iaka* (*Jacquemontia ovalifolia*) (Figures 6 to 8).

Culture-Historical Background

The modern-day *ahupua'a* of Waikōloa is bound to the north by Lālāmilo Ahupua'a, to the east by Pā'auhau Ahupua'a, and to the south by the *ahupua'a* of Pu'u Anahulu. The place name "Waikōloa" is said to derive from the wild ducks that lived in Waikōloa stream, the name meaning "duck water" (Judd 1932; Pukui et al. 1974:223). An alternative origin of the name can be found in *Ka 'ao Ho 'oniua Pu 'uwai No Ka Miki* (The Heart-Stirring Story of Ka Miki), where the name refers to the wind named Waikōloa blows sacred water in an 'awa bowl the long distance from Holoholokū in Waimea to Waiki'i (Maly 1992; Wise and Kihe 1914). The modern *ahupua'a* of Waikōloa was traditionally an 'ili (land section smaller than an *ahupua'a*) of the *kalana* (or 'okana) of Waimea, and in ancient times was referred to as Waikōloa Nui, or "large Waikōloa." The neighboring area of Lālāmilo was referred to as Waikōloa Iki, or "little Waikōloa" (Maly 1999).

The initial permanent settlements were established at sheltered bays with access to fresh water primarily in the windward valleys and gulches. These early communities would have shared extended familial relations and had an occupational focus on the collection of marine resources. The upland habitation that followed focused on agricultural field systems, which undoubtedly provided much of the produce for the coastal inhabitants (Carlson and Rosendahl 1990). The upper reaches of Waikōloa Ahupua'a and the greater Kohala District were ideal for bird hunting, where the prized feathers were utilized for the creation of 'ahu'ula (feather cloak), mahiole (feather helmet), and kahili (feather standard) —all iconic symbols of Hawaiian royalty. In addition, birds were an important source of meat for subsistence purposes (Gomes 2016:33). The current project area, located at a slightly lower elevation, was situated in *pili* grass plains on the *kula* lands.

Around the turn of the nineteenth century, Kamehameha I gave control of Waikōloa Nui Ahupua'a (excluding the coastal 'ili of 'Anaeho'omalu and Kalāhuipua'a) to Isaac Davis (Rosendahl 2000). Although the land of Waikōloa Nui gifted to Davis encompassed a large area, it lacked extensive resources and was primarily a place for catching birds and gathering *pili* grass. When Davis died in 1810 without naming an heir, John Young took control of the land and protected it for Davis' children, who were at that time too young to take on the responsibility (Rosendahl 2000). Waikōloa Nui would eventually become a favored pasture for the cattle given by Vancouver to Kamehameha during his 1793 and 1794 visits, which Kamehameha immediately made *kapu*, thus preventing them from being killed (Kamakau 1992).

Over the course of the early nineteenth century, leeward settlement shifted to the windward side of Kohala as the leeward, agriculturally marginal areas were abandoned in favor of more productive and wetter sugarcane lands. According to Tomonari-Tuggle (1988), the remnant leeward population nucleated into a few small coastal communities and dispersed upland settlements. These settlements were no longer based on traditional subsistence patterns, largely because of the loss of access to the full range of necessary resources. The wetter windward slopes of North Kohala and the Waimea plain were the focus of the shifting settlement pattern, and they eventually became the population centers for the district.

As a result of the Māhele of 1848, Waikōloa Nui was awarded to George Davis Hū'eu based on Kamehameha I's gift of the land to Hū'eu's father, Isaac Davis. This award (LCAw. 8521-B:1) did not include the coastal areas of 'Anaeho'omalu and Kalāhuipua'a, which were retained by the crown. The Davis Hū'eu award was primarily restricted to the non-agricultural *pili* lands south of the agriculturally productive Lālāmilo area and *mauka* of the rich coastal resource area. By the mid-1860s the Waimea Grazing and Agricultural Company (WGAC) had acquired considerable strategic assets around Waimea in an attempt to monopolize the livestock industry in the region (Bergin 2004). On July 2nd, 1868, G. D. Hū'eu leased lands in Waikōloa Nui to the WGAC for twenty years, which made the WGAC the largest ranching operation on the island (Maly and Maly 2002). Under the terms of the lease, the Hū'eu family was allowed to continue grazing their 1,000 head of cattle, 1,000 head of sheep, and 100 horses on the Waikōloa lands (Escott 2008). By the late 1870s, largely due to persistent drought conditions, the WGAC went out of business, and its herd was purchased by Parker Ranch (Bergin 2004). Francis Spencer, one of the officers of the failed WGAC, formed Pu'uloa Sheep and Stock Company and continued to raise sheep on the leased

lands in Waikōloa. In October of 1876, Spencer sold his interest in the sheep ranch and the leased Waikōloa Nui lands to George W. Macfarlane (Maly and Maly 2002).

Meanwhile, Parker Ranch continued to expand its operations in the Waimea area throughout the 1870s and 1880s. The ranch eventually acquired the lease to roughly 95,000 acres in Waikōloa still held by G.D. Hū‘eu, and in 1903, under the direction of Alfred W. Carter, the guardian and trustee for Thelma Parker, purchased a nine-tenths interest in the Waikōloa Nui lands (Bergin 2004). Much of these grazed lands were divided into paddocks, and transportation and water conveyance infrastructure projects were undertaken to increase the productivity of the Waikōloa rangelands.

By the early 1900s, Parker Ranch was under the direction of Alfred W. Carter, chosen as the guardian and trustee for Thelma Parker, John Parker III’s daughter, upon his death at the age of nineteen. Early on in his tenure as Ranch Manager, Carter concentrated on acquiring and converting more of the ranch’s lands from leasehold to fee simple. In 1903, with only a short period left on its lease, Carter acquired nine-tenths interest in the Waikōloa Nui lands from Ms. Lucy Peabody for \$112,000, along with others in South Kohala, securing important grazing lands for the ranch (Bergin 2004). In 1906, on behalf of Thelma Parker, Carter bought out Sam Parker’s half-interest in Parker Ranch for a sum of \$600,000 (Bergin 2004). The expansion of Parker Ranch’s land- and lease holdings throughout the late 19th and early 20th centuries allowed the ranch to raise cattle and sheep in paddocks around the island. Once ready for the market, these animals would be brought back to Waimea for sorting before being driven down to Kawaihae to be shipped. During these cattle drives, the cowboys followed a well-used network of trails that connected the distant stations at Waiki‘i, Kalai‘ehā, and Ke‘āmuku with the town of Waimea and shipping harbors on the Kohala coast (Maly and Maly 2002).

Ranching operations were briefly interrupted during World War II. Several months before the bombing of Pearl Harbor in 1941, the U.S. Army established an infantry headquarters at Parker Ranch in the Pu‘ukapu area of Waimea (Bergin 2006). In December of 1943, the Second Marine Division arrived on Hawai‘i Island for rest and relaxation after fighting in the Gilbert Islands (Chapman 2014). They were dispersed into three camps: one at Hāpuna Bay, one at Pōhakuloa, and one in Waimea, which became known as Camp Tarawa. The U.S. War Department leased approximately 123,000 acres of land in the Waimea and Waikōloa area for use as a training area. With this lease the current APE became part of the U.S. Navy’s 91,000-acre Waikōloa Maneuver Area.

The 2nd Marine Division was the first to train at Waikōloa, spending five months there in preparation for the invasion of Saipan and Tinian. The 5th Marine Division replaced the 2nd Division in August 1944 and used the Waikōloa Maneuver Area to prepare for the assault on Iwo Jima. While training, the marines resided at Camp Tarawa just outside of Waimea Town. Camp Tarawa was the largest U.S. Marine training facility in the Pacific, covering an area of approximately 467 acres, and between 1943 and 1945 as many as 50,000 men passed through the camp on their way to the Pacific Theater (Escott 2008). The last of the Marines of the 5th Division departed Camp Tarawa in June of 1946, and the Waikōloa Maneuver Area was returned to the Parker Ranch in September of 1946 (Haun et al. 2010). Clean-up of unexploded ordnance (UXO) within the Waikōloa Maneuver Area is still ongoing.

Substantial changes of the Parker Ranch lands began to occur in the mid-twentieth century with the transfer to its sixth-generation heir, Richard Palmer Smart. Among these changes was a decision to initiate resort and residential developments in coastal ‘Anaeho‘omalū and the lands extending north towards Kawaihae. By December 1959, Smart initiated the \$300,000,000 resort and residential development of 10,000 acres of land along the South Kohala coastline referred to as the “Gold Coast” (Honolulu Star-Bulletin 1968; The Honolulu Advertiser 1959). Although he initially intended to retain ‘Anaeho‘omalū as part of Parker Ranch and simply make its acreage available through lease, Smart sold 25,500 acres of land above ‘Anaeho‘omalū Bay in May of 1968 to the Boise Cascade Home and Land Corp. Although the development of the resort was aimed at attracting tourists to the famed coast, the ultimate success of the resort was at least partially reliant on the creation of Waikōloa Village, a residential subdivision located *mauka* of ‘Anaeho‘omalū Bay in the vicinity of the current project area.

By the late 1960s, groundwork for Waikōloa Village was underway, and on June 27, 1970, Boise Cascade held their first open house to welcome the public and to “celebrate the advances made by Boise Cascade and Morrison-Knudsen in reclaiming the Ahupua‘a of Waikoloa for Man” (Boise Cascade 1970:1). Plans for this new community included construction of a vast water system to furnish future residents and businesses with water, creation of a golf course, a residential subdivision, equestrian center, condominiums, and a shopping center. In June of 1972, the golf course was finished and ready for its grand opening (Boise Cascade 1972) and by the mid to late-1970s, Waikōloa Village had been mostly built out. Over the next 50 years, development of Waikōloa Village continued spreading to the north. The current project area is located at the northern extremity of the subdivision, adjacent to a park that was developed between 2007 and 2012. An aerial image taken in 2011 (Figure 9) shows a portion of the current project area used as a staging facility for machines and equipment during construction of the park.

Prior Archaeological Work

The subject parcel was included in two older archaeological studies that encompassed larger areas surrounding the proposed project (Figure 10). The first was conducted by the B. P. Bishop Museum in 1972 to determine the nature and distributions of archaeological sites within areas of Waikōloa that were slated for development at that time (Bevacqua 1972). Seven large areas (Areas A-G) dispersed throughout the *ahupua‘a* were examined. The current project area was included in the roughly 2,000-acre Area F of that study, where five sites (Sites 17 through 21) were identified, including a roughly circular enclosure, C-shaped shelters, walls, cairns, and a rectangular enclosure. None of these sites are situated within the current project area. Later, William Bonk (1988) conducted an archaeological reconnaissance survey of roughly 580 acres in support of the EIS for the Waikoloa Affordable Housing Master Plan. Bonk (1988:9) “found nothing of prehistoric or historic interest within the area investigated,” and recommended that “no further archaeological work be required” prior to development of the area. More recent studies (Clark 2022; Ketner and Clark 2021) in the vicinity of the project area (see Figure 10) have produced negative findings as well, and have indicated that this area has undergone mechanical disturbance in the past.

Field Inspection Methods and Results

On May 22, 2023, Matthew R. Clark, M.A. (Principal Investigator) conducted an archaeological field inspection of the project area in compliance with HAR 13§13-275. The pedestrian surface survey included 100% ground coverage. The overall lack of vegetation provided excellent ground visibility for identification of historic properties. As a result of the pedestrian survey no historic properties were encountered within the project area. Observations made during the field inspection indicate that the entire eastern portion of the subject parcel had been previously graded and was used for staging during construction of the park to the east (see Figures 9 and 11). A linear bulldozer push pile created during the grading process extends roughly across the center of the parcel from the northern boundary to the southern boundary (Figure 12).

Recommend Effect Determination

No historic properties were identified as a result of the field inspection of TMK: (3) 6-8-041:020, therefore ASM recommends an effect determination of “no historic properties affected” for the proposed Waikōloa Library Project. In the unlikely event that unanticipated archaeological resources are unearthed during ground disturbing activities associated with the project, work in the immediate area of the discovery will be halted and DLNR-SHPD contacted as outlined in Hawai‘i Administrative Rules 13§13-275-12.

Should you require further information, or wish to visit the property, please contact me directly.

Sincerely,



Matthew R. Clark, M.A.
Principal Investigator, ASM Affiliates

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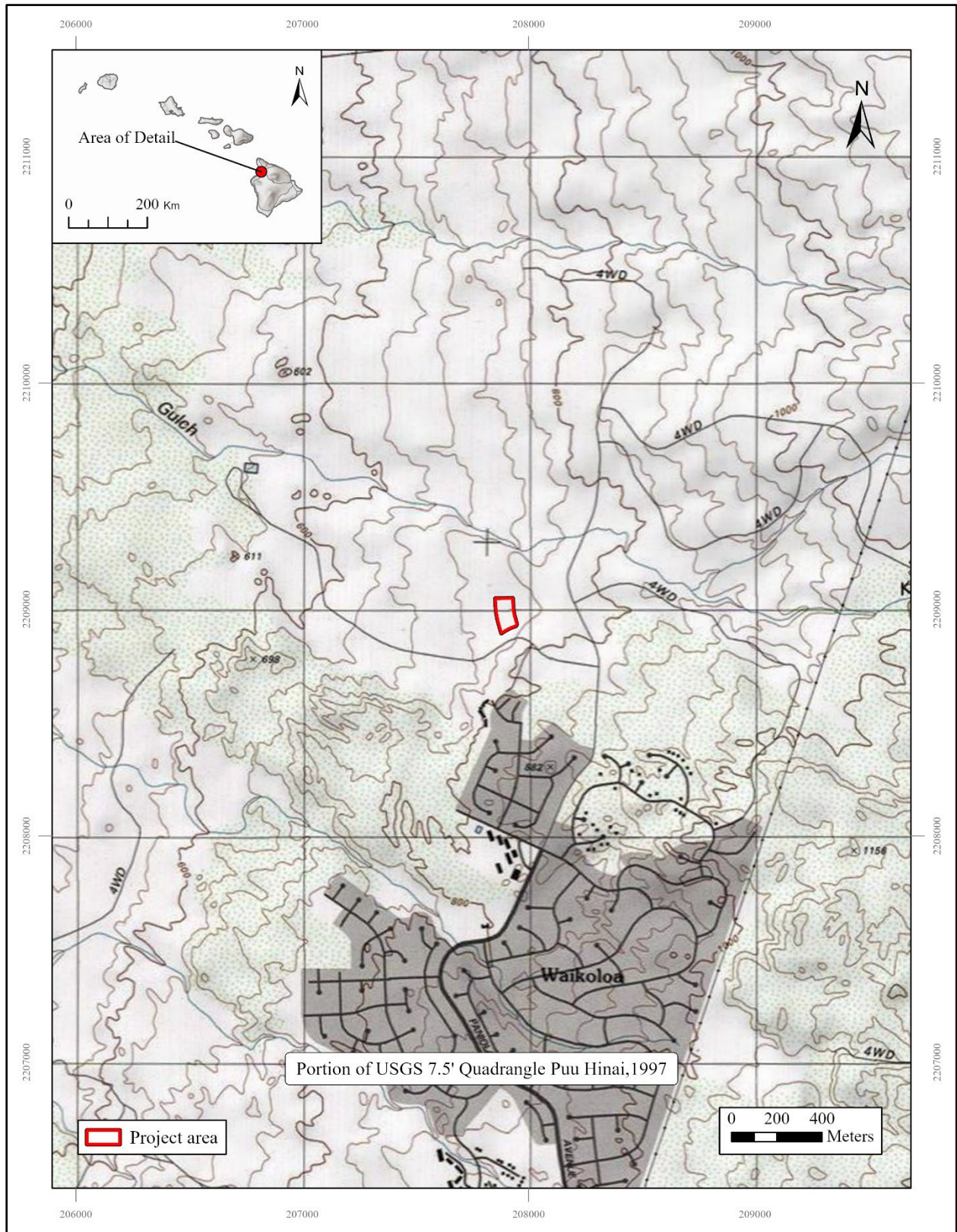


Figure 1. Project area location.

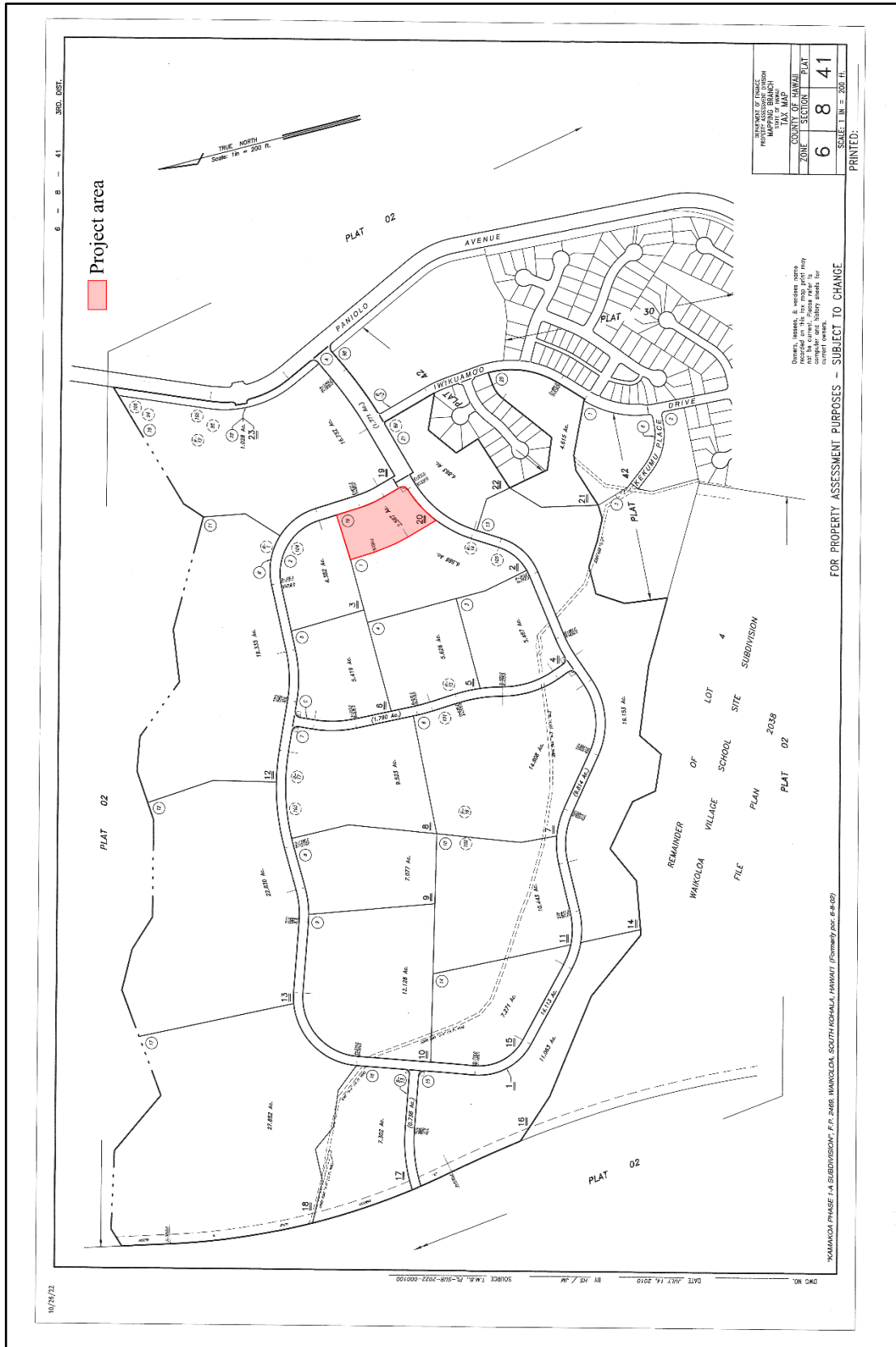


Figure 2. Tax map Key (3) 6-8-041, showing the current project area located on parcel 020.



Figure 3. Google Earth image showing the project area.

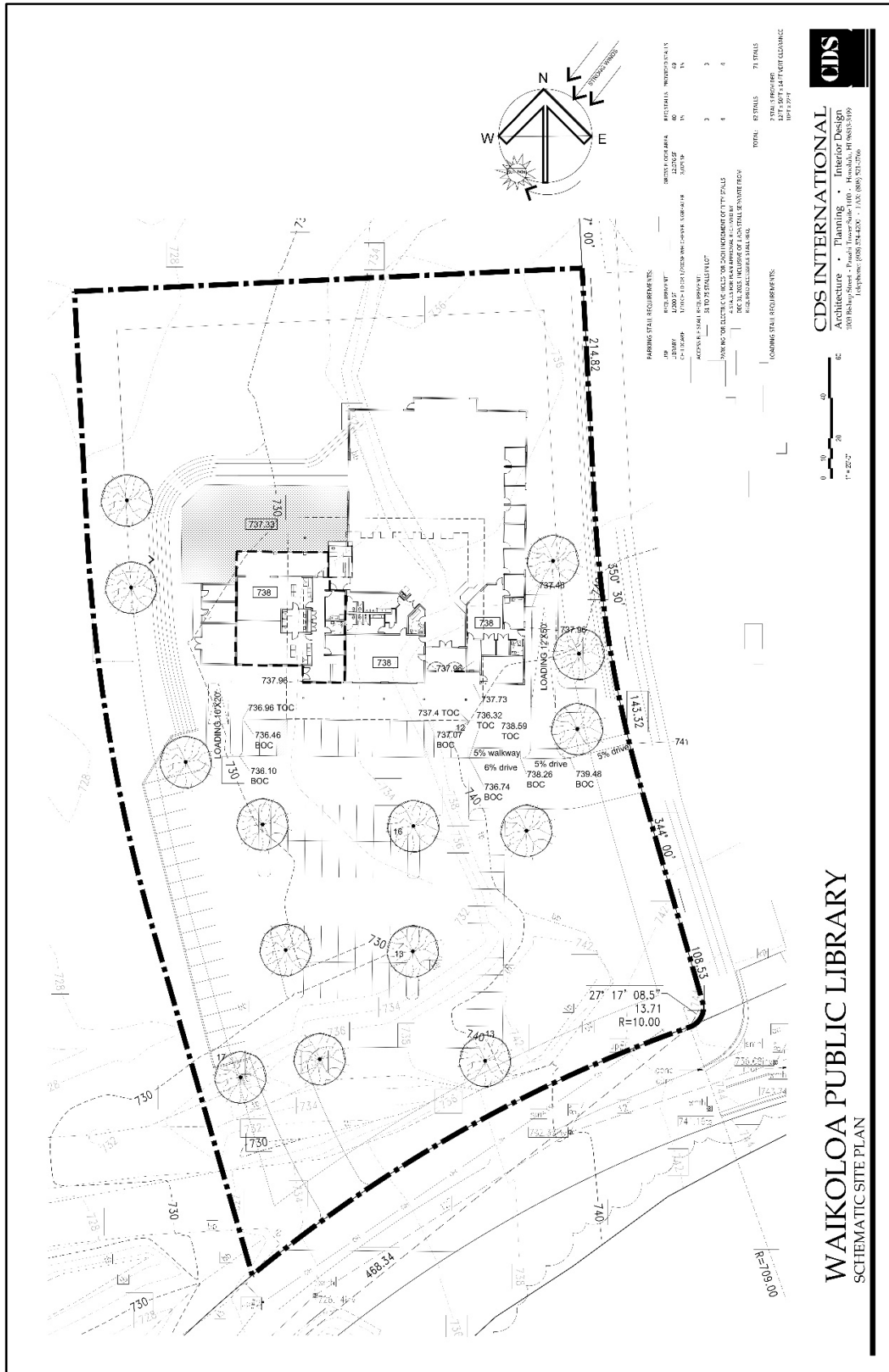


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Figure 8. Project area, view to the north.



Figure 9. 2011 Google Earth image showing the current project area.

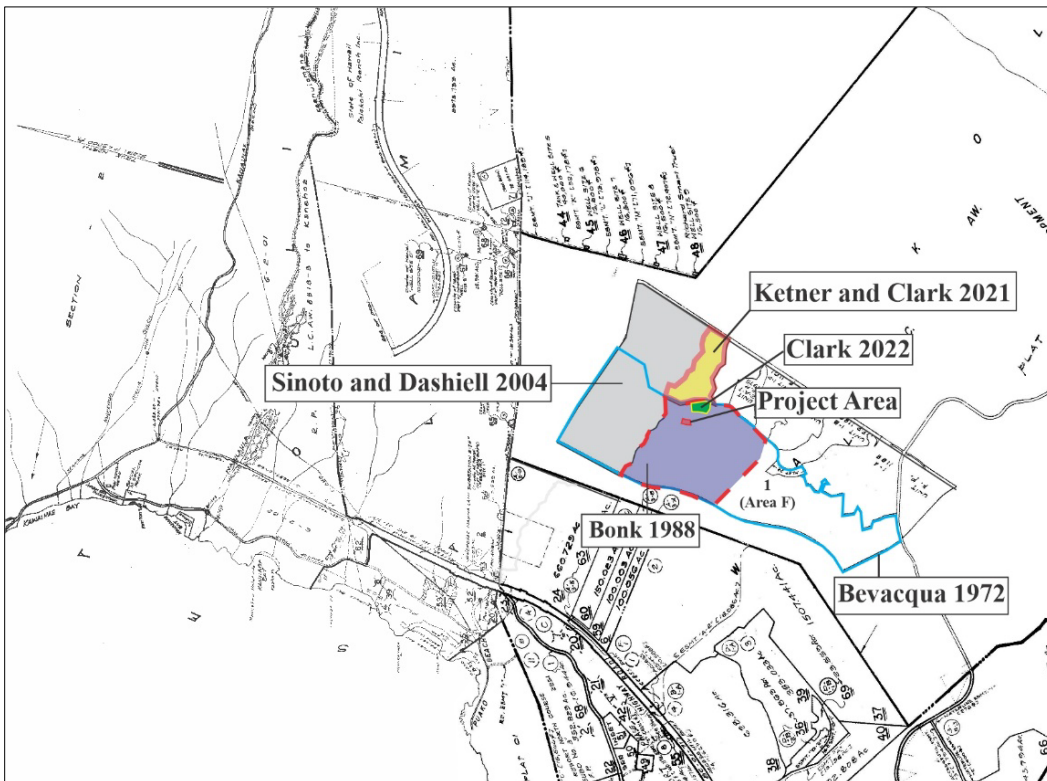


Figure 10. Previous archaeological studies near the project area.



Figure 11. Mechanically cleared portion of project area, view to the northwest.



Figure 12. Bulldozer push pile, view to the northwest.

Appendix I: Cultural Impact Assessment



A Cultural Impact Assessment for the Proposed Waikōloa Public Library

TMK (3) 6-8-041:020

Waikōloa Ahupua‘a
South Kohala District
Island of Hawai‘i

DRAFT VERSION



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A Cultural Impact Assessment for the Proposed Waikōloa Public Library

TMK (3) 6-8-041:020

Waikōloa Ahupua‘a
South Kohala District
Island of Hawai‘i



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1. INTRODUCTION

At the request of PBR Hawai‘i & Associates, Inc., on behalf of the Hawai‘i State Public Library System (the “Agency”), ASM Affiliates (ASM) has prepared this Cultural Impact Assessment (CIA) to inform an Environmental Assessment (EA) being prepared for the proposed Waikōloa Public Library (referred to hereafter as the proposed project). The roughly 2.5-acre proposed development area is situated within the northern portion of Waikōloa Village at the western termination of Kamakoa Drive on a portion of Tax Map Key (TMK): (3) 6-8-041:020, in Waikōloa Ahupua‘a, South Kohala District, Island of Hawai‘i (Figures 1, 2, and 3). A detailed description and schematic of the proposed project are provided in the ensuing section.

The expenditure of state funds qualifies the proposed project as a project subject to the Hawai‘i Environmental Policy Act (HEPA) as codified in Hawai‘i Revised Statutes (HRS), Chapter 343. This CIA study is intended to inform an EA conducted in compliance with HRS Chapter 343; and has been conducted pursuant to Act 50 and in accordance with the Office of Environmental Quality Control (OEQC) *Guidelines for Assessing Cultural Impacts*, adopted by the Environmental Council, State of Hawai‘i, on November 19, 1997 (OEQC 1997). As stated in Act 50, which was proposed and passed as Hawai‘i State House of Representatives Bill No. 2895 and signed into law by the Governor on April 26, 2000, specifically acknowledges the State’s responsibility to protect native Hawaiian cultural practices. Act 50 further states that “environmental assessments . . . should identify and address effects on Hawaii’s culture, and traditional and customary rights” and that “native Hawaiian culture plays a vital role in preserving and advancing the unique quality of life and the ‘aloha spirit’ in Hawai‘i. Articles IX and XII of the state constitution, other state laws, and the courts of the State impose on governmental agencies a duty to promote and protect cultural beliefs, practices, and resources of native Hawaiians as well as other ethnic groups.”

This report is divided into four main sections, beginning with an introduction and includes a description of the project area and the proposed library project. To provide a physical and cultural context of the project area, section two of this report includes a detailed cultural and historical background for the general study area, which includes background information for Waikōloa Ahupua‘a and the greater district of South Kohala. This section also includes a presentation of prior studies conducted within the vicinity of the proposed project area. The results of the consultation process are presented in section three of this report and section four concludes with a discussion of potential cultural impacts as well as appropriate actions and strategies that may help to mitigate any such impacts.

1. Introduction

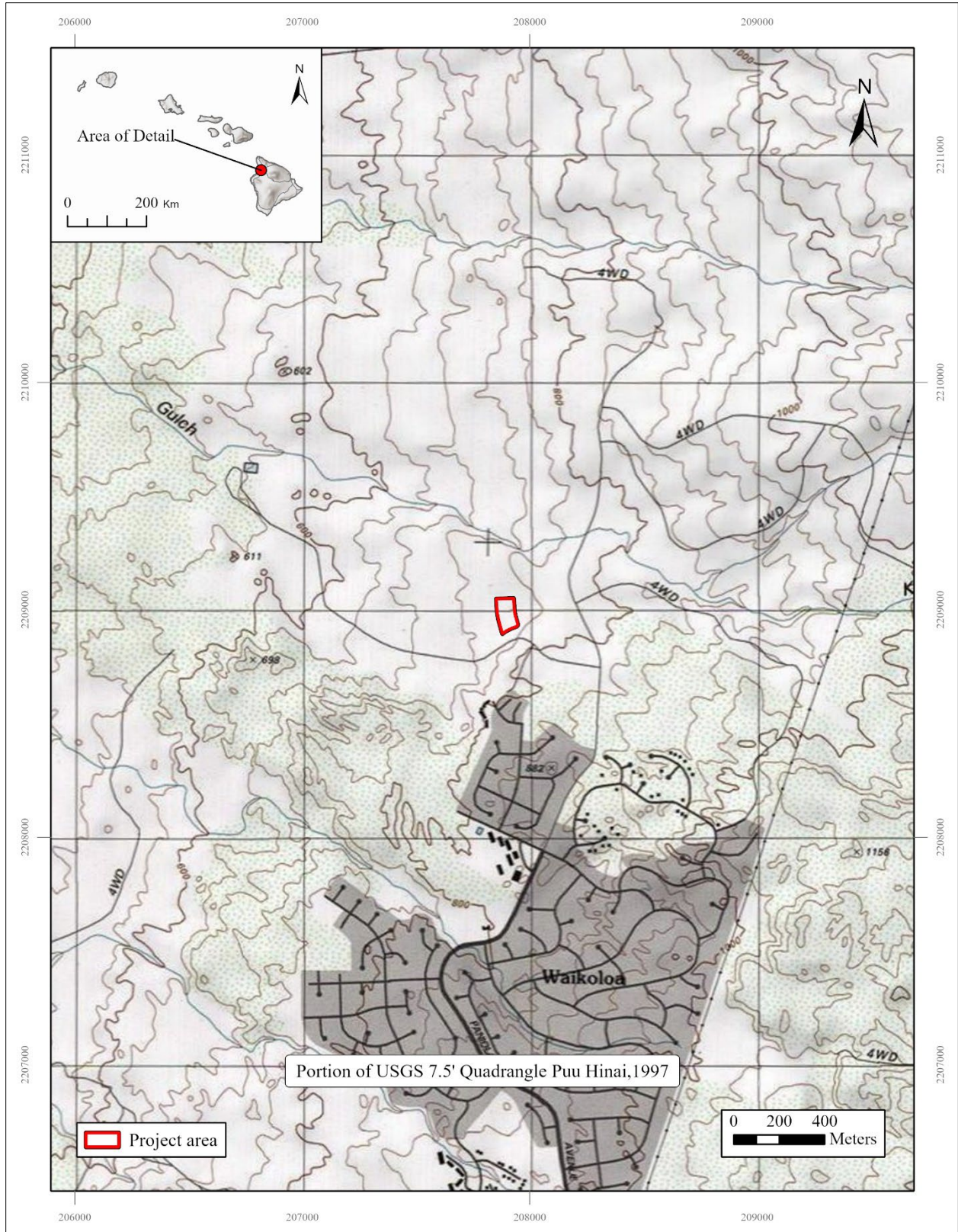


Figure 1. Project area location.

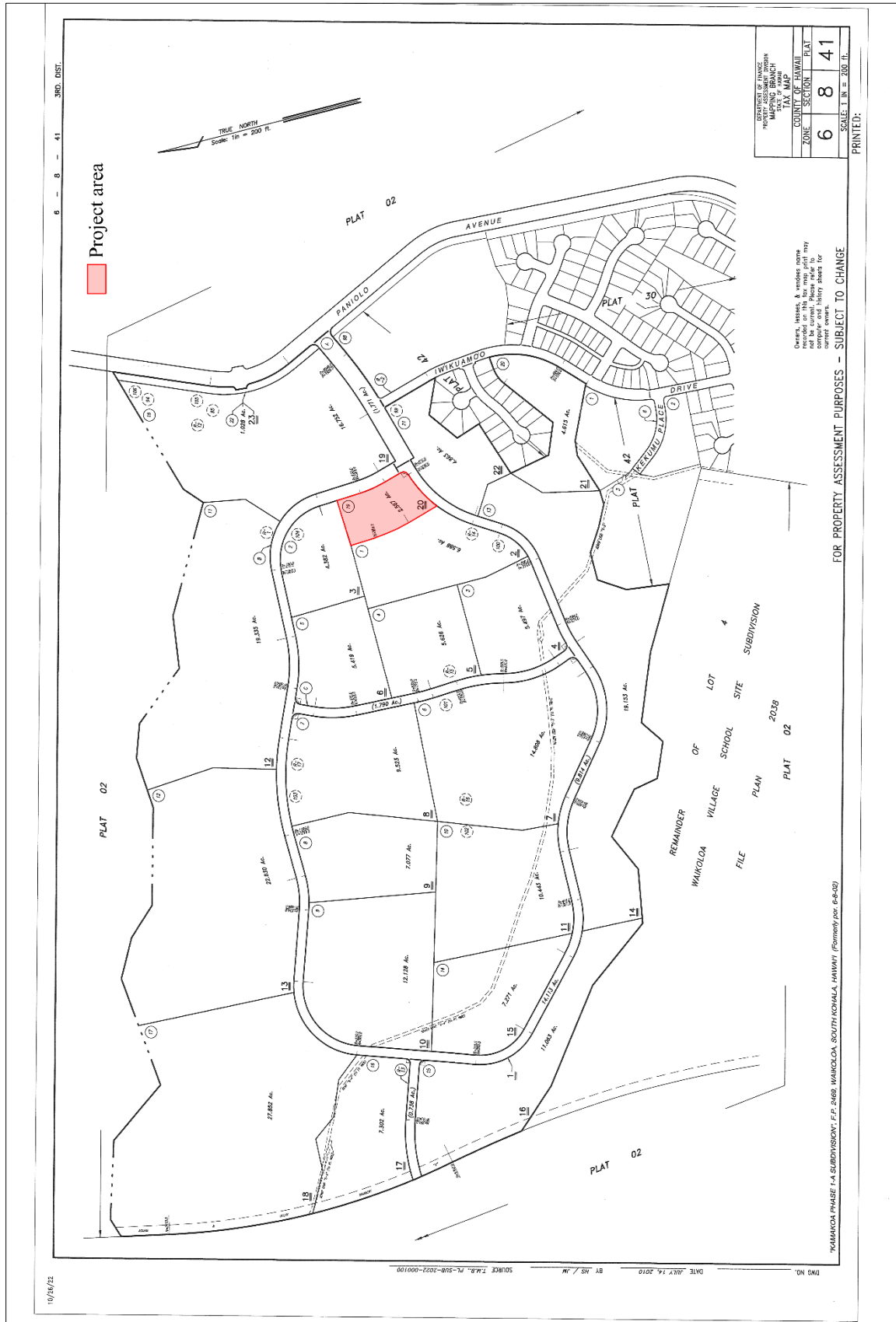


Figure 2. County of Hawai'i Tax Map (3) 6-8-041 showing the project area (parcel 020).

1. Introduction

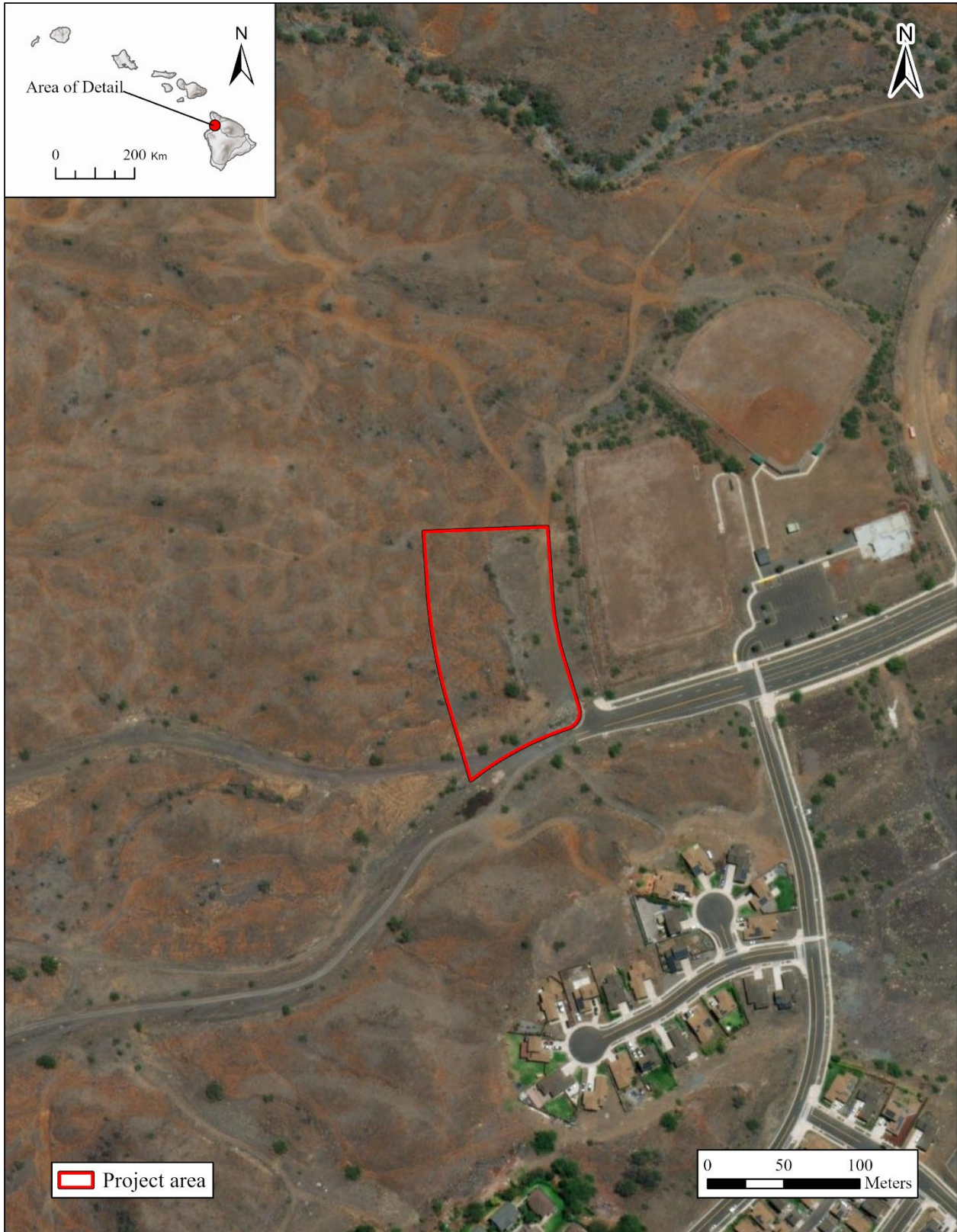


Figure 3. Google Earth™ satellite image showing project area location (outlined red).

DESCRIPTION OF THE PROPOSED PROJECT

The proposed project includes the construction of a single-story structure measuring 12,000 square feet that will house a public library, an early learning center, meeting spaces for the community, and restrooms (Figure 4). Vehicular access to the library would be through an egress from Kamakoa Drive and Road A. These vehicular access points would lead to a roughly seventy-one-stall parking lot and a loading zone.

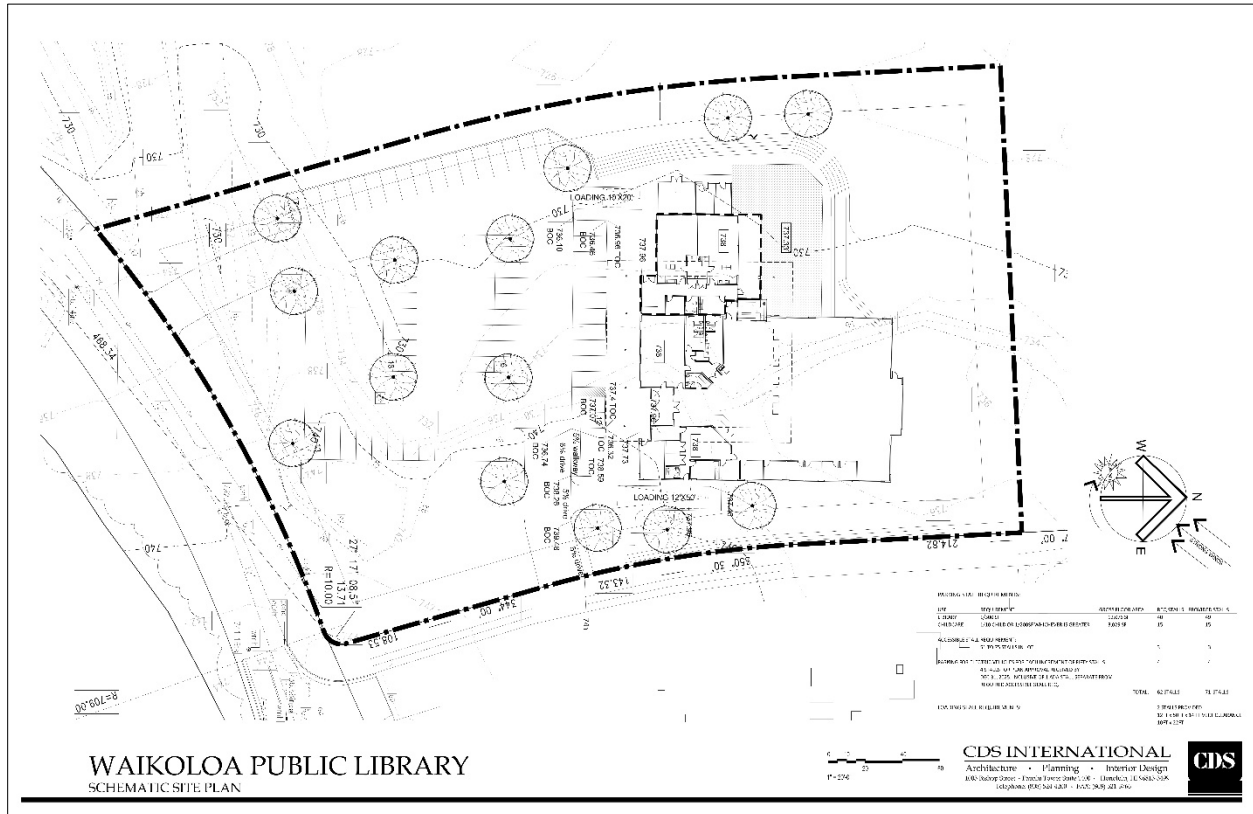


Figure 4. Proposed development plan for the Waikōloa Public Library.

PROJECT AREA DESCRIPTION

The project area consists of a 2.5-acre parcel (TMK [3] 6-8-041:020) located in the northern portion of Waikōloa Village in Waikōloa Ahupua‘a, South Kohala District, Island of Hawai‘i. It is situated between 744 and 757 feet above sea level and is approximately 3 miles inland from the coast. The subject parcel is bound to the south by Kamakoa Drive, to the north and west by undeveloped land, and to the east by a road easement (Road A) bordering the western side of the Waikōloa soccer fields (see Figure 3). Minimal soil accumulation was observed within the project area (Figure 5) consisting of Hapuna-Waikui-Lalamilo complex (labeled 373 in Figure 6), an extremely cobbly medial silty loam developed from volcanic ash and medial fine sandy loam developed from alluvium over basic volcanic ash deposits (Soil Survey Staff 2022). These soils overly ‘a‘ā lava flows (Hamakua Volcanics series, Qhm; Figure 7) that originated from Mauna Kea 64,000 to 300,000 B.P. (Sherrod et al. 2007). This region is generally arid with temperatures ranging between 68 and 75 degrees Fahrenheit and annual rainfall less than 2 inches a year (Giambelluca et al. 2014). Low rainfall and minimal soil lend to a sparsely vegetated ground surface mostly consisting of sparse buffel grass (*Cenchrus ciliaris*) and a few scattered kiawe (*Prosopis pallida*) trees. Most of the subject parcel has been subject to previous mechanical disturbance (Figure 8) and there is a linear bulldozer push pile extending through the center of the parcel from the northern boundary to the southern boundary (see Figures 3 and 9).



Figure 5. Project area, view to the east.

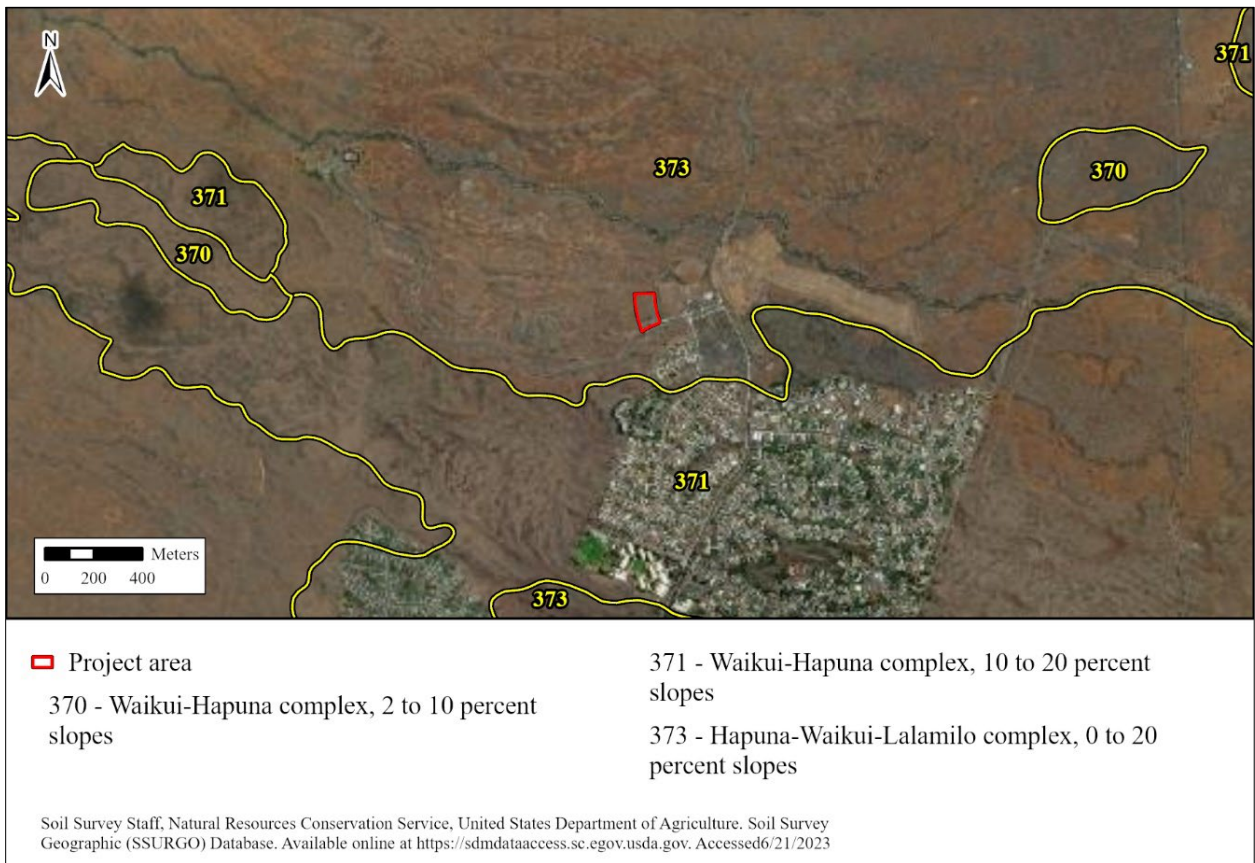


Figure 6. Soils within the vicinity of the project area (outlined in red).

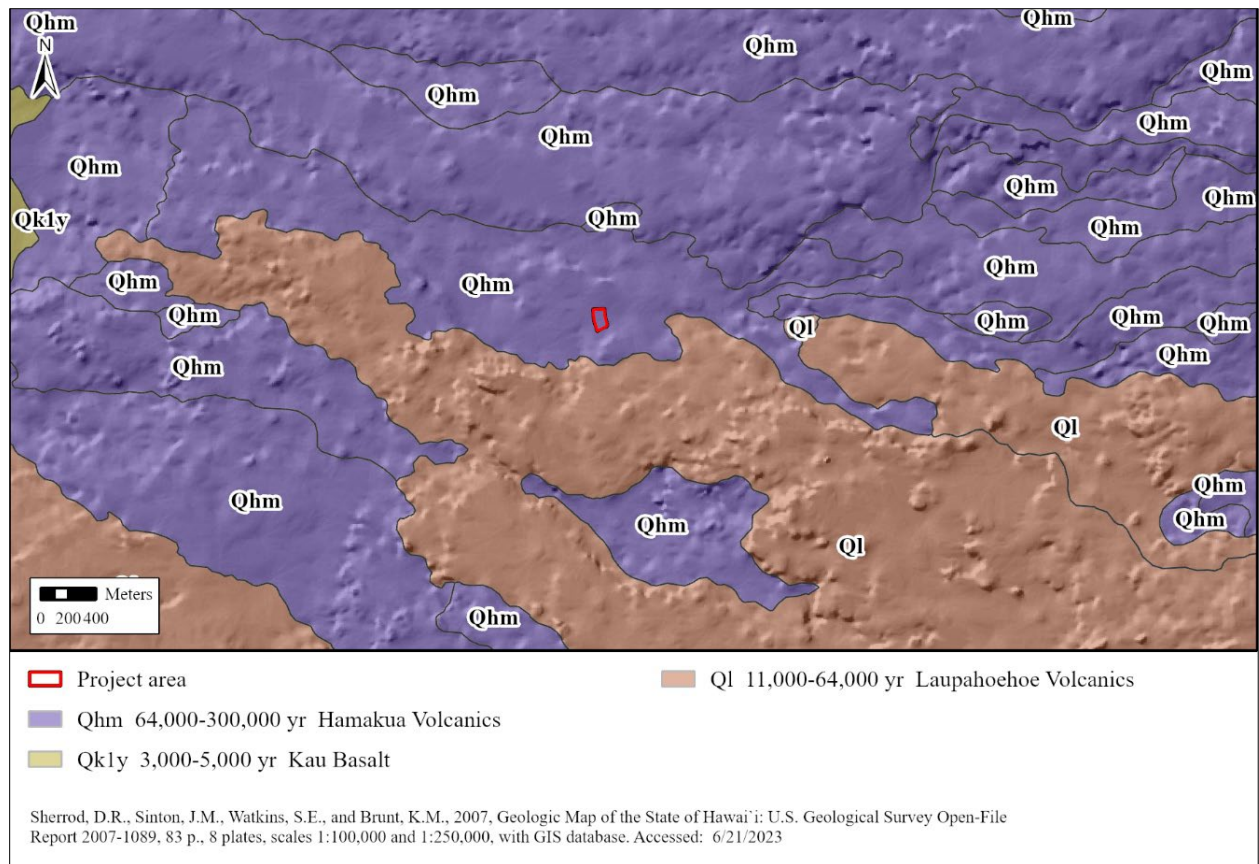


Figure 7. Geology within the vicinity of the project area (outlined in red).



Figure 8. Mechanically cleared portion of project area, view to the northwest.



Figure 9. Bulldozer push pile, view to the northwest.

2. BACKGROUND

As specified in the OEQC *Guidelines for Assessing Cultural Impacts* (1997:1), “...the geographical extent of the inquiry should, in most instances, be greater than the area over which the proposed action will take place. This is to ensure that cultural practices which may not occur within the boundaries of the project area, but which may nonetheless be affected, are included in the assessment.” For this CIA, Waikōloa Ahupua‘a is considered the ‘study area’, while the location of the proposed development activities is referred to as the ‘project area’.

To generate a set of expectations regarding the nature of cultural resources and customary practices that might be encountered within the current project area and to establish a context within which to assess the significance of such resources, the background section begins with a general culture-historical context. This is followed by culture-historical background information concerning the history of Waikōloa. Limited background information for South Kohala, the broader regional designation in which Waikōloa is situated, also falls within the parameters of the OEQC guidelines and ensures that a broader set of cultural practices and histories are considered. Following this background section is a discussion of relevant prior archaeological and cultural studies that have been conducted within and in the immediate vicinity of the project area.

RESEARCH METHODS

The culture-historical context and summary of previously conducted archaeological and cultural research presented below are based on research conducted by ASM Affiliates at various physical and digital repositories. Primary English language and Hawaiian language resources were found at multiple state agencies, including the State Historic Preservation Division, Hawai‘i State Archives, and the Department of Accounting and General Services Land Survey Division. Digital collections provided through the Office of Hawaiian Affairs Papakilo and Kīpuka databases, Waihona ‘Āina, the Ulukau Hawaiian Electronic Library, and Newspapers.com. Lastly, secondary resources curated

at ASM Affiliates' Hilo office offer general information regarding the history of land use, politics, and culture change in Hawai'i, enhancing the broad sampling of source materials cited throughout this CIA.

CULTURE-HISTORICAL CONTEXT

While the question of when Hawai'i was first settled by Polynesians remains contested, scholars working in the fields of archaeology, folklore, Hawaiian studies, and linguistics have offered several theories. With advances in palynology and radiocarbon dating techniques, Kirch (2011), Athens et al. (2014), and Wilmshurst et al. (2011) have argued that Polynesians arrived in the Hawaiian Islands sometime between A.D. 1000 and A.D. 1200. This initial migration on intricately crafted *wa'a kaulua* (double-hulled canoes) to Hawai'i from Kahiki, the ancestral homelands of Hawaiian deities and peoples from southern Pacific islands, occurred at least from initial settlement to the 13th century. According to Fornander (1969), Hawaiians brought from their homeland certain Polynesian customs and beliefs: the major gods Kāne, Kū, Lono, and Kanaloa (who have cognates in other Pacific cultures); the *kapu* system of political and religious governance; and the concepts of *pu'uhonua* (places of refuge), *'aumakua* (ancestral deity), and *mana* (divine power). Archaeologist Kenneth Emory who worked in the early to mid-20th century reported that the sources of early Hawaiian populations originated from the southern Marquesas Islands (Emory in Tatar 1982). However, Emory's theory is not universally accepted, as Hawaiian scholars in the past and present have argued for a pluralistic outlook on ancestral Hawaiian origins from Kahiki (Case 2015; Fornander 1916-1917; Kamakau 1866; Kikiloi 2010; Nakaa 1893; Poepeo 1906).

While stories of episodic migrations were widely published in the Hawaiian language by knowledgeable and skilled *kū'auhau* (individuals trained in the discipline of remembering genealogies and associated ancestral stories), the cultural belief that living organisms were *hānau 'ia* (born) out of a time of eternal darkness (*pō*) and chaos (*kahuli*) were brought and adapted by ancestral Hawaiian populations to reflect their deep connection to their environment. As an example, the *Kumulipo*, Hawai'i's most famed *ko'ihonua* (a cosmogonic genealogical chant), establishes a birth-rank genealogical order for all living beings (Beckwith 1951; Liliuokalani 1978). One such genealogical relationship that remains widely accepted in Hawai'i is the belief that *kalo* (taro) plants (in addition to all other plants, land animals, and sea creatures), are elder siblings to humans (Beckwith 1951). This concept of hierarchical creation enforces the belief that all life forms are intimately connected, evidencing the cultural transformations that occurred in the islands through intensive interaction with their local environment to form a uniquely Hawaiian culture.

In Hawai'i's ancient past, inhabitants were primarily engaged in subsistence-level agriculture and fishing (Handy et al. 1991). Following the initial settlement period, communities clustered in the *ko'olau* (windward) shores of the Hawaiian Islands where freshwater was abundant. Sheltered bays allowed for nearshore fisheries (enriched by numerous estuaries) and deep-sea fisheries to be easily accessed (McEldowney 1979). Widespread environmental modification of the land also occurred as early Hawaiian *kanaka mahi'ai* (farmers) developed new subsistence strategies, adapting their familiar patterns and traditional tools to work efficiently in their new home (Kirch 1985; Pogue 1978). Areas with the richest natural resources became heavily populated over time, resulting in the population's expansion to the *kona* (leeward) side of the islands and to more remote areas (Cordy 2000).

Overview of Traditional Hawaiian Land Management Strategies

Adding to an already complex society was the development of traditional land stewardship systems, including the *ahupua'a*. The *ahupua'a* was the principal land division that functioned for both taxation purposes and furnished its residents with nearly all subsistence and household necessities. *Ahupua'a* are land divisions that typically include multiple ecozones from *mauka* (upland mountainous regions) to *makai* (shore and near-shore regions), assuring a diverse subsistence resource base (Hommon 1986). Although the *ahupua'a* land division typically incorporated all of the eco-zones, their size and shape varied greatly (Cannelora 1974). Noted Hawaiian historian and scholar Samuel Kamakau summarized the ecozones that could be found in a given *ahupua'a*:

Here are some names for [the zones of] the mountains—the *mauna* or *kuahiwi*. A mountain is called a *kuahiwi*, but *mauna* is the overall term for the whole mountain, and there are many names applied to one, according to its delineations (*'ano*). The part directly in back and in front of the summit proper is called the *kuamauna*, mountaintop; below the *kuamauna* is the *kuahea*, and makai of the *kuahea* is the *kuahiwi* proper. This is where small trees begin to grow; it is the *wao nahele*. Makai of this region the trees are tall, and this is the *wao lipo*. Makai of the *wao lipo* is the *wao 'eiwa*, and makai of that the *wao ma'ukele*. Makai of the *wao ma'ukele* is the *wao akua*, and makai of there is the *wao kanaka*, the area that people cultivate. Makai of the *wao kanaka* is the *'ama'u*, fern belt, and makai of the *'ama'u* the *'apa'a*, grasslands.

A solitary group of trees is a *moku la'au* (a "stand" of trees) or an *ulu la'au*, grove. Thickets that extend to the *kuahiwi* are *ulunahale*, wild growth. An area where *koa* trees suitable for canoes (*koa*

wa 'a) grow is a *wao kōa* and mauka of there is a *wao la 'au*, timber land. These are dry forest growths from the *'apa'a* up to the *kuahiwi*. The places that are “spongy” (*naele*) are found in the *wao ma'ukele*, the wet forest.

Makai of the *'apa'a* are the *pahe'e* [*pili* grass] and *'ilima* growths and makai of them the *kula*, open country, and the *'apoho* hollows near to the habitations of men. Then comes the *kahakai*, coast, the *kahaone*, sandy beach, and the *kalawa*, the curve of the seashore—right down to the *'ae kai*, the water's edge.

That is the way *ka po'e kahiko* [the ancient people] named the land from mountain peak to sea. (Kamakau 1976:8-9)

The *maka'āinana* (commoners, literally the “people that attend the land”) who lived on the land had rights to gather resources for subsistence and tribute within their *ahupua'a* (Jokiel et al. 2011). As part of these rights, residents were required to supply resources and labor to *ali'i* (chiefs) of local, regional, and island chiefdoms. The *ahupua'a* became the equivalent of a local community with its own social, economic, and political significance and served as the taxable land division during the annual *Makahiki* procession (Kelly 1956). During the time of *Makahiki*, the paramount *ali'i* sent select members of his/her retinue to collect *ho'okupu* (tribute and offerings) in the form of goods from each *ahupua'a*. The *maka'āinana* brought their share of *ho'okupu* to an *ahu* (altar) that was marked with the image of a *pua'a* (pig), serving as a physical visual marker of *ahupua'a* boundaries. In most instances, these boundaries followed mountain ridges, hills, rivers, or ravines (Alexander 1890). However, Chinen (1958:1) reports that “oftentimes only a line of growth of a certain type of tree or grass marked a boundary; and sometimes only a stone determined the corner of a division.” These ephemeral markers, as well as their more permanent counterparts, were oftentimes named as evidenced in the thousands of boundary markers names that are listed in (Soehren 2005).

Ahupua'a were ruled by *ali'i 'ai ahupua'a* or chiefs who controlled the *ahupua'a* resources. Generally speaking, *ali'i 'ai ahupua'a* had complete autonomy over the *ahupua'a* they oversaw (Malo 1951). *Ahupua'a* residents were not bound to the land nor were they considered property of the *ali'i*. If the living conditions under a particular *ahupua'a* chief were deemed unsuitable, the residents could move freely in pursuit of more favorable conditions (Lam 1985). This structure safeguarded the well-being of the people and the overall productivity of the land, lest the chief loses the principal support and loyalty of his or her supporters. In turn, *ahupua'a* lands were managed by an appointed *konohiki*, oftentimes a chief of lower rank, who oversaw and coordinated stewardship of an area's natural resources (Lam 1985). In some places, the *po'o lawai'a* (head fisherman) held the same responsibilities as the *konohiki* (Jokiel et al. 2011). When necessary, the *konohiki* took the liberty of implementing *kapu* (restrictions and prohibitions) to protect the *mana* of an area's resources from environmental and spiritual depletion.

Many *ahupua'a* were divided into smaller land units termed *'ili* and *'ili kūpono* (often shortened to *'ili kū*). *'Ili* were created for the convenience of the *ahupua'a* chief and served as the basic land unit which *hoa'āina* (caretakers of particular lands) often retained for multiple generations (Jokiel et al. 2011; MacKenzie 2015). As *'ili* were typically passed down in families, so too were the *kuleana* (responsibilities, privileges) that were associated with it. The right to use and cultivate *'ili* was maintained within the *'ohana*, regardless of the succession of *ali'i 'ai ahupua'a* (Handy et al. 1991). Malo (1951) recorded several types of *'ili*, including the *'ili pa'a* (a single intact parcel) and *'ili lele* (a discontinuous parcel dispersed across an area). Whether dispersed or wholly intact, *'ili* required a cross-section of available resources, and for the *hoa'āina*, this generally included access to agriculturally fertile lands and coastal fisheries. *'Ili kūpono* differed from other *'ili* lands because they did not fall under the jurisdiction of the *ahupua'a* chief. Rather, they were specific areas containing resources that were highly valued by the ruling paramount chiefs, such as fishponds (Handy et al. 1991).

Ali'i 'ai ahupua'a, in turn, answered to an *ali'i 'ai moku* (chief who claimed the abundance of the entire *moku* or district) (Malo 1951). Hawai'i Island is comprised of six *moku* (districts) that include Kona, Ka'ū, Puna, Hilo, Hāmākua, and Kohala. Although a *moku* comprises multiple *ahupua'a*, *moku* were considered geographical subdivisions with no explicit reference to rights in the land (Cannelora 1974). While the *ahupua'a* was the most common and fundamental land division unit within the traditional Hawaiian land management structure, variances occurred, such as the existence of the *kalana*. By definition, a *kalana* is a division of land that is smaller than a *moku*. *Kalana* was sometimes used interchangeably with the term *'okana* (Lucas 1995; Pukui and Elbert 1986), but Kamakau (Kamakau 1976) equates a *kalana* to a *moku* and states that *'okana* is merely a subdistrict. Despite these contending and sometimes conflicting definitions, what is clear is that *kalana* consisted of several *ahupua'a* and *'ili 'āina*.

This form of district subdividing was integral to Hawaiian life and the product of advanced natural resource management systems. As populations resided in an area over centuries, direct teaching and extensive observations of an area's natural cycles and resources were retained, well-understood, and passed down orally over the generations. This knowledge informed management decisions that aimed to sustainably adapt subsistence practices to meet the

needs of growing populations. The *ahupua'a* system and the highly complex land management system that developed in the islands are but one example of the unique Hawaiian culture that developed in these islands.

Intensification and Development of Hawaiian Land Stewardship Practices

Hawaiian philosophies of life in relation to the environment helped to maintain both natural, spiritual, and social order. In describing the intimate relationship that exists between Hawaiians and *'āina* (land), Kepā Maly writes:

In the Hawaiian context, these values—the “sense of place”—have developed over hundreds of generations of evolving “cultural attachment” to the natural, physical, and spiritual environments. In any culturally sensitive discussion on land use in Hawai‘i, one must understand that Hawaiian culture evolved in close partnership with its’ natural environment. Thus, Hawaiian culture does not have a clear dividing line of where culture and nature begins.

In a traditional Hawaiian context, nature and culture are one in the same, there is no division between the two. The wealth and limitations of the land and ocean resources gave birth to, and shaped the Hawaiian world view. The *'āina* (land), *wai* (water), *kai* (ocean), and *lewa* (sky) were the foundation of life and the source of the spiritual relationship between people and their environs. (Maly 2001)

The *'ōlelo no'eau* (proverbial saying) “*hānau ka 'āina, hānau ke ali 'i, hānau ke kanaka*” (born was the land, born were the chiefs, born were the commoners), conveys the belief that all things of the land, including *kanaka* (humans), are connected through kinship links that extend beyond the immediate family (Pukui 1983:57). *'Āina* or land, was perhaps most revered, as noted in the *'ōlelo no'eau* “*he ali 'i ka 'āina; he kauwā ke kanaka,*” which Pukui (Pukui 1983:62) translated as “[t]he land is a chief; man is its servant.” The lifeways of early Hawaiians, which were dependent entirely from the finite natural resources of these islands, necessitated the development of sustainable resource management practices. Over time, what developed was an ecologically responsive management system that integrated the care of watersheds, natural freshwater systems, and nearshore fisheries (Jokieli et al. 2011).

Disciplined and astute observation of the natural world became one of the most fundamental stewardship tools used by the ancient Hawaiians. The vast knowledge acquired through direct observation enabled them to detect and record the subtlest of changes, distinctions, and correlations in the natural world. Examples of their keen observations are evident in the development of Hawaiian nomenclature to describe various rains, clouds, winds, stones, environments, flora, and fauna. Many of these names are geographically unique or island-specific, and have been recorded in *oli* (chants), *mele* (songs), *pule* (prayers), *inoa 'āina* (place names), and *'ōlelo no'eau* (proverbial sayings). Other Hawaiian arts and practices such as *hula* (traditional dance), *lapa'au* (traditional healing), *lawai'a* (fishing), *mahi'ai* (farming) further aided in the practice of knowing the rhythms and cycles of the natural world.

Comprehensive systems of observing and stewarding the land were coupled by the strict adherence to practices that maintained and enhanced the *kapu* and *mana* of all things in the Hawaiian world. In Hawaiian belief, all things natural, places, and even people, especially those of high rank, possessed *mana* or “divine power” (Pukui and Elbert 1986:235; Pukui et al. 1972). *Mana* was believed to be derived from the plethora of Hawaiian gods (*kini akua*) who were embodied in elemental forces, land, natural resources, and certain material objects and persons (Crabbe et al. 2017). Buck (1993) expanded on this concept noting that *mana* was associated with “the well-being of a community, in human knowledge and skills (canoe building, harvesting) and in nature (crop fertility, weather etc.)” (c.f. Else 2004:244).

To ensure the *mana* of certain resources, places, and people, *kapu* of various kinds were implemented and strictly enforced to limit over-exploitation and defilement. Elbert and Pukui (1986:132) defined *kapu* as “taboo, prohibitions; special privilege or exemption.” Kepelino noted that *kapu* associated with *akua* (deities) applied to all social classes, while *kapu* associated with *ali 'i* were applied to the people (in Beckwith 1971). As *kapu* dictated social relationships, they also provided “environmental rules and controls that were essential for a subsistence economy” (Else 2004:246). The companion to *kapu* was *noa*, translated as “freed of taboo, released from restrictions, profane, freedom” (Pukui and Elbert 1986:268). Some *kapu*, particularly those associated with maintaining social hierarchy and gender differentiation were unremitting, while those *kapu* placed on natural resources were applied and enforced according to seasonal changes. The application of *kapu* to natural resources ensured that such resources remained available for future use. When the *ali 'i* or the lesser chiefs (including *konohiki* and *po'o lawai'a*) determined that a particular resource was to be made available to the people, a decree was proclaimed indicating that *kapu* had been lifted, thereby making it *noa*. Although transitioning a resource from a state of *kapu* to *noa* allowed for its use, people were expected to practice sustainable harvesting methods and pay tribute to the paramount chief and the *akua* associated with that resource. *Kapu* were strictly enforced and violators faced serious consequences including death (Jokieli et al. 2011). Violators who escaped execution sought refuge at a *pu'uhonua*, a designated place of refuge or an individual who

could pardon the accused (Kamakau 1992). After completing the proper rituals, the violator was absolved of his or her crime and allowed to reintegrate back into society.

In summary, the layering and interweaving of beliefs, land stewardship practices, and the socio-political system form the basis of the relationship shared between the Hawaiian people and the land. It is through the analysis of these dynamic elements that we develop an understanding of the complexity of place.

WAIKŌLOA AHUPUA‘A AND THE GREATER KOHALA DISTRICT

The project area is located within the *ahupua‘a* of Waikōloa, which is one of some seventy *ahupua‘a* that make up the traditional *moku-o-loko* (interior district) of Kohala. The Kohala District is one of six major districts that make up Hawai‘i Island. Large districts, such as Kohala and the adjacent Kona, were further divided into more manageable land units that followed basic geographical distinctions such as Kohala ‘Ākau (North Kohala) and Kohala Hema (South Kohala). As Waikōloa Ahupua‘a is the southernmost land division within Kohala, the current project area is situated in Kohala Hema. Traditional poetical expressions for this district also identifies other geographical designations. Once such saying derived from an ancient chant titled *Kū e ho‘opi‘o ka lā* states:

<i>‘O Kohala-iki, ‘o Kohala-nui</i>	lesser Kohala, greater Kohala
<i>‘O Kohala-loko, ‘o Kohala-waho...</i>	inner Kohala, outer Kohala...
(Pukui and Korn 1973:188)	(Pukui and Korn 1973:190)

Another traditional Hawaiian proverb describes the extent of the Kohala district, spanning from Honoke‘ā in the north to Keahualono at the south:

Kohala, mai Honoke‘ā a Keahualono.
Kohala, from Honoke‘ā to Keahualono.
The extent of Kohala. (Pukui 1983:196)

The modern-day *ahupua‘a* of Waikōloa, which translates literally as “duck water” (Pukui et al. 1974:223), is bound on the north by Lālāmilo Ahupua‘a, to the east by Pā‘auhau Ahupua‘a, and to the south by the *ahupua‘a* of Pu‘u Anahulu. While Waikōloa is referred to today as an *ahupua‘a*, traditionally it was an *‘ili* (land section smaller than an *ahupua‘a*) of the *kalana* (or *‘okana*) of Waimea, and in ancient times was referred to as Waikōloa Nui. As a *kalana*, Waimea was treated as a sub-district: smaller than a district (*moku-o-loko*), but was composed of several other land divisions, such as *ahupua‘a* and the more independent *‘ili kūpono*, all of which contributed to its wealth (Maly and Maly 2002). Concerning the *kalana* of Waimea, Bernice Judd, a former librarian at the Hawaiian Mission Children’s Society, explains that:

In the early days Waimea meant all the plateau between the Kohala Mountains and Mauna Kea, inland from Kawaihae. This area is from eight to ten miles long and from three to five miles wide. There was no running water on Mauna Kea, so the inhabitants lived at the base of the Kohala Mountains, where three streams touched the plain on their way towards the sea. . . The middle stream, which was famous for wild ducks, was named Waikoloa, or Duckwater. This and the most westerly stream, called Kahakohau, went towards Kawaihae, but neither reached the sea, except in times of flood. (Judd 1932:14)

The lands subject to the *kalana* of Waimea were those that form the southern limits of the present-day South Kohala District including ‘Ōuli, Wai‘aka, Lālāmilo, Puakō, Kalāhuipua‘a (Lāhuipu‘a), ‘Anaeho‘omalua, Kakanakana, Ala‘ōhi‘a, Paulama, Pu‘ukalani (Pukalani), Pu‘ukapu, and Waikōloa. In ancient times, Waikōloa was referred to as Waikōloa Nui, and the neighboring area of Lālāmilo was referred to as Waikōloa Iki (Maly 1999b).

Agricultural Practices of the South Kohala District

In Kohala, the long ridge of the Kohala Mountains extends perpendicular to the predominant northeasterly trade winds, creating an orographic rainfall pattern that separates the district into two distinct environmental zones; a wetter windward zone, and a drier leeward zone. The initial permanent settlements were established at sheltered bays with access to fresh water primarily in the windward valleys and gulches. These early communities would have shared extended familial relations and had an occupational focus on the collection of marine resources. The upland habitation that followed focused on agricultural field systems, which undoubtedly provided much of the produce for the coastal inhabitants (Carlson and Rosendahl 1990). Most of the *kalo* (taro) and *‘uala* (sweet potato) fields of this part of the island were located in the rainier uplands near the present-day town of Waimea, where there was a sizable permanent population. Waimea’s high elevation, fertile landscape, and sufficient rainfall facilitated the creation and development of the Waimea Field System during the 16th century. The traditional cultivating places in the upland field systems were planted in sweet potato, irrigated *kalo*, *wauke* (paper mulberry), *māmaki*, plantains, bananas, sugarcane,

coconuts, and *hala* (pandanus) (Haun et al. 2003). Coastal residents in South Kohala, however, relied primarily on the ocean for sustenance, and they augmented their diet with produce procured through trade with the upland areas. Marine resources were brought ashore in the small bays with sandy shores found in the coastal section of Waimea (now called South Kohala), where, as Handy and Handy (1991:532) relate, fishermen lived and probably cultivated potatoes in small patches.”

In drawing from early historic accounts, ground and aerial photography, and ground surveys conducted during the early 1980s, Holly McEldowney (1983) provided a vegetation reconstructive model to represent predominant historic (1792-1850) native plant communities for the South Kohala region. As the first cattle was introduced to the Waimea plateau of Hawai‘i Island in 1793 by Captain George Vancouver, their sizeable population and decades of incessant roaming had severely degraded the native forest and plant life of this region (Bergin 2004; Kuykendall 1938). Based on McEldowney’s (1983:414-415) model, the proposed project area falls within the “Pili land 1” zone, which is historically characterized as extending from the coast to roughly the 1,500 foot elevation and described as “barren, stoney, and dried landscape” with “very low shrubs, thistles, and dry looking grass.”

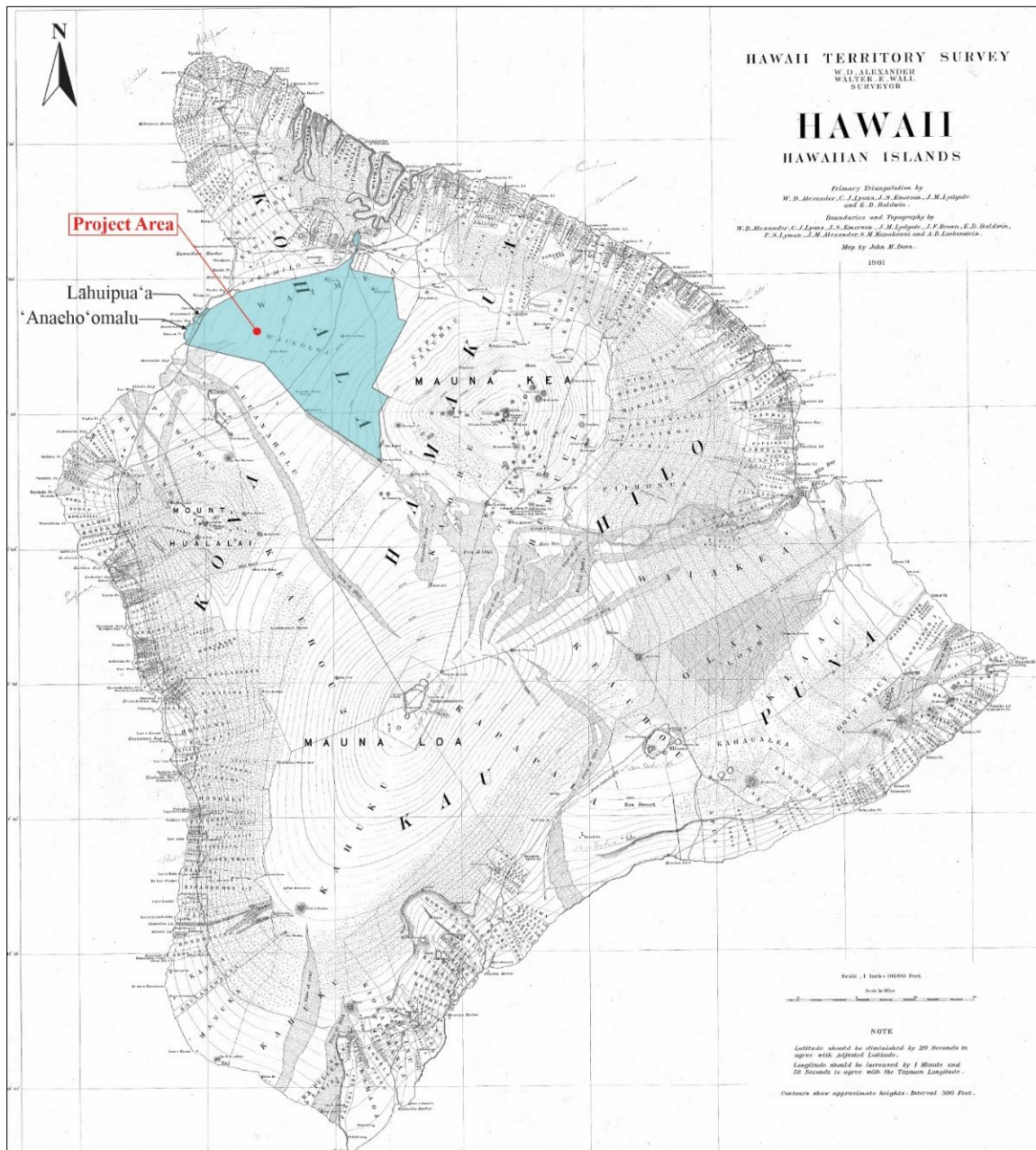


Figure 10. Hawai‘i Registered Map No. 2060 by J. M. Donn showing the project area location within Waikōloa Ahupua‘a (shaded blue).

Hawaiian Bird Hunting

The upper reaches of Waikōloa Ahupua‘a and the greater Kohala District were ideal for bird hunting, where the prized feathers were utilized for the creation of *‘ahu‘ula* (feather cloak), *mahiōle* (feather helmet), and *kahili* (feather standard)—all iconic symbols of Hawaiian royalty. In addition, birds were an important source of meat for subsistence purposes (Gomes 2016:33). Birds could be found throughout an *ahupua‘a*, spanning from the ocean (sea birds, shorebirds, and wetland species) to the plains (*kōlea* [Pacific golden plover; *Pluvialis dominica*] and *pueo* [Hawaiian short-eared owl; *Asio flammeus sandwichensis*]) to the forests where the rare *‘ua‘u* (dark-rumped petrel; *Pterodroma phaeopygia sandwichensis*) can still be found today (Gomes 2016:39). The *‘ua‘u* (also spelled *‘uwa‘u*) consists of a gray to black feathers spanning from its crown to tail with white on its throat to undertail.

One of the most highly prized feathers came from the *mamo* (Black Hawaiian honeycreeper; *Drepanis pacifica*), an all-black honeycreeper with hints of yellow on its back and flank, which was previously only on Hawai‘i Island (Mitchell 2001:93; Pukui and Elbert 1986:235). Other prized feathers include those found from the *‘ō‘ō* (black honeyeater; *Moho nobilis*), a black bird with yellow patches on its nape, wings, and flank; the *‘i‘iwi* (Scarlet Hawaiian honeycreeper; *Vestiaria coccinea*) was known for its bright red-orange feathers and black wings and tail; and the *‘apapane* (Hawaiian honeycreeper; *Himatione sanguinea*), a bird noted for its red body with black wing, and a white rump (Mitchell 2001:93-94). Another prized bird was the *‘amakihī* (Hawaiian honeycreeper; *Loxops virens*) that was entirely yellow-green in color.

Kia manu (bird catcher) techniques in capturing varied by island, district, and *ahupua‘a*, however, one of the more important aspects to this skill was to observe the mannerisms and habitats of each bird species (Emerson 1894:103). Emerson (1894:104) noted that there were two bird seasons that corresponded to the flowering seasons of the *lehua*: March to May (lowland) and August to early November (upland). *Pule* (prayer) and *ho‘okupu* (offering) were performed prior to entering the forest as well (ibid.). In addition, the proper tools were brought to ensure a fruitful catch which consisted of snaring birds with a gum created from the fruits of the *pāpala kēpau* (*Pisonia*) tree and a long pole where it acted as a temporary adhesive (Mitchell 2001:93). The *kia manu* would mimic the call of a bird thus tricking it to land on the ultra-sticky *pāpala kēpau* sap, where it was collected.

Some of the most insightful sources of bird catching are found in the Boundary Commission testimonies, which were recorded in the 1870s to describes the metes and bounds and clarify holdings. These testimonies also provided details of traditional land use activities (Cordy 2003). The Boundary Commission testimony provided by Ehu for Isaac Davis in the *‘ili* of Waikōloa Nui states:

There was no pili grass on that land—my father was not a bird catcher, he used to mahiai [farm].
Waikoloa was the land that had the birds. The boundary as stated is the boundary from the time of
Kamehemeha first. (Soehren 2005)

While the above sections provide insight into the traditional landscape and practices of Waikōloa, the following section covering select traditional accounts relates other important cultural information including the formation of natural features, past chiefs, their life, practices, and connection to this vast landscape.

Select *Mo‘olelo* for the Waikōloa Ahupua‘a and the Greater South Kohala District

As the Hawaiian people had no written language until after the arrival of the first Protestant missionaries in 1820, traditional *mo‘olelo* (stories, tales, and myths), *mele* and *oli* (songs and chants), and *‘ōlelo no‘eau* (proverbs and sayings) were passed down orally from one generation to the next. Traditional *mo‘olelo* associated with Waikōloa are limited, and those recorded focus primarily on the famous winds of the Kohala region including the intense *Mūmuku*, *‘Āpa‘apa‘a*, and namesake *Waikōloa* winds. Other references to Waikōloa include exalted figures in Hawaiian history such as Lonoikamakahiki, Kamalālāwalu, Keawenui a ‘Umi, and the inclusion in at least one eminent battle that played a significant role in the sociopolitical history of Hawai‘i Island.

The Ancestry of Waikōloa in The Heart Stirring Story of Ka-Miki

The name of a land division sometimes indicates its importance, records its history, or reveals something about its resources or population. A traditional *mo‘olelo*, “The Heart Stirring Story of Ka-Miki” (*Ka‘ao Ho‘oniu Pu‘uwai no Ka-Miki*), originally appeared in the Hawaiian language newspaper *Ka Hōkū o Hawai‘i* between 1914 and 1917. This *mo‘olelo* was likely authored during the late 1800s through early 1900s by noted Hawaiian scholars John Wise and J.W.H.I. Kihe. Maly (1998:17) notes that although this *mo‘olelo*:

. . . is not an ancient account, the authors set the account in the thirteenth century (by association with the chief Pili, who came to Hawai‘i with Pā‘ao). They used a mixture of local stories, tales, and family traditions in association with place names to tie together fragments of site specific history that had been handed down over the generations. Thus, while in many cases, the personification of

individuals and their associated place names may not be “ancient,” the site documentation within the “story of Ka-Miki” is of both cultural and historical value.

This *mo‘olelo* (story) tells of the two supernatural brothers, Ka-Miki and Maka-‘iole, who were skilled *‘ōlohe* (competitors/fighters) and their travels around Hawai‘i Island by way of the ancient trails and paths (*ala loa* and *ala hele*), seeking competition with other *‘ōlohe*. Upon the mysterious and premature birth of Ka-Miki, he was placed in the cave of Pōnahanaha and given up for dead. He was eventually saved and raised by his ancestress, Ka-uluhe-nui-hihi-kolo-i-uka, a manifestation of the goddess Haumea, at Kalama‘ula, an area located on Hualālai. Ka-Miki was later joined by his elder brother Maka-‘iole, and their ancestress trained her grandsons in *‘ōlohe*, or experts skilled in fighting, wrestling, debating, riddle solving, running, and how to use their supernatural power.

A portion of this tale describes the naming of South Kohala’s land divisions, and focuses explicitly on the Waimea region and three associated *‘ili*, including Lālāmilo, Puakō, and Waikōloa:

Pili-a-Ka‘aiea the chief of Kona greatly loved octopus fishing, and had sent several messengers to inquire of Lālāmilo how he might acquire the lure. All of the messengers were killed by Lālāmilo and Piliamo‘o. While at the contest field called Hinakahua in Puapua‘a, Ka-Miki agreed to fetch the lure for Pili as one of the conditions he needed to fulfill in order to become the foremost favorite of Pili. Now as these events at the court of Pili were unfolding, Lālāmilo decided to visit his father Pu‘u-hīna‘i [located to the southeast of the proposed project area]; his sister Pu‘u‘iwa‘iwa; and his grand aunt Waikōloa, who was Pu‘u‘iwa‘iwa’s guardian. To this day, places are named for all of these people as well.

Lālāmilo arose and told his wife Puakō, and his mother Nē‘ula that he was going to the uplands to visit his father, sister, and the people who worked the upland plantations. Lālāmilo desired to eat the sugar cane and bananas, and drink the *‘awa* which grew on the hill of Po‘opo‘o. Po‘opo‘o was also the name of a seer (*makāula*) who saw to the continued peaceful dwelling of the people. Lālāmilo placed the lure in Kanakanaka’s gourd and secured it near the ridge pole of his house. Lālāmilo then asked Puakō and Nē‘ula to go and look after the gourd in which the *‘ōnohi* (eyeball or cherished possession) of Ha‘alaea was kept.

Lālāmilo then departed and traveled up towards the residences and agricultural lands of Pu‘uhīna‘i *mā*, as he drew near his destination, his thoughts returned to the lure. Lālāmilo looked towards the ocean, and his desire to see the lure was very great (July 5, 1917). At the same time, Lālāmilo also had a premonition, so he returned to the shore without visiting his father and sister. During the time when Lālāmilo was gone, Ka-Miki had traveled to Lālāmilo’s land and met with a man of the area named Nīheu. Ka-Miki inquired, “Where is the chief Lālāmilo’s house?” Nīheu said, “It is there above the canoe landing.” Ka-Miki then asked, “And where is the chief?” Nīheu responded by saying, “I don’t know, perhaps he is in the house.” Ka-Miki then went to Lālāmilo’s house, peering in he saw the gourd container and he lowered it, removing the cordage. Ka-Miki then took out the lure and departed from Lālāmilo without incident. . . (Maly 1998:28)

Another portion of the legend was set in Waikōloa, where the brothers gathered *Ka-lau-o-ke-kāhuli*, a native sedge to strain their *‘awa* (kava; *Piper methysticum*) to mix with the sacred waters from Mauna Kea. Upon transporting the bowl of *‘awa* from Holoholokū in Waimea, a gust of wind identified in the story as the Waikōloa wind blew a bit of the sacred water out of the bowl, thereby forming a spring called Waiki‘i:

Upon completing their training, Ka-uluhe sent Ka-Miki and Maka-‘iole to fetch *‘awa* from Waipi‘o water from a sacred spring on Mauna Kea, and other items needed to prepare the *‘awa* for drinking. While traveling on the plain of Waikōloa, Ka-Miki and Maka-‘iole gathered the sedge *Ka-lau-o-ke-kāhuli* which was to be used for straining the ceremonial *‘awa* drink. At Holoholokū, some of the sacred water of Kāne which Ka-Miki was carrying in the *‘awa* bowl Hōkū‘ula was lifted out by the wind, Waikōloa. The water was carried some distance, and where it fell a spring was formed. The deity Pōhaku-a-Kāne retrieved some of the water from the spring, and carried it to his companion deity Pōhakuloa at the base of Mauna Kea. The spring from where Pōhakuakāne fetched the water came to be called Waiki‘i (Water fetched). . .

While on their journey around the island, the brothers stopped at Kapalilua, South Kona, and Ka-Miki was described as the skilled *‘ōlohe* from the lands of Nāpu‘u (the Pu‘u Anahulu-Kekaha region). In describing Nāpu‘u, the wind Waikōloa was mentioned:

Nāpu‘u (pū) ‘Alu Kinikini i ku‘ia e ke ao-lewa i ka makani i ka ho‘ohae a ka Nāulu, i ka hō‘elo ‘ia e ka Waikōloa a me ke Kaumuku kuehu lepo i ke kula pili – the many gullied or folded hills where

the wind borne Nāulu rain clouds appear, [land] moistened by the Waikōloa wind, with the Kaumuku winds which stir up the dust on the pili grass covered plain. . .

Native historian Samuel Kamakau also wrote that Waikōloa was one of several winds that came to Hawai'i from Kahiki when they were sent by Lonopele as he tried to destroy the priest Pā'ao and his companions. (Maly 1999b:25)

The Legend of Kuapāka'a and the Wind-Gourd of La'amaomao

The winds of Kohala are also enumerated in a traditional *mo'olelo* featuring the famous wind-gourd La'amaomao, which was said to contain all the winds of Hawai'i. Originally published by Moses Kuaea Nakuina, the legend relates the story of Pāka'a, son of La'amaomao and Kūanu'uauu and the highly trusted, personal attendant and favorite of the *ali'i 'ai moku* Keawenui a 'Umi, grandson of celebrated *ali'i nui* 'Umi a Līloa. Pāka'a succeeded his father as *kahu* (personal attendant) of Keawenui a 'Umi, and had charge over many belongings, and he dutifully served the the *ali'i* by keeping a close and careful watch over his material possessions. But Pāka'a's greatest and most cherished responsibility was the keeping of a highly treasured personal possession: a very special and sacred *ipu* (gourd) passed down to him from his mother. Originally, the *ipu*, known as the wind-gourd of La'amaomao, belonged to Pāka'a's grandmother. Nakuina (2005:14-15) explains the gifting of the *ipu* to Pāka'a and the instructions from his mother:

Then La'amaomao lifted the lid of a large calabash and took out a small, long, highly polished gourd in a woven bag. The gourd was covered securely. She [La'amaomao] turned to her keiki and said, "I'm giving you this gourd which belonged to your extraordinary kupunawahine for whom I was named. Her bones are inside the gourd. While she was alive, she controlled all the winds of the islands—she had them under a supernatural power. She gathered all the winds and put them into this gourd, where they're still kept. She memorized one by one the names of all the winds of Hawai'i to Ka'ula. On windless days, she could remove the cover and call out the name of a wind, and the wind in this gourd would blow. This gourd, called 'the wind gourd of La'amaomao,' was famous.

Before she died, she entrusted me to put her bones inside this gourd and care for them until I had a child. Then I was to give the gourd to the child to watch over. You're my only child, so now I'm giving the gourd to you. You must look after it according to the wishes of your extraordinary kupunawahine.

You must care for this gourd because it had been handed down from the kupuna. This gourd has great value—you may not think so now, but when you sail with the *ali'i* and arrive at an area where no wind blows and the canoes are becalmed, say that the winds are at your command; all you have to do is call, and the winds will blow.

"When you're laughed at, remove the lid of the gourd and call for a wind. The wind will blow and bring the canoes to shore. The *ali'i* will be grateful to you, and you'll be loved and valued by him."

Before Pāka'a sailed off, La'amaomao taught him the names of all the winds, along with the prayers, songs and chants concerning them, and when she was done, Pāka'a had memorized everything. Then he took the wind gourd and tied it with a cord he had made, prepared his other things for the voyage, and left home.

Pāka'a settled into his role as *kahu*, and he became the utmost favorite of Keawenui a 'Umi. However, the favoritism of Pāka'a inspired considerable virulence and collusion against him by two men, Ho'okele-i-Hilo and Ho'okele-i-Puna. The pair conspired to entrap Pāka'a in scandal by spreading untruths about him to Keawenui a 'Umi and slandered his name in an effort to undermine Pāka'a's prestige in the eyes of his *haku* (master). Keawenui a 'Umi was incensed, and relinquished all of Pāka'a's gifted lands and authority, transferring all power to the two antagonistic men who had usurped Pāka'a's power with their cruel deception. Utterly hurt by Keawenui a 'Umi's naivety to the slander that had befallen his name, Pāka'a gathered some of the belongings of his former *haku*, placed them inside his special family heirloom, departed from Waipi'o, and eventually made a life for himself on Moloka'i. While on Moloka'i, Pāka'a fathered a son, Kūapāka'a whom he groomed the way his own father had groomed him, to one day serve the man who would one day become his *haku* and avenge Pāka'a's enemies.

Meanwhile, the true character of the two schemers who deposed Pāka'a of his esteemed position began to surface, and Keawenui a 'Umi grew regretful of his decision to scorn his former *kahu* in their favor. The tale continues with Keawenui a 'Umi's frantic and persistent search for Pāka'a, with whom he had been communicating with in dreams. Pāka'a and Kūapāka'a knew that the *ali'i* would come searching for them, and strategically positioned themselves in their canoe where they fished for *uhu* (parrot fish; *Scarus perspicillatus*) in the dark of morning off the shore of Moloka'i. Keawenui a 'Umi's party approached the pair, but unsuspected their true identity, especially because Pāka'a

had assumed the guise of a hunched-over deaf fishermen. The six fleets of men and chiefs from each district on Hawai'i Island approached Pāka'a and Kūapāka'a, led by the *ali'i* of Kohala, Wahilani:

Then Wahilani's canoe passed by, and Kūapāka'a called out loudly: "Wahilani, our *ali'i* of Kohala goes by. He's not an *ali'i*, only a *kaukauali'i* [low-ranking chief] who hides himself in the stands of Kohala cane. The only *i'a* in his land is the grasshopper—there on the sugarcane leaf, there on the flower-stem of grass. Kohala is a land without any *i'a* and the only *'ai* is the sweet potato. The defect in the land is that Wahilani is not an *ali'i*, yet he enjoys the bounty of Kohala, so he's called an *ali'i*." (Nakuina 2005:31)

With each passing fleet, Kūapāka'a continued to hurl insults, incensing each district *ali'i*, who continued past the father and son allowing Keawenui a 'Umi's bevy closer and closer to them. Just before dawn, as Keawenui a 'Umi's party approached, Kūapāka'a chanted to his *haku* at the request of his father. His chant was rivaled by a chant from the Kuhina Nui, Kahikuokamoku, who was part of Keawenui a 'Umi's party and unaware of the youth's true identity. Kūapāka'a, in an effort to lure Keawenui a 'Umi's party onshore so he could isolate Ho-okele-i-Hilo and Ho'okele-i-Puna, continued his chants implicating impending stormy weather. However, Kahikuokamoku challenged his prophecy, arguing the impossibility of poor weather, and refused to come ashore. Furthermore, Kahikuokamoku challenged Kūapāka'a's knowledge of Hawai'i Island's winds, for how could a young native boy from Moloka'i possibly understand and foretell that strong winds would be heading towards them from Hawai'i Island and cause havoc enough that they would be forced upon the shore. In response, Kūapāka'a drew upon his heirloom gourd and his ancestral knowledge and began chanting his warning of destruction. Although no specific wind name for Waikōloa is recounted in this chant, the wind names (bolded and underlined) of the adjacent lands (bolded and italicized) are mentioned:

Hurry, hurry,
 The source of the storms of Hilo,
 Is the wind called ua kea,
 Shearing off the edges of a hale and breaking it up,
 Kēpia is of Hilo of the upright cliffs,
 Uluau is of Waiākea,
 Ulumano, 'Awa, Pu'ulena,
 Moani'ala are of Puna,
The winds of Kuamoa'e have gathered,
My Moa'e, the wind that is swelling,
 Apaiahaa is at Kanakaloloa,
 Hau is of Kapalilua,
 'Eka is of Kona,
 Kipu is of Kahuā,
 'E'elekoa is of Uli,
Kīpu'upu'u is of *Waimea*,
 'Ōlauniu is of Kekaha,
 Pa'ala'a is in the ocean,
Nāulu is of *Kawaihae*,
A wind that comes
And dashes the milo leaves of *Makaopau*,
***Kalāhuipua'a*, 'Āpa'apa'a is of *Kohala's* upland cliffs,**
The wind that flies about like vapor,
 Pu'ukolea is of Kapa'au,
 Holopo'opo'o is of Waipi'o,
 'Aelo is of Hāmākua,
 Kona is the wind of the sky
 Above the 'Alenuihāhā sea,
 You should come ashore,
 The spray of the sea flies up,
 The spray of the wind, a storm is coming (Nakuina 2005:39-40)

Keawenui a 'Umi was rapt with attention at the youth's enumeration, so Kūapāka'a continued chanting, the winds of Hawai'i:

At Ka'ū's windy cape is Ka 'Īlio a Lono,
 The paddle is dipped into the sea of Kāiliki'i,

At Puna's foundation turns the sun, the light,
Go and feel the wind of Kumukahi,
Hilo's wind-blown rain at sea,
The rain is seaward, over the hala of Leleiwi,
The spray of rain is at Hāmākua,
Hāmākua is the bridge to the cliffs,
At Kohala-iki is the Moa'e wind, the Moa'e blows,
Kona awakens with the Kēhau breeze,
Kona's burden diminishing with the Kēhau breeze,
Keawenuia'umi, come ashore, a storm is coming. (2005:40)

He continued:

There, there are the winds rising from the earth,
The Āpa'apa'a is of Kohala,
The rainy wind called Nāulu is of Kawaihae,
The Kīpu'upu'u is of Waimea,
A cold wind that hurts the skin,
A wind that whips the kapa of that land about,
Tossing up dust before it,
Frightening the procession of travelers,
'Ōlaniu is the wind,
Pili-a is of Kanikū,
A'e is of Kala'au,
Pohu and 'Eka are the winds of Kona,
Ma'a'akuulapu is of Kahalu'u,
Pilihala is of Ka'awaloa,
Kēhau is of Kapalilua,
Piuohooilo is of Ka'ū,
Ho'olapa is of Kamā'oa,
Kuehulepo is of Nā'ālehu
Uahi-pele is of Kīlauea,
'Awa is of Leleiwi,
Pu'ulena is of Waiākea,
Uluau is of Hilo-pali-kū,
Koholālele is of Hāmākua,
Holopo'opo'o is of Waipi'o,
The tip of that wind,
The tip of this wind,
They will twist into a whirlwind,
The bundle of bones at the back of the canoe exhaling,
Breaking off the buoy floating at the front;
Taking the load from the swamped canoe,
The small canoe will be swamped,
Destroyed with the large canoe,
The ali'i will die, the kahuna will die,
The weak will die, the strong will die,
The dark wisemen, the bright wisemen,
They will search out, they will confer
To locate the stars of the wave,
O Hōkū'ula, O Hōkūlei,
They will swimpingly, they will swim by twos,
Yesterday was a calm day,
A crowd of fishermen was at sea,
The paddling of the good canoes,
The strength of the hoewa'a,
The wisdom of the ho'okele,
Don't go far out to sea, ē dear ones,
Stop here, those from Hawai'i,

Come here over the sea surface,
 You will be possessed on O‘ahu,
 There will be darkness only on calm O‘ahu,
 Yesterday was calm, today will be stormy;
 Keawenuia‘Umi, come ashore, a storm is coming. (2005:41-42)

After Kūapāka‘a’s recital of the winds of Hawai‘i, O‘ahu, Kaua‘i, Maui, and Ka‘ula, Keawenui a ‘Umi became unsettled with a suspicion that the boy’s forecast would be realized. Perturbed at the possibility of meeting certain death in the face of violent weather, Keawenui a ‘Umi consulted with his two advisors, and thus the ultimate targets of the trickery, who adamantly insisted that Kūapāka‘a was lying and that they should depart. Kūapāka‘a continued chanting his warning, enumerating upon the winds of Maui and Moloka‘i in an effort to beguile them onshore, but Keawenui a ‘Umi’s party still retained suspicion and were not sure if they were being duped. Kahikuokamoku demanded the youth’s name, but Kūapāka‘a denied him, arguing that he would reveal his name once the men landed, but they did not comply, and instead, the canoes sailed off to O‘ahu.

Soon after their departure, and upon the command of his father, Kūapāka‘a chanted:

Ē winds that I’ve called,
 Blow here, those of Ka‘ula and Kaua‘i first,
 Those of O‘ahu and Hawai‘i from the sides,
 Those of Maui and Moloka‘i last,
 Blow true, and overtake the canoe fleet
 Of Keawenuia‘umi, the ali‘i. (2005:63)

And with this utterance, every wind that had escaped Kūapāka‘a’s lips through chant ravaged the atmosphere, wreaking utter havoc upon Keawenui a ‘Umi’s fleet. Soon, the survivors and their *ali‘i* made their way back to Moloka‘i to escape the mayhem and were led safely to shore by Kūapāka‘a and his father, who continued to play the role of the unassuming fisherman. Keawenui a ‘Umi was cold and wet from the escapade, and Kūapāka‘a was concerned for his wellbeing:

By evening, all the canoes had landed, but Keawenuia‘umi remained on the platform of his double-hulled canoe because he had no dry kapa or malo to wear since all his clothing had been lost at sea. Kūapāka‘a saw his haku shivering on the canoe, so he went to speak to his father: “I pity my haku because he’s suffering from the cold. He just sits there in a wet malo on the canoe, without any kapa covering.”

Pāka‘a took out one of Keawenuia‘umi’s malo which he had cared for when he was the ali‘i’s kahu; he gave it to his keiki: “Here’s one of your haku’s malo. Take it to him. Ask him to remove the wet malo he’s wearing and bring it back here. Tell him that this malo you give him is yours.”

Kūapāka‘a took the dry malo and offered it to Keawenuia‘umi saying, “Here’s my insignificant malo for you. Please remove your wet one.”

Keawenuia‘umi gave his wet malo to Kūapāka‘a, and the keiki gave the ali‘i the dry one. Keawenuia‘umi noticed the dry malo looked very much like one of his own. He said to Kūapāka‘a, “Perhaps this is one of my malo—it looks like one of mine.”

The keiki said, “The malo is mine. My mother beat the kapa for it and I was saving it until I could wear it in public as an adult. But now it’s yours, my haku.”

After the ali‘i had taken off his wet malo and put on the dry one, he placed the wet one in the keiki’s care.

The keiki returned with it and when he reached the door of Pāka‘a’s hale, his father asked him, “Where is your haku’s malo?”

“Here it is.”

“Hang it at the door of my hale, so that the ‘ā‘ipu‘upu‘u can no longer come in here.”

“I’ve hung it at the door.”

Pāka‘a said, “Now only you can enter here because you’ve been made sacred for your haku by the handling of his kapa. From now on, you’ll distribute the food in here to the ‘ā‘ipu‘upu‘u who come, because they can longer enter.” (2005:66-67)

The scenario repeated with Pāka‘a giving Kūapāka‘a a beautifully-scented *kapa* (cloth made of *wauke* or *māmaki* bark) that he had cared for over the years for Keawenui a ‘Umi. Although suspicious, the *ali‘i* presumed the tale told to him by the boy was true, that it was a *kapa* of the same fragrance as his but from Wailau, Moloka‘i and not in fact one of his own. Being that Keawenui a ‘Umi had lost everything in the storm, Kūapāka‘a continued to care for his *haku*, who was still clueless as to the boy’s true identity. He dutifully attended to his every need, just as his father

(Pāka‘a) had in previous years. Meanwhile, Pāka‘a continued to craft his revenge plot on Ho‘okele-i-Hilo and Ho‘okele-i-Puna, and in order to facilitate this, his son let loose the winds of his gourd to keep the weather just unstable enough so Keawenui a ‘Umi would not be able to leave the island.

Four months later the weather became agreeable once more, and Keawenui a ‘Umi and his men readied their canoes for sailing. That night, Kūapāka‘a chanted to each of the six district *ali‘i* and their men to ready themselves for sailing:

Get up, get up, it’s day, there’s light,
The sun has arrived, and there above,
Iao [the planet Jupiter], Maio [a navigation star],
Kamaha, Kahikikuokamoku,
Kani-‘ū‘ū, the star at Helani,
Get up, move, Kohala,
The land of Wahilani. (2005:73-74)

The men were confused, as the voice urging them to depart belonged to Kūapāka‘a, who instructed them to set sail to Ka‘ula and explained to them that Keawenui a ‘Umi would shortly follow. However, Kūapāka‘a did not wake his *haku* immediately, and allowed him to sleep in, while the other fleets departed Moloka‘i. When day broke, Keawenui a ‘Umi and his men (including Ho‘okele-i-Hilo and Ho‘okele-i-Puna) departed to Ka‘ula in search of Pāka‘a. Being that the rest of his party had departed, Keawenui a ‘Umi requested that Kūapāka‘a accompany him to Ka‘ula to search for Pāka‘a, which he agreed to do as this was part of his father’s plan. As part of Pāka‘a’s conspiracy to exact revenge on his enemies, he had instructed his son to load the double-hulled canoe of the *ali‘i* with a hollowed-out tree trunk secretly filled with food, drink, palm fronds, and a large stone to be used as an anchor.

Meanwhile, the rest of Keawenui a ‘Umi’s party was enroute to Ka‘ula, but stalled at O‘ahu to wait for their *ali‘i*, but he never arrived. Exhausted from their journey, the men fell asleep. When they awoke, they unexpectedly found that they had drifted to Hawai‘i Island, and found themselves on the shores of Kawaihae. Meanwhile, Keawenui a ‘Umi and his party were voyaging to Ka‘ula, with Ho‘okele-i-Hilo and Ho‘okele-i-Puna steering the canoe, oblivious to their imminent, discretely planned demise. To carry out the final segment of the grand scheme, Kūapāka‘a allowed the winds out of La‘amaomao, and the weather became severe. He anchored the canoe with his big rock and encouraged the men to ride out the storm in place, arguing that it would be better than fighting the bad weather. The bitter wind and rain chilled the men to the bone and they began to get hypothermic. Just before they reached the verge of death, Kūapāka‘a then revealed the hidden trove of food. He gave palm fronds for protection and food and drink for strength to everyone on board except his father’s enemies, Ho‘okele-i-Hilo and Ho‘okele-i-Puna, who inevitably succumbed to the cold and perished.

As the weather cleared and became pleasant, Kūapāka‘a assumed the role of the now-deceased steersmen and set sail for Ka‘ula. However, that night when everyone was sleeping, the boy opened his wind-gourd yet again, and the winds wafted them to Hawai‘i Island where they landed at Kawaihae. Once there, joy and excitement overcame Keawenui a ‘Umi and his party, and they rushed to lovingly greet their families while Kūapāka‘a was utterly forgotten, abandoned, and alone. Eventually, word of a canoe race that the boy participated in reached the ears of Keawenui a ‘Umi by a messenger, and it was realized that Kūapāka‘a’s neglect had been inadvertent, as it was mistakenly presumed that the youth had been taken in and cared for. As part of the wager for the canoe race against Keawenui a ‘Umi’s favorite fishermen, it was agreed that should Kūapāka‘a reign victorious, the losers be baked in an *imu* (underground oven). During their conversation, Kūapāka‘a informed his *haku* that he intended to make true on his wager and kill the men. But he was met with opposition from Keawenui a ‘Umi, who did not want to see his men perish. Eventually, a deal was made in which Kūapāka‘a would fetch Pāka‘a from Moloka‘i if Keawenui a ‘Umi agreed that the fishermen be put to death.

Though Pāka‘a longed to serve his *haku* once more, he refused to travel back to Hawai‘i Island without having his land, position as navigator, and other rights restored. When Keawenui a ‘Umi was informed of this, he immediately consented, eager to reconnect. Only when Keawenui a ‘Umi agreed to restore everything that had been revoked from Pāka‘a, did his beloved *kahu* return to him to serve him faithfully for the rest of his days.

Lonoikamakahiki and the Battle of Hōkū‘ula

Lonoikamakahiki was a celebrated ruling chief of Hawai‘i Island and boasts lineage from the ancient Pili dynasty with a heritage rooted on Hawai‘i Island, and likely Waipi‘o Valley, since roughly A.D. 1300. He was the son of Keawenui a ‘Umi, and the grandson of celebrated *ali‘i nui* ‘Umi a Līloa, and recognized as an accomplished and dexterous warrior. He integrates prominently into the history and significance of Waikōloa. With respect to Waikōloa, Lonoikamakahiki figures into this notable *mo‘olelo* regarding his triumph over the invading Maui chief Kamalālāwalu.

During the time of Lonoikamakahiki's rule, several battles transpired in the coastal portion of South Kohala. One such battle was fought between Lonoikamakahiki and his older brother, Kanaloakua'ana, who rebelled against him. According to Fornander (1880:120-121):

Informed by Kaikilani of the revolt on Hawaii, Lonoikamakahiki left Oahu at once, crossed the channels of the group, and avoiding the Kohala coast, where the rebels were in force, sailed to Kealakeakua [Kealakekua], and sent messengers to Kau to acquaint Pupuakea of the arrival of himself and Kaikilani. Pupuakea responded promptly, and, taking a mountain road above the coast villages, he joined Lono and the forces that the latter had collected in Kona at Puuanahulu, on a land called Anaehoomalu, near the boundaries of Kohala and Kona. The rebel chiefs were encamped seaward of this along the shore. The next day Lono marched down and met the rebels at a place called Wailea, not far from Wainanalii, where in those days a watercourse appears to have been flowing. Lono won the battle, and the rebel chiefs fled northward with their forces. At Kaunaoa, between Puako and Kawaihae, they made another stand, but were again routed by Lono, and retreated to Nakikiaianihau, where they fell in with reinforcements from Kohala and Hamakua. Two other engagements were fought at Puupa [on the plain north of Waikōloa] and Puukohola, near the Heiau of that name, in both of which Lono was victorious. His brother Kanaloakapulehu was taken prisoner, slain, and sacrificed at the Heiau, but Kanaloakuakawaiea escaped with the scattered remnant of the rebel forces. The rebels now fled into Kohala, and were hotly pursued by Lonoikamakahiki. Several skirmishes were fought during the pursuit; at Kaiopae, where Kanaloakuakawaiea was slain; at Kaiopihi, and finally at Puumaneo, on the high lands above Pololu, where the last remnant of the rebel force was conquered and slain, and the island returned to its allegiance to Lono and Kaikilani.

Fornander (1916-1917) relates that a series of subsequent attacks were instigated and waged by Kamalālāwalu, the *ali'i nui* of Maui, against Lonoikamakahiki. These battles occurred along the South Kohala coastline, the first of which ensued at Wailea, then Kauna'oa, and finally commenced at Puakō, where his brother and high chief Kanaloakua'ana, was brutally tortured and eventually slaughtered. Thereafter, Kamalālāwalu and his army, upon the advice of two of Lonoikamakahiki's allies Kauhapaewa and Kihapaewa who had gained his trust and infiltrated Kamalālāwalu's camp, proceeded to Hōkū'ula in Waimea in anticipation of the continuation of battle in which they assumed an automatic victory. Upon awakening the next morning, Kamalālāwalu was stunned to discover that a great constellation of men had amassed near the coast; what seemed like thousands of warriors from all of Hawai'i Island had gathered as far as the eye could see and were prepared to savagely wage war upon the intruder Maui chief.

Realizing that he was vastly outnumbered, Kamalālāwalu attempted to reconcile differences with Lonoikamakahiki in an attempt to escape certain death, but the former, being enraged at the manner in which his ally Kanaloakua'ana was slain, denied him. The supreme volume of Lonoikamakahiki's forces was incomparable to Kamalālāwalu's, especially when coupled with the latter's unfamiliarity with the battleground. According to Fornander (1916-1917:344), "the Kau and Puna warriors were stationed from Holoholoku to Waikoloa. Those of Hilo and Hamakua were located from Mahiki to Puukanikanihia, while those of Kohala guarded from Momouloa to Waihaka." After just three days, Lonoikamakahiki reigned victoriously, and Kamalālāwalu and nearly all of the invaders, with the exception of his son Kauhiakama, were executed.

'Ōlelo No 'eau of South Kohala

The oral tradition of Hawai'i is perhaps best preserved in *'ōlelo no 'eau*, which has been passed down throughout the generations. Many *'ōlelo no 'eau* speak of South Kohala, and most mention the famed winds of the region. The following proverbs illustrate the character of South Kohala in great detail, and appear below as they were interpreted and published in *'Ōlelo No 'eau, Hawaiian Proverbs & Poetical Sayings* by Mary Kawena Pukui (1983):

'A'ohe u'i hele wale o Kohala.

No youth of Kohala goes empty-handed.

Said in praise of people who do not go anywhere without a gift or a helping hand. The saying originated at Honomaka'u in Kohala. The young people of that locality, when on a journey, often went as far as Kapua before resting. Here, they made *lei* to adorn themselves and carry along with them. Another version is that no Kohala person goes unprepared for any emergency. (Pukui 1983:25)

He pā'ā kō kea no Kohala, e kole ai ka waha ke 'ai.

A resistant white sugar cane of Kohala that injures the mouth when eaten.

A person that one does not tamper with. This was the retort of Pupukea, a Hawai‘i chief, when the Maui chief Makakuikalani made fun of his small stature. Later used in praise of the warriors of Kohala, who were known for valor. (ibid.:95)

I ‘ike ‘ia no o Kohala i ka pae kō, a o ka pae kō ia kole ai ka waha.

One can recognize Kohala by her rows of sugar cane which can make the mouth raw when chewed. When one wanted to fight a Kohala warrior, he would have to be a very good warrior to succeed. Kohala men were vigorous, brave, and strong. (ibid.:127)

Ipu lei Kohala na ka Moa‘ekū.

Kohala is like a wreath container for the Moa‘e breeze.
Kohala is a windy place. (ibid.:136)

Kahilipulu Kohala na ka makani.

Kohala is swept, mulch and all, by the wind.
Kohala is a windy place. (ibid.:143)

Ka makani ‘Āpa‘apa‘a o Kohala.

The ‘Āpa‘apa‘a wind of Kohala.
Kohala was famed in song and story for the ‘Āpa‘apa‘a wind of that district. (ibid.:157)

Kohala ‘āina ha‘aheo.

Kohala, land of the proud.
The youths, *lei*-bedecked, were proud of their handsome appearance and of their home district. (ibid.:196)

Kohala ihu hakahaka.

Kohala of the gaping nose.
Kohala is full of hills, and the people there are said to breathe hard from so much climbing. (ibid.:196)

Le‘i o Kohala i ka nuku na kānaka.

Covered is Kohala with men to the very point of land.
A great population has Kohala. Kauhiakama once traveled to Kohala to spy for his father, the ruling chief of Maui. While there, he did not see many people for they were all tending their farms in the upland. He returned home to report that there were hardly any men in Kohala. But when the invaders from Maui came they found a great number of men, all ready to defend their homeland. (ibid.:213)

Lele au la, hokahoka wale iho.

I fly away, leaving disappointment behind.
Said of one who is disillusioned after giving many gifts. Waka‘ina was a ghost of North Kohala who deceived people. He often flew to where people gathered and chanted. When he had their attention he would say, “I could chant better if I had a tapa cloth.” In this way he would name one thing after another, and when all had been given him he would fly away chanting these words. (ibid.:213)

Lele o Kohala me he lupe la.

Kohala soars as a kite.
An expression of admiration for Kohala, a district that has often been a leader in doing good works. (ibid.:214)

Na ‘ilina wai ‘ole o Kohala.

The waterless plains of Kohala, where water will not remain long.
After a downpour, the people look even in the hollows of rocks for the precious water. (ibid.:243)

Nani ka waiho a Kohala i ka la‘i.

Beautiful lies Kohala in the calm.
An expression of admiration for Kohala, Hawai‘i, or for a person with poise and charm—especially a native of that district. (ibid.:248)

‘Ohi hāpuku ka wahie o Kapa‘au.

Anything was gathered up as fuel at Kapa‘au.
Said of one who takes anything and everything. At one time Kohala suffered a drought and food became scarce. The women did their best to raise food at ‘Āinakea while the men traveled far in

search of some means of relieving the famine. In order to cook their meager, inferior crops, the women used whatever they found for fuel—dried sugar-cane leaves, grasses, potatoes, and so forth. (ibid.:258)

‘Ope‘ope Kohala i ka makani.

Kohala is buffeted by the wind. (ibid.:277)

‘Uala ne‘ene‘e o Kohala.

Ne‘ene‘e potato of Kohala.

A person who hangs around constantly. Ne‘ene‘e, a variety of sweet potato, also means “to move up closer.” (ibid.:309)

Chiefly Rule in South Kohala, the Death of Kamehameha, and Early Historic Accounts

By the 17th century, large areas of Hawai‘i Island were controlled by a few powerful *ali‘i ‘ai moku*. There is island-wide evidence to suggest that growing conflicts between independent chiefdoms were resolved through warfare, culminating in a unified political structure at the district level. It has been suggested that the unification of the island resulted in a partial abandonment of portions of leeward Hawai‘i, with people moving to more favorable agricultural areas (Barrera 1971; Schilt and Sinoto 1980). ‘Umi a Līloa, a renowned *ali‘i* (chief) of the Pili line, is often credited with uniting the Island of Hawai‘i under one rule during the Precontact Period (Cordy 1994). ‘Umi-a-Līloa is also credited with formalizing the land division system on Hawai‘i Island and separating the various classes of chiefs, priests, and laborers (Beamer 2014; Cordy 2000; Kamakau 1992). Upon the death of ‘Umi-a-Līloa, Hawai‘i Island came under the control of his eldest son Keli‘iokāloa-A-‘Umi (Cordy 2000), whose reign is marked by his mistreatment of the lesser chiefs and commoners. His reign was short-lived and by the early 18th century Hawai‘i Island fell under the control of Alapa‘inui, who assembled a robust army and assigned his closest potential usurpers (his nephews Keawema‘uhili, Kalani‘ōpu‘u, and Keōua) as generals in his militia. The prodigious ‘Ī clan, which spread across the districts of Ka‘ū, Puna, Hilo, and portion of Hāmākua, was also a powerful force and threat to Alapa‘i campaign (Cordy 2000). As Alapa‘i gathered his forces to wage war against Kekaulike, the *ali‘i nui* of Maui, the high ranking *ali‘i wahine* (chiefess) Keku‘iapoiwa made her way to Kokoiki, Kohala to give birth to Pai‘ea, the birth name of Kamehameha, sometime between A.D. 1736 and 1758 near Mo‘okini Heiau (Kamakau 1992). Kamehameha was reared in the traditions and customs of the ancient chiefs and trained under some of the most skilled warriors of that time including Kekūhaupi‘o. Upon Alapa‘i’s death, his eldest son Keawe‘ōpala was named heir to the kingdom.

By the mid-18th century, the young and determined Kamehameha directed his efforts toward consolidating Hawai‘i Island under his rule. To accomplish this monumental task, Kamehameha continued his training under his more experienced kin namely Kalani‘ōpu‘u, who was the *ali‘i nui* of Hawai‘i Island (Ii 1959). During Kalani‘ōpu‘u’s reign, he fought several battles against Maui *ali‘i* Kahekili between 1777 and 1779. During this time the first foreign vessels arrived in Hawaiian waters captained by the British explorer, James Cook. Cook first landed at Waimea, Kaua‘i in 1778 and in 1779, he anchored just off the shores of Kealakekua Bay, Kona. Aboard these ships were innovative technologies and diseases unknown to the inhabitants of these islands. Items such as metal, nails, guns, canons, and the large foreign vessels themselves stirred the interest of the *ali‘i* and *maka‘āinana* (commoners) alike. The acquisition of these foreign technologies came through barter.

On February 4th, Cook set sail from Kealakekua Bay, but a storm off the Kohala coast damaged the mast of the *H.M.S. Resolution*, and both ships were forced to return to Kealakekua Bay to make repairs. With Cook’s return, many of the inhabitants of Kealakekua began to doubt that he was the physical manifestation of Lono (Kamakau 1992). After conflicts with Hawaiians who were accused of stealing nails from the British ships and the theft of one of Cook’s boats, Cook set ashore at Ka‘awaloa with six marines to ask Kalani‘ōpu‘u for its return. Kalani‘ōpu‘u denied any knowledge of the theft, so Cook decided to hold the chief captive until the boat was returned (Kamakau 1992). When Cook tried to seize Kalani‘ōpu‘u, a scuffle ensued and Cook was killed (along with four of his men and several natives), struck down by a metal dagger, on the shores of Ka‘awaloa.

After the death of Captain Cook and the departure of *H.M.S. Resolution* and *Discovery*, Kalani‘ōpu‘u moved to Kona, and while he was living there, famine struck the district (Kamakau 1992). Kalani‘ōpu‘u ordered that all the cultivated products of that district be seized, and then he set out on a circuit of the island. While in North Kohala, Kalani‘ōpu‘u proclaimed that his son Kīwala‘ō would be his successor, and he gave the guardianship of the war god Kūka‘ilimoku to Kamehameha. However, Kamehameha and a few other chiefs were concerned about their land claims, which Kīwala‘ō did not seem to honor (Fornander 1996; Kamakau 1992). After dedicating the *heiau* of Moa‘ula in Waipi‘o (ca. A.D. 1781), Kalani‘ōpu‘u set out for Hilo to quell a rebellion by a Puna chief named Imakakolo‘a. Imakakolo‘a was eventually captured and brought to a *heiau* called “Pakini, or Halauwailua, near Kama‘oa” in Ka‘ū (Kamakau 1992:108), where Kīwala‘ō was to sacrifice him. However, before Kīwala‘ō could finish

2. Background

the first offerings, Kamehameha, “grasped the body of Imakakolo‘a and offered it up to the god, and the freeing of the tabu for the *heiau* was completed” (Kamakau 1992:109). Upon observing this single act of insubordination, many of the chiefs believed that Kamehameha would eventually rule over all of Hawai‘i. Kamehameha retreated to his home district of Kohala, where he farmed the land, growing taro and sweet potatoes (Handy et al. 1991). Kalani‘ōpu‘u died in April of 1782 and was succeeded by his son Kīwala‘ō.

After Kalani‘ōpu‘u died, several chiefs were unhappy with Kīwala‘ō’s division of the island’s lands, and civil war broke out. Kīwala‘ō was killed at the battle of Moku‘ōhai, South Kona in July of 1782. Supporters of Kīwala‘ō, including his half-brother Keōua and his uncle Keawemauhili, escaped the battle and laid claim to the districts of Hilo, Puna, and Ka‘ū. According to ‘Ī‘ī (1963), nearly ten years of almost continuous warfare followed the death of Kīwala‘ō, as Kamehameha endeavored to unite the island of Hawai‘i under one rule and conquer the islands of Maui and O‘ahu. Keōua, who ruled over the Ka‘ū District, became Kamehameha’s main rival on the island of Hawai‘i, and he proved difficult to defeat (Kamakau 1992). Around 1790, to secure his rule, Kamehameha began building the *heiau* of Pu‘ukoholā at Kawaihae (Figure 11), which was to be dedicated to the war god Kūka‘ilimoku (Fornander 1996). When Pu‘ukoholā Heiau was completed in the summer of 1791, Kamehameha sent his two counselors, Keaweahu and Kamanawa, to Keōua to offer peace. Keōua was enticed to the dedication of the Pu‘ukoholā Heiau by this ruse and when he arrived at Kawaihae he and his party were sacrificed to complete the dedication (Kamakau 1992). The assassination of Keōua gave Kamehameha undisputed control of Hawai‘i Island by A.D. 1792 (Greene 1993). Between 1792 and 1796, after the dedication of Pu‘ukoholā, Kamehameha mostly resided at Kawaihae and worked the lands of the Waikōloa-Waimea region (Maly and Maly 2002). By 1796, Kamehameha had conquered all the island kingdoms except for Kaua‘i. It was not until 1810, when Kaumuali‘i of Kaua‘i gave his allegiance to Kamehameha, that the Hawaiian Islands were unified under one ruler (Kuykendall and Day 1976).



Figure 11. Pu‘ukoholā Heiau in Kawaihae Ahupua‘a, South Kohala (Hawaii State Archives PP-35-7-028).

In the twelve years following the death of Captain Cook, sixteen foreign ships (all British and American) called in Hawaiian waters (Restarick 1928). In 1790, two sister ships, the *Eleanora* and the *Fair American*, were trading in Hawaiian waters when a skiff was stolen from the *Eleanora* and one of its sailors was murdered. The crew of the *Eleanora* proceeded to slaughter more than 100 natives at Olowalu on Maui. After leaving Maui, the *Eleanora* sailed to Hawai‘i Island, where one of its crew, John Young, went ashore and was detained by Kamehameha’s men. The other vessel, the *Fair American*, was captured by the forces of Kamehameha off the coast of North Kona, and in an act of retribution for the Olowalu massacre, they slaughtered all but one crew member, Isaac Davis. Guns and a cannon

(later named “Lopaka”) were recovered from the *Fair American*, and were kept by Kamehameha as part of his fleet (Kamakau 1992). Kamehameha eventually made John Young and Isaac Davis his advisors.

In 1792, Captain George Vancouver, who had sailed with Cook during his 1778-1779 voyages, arrived in Kealahou Bay with a small fleet of British ships, where he met with Kamehameha. Vancouver stayed only a few days on this first visit but returned in 1793 and 1794 to take on supplies. Vancouver introduced cattle to the Island of Hawai‘i during his 1793 and 1794 visits, giving them as gifts to Kamehameha I, who immediately made them *kapu*, thus preventing them from being killed (Kamakau 1992). During one of his visits Vancouver anchored at Kawaihae and a member of his crew, Archibald Menzies, a surgeon, and naturalist, trekked inland towards Waimea. Menzies’ (1920:55) describes the arid lands:

I travelled a few miles back...through the most barren, scorching country I have ever walked over, composed of scorious dregs and black porous rock, interspersed with dreary caverns and deep ravines...The herbs and grasses which the soil produced in the rainy seasons were now mostly in the shriveled state, thinly scattered and by no means sufficient to cover the surface from the sun’s powerful heat, so that I met with few plants in flower in this excursion.

Around the turn of the century, Kamehameha gave control of Waikōloa Nui Ahupua‘a (excluding the coastal *‘ili* of ‘Anaeho‘omalu and Kalāhuipua‘a) to Isaac Davis (Rosendahl 2000). Although the land of Waikōloa Nui gifted to Davis encompassed a large area, it lacked extensive resources and was primarily a place for catching birds and gathering *pili* grass. When Davis died in 1810 without naming an heir, John Young took control of the land and protected it for Davis’ children, who were at that time too young to take on the responsibility (Rosendahl 2000).

Waikōloa Nui would eventually become a favored pasture for the cattle given by Vancouver to Kamehameha. After 1794, the *kapu* cattle quickly multiplied in the region, becoming a scourge for the native planters of the area, so much so that sometime between 1813 and 1819 their numbers necessitated that a wall be built from the northern boundary of Waikōloa Nui to the area near Pu‘u Huluhulu (Barrère 1983). The wall was designed to keep wild cattle in Waikōloa Nui, and out of the more agriculturally productive areas on the Waimea side. The wall was called the Pā of Kauliokamoa after the *konohiki* who oversaw its construction (Wolforth 2000).

Kamehameha I died on May 8, 1819, at Kamakahonu in Kailua-Kona, and the changes that had been affecting the Hawaiian culture since the arrival of Captain Cook in the Islands began to accelerate. Following the death of a prominent chief, it was customary to eliminate all of the *kapu* that maintained social order and the separation of men from women, and elite from commoner. Thus, following Kamehameha’s death, a period of *‘ai noa* (free eating) was observed along with the relaxation of other traditional *kapu*. It was the responsibility of the new ruler and *kahuna* to re-establish *kapu* and restore social order, but at this point in history, traditional customs were altered. Immediately upon the death of Kamehameha I, Liholiho (his son and to be successor) was sent away to Kawaihae to keep him safe from the impurities of Kamakahonu brought about from the death of Kamehameha. After purification ceremonies, Liholiho returned to Kamakahonu but rather than reinstate the *kapu*, he made a public display of continuing the period of *‘ai noa*, and, at the prompting of Ka‘ahumanu, decreed that the *kapu* was permanently ended (Kamakau 1992).

While many supported this change, others, like Kekuaokalani, caretaker of the war god Kūka‘ilimoku, was dismayed by his cousin’s (Liholiho) actions. Kekuaokalani revolted against Liholiho but was ultimately defeated in the battle of Kuamo‘o. By December of 1819, Liholiho had sent edicts throughout the kingdom renouncing the ancient state religion, ordering the destruction of the ancient *ki‘i* (carved wooden images often placed at *heiau*), and ordering that the *heiau* structures be destroyed or abandoned and left to deteriorate. He did, however, allow the personal family religion, the *‘aumakua* worship, to continue (Kamakau 1992; Oliver 1961). With the end of the *kapu* system, changes in the social and economic patterns began to affect the lives of the common people. Liholiho moved his court to O‘ahu, lessening the burden of resource procurement for the chiefly class on the residents of Hawai‘i Island. Some of the work of the commoners shifted from subsistence agriculture to the production of foods and goods that they could trade with Western visitors.

The Arrival of Westerners and Early Historical Accounts of South Kohala (1823-1847)

The arrival of Western explorers in Hawai‘i in 1778 signified the end of the Precontact Period and the beginning of the Historic Period. With the influx of foreigners, Hawai‘i’s culture and economy underwent drastic changes. Demographic trends during the early Historic Period indicate population reduction in some areas, due to war and disease, yet increase in others, with relatively little change in material culture. At first, there was a continued trend toward craft and status specialization, intensification of agriculture, *ali‘i* controlled aquaculture, the establishment of upland residential sites, and the enhancement of traditional oral history. The Kū cult, *luakini heiau* (sacrificial altar), and the *kapu* system were at their peaks, although western influence was already altering the cultural fabric of the Islands (Kent 1983; Kirch 1985). Foreigners very quickly introduced the concept of trade for profit, and by the time

Kamehameha had conquered O‘ahu, Maui, and Moloka‘i, in 1795, Hawai‘i saw the beginnings of a market system economy (Kent 1983). Some of the work of the *maka‘āinana* shifted from subsistence agriculture to the production of foods and goods to trade with early visitors. Introduced foods often grown for trade included yams, coffee, melons, Irish potatoes, Indian corn, beans, figs, oranges, guavas, and grapes (Wilkes 1845).

During this period, the sandalwood trade wreaked havoc on the lives of the commoners, as they weakened from the heavy production, exposure, and famine just to fill the coffers of the *ali‘i*, who were no longer under any traditional constraints (Kuykendall 1967; Oliver 1961). The lack of control of the sandalwood trade was to soon lead to the first Hawaiian national debt as promissory notes and levies were initiated by American traders and enforced by American warships, and was the force that ultimately propelled the assimilation of Hawaiian and Western culture (Oliver 1961).

Shortly after 1820, Christianity established a firm foothold in the islands, and introduced diseases and global economic forces began to have a devastating impact on traditional lifeways. Some of the earliest written descriptions of Kohala come from the accounts of the first Protestant Missionaries to visit the island. While explicit references to Waikōloa are notably absent from these accounts, several exist for the greater South Kohala region. In 1823, British missionary William Ellis and other members of the American Board of Commissioners for Foreign Missions (ABCFM) toured the island of Hawai‘i seeking out communities in which to establish church centers for the growing Calvinist mission (Ellis 2004). Ellis described the coastal communities of the north part of the island (presumably along the shores of North and South Kohala) as subsisting almost exclusively on dried, salted fish, *poi*, and *‘uala*. While in South Kohala, Ellis visited Kawaihae, and attested to the great number of Kohala men involved in the transportation of sandalwood from the uplands to the harbor at the time of his visit:

About eleven at night we reached Towaihae [Kawaihae], where we were kindly received by Mr. Young... Before daylight on the 22nd, we were roused by vast multitudes of people passing through the district from Waimea with sandal-wood, which had been cut in the adjacent mountains for Karaimoku [Kālaïmoku], by the people of Waimea, and which the people of Kohala, as far as the north point, had been ordered to bring down to his storehouse on the beach, for the purpose of its being shipped to Oahu. There were between two and three thousand men, carrying each from one to six pieces of sandal-wood, according to their size and weight. It was generally tied on their backs by bands of ti leaves, passed over the shoulders and under the arms, and fastened across their breasts. (Ellis 2004:405-406)

Much of the population of South Kohala at this time resided near the shore or in the rainier uplands of Waimea. Lorenzo Lyons arrived at Kawaihae on July 16, 1832, and replaced Reverend Dwight Baldwin as the minister in Waimea (Maly 1999a). Lyons’ missionary territory, although centered in Waimea, included the districts of Kohala and Hāmākua. He served as the preeminent missionary of the area until his death in 1886 (Puakō Historical Society 2000), becoming one of the most beloved of the Hawaiian missionaries, known to his parishioners as *Ka Makua Laiana, haku mele o ka aina Mauna* (Father Lyons, lyrical poet of the mountain country). During his tenure at Waimea, Lyons’ toured the territory spreading the gospel. He helped establish and maintain many of the early churches and schools in Kohala, including a school at Puakō and Hōkūloa Church. In 1835, Lyons visited the nearby village of Puakō, which was likely very similar to ‘Anaeho‘omalū at that time. There he found a coastal village still deeply rooted in traditional lifeways:

Puako is a village on the shore, very like Kawaihae, but larger. It has a small harbor in which native vessels anchor. Coconut groves give it a verdant aspect. No food grows in the place. The people make salt and catch fish. These they exchange for vegetables grown elsewhere (Lyons in Doyle 1953:85)

With Kawaihae being the principal port of South Kohala, the development of a thoroughfare was necessary to accommodate the growing numbers of people who required reliable access to it. A detailed description of the coastal section of South Kohala was provided in *The Southern Literary Messenger* published in 1837. Described as barren and warm, improvements to the district had begun with the establishment of a convict-constructed roadway leading to Pu‘u Koholā Heiau and the continual advancement of Kawaihae as an intensively utilized port:

... The western district on the coast is barren rock and long grass—and nothing relieves the eye but the yellow blossoms of the *Nohu* (Tribulus). A road has lately been made to the plains by clearing away the stones, and covering the surface with long grass—done by convicts. The road terminates at a *large temple* built by *Kamehameha the First*. The strong north-east wind is called *Mumuku*. There are *salt works* at Kawaihae, and also *tepid baths*. Once it was the head quarters of the chiefs. The climate of the island varies “from the oven-like dryness and heat of Kawaihae, to the cold-wet rawness of Pukapu [Pu‘ukapu] and the freezing snows of Mauna Kea”. . . There is much rain and wind at Kawaihae—a nasty drizzling, soaking Scotch mist for weeks. If you remain in the house

you are tormented by the bites of mosquitoes [mosquitos]. . . The earth on the shore on the west side is at an even temperature of 80 throughout the year. The water is brackish. Population fluctuates according to the movements of Governor Adams *Kuakini*, who frequently resides here. Many foreigners, chiefly mechanics, are on the cattle farms. Large quantities of leather are made. Principal articles exported—livestock, salt and jerked beef, hides, tallow, leather, Mamaki kapas, feathers, koa plank, &c. &c. (The Southern Literary Messenger 1837:422)

In 1840, Lieutenant Charles Wilkes, head of the U.S. Exploring Expedition, traveled to Kawaihae. His narrative provides a similar account to those written by others in earlier times, illustrating the Kawaihae landscape as arid and gusty, and remarking upon the bustling port of Kawaihae:

. . . Kawaihae is the port or bay nearest to Maui and the islands to the westward, and there are many small native vessels which trade to this island, which only frequent this port. This bay is readily known by the gorge in the mountains that is directly behind it, in which lies the town of Waimea, where a lively trade is carried on by the natives shipping their productions to Honolulu, consisting of hides, tallow, leather, beef, wood, &c. The mountains rise from the coast to a great height, and the country has the appearance of a parched or burnt district. This port was first brought into notice by Kuakini, well known under his English appellation of Governor Adams. The Bay of Kawaihae does not deserve the name of a port. Being under the lee of the island, it is difficult to reach; calms and light airs predominate; the trade wind sometimes blows very strong, rushing down the mountain side; vessels lying in the roadstead are frequently blown off. A peculiar squall, called by the natives *Mumuke* [*Mumuku*], sometimes bursts upon the bay a short time before sunset; its duration is not long, but of great violence; its coming is prognosticated by an illuminated streak, seen far inland, by the natives, who prepare in time to resist its violence; it is accompanied by quantities of sand. . . As a place of resort it is by no means agreeable, the air being hot and stifling. The morning hours are best to transact business in, and the shipment of cargo at that time does not meet with interruption from the weather. (Wilkes 1861:291-292)

With the arrival of foreigners in Hawai'i, the introduction of a western economy, and the rise of the sugar and cattle industries, life in Kohala began to drastically change. The population of the district also declined rapidly as native populations were decimated by disease and a depressed birth rate. Epidemics in 1848 and 1849 killed more than 10,000 people in twelve months throughout the Hawaiian Islands (Tomonari-Tuggle 1988). In 1848 in North Kohala, Reverend Bond reported that 100 people had died within three weeks, and in October of that year he reported that a measles epidemic had nearly every resident of the district in the hospital (Damon 1927). Following these epidemics, the population of the district had been reduced to nearly half of the more than 6,000 people reported in the 1835 census (Schmitt 1977).

During this time, leeward settlement shifted to the windward side of Kohala as the leeward, agriculturally marginal areas were abandoned in favor of more productive and wetter sugarcane lands. According to Tomonari-Tuggle (1988), the remnant leeward population nucleated into a few small coastal communities and dispersed upland settlements. These settlements were no longer based on traditional subsistence patterns, largely because of the loss of access to the full range of necessary resources. The wetter windward slopes of North Kohala and the Waimea plain were the focus of the shifting settlement pattern, and they eventually became the population centers for the district. Tomonari-Tuggle (1988:33) clarifies some of the reasons for this migration:

Outmigration and a demographic shift from rural areas to growing urban centers reflected the lure of a larger world and world view on previously isolated community. Foreigners, especially whalers and merchants, settled around good harbors and roadsteads. Ali'i and their followers gravitated towards these areas, which were the sources of Western material goods, novel status items which would otherwise be unavailable. Associated with the emergence of the market, cash-based economy, commoners followed in search of paying employment.

While the early historical accounts lack detailed information about the proposed project area, collectively these accounts describe important cultural transformation of this time. These written descriptions depict the movement of people in the greater South Kohala District and their connection to the changing industries all while facing serious epidemics that continued to send the Hawaiian population into decline.

The *Māhele* 'Āina of 1848

By the mid-19th century, the ever-growing population of Westerners in the Hawaiian Islands forced socioeconomic and demographic changes that promoted the establishment of a Euro-American style of land ownership. By 1840 the first Hawaiian constitution had been drafted and the Hawaiian Kingdom shifted from an absolute monarchy into a

constitutional government. Convinced that the feudal system of land tenure previously practiced was not compatible with a constitutional government, the King (Kauikeouli a.k.a Kamehameha III) and his high-ranking chiefs decided to separate and define the ownership of all lands in the Kingdom (King n.d.). This change was further promoted by missionaries and Western businessmen in the islands who were generally hesitant to enter business deals on leasehold lands that could be revoked from them at any time. After much consideration, it was decided that three classes of people each had one-third vested rights to the lands of Hawai'i: the King, the chiefs and *konohiki*, and their tenants (the *maka'āinana* or common people). In 1845 the legislature created the Board of Commissioners to Quiet Land Titles (more commonly known as the Land Commission), first to adopt guiding principles and procedures for dividing the lands and granting land titles, and then to act as a court of record to investigate and ultimately award or reject all claims brought before them. All land claims, whether by chiefs for entire *ahupua'a* or by tenants for their house lots and gardens, had to be filed with the Land Commission within two years of the effective date of the Act (February 14, 1846) to be considered (this deadline was extended several times for chiefs and *konohiki*, but not for commoners) (Soehren 2005).

The King and some 245 chiefs (Kuykendall 1938) spent nearly two years trying unsuccessfully to divide all the lands of Hawai'i amongst themselves before the whole matter was referred to the Privy Council on December 18, 1847 (King n.d.). Once the King and his chiefs accepted the principles of the Privy Council, the *Māhele 'Āina* (Land Division) was completed in just forty days (on March 7, 1848), and the names of all of the *ahupua'a* and *'ili kūpono* (nearly independent *'ili* land division within an *ahupua'a*, that paid tribute to the ruling chief and not to the chief of the *ahupua'a*) of the Hawaiian Islands and the chiefs who claimed them, were recorded in the *Māhele* Book (Soehren 2005). As this process unfolded King Kamehameha III, who received roughly one-third of the lands of Hawai'i, realized the importance of setting aside public lands that could be sold to raise money for the government and also purchased by his subjects to live on. Accordingly, the day after the division with the last chief was recorded in the *Buke Māhele* (*Māhele* Book), the King commuted about two-thirds of the lands awarded to him to the government (King n.d.). Unlike the King, the chiefs and *konohiki* were required to present their claims to the Land Commission to receive their awards (LCAw.). The chiefs who participated in the *Māhele* were also required to provide to the government commutations of a portion of their lands in order to receive a Royal Patent giving them title to their remaining lands. The lands surrendered to the government by the King and chiefs became known as "Government Land," while the lands retained by Kamehameha III became known as "Crown Land," and the lands received by the chiefs became known as "*Konohiki* Land" (Chinen 1958:vii; 1961:13). All lands awarded during the *Māhele* were identified by name only, with the understanding that the ancient boundaries would prevail until the land could be surveyed. This process expedited the work of the Land Commission.

During the *Māhele*, native tenants of the lands that were divided up among the Crown, *Konohiki*, and Government could claim, and acquire title to, *kuleana* parcels that they actively lived on or farmed. The Board of Commissioners oversaw the program and administered the *kuleana* as Land Commission Awards (LCAw). Claims for *kuleana* had to be submitted during a two-year period that expired on February 14, 1848, to be considered. All of the land claimants were required to provide proof of land use and occupation, which took the form of volumes of native registry and testimony. The claims and awards were numbered, and the LCAw numbers, in conjunction with the volumes of documentation, remain in use today to identify the original owners and their use of the *kuleana* lands. The work of hearing, adjudicating, and surveying the claims required more than the two-year term, and the deadline was extended several times for the Land Commission to finish its work (Maly and Maly 2002). In the meantime, as the new owners of the lands on which the *kuleana* were located began selling parcels to foreigners, questions arose concerning the rights of the native tenants and their ability to access and collect the resources necessary for sustaining life. The "Enabling" or "*Kuleana* Act," passed by the King and Privy Council on December 21, 1849, clarified the native tenants' rights to the land and resources, and the process by which they could apply for fee-simple interest in their *kuleana*.

As a result of the *Māhele*, Waikōloa Nui (originally an *'ili* of Waimea *kalana*) was awarded to George Davis Hū'eu as an *ahupua'a* based on Kamehameha I's gift of the land to Hū'eu's father Isaac Davis. This award, LCAw 8521-B:1), excluded the coastal areas of 'Anaeho'omalū and Kalāhuipua'a, which were retained by the Crown. The Davis Hū'eu award was primarily restricted to the non-agricultural *pili* lands south of the agriculturally-productive Lālāmilo area and *mauka* of the rich coastal resource area. An undated Hawai'i Registered Map No. 574 (Figure 12) produced by John L. Kaelemakule shows the extent of the *pili* lands, which are depicted as pockets south of the current project area near the South Kohala and North Kona boundary. Kaelemakule's maps shows an area labeled as "Aina Mahi" or farm land southeast of Pu'u Hīna'i. His map also shows a trail alignment extending north of the project labeled as "Alanui o ka wa kahiko," which appear to have connected the coastal area of Puakō and 'Anaeho'omalū to Waimea.

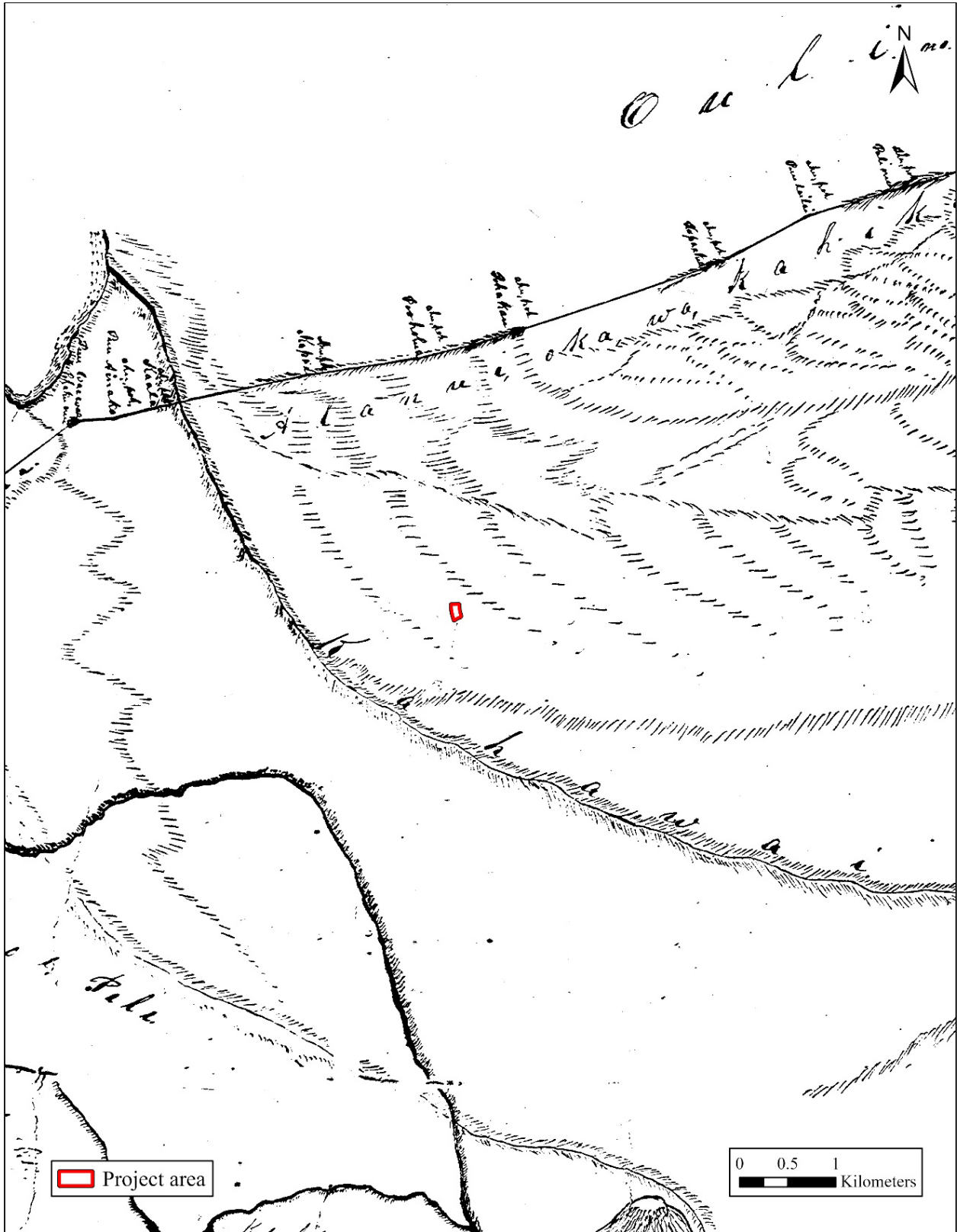


Figure 12. Undated Hawai'i Registered Map No. 574 by J. L. Kaelemakule showing *kula pili* (pili plains) near the project area.

Waikōloa and the Greater South Kohala District after the *Māhele* and the Rise of Ranching

By the mid-1860s the Waimea Grazing and Agricultural Company (WGAC), founded by Robert C. Janion and William H. Green in 1861, and joined by F. Spencer and Company soon thereafter, had acquired considerable strategic assets around Waimea in an attempt to monopolize the livestock industry in the region (Bergin 2004). From the outset, Spencer, Janion, and Green maintained an adversarial relationship with Parker Ranch, and land disputes and alleged cattle rustling were common occurrences between these two competing entities. During the early 1860s, Parker successfully thwarted Janion's men from harvesting unbranded cattle on his lands, but attacks by Frank Spencer contesting Parker's claim to more than 17,800 acres in other parts of the island were more difficult to resolve and were still ongoing when John Palmer Parker, the founder of Parker Ranch, died on August 20, 1868 (Bergin 2004). At the time, Parker Ranch controlled about 47,000 acres of land in the region. The ranch lands were divided evenly between John Parker II and his adopted son and nephew, Sam Parker Sr. (Bergin 2004).

On July 2nd, 1868, G. D. Hū'eu leased his remaining lands in Waikōloa Nui to the WGAC for twenty years (Maly and Maly 2002). With the acquisition of this land, the WGAC became the largest ranching operation on the island. Under the terms of the lease, the Hū'eu family was allowed to continue grazing their 1,000 head of cattle, 1,000 head of sheep, and 100 horses on the Waikōloa lands (Escott 2008). An 1877 *Report of the Royal Commissioners on Development of Resources* documents the effects of cattle ranching on the environment of the Kohala-Waimea region, and the resultant outmigration of the native population during this period:

The forests on the Kohala mountains are dying rapidly. The land is mostly for grazing purposes, though on the mountain potatoes of fine quality can be raised in large quantities. In sheltered places, coffee would doubtless grow, but owing to the sparseness of the population and the superior attractions to other parts of the district, this part will hardly soon be settled. The once fertile and populous plain of Waimea looked sterile and desolate when visited by the Commission - a painful contrast to Kohala loko on the other side of the mountain.

The complaint of the people is well founded. The water they use is fouled in many places by cattle, horses and other animals, and as the stream is sluggish it has no chance to free itself of impurities, and the water used by the people in their houses must be a cause of disease and death, especially to the children . . . It is little wonder that with his crops trodden out by the sheep or cattle of his stronger neighbors, his family sickened perhaps to death by the polluted waters, that the small holder should yield to despair, and abandoning his homestead seek employment in some other district, usually without making another home . . .

The plains of Pukapu [Pu'ukapu] and Waimea are subject to high winds, aggravated by the loss of the sheltering forests of former days. The soil however is very good in many places for sugar cane and other products. To develop its best resources, efforts must be made to restore the forests and husband the supply of water at their sources to furnish a supply for agricultural purposes. At present the lands are used almost exclusively for grazing purposes. Although the proprietors and lessors are probably not averse to the establishment of agricultural enterprises, it is to be feared that the denudation of the neighboring mountains and plains of the forests will render the climatic conditions unfavorable to success.

It would seem that a wise appreciation of the best interests of this district, even of the grazing interests themselves, would lead to the decrease of the immense herds which threaten not only Waimea but even Hamakua with almost irreparable disaster. It is to be feared that they will in time render a large part of the land of little value even for grazing purposes. Owing to the increasing frequency and severity of droughts and consequent failure of springs. Some thousands of cattle are said to have died this last winter from want of water, and the works erected in Waimea for the purpose of trying out cattle have been idle for months for want of water.

The commission do not propose here to discuss fully the vexed Questions of the causes of the diminution of the forests, but in view of the fact that they are diminishing and the streams and springs diminishing a corresponding rations, also that with the cattle running upon the lands as at present, any effort to restore them must be futile and any hopes of their recuperation vain, the Government, if it would wish to preserve that part of the island of Hawaii from serious injury, must take some steps for reclaiming the forests.

In this connection we would say that it is unfortunate that large tracts of Crown and Government lands have been lately leased on long terms for grazing purposes, without conditions as to their

protection from permanent injury, at rates much lower than their value even as preserves for Government purposes or public protection. The commission deem (sic) this a matter of grave importance, challenging the earnest attention of the Government, and involving the prosperity of two important districts. (in Maly and Maly 2005:58-59)

By the late-1870s, largely due to persistent drought conditions within its grazing lands, the WGAC went out of business, and its herd was purchased by Parker Ranch (Parker Ranch would also eventually acquire the lease for Waikōloa Ahupua'a) (Bergin 2004). Francis Spencer formed Pu'uoloa Sheep and Stock Company and continued to raise sheep in Waikōloa and neighboring lands. In October of 1876 Spencer sold his interest in the sheep ranch to George W. Macfarlane; included in this transaction were the Waikōloa Nui lands lease from G. D. Hū'eu (Maly and Maly 2002). George Bowser, the editor of *The Hawaiian Kingdom Statistical and Commercial Directory and Tourists Guide*, visited Waimea in 1880 and stayed at Spencer's house. Bowser writes:

. . . Waimea has always been a place of some considerable importance, and there are around it several pretty homesteads, notably the residences of Mr. F. Spencer and the Reverend Lyons. From Mr. Spencer's veranda there is a striking view of Maunakea, the summit of which was at this time of the year still in its winter robe of snow. The snow never leaves this mountain top entirely, but the position of the snow-line varies considerably with the season of the year, and also from one year to another, according to the weather which characterizes them. The country all round is chiefly suitable for grazing, and, besides innumerable wild cattle, descended, no doubt, from those which Vancouver gave to Kamehameha I, there are some 20,000 head depastured in the neighborhood, the property of Mr. Parker, who has, besides, some large droves of horses, probably numbering a thousand head in all. Mr. Spencer has turned his attention chiefly to sheep farming, and occupies a large tract of country with his flock of 15,000 sheep and 15,000 goats. Waimea itself, although of immemorial age, and once populous, is now only a scattered village, with but two stores and a boarding and lodging house and coffee saloon. (Bowser 1880:540)

Parker Ranch continued to expand its operations in the Waimea area throughout the 1870s and 1880s. The ranch eventually acquired the lease to roughly 95,000 acres in Waikōloa still held by G. D. Hū'eu that had formerly been leased to the WGAC. By the mid-1880s Sam Parker's poor business dealings had led to a rapidly degenerating financial situation for Parker Ranch, and in 1887 the entire ranching operation was entrusted to Charles R. Bishop and Co. for a fee of \$200,000 (Bergin 2004). With the move to trusteeship, new managers were brought in to oversee the day-to-day operations at the ranch.

By the early 1900s, Parker Ranch was under the direction of Alfred W. Carter, chosen as the guardian and trustee for Thelma Parker, John Parker III's daughter, upon his death at the age of nineteen. Early on in his tenure as Ranch Manager, Carter concentrated on acquiring and converting more of the ranch's lands from leasehold to fee simple. In 1903, with only a short period left on its lease, Carter acquired nine-tenths interest in the Waikōloa Nui lands from Ms. Lucy Peabody for \$112,000, securing important grazing lands for the ranch (Bergin 2004). Soon thereafter, Carter purchased the adjacent lands of 'Ōuli and the Pu'uoloa Sheep and Stock Company, encompassing over 3,700 acres and including the Ke'āmuku Sheep station in Waikōloa, which he converted to cattle ranching over the next decade. Much of these grazed lands were divided into paddocks, and transportation and water conveyance infrastructure projects were undertaken to increase the productivity of the Waikōloa rangelands. In 1906, on behalf of Thelma Parker, Carter bought out Sam Parker's half-interest in Parker Ranch for a sum of \$600,000. Other important purchases made by Carter during the first dozen or so years of his trusteeship included Humu'ula, Ka'ohe, Waipunalei, and Kahuku Ranch (Bergin 2004). During his time as ranch manager, Alfred W. Carter obtained water rights at the headwaters in the Kohala watershed, which he used to create a large high-pressure water pipe that brought water up to nearby Waiki'i (which had no consistent water source). This waterline ran from the headwaters in the Kohala Mountains down through the current day Waimea Town. From the town, the pipeline expanded into a network of pipes that continued across the Waimea-Waikōloa plains, through the study area, and on to Waiki'i. This system was quite controversial on the ranch and contributed to the on-going conflict between Carter and Sam Parker, Jr. (Bergin 2004). After Carter's initial pipeline proved successful, however, other pipes and pump stations were added to this water conveyance system.

The expansion of Parker Ranch's land- and lease holdings throughout the late 19th and early 20th centuries allowed the ranch to raise cattle and sheep in paddocks around the island. Once ready for the market, these animals would be brought back to Waimea for sorting before being driven down to Kawaihae to be shipped. During these cattle drives, the cowboys followed a well-used network of trails that connected the distant stations at Waiki'i, Kalai'ehā, and Ke'āmuku with the town of Waimea and shipping harbors on the Kohala coast (Maly and Maly 2002).

2. Background

The earliest published depiction of a trail through Waikōloa from Waimea Town was published in the *Pacific Commercial Advertiser* on February 17, 1859 (Figure 13). The route appears as a dashed line between Waimea and the saddle between Mauna Kea and Mauna Loa. The scale of the map, which was drawn to show the progress of the lava flow from the Mauna Loa eruption, does not allow for any detailed information about the route. The general route indicated in the 1859 map proceeds in a southerly direction from Waimea, across Waikōloa, and around Mauna Kea into the saddle. While the position of the trail is shown in very general terms, the basic route across Waikōloa appears to have persisted at least until the turn of the 20th century, when the Waimea-Kona highway redirected traffic across the Waikōloa plain. Three years after the 1859 map was published, surveying work began on a “Mountain Road” between Waimea and Hilo that crossed through Waikōloa. S. C. Wiltse was contracted to survey a route that would connect Waimea with Hilo *via* Waiki‘i and Kalai‘ehā (Maly and Maly 2003:118).

During the period of Wiltse’s contract for the Mountain Road, the Waimea Grazing and Agricultural Company (WGAC) had begun to expand into Waikōloa by leasing G. D. Hū‘eu’s lands for cattle grazing. The trails connecting the WGAC’s and other ranching stations appear in maps drawn by J. Perryman in J.S. Emerson’s Field Note Books from 1882 (Figure 14) (Book 251:109, reproduced in Maly and Maly 2003). As seen on Perryman’s map, the current project area is located between two trails, one to the south labeled “To Puako” which connected the coastal area of Puakō to Ke‘āmuku and one to the north which connected Puakō to Waimea.

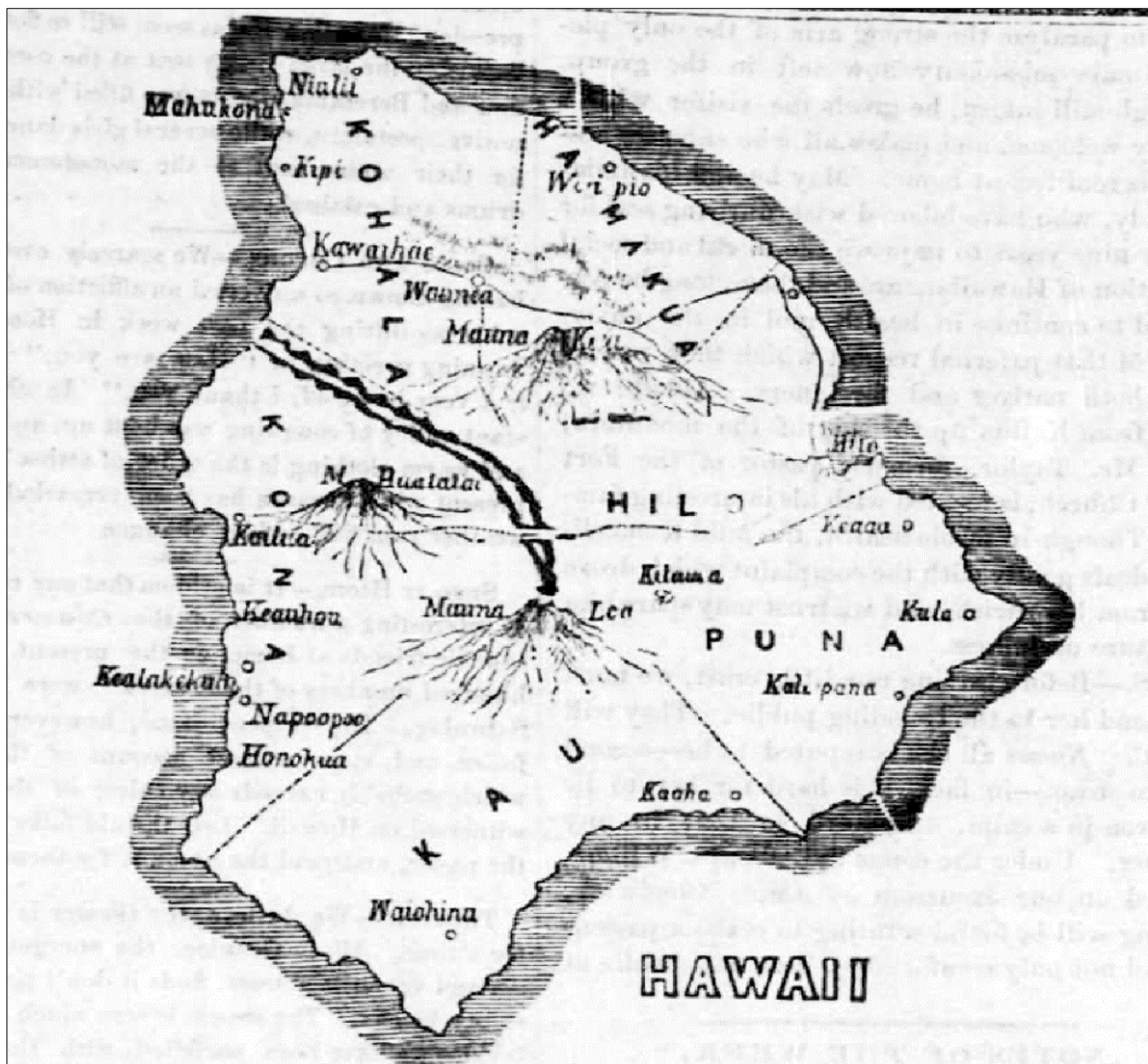


Figure 13. Map of Hawai‘i Island published in the *Pacific Commercial Advertiser* on February 17, 1859, showing a trail across Waikōloa connecting Waimea and Hilo.

Waikōloa Maneuver Area

The use of the project area and vicinity for cattle grazing was briefly interrupted during World War II. Several months before the bombing of Pearl Harbor in 1941, the U.S. Army established an infantry headquarters at Parker Ranch in the Pu'ukapu area of Waimea (Bergin 2006). This was in keeping with a spirit of cooperation between the military and the ranch that began in 1908 with the ranch participating in the U.S. cavalry's remount program. In December of 1943, the Second Marine Division arrived on Hawai'i Island for rest and relaxation after fighting in the Gilbert Islands (Chapman 2014). They were dispersed into three camps: one at Hāpuna Bay, one at Pōhakuloa, and one in Waimea, which became known as Camp Tarawa. The U.S. War Department leased approximately 123,000 acres of land in the Waimea and Waikōloa area for use as a training area. With this lease, the project area became part of the U.S. Navy's 91,000-acre Waikōloa Maneuver Area. This training area extended *mauka* from the coast to the Pohakuloa Training Area, and from the Waimea-Kawaihae Road to south of the Waikoloa Road.

The 2nd Marine Division was the first to train at Waikōloa, spending five months there in preparation for the invasion of Saipan and Tinian. The 5th Marine Division replaced the 2nd Division in August 1944 and used the Waikōloa Maneuver Area to prepare for the assault on Iwo Jima. While training, the marines resided at a military camp just outside of Waimea Town that came to be called Camp Tarawa. As the largest U.S. Marine training facility in the Pacific, Camp Tarawa covering an area of approximately 467 acres, and between 1943 and 1945 as many as 50,000 men passed through the camp on their way to the Pacific Theater (Escott 2008).

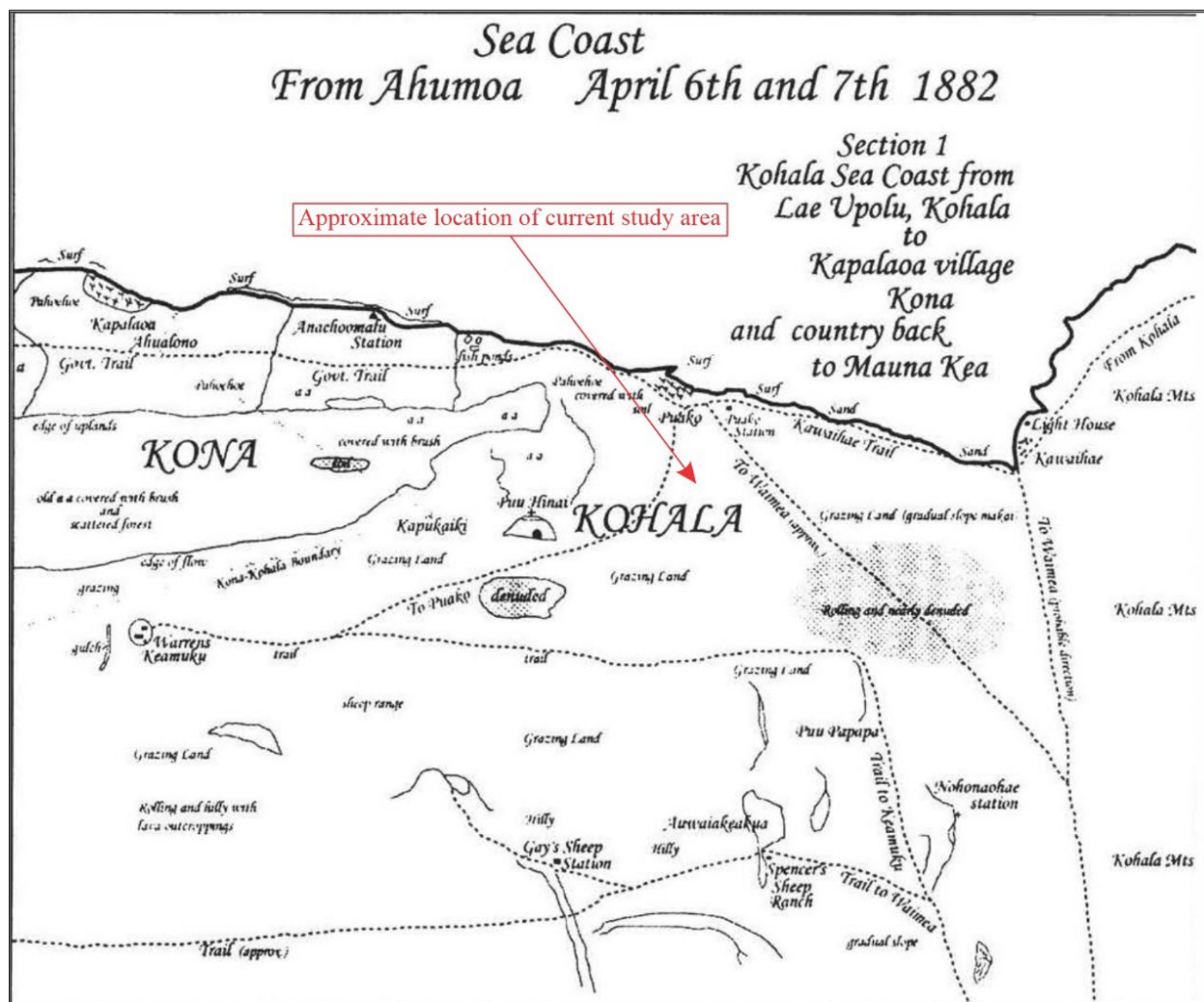


Figure 14. A portion of a sketch map of the seacoast viewed from Ahumoa (Emerson's Sketch Book No. 259:109)

The last of the Marines of the 5th Division departed Camp Tarawa in June of 1946, and the Waikōloa Maneuver Area was returned to Parker Ranch in September of 1946 (Haun et al. 2010). Clean-up of unexploded ordnance (UXO) within the Waikōloa Maneuver Area is still ongoing.

Resort Development and the Creation of the Waikōloa Village Community

Substantial changes of the Parker Ranch lands began to occur in the mid-twentieth century with the transfer to its sixth-generation heir, Richard Palmer Smart. Seeking to diversify the ranch's business interests, Smart initiated a \$300,000,000 resort and residential development on 10,000 acres of land in 'Anaeho'omalū (Figure 15) and along the South Kohala coastline *makai* of the project area, which the press referred to as the "Gold Coast" (Honolulu Star-Bulletin 1968; The Honolulu Advertiser 1959). Although the barren land, capable of supporting "only brush, scrubby trees, cactus and rocks," reportedly made it "difficult to envision. . . as a future resort or city," Smart's plans drew the interest of several resort developers (Honolulu Star-Bulletin 1969). Smart initially intended to offer 'Anaeho'omalū's 31,000-acres for lease, but in 1963 decided to sell the *ahupua'a* for roughly \$11 million.

In May of 1968, the Boise Cascade Home and Land Corporation purchased 25,500 acres of land above 'Anaeho'omalū Bay (excluding select portions of the coastline) with visions of creating an amenity-rich resort dreamscape. Although the development of the resort was aimed at attracting tourists to the famed coast, the ultimate success of the resort was at least partially reliant on the creation of Waikōloa Village, a residential subdivision *mauka* of 'Anaeho'omalū Bay, adjacent to the southern border of the project area. Plans for this new community included construction of a vast water system to furnish future residents and businesses, as well as a golf course, a residential subdivision, equestrian center, condominiums, and a shopping center. The village was connected to Māmalahoa Highway by the newly constructed Waikoloa Road (Figure 16). On June 27, 1970, Boise Cascade held their first open house to welcome the public and, as their promotional material boasted, to "celebrate the advances made by Boise Cascade and Morrison-Knudsen in reclaiming the Ahupua'a of Waikoloa for Man" (Boise Cascade 1970:1). By August of 1972, Waikōloa Village's first permanent resident had moved in (Boise Cascade 1972), and on July 7th, 1974, the extension of Waikoloa Road leading *makai* to 'Anaeho'omalū was formally dedicated (Waikoloa Office of Public Affairs 1974). The opening of this road drastically reduced travel time from the newly created Waikōloa Village to the resorts and other important centers along the Kona-Kohala coastline. By the mid to late-1970s, Waikōloa Village had been mostly built out, and within the next decade, the coastal resorts became operational. With the opening of the coastal resorts in the mid-1980s, Waikōloa Village continued to expand to meet the demands of a growing visitor industry and the influx of new residents.

While most of the early development of Waikōloa Village was centered in the area south of the project area, in more recent years, development has since expanded to the area south and north of the residential community. The increased development of Waikōloa Village has also led to the preparation of a number of archaeological and cultural studies, which have been summarized in the following section.



Figure 15. 'Anaeho'omalū Bay prior to resort development ca. 1970 (Boise Cascade 1970:3).

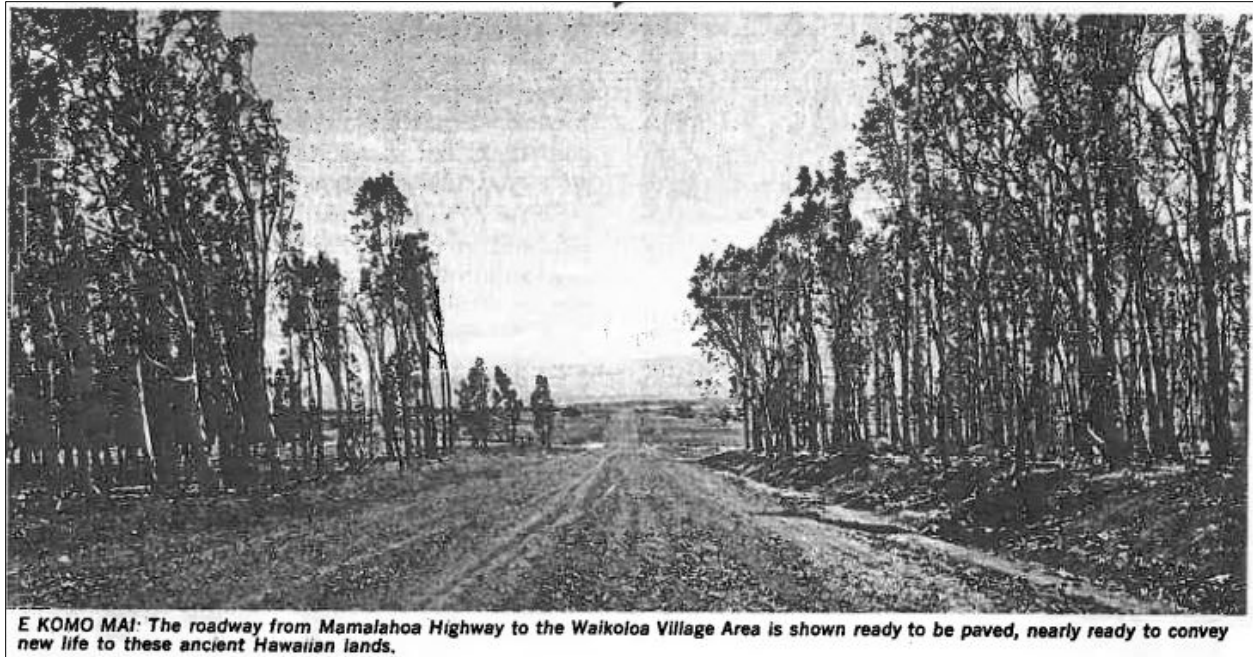


Figure 16. Unpaved Waikōloa Road in the 1970s (Boise Cascade 1970:1).

PREVIOUS STUDIES

Many of the early archaeological and cultural studies conducted in Waikōloa have concentrated on the coastal areas in the vicinity of the large resort developments *makai* of Queen Ka‘ahumanu Highway, with the *‘ili* of ‘Anaeho‘omalu being one of the most extensively investigated areas (Burgett and Rosendahl 1990; Ching 1971; Corbin 2011; Cordy 1987; Haun and Henry 2014, 2017; Jensen 1989a, 1989b, 1989c, 1989d, 1989e, 1989f, 1990a, 1990b, 1990c, 1991a, 1991b, 1994; Jensen and Rosendahl 1989; Jensen 1990d; Kirch 1979; Reinecke 1930; Rosendahl 1972, 2000; Tam Sing and Barna 2019; Tam Sing and Brandt 2019; Walker and Rosendahl 1986; Yent 1991; Yent and Griffin 1978). Collectively, these investigations have documented a wide array of archaeological sites that represent permanent habitation, ritual activity, marine resource exploitation, and fishpond management within the immediate coastal zone (between the shoreline and about 100 meters inland), along with temporary habitation occurring along trails within the coastal zone.

Multiple archaeological studies have been conducted in the vicinity of the current project area, including two that covered the current project area (Bevacqua 1972; Bonk 1988) and one specifically for the Waikōloa Library Project (Clark 2023-in Prep). Many of these studies were for small well parcels and access corridors (Clark and Rechtman 2005, 2011; Rechtman 2003, 2005, 2006, 2008a, 2008b, 2008c; Rosendahl 1992a, 1992b). Larger studies conducted near present-day Waikōloa Village (Bevacqua 1972; Clark and Kirch 1983; Clark et al. 2014; Clark et al. 2016; Kennedy 1987; Moore et al. 2002; Rieth and Morrison 2010; Schilz and Shun 1991; Sinoto and Dashiell 2004; Spear and Chaffee 1994) have identified a relatively sparse distribution of sites pre-dating the military training activities that occurred during World War II. The most common feature types recorded *mauka* of the Queen Ka‘ahumanu Highway have been C-shaped shelters and cairns, along with Historic military and ranching features. The findings of the previous studies agree that the dry, intermediate inland areas of Waikōloa Ahupua‘a were not extensively utilized during Precontact times but were an area where small scale resource procurement was conducted on a limited basis. Previous archaeological studies conducted in this intermediate zone and near/within the current project area are discussed in more detail below (Figure 17; Table 1).

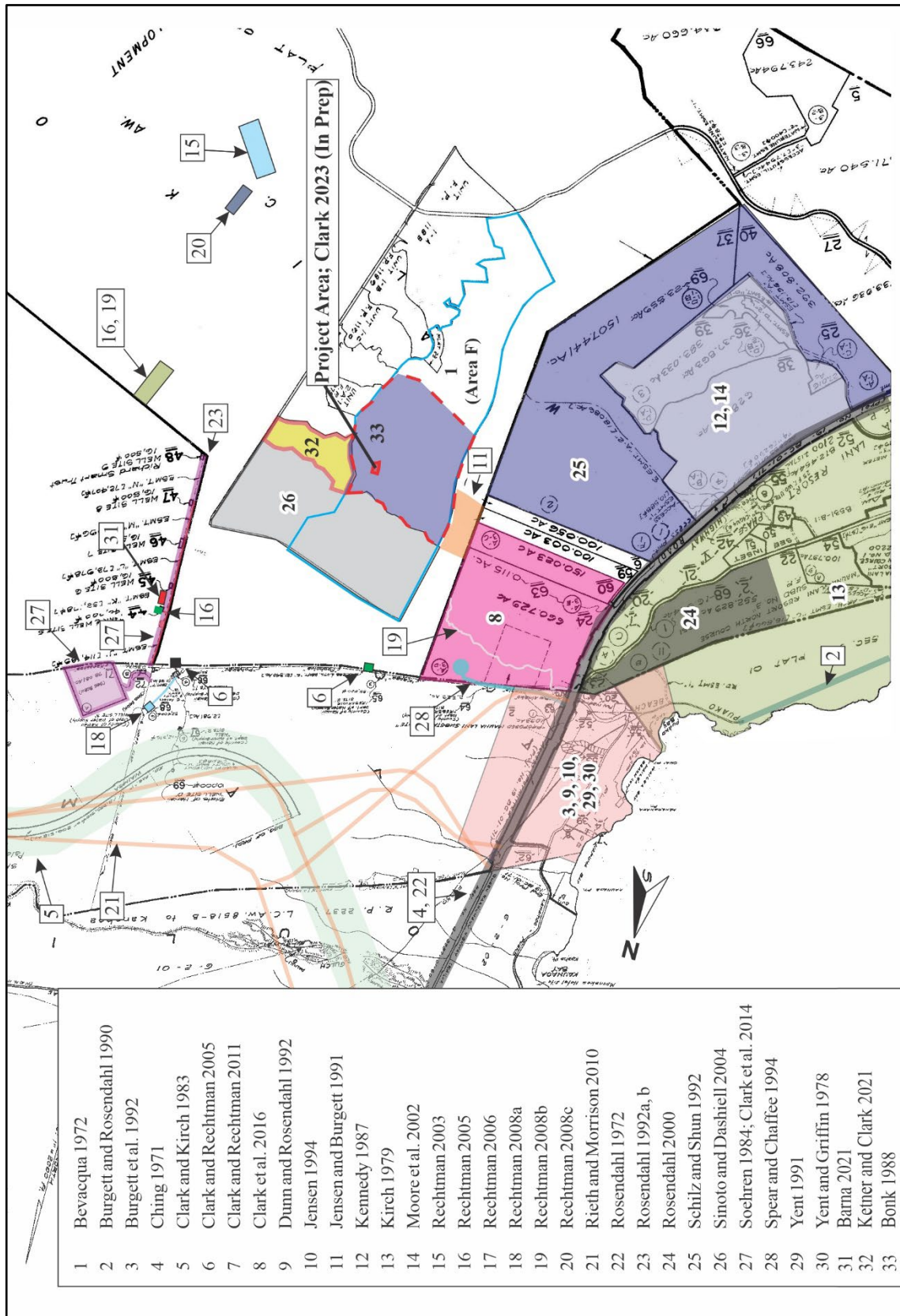


Figure 17. Previous archaeological studies conducted in the vicinity of the current project area.

Table 1. Previous archaeological studies conducted mauka of Queen Ka'ahumanu Highway.

<i>Year</i>	<i>Author(s)</i>	<i>Type of Study</i>	<i>Relevant Findings</i>
1972	Bevacqua	Reconnaissance	Five sites in Area F
1983	Clark and Kirch	Survey	World War II military training features
1984	Soehren	Survey	World War II debris, rock alignments
1987	Kennedy	Reconnaissance	1 rock shelter
1988	Bonk	Survey	No findings
1991	Jensen and Burgett	Inventory Survey	5 sites (Alignments, terraces, modern hunting blinds)
1992a, b	Rosendahl	Inventory Survey	Cattle wall (Site 9012)
1992	Schilz and Shun	Inventory Survey	Lava tube burial, modern hunting blinds
1994	Spear and Chaffee	Inventory Survey	2 shell middens.
2002	Moore et al.	Inventory Survey	10 sites (C-shapes, <i>ahu</i>)
2003	Rechtman	Inventory Survey	No findings
2004	Sinoto and Dashiell	Inventory Survey Addendum	No findings
2005	Clark and Rechtman	Inventory Survey	C-shaped enclosure and small rock pile
2005	Rechtman	Inventory Survey	No findings
2006	Rechtman	Field Inspection	No findings
2006	Hammatt	Cultural Impact Assessment	No impact on cultural practices resources
2007	Wong-Smith	Cultural Impact Assessment	Identified a burial in a lava tube. Did not identify any ongoing cultural practices. Concluded that impacts to cultural practices and resources would be minimal.
2008a	Rechtman	Field Inspection	No findings
2008b	Rechtman	Field Inspection	No findings
2008c	Rechtman	Field Inspection	No findings
2010	Rieth and Morrison	Inventory Survey	8 mounds, stone wall (Site 9012)
2011	Clark and Rechtman	Inventory Survey	Flume, 2 rock piles, dike, hunting blind, C-shape
2014	Clark et al.	Inventory Survey	Rock wall, World War II encampment/possible Precontact component, cairn complex
2016	Clark et al.	Inventory Survey	21 short-term/recurrent habitation complexes, trail segment, hunting blinds
2018	Vernon et al.	Cultural Impact Assessment	No impact on cultural practices resources
2020	Ishihara and Brandt	Cultural Impact Assessment	No impacts to cultural practices or resources.
2020	Brandt	Cultural Impact Assessment	No impacts to cultural practices or resources.
2021	Barna	Inventory Survey	No findings
2023	Clark	Field Inspection	No findings

The B. P. Bishop Museum conducted an archaeological study (Bevacqua 1972) of portions of Waikōloa Ahupua'a to determine the nature and distributions of archaeological sites within areas that were slated for development at that time. Seven large areas (Areas A-G) dispersed throughout the *ahupua'a* were examined. The current project area is located within Survey Area F (see Figure 17). Within Area F, Bevacqua (1972) identified five sites including a roughly circular enclosure, C-shaped shelters, walls, cairns, and a rectangular enclosure. None of the identified sites in Area F are within the current project area.

The Mudlane-Waimea-Kawaihae Road Corridor, north of the current project area, was the subject of an archaeological survey conducted by the Bishop Museum (Barrera and Kelly 1974), with subsequent feature excavations and historic studies (Clark and Kirch 1983) (see Figure 17). As a result of that study, 4,561 archaeological features were identified, most of which were situated along the coastal margin of Kawaihae and in the uplands of

Lālāmilo. Archaeological investigations in Section 2 of the proposed road, a roughly 600 meter wide corridor extending from an elevation of 145 meters above sea level in ‘Ōuli Ahupua‘a to 620 meters above sea level in Lālāmilo Ahupua‘a revealed the presence of sixty-four sites containing 381 features (Clark and Kirch 1983:138-179). Three main categories of features were identified at these sites including cairns, shelters, and alignments. Clark and Kirch (1983) indicate that the majority of structures in Section 2 appeared to have been built as defensive positions and wind shelters during World War II. Only a few sites were located in the middle zone of Section 2 at elevations proximate to the current project area; subsurface testing of features within this zone revealed that all were likely of modern or military origins. Survey of areas outside of the road corridor indicated that Hawaiian occupation of the middle zone may have been limited to the banks of Waikōloa Stream and along Wai‘ula‘ula Gulch.

Soehren (1984) conducted an archaeological reconnaissance survey of approximately 80 acres north of the current project area for the construction of the first Lālāmilo Wind Farm (see Figure 17). Soehren (1984) identified evidence of World War II era military training, and possibly nineteenth century ranching use, in the form of surface debris and a stacked stone alignment.

Archaeological Consultants of Hawai‘i conducted an archaeological reconnaissance survey (Kennedy 1987) of roughly 1,000 acres southwest of the current project areas within Waikōloa Ahupua‘a extending inland from Queen Ka‘ahumanu Highway (see Figure 17). Only one site consisting of a shallow rock shelter, an *ahu*, and a low wall, was identified. Kennedy (1987) noted the presence of a single ‘*opihī* shell at the site and modern debris, but given the reconnaissance nature of the survey, did not investigate further. Moore et al. (2002) later conducted an archaeological inventory survey of this same study area (see Figure 17), identifying ten archaeological sites containing a total of thirteen features (SIHP Sites 22509-22518). The recorded sites included the rock shelter previously recorded by Kennedy (1987), seven C-shaped walls with associated *ahu*, four independent *ahu* (three of which were grouped together), and a stone covered hearth. With the exception of the individual *ahu*, which were interpreted as demarcating Historic pasturelands, the recorded sites were thought to have been “utilized for temporary habitation during the pre-Contact Period with the utilization of some sites potentially extending into the early post-Contact Period” (Moore et al. 2002:i). A radiocarbon date obtained from charcoal in the rock shelter returned a date of A.D. 1480, interpreted to represent the initial utilization of the site.

In 1988, William Bonk conducted an archaeological reconnaissance survey of roughly 580 acres in support of the EIS for the Waikōloa Affordable Housing Master Plan (Bonk 1988). The current project area lies within the northeast corner of Bonk’s survey area (see Figure 17). Bonk (1988:9) “found nothing of prehistoric or historic interest within the area investigated,” and recommended that “no further archaeological work be required” prior to development of the area.

In 1991, PHRI conducted an AIS (Jensen and Burgett 1991) of an approximately 80-acre portion of TMK: (3) 6-8-002:019 located in Waikōloa Ahupua‘a, west of the current project area (see Figure 17). Five archaeological sites (State Inventory of Historic Places [SIHP] Sites 15066-15070) containing twenty-two features were identified. These included three boulder alignments (possibly check dams) that spanned Kamakoa Gulch, terraces on the northwestern bank of Kamakoa Gulch, a wall, and seventeen hunting blinds. Jensen and Burgett (1991) interpret the boulder alignments and terraces within the Kamakoa Gulch drainage channel (Sites 15066, 15067, and 15068) as potential Precontact Period features, suggesting that intermittent water flow within the drainage may have been channeled and stored to provide water for agricultural pursuits along the gulch edges. A low wall (Site 15069), which extended along a meandering course across a flat area between two knolls south of Kamakoa Gulch, was interpreted as having a possible agricultural function. Seventeen hunting blinds (Site 15070) consisted of crudely constructed stacked stone structures located within a 150 by 50-meter area to the south of Site 15069. Expended shotgun shells (pre-dating 1965) were found at all the blinds. The hunting blinds were interpreted as modern features by Jensen and Burgett (1991), who did not consider Site 15070 a historic property requiring further evaluation.

Rosendahl (1992b) conducted an AIS of a roughly 2,800-meter-long by 40-meter-wide corridor across a portion of TMK: (3) 6-8-001:001 northeast of the current project area (see Figure 17) for proposed Mauna Lani well sites. Extensive ground disturbance was noted throughout the corridor. Rosendahl (1992b:5) noted the presence of a cattle wall along with “bulldozer berms, and recent trash.” Don Hibbard of DLNR-SHPD cited an earlier correspondence that indicated that the proposed wells were “adjacent to a long historic boundary wall (Site 9012) that divides Waikōloa and has been determined to be significant under criterion ‘a’ or for its association with events important to broad patterns in Hawaii’s history”, and did not concur with Rosendahl’s findings (Hibbard 1991). In response to the letter, Rosendahl (1992a) conducted additional historical research to document the history of the wall. Following this, construction proceeded on two of the proposed wells (Parker wells No. 1 and 2) and a paved roadway along the *mauka* edge of the Site 9012 wall.

2. Background

Schilz and Shun (1992) conducted an archaeological survey and evaluation south/southwest of the current project area consisting of approximately 3,000 acres surrounding the area earlier surveyed by Kennedy (1987) and later by Moore et al. (2002) (see Figure 17). Schilz and Shun (1992) identified one burial site consisting of a lava tube containing human skeletal remains (SIHP Site 15033), and twelve additional features in the survey area (cairns, wall shelters, rock mounds, and C-shapes) that they interpreted as modern. The four C-shapes were interpreted to be hunters' blinds.

In 1994, Scientific Consultant Services, Inc. (SCS) conducted an AIS (Spear and Chaffee 1994) northwest of the current project area of a transmission route for the Kohala Water System Project in the Districts of North and South Kohala (see Figure 17). The archaeological survey area extended south, following Akoni Pule Highway and then Queen Ka'ahumanu Highway, from Makapala Ahupua'a in North Kohala to Lālāmilo Ahupua'a. Along the access route to the proposed reservoir location (the reservoir was never built), SCS identified two archaeological sites (SIHP Sites 19777 and 19778), both surface scatters of shell midden, located within Waikōloa Ahupua'a. The shell scatters were interpreted as rest stops (Precontact temporary habitation areas) utilized by travelers along a trail route that once followed the Lālāmilo/Waikōloa boundary between the coastal settlement zone and the inland agricultural zone. No trail route or surface architecture was identified near either site. A shovel probe excavated at Site 19777 revealed the absence of any subsurface cultural deposit. The marine shell fragments from the surface of both sites were collected by SCS. Sites 19777 and 19778 were deemed significant (under Criterion D) for information they contained, but no further work was recommended. Spear and Chaffee (1994) argued that sufficient data was gathered during the inventory survey to make the sites no longer significant; DLNR-SHPD concurred with this recommendation.

Rechtman (2003) conducted an AIS for a proposed access roadway and waterline corridor at approximately 1,200 feet to 1,320 feet (366–402 meters) above sea level, southeast of the current project area (see Figure 17). No archaeological resources were observed within that study area.

Sinoto and Dashiell (2004) conducted an AIS of TMK: (3) 6-8-02:022, a portion of which includes the current project area. Their total surveyed area encompassed roughly 860 acres within the Waikōloa Village development area (see Figure 17), a portion of which was previously surveyed as part of Bevacqua's (1972) Area F. Sinoto and Dashiell (2004) reported no archaeological findings.

In 2005, Rechtman Consulting, LLC conducted an AIS (Clark and Rechtman 2005) of two proposed water tank locations near the Lālāmilo-Waikōloa boundary, north of the current project area (see Figure 17). One archaeological site (Site 24396) consisting of a C-shaped enclosure (Feature A) and small rock pile (Feature B), were identified. A test unit was excavated within Feature A which yielded no cultural material. It was determined that this feature may have functioned as a temporary habitation shelter during Precontact times. Nearby Feature B was interpreted as a cairn that may have been associated with Feature A, but also potentially may have served as an *ahupua'a* boundary or trail marker. Site 24396 was evaluated as significant under Criterion d, and no further work was the accepted treatment for the site.

That same year, Rechtman (2005) inspected an area north of the current project area within the Rosendahl (1992b) survey corridor for the proposed development of Parker well No. 3 and the stub road leading to it (see Figure 17). No archaeological sites, features, or deposits were observed.

International Archaeological Research Institute, Inc. (IARII) (Rasmussen 2005) completed an AIS of a 4.6-acre parcel located on TMK (3) 6-8-003:028 located to the south of the current project area, adjacent to Pua Melia Street. While modern trash and evidence of bulldozing was observed near the parcel boundaries, no archaeological sites or features were found. Rasmussen (2005:3) also noted that "although the interior [of the parcel] does not appear to have been bulldozed, it appears heavily eroded, possibly due to cattle grazing." Thirteen years later, Pacific Consulting Services, Inc. (Vernon et al. 2018) conducted a Cultural Impact Assessment (CIA) and reconnaissance for the same parcel. Vernon et al. (2018) prepared culture-historical background information and initiated consultation with six individuals and received a single response from Ms. Kaena Peterson, President of the South Kohala Hawaiian Civic Club, who shared that there were no ongoing cultural practices occurring in the area. In summary, Vernon et al. (2018) concluded that the proposed Kaiāulu O Waikōloa Housing Development Project would have no effect on any historic properties on cultural practices.

In 2006, Cultural Surveys Hawai'i conducted a Cultural Impact Assessment (Hammatt 2006) for a 702-acre property (TMK: (3) 6-8-002:016). A culture-historical background was prepared, and native Hawaiian organizations, agencies, and community members were contacted in order to identify individuals with cultural expertise and/or knowledge of the project area and the general vicinity. Three individuals, Mr. Eric Arakaki, Ms. Ruby MacDonald, and Ms. Hannah Springer responded to Cultural Surveys Hawai'i's request for comment. Although Hammatt (2006) did not identify any ongoing traditional cultural practices within the study area, in her telephone reply, Ms. Hannah Springer shared the following concerns:

My concern is that we need to understand that the whole landscape is a cultural landscape which is an impact. Just because we do not find anything does not mean there is no cultural impact to a landscape. It is dependent on the cultural practitioners of those lands in order to see the depth of impact. It requires the people of the land. We, people who live and know lava lands look at the land with a different eye. We have a deeper familiarity with body form of the lava lands. It does not diminish the impact. It is my hope that there will be attention made to the cultural landscape in its entirety. The Hill Puu Hina'i I use as an example of degradation to our lands. To us it is about a sense of place and a sense of space, thus allowing the new people coming in to the breath in the spaciousness of the land. (Hammatt 2006:20-21)

In 2007, Helen Wong Smith prepared a CIA for the rezoning application for approximately 1,060 acres in the State Land Use Urban District for TMKs: (3) 6-8-001 :025, 036, 037, 038, 039, and 040 for the Bridge 'Aina Lea project (Wong-Smith 2007). The assessment was based on a review of previous archaeological reports, historical records, Hawaiian language sources translated into English, and transcripts of a long series of previously conducted interviews with native Hawaiians who resided within the area. As a result of her research, no cultural resources with the exception of a single burial found within a natural lava cave were documented. She also did not identify any ongoing cultural practices be associated with the study area. It was determined that the Bridge 'Aina Lea would have minimal impact on Hawaiian cultural resources, beliefs and practices.

Rechtman Consulting, LLC conducted three other archaeological studies at proposed well sites near the current project area (Rechtman 2008a, 2008b, 2008c). These studies reported no findings within their respective project areas. At Lālāmilo Well E (north of the current project area in Lālāmilo Ahupua'a), Rechtman (2008a:3) noted:

. . . three small enclosures were noted outside the corridor near the existing Well D. Based on the presence of broken glass, bullets and bullet shell casings, the enclosures appear to be U.S. Military WW II era training related features. All three features are located along the upper edge of a south facing slope, spaced four to fifteen meters west (outside) of the survey area. They were likely constructed by U.S. marines in the 1940s as defensive positions during training exercises.

Rieth and Morrison (2010) conducted an AIS of a roughly 1,548-acre area of potential road corridors north of the current project area extending from Māmalahoa Highway near Waimea Town to Highways 19 and 270, traversing Waikōloa, Lālāmilo, 'Ōuli, and Kawaihae *ahupua'a* (see Figure 17). In the general vicinity (at the same elevation) of the current project area they identified nine sites, eight of which were described as single mounds of undetermined age and function and the ninth was the prominent stone wall (Site 9012) that extends north/south through the greater area.

Clark and Rechtman (2011) investigated a *mauka-makai* oriented corridor northwest of the current project area located within the Spear and Chaffee (1994) project area. Five archaeological sites (SIHP 50-10-11-28682 to 28686) were identified: a portion of the old Puakō Sugar Plantation's wooden flume from Waikōloa Stream, two rock piles that seemed to mark the former route of a World War II-era communications line, a Historic dike constructed for flood-control purposes, a circular enclosure containing a rock pile that may have been a Historic hunting blind or skeet shooting area, and a C-shaped enclosure.

ASM Affiliates conducted an AIS (Clark et al. 2014) of approximately 87.5 acres for the Lālāmilo Wind Farm Repowering Project. Three archaeological sites, a rock wall (SIHP 50-10-11-9012), a World War II military encampment with a possible earlier Precontact component (SIHP 50-10-11-30109), and a complex of cairns marking the boundary between Lālāmilo and Waikōloa *ahupua'a* (SIHP 50-10-11-30110), were recorded within their project area.

To the north of the Schilz and Shun (1992) project area, and northwest of the current project area, ASM Affiliates conducted an AIS (Clark et al. 2016) of roughly 810 acres extending inland from Queen Ka'ahumanu Highway along the Lālāmilo boundary (see Figure 17). Archaeological surveys of two corridors across this property had previously been conducted by (Spear and Chaffee 1994) and Clark and Rechtman (2011). All of the previously recorded sites in these two project areas, along with a portion of Site 21976, a Historic cart path, previously recorded by Rosendahl (2000), were incorporated into the findings of the Clark et al. (2016) study. Sites newly identified by Clark et al. (2016) (SIHP 50-10-11-30071 to 30083) included two C-shaped enclosures interpreted as Precontact Period shelters, three Precontact Period habitation complexes, two modified outcrops interpreted as Precontact Period shelters, a rock pile and modified outcrop that appear to have functioned as a Historic survey station, a short wall interpreted as a Precontact Period shelter, a surface scatter of marine shell, a rock pile with an associated trail segment that may have been a rest area along an old trail route, a complex of features used for Historic Period habitation and agricultural purposes, and a complex of eighty-nine twentieth century hunting blinds built by bird hunters. The Precontact Period

sites, mostly indicative of short-term or recurrent habitation, were concentrated in the northern portion of their project area near the Lālāmilo boundary.

During an earlier iteration of the proposed library project, in 2020, ASM conducted a CIA for TMK: (3) 6-8-003:016 located along the north side of Pua Melia Street and south of the project area. Culture-historical background information was prepared and one community member, Jen Lawson of the Waikōloa Dry Forest Initiative responded to ASM’s request for consultation. Ms. Lawson noted that the area known today as Waikōloa Village was not inhabited and was most likely used as a place of travel and accessed periodically for certain dryland resources (i.e. *wiliwili*, *pili*, etc.). One of the concerns raised by Ms. Lawson was the potential introduction of invasive species during construction and wildfires. Concerning the proposed library project, Mr. Lawson offered the following statement:

Ms. Lawson sees the proposed project as an opportunity to engage the community and to teach the community and visitors about Waikōloa. “Like right now it’s just a parking lot, but it wasn’t always that way. It would be nice to see especially a public place like the library to do some sort of concerted effort to understand Waikōloa better than people do now.” She continued, “it would be great to have the opening of the library or something like that be a little more relevant to the history of the place instead of just occupying the land and just being a good steward of the area.” (Ishihara and Brandt 2020:52)

ASM Affiliates conducted an AIS (Barna 2021) of approximately 10 acres northeast of the current project area for a 10MG above-ground water reservoir within Tax Map Key (TMK): (3) 6-8-001:001 (see Figure 17). No archaeological resources were observed within their study area. A CIA (Brandt 2020) was also conducted for this same parcel, and likewise no impacts to cultural practices or resources were anticipated.

A field inspection of the current subject parcel was completed in 2023 for the Waikōloa Library Project (Clark 2023-In Prep). No archaeological resources were observed during the field inspection.

3. CONSULTATION

Gathering input from community members with genealogical ties and long-standing residency or relationships to the study area is vital to the process of assessing potential cultural impacts to resources, practices, and beliefs. It is precisely these individuals that ascribe meaning and value to traditional resources and practices. Community members often possess traditional knowledge and in-depth understanding that are unavailable elsewhere in the historical or cultural record of a place. As stated in the OEQC Guidelines for Assessing Cultural Impacts, the goal of the oral interview process is to identify potential cultural resources, practices, and beliefs associated with the affected project area. It is the present authors’ further contention that the oral interviews should also be used to augment the process of assessing the significance of any identified traditional cultural properties. Thus, it is the researcher’s responsibility to use the gathered information to identify and describe potential cultural impacts and propose appropriate mitigation as necessary.

In an effort to identify individuals knowledgeable about traditional cultural practices and/or uses associated with the current subject property, a public notice was submitted to the Office of Hawaiian Affairs (OHA) for publication in their newspaper, *Ka Wai Ola*. The notice was submitted via email on July 5th 2023, and was published in the August 2023 issue. As of the date of the current report, no responses have been received from the public notice.

In addition to the publication in *Ka Wai Ola*, three individuals/organizations were contacted via email: Lauren Muneoka and Shelley Muneoka of KAHEA, OHA, and Waikōloa Dry Forest Initiative, and three individuals/organizations were contacted via U.S. postal mail: Scott Head of The Waikōloa Beach Association – Hō’ala Loko I’a, Ski Kwiatowski of The Royal Order of Kamehameha – Moku o Kohala, and the Waikōloa Village Outdoor Circle. None of the six individuals/organizations that were contacted for this study responded.

Table 2. Person/Organization Contacted for Consultation.

<i>Name</i>	<i>Initial Contact Date</i>	<i>Comments</i>
Head, Scott	7/5/2023	No response.
KAHEA	7/5/2023	No response.
Kwiatkowski, Ski	7/5/2023	No response.
Office of Hawaiian Affairs	7/5/2023	No response.
Waikōloa Dry Forest Initiative	7/5/2023	No response.
Waikōloa Village Outdoor Circle	7/5/2023	No response.

4. IDENTIFICATION AND MITIGATION OF POTENTIAL CULTURAL IMPACTS

The OEQC guidelines identify several possible types of cultural practices and beliefs that are subject to assessment. These include subsistence, commercial, residential, agricultural, access-related, recreational, and religious and spiritual customs. The guidelines also identify the types of potential cultural resources, associated with cultural practices and beliefs that are subject to assessment. Essentially these are natural features of the landscape and historic sites, including traditional cultural properties. In the Hawai‘i Revised Statutes—Chapter 6E a definition of traditional cultural property is provided.

“Traditional cultural property” means any historic property associated with the traditional practices and beliefs of an ethnic community or members of that community for more than fifty years. These traditions shall be founded in an ethnic community’s history and contribute to maintaining the ethnic community’s cultural identity. Traditional associations are those demonstrating a continuity of practice or belief until present or those documented in historical source materials, or both.

The origin of the concept of traditional cultural property is found in National Register Bulletin 38 published by the U.S. Department of Interior-National Park Service. “Traditional” as it is used, implies a time depth of at least 50 years, and a generalized mode of transmission of information from one generation to the next, either orally or by act. “Cultural” refers to the beliefs, practices, lifeways, and social institutions of a given community. The use of the term “Property” defines this category of resource as an identifiable place. Traditional cultural properties are not intangible, they must have some kind of boundary; and are subject to the same kind of evaluation as any other historic resource, with one very important exception. By definition, the significance of traditional cultural properties should be determined by the community that values them.

It is however with the definition of “Property” wherein there lies an inherent contradiction, and corresponding difficulty in the process of identification and evaluation of potential Hawaiian traditional cultural properties, because it is precisely the concept of boundaries that runs counter to the traditional Hawaiian belief system. The sacredness of a particular landscape feature is often cosmologically tied to the rest of the landscape as well as to other features on it. To limit a property to a specifically defined area may actually partition it from what makes it significant in the first place. However offensive the concept of boundaries may be, it is nonetheless the regulatory benchmark for defining and assessing traditional cultural properties. As the OEQC guidelines do not contain criteria for assessing the significance for traditional cultural properties, this study will adopt the state criteria for evaluating the significance of historic properties, of which traditional cultural properties are a subset. To be significant the potential historic property or traditional cultural property must possess integrity of location, design, setting, materials, workmanship, feeling, and association and meet one or more of the following criteria:

- a Be associated with events that have made an important contribution to the broad patterns of our history;
- b Be associated with the lives of persons important in our past;
- c Embody the distinctive characteristics of a type, period, or method of construction; represent the work of a master; or possess high artistic value;
- d Have yielded, or is likely to yield, information important for research on prehistory or history;
- e Have an important value to the native Hawaiian people or to another ethnic group of the state due to associations with cultural practices once carried out, or still carried out, at the property or due to associations with traditional beliefs, events or oral accounts—these associations being important to the group’s history and cultural identity.

While it is the practice of the DLNR-SHPD to consider most historic properties significant under Criterion d at a minimum, it is clear that traditional cultural properties by definition would also be significant under Criterion e. A further analytical framework for addressing the preservation and protection of customary and traditional native practices specific to Hawaiian communities resulted from the *Ka Pa‘akai O Ka ‘Āina v Land Use Commission* court case. The court decision established a three-part process relative to evaluating such potential impacts: first, to identify whether any valued cultural, historical, or natural resources are present; and identify the extent to which any traditional and customary native Hawaiian rights are exercised; second, to identify the extent to which those resources and rights will be affected or impaired; and third, specify any mitigative actions to be taken to reasonably protect native Hawaiian rights if they are found to exist.

Summary of Cultural Historical Background Information

An analysis of the culture-historical background reveals that Waikōloa, though referred to today as an *ahupua'a*, was traditionally considered an *'ili* of the *kalana* of Waimea. The district of Kohala is renowned for its association with being the initial ruling center for the Pili dynasty, the burial place of the *kahuna* Pā'ao, and later as the birthplace of Kamehameha. Furthermore, Waikōloa explicitly figures into the intensive sociopolitical history of Hawai'i Island with its inclusion as the location of several notable battles and its association with ruling chiefs in addition to other distinguished individuals in Hawaiian pre-history.

The introduction of cattle in Waimea in 1793 by Captain George Vancouver paired with large herds and incessant roaming amongst the land, severely destroyed the native forest. By the mid-19th century, the population of South Kohala declined rapidly, and historical accounts indicate a pronounced shift from intensive utilization of coastal areas to the more fertile and productive uplands areas such as Waimea which were capable of supporting more stable agricultural pursuits. Traditional subsistence strategies were abandoned in favor of these more productive lands, and much of the population deviated as a result. Through the process established by the 1848 *Māhele 'Āina*, Waikōloa Nui was awarded to the son of Isaac Davis, George Hū'eu, which includes the current project area. Additionally, a total of nine residential *kuleana* parcels were awarded in Waikōloa, all of which were situated in more *mauka* areas of Waikōloa closer to Waimea Town, reflective of the settlement shift from agriculturally marginal areas to the windward side of the district.

Further knowledge of the traditional settlement patterns of Waikōloa are derived from a review of the previous archaeological and cultural studies within and in the vicinity of the project area. These studies suggest that generally, Precontact archaeological sites are sparse in the intermediate, *pili* lands of Waikōloa, which is situated between the more traditionally and intensively utilized coastal and upland resource/habitation areas. Additionally, intensive ranching activities spanning from the late 19th century to the present day combined with military use of the land have significantly impacted and/or obliterated much of the Precontact archaeological landscape in the vicinity of the project area, as has the development of the area to facilitate highly efficient modern-day transportation routes (e.g. Highway 190 and Waikōloa Road) that replaced traditional *mauka-makai* trail systems.

Identification of Potential Cultural Impacts and Recommendation for Mitigation

Based on the information presented in the culture-historical background and the lack of information obtained during the consultation process, coupled with the knowledge that previous CIA reports (Hammatt 2006; Ishihara and Brandt 2020; Vernon et al. 2018; Wong-Smith 2007) prepared for locations within Waikōloa have not identified ongoing traditional cultural practices occurring within the vicinity of the project area, this study finds that there are no ongoing cultural practices or valued cultural resources within the proposed Waikōloa Public Library project area. In addition, archaeological research conducted on the subject parcel (Clark 2023-In Prep) yielded no findings within the proposed project area. Therefore, the development of the Waikōloa Public Library will have no direct impact on any historic properties or traditional and customary Native Hawaiian practices or valued historical or cultural resources.

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**APPENDIX A.
AUGUST 2023 *KA WAI OLA* PUBLIC NOTICE**

**CULTURAL IMPACT
ASSESSMENT:
WAIKŌLOA AHUPUA'A,
HAWAII ISLAND**

ASM Affiliates is preparing a Cultural Impact Assessment (CIA) in compliance with a HRS Chapter 343 Environmental Assessment for a 2.5-acre property on TMK (3) 6-8-041:020, situated in Waikōloa Ahupua'a, South Kohala District, Island of Hawai'i. We are seeking consultation with community members that might have knowledge of traditional cultural uses of the proposed project area; or who are involved in any ongoing cultural practices that may be occurring on or in the general vicinity of the subject property, that may be impacted by the proposed project. If you have and can share any such information please contact Amy Ketner (aketner@asmaffiliates.com); phone (808) 969-6066, mailing address ASM Affiliates 507-A East Lanikaula Street, Hilo, HI 96720.

Appendix J:
Transportation Impact Assessment Report



WAIKŌLOA PUBLIC LIBRARY

Transportation Impact Assessment Report



View of TMK (3) 6-8-041:020

AUGUST 2023



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TMK: (3) 6-8-041:020
AECOM Project Number: 60707706
DAGS Project Number: 11-36-6546

Transportation Impact Assessment Report

Waikōloa Public Library Waikōloa Village, Hawai'i

August 2023

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1.0 INTRODUCTION

The State of Hawai'i is proposing a new public library for the Waikōloa Village area located in the South Kohala District of the Hawai'i Island. The proposed Waikōloa Public Library would provide library service to the Waikōloa Village community. The goal would be to become a gathering place and community center for the Waikōloa Village area. The Waikōloa BookMobile, which is a mobile library managed by the Friends of the Library Waikōloa Region, currently provides its service of limited books and materials to the Waikōloa community.

The Waikōloa Library was previously proposed on a site located along Pua Melia Street, across the Waikōloa Village subdivision. The new proposed site for the facility is within the Waikōloa Village subdivision along Kamakoa Drive. The assumption is that the proposed library will serve primarily the Waikōloa Village community and most of the traffic accessing the facility will be internal to the subdivision. Figure 1 illustrates the site location.

The purpose of this transportation impact analysis report (TIAR) is to document the existing conditions, analyze the traffic operational impacts resulting from the increased traffic from the proposed Waikōloa Public Library, report the results of the analysis, and summarize key findings and recommendations based on the results of the analysis.

Waikōloa Public Library Transportation Impact Analysis Report

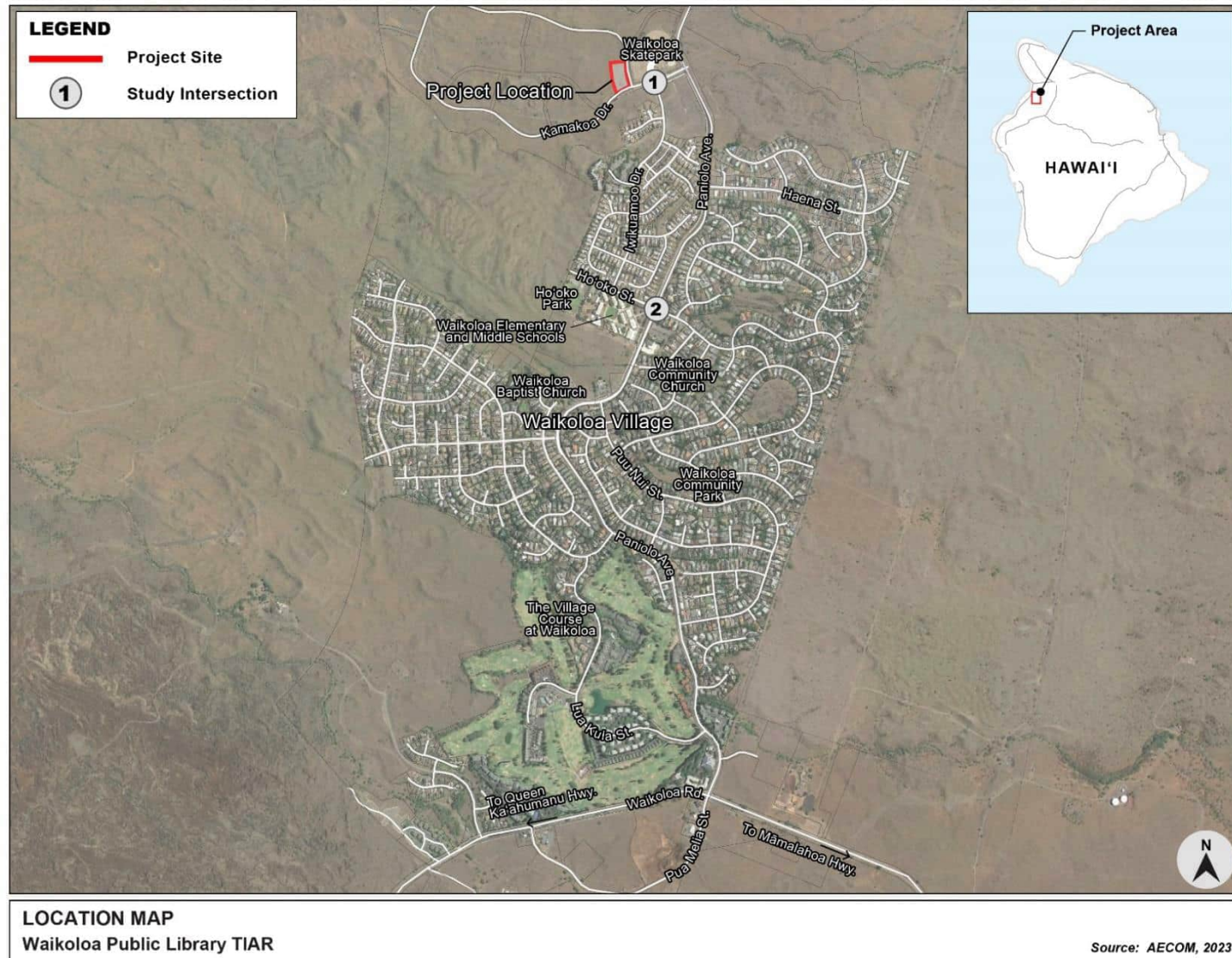


Figure 1 Site Location Map

2.0 EXISTING CONDITIONS

2.1 Site Description

The new location of the proposed Waikōloa Public Library will be along Kamakoa Drive in the Waikōloa Village subdivision. It is in the vicinity of the Waikōloa Skatepark and a nearby park. It is currently proposed to have two different access points from the roadway network to the library parking. One of the access points will be located along Kamakoa Drive and the other on a proposed Road A. The proposed Road A is a new road that intersects with Kamakoa Drive and will be located between the proposed library site, the existing grass area and Waikōloa Skatepark. The existing conditions around the project site such as the existing roadway, intersection, and pedestrian facilities are illustrated in Figure 2.

Waikōloa Public Library Transportation Impact Analysis Report

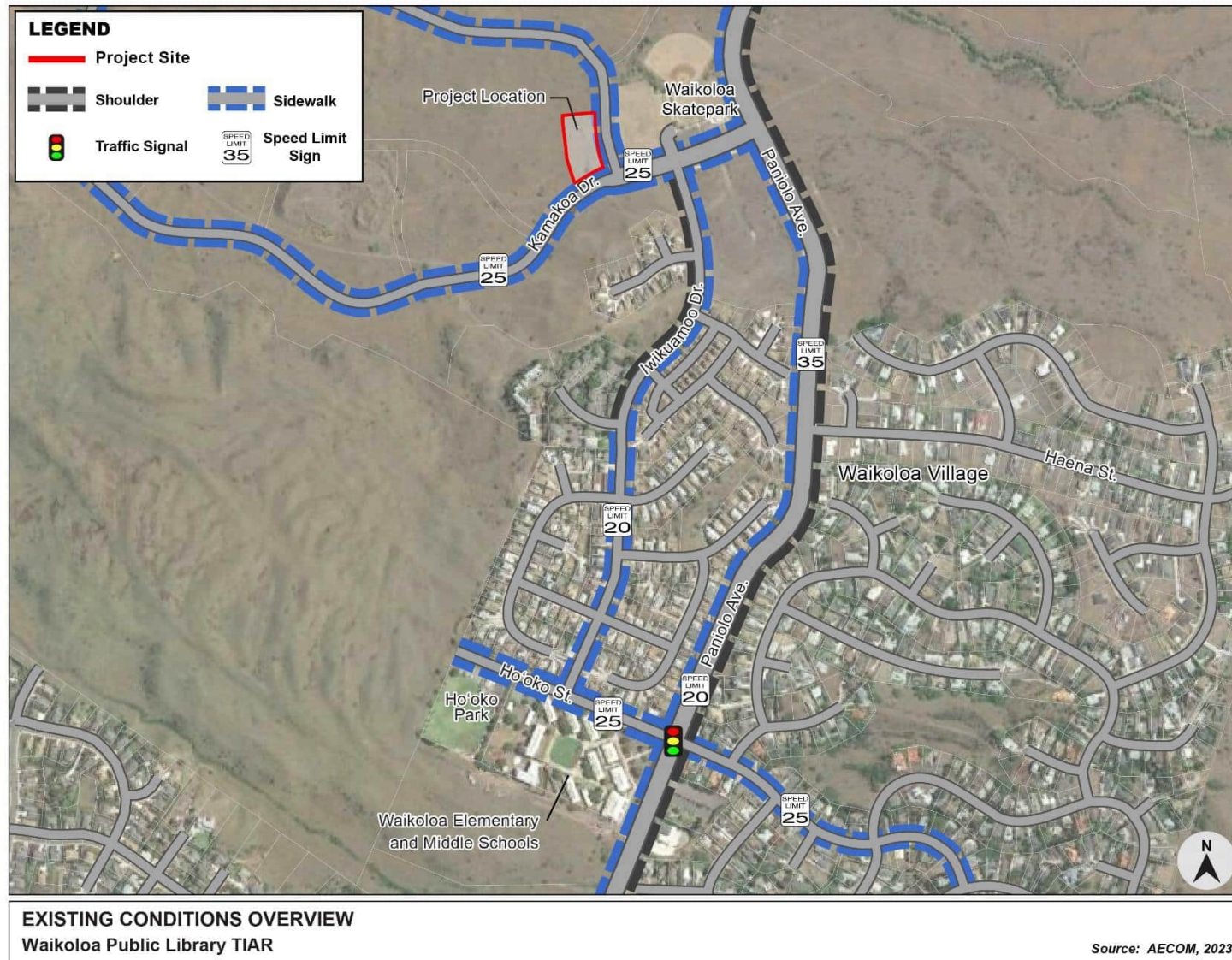


Figure 2 Existing Conditions Overview

2.2 Roadway Conditions

The key existing roadways around the proposed Waikōloa Public Library site include Paniolo Avenue, Ho'oko Street, Kamakoa Drive, and Iwikuamo'o Drive. Paniolo Avenue serves as the primary access and main circulation roadway for the Waikōloa Village subdivision. Ho'oko Street, Iwikuamo'o Drive, and Kamakoa Drive all primarily serve as local roads.

2.2.1 Roadway Descriptions

Paniolo Avenue is a collector roadway that provides access and circulation for Waikōloa Village. South of the intersection with Ho'oko Street, Paniolo Avenue is a four-lane, undivided roadway with two lanes in each direction. It has curb and gutters along both sides of the road. North of the intersection with Ho'oko Street, it becomes a two-lane, undivided roadway with one lane in each direction. It has curb and gutter for a portion of the road near the intersection. Further north, the road ends at the edge of pavement. The posted speed limit is 35 miles per hour (mph); with the exception of the school zone around Waikōloa Elementary & Middle School that limits the speed limit to 20 mph when flashing. Paniolo Avenue is under the jurisdiction of the County of Hawai'i. Figure 3 illustrates the view of Paniolo Avenue from both sides of the intersection.



Figure 3 View along Paniolo Avenue (Top: Facing North, Bottom Facing South)

Ho'oko Street connects several residential areas within Waikōloa Village with Paniolo Avenue. Ho'oko Street is a two-lane, undivided roadway with one lane in each direction. There is curb and gutter along both sides of the road. The posted speed limit is 25 mph. Figure 4 illustrates the view of Ho'oko Street looking east and west from the intersection with Paniolo Avenue.



Figure 4 View along Ho'oko Street (Top: Facing West, Bottom: Facing East)

Iwikuamo'o Drive connects several of the residential areas within Waikōloa Village and directs vehicles toward either Ho'oko Street or Kamakoa Drive. It is a two-lane, undivided roadway with one lane in each direction. There is curb and gutters along both sides of the road. The posted speed limit is 20 mph. Figure 5 illustrates the geometrics of Iwikuamo'o Drive looking south from Kamakoa Drive.



Figure 5 View along Iwikuamo'o Drive (Facing South)

Kamakoa Drive is a local roadway that is near the proposed project site. It currently terminates approximately 400 feet west of Iwikuamo'o Drive. East of the intersection with Iwikuamo'o Drive, Kamakoa Drive is a four-lane, divided roadway with two lanes in each direction and a raised median. There is curb and gutters along both sides of the road. West of the intersection, Kamakoa Drive is a four-lane, undivided roadway with two lanes in each direction. There is curb and gutters along both sides of the road. The posted speed limit is 25 mph. Figure 6 illustrates the views along Kamakoa Drive.



Figure 6 Views along Kamakoa Drive (Top: Facing East, Bottom: Facing West)

2.2.2 Intersection Descriptions

The following existing intersections are in the vicinity of the project site:

- Paniolo Avenue/Ho'oko Street; and
- Kamakoa Drive/Iwikuamo'o Drive.

The Paniolo Avenue and Ho'oko Street intersection is a four-legged, signalized intersection that is located adjacent to Waikōloa Elementary & Middle School. The northbound Paniolo Avenue approach has a right-turn lane, a through lane, and a left turn lane. The southbound Paniolo Avenue approach has a shared through/right-turn lane, a through lane, and a left turn lane. Both Ho'oko Street approaches have a shared through/right-turn lane and a left turn lane. Figure 7 shows a current view of the intersection.



Figure 7 Aerial View of Paniolo Avenue and Ho'oko Street Intersection

The Kamakoa Drive and Iwikuamo'o Drive is a four-legged, unsignalized intersection that is stop controlled and located near the proposed Waikōloa Public Library site. The Kamakoa Drive approaches have a shared through/right-turn lane and a shared through/left-turn lane. The Iwikuamo'o Drive approach has a single lane for the left/through/right movements, which is included as all movements. The north leg of the intersection is the access to parking lot for the Waikōloa Skatepark. The Iwikuamo'o Drive and skatepark parking lot access are stop controlled. Figure 5, which shows the Iwikuamo'o Drive configuration at this intersection.

2.3 Pedestrian and Bicycle Facilities

2.3.1 Pedestrian Facilities

In the vicinity of Waikōloa Elementary & Middle School, Paniolo Avenue has attached sidewalks along both sides of the road south of the intersection with Ho'oko Street. North of the intersection, Paniolo Avenue has a detached sidewalk along the west side of the road, while the sidewalk on the east side ends approximately 20 feet after the intersection.

Along Ho'oko Street, there are attached sidewalks along both sides of the road in the vicinity of Waikōloa Elementary & Middle School. On Iwikuamo'o Drive, there is a detached sidewalk on the east side of the road and no sidewalk on the west side.

Kamakoa Drive has detached sidewalks along both sides of the road east of the intersection with Iwikuamo'o Drive. There is a detached sidewalk is only on the north side of Kamakoa Drive west of the intersection with Iwikuamo'o Drive.

At the signalized intersection of Paniolo Avenue and Ho'oko Street, there are marked crosswalks across all legs of the intersection. Prior to Waikōloa Elementary & Middle School beginning and ending each school day, a school crossing guard was observed at the

intersection to help facilitate safe pedestrian crossing movements for students and parents. There is a single crosswalk across the east leg of Kamakoa Drive at Iwikuamo'o Drive.

2.3.2 Bicycle Facilities

There are no marked bicycle facilities along Paniolo Avenue and Ho'oko Street near Waikōloa Elementary & Middle School nor along Iwikuamo'o Drive and Kamakoa Drive in the vicinity near the proposed Waikōloa Public Library site. Bicyclists observed during the data collection process either shared the roadway with other vehicles or were traveling on the sidewalks.

2.4 Public Transit Conditions

Public transit service is provided by the Hele-On bus system on Hawai'i island. Currently, there are a few bus routes that travel along Waikōloa Road, which is a minor arterial roadway that provides regional access to the Waikoloa Village area. These routes include Route 2, Route 75, and Route 76. Of these bus routes, Routes 75 and 76 travel along Paniolo Avenue. but do not travel near the proposed library site.

Route 2 – Blue Line – Hilo to Kailua-Kona via Daniel K. Inouye Hwy. Route 2 buses travel along Waikōloa Road between Hilo and Kailua-Kona. It stops at Stop #449 at the Waikōloa Village Highlands Shopping Center nine times a day (4 times for the eastbound route to Hilo and 5 times for the westbound route to Kailua-Kona).

Route 75 – N. Kohala – Waimea – S. Kohala Resorts – Kailua Kona and Route 76 – Honoka'a to Kailua-Kona. Routes 75 and 76 both travel along Waikōloa Road when traveling to the respective destinations. Both make a loop in Waikōloa Village using Paniolo Avenue but do not pass by Waikōloa Elementary & Middle School. Route 75 stops at two bus stops in the Waikōloa Village area (Stop #449 and #451), once during the morning commuter peak period and once during the afternoon commuter peak period. Route 76 also stops at two stops in the vicinity of Waikōloa Village (Stop #449 and #451) during the morning commuter peak period and at two stops during the afternoon commuter peak period (Stop #451 and a stop without an ID number).

2.5 Traffic Conditions

2.5.1 Existing Transportation Volume Counts

Manual transportation volume turning movement counts and observations were conducted on Wednesday, May 24, 2023, during the AM, midday, and PM peak periods. These intersection counts included vehicular, pedestrian, and bicycle counts at Paniolo Avenue/Ho'oka Street and Kamakoa Drive/Iwikuamo'o Drive. The midday count was included to capture the school-related traffic as part of the study. The bell schedule for Waikōloa Elementary & Middle School is from 8:00 AM to 1:00 PM on Wednesdays. On the other days, the school finishes at 2:15 PM.

From these counts, the AM peak hour was determined to occur from 7:15 AM to 8:15 AM, the midday peak was determined to occur from 12:45 PM to 1:45 PM, and the PM peak hour was determined to occur from 3:00 PM to 4:00 PM. The traffic count worksheets are included in Appendix A. Figure 8 summarizes the existing the vehicular counts for the AM, midday, and PM peak hours.

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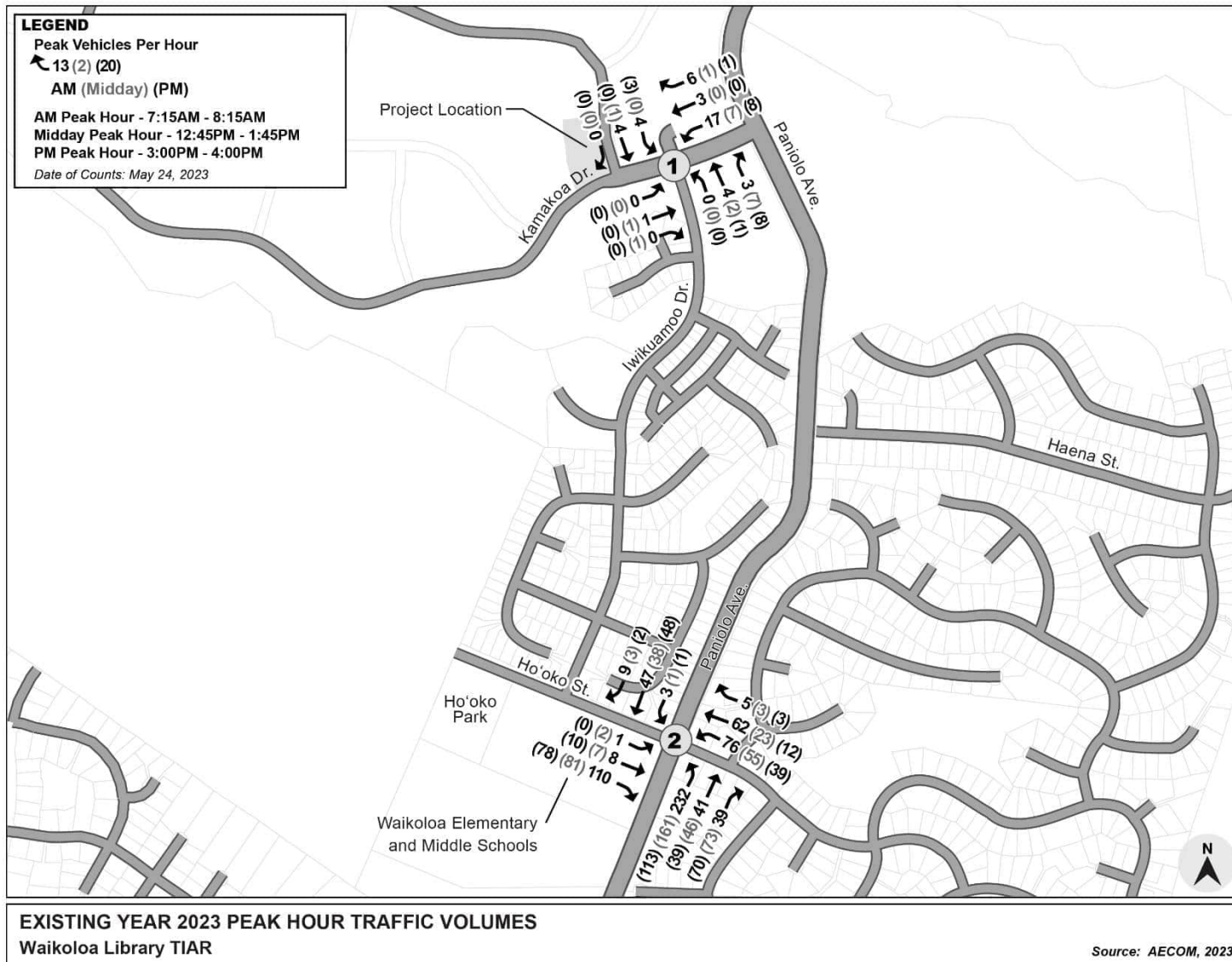


Figure 8 Existing Year 2023 Peak Hour Traffic Volumes

The pedestrian and bicycle counts were collected for both intersections. The pedestrian and bicycle count worksheets are included in Appendix A. The Kamakoa Drive/Iwikuamo'o Drive intersection had very little pedestrian and bicycle activity. During the peak hour periods, it was observed that there were at maximum 3 pedestrians per hour entering the intersection. During the AM peak hour, it was observed that there were 6 bicycles turning right from Iwikuamo'o Drive onto Kamakoa Drive. However, most of that bicycle volume was from a single bicyclist that appeared to be riding along a morning exercise route.

At the Paniolo Avenue/Ho'oka Street intersection, during the AM peak hour, there were 22 pedestrians per hour crossing the crosswalk on the east side of the intersection toward Waikōloa Elementary & Middle School and 28 pedestrians per hour crossing the crosswalk on the southside of the intersection. Most of these pedestrians were children headed toward school along with some parents. During the midday peak, which occurred around the time school ended that day, there were 10 pedestrians crossing the east crosswalk and 41 crossing the south crosswalk. Similar to the Kamakoa Drive/Iwikuamo'o Drive intersection, there were not many bicycles observed during any of the observation periods. During the AM peak hour, the same bicyclist observed at the Kamakoa Drive/Iwikuamo'o Drive intersection was also observed at this intersection turning right from southbound Paniolo Avenue onto Ho'oko Street.

2.5.2 Intersection Operations Methodology

Traffic signal control and stop control schemes were used to evaluate the two intersections to determine any potential impacts resulting from the proposed Waikōloa Public Library. Based on consultation with the County of Hawai'i, it was assumed that the roadways would maintain the existing lane configuration and traffic control operations under the future conditions.

For the Paniolo Avenue/Ho'oka Street and Kamakoa Drive/Iwikuamo'o Drive intersections, traffic operational analyses were conducted using Synchro/SimTraffic 11.0 in accordance with procedures outlined in the Highway Capacity Manual (HCM). Table 1 shows the control delays and corresponding levels of service (LOS) established in the HCM for signalized and unsignalized intersections.

Table 1 Intersection Delay and Corresponding Levels-of-Service

Level-of-Service	Signal Control Delay (sec/veh)	Stop Control Delay (sec/veh)
A	< 10	< 10
B	10 – 20	10 – 15
C	20 – 35	15 – 25
D	35 – 55	25 – 35
E	55 – 80	35 – 50
F	> 80	> 50

Source: HCM 6th Edition, Volume 3: pg. 18-6

The goal of this analysis was to understand the operational sufficiency of the signalized and stop controlled intersection concepts to serve the added demand of traffic as a result of adding the proposed library. The following assumptions/input parameters were used in the intersection analysis:

- Peak hour factor: 0.77 during the AM Peak Hour and 0.92 for the PM Peak Hour
- Percent Heavy Vehicles: 2%
- Vehicle travel speed: the posted speed limit
- Lane widths: 12'
- Base saturation flow rate: 1,900 vehicles per hour per lane (vphpl) for all movements
- Right-turn on red movements: These traffic movements were included in the analysis and modeled in the software
- Signal cycle length: 90 seconds (based on field measurements of the existing signal timing)

2.5.3 Intersection Operations

Table 2 summarizes the existing (Year 2023) intersection LOS and delay results for the AM and PM peak hours. The AM and PM existing traffic volumes are more conservative than the midday traffic volumes and were the volumes used for the remainder of the analysis. The corresponding Synchro worksheets are included as part of Appendix B.

Table 2 Existing Intersection Operations

Intersection	AM Peak Hour		PM Peak Hour	
	LOS	Delay (sec/veh)	LOS	Delay (sec/veh)
Paniolo Avenue/Ho'oko Street				
Paniolo Avenue/Ho'oko Street	B	16.8	B	14.0
Kamakoa Drive/Iwikuamo'o Drive*				
Kamakoa Drive WB LT	A	7.3	A	7.2
Kamakoa Drive EB LT	A	0.0	A	0.0
Iwikuamo'o Drive	A	9.0	A	8.4
Parking Lot Access	A	9.2	A	8.7
Notes: Based on counts conducted on Wednesday, 5/24/23 AM Peak Hour: 7:15 AM - 8:15 AM, PM Peak Hour: 3:00 PM - 4:00 PM * Unsignalized STOP-controlled intersection LOS = Level of service, sec/veh = seconds per vehicle, WB = Westbound, EB = Eastbound, LT = Left Turn				

The Paniolo Avenue/Ho'oko Street intersection currently operates at a LOS B during both the AM and PM peak hour periods while the key movements at the Kamakoa Drive/Iwikuamo'o Drive intersection operate at LOS A. The results from the analysis are consistent with what was observed during data collection. The Paniolo Avenue/Ho'oko Street intersection appeared to operate with minimal delay during the data collection study with the signal appearing to be an actuated traffic signal. It was observed that the Kamakoa Drive/Iwikuamo'o Drive intersection did not have many vehicles enter the intersection during the peak periods, which is reflected in the low levels of delay for the key movements.

3.0 FUTURE YEAR 2028 CONDITIONS

3.1 Proposed Development

The Waikōloa Public Library is a proposed facility that is approximately 12,000 square feet in area. It is in the vicinity of Waikolao Skatepark. The goal of the library is to have it become a gathering place that Waikōloa community can utilize. In addition to the library, the plans will also include an early learning center (ELC) that will be connected to the library. The current plans include two ELC classrooms that have the capacity for 20 children each. There will be two access points to the library: one from Kamakoa Drive and one from a proposed Road A. The goal of having both driveways is to relieve any potential congestion within the parking lot. Figure 9 below illustrates the draft site plan of the proposed project. The current plans state that there will be 64 total parking stalls, 49 for the library and 15 for the ELC.

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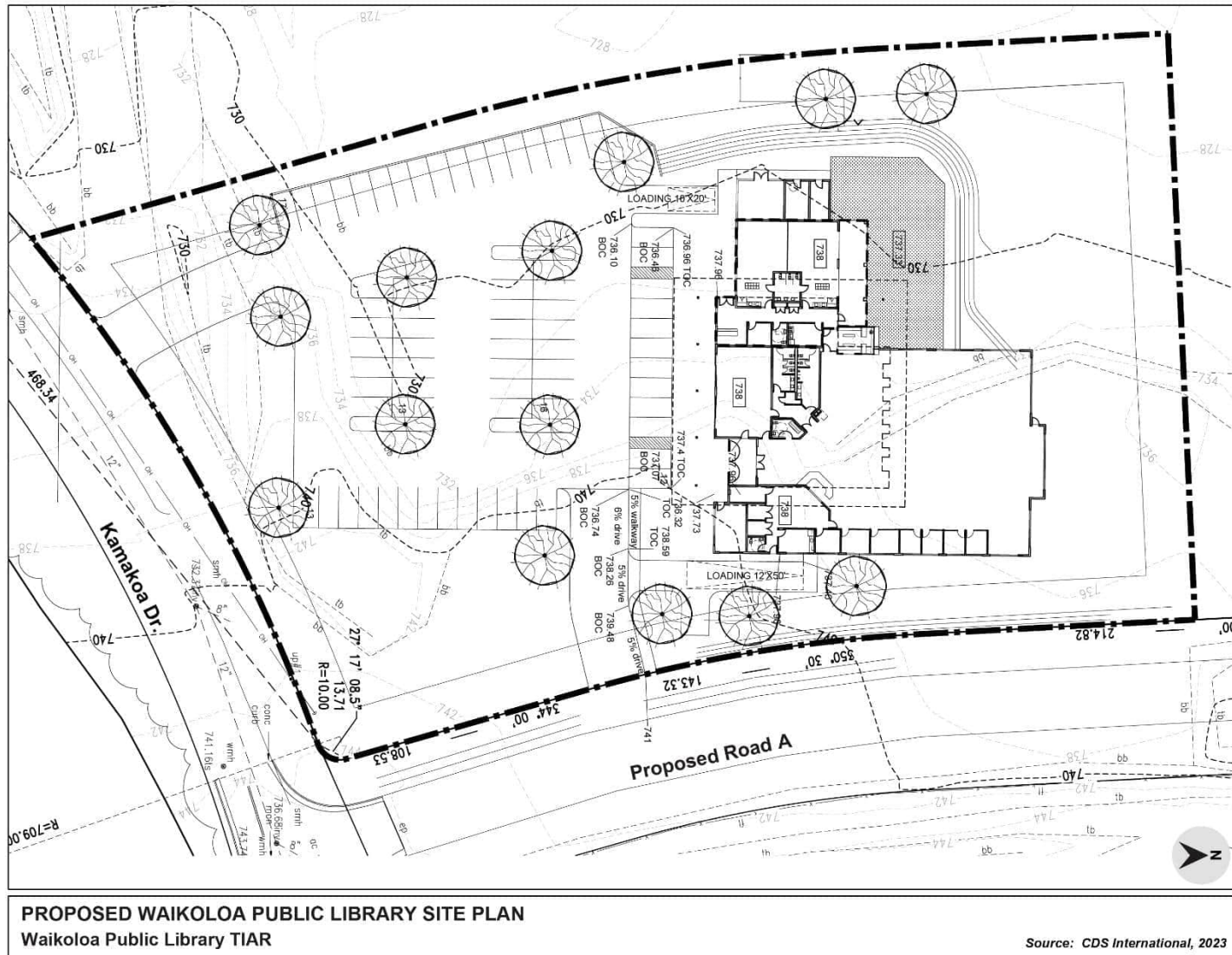


Figure 9 Proposed Waikōloa Public Library Site Plan

3.2 Future Roadway Conditions

3.2.1 Roadway Conditions

It is assumed that there would not be any major changes to the within the study limits as it relates to the development of the Waikōloa Public Library. In consultation with the County of Hawai'i, it was determined that there were no planned work for the roads within the study limits of this project that affect the geometry of the road. It should be noted that the Ke'Olalani in Waikōloa development has been proposed just west of the proposed library site. The proposed development looks to add 2,400 homes over the next ten years with the first phase adding 33 homes at an affordable rate (CoH Office of Housing and Community Development 2023). The impact analysis in this traffic study does not consider future volumes from the housing development. Future modifications to Kamakoa Drive shall be subject to future studies associated with the Ke'Olalani development.

The proposed Road A that will provide access to the proposed library site will also be constructed. It is assumed that Road A will be a two-lane, undivided roadway (with one lane in each direction).

3.2.2 Intersection Conditions

It is assumed that the two intersections that were studied as part of the data collection effort would not change prior to the completion of the proposed library. The Kamakoa Drive/Iwikuamo'o Drive may need to be re-reviewed as more of the Ke'Olalani development is established and more traffic enters the intersection. The other new intersection that would be established is the intersection of Kamakoa Drive and proposed Road A. This intersection would be utilized by some of the traffic accessing the proposed library. In this study, this intersection will be referenced as the Kamakoa Drive/Road A intersection. It is currently assumed that this intersection will be two-way, stop controlled.

3.3 Future Pedestrian, Bicycle, and Public Transit Conditions

3.3.1 Future Pedestrian Facilities

As noted in Section 2.3.1, Pedestrian Facilities, the areas around the study intersections primarily have useable sidewalks and crosswalks.

It is assumed that in the vicinity of the Paniolo Avenue/Ho'oko Street intersection, there will not be any major changes to the existing pedestrian facilities.

3.3.2 Future Bicycle Facilities

Based on Hawaii Department of Transportation (HDOT) Bike Plan Hawaii, there are no proposed bicycle projects in the Waikōloa area. The development of Ke'Olalani has potential to add bicycle facilities to the roadway network, but it is assumed that there would not be any major bicycle facility changes prior to the completion of the Ke'Olalani.

3.3.3 Future Public Transit Facilities

As noted in Section 2.4, Public Transit Conditions, the current bus routes do not travel to the vicinity of the proposed library site. From the County of Hawai'i's Final Transit and Multi-Modal Transportation Master Plan, there are not any proposed plans to extend the transit routes further into Waikōloa Village (SSFM 2018).

3.4 Future Traffic Conditions

3.4.1 Projected Year 2028 Peak Hour Background Traffic

Background traffic accounts for the growth in traffic unrelated to the proposed Waikōloa Public Library. The proposed Waikōloa Public Library project is assumed to open five years from the point of data collection. The future background traffic was grown and projected out to the Year 2028 and will be used for all of the future traffic analyses.

In consultation with the County of Hawai'i Traffic Division, it was determined that an annual growth rate of two (2) percent would be uniformly applied to all directions of traffic at both intersections.

Figure 10 illustrates the projected Year 2028 peak hour turning movement volumes for the background traffic.

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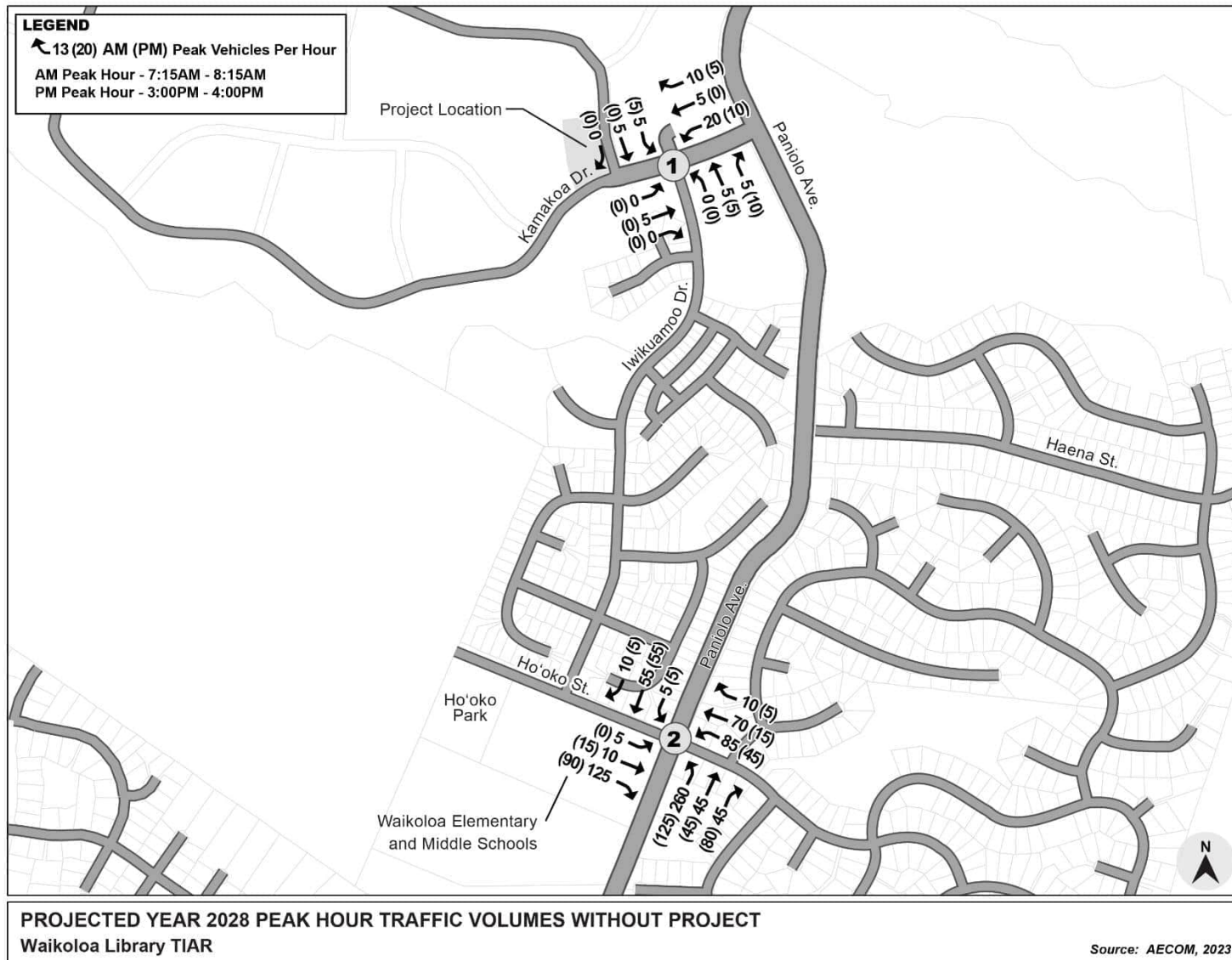


Figure 10 Projected Year 2028 Peak Hour Traffic Volumes Without Project

3.4.2 Vehicular Trips Generated by the Waikōloa Public Library

Table 3 summarizes the land use and estimated vehicular volumes that would be generated by the proposed Waikōloa Public Library. The vehicular volume is based on the trip generation rates documented in the Institute of Transportation (ITE) publication, Trip Generation, 11th Edition. Equations for the AM and PM peak hours of adjacent street traffic periods were used in this estimation.

Trip generation equations for Category 590 – Library were used to estimate the vehicular traffic generated by the proposed Waikōloa Public Library. The index used as the predictor of generated traffic was gross floor area (in 1000 square feet). For the ELC, Category 565 – Day Care Center was used to estimate the traffic generated by the ELC. The index used as the predictor of the generated traffic for this category was number of students.

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Table 3 Projected Trip Generation by Waikōloa Public Library

Land Use	Intensity	ITE Category	AM Peak Hour		PM Peak Hour	
			In	Out	In	Out
Library	12,000 sf	590	5	2	46	49
Day Care Center	40 students	565	17	15	15	17
Total			22	17	61	66

Notes: AM and PM Peak Hour traffic volumes are in vehicles per hour. Trip Generation is the estimation of vehicular traffic based on equations documented in the Institute of Transportation Engineers' publication, Trip Generation, 11th Edition.

For Category 590 - Library, the trip generation equations are:

AM Peak Hour: $T = 1.75 (X) - 14.59$, 79% inbound/21% outbound
 PM Peak Hour: $T = 9.33(X) - 17.13$, 48% inbound/52% outbound

where T = traffic volume (vehicles per hour), X = 1000 square feet gross floor area, and sf = square feet

For Category 656 - Day Care Center, the average rates for the AM and PM peak hours are:

AM Peak Hour: $T = 0.78 (X)$, 53% inbound/47% outbound
 PM Peak Hour: $T = 0.79 (X)$, 47% inbound/53% outbound

where T = traffic volume (vehicles per hour), X = number of students

3.4.3 Vehicular Trip Distribution and Assignment

The projected Year 2028 vehicular traffic volumes generated by the Waikōloa Public Library summarized in Table 3 were directionally assigned to the roadway network. It was assumed that the trips heading to and from the proposed library and ELC would primarily originate from the surrounding Waikōloa Village. For the purpose of this study, the project generated traffic was assigned to the roadway network using similar distribution patterns as the existing traffic. The trips generated and assigned to the roadway network are summarized in Figure 11 below.

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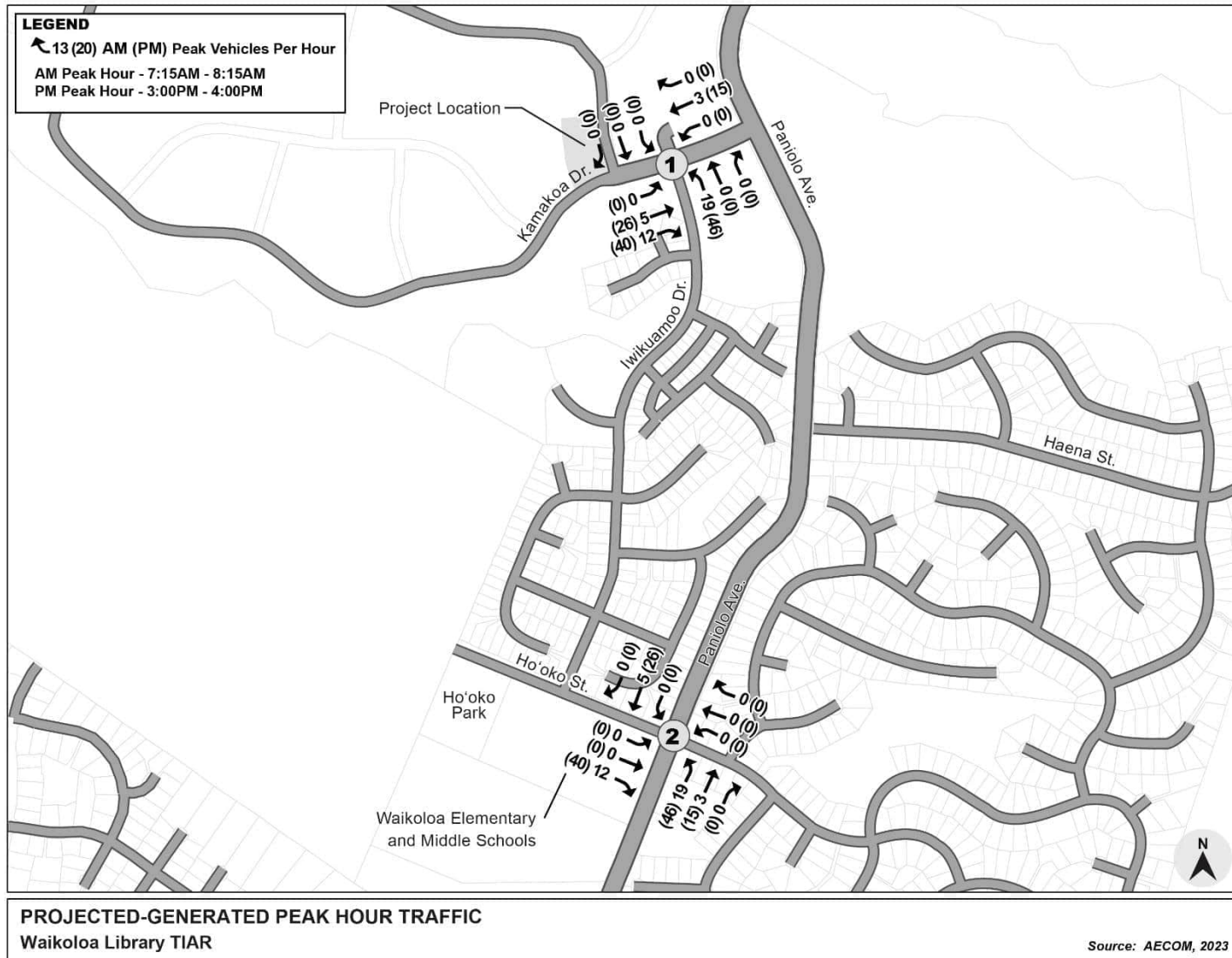


Figure 11 Project-Generated Peak Hour Traffic

3.4.4 Total Projected Year 2028 Peak Hour Traffic Volumes

The projected traffic volumes generated by the proposed Waikōloa Public Library summarized in Figure 11 were combined with the projected Year 2028 background traffic summarized in Figure 10 to calculate the total projected Year 2028 peak hour traffic volumes. The total projected Year 2028 peak hour traffic volumes are summarized in Figure 12 below.

Waikōloa Public Library Transportation Impact Analysis Report

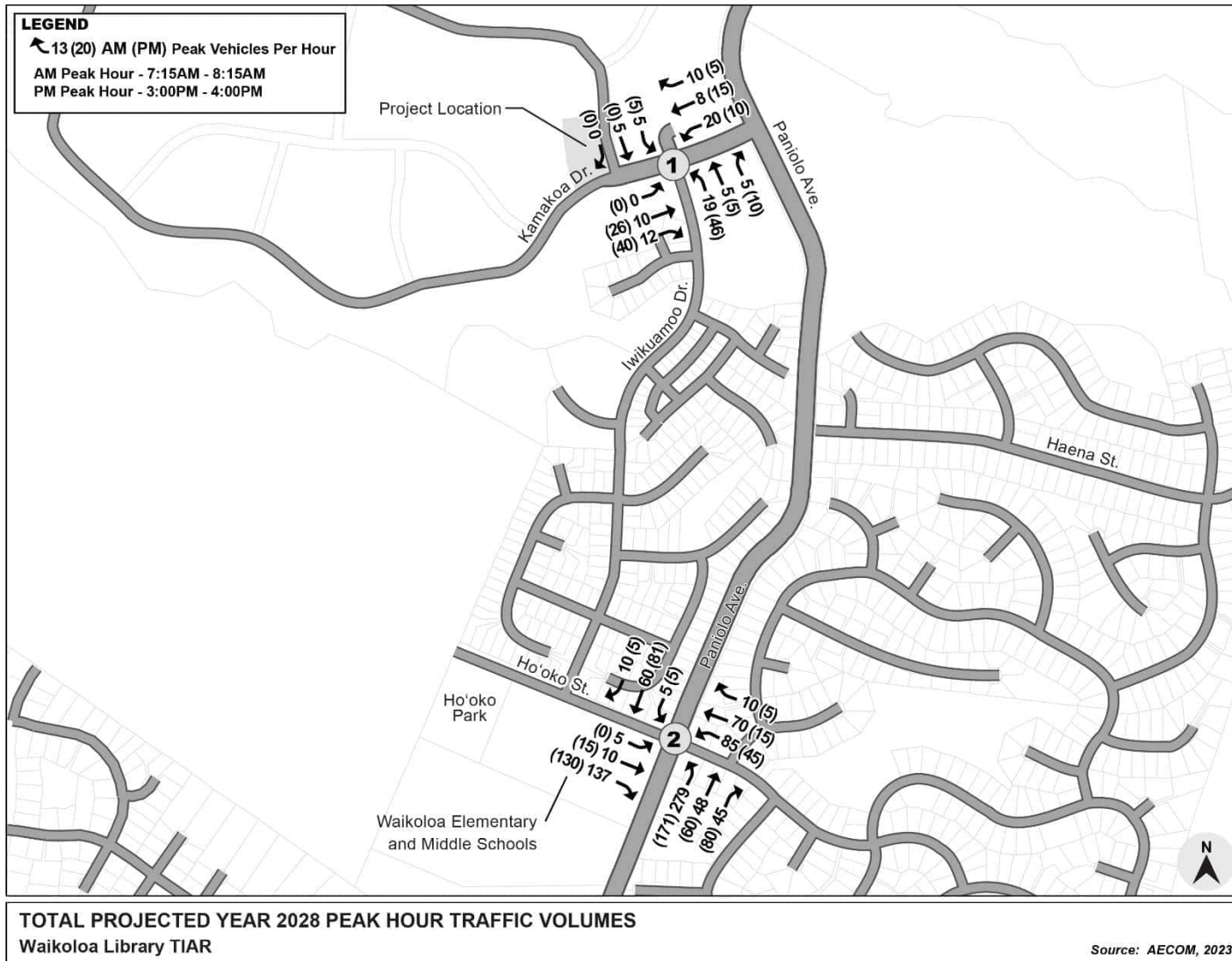


Figure 12 Total Projected Year 2028 Peak Hour Traffic Volumes

3.4.5 Projected Year 2028 Peak Hour Intersection Operations

The projected Year 2028 peak hour traffic volumes with (build) and without (no build) the proposed project were evaluated using the same methodologies described in Section 2.5.2, Intersection Operations Methodology using Synchro/SimTraffic analysis software. Table 4 and Table 5 summarize the results of the analysis for the AM peak hour conditions and the PM peak hour conditions, respectively.

Table 4 Projected Year 2028 AM Peak Hour Intersection Operations

Intersection	Year 2028 No Build		Year 2028 Build	
	LOS	Delay (sec/veh)	LOS	Delay (sec/veh)
Paniolo Avenue/Ho'oko Street				
Paniolo Avenue/Ho'oko Street	B	17.6	B	18.1
Kamakoa Drive/Iwikuamo'o Drive*				
Kamakoa Drive WB LT	A	7.3	A	7.3
Kamakoa Drive EB LT	A	0.0	A	0.0
Iwikuamo'o Drive	A	9.0	A	9.2
Parking Lot Access	A	9.3	A	9.4
Notes: * Unsignalized STOP-controlled intersection LOS = Level of service, sec/veh = seconds per vehicle, WB = Westbound, EB = Eastbound, LT = Left Turn				

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Table 5 Projected Year 2028 PM Peak Hour Intersection Operations

Intersection	Year 2028 No Build		Year 2028 Build	
	LOS	Delay (sec/veh)	LOS	Delay (sec/veh)
Paniolo Avenue/Ho'oko Street				
Paniolo Avenue/Ho'oko Street	B	14.3	B	15.0
Kamakoa Drive/Iwikuamo'o Drive*				
Kamakoa Drive WB LT	A	7.2	A	7.4
Kamakoa Drive EB LT	A	0.0	A	0.0
Iwikuamo'o Drive	A	8.7	A	9.3
Parking Lot Access	A	8.8	A	9.0
Notes: * Unsignalized STOP-controlled intersection LOS = Level of service, sec/veh = seconds per vehicle, WB = Westbound, EB = Eastbound, LT = Left Turn				

As shown in Table 4 and Table 5, the intersection movements are projected to operate with a LOS B or better with or without the proposed Waikōloa Public Library during both peak hour periods. This analysis indicates that traffic generated from both the library and ELC is not expected to affect the operations at each intersection. The projected delays and LOS are very similar with both scenarios and the completion of the Waikōloa Public Library is not expected to affect traffic operations in the area.

3.5 Intersection Sight Distance

In addition to the intersection operations, the sight distance for the access points was briefly analyzed in accordance with the American Association of State Highway and Transportation Officials (AASHTO) publication A Policy of Geometric Design of Highways and Streets, 2018 7th Edition. The sight distance was evaluated to determine what sight distance was required for both driveways.

The posted speed limit on Kamakoa Drive is 25 mph. It is assumed that the speed limit on the proposed Road A will have a similar posted speed limit. Based on the 25-mph speed limit, the stopping sight distance is typically used to evaluate sight distance. The design guidelines state that at 25 mph, 155 feet of sight distance is required in both directions.

As seen in Figure 6, there is currently no obstructions along Kamakoa Drive that would inhibit drivers' line of sight when accessing the driveway. When the driveways are constructed, care should be taken to ensure that no obstruction such as signs and landscaping block the direct line of sight to Kamakoa Drive and the proposed Road A.

4.0 SUMMARY AND RECOMMENDATIONS

4.1 Summary

The proposed Waikōloa Public Library is planned to serve the Waikōloa Village area. The proposed Waikōloa Public Library site will include the proposed library and two ELC classrooms. The site is located along Kamakoa Drive and the proposed site plan will include a parking lot with two access points. One access point will be from Kamaka Drive and the other from the proposed Road A as seen in Figure 9. The goal of having both driveways is to relieve any potential congestion within the parking lot.

The proposed Waikōloa Public Library is projected to generate relatively low volumes of traffic during the peak hour periods. For the library portion, it is expected to generate 7 vehicles per hour (vph) during the AM peak hour and 95 vph during the PM peak hour. For the ELC, it is expected to generate approximately 32 vph during both the AM and PM peak hour periods.

The additional traffic generated by the proposed Waikōloa Public Library site is projected to have a minimal impact on the peak hour intersection operations for the surrounding intersections. The analysis indicated that there was very little change to the delay and LOS between the build and no build scenarios. The design guidelines state that for a speed of 25 mph, the required sight distance is 155 feet in both directions.

4.2 Recommendations

Based on the results of the operations analysis, there are minimal roadway improvements recommended for the proposed Waikōloa Public Library site.

Other recommendations include the addition of warning signs near the crosswalks for pedestrians to help alert drivers that there may be pedestrians crossing the road. It is recommended that crosswalks be added for the intersection of Kamakoa Drive and the proposed Road A, if there are not any crosswalks prior to the completion of the proposed library. In addition to the crosswalk, the appropriate signage should be added to alert drivers of the crosswalk such as the W11-2 sign from the Manual on Uniform Control Devices (MUTCD). Consideration should be put into the installation of bicycle lanes/facilities and storage to provide multimodal access around the proposed facility when the surrounding area develops further.

The recommendations include the following:

- Implement stop control access at both of the proposed library driveways..
- Maintain line of sight around each of the proposed library driveways based on required stopping sight distance.
- Implement crosswalks and ADA-compliant curb ramps at the Kamakoa Drive and proposed Road A intersection, if there are none prior to the completion of the library.
- Install, as appropriate, pedestrian warning signs to alert drivers of potential pedestrian activities in the vicinity of the site.
- Consideration for potential future bicycle facilities as the surrounding area is developed.

5.0 REFERENCES

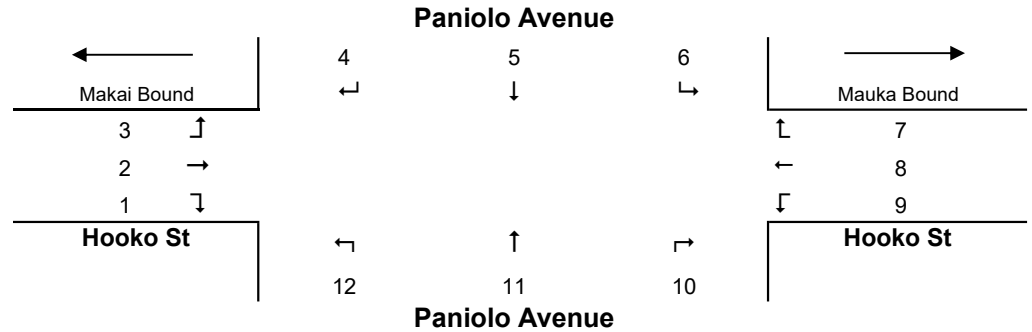
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Appendix A Transportation Count Worksheets

AM Peak Hour Vehicular Volumes

WAIKOLOA PUBLIC LIBRARY TRANSPORTATION ANALYSIS VEHICLE TURNING MOVEMENT FORM

LOCATION: Paniolo Ave & Hooko St
DATE: 05/24/23 (Wednesday)
TIME: 6:30a-8:30a
WEATHER: Clear
RECORDER: JY

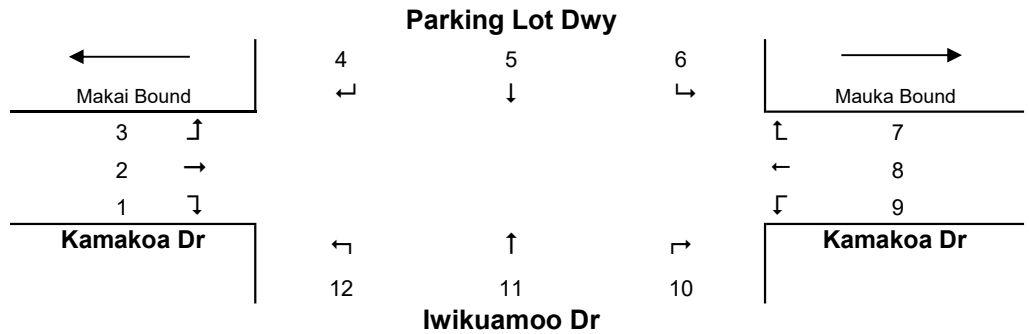


TIME PERIOD	MOVEMENT NUMBER											
	1	2	3	4	5	6	7	8	9	10	11	12
6:30-6:45a	24	0	0	0	12	1	0	2	15	2	13	1
6:45-7:00a	24	1	0	0	6	0	0	2	15	5	3	9
7:00-7:15a	32	1	0	1	9	1	0	1	26	2	5	22
7:15-7:30a	22	0	0	0	10	1	0	8	16	6	12	50
7:30-7:45a	31	2	0	4	11	1	1	16	22	11	9	69
7:45-8:00a	25	2	0	5	13	0	3	32	20	14	11	81
8:00-8:15a	32	4	1	0	13	1	1	6	18	8	9	32
8:15-8:30a	15	4	1	0	8	2	0	3	16	4	4	9
Peak Hour 7:15-8:15a	110	8	1	9	47	3	5	62	76	39	41	232

Notes:

WAIKOLOA PUBLIC LIBRARY TRANSPORTATION ANALYSIS VEHICLE TURNING MOVEMENT FORM

LOCATION: Kamakoa Dr & Iwikuamoo Dr
DATE: 05/24/23 (Wednesday)
TIME: 6:30a-8:30a
WEATHER: Clear
RECORDER: ZC



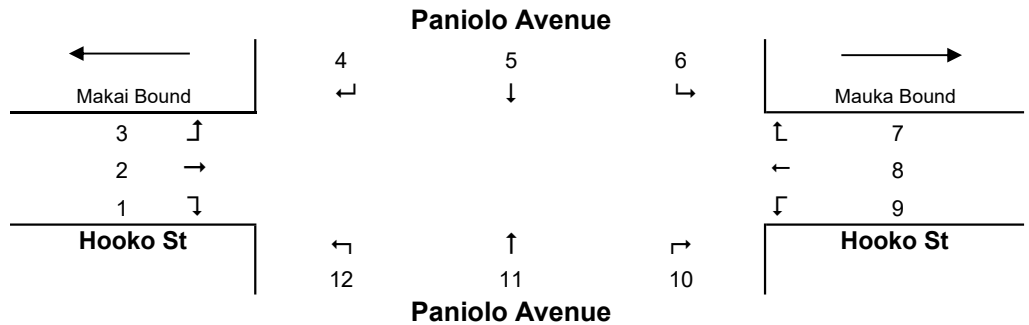
TIME PERIOD	MOVEMENT NUMBER											
	1	2	3	4	5	6	7	8	9	10	11	12
6:30-6:45a	0	0	0	0	0	3	0	0	0	2	1	0
6:45-7:00a	0	0	0	1	0	0	0	0	2	0	0	0
7:00-7:15a	0	1	0	0	0	0	0	1	1	0	0	0
7:15-7:30a	0	0	0	0	0	0	1	1	3	0	0	0
7:30-7:45a	0	0	0	0	1	1	3	0	3	1	0	0
7:45-8:00a	0	0	0	0	1	2	1	2	7	2	3	0
8:00-8:15a	0	1	0	0	2	1	1	0	4	0	1	0
8:15-8:30a	1	0	0	1	0	1	1	0	0	1	1	0
Peak Hour 7:15-8:15a	0	1	0	0	4	4	6	3	17	3	4	0

Notes:

Midday Peak Hour Vehicular Volumes

WAIKOLOA PUBLIC LIBRARY TRANSPORTATION ANALYSIS VEHICLE TURNING MOVEMENT FORM

LOCATION: Paniolo Ave & Hooko St
DATE: 05/24/23 (Wednesday)
TIME: 12:30p-2:00p
WEATHER: Clear
RECORDER: JY

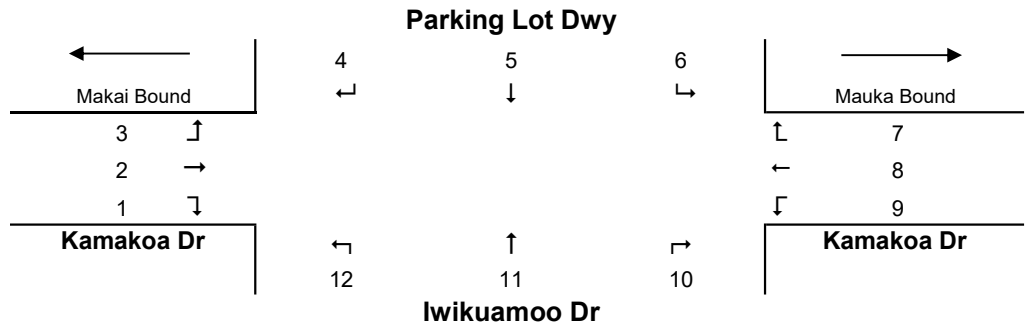


TIME PERIOD	MOVEMENT NUMBER											
	1	2	3	4	5	6	7	8	9	10	11	12
12:30-12:45p	2	0	0	2	7	0	2	2	7	11	8	31
12:45-1:00p	12	1	0	0	6	1	0	9	15	15	13	59
1:00-1:15p	31	4	2	2	13	0	2	11	16	27	16	53
1:15-1:30p	18	1	0	1	10	0	1	3	12	18	6	32
1:30-1:45p	20	1	0	0	9	0	0	0	12	13	11	17
1:45-2:00p	17	1	0	0	11	2	1	1	15	14	5	19
Peak Hour 12:45-1:45p	81	7	2	3	38	1	3	23	55	73	46	161

Notes:

WAIKOLOA PUBLIC LIBRARY TRANSPORTATION ANALYSIS VEHICLE TURNING MOVEMENT FORM

LOCATION: Kamakoa Dr & Iwikuamoo Dr
DATE: 05/24/23 (Wednesday)
TIME: 12:30p-2:00p
WEATHER: Clear
RECORDER: ZC



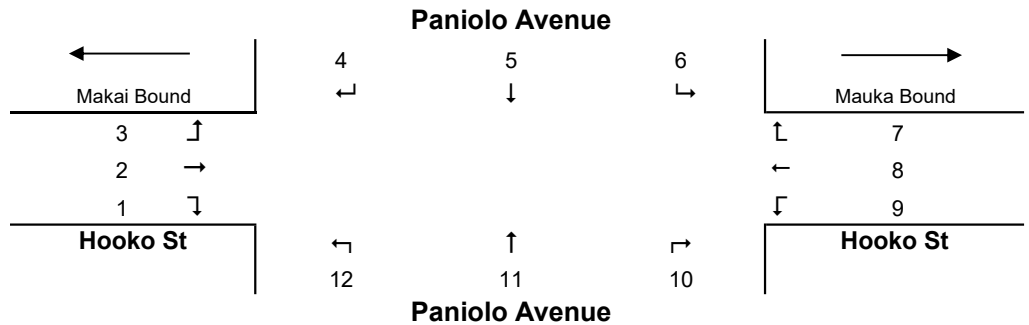
TIME PERIOD	MOVEMENT NUMBER											
	1	2	3	4	5	6	7	8	9	10	11	12
12:30-12:45p	0	0	0	1	0	1	3	0	1	2	0	0
12:45-1:00p	1	0	0	0	1	0	0	0	0	2	1	0
1:00-1:15p	0	1	0	0	0	0	0	0	5	1	1	0
1:15-1:30p	0	0	0	0	0	0	0	0	1	3	0	0
1:30-1:45p	0	0	0	0	0	0	1	0	1	1	0	0
1:45-2:00p	0	0	0	0	0	0	0	0	3	2	0	0
Peak Hour 12:45-1:45p	1	1	0	0	1	0	1	0	7	7	2	0

Notes: Construction activity occurred around 12:40 PM that lasted approximately 10 minutes where the roads near this intersection were closed to traffic, however that largely did not impact the results of the data collection.

PM Peak Hour Vehicular Volumes

WAIKOLOA PUBLIC LIBRARY TRANSPORTATION ANALYSIS VEHICLE TURNING MOVEMENT FORM

LOCATION: Paniolo Ave & Hooko St
DATE: 05/24/23 (Wednesday)
TIME: 2:45p-4:00p
WEATHER: Clear
RECORDER: JY

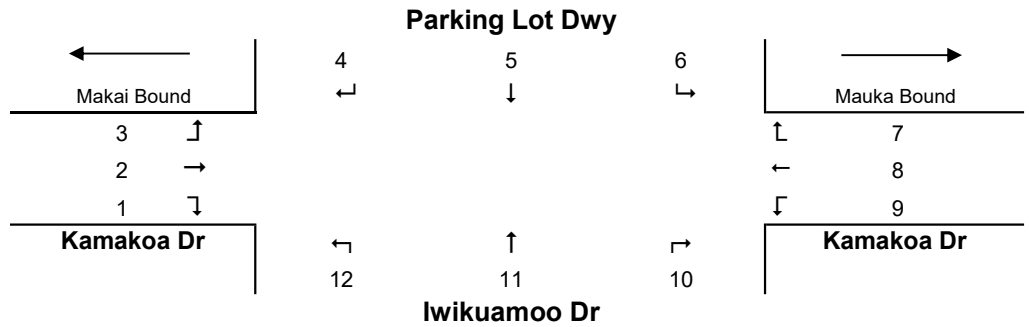


TIME PERIOD	MOVEMENT NUMBER											
	1	2	3	4	5	6	7	8	9	10	11	12
2:45-3:00p	19	0	1	1	6	1	0	3	14	9	15	25
3:00-3:15p	17	3	0	1	11	0	0	3	7	19	9	22
3:15-3:30p	18	2	0	0	15	1	1	3	10	20	8	25
3:30-3:45p	19	1	0	0	17	0	2	1	9	17	12	28
3:45-4:00p	24	4	0	1	5	0	0	5	13	14	10	38
Peak Hour 3:00-4:00p	78	10	0	2	48	1	3	12	39	70	39	113

Notes:

WAIKOLOA PUBLIC LIBRARY TRANSPORTATION ANALYSIS VEHICLE TURNING MOVEMENT FORM

LOCATION: Kamakoa Dr & Iwikuamoo Dr
DATE: 05/24/23 (Wednesday)
TIME: 2:45p-4:00p
WEATHER: Clear
RECORDER: ZC



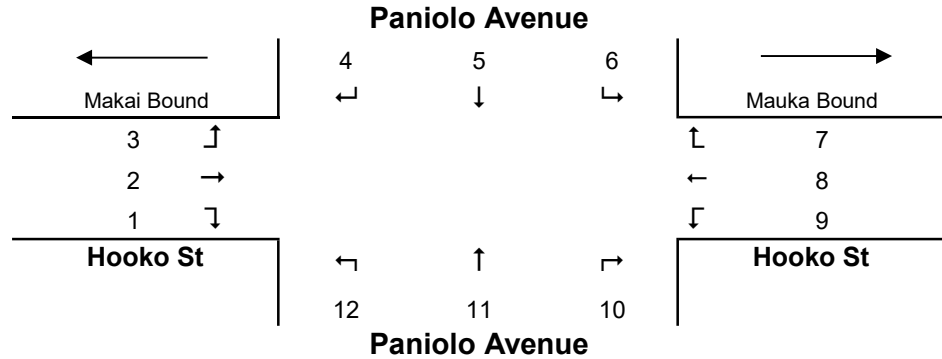
TIME PERIOD	MOVEMENT NUMBER											
	1	2	3	4	5	6	7	8	9	10	11	12
2:45-3:00p	0	0	0	0	0	1	0	0	1	0	0	0
3:00-3:15p	0	0	0	0	0	1	0	0	0	2	0	0
3:15-3:30p	0	0	0	0	0	1	1	0	1	0	0	0
3:30-3:45p	0	0	0	0	0	1	0	0	5	3	1	0
3:45-4:00p	0	0	0	0	0	0	0	0	2	3	0	0
Peak Hour 3:00-4:00p	0	0	0	0	0	3	1	0	8	8	1	0

Notes:

AM Peak Hour Pedestrian Volumes

WAIKOLOA PUBLIC LIBRARY TRANSPORTATION ANALYSIS PEDESTRIAN TURNING MOVEMENT FORM

LOCATION: Paniolo Ave & Hooko St
DATE: 05/24/23 (Wednesday)
TIME: 6:30a-8:30a
WEATHER: Clear
RECORDER: JY

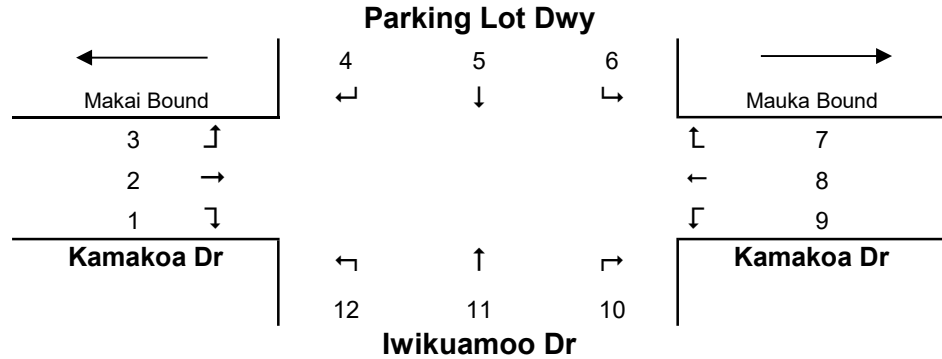


TIME PERIOD	MOVEMENT NUMBER											
	1	2	3	4	5	6	7	8	9	10	11	12
6:30-6:45a	0	0	0	2	0	0	0	1	0	0	0	0
6:45-7:00a	0	0	0	0	0	0	0	0	0	0	0	0
7:00-7:15a	0	0	1	0	0	0	0	0	0	0	2	0
7:15-7:30a	0	1	0	0	4	0	0	3	0	0	1	0
7:30-7:45a	0	0	0	0	8	0	0	5	0	0	0	0
7:45-8:00a	0	0	0	0	10	1	0	16	0	0	0	0
8:00-8:15a	0	0	0	0	0	0	0	4	0	0	1	0
8:15-8:30a	0	0	0	0	0	0	0	1	0	1	0	0
Peak Hour 7:15-8:15a	0	1	0	0	22	1	0	28	0	0	2	0

Notes: Movement 2, 5, 8, and 11 are movements in the crosswalks

WAIKOLOA PUBLIC LIBRARY TRANSPORTATION ANALYSIS PEDESTRIAN TURNING MOVEMENT FORM

LOCATION: Kamakoa Dr & Iwikuamoo Dr
DATE: 05/24/23 (Wednesday)
TIME: 6:30a-8:30a
WEATHER: Clear
RECORDER: ZC



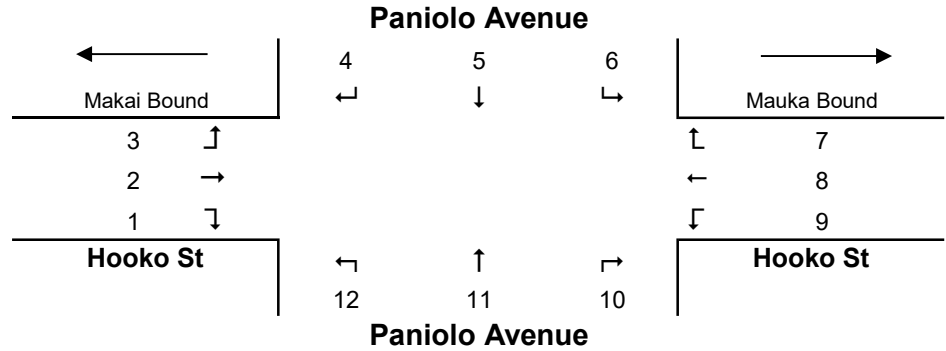
TIME PERIOD	MOVEMENT NUMBER											
	1	2	3	4	5	6	7	8	9	10	11	12
6:30-6:45a	0	0	0	0	0	0	0	1	0	0	0	0
6:45-7:00a	0	1	0	0	0	0	0	0	0	0	1	0
7:00-7:15a	0	2	0	0	1	0	1	0	0	0	0	0
7:15-7:30a	0	0	0	0	0	0	0	0	2	0	0	0
7:30-7:45a	0	0	0	0	1	0	0	0	0	0	0	0
7:45-8:00a	0	0	0	2	0	0	0	0	0	1	0	0
8:00-8:15a	0	0	1	0	0	0	0	0	0	1	0	0
8:15-8:30a	0	0	0	0	0	0	0	0	0	0	0	0
Peak Hour 7:15-8:15a	0	0	1	2	1	0	0	0	2	2	0	0

Notes: Movement 2, 5, 8, and 11 are movements in the crosswalks

Midday Peak Hour Pedestrian Volumes

WAIKOLOA PUBLIC LIBRARY TRANSPORTATION ANALYSIS PEDESTRIAN TURNING MOVEMENT FORM

LOCATION: Paniolo Ave & Hooko St
DATE: 05/24/23 (Wednesday)
TIME: 12:30p-2:00p
WEATHER: Clear
RECORDER: JY

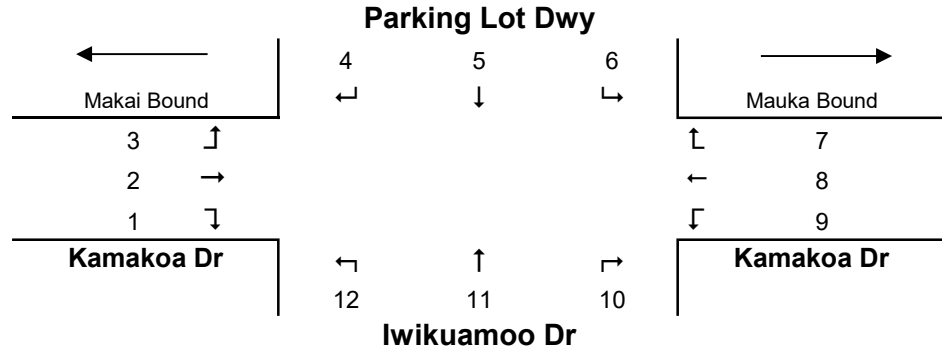


TIME PERIOD	MOVEMENT NUMBER											
	1	2	3	4	5	6	7	8	9	10	11	12
12:30-12:45p	0	0	0	0	0	0	0	0	0	0	0	0
12:45-1:00p	0	1	0	0	1	0	0	1	0	0	0	0
1:00-1:15p	0	36	0	0	0	0	0	1	0	0	10	0
1:15-1:30p	0	2	0	0	0	0	0	0	0	0	0	0
1:30-1:45p	0	2	0	0	1	0	0	2	0	0	0	0
1:45-2:00p	0	0	0	0	0	0	0	0	0	0	0	0
Peak Hour 12:45-1:45p	0	41	0	0	2	0	0	4	0	0	10	0

Notes: Movement 2, 5, 8, and 11 are movements in the crosswalks

WAIKOLOA PUBLIC LIBRARY TRANSPORTATION ANALYSIS PEDESTRIAN TURNING MOVEMENT FORM

LOCATION: Kamakoa Dr & Iwikuamoo Dr
DATE: 05/24/23 (Wednesday)
TIME: 12:30p-2:00p
WEATHER: Clear
RECORDER: ZC



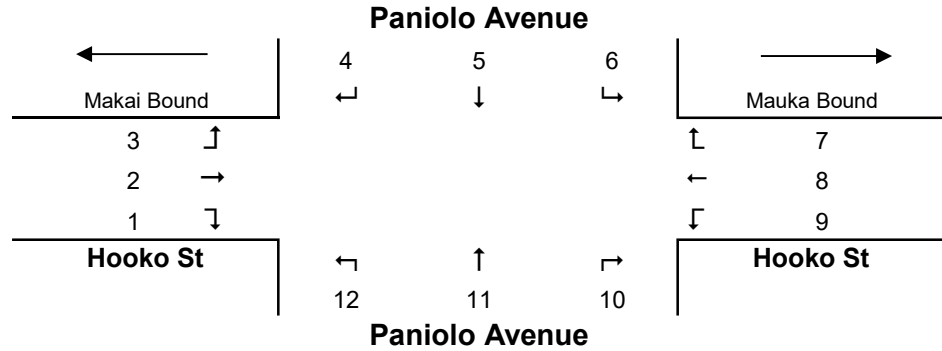
TIME PERIOD	MOVEMENT NUMBER											
	1	2	3	4	5	6	7	8	9	10	11	12
12:30-12:45p	0	0	0	0	0	0	0	0	0	0	0	0
12:45-1:00p	0	0	0	0	0	0	0	0	0	0	0	0
1:00-1:15p	0	0	0	0	0	0	0	0	0	0	0	0
1:15-1:30p	0	0	0	0	0	0	0	0	0	0	0	0
1:30-1:45p	0	0	0	0	0	0	0	0	0	0	1	0
1:45-2:00p	0	0	0	0	0	0	0	0	1	1	0	0
Peak Hour 12:45-1:45p	0	0	0	0	0	0	0	0	0	0	1	0

Notes: Movement 2, 5, 8, and 11 are movements in the crosswalks

PM Peak Hour Pedestrian Volumes

WAIKOLOA PUBLIC LIBRARY TRANSPORTATION ANALYSIS PEDESTRIAN TURNING MOVEMENT FORM

LOCATION: Paniolo Ave & Hooko St
DATE: 05/24/23 (Wednesday)
TIME: 2:45p-4:00p
WEATHER: Clear
RECORDER: JY

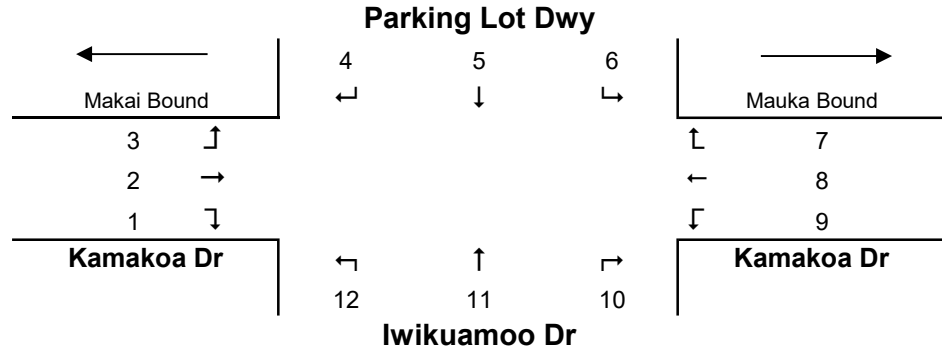


TIME PERIOD	MOVEMENT NUMBER											
	1	2	3	4	5	6	7	8	9	10	11	12
2:45-3:00p	0	0	0	0	0	0	0	0	0	0	0	0
3:00-3:15p	0	0	0	0	0	0	0	0	0	0	2	0
3:15-3:30p	0	0	1	1	1	0	0	1	1	0	0	1
3:30-3:45p	0	0	0	0	2	0	0	0	0	0	1	1
3:45-4:00p	2	1	0	1	1	0	0	2	0	0	0	0
Peak Hour 3:00-4:00p	2	1	1	2	4	0	0	3	1	0	3	2

Notes: Movement 2, 5, 8, and 11 are movements in the crosswalks

WAIKOLOA PUBLIC LIBRARY TRANSPORTATION ANALYSIS PEDESTRIAN TURNING MOVEMENT FORM

LOCATION: Kamakoa Dr & Iwikuamoo Dr
DATE: 05/24/23 (Wednesday)
TIME: 2:45p-4:00p
WEATHER: Clear
RECORDER: ZC



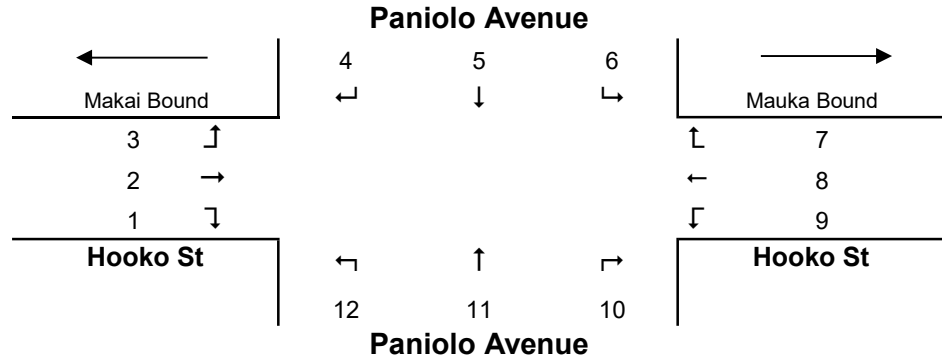
TIME PERIOD	MOVEMENT NUMBER											
	1	2	3	4	5	6	7	8	9	10	11	12
2:45-3:00p	0	0	0	0	0	0	0	0	0	0	0	0
3:00-3:15p	0	0	0	0	0	0	0	0	0	0	0	0
3:15-3:30p	0	0	0	0	0	0	2	0	0	0	0	0
3:30-3:45p	0	0	0	0	0	0	0	0	0	1	0	0
3:45-4:00p	0	0	0	0	0	0	1	0	0	0	0	0
Peak Hour 3:00-4:00p	0	0	0	0	0	0	3	0	0	1	0	0

Notes: Movement 2, 5, 8, and 11 are movements in the crosswalks

AM Peak Hour Bicycle Volumes

WAIKOLOA PUBLIC LIBRARY TRANSPORTATION ANALYSIS BICYCLE TURNING MOVEMENT FORM

LOCATION: Paniolo Ave & Hooko St
DATE: 05/24/23 (Wednesday)
TIME: 6:30a-8:30a
WEATHER: Clear
RECORDER: JY



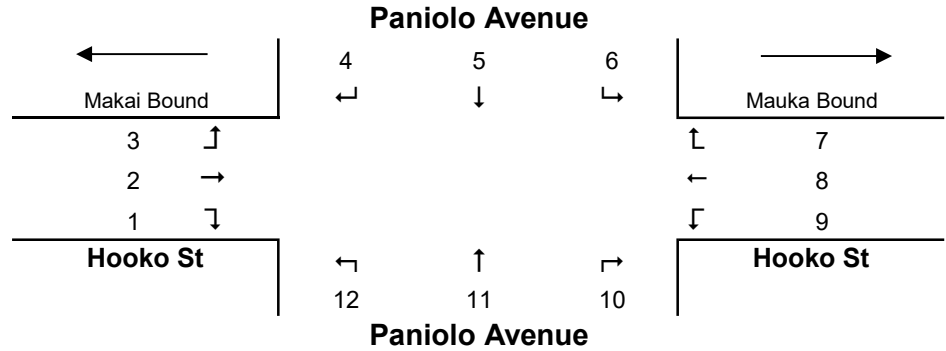
TIME PERIOD	MOVEMENT NUMBER											
	1	2	3	4	5	6	7	8	9	10	11	12
6:30-6:45a	0	0	0	0	0	0	0	1	0	0	0	0
6:45-7:00a	0	0	0	2	0	0	0	0	0	0	0	0
7:00-7:15a	0	0	0	2	0	0	0	0	0	0	0	0
7:15-7:30a	0	0	0	2	0	0	0	1	0	0	0	0
7:30-7:45a	0	0	0	1	0	0	0	1	0	0	0	0
7:45-8:00a	0	0	0	2	0	0	0	0	0	0	0	0
8:00-8:15a	0	0	0	0	0	1	0	0	0	0	0	0
8:15-8:30a	1	0	0	0	0	0	0	1	0	0	0	0
Peak Hour 7:15-8:15a	0	0	0	5	0	1	0	2	0	0	0	0

Notes:

Midday Peak Hour Bicycle Volumes

WAIKOLOA PUBLIC LIBRARY TRANSPORTATION ANALYSIS BICYCLE TURNING MOVEMENT FORM

LOCATION: Paniolo Ave & Hooko St
DATE: 05/24/23 (Wednesday)
TIME: 12:30p-2:00p
WEATHER: Clear
RECORDER: JY

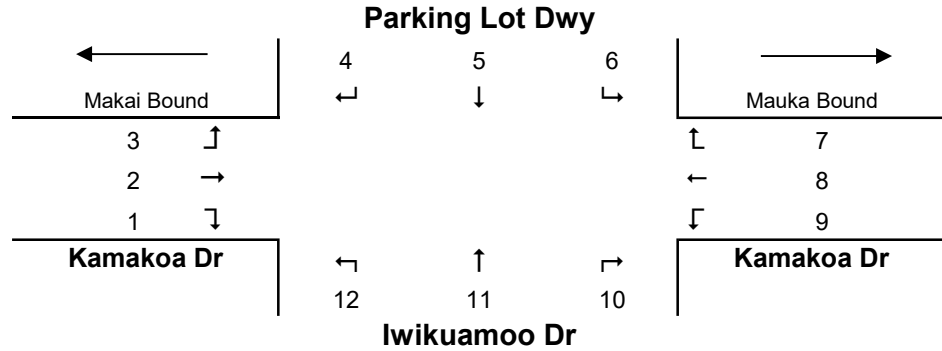


TIME PERIOD	MOVEMENT NUMBER											
	1	2	3	4	5	6	7	8	9	10	11	12
12:30-12:45p	0	0	0	0	0	0	0	0	0	0	0	0
12:45-1:00p	0	0	0	0	0	0	0	0	0	0	0	0
1:00-1:15p	0	1	0	0	0	0	0	0	0	0	1	0
1:15-1:30p	0	0	0	0	0	0	0	0	0	0	0	0
1:30-1:45p	0	1	0	0	0	0	0	1	0	0	0	0
1:45-2:00p	0	0	0	0	0	0	0	0	0	0	0	0
Peak Hour 12:45-1:45p	0	2	0	0	0	0	0	1	0	0	1	0

Notes:

WAIKOLOA PUBLIC LIBRARY TRANSPORTATION ANALYSIS BICYCLE TURNING MOVEMENT FORM

LOCATION: Kamakoa Dr & Iwikuamoo Dr
DATE: 05/24/23 (Wednesday)
TIME: 12:30p-2:00p
WEATHER: Clear
RECORDER: ZC



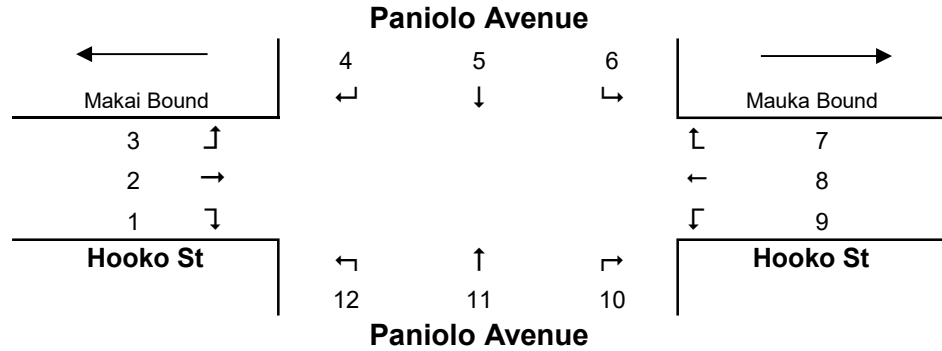
TIME PERIOD	MOVEMENT NUMBER											
	1	2	3	4	5	6	7	8	9	10	11	12
12:30-12:45p	0	0	0	0	0	0	0	0	0	0	0	0
12:45-1:00p	0	0	0	0	0	0	0	0	0	0	0	0
1:00-1:15p	0	0	0	0	0	0	0	0	0	0	0	0
1:15-1:30p	0	0	0	0	0	0	0	0	0	0	0	0
1:30-1:45p	0	0	0	0	0	0	0	0	0	0	0	0
1:45-2:00p	0	0	0	0	0	0	0	0	0	0	0	0
Peak Hour 12:45-1:45p	0	0	0	0	0	0	0	0	0	0	0	0

Notes:

PM Peak Hour Bicycle Volumes

WAIKOLOA PUBLIC LIBRARY TRANSPORTATION ANALYSIS BICYCLE TURNING MOVEMENT FORM

LOCATION: Paniolo Ave & Hooko St
DATE: 05/24/23 (Wednesday)
TIME: 2:45p-4:00p
WEATHER: Clear
RECORDER: JY

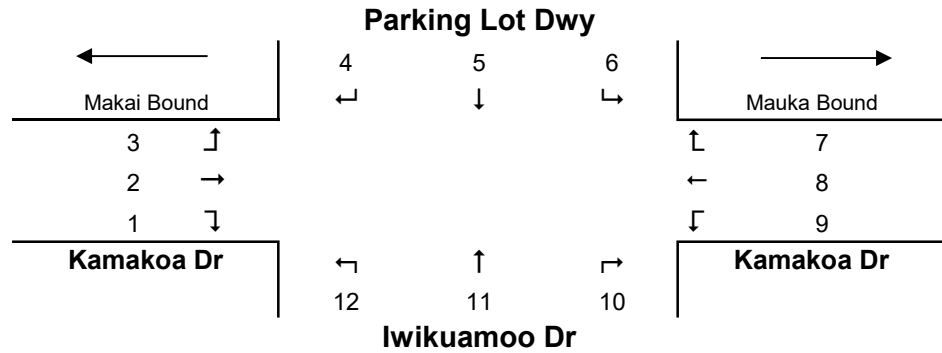


TIME PERIOD	MOVEMENT NUMBER											
	1	2	3	4	5	6	7	8	9	10	11	12
2:45-3:00p	0	0	0	0	0	0	0	0	0	0	0	0
3:00-3:15p	0	0	0	0	0	0	0	0	0	0	0	2
3:15-3:30p	0	0	0	0	0	0	0	0	0	0	0	0
3:30-3:45p	2	0	0	0	0	0	0	0	0	0	1	0
3:45-4:00p	0	0	0	0	0	0	0	2	3	0	0	0
Peak Hour 3:00-4:00p	2	0	0	0	0	0	0	2	3	0	1	2

Notes:

WAIKOLOA PUBLIC LIBRARY TRANSPORTATION ANALYSIS BICYCLE TURNING MOVEMENT FORM

LOCATION: Kamakoa Dr & Iwikuamoo Dr
DATE: 05/24/23 (Wednesday)
TIME: 2:45p-4:00p
WEATHER: Clear
RECORDER: ZC



TIME PERIOD	MOVEMENT NUMBER											
	1	2	3	4	5	6	7	8	9	10	11	12
2:45-3:00p	0	0	0	0	0	0	0	0	0	0	0	0
3:00-3:15p	0	0	0	0	0	0	0	0	0	0	0	0
3:15-3:30p	0	0	0	0	0	0	0	0	0	0	0	0
3:30-3:45p	0	0	0	0	0	0	0	0	0	0	0	0
3:45-4:00p	0	0	0	0	0	0	0	0	0	0	0	0
Peak Hour 3:00-4:00p	0	0	0	0	0	0	0	0	0	0	0	0

Notes:

Appendix B Synchro Worksheets

Existing Year 2023 AM Peak Hour

HCM 6th Signalized Intersection Summary

8: Paniolo Ave & Hooko St

07/21/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↗	↘		↗	↘		↗	↑	↗	↗	↗	↗
Traffic Volume (veh/h)	1	8	110	76	62	5	232	41	39	3	47	9
Future Volume (veh/h)	1	8	110	76	62	5	232	41	39	3	47	9
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	1	10	143	99	81	6	301	53	51	4	61	12
Peak Hour Factor	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	286	14	197	275	335	25	813	919	779	585	1073	205
Arrive On Green	0.00	0.13	0.13	0.06	0.19	0.19	0.14	0.49	0.49	0.01	0.36	0.36
Sat Flow, veh/h	1781	105	1496	1781	1720	127	1781	1870	1585	1781	2976	569
Grp Volume(v), veh/h	1	0	153	99	0	87	301	53	51	4	36	37
Grp Sat Flow(s),veh/h/ln	1781	0	1601	1781	0	1847	1781	1870	1585	1781	1777	1768
Q Serve(g_s), s	0.0	0.0	6.0	3.0	0.0	2.6	6.3	1.0	1.1	0.1	0.9	0.9
Cycle Q Clear(g_c), s	0.0	0.0	6.0	3.0	0.0	2.6	6.3	1.0	1.1	0.1	0.9	0.9
Prop In Lane	1.00		0.93	1.00		0.07	1.00		1.00	1.00		0.32
Lane Grp Cap(c), veh/h	286	0	211	275	0	360	813	919	779	585	641	637
V/C Ratio(X)	0.00	0.00	0.73	0.36	0.00	0.24	0.37	0.06	0.07	0.01	0.06	0.06
Avail Cap(c_a), veh/h	475	0	565	351	0	652	1063	919	779	794	641	637
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	24.5	0.0	27.1	21.8	0.0	22.2	8.8	8.7	8.7	13.1	13.6	13.6
Incr Delay (d2), s/veh	0.0	0.0	4.7	0.8	0.0	0.3	0.3	0.1	0.2	0.0	0.2	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	2.4	1.2	0.0	1.1	2.1	0.4	0.4	0.0	0.3	0.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	24.5	0.0	31.9	22.5	0.0	22.5	9.1	8.8	8.9	13.1	13.8	13.8
LnGrp LOS	C	A	C	C	A	C	A	A	A	B	B	B
Approach Vol, veh/h		154			186			405				77
Approach Delay, s/veh		31.8			22.5			9.0				13.7
Approach LOS		C			C			A				B
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	5.3	37.0	9.2	13.6	13.9	28.5	5.1	17.7				
Change Period (Y+Rc), s	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0				
Max Green Setting (Gmax), s	8.0	32.0	7.0	23.0	18.0	22.0	7.0	23.0				
Max Q Clear Time (g_c+I1), s	2.1	3.1	5.0	8.0	8.3	2.9	2.0	4.6				
Green Ext Time (p_c), s	0.0	0.4	0.0	0.7	0.6	0.3	0.0	0.3				
Intersection Summary												
HCM 6th Ctrl Delay			16.8									
HCM 6th LOS			B									

HCM 6th TWSC
3: Iwikuamoo Dr/Parking Lot & Kamakoa Dr

07/21/2023

Intersection												
Int Delay, s/veh	6.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		EBT			EBT			EBT			EBT	
Traffic Vol, veh/h	0	1	0	17	3	6	0	4	3	4	4	0
Future Vol, veh/h	0	1	0	17	3	6	0	4	3	4	4	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	77	77	77	77	77	77	77	77	77	77	77	77
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	1	0	22	4	8	0	5	4	5	5	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	12	0	0	1	0	0	50	57	1	55	53	6
Stage 1	-	-	-	-	-	-	1	1	-	52	52	-
Stage 2	-	-	-	-	-	-	49	56	-	3	1	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.54	6.54	6.94	7.54	6.54	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Follow-up Hdwy	2.22	-	-	2.22	-	-	3.52	4.02	3.32	3.52	4.02	3.32
Pot Cap-1 Maneuver	1605	-	-	1620	-	-	944	833	1083	936	838	1075
Stage 1	-	-	-	-	-	-	1021	895	-	954	851	-
Stage 2	-	-	-	-	-	-	958	848	-	1019	895	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1605	-	-	1620	-	-	930	821	1083	918	826	1075
Mov Cap-2 Maneuver	-	-	-	-	-	-	930	821	-	918	826	-
Stage 1	-	-	-	-	-	-	1021	895	-	954	839	-
Stage 2	-	-	-	-	-	-	939	836	-	1009	895	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	4.7	9	9.2
HCM LOS			A	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	916	1605	-	-	1620	-	-	870
HCM Lane V/C Ratio	0.01	-	-	-	0.014	-	-	0.012
HCM Control Delay (s)	9	0	-	-	7.3	0	-	9.2
HCM Lane LOS	A	A	-	-	A	A	-	A
HCM 95th %tile Q(veh)	0	0	-	-	0	-	-	0

Existing Year 2023 PM Peak Hour

HCM 6th Signalized Intersection Summary
 8: Paniolo Ave & Hooko St

06/27/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗		↖	↑	↗	↖	↗	
Traffic Volume (veh/h)	0	10	78	39	12	3	113	39	70	1	48	2
Future Volume (veh/h)	0	10	78	39	12	3	113	39	70	1	48	2
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	0	11	85	42	13	3	123	42	76	1	52	2
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	251	16	120	241	320	74	842	953	808	687	1516	58
Arrive On Green	0.00	0.08	0.08	0.04	0.22	0.22	0.08	0.51	0.51	0.00	0.43	0.43
Sat Flow, veh/h	1781	185	1428	1781	1470	339	1781	1870	1585	1781	3490	133
Grp Volume(v), veh/h	0	0	96	42	0	16	123	42	76	1	26	28
Grp Sat Flow(s),veh/h/ln	1781	0	1613	1781	0	1809	1781	1870	1585	1781	1777	1846
Q Serve(g_s), s	0.0	0.0	3.2	1.1	0.0	0.4	1.9	0.6	1.4	0.0	0.5	0.5
Cycle Q Clear(g_c), s	0.0	0.0	3.2	1.1	0.0	0.4	1.9	0.6	1.4	0.0	0.5	0.5
Prop In Lane	1.00		0.89	1.00		0.19	1.00		1.00	1.00		0.07
Lane Grp Cap(c), veh/h	251	0	135	241	0	393	842	953	808	687	772	802
V/C Ratio(X)	0.00	0.00	0.71	0.17	0.00	0.04	0.15	0.04	0.09	0.00	0.03	0.03
Avail Cap(c_a), veh/h	409	0	730	454	0	950	1092	953	808	942	772	802
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	0.0	24.7	20.1	0.0	17.1	6.5	6.8	7.0	8.8	9.0	9.0
Incr Delay (d2), s/veh	0.0	0.0	6.7	0.3	0.0	0.0	0.1	0.1	0.2	0.0	0.1	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	1.4	0.4	0.0	0.2	0.6	0.2	0.4	0.0	0.2	0.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	0.0	31.3	20.4	0.0	17.1	6.6	6.9	7.2	8.8	9.1	9.1
LnGrp LOS	A	A	C	C	A	B	A	A	A	A	A	A
Approach Vol, veh/h		96			58			241				55
Approach Delay, s/veh		31.3			19.5			6.8				9.1
Approach LOS		C			B			A				A
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	5.1	33.2	7.4	9.6	9.2	29.0	0.0	17.0				
Change Period (Y+Rc), s	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0				
Max Green Setting (Gmax), s	8.0	28.0	9.0	25.0	12.0	24.0	5.0	29.0				
Max Q Clear Time (g_c+I1), s	2.0	3.4	3.1	5.2	3.9	2.5	0.0	2.4				
Green Ext Time (p_c), s	0.0	0.4	0.0	0.4	0.2	0.2	0.0	0.0				
Intersection Summary												
HCM 6th Ctrl Delay			14.0									
HCM 6th LOS			B									

HCM 6th TWSC
 3: Iwikuamoo Dr/Parking Lot & Kamakoa Dr

06/27/2023

Intersection												
Int Delay, s/veh	7.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		EBT		EBT			EBT			EBT		
Traffic Vol, veh/h	0	0	0	8	0	1	0	1	8	3	0	0
Future Vol, veh/h	0	0	0	8	0	1	0	1	8	3	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	0	9	0	1	0	1	9	3	0	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	1	0	0	1	0	0	19	20	1	20	20	1
Stage 1	-	-	-	-	-	-	1	1	-	19	19	-
Stage 2	-	-	-	-	-	-	18	19	-	1	1	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.54	6.54	6.94	7.54	6.54	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Follow-up Hdwy	2.22	-	-	2.22	-	-	3.52	4.02	3.32	3.52	4.02	3.32
Pot Cap-1 Maneuver	1620	-	-	1620	-	-	992	873	1083	990	873	1083
Stage 1	-	-	-	-	-	-	1021	895	-	997	879	-
Stage 2	-	-	-	-	-	-	999	879	-	1021	895	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1620	-	-	1620	-	-	987	868	1083	976	868	1083
Mov Cap-2 Maneuver	-	-	-	-	-	-	987	868	-	976	868	-
Stage 1	-	-	-	-	-	-	1021	895	-	997	874	-
Stage 2	-	-	-	-	-	-	993	874	-	1012	895	-























Approach	EB			WB			NB			SB		
HCM Control Delay, s	0			6.4			8.4			8.7		
HCM LOS							A			A		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	1054	1620	-	-	1620	-	-	976
HCM Lane V/C Ratio	0.009	-	-	-	0.005	-	-	0.003
HCM Control Delay (s)	8.4	0	-	-	7.2	0	-	8.7
HCM Lane LOS	A	A	-	-	A	A	-	A
HCM 95th %tile Q(veh)	0	0	-	-	0	-	-	0

Future Year 2028 AM Peak Hour without Project

HCM 6th Signalized Intersection Summary
 8: Paniolo Ave & Hooko St

07/21/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	10	125	85	70	10	260	45	45	5	55	10
Future Volume (veh/h)	5	10	125	85	70	10	260	45	45	5	55	10
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	6	13	162	110	91	13	338	58	58	6	71	13
Peak Hour Factor	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	310	17	217	283	334	48	795	893	757	545	1000	178
Arrive On Green	0.01	0.15	0.15	0.07	0.21	0.21	0.15	0.48	0.48	0.01	0.33	0.33
Sat Flow, veh/h	1781	119	1484	1781	1601	229	1781	1870	1585	1781	3013	538
Grp Volume(v), veh/h	6	0	175	110	0	104	338	58	58	6	41	43
Grp Sat Flow(s),veh/h/ln	1781	0	1603	1781	0	1829	1781	1870	1585	1781	1777	1774
Q Serve(g_s), s	0.2	0.0	7.0	3.4	0.0	3.2	7.6	1.1	1.3	0.1	1.1	1.1
Cycle Q Clear(g_c), s	0.2	0.0	7.0	3.4	0.0	3.2	7.6	1.1	1.3	0.1	1.1	1.1
Prop In Lane	1.00		0.93	1.00		0.13	1.00		1.00	1.00		0.30
Lane Grp Cap(c), veh/h	310	0	234	283	0	381	795	893	757	545	590	589
V/C Ratio(X)	0.02	0.00	0.75	0.39	0.00	0.27	0.43	0.06	0.08	0.01	0.07	0.07
Avail Cap(c_a), veh/h	482	0	550	343	0	628	1000	893	757	744	590	589
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	24.1	0.0	27.4	21.5	0.0	22.3	9.8	9.4	9.5	14.7	15.3	15.3
Incr Delay (d2), s/veh	0.0	0.0	4.7	0.9	0.0	0.4	0.4	0.1	0.2	0.0	0.2	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	0.0	2.9	1.4	0.0	1.3	2.6	0.4	0.5	0.1	0.4	0.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	24.1	0.0	32.2	22.4	0.0	22.6	10.2	9.6	9.7	14.7	15.5	15.6
LnGrp LOS	C	A	C	C	A	C	B	A	A	B	B	B
Approach Vol, veh/h		181			214			454				90
Approach Delay, s/veh		31.9			22.5			10.0				15.5
Approach LOS		C			C			B				B
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	5.5	37.0	9.7	14.8	15.3	27.2	5.5	19.0				
Change Period (Y+Rc), s	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0				
Max Green Setting (Gmax), s	8.0	32.0	7.0	23.0	18.0	22.0	7.0	23.0				
Max Q Clear Time (g_c+I1), s	2.1	3.3	5.4	9.0	9.6	3.1	2.2	5.2				
Green Ext Time (p_c), s	0.0	0.5	0.0	0.8	0.7	0.3	0.0	0.4				
Intersection Summary												
HCM 6th Ctrl Delay			17.6									
HCM 6th LOS			B									

HCM 6th TWSC
3: Iwikuamoo Dr/Parking Lot & Kamakoa Dr

07/21/2023

Intersection												
Int Delay, s/veh	5.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		EBT			WBT			NBT			SBT	
Traffic Vol, veh/h	0	5	0	20	5	10	0	5	5	5	5	0
Future Vol, veh/h	0	5	0	20	5	10	0	5	5	5	5	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	77	77	77	77	77	77	77	77	77	77	77	77
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	6	0	26	6	13	0	6	6	6	6	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	19	0	0	6	0	0	64	77	3	71	71	10
Stage 1	-	-	-	-	-	-	6	6	-	65	65	-
Stage 2	-	-	-	-	-	-	58	71	-	6	6	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.54	6.54	6.94	7.54	6.54	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Follow-up Hdwy	2.22	-	-	2.22	-	-	3.52	4.02	3.32	3.52	4.02	3.32
Pot Cap-1 Maneuver	1596	-	-	1613	-	-	923	813	1080	912	819	1069
Stage 1	-	-	-	-	-	-	1015	890	-	938	840	-
Stage 2	-	-	-	-	-	-	947	835	-	1015	890	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1596	-	-	1613	-	-	906	800	1080	890	806	1069
Mov Cap-2 Maneuver	-	-	-	-	-	-	906	800	-	890	806	-
Stage 1	-	-	-	-	-	-	1015	890	-	938	827	-
Stage 2	-	-	-	-	-	-	925	822	-	1002	890	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	4.2	9	9.3
HCM LOS			A	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	919	1596	-	-	1613	-	-	846
HCM Lane V/C Ratio	0.014	-	-	-	0.016	-	-	0.015
HCM Control Delay (s)	9	0	-	-	7.3	0	-	9.3
HCM Lane LOS	A	A	-	-	A	A	-	A
HCM 95th %tile Q(veh)	0	0	-	-	0	-	-	0

Future Year 2028 PM Peak Hour without Project

HCM 6th Signalized Intersection Summary

8: Paniolo Ave & Hooko St

07/03/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	15	90	45	15	5	125	45	80	5	55	5
Future Volume (veh/h)	0	15	90	45	15	5	125	45	80	5	55	5
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	0	16	98	49	16	5	136	49	87	5	60	5
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	269	23	139	252	321	100	816	924	783	669	1406	116
Arrive On Green	0.00	0.10	0.10	0.05	0.24	0.24	0.08	0.49	0.49	0.01	0.42	0.42
Sat Flow, veh/h	1781	227	1392	1781	1366	427	1781	1870	1585	1781	3324	274
Grp Volume(v), veh/h	0	0	114	49	0	21	136	49	87	5	32	33
Grp Sat Flow(s),veh/h/ln	1781	0	1620	1781	0	1793	1781	1870	1585	1781	1777	1821
Q Serve(g_s), s	0.0	0.0	3.9	1.3	0.0	0.5	2.3	0.8	1.7	0.1	0.6	0.6
Cycle Q Clear(g_c), s	0.0	0.0	3.9	1.3	0.0	0.5	2.3	0.8	1.7	0.1	0.6	0.6
Prop In Lane	1.00		0.86	1.00		0.24	1.00		1.00	1.00		0.15
Lane Grp Cap(c), veh/h	269	0	161	252	0	422	816	924	783	669	751	770
V/C Ratio(X)	0.00	0.00	0.71	0.19	0.00	0.05	0.17	0.05	0.11	0.01	0.04	0.04
Avail Cap(c_a), veh/h	422	0	713	450	0	916	1054	924	783	908	751	770
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	0.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	0.0	24.7	19.8	0.0	16.8	7.1	7.5	7.7	9.3	9.6	9.6
Incr Delay (d2), s/veh	0.0	0.0	5.6	0.4	0.0	0.0	0.1	0.1	0.3	0.0	0.1	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	1.6	0.5	0.0	0.2	0.7	0.3	0.5	0.0	0.2	0.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	0.0	30.3	20.2	0.0	16.8	7.2	7.6	8.0	9.3	9.7	9.7
LnGrp LOS	A	A	C	C	A	B	A	A	A	A	A	A
Approach Vol, veh/h		114			70			272			70	
Approach Delay, s/veh		30.3			19.2			7.5			9.7	
Approach LOS		C			B			A			A	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	5.4	33.0	7.7	10.7	9.4	29.0	0.0	18.3				
Change Period (Y+Rc), s	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0				
Max Green Setting (Gmax), s	8.0	28.0	9.0	25.0	12.0	24.0	5.0	29.0				
Max Q Clear Time (g_c+I1), s	2.1	3.7	3.3	5.9	4.3	2.6	0.0	2.5				
Green Ext Time (p_c), s	0.0	0.5	0.0	0.5	0.2	0.2	0.0	0.1				
Intersection Summary												
HCM 6th Ctrl Delay			14.3									
HCM 6th LOS			B									

HCM 6th TWSC
3: Iwikuamoo Dr/Parking Lot & Kamakoa Dr

07/03/2023

Intersection												
Int Delay, s/veh	6.8											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		EBT		WBT			NBT			SBT		
Traffic Vol, veh/h	0	0	0	10	0	5	0	5	10	5	0	0
Future Vol, veh/h	0	0	0	10	0	5	0	5	10	5	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	0	11	0	5	0	5	11	5	0	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	5	0	0	1	0	0	23	28	1	28	26	3
Stage 1	-	-	-	-	-	-	1	1	-	25	25	-
Stage 2	-	-	-	-	-	-	22	27	-	3	1	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.54	6.54	6.94	7.54	6.54	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Follow-up Hdwy	2.22	-	-	2.22	-	-	3.52	4.02	3.32	3.52	4.02	3.32
Pot Cap-1 Maneuver	1615	-	-	1620	-	-	986	864	1083	978	867	1080
Stage 1	-	-	-	-	-	-	1021	895	-	989	874	-
Stage 2	-	-	-	-	-	-	993	872	-	1019	895	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1615	-	-	1620	-	-	981	858	1083	958	861	1080
Mov Cap-2 Maneuver	-	-	-	-	-	-	981	858	-	958	861	-
Stage 1	-	-	-	-	-	-	1021	895	-	989	868	-
Stage 2	-	-	-	-	-	-	986	866	-	1003	895	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	4.8	8.7	8.8
HCM LOS			A	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	996	1615	-	-	1620	-	-	958
HCM Lane V/C Ratio	0.016	-	-	-	0.007	-	-	0.006
HCM Control Delay (s)	8.7	0	-	-	7.2	0	-	8.8
HCM Lane LOS	A	A	-	-	A	A	-	A
HCM 95th %tile Q(veh)	0.1	0	-	-	0	-	-	0

Future Year 2028 AM Peak Hour with Project

HCM 6th Signalized Intersection Summary

8: Paniolo Ave & Hooko St

07/21/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	10	137	85	70	10	279	48	45	5	60	10
Future Volume (veh/h)	5	10	137	85	70	10	279	48	45	5	60	10
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	6	13	178	110	91	13	362	62	58	6	78	13
Peak Hour Factor	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	320	17	232	278	348	50	790	890	754	526	979	159
Arrive On Green	0.01	0.16	0.16	0.07	0.22	0.22	0.16	0.48	0.48	0.01	0.32	0.32
Sat Flow, veh/h	1781	109	1493	1781	1601	229	1781	1870	1585	1781	3059	498
Grp Volume(v), veh/h	6	0	191	110	0	104	362	62	58	6	45	46
Grp Sat Flow(s),veh/h/ln	1781	0	1602	1781	0	1829	1781	1870	1585	1781	1777	1781
Q Serve(g_s), s	0.2	0.0	7.9	3.4	0.0	3.2	8.5	1.2	1.4	0.2	1.2	1.3
Cycle Q Clear(g_c), s	0.2	0.0	7.9	3.4	0.0	3.2	8.5	1.2	1.4	0.2	1.2	1.3
Prop In Lane	1.00		0.93	1.00		0.13	1.00		1.00	1.00		0.28
Lane Grp Cap(c), veh/h	320	0	249	278	0	398	790	890	754	526	569	570
V/C Ratio(X)	0.02	0.00	0.77	0.40	0.00	0.26	0.46	0.07	0.08	0.01	0.08	0.08
Avail Cap(c_a), veh/h	487	0	536	336	0	612	965	890	754	719	569	570
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	24.1	0.0	27.8	21.6	0.0	22.3	10.3	9.8	9.8	15.6	16.3	16.3
Incr Delay (d2), s/veh	0.0	0.0	4.9	0.9	0.0	0.3	0.4	0.2	0.2	0.0	0.3	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	0.0	3.2	1.4	0.0	1.4	3.0	0.5	0.5	0.1	0.5	0.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	24.1	0.0	32.7	22.5	0.0	22.7	10.8	9.9	10.0	15.6	16.6	16.6
LnGrp LOS	C	A	C	C	A	C	B	A	B	B	B	B
Approach Vol, veh/h		197			214			482				97
Approach Delay, s/veh		32.4			22.6			10.6				16.5
Approach LOS		C			C			B				B
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	5.5	37.7	9.8	15.7	16.2	27.0	5.5	19.9				
Change Period (Y+Rc), s	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0				
Max Green Setting (Gmax), s	8.0	32.0	7.0	23.0	18.0	22.0	7.0	23.0				
Max Q Clear Time (g_c+I1), s	2.2	3.4	5.4	9.9	10.5	3.3	2.2	5.2				
Green Ext Time (p_c), s	0.0	0.5	0.0	0.9	0.7	0.4	0.0	0.4				
Intersection Summary												
HCM 6th Ctrl Delay			18.1									
HCM 6th LOS			B									

HCM 6th TWSC
 3: Iwikuamoo Dr/Parking Lot & Kamakoa Dr

07/21/2023

Intersection												
Int Delay, s/veh	5.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Vol, veh/h	0	10	12	20	8	10	19	5	5	5	5	0
Future Vol, veh/h	0	10	12	20	8	10	19	5	5	5	5	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	77	77	77	77	77	77	77	77	77	77	77	77
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	13	16	26	10	13	25	6	6	6	6	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	23	0	0	29	0	0	81	96	15	79	98	12
Stage 1	-	-	-	-	-	-	21	21	-	69	69	-
Stage 2	-	-	-	-	-	-	60	75	-	10	29	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.54	6.54	6.94	7.54	6.54	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Follow-up Hdwy	2.22	-	-	2.22	-	-	3.52	4.02	3.32	3.52	4.02	3.32
Pot Cap-1 Maneuver	1591	-	-	1582	-	-	898	793	1061	901	791	1065
Stage 1	-	-	-	-	-	-	995	877	-	933	837	-
Stage 2	-	-	-	-	-	-	944	832	-	1009	870	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1591	-	-	1582	-	-	881	780	1061	878	778	1065
Mov Cap-2 Maneuver	-	-	-	-	-	-	881	780	-	878	778	-
Stage 1	-	-	-	-	-	-	995	877	-	933	823	-
Stage 2	-	-	-	-	-	-	921	818	-	995	870	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	3.8	9.2	9.4
HCM LOS			A	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	887	1591	-	-	1582	-	-	825
HCM Lane V/C Ratio	0.042	-	-	-	0.016	-	-	0.016
HCM Control Delay (s)	9.2	0	-	-	7.3	0	-	9.4
HCM Lane LOS	A	A	-	-	A	A	-	A
HCM 95th %tile Q(veh)	0.1	0	-	-	0.1	-	-	0

Future Year 2028 PM Peak Hour with Project

HCM 6th Signalized Intersection Summary
 8: Paniolo Ave & Hooko St

07/03/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	15	130	45	15	5	171	60	80	5	81	5
Future Volume (veh/h)	0	15	130	45	15	5	171	60	80	5	81	5
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	0	16	141	49	16	5	186	65	87	5	88	5
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	308	22	192	251	359	112	778	901	763	624	1364	77
Arrive On Green	0.00	0.13	0.13	0.05	0.26	0.26	0.09	0.48	0.48	0.01	0.40	0.40
Sat Flow, veh/h	1781	164	1446	1781	1366	427	1781	1870	1585	1781	3420	193
Grp Volume(v), veh/h	0	0	157	49	0	21	186	65	87	5	45	48
Grp Sat Flow(s),veh/h/ln	1781	0	1610	1781	0	1793	1781	1870	1585	1781	1777	1836
Q Serve(g_s), s	0.0	0.0	5.6	1.3	0.0	0.5	3.4	1.1	1.8	0.1	0.9	1.0
Cycle Q Clear(g_c), s	0.0	0.0	5.6	1.3	0.0	0.5	3.4	1.1	1.8	0.1	0.9	1.0
Prop In Lane	1.00		0.90	1.00		0.24	1.00		1.00	1.00		0.11
Lane Grp Cap(c), veh/h	308	0	214	251	0	471	778	901	763	624	709	732
V/C Ratio(X)	0.00	0.00	0.73	0.20	0.00	0.04	0.24	0.07	0.11	0.01	0.06	0.07
Avail Cap(c_a), veh/h	453	0	669	434	0	864	974	901	763	849	709	732
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	0.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	0.0	25.1	19.7	0.0	16.6	7.8	8.4	8.6	10.7	11.2	11.2
Incr Delay (d2), s/veh	0.0	0.0	4.8	0.4	0.0	0.0	0.2	0.2	0.3	0.0	0.2	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	2.3	0.5	0.0	0.2	1.1	0.4	0.6	0.0	0.4	0.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	0.0	29.9	20.1	0.0	16.6	7.9	8.5	8.9	10.7	11.3	11.3
LnGrp LOS	A	A	C	C	A	B	A	A	A	B	B	B
Approach Vol, veh/h		157			70			338				98
Approach Delay, s/veh		29.9			19.0			8.3				11.3
Approach LOS		C			B			A				B
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	5.4	34.0	7.8	13.0	10.4	29.0	0.0	20.8				
Change Period (Y+Rc), s	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0				
Max Green Setting (Gmax), s	8.0	28.0	9.0	25.0	12.0	24.0	5.0	29.0				
Max Q Clear Time (g_c+I1), s	2.1	3.8	3.3	7.6	5.4	3.0	0.0	2.5				
Green Ext Time (p_c), s	0.0	0.6	0.0	0.8	0.3	0.4	0.0	0.1				
Intersection Summary												
HCM 6th Ctrl Delay			15.0									
HCM 6th LOS			B									

HCM 6th TWSC
3: Iwikuamoo Dr/Parking Lot & Kamakoa Dr

07/03/2023

Intersection												
Int Delay, s/veh	4.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		EB			WB			NB			SB	
Traffic Vol, veh/h	0	26	40	10	15	5	46	5	10	5	0	0
Future Vol, veh/h	0	26	40	10	15	5	46	5	10	5	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	28	43	11	16	5	50	5	11	5	0	0

Major/Minor	Major1		Major2		Minor1		Minor2					
Conflicting Flow All	21	0	0	71	0	0	80	93	36	58	112	11
Stage 1	-	-	-	-	-	-	50	50	-	41	41	-
Stage 2	-	-	-	-	-	-	30	43	-	17	71	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.54	6.54	6.94	7.54	6.54	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Follow-up Hdwy	2.22	-	-	2.22	-	-	3.52	4.02	3.32	3.52	4.02	3.32
Pot Cap-1 Maneuver	1593	-	-	1527	-	-	899	796	1029	932	777	1067
Stage 1	-	-	-	-	-	-	957	853	-	968	860	-
Stage 2	-	-	-	-	-	-	983	858	-	1000	835	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1593	-	-	1527	-	-	895	790	1029	912	772	1067
Mov Cap-2 Maneuver	-	-	-	-	-	-	895	790	-	912	772	-
Stage 1	-	-	-	-	-	-	957	853	-	968	854	-
Stage 2	-	-	-	-	-	-	976	852	-	983	835	-

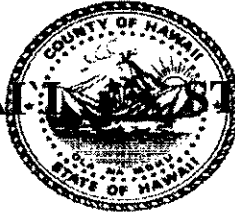
Approach	EB		WB		NB		SB	
HCM Control Delay, s	0		2.5		9.3		9	
HCM LOS					A		A	

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	904	1593	-	-	1527	-	-	912
HCM Lane V/C Ratio	0.073	-	-	-	0.007	-	-	0.006
HCM Control Delay (s)	9.3	0	-	-	7.4	0	-	9
HCM Lane LOS	A	A	-	-	A	A	-	A
HCM 95th %tile Q(veh)	0.2	0	-	-	0	-	-	0

Appendix K:
County of Hawai'i Council Resolution
No. 416-07



COUNTY OF HAWAII STATE OF HAWAII



RESOLUTION NO. 416 07

RESOLUTION AUTHORIZING THE EXEMPTION OF CERTAIN ZONING CODE REQUIREMENTS FOR THE WAIKOLOA EMPLOYEE HOUSING PROJECT PURSUANT TO CHAPTER 46-15 OF THE HAWAII`I REVISED STATUTES

WHEREAS, on September 7, 2006, the Hawai`i County Council adopted Resolution No. 439-06 which designated the Waikoloa Workforce Housing Project (WWHP) as an "Experimental and Demonstration Housing Project" as provided by Section 46-15, Hawai`i Revised Statutes (HRS); and

WHEREAS, since the approval of Resolution No. 439-06, the Office of Housing and Community Development and UniDev Hawai`i, LLC, has determined that it is necessary to revise a few of the previously approved exemptions and to add some exemptions; and

WHEREAS, as the project progresses it may be necessary to further amend the list of exemptions for future phases; and

WHEREAS, the Office of Housing and Community Development wishes to amend Resolution No. 439-06.

NOW, THEREFORE, BE IT RESOLVED BY THE COUNCIL OF THE COUNTY OF HAWAII`I, that the project site, identified on a map attached hereto as Exhibit "A", shall be exempt from certain laws, code requirements and standards, as established by the Department of Public Works and the Planning Department as identified in Exhibits "B" and "C"; and

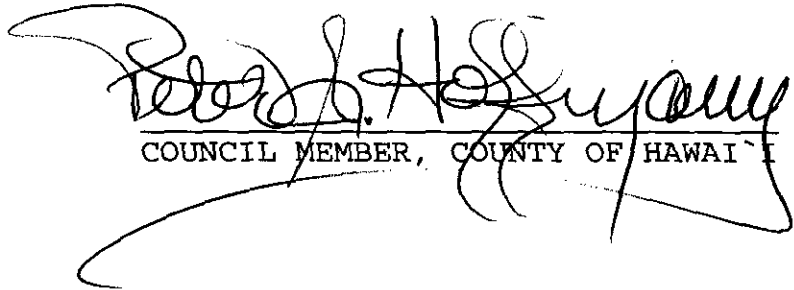
BE IT FURTHER RESOLVED, that the Mayor is authorized to designate the Housing Administrator of the County of Hawai`i to serve as the designated County Official to administer the "Experimental and Demonstration Housing Project" as provided by Section 46-15, HRS.

BE IT FURTHER RESOLVED, that copies of this Resolution be sent to the Office of Housing and Community Development, Department of Public Works, Planning Department and the Hawai'i Island Housing Trust.

BE IT FURTHER RESOLVED, that this resolution shall take effect immediately.

Dated at Kona, Hawai'i, this 20th day of November, 2007.

INTRODUCED BY:


COUNCIL MEMBER, COUNTY OF HAWAI'I

COUNTY COUNCIL
County of Hawai'i
Hilo, Hawai'i

ROLL CALL VOTE

I hereby certify that the foregoing RESOLUTION was by the vote indicated to the right hereof adopted by the COUNCIL of the County of Hawai'i on November 20, 2007.

ATTEST:

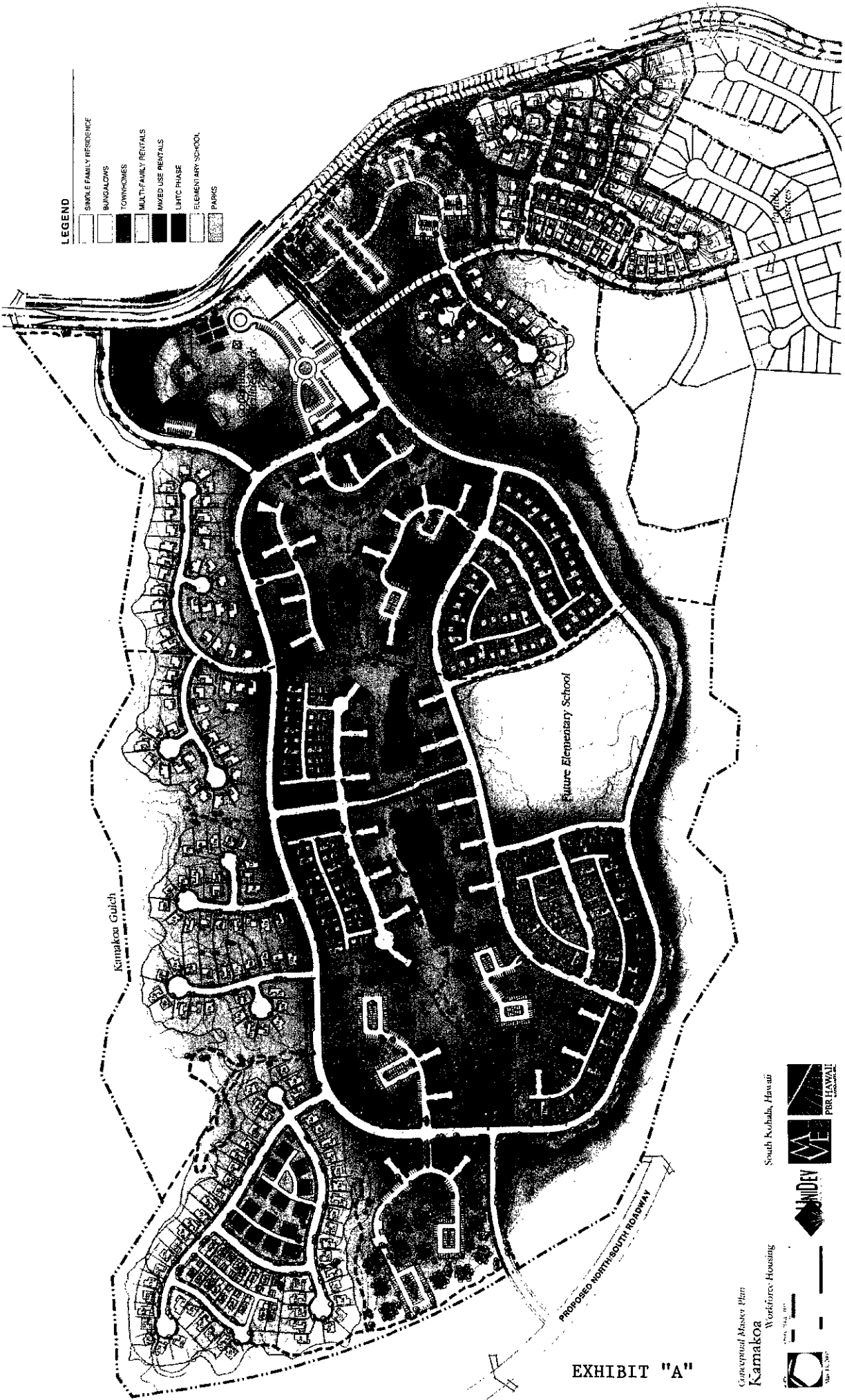
	AYES	NOES	ABS	EX
FORD	X			
HIGA	X			
HOFFMANN	X			
IKEDA	X			
JACOBSON	X			
NAEOLE	X			
PILAGO	X			
YAGONG			X	
YOSHIMOTO	X			
	8	0	1	0


COUNTY CLERK


CHAIRMAN & PRESIDING OFFICER

Reference C-798/CHA - 11/6/07

RESOLUTION NO. 416 07



- LEGEND**
- SINGLE FAMILY RESIDENCE
 - BUNGALOWS
 - TOWNHOUSES
 - MULTI-FAMILY RENTALS
 - MIXED USE RENTALS
 - LIMFC PHASE
 - ELEMENTARY SCHOOL
 - PARKS

Kamakoa Gulch

Future Elementary School

PROPOSED NORTH-SOUTH ROADWAY




EXHIBIT "A"







Conceptual Master Plan
Kamakoa
 Workforce Housing



South Kohala, Hawaii

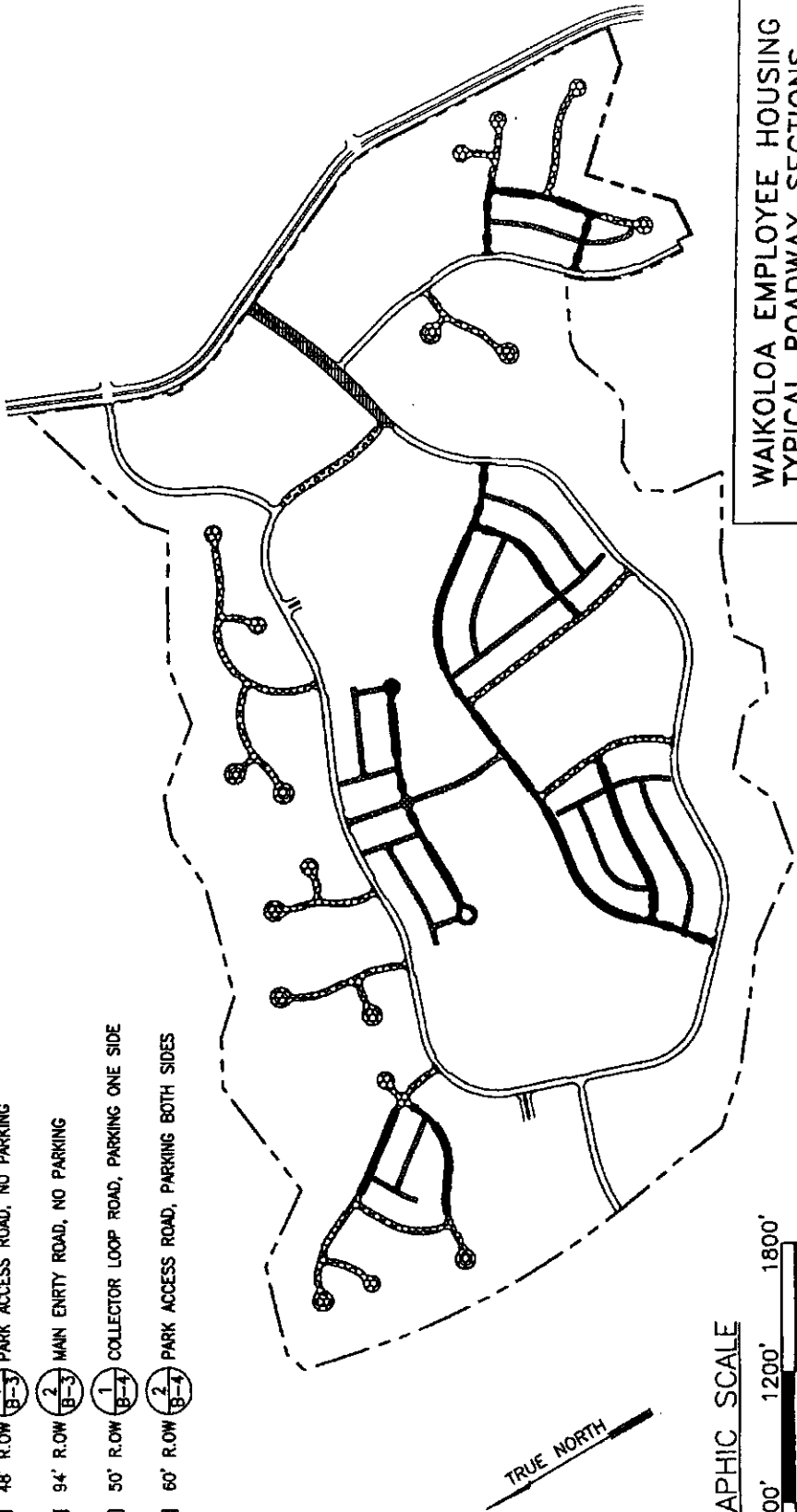
SCALE
 0 100 200 FT

DATE: 11.2017


-  67' R.O.W. $\frac{1}{B-2}$ ROAD IN FRONT OF SCHOOL, PARKING ON BOTH SIDES
-  50' R.O.W. $\frac{2}{B-2}$ CUL-DE-SAC, PARKING ONE SIDE
-  48' R.O.W. $\frac{1}{B-3}$ PARK ACCESS ROAD, NO PARKING
-  94' R.O.W. $\frac{2}{B-3}$ MAIN ENTRY ROAD, NO PARKING
-  50' R.O.W. $\frac{1}{B-4}$ COLLECTOR LOOP ROAD, PARKING ONE SIDE
-  60' R.O.W. $\frac{2}{B-4}$ PARK ACCESS ROAD, PARKING BOTH SIDES

-  20' R.O.W. $\frac{1}{B-5}$ ALLEY, NO PARKING
-  58' R.O.W. $\frac{2}{B-5}$ CONNECTOR ROAD, PARKING BOTH SIDES

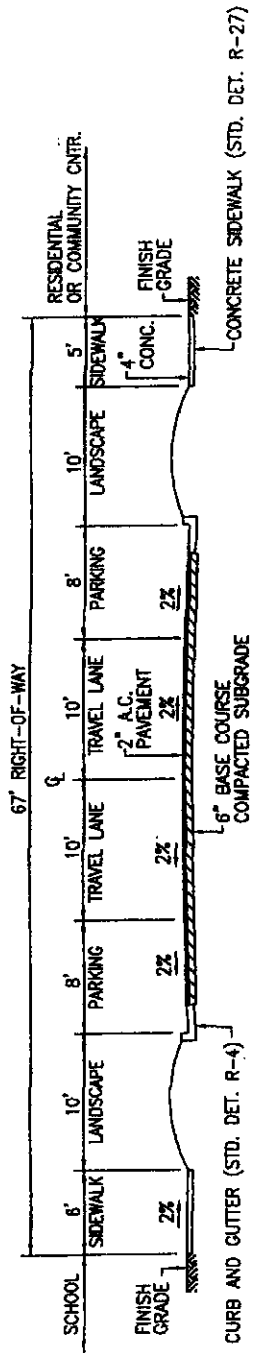


GRAPHIC SCALE

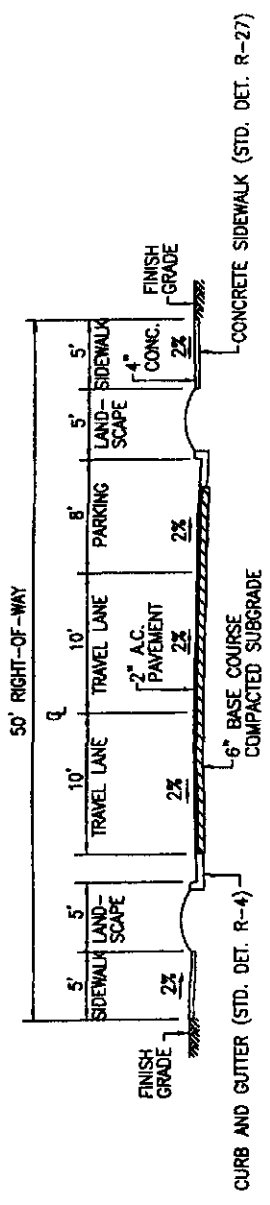


WAIKOLOA EMPLOYEE HOUSING
TYPICAL ROADWAY SECTIONS
EXHIBIT B-1

EXHIBIT "B"

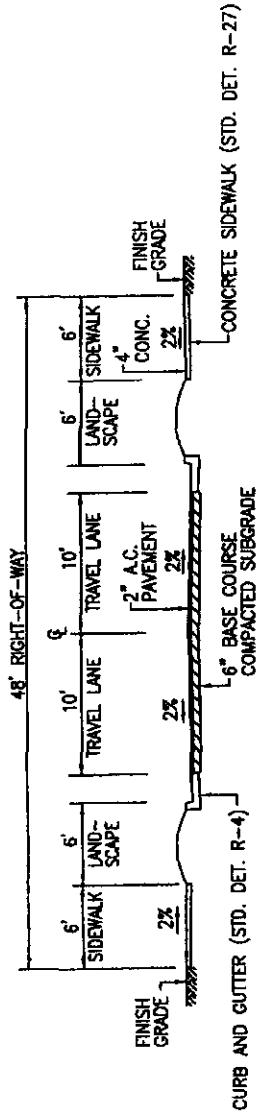


1 67' RIGHT-OF-WAY, ROAD IN FRONT OF SCHOOL, PARKING BOTH SIDES
 B-2 SCALE: 1"=10'

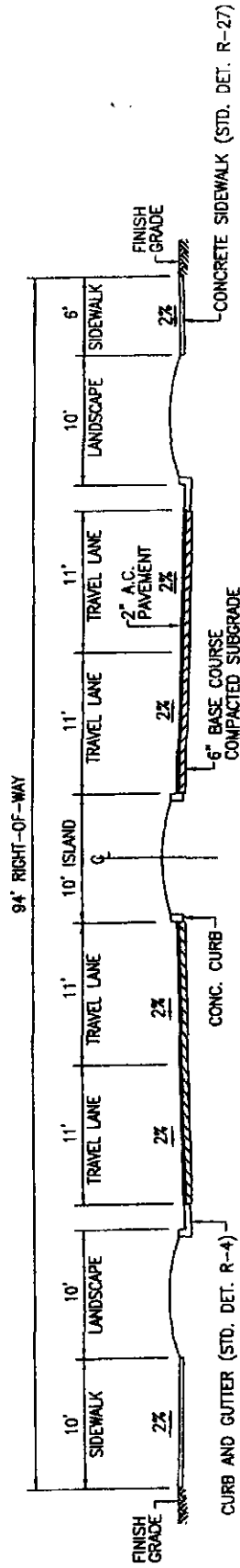


2 50' RIGHT-OF-WAY, CUL-DE-SAC STREET, PARKING ONE SIDE
 B-2 SCALE: 1"=10'

WAIKOLOA EMPLOYEE HOUSING
 TYPICAL ROADWAY SECTIONS
 EXHIBIT 9-2



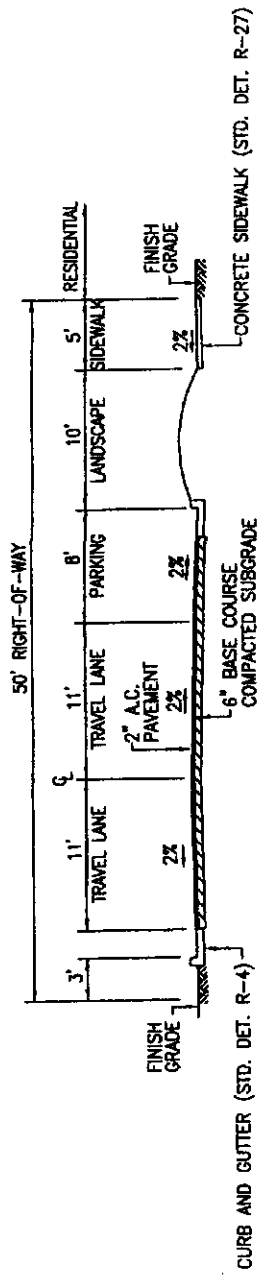
1 48' RIGHT-OF-WAY, PARK ACCESS ROAD, NO PARKING
SCALE: 1"=10'



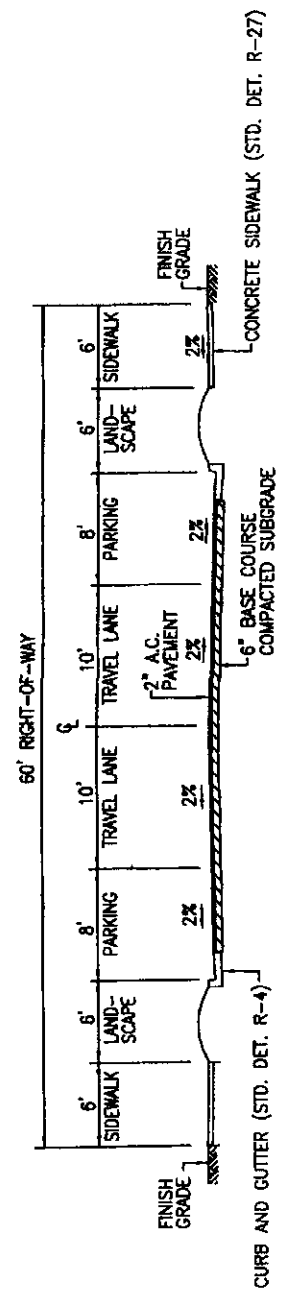
2 94' RIGHT-OF-WAY, MAIN ENTRY ROAD, NO PARKING
SCALE: 1"=10'

WAIKOLOA EMPLOYEE HOUSING
TYPICAL ROADWAY SECTIONS

EXHIBIT B-3

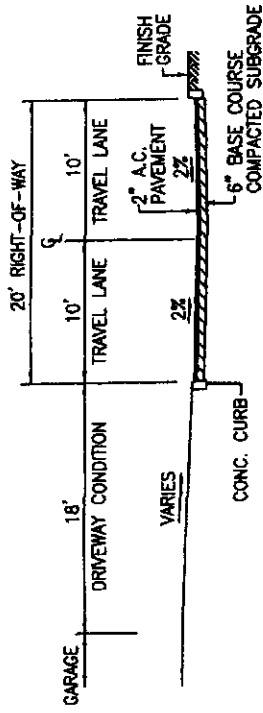


1 50' RIGHT-OF-WAY, COLLECTOR LOOP ROAD, PARKING ONE SIDE
 B-4 SCALE: 1"=10'

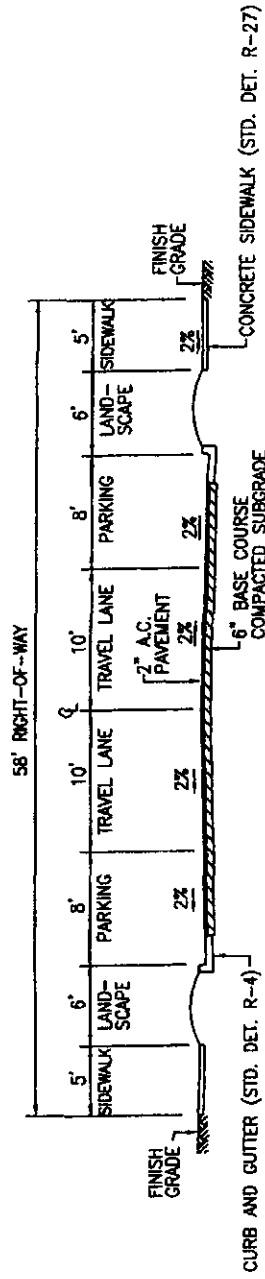


2 60' RIGHT-OF-WAY, PARK ACCESS ROAD, PARKING BOTH SIDES
 B-4 SCALE: 1"=10'

WAIKOLOA EMPLOYEE HOUSING
 TYPICAL ROADWAY SECTIONS
 EXHIBIT B-4



1. 20' RIGHT-OF-WAY, ALLEY, NO PARKING
 8-5 SCALE: 1"=10'



2. 58' RIGHT-OF-WAY, CONNECTOR ROAD, PARKING BOTH SIDES
 8-5 SCALE: 1"=10'

WAIKOLOA EMPLOYEE HOUSING
 TYPICAL ROADWAY SECTIONS

EXHIBIT 8-5

KAMAKOIA

(Waikoloa Employee Housing Project)

List of Preemptions from the Hawaii County Code (HCC) and Hawaii Revised Statutes (HRS)

1.0 Site Plan

1.1 Article 3, Division 2, Section 23-29 (c) (Hawaii County Code). Block sizes.

Waiving the recommended minimum distance between intersections on arterial streets.

The minimum distance between intersections on arterial streets will be less than the recommended eighteen hundred feet to accommodate the two main Project intersections with the planned extension of Paniolo Avenue (designated as a secondary arterial street on the County General Plan.) Intersection locations are reflected on construction plans for the extension of Paniolo Avenue being prepared by Waikoloa Heights, developers of the adjoining subdivision, which will be reviewed and approved by the Director of Public Works.

1.2 Article 3, Division 3, Section 23-32 (Hawaii County Code). Lot size, shape, and setback line.

Waiving the requirement of Section 23-32 that the lot size, width, shape, and orientation and minimum building setback lines be in conformance with the provisions of Chapter 25, Zoning Code.

Lot sizes, shapes, setbacks will vary from that specified within the County Code to accommodate a mix of product type, increase the efficiency of the land use, and thus yield a more compact and pedestrian oriented development. The widths, shape and setback lines for such lots will conform to specific standards approved by the County Council for the Waikoloa Employee Housing Project (Project), as detailed below.

1.3 Article 3, Division 3, Section 23-33 (Hawaii County Code). Minimum Lot Sizes

Waiving the requirement of Section 23-33 (a) that the minimum sizes of various types of lots shall be in conformance with the provisions of Chapter 25, Zoning Code.

The minimum lot size for the Waikoloa Employee Housing project will be twenty-five hundred (2,500) square feet, except for Town Home lots indicated in Exhibit "A-1", which shall have a minimum lot size of fifteen hundred (1,500) square feet.

1.4 Article 2, Division 6, Section 25-2-61 (a) (Hawaii County Code). Applicability; use permit required.

Waiving the provisions within Section 25-2-61 (a) requiring a use permit for meeting facilities, day care facilities, and schools.

Meeting facilities, a day care facility, and a public elementary school are uses specifically proposed for the Project as detailed below with regards to Section 25-5-3, Permitted Uses, (Item 1.9) and, therefore, use permits are not required for such uses.

1.5 Article 3, Section 25-3-5 (Hawaii County Code), Application of district regulations.

Waiving the requirement of Section 25-3-5 that any building, structure, or land use shall comply with all of the regulations specified in this chapter for the district in which it is located.

The building, structure, and land use will be in accordance with the specific regulations for the existing Residential Single-Family (RS-10) District approved by the County Council for the Project, as detailed below pertaining to Sections 25-5-2 through Section 25-5-8 (Items 1.8 to 1.14).

1.6 Article 4, Division 1, Section 25-4-8. (Hawaii County Code). Temporary real estate offices and model homes.

Waiving the requirements of Sections 25-4-8 (b) (2), (4), and (6) that state:

"(2) The temporary real estate office and/or model home shall not be used for a period longer than twenty-four months from the date of plan approval by the director; provided that extensions may be granted by the director. "

“(4) The temporary real estate office an/or model home shall be used exclusively for marketing of lots and/or units located within the development in which it is to be located. In multi-phased developments, a temporary real estate office or model home may be allowed for each development phase for a period not to exceed twenty-four months. Time extensions may be granted by the director. “

“(6) The temporary real estate office and/or model home shall comply with the minimum set-back and height requirements of the particular zoning district. “

In that units and homes, if sold by the first and subsequent owners, are to be sold back to the property leaseholder and developer, Waikoloa Workforce Housing, LLC; marketing and sales of homes within the Waikoloa Employee Housing Project will be an ongoing activity of the Project. Therefore, real estate offices and/or model homes shall be a permitted use in the Waikoloa Employee Housing Project, as specified below pertaining to Section 25-5-3 (Item 1.9) and there shall be no time limit as to their use. Furthermore, the maximum height limit and minimum yard requirements for a real estate office and/or model home shall be as specified below pertaining to Sections 25-5-4 and 25-5-7 (Items 1.10 and 1.13, respectively).

1.7 Article 4, Division 4, Section 25-4-42 Corner Building Sites

Waiving the requirements of Section 25-4-42 that states:

- a) On any corner building site, the interior lines shall be side lot lines and all rear yard regulations shall be inapplicable.
- b) On any corner building site in all zoning districts except in the CN district, within the area of a triangle formed by the street lines and such building site (ignoring any corner radius), and a line drawn between points on such street lines twenty-five feet from the intersection thereof, no fence, wall, hedge, or building shall be higher than three feet nor shall there be any obstruction to vision other than a post, column, tree trunk clear of branches or foliage, between the height of three feet and eight feet above the level of the street or the level of the point of intersection if the streets are sloping.”

PROPOSED STANDARD

For all corner building sites within the Project, there shall be one front and one side yard facing the intersecting streets and interior lot lines shall be considered side yards. All rear yard regulations shall inapplicable.

Additionally, for all corner building sites within the Project, the area of a triangle formed by the street lines and such corner building site (ignoring any corner radius), and a line drawn between points on such street lines fifteen (15) feet from the intersection thereof, no fence, wall, hedge, or building shall be higher than

three feet; nor shall be any obstruction to vision other than a post, column, tree trunk clear of branches or foliage, between the height of three feet and eight feet above the level of the street or the level of the point of intersection if the streets are sloping. For the purpose of traffic safety, all intersections will meet or exceed the American Association of State Highway and Transportation Officials (AASHTO) standards for intersection sight distances, as set forth AASHTO Policy of Geometric Design of Highways and Streets and as verified by the project engineer registered with the State of Hawai'i.

1.8 Chapter 22, Article 2, Section 22-2.2 (Hawaii County Code). Intersection sight distance.

Waiving the requirements of Section 22-2.2 that establishes a setback from intersections of County streets.

PROPOSED STANDARD

To preserve adequately vehicular sight distances at intersections of two or more County streets, no object with a height between three (3) feet and eight (8) shall be allowed within the area defined by the chord of an arc having a radius of fifteen (15) feet from the intersection of property lines or their extensions that form the intersection. All intersections will meet or exceed the American Association of State Highway and Transportation Officials (AASHTO) standards for intersection sight distances, as set forth AASHTO Policy of Geometric Design of Highways and Streets and as verified by the project engineer registered with the State of Hawai'i.

1.9 Article 5, Division 1, Section 25-5-3 (Hawaii County Code). Permitted uses.

Waiving the requirements of Section 25-5-3 (a). The permitted uses within the Waikoloa Employee Housing Project shall be as follows:

1. Adult day care homes
2. Churches, temples and synagogues
3. Commercial or personal service uses on a small scale
4. Community buildings
5. Community parks, playgrounds, tennis courts, swimming pools, or similar community neighborhood recreational areas and uses
6. Convenience stores
7. Day care centers
8. Dwellings, double-family or duplex
9. Dwellings, multiple-family
10. Dwellings, single-family
11. Family child care homes
12. Home occupations

13. Medical clinics
14. Meeting facilities
15. Model homes
16. Public uses and structures
17. Restaurants
18. Schools
19. Temporary real estate offices
20. Utility substations
21. Mixed use residential

1.10 Article 5, Division 1, Section 25-5-4 (Hawaii County Code). Height Limit.

Waiving the requirements of Section 25-5-4.

The height limit within the Waikoloa Employee Housing Project shall be forty-five (45) feet. Additionally, the Planning Director may permit by plan approval any non-residential structure to be constructed to a height above forty-five feet if the director determines that additional height above the forty-five foot limit is necessary.

1.11 Article 5, Division 1, Section 25-5-5 (Hawaii County Code). Minimum building area.

Waiving the requirements of Section 25-5-5 pertaining to minimum building site area.

The minimum building site area in the Waikoloa Employee Housing Project shall be fifteen hundred (1,500) for town home units, and twenty thousand five hundred (2,500) square feet for all other uses.

1.12 Article 5, Division 1, Section 25-5-6 (Hawaii County Code). Minimum building site average width.

Waiving the requirements of Section 25-5-6 pertaining to minimum building site average width.

The minimum building site average width within the Waikoloa Employee Housing Project shall be twenty (20) feet for town home units, thirty (30) feet for duplex units, and fifty (50) feet for all other uses.

1.13 Article 5, Division 1, Section 25-5-7 (Hawaii County Code). Minimum yards.

Waiving the requirements of Section 25-5-7 pertaining to minimum yards.

The minimum yards in the Waikoloa Employee Housing Project shall be eight (8) feet for front and rear yards and five (5) feet for side yards, except for town home units, which shall have no side yard requirements.

1.14 Article 5, Division 1, Section 25-5-8 (Hawaii County Code). Other regulations.

Waiving the requirements of Section 25-5-8. Other regulations for the Waikoloa Employee Housing Project shall be as follows:

- a) There may be more than one main building on any building site.
- b) The distance between the main buildings on the same building site shall be at least fifteen (15) feet
- c) One guest house, in addition to a single-family dwelling, may be located on any building site.
- d) Exceptions to the standards regarding heights, building site areas, building site average widths, and yards may be approved by the Planning Director with Plan Approval.

2.0 Subdivision

2.1 Article 3, Division 1, Section 23-22 (Hawaii County Code). Compliance with design standards required.

Waiving the requirements that each subdivision and the plat thereof conform to the standards set forth in this article (Article 3. Design Standards).

The subdivision will vary from the design standards pertaining to park area dedication, block sizes, pedestrian ways, lot size, shape and setbacks, and street design; and waivers from these sections of the Subdivision Code are sought, as detailed below. The design and construction of the subdivision will conform to project construction plans approved by the appropriate County departments.

2.2 Article 3, Division 3, Section 23-34. Access to lot from street.

Waiving the requirements of Section 23-34 for town home units. Section 23-34 requires that each subdivided shall abut upon a public or approved private street.

Town home units within the Waikoloa Employee Housing project shall access onto a public street, via an easement over a private drive maintained by the Project.

2.3 Article 3, Division 3, Section 23-35. Lot side lines.

Waiving the requirements of Section 23-35 that states that the side lines of a lot shall run a tight angles to the street upon which the lot faces.

While lot lines within the Project shall generally run perpendicular to the street that the lot abuts, there will variation to the angle of the lot line to the street to accommodate irregular shaped lots and to maximize the lot layout in relation to the site topography.

2.4 Article 4, Division 1, Section 23-60. Application fees for subdivision plans.

Waiving the requirements of Section 23-60 for payment of filing fees for Project subdivisions.

In the interest of minimizing the cost to the developer, Waikoloa Workforce Housing, in providing affordable housing, filing fees for Project subdivision applications will not be required for the Project.

2.5 Article 5, Section 23-76. No conveyance of land prior to approval for recordation.

Waiving the requirements of Section 23-76 that states that "(l)and shall not be offered for sale, lease or rent in any subdivision, nor shall options or agreements for the purchase, sale leasing or rental of the land be made until approval for recordation of the final plat is granted by the director. "

In order to assure the greatest exposure possible to the intended workforce market, the developer, Waikoloa Workforce Housing, LLC, (WWH) intends to utilize many forms of advertisement, including, but not limited to, the use of the internet, publications, mailings, public announcements, or publicizing through other agencies and organizations with common goals; any one of which could be construed as an offering for sale, lease or rent. A waiver from the requirements of Chapter Section 23-76 is needed to provide WWH with greater latitude to more immediately market

and test consumer interest in the proposed leasehold product prior to receipt of final subdivision approval.

2.6 Article 6, Division 1, Sections 23-81, 82 and 83 (Requirements for Bonding)

Waiving the requirements of Sections 23-81, 82, and 83 to either complete subdivision improvements or provide a bond and agreement with the County as a condition of final subdivision approval and offering of sale.

The Project infrastructure will be financed with the County by means of a Community Facilities District (CFD) bond and/or County funding, as approved by the County Council. The approval of the CFD Bond or County funding by the County Council insures that adequate funding will in place for the construction of all subdivision related infrastructure, therefore, a bond and agreement for the completion of the required improvements and utilities shall not be a requirement of final subdivision approval and offering of sale.

2.7 Article 7, Section 23-96 (Hawaii County Code) Inspection by director of public works and manger.

Waiving the requirements of Section 23-96 pertaining to inspection by Director of Public Works and Manger.

Inspection will be conducted by the director of public works and manager or by Project inspectors approved by the Director of Public Works and Manger.

2.8 Article 7, Section 23-97 (Hawaii County Code) Inspection fee.

Waiving the requirement for inspection fee for inspections of subdivision improvements.

In the interest of minimizing the cost to the developer, Waikoloa Workforce Housing, in providing affordable housing, inspection fees will not required for Project related grading permit applications.

3.0 Grading and Drainage

3.1 Article 2, Section 10-11 (Hawaii County Code), Fees

Waiving the requirement for grading permit fees.

In the interest of minimizing the cost to the developer, Waikoloa Workforce Housing, in providing affordable housing, grading permit fees will not be required for Project related grading permit applications.

3.2 Article 3, Section 10-18 (a) (1), (2), and (3) (Hawaii County Code), Conditions of Permit

Waiving the requirements of Section 10-18 (a) pertaining to the cut and fill heights and slopes.

Cut and fill heights and slopes for grading within the Project will be determined by the Project's licensed geotechnical engineer.

3.3 Article 3, Section 10-19, Distance from property line for cut or fill slopes.

Waiving the requirements of Section 10-19 pertaining to the distance from the property line for cut or fill slopes.

Distances to the property line for cut or fill slopes within the Project will be determined by the Project's licensed geotechnical engineer.

3.4 Article 3, Section 10-20 (Hawaii County Code) Maximum cleared area.

Waiving the requirements of Section 10-20 (HCC) that limits the maximum area to be cleared to twenty acres.

Erosion and sedimentation controls will be per a Department of Public Works approved Erosion and Sedimentation Control Plan for the Project or each subdivision increment of the Project.

4.0 Roads and Pedestrian Ways

4.1 Article 3, Division 2, Section 23-31 (Hawaii County Code). Pedestrian ways.

Waiving the requirement that, for any block over seven hundred fifty feet in length, the director may require creation of a pedestrian way to be constructed to conform to standards adopted by the Department of Public Works.

Sidewalks will be incorporated with roadways designs that will conform to construction plans approved by the Department of Public Works.

4.2 Article 3, Division 4, Section 23-41 (Hawaii County Code). Minimum right-of-way and pavement widths.

Waiving the requirements of Section 23-41 for minimum right-of-way and pavement widths.

Rights-of-ways and pavement widths will be in accordance with construction plans approved by the County Department of Public Works. Plans and dimensions for typical Project roadways are shown on the attached Exhibits B-1 to B-5, Waikoloa Housing Typical Road Sections.

4.3 Article 3, Division 4, Section 23-48 (a) (Hawaii County Code). Cul-de-sacs.

Waiving the requirements of Section 23-48 (a), which states:

“(a) A cul-de-sac shall be as short as possible and shall not be more than six hundred feet in length nor serve more than eighteen lots: provided that longer streets may be approved by the director when unusual conditions exist.”

Due to the relative smaller lot sizes and topographic constraints of the site, the maximum number of lots on a cul-de-sac will be twenty-six (26) lots and the maximum length of a cul-de-sac will be eight hundred (800) feet.

4.4 Article 3, Division 4, Section 23-52. Alleys

Waiving the requirements of Section 23-52 that requires that “(a)t the street and alley intersections, ten feet corner radii shall be required.

The requirements for alleys shall be in accordance with construction plans approved by the County Department of Public Works. Plans and dimensions for typical Project roadways, including alleys, are shown on the attached Exhibits B1 to B5, Waikoloa Housing Typical Road Sections.

4.5 Article 3, Division 4, Section 23-52. Private streets.

Waiving the requirement of Section 23-53 that states; “No private street or alley shall be approved unless they are improved as specified under article 6, division 2 of this chapter.

The requirements for private streets within the Project shall be in accordance with construction plans approved by the County Department of Public Works. Plans and dimensions for typical Project roadways are shown on the attached Exhibits B1 to B5, Waikoloa Housing Typical Road Sections.

4.6 Article 6, Division 2, Improvements Required, Section 23-86.

Requirements for dedicable streets;

Article 6, Division 2, Section 23-89. Sidewalks;

Article 6, Division 2, Section 23-90. Pedestrian way;

Article 6, Division 2, Section 23-91. Curbs and gutters;

Article 6, Division 2, Section 23-93. Street Lights;

Article 6, Division 2, Section 23-94. Street name and traffic signs; and

Article 6, Division 2, section 23-95. Right-of-way improvement.

Waiving the requirements of the above sections which state that dedicable streets be designed in accordance with “specifications on file with the department of public works.”

Dedicable streets will be designed in accordance with construction plans approved by the County Department of Public Works. Plans and dimensions for typical Project roads are shown on the attached Exhibits B1 to B5, Waikoloa Housing Typical Road Sections.

5.0 Buildings

5.1 Section 26-17 (Hawaii County Code) License Fees

Waiving the requirements of Section 26-17 requiring licensing fees for the testing and inspection of fire extinguishing systems and portable fire extinguishers.

In the interest of minimizing the cost to the developer, Waikoloa Workforce Housing, in providing affordable housing, licensing fees will not be required for the testing and inspection of fire extinguishing systems and portable fire extinguishers within the Project.

5.2 Article 4, Division 1, Section 25-4-2 (Hawaii County Code). Conditions for construction of buildings designed for human occupancy.

Waiving the requirements of Section 25-4-2 which states:

- (a) "On any building site, no building designed or intended for human occupancy shall be constructed and no permit therefore shall be issued unless:
 - (1) the building site is served by a County water system or privately owned and operated water system, or other private, individual means of providing water to the building site is demonstrated; and
 - (2) a wastewater treatment system for the proposed building has been approved by the State department of health.
- (b) On any building site in any subdivision approved by the director under chapter 23 of this code, no building designed or intended for human occupancy shall be constructed and no permit issued therefore until either:
 - (1) The streets, drainage improvements, water supply system, if any, and sewage disposal system, if any, have been constructed, inspected and approved by the appropriate County agencies; or
 - (2) Final subdivision approval has been secured by the subdivider in accordance with chapter 23, by posting a surety bond or other security guaranteeing the construction of all of the subdivision improvements as shown on approved construction drawings and specifications, provided that final occupancy of any dwelling unit shall not be granted until the subdivision improvements for the particular increment in which such dwelling unit is situated have been constructed, inspected and approved by the appropriate County agencies. "

Construction of the Project water, streets, drainage improvements, and sewage disposal system will be constructed concurrent with the building construction. Therefore, building permits shall be issued prior to such systems having been inspected and approved by the appropriate County agencies. Provided, however, final occupancy of any dwelling unit shall not be granted until the subdivision

improvements for the particular increment in which such dwelling unit is situated have been constructed, inspected, and approved by the appropriate County agencies; and a wastewater treatment system for the proposed building has been approved by the State department of health.

Additionally, as detailed above pertaining to Sections 23-81 through 83 (Item 2.6), posting of a surety bond or other security will not be required as a condition of final subdivision approval for the Waikoloa Employee Housing Project. The Project infrastructure will be financed with the County by means of a Community Facilities District (CFD) or other County financing approved by the County Council. The approval of the CFD or other County financing by the County Council will insure that adequate funding is in place for the construction of the required subdivision related infrastructure. Final subdivision approval, however, shall not be issued prior Council approval of the CFD Bond financing or other County funding for the construction of the subdivision related infrastructure of the corresponding subdivision increment.

6.0 Sales – Preemptions from State Statutes

6.1 Uniform Land Sales Practices Act (Chapter 484, HRS)

Waiving the registration requirements of Chapter 484, Hawaii Revised Statutes (HRS) that provides that land “(n)o person may offer or dispose of any interest in subdivided lands located in this State before a preliminary or final order registering the subdivided land is entered.”

In order to assure the greatest exposure possible to the intended workforce market, the developer, Waikoloa Workforce Housing, LLC, may utilize many forms of advertisement, including, but not limited to, the use of the internet, publications, mailings, public announcements, or publicizing through other agencies and organizations with common goals; any one of which could be construed as an offering for sale, lease or rent. A waiver from the registration requirements of Chapter 484 is needed to provide WWH with greater latitude to more immediately market and test consumer interest in the proposed leasehold product prior to the final order registering the subdivision with the State.

6.2 Condominium Registration (Chapter 515B, HRS)

Waiving the requirements of Chapter 515B, Hawaii Revised Statutes pertaining to condominium registration.

While there will be no condominium development within the Project, there may be some concern that the for-sale town home product may be construed as a condominium property regime as it is similar to other condominium developments

in its configuration. The town home product is unique as attached for-sale product, as each unit will stand on and be physically connected to its own subdivided parcel that will be made available to the buyer through a long term lease agreement. The waiver from the requirements of Chapter 515B is required to remove any possible condition whereby the requirements of condominium registration would apply to the sale of the town home product.

6.3 Real Estate Brokers and Salespersons (Chapter 467, HRS)

Waiving the requirements of Chapter 467, Hawaii Revised Statutes, pertaining to the licensing requirements for brokers and sales persons.

The Waikoloa Workforce Housing Project will be unique in that, in an effort to maintain the affordability of the homes and avoid large brokerage fees, the Project plans to use its own sales staff. A waiver from the requirements of Chapter 467 is needed to provide greater flexibility in the hiring of sales staff and to help curtail the cost of maintaining an in-house sales staff.