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KAUA'I COUNTY HOUSING AGENCY

County of Kaua'i, State of Hawai'i
Pi'ikoi Building 4444 Rice Street Suite 330 Lihu'e Hawai'i 96766
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FILE COPY

DEC 08 2015

Mr. Scott Glenn, Director
Office of Environmental Quality Control
Department of Health, State of Hawai'i
235 S. Beretania Street, Room 702
Honolulu, Hawai'i 96813

Dear Mr. Glenn:

With this letter, the County of Kaua'i Housing Agency hereby transmits the final environmental assessment and finding of no significant impact (FEA-FONSI) for the proposed Koae Workforce Housing Development situated at TMK (4) 2-6-004:019, in Kōloa on the island of Kaua'i for publication in the next available edition of the Environmental Notice.

The County of Kaua'i Housing Agency has included copies of the comments and responses that it received during the 30-day comment period on the draft environmental assessment and anticipated finding of no significant impact (DEA-AFONSI).

Enclosed is a completed OEQC Publication Form, two copies of the FEA-FONSI, an Adobe Acrobat PDF file of the same, and an electronic copy of the publication form in MS Word. Simultaneous with this letter, we have submitted the summary of the action in a text file by electronic mail to your office.

If there are any questions, please contact me at (808) 241-4429.

Sincerely,

A handwritten signature in black ink, appearing to read "Gary Mackler".

Gary Mackler
Acting Housing Director

OFC. OF ENVIRONMENTAL
QUALITY CONTROL

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**AGENCY ACTION
SECTION 343-5(b), HRS
PUBLICATION FORM**

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DEC 08 2015

Project Name: Koae Workforce Housing Development

HRS §343-5 Trigger(s): Use of county lands

Island: Kaua'i

District: Kōloa

TMK: (4) 2-6-004:019

Permits: National Pollutant Discharge Elimination System (NPDES) Permit, Building Permit, Grading Permit

Proposing/Determination Agency: Kaua'i County Housing Agency
Pi'ikoi Building, 4444 Rice Street, Suite 330
Līhu'e, Kaua'i Hawai'i 96766

Kamuela Cobb-Adams-Housing Director
(808) 241-4418

Accepting Authority: N/A

Consultant: Community Planning and Engineering
1286 Queen Emma Street
Honolulu, HI 96813
Anson Murayama, P.E.
(808) 531-4252

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QUALITY CONTROL

Status (check one only):

- DEA-AFNSI** Submit the proposing agency notice of determination/transmittal on agency letterhead, a hard copy of DEA, a completed OEQC publication form, along with an electronic word processing summary and a PDF copy (you may send both summary and PDF to oeqchawaii@doh.hawaii.gov); a 30-day comment period ensues upon publication in the periodic bulletin.
- FEA-FONSI** Submit the proposing agency notice of determination/transmittal on agency letterhead, a hard copy of the FEA, an OEQC publication form, along with an electronic word processing summary and a PDF copy (send both summary and PDF to oeqchawaii@doh.hawaii.gov); no comment period ensues upon publication in the periodic bulletin.
- FEA-EISPN** Submit the proposing agency notice of determination/transmittal on agency letterhead, a hard copy of the FEA, an OEQC publication form, along with an electronic word processing summary and PDF copy (you may send both summary and PDF to oeqchawaii@doh.hawaii.gov); a 30-day consultation period ensues upon publication in the periodic bulletin.
- Act 172-12 EISPN** Submit the proposing agency notice of determination on agency letterhead, an OEQC publication form, and an electronic word processing summary (you may send the summary to oeqchawaii@doh.hawaii.gov). NO environmental assessment is required and a 30-day consultation period upon publication in the periodic bulletin.
- DEIS** The proposing agency simultaneously transmits to both the OEQC and the accepting authority, a hard copy of the DEIS, a completed OEQC publication form, a distribution list, along with an electronic word processing summary and PDF copy of the DEIS (you may send both the summary and PDF to oeqchawaii@doh.hawaii.gov); a 45-day comment period ensues upon publication in the periodic bulletin.
- FEIS** The proposing agency simultaneously transmits to both the OEQC and the accepting authority, a hard copy of the FEIS, a completed OEQC publication form, a distribution list, along with an electronic word processing summary and PDF copy of the FEIS (you may send both the summary and PDF to oeqchawaii@doh.hawaii.gov); no comment period ensues upon publication in the periodic bulletin.

___ Section 11-200-23
Determination

The accepting authority simultaneously transmits its determination of acceptance or nonacceptance (pursuant to Section 11-200-23, HAR) of the FEIS to both OEQC and the proposing agency. No comment period ensues upon publication in the periodic bulletin.

___ Section 11-200-27
Determination

The accepting authority simultaneously transmits its notice to both the proposing agency and the OEQC that it has reviewed (pursuant to Section 11-200-27, HAR) the previously accepted FEIS and determines that a supplemental EIS is not required. No EA is required and no comment period ensues upon publication in the periodic bulletin.

___ Withdrawal (explain)

Summary (Provide proposed action and purpose/need in less than 200 words. Please keep the summary brief and on this one page):

The Kaua'i County Housing Agency proposes to develop the Koaie Workforce Housing Development. The Koaie Development would include 130 to 150 multi-family residential units within Tax Map Key (TMK) (4) 2-6-004; Parcel 019 located in Kōloa, Hawai'i. The purpose of the proposed project is to provide affordable housing to the people of Kaua'i. The proposed project need is to meet the widespread and growing demand for affordable housing options for Kaua'i residents. The project site was identified as a suitable location to provide the needed affordable housing to Kaua'i residents since it is located in a central location within close proximity to existing job centers, schools, recreational activities, shopping, and an established residential community.

DraftFinal

ENVIRONMENTAL ASSESSMENT

August-November 2015

Koae Workforce Housing Development

Kōloa, Kaua‘i, Hawai‘i



**Community Planning
and Engineering, Inc.**

DRAFT
FINAL
ENVIRONMENTAL ASSESSMENT

Koae Workforce Housing Development
Kōloa, Kaua‘i, Hawai‘i

Prepared by:
Community Planning and Engineering, Inc.
1286 Queen Emma Street
Honolulu, HI 96813

Prepared for:
County of Kaua‘i Housing Agency
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Līhu‘e, Kaua‘i, HI 96766

Applicant:
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Approving Agency:
County of Kaua‘i Housing Agency
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Līhu‘e, Kaua‘i, HI 96766

~~August~~ November 2015

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Appendix B: ~~Draft~~ EA Comment Letters and Responses

Appendix C: Biological Surveys

Appendix D: Traffic Impact Analysis

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Appendix F: Archaeological Inventory Study

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ACRONYMS AND ABBREVIATIONS

%	percent
<	less than
A&B	Alexander and Baldwin
AIS	Archaeological Inventory Survey
AMI	area median income
ATA	Austin, Tsutsumi & Associates, Inc.
BEA	United States Bureau of Economic Analysis
bgs	below ground surface
BMP	Best Management Practice
CAA	Clean Air Act
CDP	Census Designated Place
CEQ	Council on Environmental Quality
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CH ₄	methane
CIA	Cultural Impact Assessment
Cl	chloride
CO	carbon monoxide
CO ₂	carbon dioxide
CWA	Clean Water Act
CZM	Coastal Zone Management
CZO	Comprehensive Zoning Ordinance
DAR	State of Hawai‘i Division of Aquatic Resources
dB	decibels
dBA	A-weighted decibels
DFW	State of Hawai‘i Division of Forestry and Wildlife
DLNR	State of Hawai‘i Department of Land and Natural Resources
DNL	day-night sound level
DOE	State of Hawai‘i Department of Education
DOH	County of Hawai‘i Department of Health
DOW	State of Kaua‘i Department of Water
EA	Environmental Assessment
EO	Executive Order
EPA	United States Environmental Protection Agency
ESA	Endangered Species Act
FEMA	Federal Emergency Management Agency
FONSI	Finding of No Significant Impact
GHG	greenhouse gas
gpm	gallons per minute
HAR	Hawai‘i Administrative Rules
HDOT	State of Hawai‘i Department of Transportation
HRS	Hawai‘i Revised Statutes
HT	Hawaiian Telcom

HUD	United States Department of Housing and Urban Development
IAL	Important Agricultural Land
KIUC	Kaua‘i Island Utility Cooperative
L	liter
LCA	Land Court Award
LOS	level of service
LUC	Land Use Commission
MF	multi-family
mg	milligram
mgd	million gallons per day
mph	miles per hour
msl	mean sea level
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NMFS	National Marine Fisheries Service
No.	Number
NO	nitric oxide
NO ₂	nitric dioxide
NO _x	nitric oxides
NOAA	National Oceanic and Atmospheric Administration
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
NWIS	National Water Information System
O ₃	ozone
OEQC	State of Hawai‘i Office of Environmental Quality Control
OSHA	United States Occupational Safety and Health Administration
OTWC	Oceanic Time Warner Cable
Pb	lead
PM	particulate matter
PM _{2.5}	particulate matter less than or equal to 2.5 microns in diameter
PM ₁₀	particulate matter less than or equal to 10 microns in diameter
PUC	State of Hawai‘i Public Utilities Commission
PVC	polyvinyl chloride
RCRA	Resource Conservation and Recovery Act
SHPD	State Historic Preservation Division
SIP	State Implementation Plan
SLUD	State Land Use Designation
SO ₂	sulfur dioxide
TBD	to be determined
TCP	Traffic Control Plan
TIAR	Traffic Impact Analysis Report
TMK	tax map key
U.S.	United States
U.S.C.	United States Code

USDA	United States Department of Agriculture
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
VOC	volatile organic compound
Ws	Waikomo Stony Silty Clay
Wt	Waikomo Very Stony Silty Clay
WRF	Wastewater Reclamation Facility
WWTP	Wastewater Treatment Plant

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1 INTRODUCTION

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1.1 INTRODUCTION

This Environmental Assessment (EA) is prepared pursuant to Chapter 343, Hawai‘i Revised Statutes (HRS) and associated Title 11, Chapter 200, Hawai‘i Administrative Rules (HAR), as well as the National Environmental Protection Act (NEPA) (40 Code of Federal Regulations [CFR] Parts 1500-1508) and 24 CFR Part 58; *Environmental Review Procedures for Entities Assuming HUD Environmental Responsibilities*. The environmental trigger initiating HRS 343 includes the use of county lands and funds. The environmental trigger initiating NEPA and 24 CFR Part 58 includes potential funding through the United States Department of Housing and Urban Development (HUD) programs. The intent of this document is to ensure that systematic consideration is given to the environmental, social, and economic consequences of the Proposed Action. The Proposed Action is the development of an affordable housing project located in the town of Kōloa on the island of Kaua‘i.

1.2 PROJECT INFORMATION

<u>Project Name:</u>	Draft Final EA Koae Work Force Housing Development Kōloa, Kaua‘i, Hawai‘i
<u>Applicant:</u>	County of Kaua‘i 4444 Rice Street, Suite 330 Līhu‘e, Kaua‘i, HI 96766 Contact: Kamuela Cobb-Adams (808) 241-4444
<u>Agent:</u>	Community Planning and Engineering, Inc. 1286 Queen Emma Street Honolulu, HI 96813 Contact: Anson Murayama (P.E.), Chief Executive Officer (808) 521-4252
<u>Approving Agency:</u>	County of Kaua‘i Housing Agency 4444 Rice Street, Suite 330 Līhu‘e, Kaua‘i, HI 96766
<u>Project Location:</u>	Kōloa, Kaua‘i, Hawai‘i
<u>Tax Map Key (TMK):</u>	(4) 2-6-004:019
<u>Land Area:</u>	Approximately 11.2 acres
<u>State Land Use District (SLUD):</u>	Urban
<u>County Zoning Designation:</u>	Residential (R-20)

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2 PROJECT DESCRIPTION

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2.1 SCOPE AND AUTHORITY

This EA is being conducted in accordance with HRS Chapter 343 and associated Title 11, Chapter 200, HAR, as well as the NEPA (40 CFR Parts 1500-1508) and 24 CFR Part 58; *Environmental Review Procedures for Entities Assuming HUD Environmental Responsibilities*. This EA evaluates the potential environmental, social, and economic impacts associated with the development of an affordable housing project in the town of Kōloa on the island of Kaua‘i. The proposed improvements include:

- site work and grading;
- utility and infrastructure development; and
- construction of residential housing units.

Environmental permits that would be required for the Proposed Action include a National Pollutant Discharge Elimination System (NPDES) permit during the construction period.

2.2 PROJECT LOCATION

The project site is located on the south side of the island of Kaua‘i approximately seven miles southwest of Līhu‘e town, and less than one mile south of downtown Kōloa. The project site is bound by Po‘ipū Road to the west, the Kiahuna Golf Club to the east, and an existing residential subdivision to the north. The project site includes TMK (4) 2-6-004: Parcel 019 (Figure 1).

2.3 OVERVIEW OF ALTERNATIVES

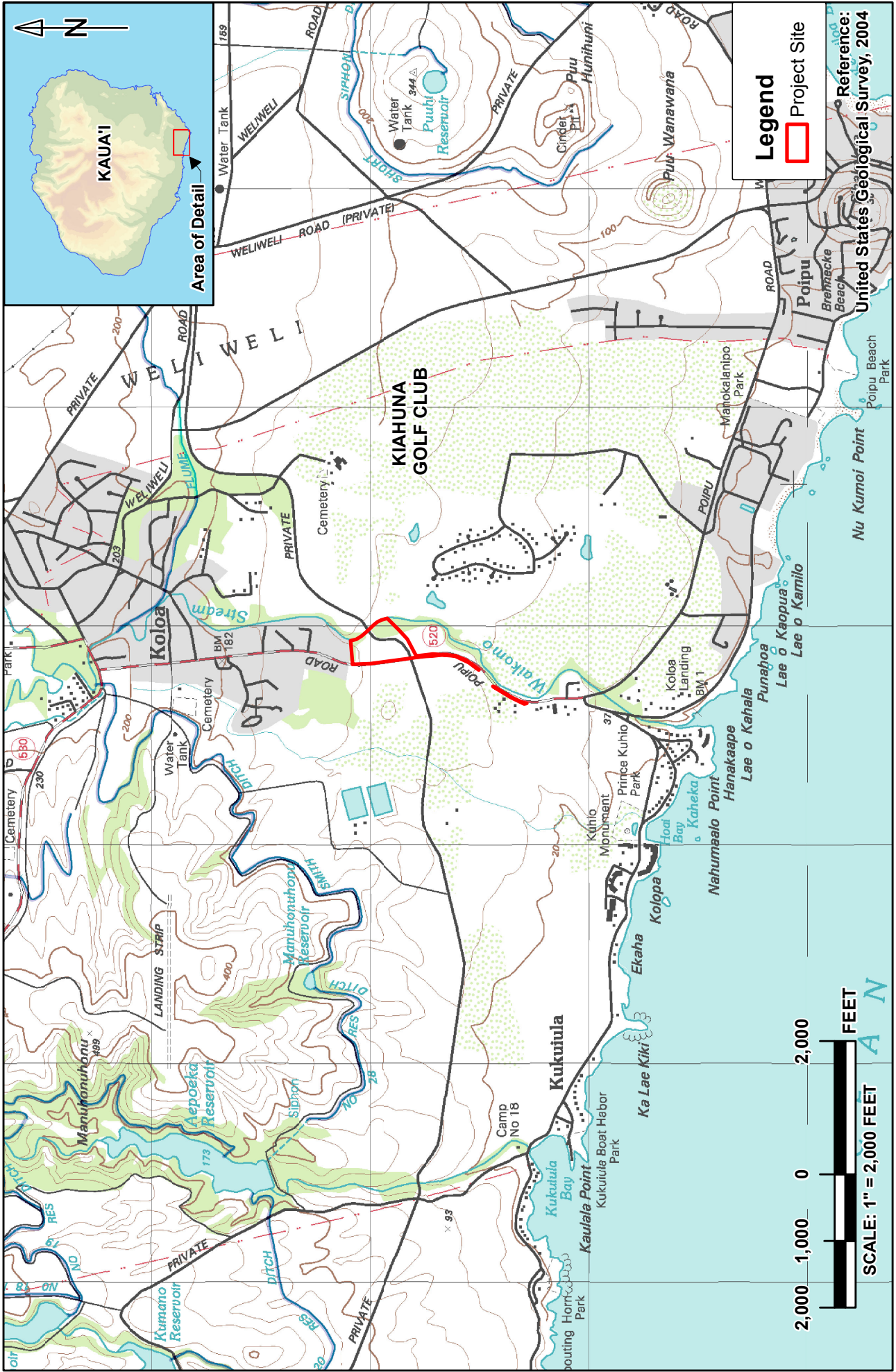
2.3.1 NO ACTION ALTERNATIVE

Under the No Action Alternative, the proposed affordable housing development would not be constructed. There would be no disturbance to the existing environment within the project site under the No Action Alternative; however, the County of Kaua‘i would not have use of the project site to provide affordable housing needed by Kaua‘i residents. There would be cumulative adverse socioeconomic impacts under the No Action Alternative, since the housing needs of Kaua‘i’s growing resident population would continue to increase without the necessary affordable housing stock in the county.

2.3.2 THE PROPOSED ACTION

The Proposed Action is the development of the Koae Workforce Housing Development; a County of Kaua‘i affordable workforce housing project that would provide the growing county population much needed affordable housing. Koae would include a mix of 130 to 150 multi-family (MF) residential units. All residential units would comply with state law and county charter. The Proposed Action would be located along Po‘ipū Road, directly west of the Kiahuna

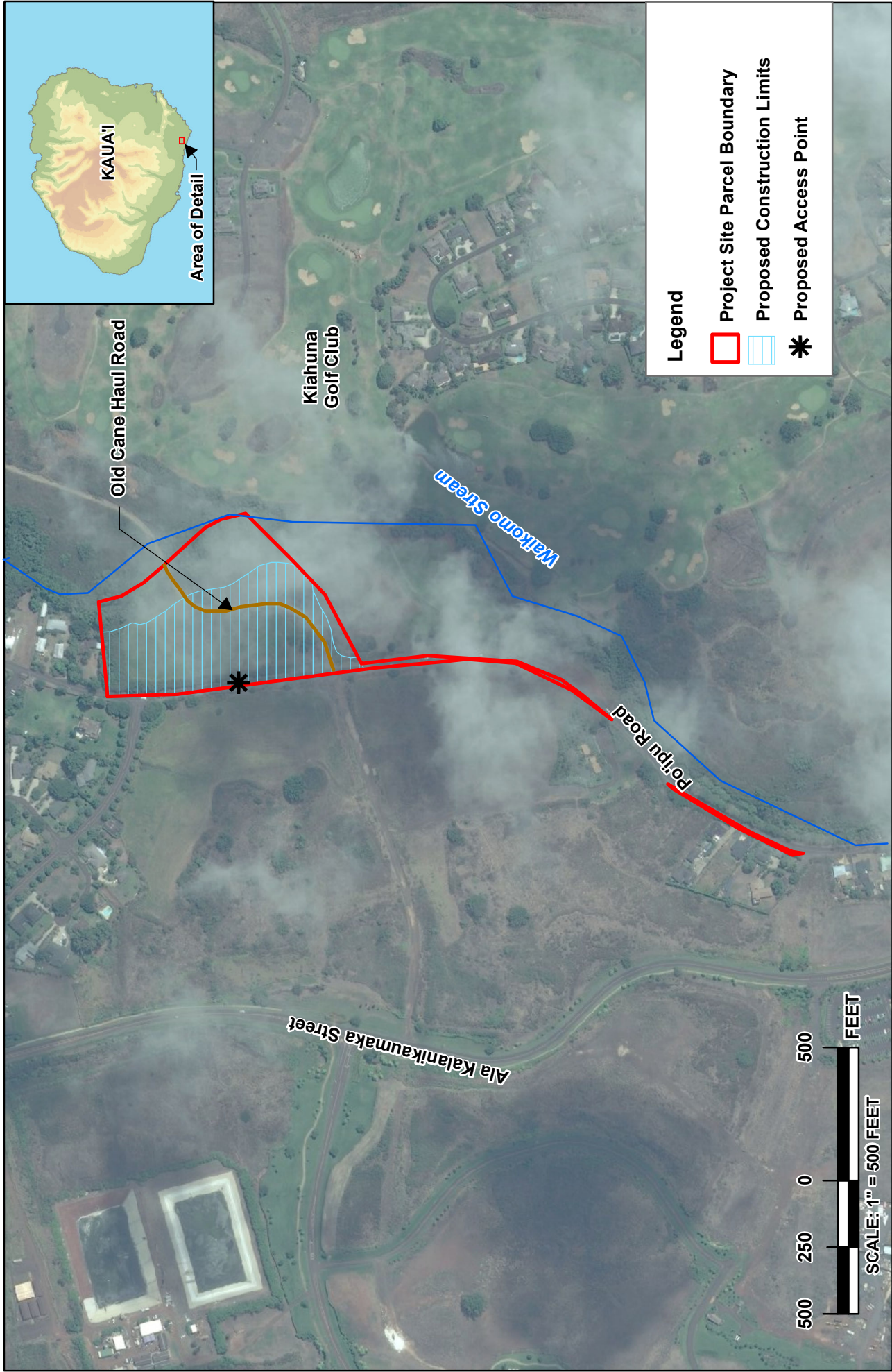
Golf Club in the town of Kōloa on the south side of Kauaʻi. Waikomo Stream runs north to south along the eastern portion of the project site. The area adjacent to Waikomo Stream is located within a flood plain; however, proposed construction activities will be limited to areas outside of the flood plain. Access to the proposed affordable housing subdivision would be provided along Poʻipū Road bordering the western boundary of the project site (Figure 2).



ENVIRONMENTAL ASSESSMENT FOR THE PROPOSED KOAE HOUSING PROJECT

PROJECT LOCATION MAP
 KOLOA, KAUAI, HAWAII

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ENVIRONMENTAL ASSESSMENT FOR THE PROPOSED KOAE HOUSING PROJECT

SITE PLAN
KŌLOA, KAUAI, HAWAII

FIGURE
2

co&e Community Planning
and Engineering, Inc.

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2.4 PURPOSE AND NEED FOR ACTION

The purpose of the Proposed Action is to satisfy the need for affordable housing on the island of Kaua‘i. The Kaua‘i County Housing Agency mission is to provide much needed affordable housing to families on Kaua‘i, due to the increasing population of Kaua‘i residents. Facilitating affordable housing opportunities for Kaua‘i residents is one of the county’s top priorities. The project site was identified as a suitable location to provide the needed affordable housing to Kaua‘i residents since it is located in a central location within close proximity to existing job centers, schools, recreational activities, shopping, and an established residential community.

2.5 REGULATORY FRAMEWORK

The EA is a requirement under Chapter 343 HRS due to the use of county land and funds. This EA has been prepared in accordance with HRS 343, and its implementing regulations, including Title 11, Chapter 200 of the HAR. This EA also complies with NEPA (40 CFR 1500-1508), as well as 24 CFR Part 58; *Environmental Review Procedures for Entities Assuming HUD Environmental Responsibilities*. Compliance with NEPA and 24 CFR Part 58 are needed since HUD funding may be sought for the proposed project. A separate *Environmental Assessment for HUD-Funded Proposals* is included as Appendix A of this EA in compliance with 24 CFR Part 58. In addressing environmental considerations, the following relevant regulations that establish standards and provide guidance on environmental and natural resource management and planning are discussed throughout subsequent sections of this EA:

- Chapter 343 HRS;
- Chapter 226 HRS;
- 40 CFR Parts 1500-1508;
- 24 CFR, Part 58;
- Chapter 6E HRS;
- Chapter 205 HRS;
- Title 11, Chapter 200 HAR;
- County of Kaua‘i General Plan (Amended November 2000);
- Coastal Zone Management (CZM) Act;
- Kaua‘i County Comprehensive Zoning Ordinance;
- The Clean Air Act (CAA);
- The Clean Water Act (CWA);
- The Endangered Species Act (ESA);
- Executive Order (EO) 12898 (*Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*); and

- EO 13045 (*Protection of Children from Environmental Health Risks and Safety Risks*).

2.6 PUBLIC AND AGENCY CONSULTATION

This environmental review includes public involvement and agency consultation, as required by HRS 343, NEPA and 24 CFR Part 58. Public participation has ~~will~~ included an opportunity for public review and comment on this EA. Availability of this EA will be announced using local media, including the State of Hawai'i Office of Environmental Quality Control (OEQC) Environmental Notice. Consultation correspondence is ~~in progress and will be~~ included in Appendix B of ~~the~~ this Final EA.

3 ENVIRONMENTAL SETTING AND POTENTIAL IMPACTS

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3.1 INTRODUCTION

The environmental, social, and economic setting of the existing environment and the probable impacts of the No Action Alternative and the Proposed Action are described in this section of the EA. Impacts are evaluated as to whether they constitute a “significant effect” on a particular environmental setting. Impacts are described as having No Impact, Significant Adverse Impact, or Beneficial Impact to the environment. The terms “impact” and “effect” are used synonymously in this EA. Impacts may apply to the full range of natural, aesthetic, historic, cultural, and economic resources. The following subsections define key terms used throughout Section 3.

3.1.1 REGULATORY SETTING

Impacts to the affected environment from the proposed alternatives were assessed based on procedures outlined in State regulations HRS 343, HAR Title 11, Chapter 200, as well as Federal regulations included in NEPA (40 CFR 1500-1508) and 24 CFR Part 58; *Environmental Review Procedures for Entities Assuming HUD Environmental Responsibilities*.

3.1.2 SIGNIFICANCE CRITERIA

A “significant effect” is defined by HRS Chapter 343 as “the sum of effects on the quality of the environment, including actions that irrevocably commit a natural resource, curtail the range of beneficial uses of the environment, are contrary to the state’s environmental policies or long-term environmental goals as established by law, or adversely affect the economic welfare, social welfare, or cultural practices of the community and state” (State of Hawai‘i, 2008). HAR 11-200-12 B offers the following guidance for determining environmental impact significance:

“In determining whether an action may have a significant effect on the environment, the agency shall consider every phase of a proposed action, the expected consequences, both primary and secondary, and the cumulative as well as the short-term and long-term effects of the action. In most instances, an action shall be determined to have a significant effect on the environment if it:

1. involves an irrevocable commitment to loss or destruction of any natural or cultural resource;
2. curtails the range of beneficial uses of the environment;
3. conflicts with the state’s long-term environmental policies or goals and guidelines as expressed in Chapter 344 HRS, and any revisions thereof and amendments thereto, court decisions, or executive orders;
4. substantially affects the economic welfare, social welfare, and cultural practices of the community or state;
5. substantially affects public health;
6. involves substantial secondary impacts, such as population changes or effects on public facilities;
7. involves a substantial degradation of environmental quality;

8. is individually limited but cumulatively has considerable effect upon the environment or involves a commitment for larger actions;
9. substantially affects a rare, threatened, or endangered species, or its habitat;
10. detrimentally affects air or water quality or ambient noise levels;
11. affects or is likely to suffer damage by being located in an environmentally sensitive area such as a flood plain, tsunami zone, beach, erosion-prone area, geologically hazardous land, estuary, fresh water, or coastal waters;
12. substantially affects scenic vistas and viewplanes identified in county or state plans or studies; or
13. requires substantial energy consumption (HAR §11-200-12 B).

3.1.3 DIRECT VERSUS INDIRECT IMPACTS

Definitions and examples of “direct” and “indirect” impacts as used in this document are as follows:

“Primary impact” or “primary effect” or “direct impact” or “direct effect” means effects which are caused by the action and occur at the same time and place (HAR §11-200-2). For direct impacts to occur, a resource must be present in the particular project site.

“Secondary impact” or “secondary effect” or “indirect impact” or “indirect effect” means effects which are caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable. Indirect effects may include growth inducing effects and other effects related to induced changes in the pattern of land use, population density or growth rate, and related effects on air and water and other natural systems, including ecosystems (HAR §11-200-2).

3.1.4 BENEFICIAL VERSUS ADVERSE IMPACTS

Impacts from the Proposed Action may also have beneficial or adverse effects to the environment. Beneficial impacts are those that would produce favorable outcomes and add value to the environment. Adverse impacts are those that would produce detrimental effects and cause harm to the environment.

Council on Environmental Quality (CEQ) Regulations for Implementing the Procedural Provisions of NEPA (40 CFR Parts 1500-1508, Section 1502.13) also include the following guidance relating to impact analysis.

Impact Analysis

Direct Impacts: are caused by the action and occur at the same time and place.

Indirect Impacts: are caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable. Indirect impacts may include growth inducing impacts and other impacts related to induced changes in the pattern of land use, population density or growth rate, and related effects on air, water and other natural systems, including ecosystems.

Impacts include ecological (such as the effects on natural resources and on the components, structures, and functioning of affected ecosystems), aesthetic, historical, cultural, economic, social, or health, whether direct, indirect, or cumulative. Impacts may also include those resulting from actions which may have both beneficial and detrimental effects, even if on balance the agency believes that the effect will be beneficial (40 CFR 1508.8).

Significance of Environmental Impacts

According to CEQ regulations 40 CFR 1500-1508, the determination of a significant impact is a function of both context and intensity.

Context: This means that the significance of an action must be analyzed in several contexts such as society as a whole (human, national), the affected region, the affected interests, and the locality. Significance varies with the setting of the proposed action. For instance, in the case of a site-specific action, significance would usually depend upon the effects in the locale rather than in the world as a whole. Both short- and long-term effects are relevant.

Intensity: This refers to the severity of impact. Responsible officials must bear in mind that more than one agency may make decisions about partial aspects of a major action.

To determine significance, the severity of the impact must be examined in terms of the type, quality and sensitivity of the resource involved; the location of the proposed project; the duration of the effect (short or long-term) and other consideration of context. Significance of the impact will vary with the setting of the proposed action and the surrounding area (including residential, industrial, commercial, and natural sites).

3.1.5 CUMULATIVE IMPACTS

Cumulative impacts are two or more individual effects which, when considered together, compound or increase the overall impact. Cumulative impacts can arise from the individual effect of a single action or from the combined effects of past, present, or future actions. Thus, cumulative impacts can result from individually minor, but collectively significant actions taken over a period of time. The cumulative impacts of implementing the Proposed Action, along with past and reasonably foreseeable future projects proposed, were assessed based upon available information.

In accordance with NEPA and the CEQ memorandum of “Guidance on the Consideration of Past Actions in Cumulative Effects Analysis,” a discussion of cumulative impacts resulting from projects which are proposed, under construction, recently completed, or anticipated to be implemented in the near future is included in this EA.

3.2 PHYSICAL ENVIRONMENT

3.2.1 GEOLOGICAL RESOURCES

Definition of Resources

Geological resources typically consist of surface and subsurface materials and their inherent properties. Principal geologic factors affecting the ability to support structural development are seismic properties (*i.e.*, potential for subsurface shifting, faulting, or crustal disturbance), soil stability, and topography.

The term *soil*, in general, refers to unconsolidated materials overlying bedrock or other parent material. Soils play a critical role in both the natural and human environment. Soil structure, elasticity, strength, shrink-swell potential, and erodibility all determine the ability for the ground to support man-made structures and facilities. Soils typically are described in terms of their complex type, slope, physical characteristics, and relative compatibility or constraining properties with regard to particular construction activities and types of land use.

Topography is the change in elevation over the surface of a land area. An area's topography is influenced by many factors, including human activity, underlying geologic material, seismic activity, climatic conditions, and erosion. A discussion of topography typically encompasses a description of surface elevations, slope, and distinct physiographic features (*e.g.*, mountains), and their influence on human activities.

Natural geologic hazards include earthquakes and tsunamis. Earthquakes typically result from release of energy from the earth's crust and manifest themselves by shaking and sometimes displacement of the ground which can result in property damage. Earthquakes can also trigger landslides as well as volcanic activity. When the epicenter of a large earthquake is located offshore, the seabed may be displaced sufficiently to cause a tsunami. A tsunami is a series of water waves caused by the displacement of a large volume of a body of water. Tsunamis are characterized by high speeds (up to 560 miles per hour [mph]), long wave lengths (up to 120 miles), and long periods between successive wave crests (up to several hours). Tsunamis have the potential to inundate the coastline, causing severe property damage and/or loss of life. The tsunami evacuation zone is a guideline, developed by the Kaua'i Civil Defense Agency, to provide the minimum safe evacuation distance.

Regulatory Setting

Kaua'i Ordinance Number (No.) 808 Sediment and Erosion Control describes proper procedures necessary for grading, soil erosion, and sediment control during earthwork activities. All work, including excavation and fill work, shall be in accordance with current construction standards and all applicable local, state, and federal regulations.

3.2.1.1 EXISTING CONDITIONS

Geology

The Hawaiian Archipelago is a chain of seamounts and islands in the North Pacific extending 1,616 miles west by northwest from the largest island, the Big Island of Hawai‘i. Igneous rocks are the dominant rock type and consist of basaltic flows, caldera and dike complexes, and pyroclastics. The island of Kaua‘i consists of a single shield volcano, which has a volume of about 1,007 cubic miles and rises 3.17 miles above the surrounding sea floor. Kaua‘i is circular in shape and encompasses an area of approximately 550 square miles. Lava flows of the Kōloa Series cover about half the surface of the eastern part of Kaua‘i, including the Kōloa district, and consist of volcanic and sedimentary rocks that settled on the rocks previously laid down by the Waimea Canyon series (Macdonald et al., 1983).

Topography and Soils

The project site slopes down gradient gently in the seaward (*makai*) direction from north to south. The project site ranges in elevation from approximately 150 to 100 feet above mean sea level (msl).

Soils at the project site consist of the Waikomo Series, which are characterized by well-drained stony and rocky soils on the uplands of Kaua‘i that formed in material weathered from basic igneous rock. Based on the United States Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) Web Soil Survey, the predominate soil type at the project site is Waikomo stony silty clay (Ws). Ws soils are reddish-brown stony silty clay loam that has moderate permeability, slow runoff, and a slight erosion hazard. The project site also includes Waikomo very rocky silty clay (Wt). Wt soils are similar to Ws, except that rock outcrops cover 3-25 percent (%) of the ground surface (Foote, et al., 1972) (Figure 3).

Earthquakes

In Hawai‘i, earthquakes are generally linked to volcanic activity and occur thousands of times annually; the vast majority of which are at a very small magnitude. According to the Hawai‘i Seismic Zone Assignments (United States Geological Survey [USGS], 2001), Kaua‘i lies in a seismic zone designated as Zone 1; indicating that ground accelerations of 7.5% of the acceleration due to gravity are likely to occur at a probability of 10% in a 50 year exposure time (USGS, 2001).

Tsunamis

Located in the middle of the Pacific Ocean, Hawai‘i is susceptible to tsunamis from earthquakes generated throughout the Pacific. The project site is located outside of the tsunami evacuation zone (State of Hawai‘i, 2015).

Approach to Analysis

Determination of the significance of potential impacts to geological and soil resources is based on: 1) the importance of the resource (*i.e.*, commercial, ecological, and/or scientific); 2) the proportion of the resource that would be affected relative to its occurrence in the region; and 3) the susceptibility to deleterious effects on the resource due to the Proposed Action. Impacts to geological and soil resources are significant if the physical structure, chemical composition, or visual aesthetic character are adversely affected over a relatively large area.

3.2.1.2 POTENTIAL IMPACTS AND MITIGATION

No Action Alternative

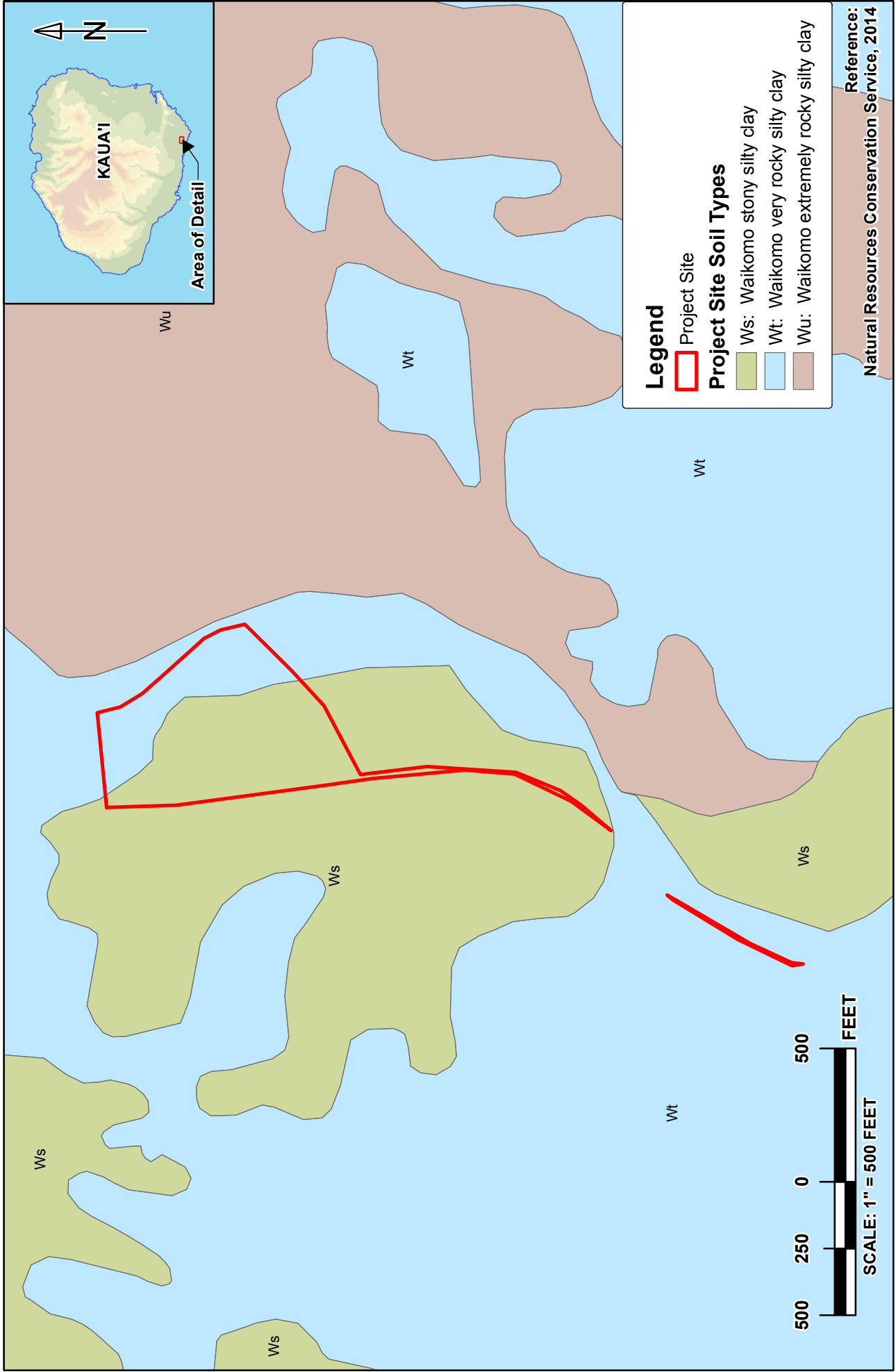
Under the No Action Alternative, no construction or change in ground surface is expected. No significant impacts to geological resources, topography, soils, or susceptibility to natural hazards are expected to result from the No Action Alternative.

Proposed Action

The Proposed Action would involve ground disturbing activities during the construction period, including grading, surface and subsurface utility and infrastructure installation, and recreational development. However, it is not anticipated that the proposed development would significantly alter the existing topography or affect geological conditions, other than leveling sites within the project area for building footprints. Therefore, there would be no significant impacts to topography or geology under the Proposed Action.

The Proposed Action could potentially have short-term less than significant impacts on soils during construction activities associated with grading, site work, utility, and infrastructure development. Soils would be temporarily excavated and stockpiled onsite during the construction period. Exposed soils are susceptible to erosion, especially if it rains heavily during site work periods. Wind erosion may also cause some unavoidable soil loss, but the greater concern is silt runoff.

Adverse impacts to soils would be minimized or avoided as a result of both temporary and permanent erosion and sedimentation control measures that shall be implemented during grading and trenching, and during the construction of the site drainage system, housing units, and roads. Control measures may include silt fences around the work area during construction. Proposed work shall comply with state erosion control standards, as well as the Construction Best Management Practices (BMPs) for Sediment and Erosion Control for the County of Kaua'i (County of Kaua'i, 2004). Soil impacts are anticipated to be short-term, and with the implementation of the BMP control measures to avoid impacts to the surrounding areas, no significant impacts are anticipated.



ENVIRONMENTAL ASSESSMENT FOR THE PROPOSED KOAE HOUSING PROJECT

SOIL MAP
KŌLOA, KAUAI, HAWAII



Community Planning
and Engineering, Inc.

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3.2.2 FIRE HAZARDS

3.2.2.1 EXISTING CONDITIONS

Currently, there is a moderate to high fire risk at the project site due to the presence of extensive vegetation. The first station to respond in case of a fire at the project site would be the Kōloa Fire Station located less than one-quarter mile south of the project site along Po‘ipū Road. The secondary response station would be the Kalaheo Fire Station located approximately 5.8 miles northwest of the project site.

3.2.2.2 POTENTIAL IMPACTS AND MITIGATION

No Action Alternative

No significant impacts are expected under the No Action Alternative. Existing potential fire hazards posed by the current conditions would remain the same.

Proposed Action

No significant short-term impacts are expected under the Proposed Action. Construction activities for the Proposed Action could create a minor fire hazard during the initial ground clearing activities due to the interaction of earth moving equipment with existing site foliage. These potential impacts would be controlled through the implementation of construction practices for fire safety in accordance with state and county guidelines. Once the vegetation is cleared, potential fire hazard impacts would be reduced at the project site. The construction fire safety practices include proper practices and fire hazard awareness for contractors at the work site. Daily equipment inspections would be conducted and all vehicles and equipment brought on site would be in



View of dry grasses and shrubs located at the project site.

proper working condition. All vehicles and equipment would be mounted with appropriately rated fire extinguishers, and additional fire extinguishers would also be available at the project site. All on-site workers would be aware of the locations and operation of fire extinguishers. On-site workers would also be aware of the flammability properties of the chemicals they are working with and their proper storage requirements, and important safety information such as emergency contact numbers, proper emergency evacuation procedures, and designated smoking areas (if smoking is permitted on site). Implementation of these measures would reduce the potential impact of short-term fire hazards to less than significant at the project site.

Beneficial long-term impacts to fire hazards are expected under the Proposed Action. The project site is currently a vacant lot that is overgrown with tall grasses and thick brush. This

brush can represent an increased fire hazard when conditions are dry, etc. Construction of the proposed subdivision would replace the overgrown brush with a residential subdivision and associated infrastructure, including maintained landscaping. The proposed housing subdivision would be built in accordance with all applicable state and county fire codes. As a result, construction of the proposed subdivision would be considered a beneficial long-term impact to fire hazards at the project site.

3.2.3 BIOLOGICAL RESOURCES

Definition of Resources

Biological resources include native or naturalized plants and animals and the habitats in which they occur. Sensitive biological resources are defined as those plants and animal species listed as threatened or endangered, or proposed as such, by the United States Fish and Wildlife Service (USFWS), the National Marine Fisheries Service (NMFS), the State of Hawai'i Department of Land and Natural Resources (DLNR) Division of Forestry and Wildlife (DFW) and Division of Aquatic Resources (DAR).

Regulatory Setting

The Endangered Species Act (ESA) was created in order to protect and recover imperiled species and the ecosystems upon which they depend. The ESA grants USFWS primary responsibility for terrestrial and freshwater organisms and the NMFS primary responsibility for marine wildlife.

The Migratory Bird Treaty Act, implemented in 1918, prohibited the hunting, killing, capturing, possession, sale, transportation, and exportation of birds, feathers, eggs and nests (16 United States Code [U.S.C.] 703). This treaty applies to bird species that are native to the United States (U.S.) or its territories, and is applicable in Mexico, Japan, and Russia.

3.2.3.1 EXISTING CONDITIONS

A survey of biological resources at the project site was completed in 2004, and an updated survey was recently completed in November, 2015. The findings of the surveys are presented below.

2004 Biological ~~Resource Assessment~~ Survey

A survey of avian and terrestrial mammalian species was conducted by Rana Productions, Ltd. on August 12, 2004. The survey documented the potential biological resources that may be impacted by the Proposed Action (Rana Productions Ltd., 2004). The survey was conducted within the project site where construction activities are anticipated to take place. The following is a summary of the findings of the survey; the complete survey is included as Appendix C. Consultation with USFWS and the DLNR is currently in progress and will continue throughout the construction planning ~~environmental review~~ process. ~~An updated avian survey is in progress, the findings of which will be included in the final EA~~ Comments and feedback will be from USFWS and the DLNR are included in Appendix B of this Final EA.

Flora

TMK (4) 2-6-004:019 is a mostly vacant lot that is overgrown with tall grasses and thick brush, and bordered by tall trees, especially along the Waikomo Stream on the eastern edge; it is virtually inaccessible, except via a former cane haul road that traverses the parcel. The project



View of koa haole (*Leucaena leucocephala*) located at the project site.

site consists primarily of Guinea grass (*Panicum maximum*) and koa haole (*Leucaena leucocephala*) with other alien weedy species dispersed among the shrubs. The area along the Waikomo Stream is populated by koa haole and numerous alien tree species such as Chinese banyan (*Ficus microcarpa*), hau (*Hibiscus tiliaceus*), and Java Plum (*Syzygium cumini*); umbrella sedge (*Cyperus alternifolius*) and wedelia (*Sphagneticola trilobata*) were also observed near the banks of Waikomo Stream, along with other alien shrubs and weeds. No evidence of state or

federally listed threatened, endangered, or candidate plant species, or rare native Hawaiian plant species was observed at the Site.

Fauna

Based on visual and auditory observations, as well as the utilization of six evenly-spaced avian count stations, 17 avian species were documented in the survey within the project site (Table 3-1). According to the survey, avian diversity and density is relatively low, as two species, the Common myna (*Acridotheres tristis*) and the Japanese White-eye (*Zosterops japonicus*), accounted for 38% of the total number of birds recorded. Of the 17 species detected at the project site, 16 are regularly encountered alien species that are common in the low to mid elevation areas on Kaua‘i. The Black-crowned Night-heron is the only indigenous species that was observed during the survey. No state or federally endangered avian species were detected during the course of the survey.

Other seabirds, particularly the endangered Hawaiian petrel (*Pterodroma sandwichensis*) and threatened Newell’s shearwater (*Puffinus auricularis newelli*), were not observed, but may fly over the project site at night while traveling to and from their upland nesting sites to the ocean. Both species nest inland in the mountainous interior of Kaua‘i, but no suitable nesting sites were identified at the project site.

The native Hawaiian short-eared owl or pueo (*Asio flammeus sandwichensis*) and the introduced barn owl (*Tyto alba*) could use the project site for hunting and roosting. Likewise, the endangered Hawaiian hoary bat (*Lasiurus cinereus semotus*) may use the project site for foraging, as the species is known to frequent Po‘ipū and Kōloa. It is possible that rodents like

the roof rat (*Rattus r. rattus*), Norway rat (*Rattus norvegicus*), European house mouse (*Mus domesticus*), and Polynesian rat (*Rattus exulans hawaiiensis*) may be present, as rodent teeth marks were found throughout the project site. Horse scat was also seen along the paved road that transects the project site.

Table 3-1: Avian Species Detected

Common Name	Scientific Name	Status
Red Junglefowl	<i>Gallus gallus</i>	Alien
Cattle Egret	<i>Bubulcus ibis</i>	Alien
Black-crowned Night-heron	<i>Nycticorax nycticorax hoactli</i>	Indigenous
Spotted Dove	<i>Streptopelia chinensis</i>	Alien
Zebra Dove	<i>Geopelia striata</i>	Alien
Japanese Bush-Warbler	<i>Cettia diphone</i>	Alien
White-rumped Shama	<i>Copsychus malabaricus indicus</i>	Alien
Hwamei	<i>Carrulax canorus</i>	Alien
Japanese White-eye	<i>Zosterops japonicas</i>	Alien
Common Myna	<i>Acridotheres tristis</i>	Alien
Western Meadowlark	<i>Sturnella neglecta</i>	Alien
Red-crested Cardinal	<i>Paroaria coronate</i>	Alien
Northern Cardinal	<i>Cardinalis cardinalis</i>	Alien
House Finch	<i>Carpodacus mexicanus frontalis</i>	Alien
House Sparrow	<i>Passer d. domesticus</i>	Alien
Common Waxbill	<i>Estrilda a. astrild</i>	Alien
Chestnut Munia	<i>Lonchura atricapilla</i>	Alien

Source: Rana Productions, Ltd., 2004

2015 Biological Survey

Following consultation with the state DLNR and the USFWS, it was recommended that an updated avian biological survey be completed at the project site. In response to this recommendation SWCA Environmental Consultants completed an updated avian biological survey at the project site in November, 2015 (Appendix C). The updated survey particularly focused on addressing the potential presence of the following avian species within the project area, as recommended by the DLNR-DFW:

- Endangered waterbirds Hawaiian coot or ‘Alae ke‘oke‘o (*Fulica alai*), Hawaiian duck or Kōloa (*Anas wyvilliana*), Hawaiian gallinule or ‘Alae ‘ula (*Gallinula galeata sandvicensis*), Hawaiian stilt or Ae‘o (*himantopus mexicanus knudseni*).
- Endangered Hawaiian goose or Nēnē (*Branta sandvicensis*).

The survey consisted of a meandering pedestrian survey during which all visual and auditory observations were noted. Most of the survey was conducted in the riparian area along Waikomo Stream where the endangered waterbirds were most likely to occur.

Eleven (11) bird species were observed during the survey, including the federally and state endangered Hawaiian goose or Nēnē. Three Nēnē were observed flying over the southern boundary of the proposed construction limits heading west. The remaining 10 bird species observed were all non-native birds typically found in disturbed lowlands on Kaua‘i. The only observed species protected by the Migratory Bird Treaty Act were the Hawaiian goose or Nēnē and northern cardinal (*Cardinalis cardinalis*).

The survey concluded that the construction limits of the Proposed Action does not contain suitable nesting or foraging habitat for the endangered waterbirds; however, suitable nesting and foraging habitat for the Hawaiian duck or Kōloa does occur to the east of the proposed construction limits in the vicinity of Waikomo Stream. Additionally, it was concluded that the endangered Hawaiian goose or Nēnē may use the southwestern corner of the proposed construction limits as well as areas in the vicinity of Waikomo Stream and the nearby Kiahuna Golf Club for nesting and foraging.

Approach to Analysis

Determination of the significance of potential impacts to biological resources is based on 1) the importance (*i.e.*, legal, commercial, recreational, ecological, or scientific) of the resource; 2) the proportion of the resource that would be affected relative to its occurrence in the region; 3) and the sensitivity of the resource to proposed activities; and 4) the duration of ecological ramifications. Impacts to biological resources are significant if species or habitats of concern are adversely affected over relatively large areas, or if disturbances cause reductions in population size or distribution. Potential physical impacts such as habitat loss, noise, and impacts to water quality were evaluated to assess potential impacts to biological resources resulting from the Proposed Action.

3.2.3.2 POTENTIAL IMPACTS AND MITIGATION

No Action Alternative

There would be no impact to biological resources from the No Action Alternative since use at the project site would remain unchanged and no flora or fauna species would be affected. Any adverse effects to threatened or endangered species present at the project site from the current use by the Kaua‘i Island Utility Cooperative (KIUC) for maintenance (*e.g.*, noise and vibration from vehicles and machinery) would continue.

Proposed Action

Construction activities planned for the Proposed Action may impact the Hawaiian hoary bat, which was not observed at the project site during the surveys, but could potentially be present. This may also be true for the endangered Hawaiian petrel and the threatened Newell’s shearwater, as both species nest inland in the mountainous interior of Kaua‘i and may fly over the project site while traveling to and from their upland nesting sites to the ocean. It is not anticipated that any owl species would be significantly impacted since suitable foraging habitats at nearby grassy areas exist. The following control measures should be implemented at the project site to minimize or avoid possible impacts to biological resources:

To prevent direct impacts to the Hawaiian hoary bat, the following control measures are recommended:

- No trees taller than 15 feet within the project site should be trimmed or removed between June 1 and September 15 when non-volant juvenile bats (bats that cannot fly) may be roosting in the trees.
- Any fences that are erected as part of the Proposed Action should have a barbless top-strand wire to prevent entanglements of the Hawaiian hoary bat on barbed wire. For existing fences at the project site, the top strand of barbed wire should be removed or replaced with barbless wire.

The following control measures are recommended to avoid and minimize light attraction of the endangered Hawaiian petrel, ~~and~~ threatened Newell’s shearwater and proposed endangered band-rumped storm petrel or ‘Akē‘akē to the project site:

- Construction activity should be restricted to daylight hours as much as practicable during the seabird breeding season (April through November) and peak fallout period (September 15 through December 15) to avoid the use of nighttime lighting that could be an attraction to seabirds.
- All outdoor lights should be shielded to prevent upward radiation at the housing development. This has been shown to reduce the potential for seabird attraction.
- Outside lights that are not needed for security and safety should be turned off from dusk through dawn during the fledgling fallout period (September 15 through December 15) (Appendix B, Appendix C).

The area around Waikomo stream is heavily overgrown; thus, the clearing of this area due to the Proposed Action may potentially invite the following endangered water bird species to the

stream; Hawaiian Duck or Kōloa (*Anas wyvilliana*), Hawaiian Coot (*Fulica alai*), or Common Moorhen (*Gallinula chloropus sandvicensis*). The USFWS and DLNR must be consulted prior to site work (i.e. grading, trenching or any earth moving activities) in order to create a construction plan that will avoid or minimize new standing surface water that could attract protected water birds. If these species are observed at the project site during construction, work should cease, and the bird should not be approached. ~~and~~ The USFWS and DLNR should be consulted to avoid / minimize impacts to these water bird species (Appendix B, Appendix C).

The protected Hawaiian goose or Nēnē (*Branta sandvicensis*) is also present within the vicinity of the project site. In order to minimize impacts to the ~~Hawaiian goose~~ Nēnē, it is recommended that a qualified biologist survey the project area prior to construction, and after any subsequent delay in work of three or more days (during which birds may attempt nesting). If a ~~Hawaiian goose (or geese)~~ Nēnē appears within 100 feet of ongoing work, the bird should not be approached, and all activity should be temporarily suspended until the ~~Hawaiian goose (or geese)~~ Nēnē leaves the area of its own accord. All regular onsite staff should be trained to identify the Nēnē and know the appropriate steps to take if the Nēnē is present on site. If a Hawaiian goose nest is found at the project site, work should cease immediately and the USFWS and DLNR should be contacted for further guidance (Appendix B, Appendix C).

The Kaua‘i cave wolf spider or blind cave spider (*Adelocoa anops*) and the Kaua‘i cave amphipod (*Spelaeorchestia koloana*) are protected arthropod species found within the vicinity of the project site. While no known habitat has been documented at the project site, the USFWS recommends the following control measures to minimize potential impacts to these arthropod species:

- Heavy use of chemical herbicides, insecticides, and fungicides should be avoided in the project area.
- The project should be designed with permeable surfacing, such as pavers, instead of asphalt or other limited or non-permeable surfacing, and other BMPs to allow ground water recharge in the project area.
- A qualified biological monitor should be present on the project site during all construction activities. In the event that heavy equipment punctures the ceiling of a cave, construction activities should cease and the USFWS and DLNR should be consulted (Appendix B, Appendix C).

3.2.4 WATER RESOURCES

Definition of Resources

Water resources analyzed encompass surface water, groundwater, floodplains, and wetlands. Surface water resources include lakes, rivers, and streams, and are important for a variety of reasons including ecological, economic, recreational, aesthetic, and human health. Groundwater comprises subsurface water resources and is an essential resource in many areas as it is used for potable water, agricultural irrigation, and industrial applications. Floodplains are belts of low, level ground present on one or both sides of a stream channel and are subject to either periodic or infrequent inundation by floodwater. Wetlands are defined as: “Those areas that are inundated or saturated by surface or ground water (hydrology) at a frequency and duration sufficient to

support, and that under normal circumstances do support, a prevalence of vegetation (hydrophytes) typically adapted for life in saturated soil conditions (hydric soils). Wetlands generally include swamps, marshes, bogs, and similar areas” (40 CFR 232.2[r]).

Regulatory Setting

Section 402 of the CWA specifically requires the U.S. Environmental Protection Agency (EPA), and authorized state governments, to develop and implement the NPDES program. HRS 342D-50(a) states that: “No person, including any public body, shall discharge any water pollutant into state waters, or cause or allow any water pollutant to enter state waters except in compliance with this chapter, rules adopted pursuant to this chapter, or a permit or variance issued by the director.” HAR Chapter 11-55 (Water Pollution Control), defines the NPDES permit program for the State of Hawai‘i, which is required for point source pollutant and storm water discharges.

3.2.4.1 EXISTING CONDITIONS

Groundwater

The project site is located in the Kōloa aquifer system of the Līhu‘e aquifer sector (Figure 4). The project site lies on top of an upper and lower aquifer, classified as 20101111 (21111) /



View of Waikomo Stream located along the eastern portion of the project site.

20101122 (21113), with a slash between the two identification codes to denote relative vertical occurrence. The upper aquifer is classified as basal (*i.e.*, fresh water in contact with seawater), confined, and having a flank / dike lithology. Further, this aquifer has a potential use for development, a drinking water utility, is fresh (*i.e.*, less than [$<$] 250 milligrams [mg] chloride [Cl] / liter [L]), is irreplaceable, and has a high vulnerability of contamination. The lower aquifer is classified as basal, confined, and has a dike-type lithology. This aquifer also is designated as having a potential use for development, a drinking water utility, is fresh (*i.e.*, $<$ 250 mg Cl/L), is irreplaceable, and has a low vulnerability to contamination (Mink and Lau, 1992).

Waikomo Stream flows north to south along the eastern portion of the project site. Waikomo Stream flows into the Pacific Ocean, which is located approximately 0.43 miles south of the project site. A series of remnant agricultural ditches are located within the vicinity of the project site. The Smith Ditch feeds from Manuhonuhonu and Aepoeka Reservoirs which are located approximately 0.89 and 1.45 miles west of the project site, respectively. The Short Siphon and

Mill Ditches feed into the Puuhi Reservoir which is located approximately 1.47 miles east of the project site. The Waita Reservoir is located approximately 1.36 miles north of the project site. Three small freshwater ponds associated with the Kiahuna Golf Course are located approximately 0.11, 0.22, and 0.54 miles east of the project site.

Water Quality

No surface water quality measurements have been reported by the USGS National Water Information System (NWIS) for the Waikomo Stream, which flows through the project site (USGS, 2014a).

Floodplains

According to Federal Emergency Management Agency (FEMA) records, the majority of the project site is located within Flood Zone X, designated as “areas outside of the 0.2% annual chance floodplain”. The portion of the project site that includes the Waikomo Stream is located within Flood Zone AE, designated as “areas subject to inundation by the 1% annual chance flood event.” The area of the project site surrounding Waikomo Stream is located within the Flood Zone with a 0.2% annual chance flood event (FEMA, 2010) (Figure 5).

Wetlands

The USFWS classifies Waikomo Stream as a perennial stream which is permanently flooded (USFWS, 2015). The soils present within the project site are not listed on the NRCS (2014) National List of Hydric Soils. Wetlands that exist in close proximity to the project site include the Smith Ditch which draws from the Manuhonuhonu and Aepeoka Reservoirs which are located approximately 0.89 and 1.45 miles west of the project site, respectively. The Short Siphon and Mill Ditches draw from the Puuhi Reservoir which is located approximately 1.47 miles east of the project site. The Waita Reservoir is located approximately 1.36 miles north of the project site. Three small freshwater ponds associated with the Kiahuna Golf Course are located approximately 0.11, 0.22, and 0.54 miles east of the project site (Figure 6).

Approach to Analysis

Determination of the significance of potential impacts to water resources is based on: 1) the importance (*i.e.*, legal, commercial, recreational, ecological, or scientific) of the resource; 2) the proportion of the resource that would be affected relative to its occurrence in the region; 3) the sensitivity of the resource to the Proposed Action; and 4) the duration of ecological ramifications. Impacts to water resources are significant if the occurrence, water quality, aquatic habitat extent, or visual aesthetic character are adversely affected over a relatively large area.

3.2.4.2 POTENTIAL IMPACTS AND MITIGATION

No Action Alternative

Under the No Action Alternative, the project site would remain unchanged and there would be no impacts to water resources within the vicinity of the project site.

Proposed Action

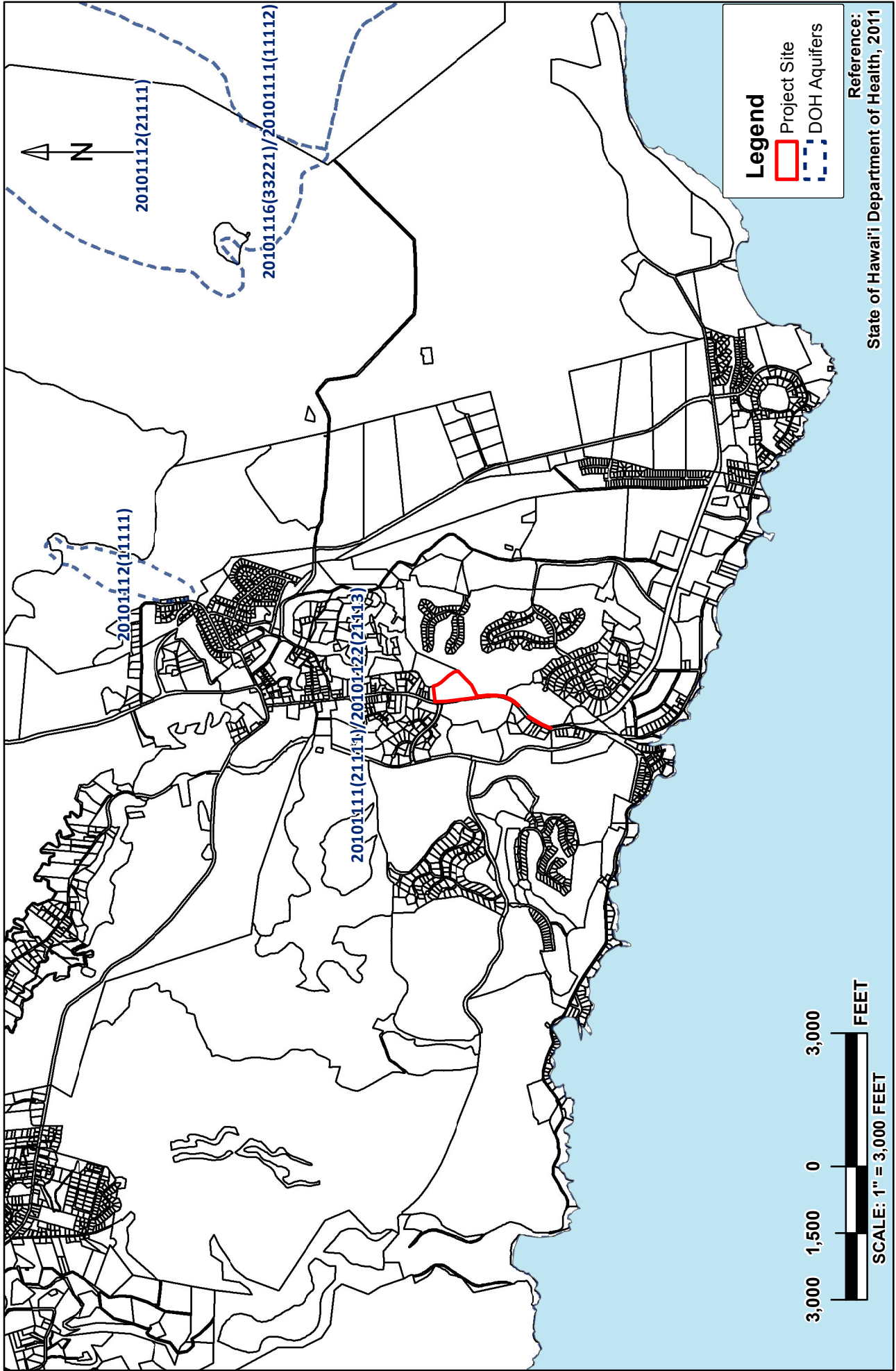
Under the Proposed Action, there would be less than significant impacts to groundwater. Given the estimated depth to groundwater of approximately 210 feet below ground surface (bgs) (USGS, 2014a), groundwater is not anticipated to be encountered. The Proposed Action would require additional withdrawals from the county water supply; however, the maximum demand of the proposed development is not expected to exceed the pumping capacity of the existing water system. Further, the underlying aquifers are not expected to be adversely impacted (*e.g.*, water level drawdown) by the additional demand needed by the Proposed Action. The proposed housing units would be serviced by potable water provided by the County of Kauaʻi Department of Water (DOW), which regularly monitors water quality parameters to ensure adherence to all state and federal standards.

The Proposed Action would require the construction of a surface water drainage system to collect storm water flow, due to the construction of impervious surfaces (paved roads and sidewalks). All features of the proposed surface water drainage system would be designed in accordance with the County of Kauaʻi, Department of Public Works standards. The DOH Clean Water Branch recommends integrating low impact development practices into project design by utilizing storm water as a resource to maintain natural groundwater infiltration/recharge within the affected environment. This can be done through implementation of permeable surfaces that allow for natural storm/ground water patterns to persist, as feasible (Appendix B). With the proposed drainage system in place, the Proposed Action would have less than significant impacts on surface water at the project site, as well as the surrounding environment.

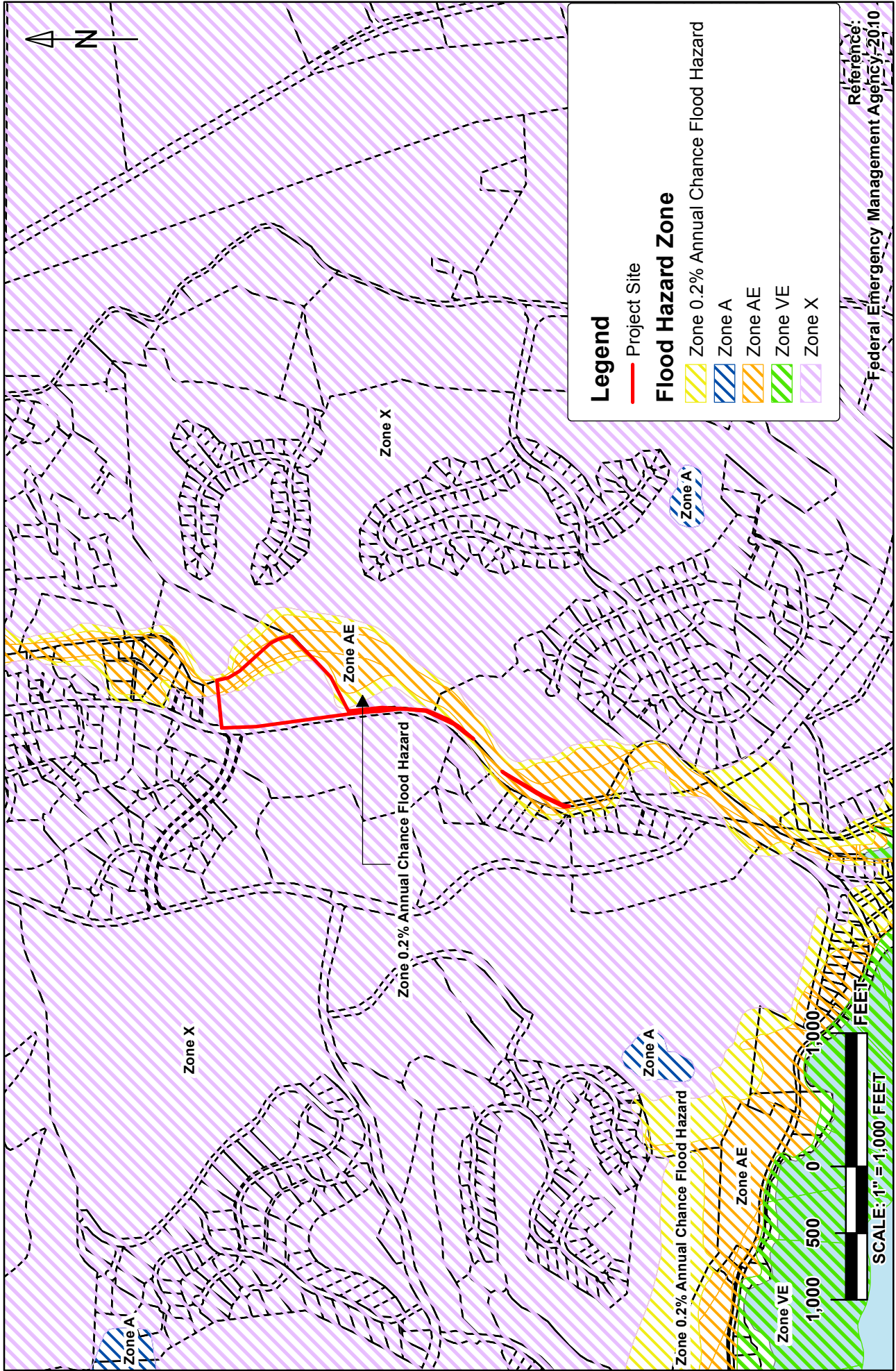
There would be less than significant impacts to surface water quality during the construction period. The Proposed Action would include soil excavation and stockpiling during grading activities. A storm water pollution prevention plan would be developed, prior to the start of construction, in order to: identify potential sources of storm water pollution; describe the practices that would be used to prevent storm water pollution; and identify procedures the contractor would implement to comply with all requirements of a NPDES permit during construction. BMPs employed during construction (*e.g.*, silt fencing, tarping / covering exposed and stockpiled soils, surface revegetation) would minimize / eliminate impacts from storm water generated at the project site.

The majority of the project site is located within Flood Zone X (outside of the 0.2% annual chance floodplain). The eastern portion of the project site that includes Waikomo Stream is located within Flood Zone AE (1% annual chance floodplain) and Flood Zone with a 0.2% annual chance flood event. However, the Proposed Action would have less than significant impacts on floodplains because the proposed site drainage system would adequately manage storm water runoff in accordance with applicable county drainage standards, and construction would be limited to areas located within Flood Zone X.

Construction activities are not planned to take place within any of the designated flood plain areas at the project site. Further, the BMPs employed during construction activities would minimize / eliminate any impact to the flood plain function or Waikomo Stream.



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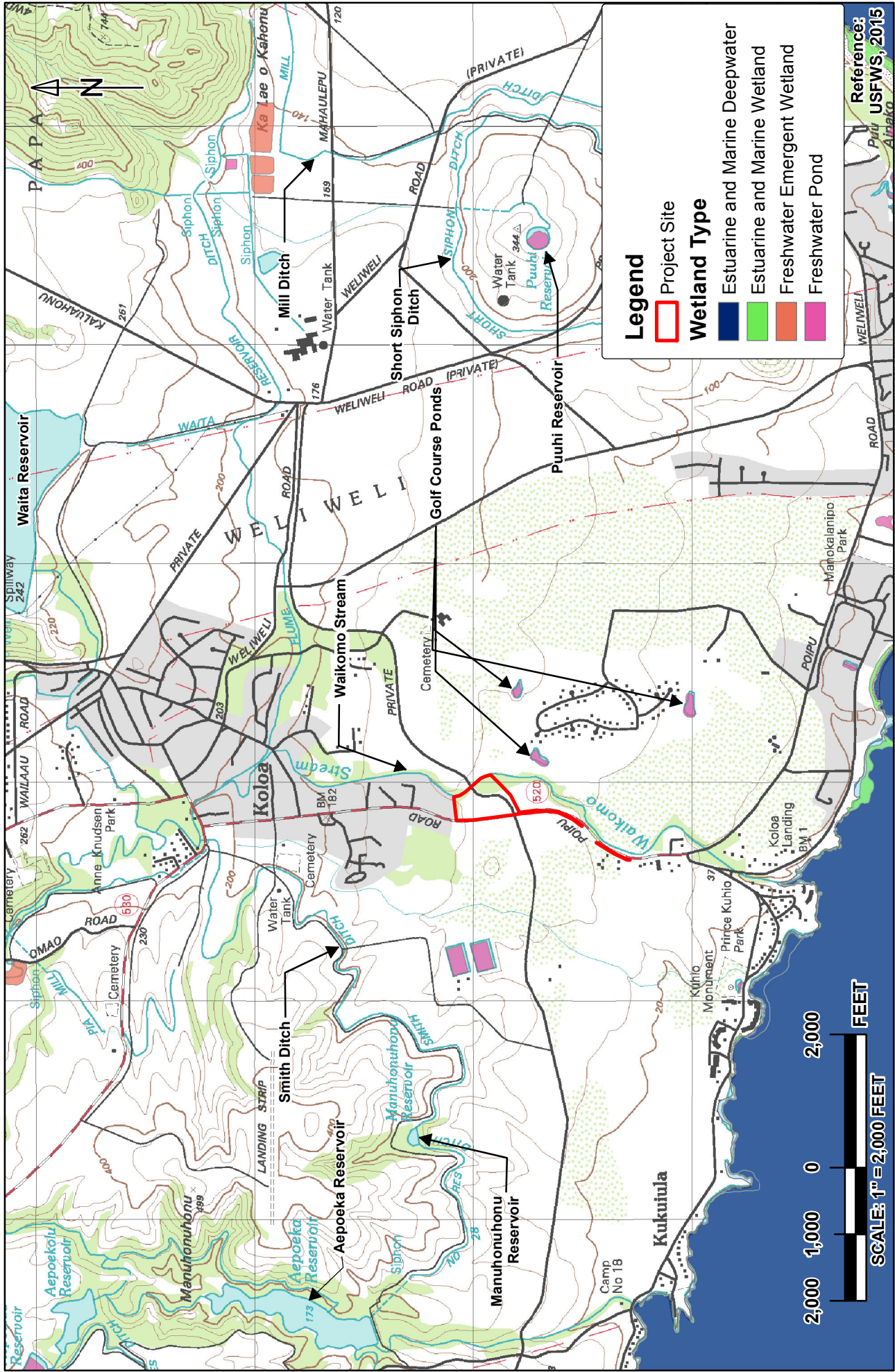
ENVIRONMENTAL ASSESSMENT FOR THE PROPOSED KOAE HOUSING PROJECT

FLOOD HAZARD MAP
KŌLOA, KAUAI, HAWAII

**Community Planning
and Engineering, Inc.**

FIGURE
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ENVIRONMENTAL ASSESSMENT FOR THE PROPOSED KOAE HOUSING PROJECT

WETLANDS MAP
KŌLOA, KAUAI, HAWAII

FIGURE
6

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3.2.5 SOLID AND HAZARDOUS MATERIALS AND WASTES

Definition of Resources

Solid Waste

Solid waste is defined as garbage, refuse, and other discarded materials, including solid, liquid, semi-solid, or contained gaseous materials resulting from industrial, commercial, mining, and agricultural operations, sludge from waste and water supply treatment plants, and residues from air pollution control facilities and community activities. However, solid waste does not include solid or dissolved materials in domestic sewage or other substances in water sources such as silt, dissolved or suspended solids in industrial waste water effluents, dissolved materials in irrigation return flows, or other common water pollutants, or source, special nuclear, or by-product material as defined by the Federal Atomic Energy Act of 1954, as amended (HAR 11-58.1).

Hazardous Materials and Wastes

Hazardous materials are defined as substances with strong physical properties of ignitability, corrosivity, reactivity, or toxicity, which may cause an increase in mortality, serious irreversible illness, incapacitating reversible illness, or pose a substantial threat to human health or to the environment. *Hazardous wastes* are defined as any solid, liquid, contained gaseous, or semisolid waste, or any combination of wastes that pose a substantial present or potential hazard to human health or to the environment.

Issues associated with hazardous materials and wastes typically center on underground storage tanks, aboveground storage tanks, and the storage, transport, and use of pesticides and fuel. When such resources are improperly used, they can threaten the health and well-being of wildlife species, botanical habitats, soil systems, water resources, and people.

Regulatory Setting

Solid Waste

Solid Waste management regulations are specified in HAR 11-58.1, with the intent to:

- 1) prevent pollution of the drinking water supply or waters of the state;
- 2) prevent air pollution;
- 3) prevent the spread of disease and the creation of nuisances;
- 4) protect public health and safety;
- 5) conserve natural resources; and
- 6) preserve and enhance the beauty and quality of the environment.

Hazardous Waste

HAR 11-262 specifies rules regulating hazardous waste management. Hazardous Waste Management regulations are specified in EPA state-specific Universal Waste Regulations and in CFR Title 40, Part 261- Identification and Listing of Hazardous Waste.

In 1980 the U.S. Congress enacted the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) in order to identify and remediate sites where hazardous substances were, or could be, released into the environment. As a result, CERCLA often addresses uncontrolled releases of hazardous substances from facilities no longer in operation. In addition, the Resource Conservation and Recovery Act (RCRA) was enacted in 1976 in order to focus on the prevention and remediation of releases from currently operating facilities. Together the two pieces of legislation effectively form the “safety net” intended to protect the ecosystems in which organisms thrive.

3.2.5.1 EXISTING CONDITIONS

The project site includes vacant land and electric utility lines. There is no known hazardous materials use or hazardous waste-generating activity that has occurred at the proposed project site. According to KIUC, no transformers are installed on or near the project site and only electrical transmission and distribution overhead lines are present. Two Phase I Environmental Site Assessments were performed for the project site in September 2004 and February 2008. The Phase I Environmental Site Assessments did document existing solid waste within the area (*i.e.*, used drip irrigation tubing and polyvinyl chloride [PVC] pipes).

Approach to Analysis

Numerous local, federal, and state laws regulate the storage, handling, disposal, and transportation of hazardous materials and wastes; the primary purpose of these laws is to protect human health and the environment. The significance of potential impacts associated with hazardous substances is based on their toxicity, reactivity, ignitability, and corrosivity. Impacts associated with hazardous materials and wastes would be significant if the storage, use, transportation, or disposal of hazardous substances substantially increased the human health risk or environmental exposure.

3.2.5.2 POTENTIAL IMPACTS AND MITIGATION

No Action Alternative

Under implementation of the No Action Alternative, the Koa'e subdivision would not be constructed. The project site would remain unchanged and there would be no additional hazardous materials or solid wastes generated.

Proposed Action

Solid Waste

During construction of the Proposed Action, solid waste in the form of construction debris will be generated. However, short-term impacts will be reduced to a level of insignificance by the contractors Solid Waste Management Plan developed in accordance with county regulations. The Proposed Action is expected to result in less than significant long-term impacts on the county solid waste collection system and landfill. Residential solid waste service would be provided by the County of Kaua'i Refuse Division in accordance with current collection policies.

As a result, the Proposed Action would result in less than significant impacts to the county solid waste disposal system.

Hazardous Materials and Waste

During construction of the Proposed Action, there may be the potential of petroleum spillage associated with construction vehicles and equipment. To minimize this hazard, all applicable spill and prevention control BMPs would be implemented to ensure that accidental releases are minimized and contained. For example, vehicles and equipment would be regularly inspected for leaks and adequate performance, and would be maintained accordingly. In the long-term, there is potential for petroleum spillage from residential sources (e.g., vehicle leaks and improper disposal of hazardous materials). These potential impacts would be reduced by adherence to all applicable county and state regulations. As a result, implementation of the Proposed Action is expected to have a less than significant impact from hazardous materials and wastes.

3.2.6 CLIMATE AND AIR QUALITY

Definition of Resource

Climate

Climate is defined as long-term atmospheric patterns that characterize a region or location, and includes measures of temperature, humidity, atmospheric pressure, wind, precipitation, atmospheric particle count, and other meteorological variables. Knowing the climate of an area enables the predictability of short-term weather phenomena; however, only the weather can specify actual short-term atmospheric conditions. Some geographic regions with great topographic variations over relatively short distances (e.g., slope steepness, aspect) have micro-climates that are distinct to small areas (e.g., canyons, leeward vs. windward, hilltops, basins).

Air Quality

Air quality at a given location is a function of several factors including the quantity and type of pollutants emitted locally and regionally, as well as the dispersion rates of these pollutants. Primary factors affecting pollutant dispersion are wind speed and direction, atmospheric stability, temperature, the presence or absence of inversions, and topography. Air quality is affected by both stationary sources (e.g., industrial development) and mobile sources (e.g., motor vehicles).

Air quality at a given location is determined by the concentration of various pollutants in the atmosphere. National Ambient Air Quality Standards (NAAQS) are established by the EPA for criteria pollutants, including: ozone (O₃), carbon monoxide (CO), nitrogen dioxide (NO₂), sulfur dioxide (SO₂), particulate matter less than or equal to ten microns in diameter (PM₁₀) and less than or equal to 2.5 microns in diameter (PM_{2.5}), and lead (Pb). NAAQS represent maximum levels of background pollution that are considered safe, with an adequate margin of safety, to protect public health and welfare.

Ozone (O₃). The majority of ground-level (or terrestrial) O₃ is formed as a result of complex photochemical reactions in the atmosphere involving volatile organic compounds (VOCs), nitrogen oxides (NO_x), and oxygen. O₃ is a highly reactive gas that damages lung tissue, reduces

pulmonary function, and sensitizes the lung to other irritants. Although stratospheric O₃ shields the earth from damaging ultraviolet radiation, terrestrial O₃ is a highly damaging air pollutant and is the primary source of smog.

Carbon Monoxide (CO). CO is a colorless, odorless, and poisonous gas produced by incomplete burning of carbon in fuel. The health threat from CO is most serious for those who suffer from cardiovascular disease, particularly those with angina and peripheral vascular disease.

Nitrogen Dioxide (NO₂). NO₂ is a highly reactive gas that can irritate the lungs, cause bronchitis and pneumonia, and lower resistance to respiratory infections. Repeated exposure to high concentrations of NO₂ may cause acute respiratory disease in children. Because NO₂ is a key precursor in the formation of O₃ or smog, control of NO₂ emissions is an important component of overall pollution reduction strategies. The two primary sources of NO₂ in the U.S. are fuel combustion and transportation.

Sulfur Dioxide (SO₂). In Hawai'i, the main source of SO₂ is vog from volcanic eruptions. SO₂ is also emitted from stationary source coal and oil combustion, steel mills, refineries, pulp and paper mills, and from nonferrous smelters. High concentrations of SO₂ may aggravate existing respiratory and cardiovascular disease; asthmatics and those with emphysema or bronchitis are the most sensitive to SO₂ exposure. SO₂ also contributes to acid rain, which can lead to the acidification of lakes and streams and damage trees.

Particulate Matter (PM₁₀ and PM_{2.5}). Particulate matter (PM) is a mixture of tiny particles that vary greatly in shape, size, and chemical composition, and can be composed of metals, soot, soil, and dust. PM₁₀ includes larger, coarse particles less than ten microns in size, whereas PM_{2.5} includes smaller, fine particles less than 2.5 microns in size. Sources of coarse particles include crushing or grinding operations, and dust from paved or unpaved roads. Sources of fine particles include vog, all types of combustion activities (e.g., motor vehicles, power plants, wood burning) and certain industrial processes.

Exposure to PM₁₀ and PM_{2.5} levels exceeding current standards can result in increased respiratory- and cardiac-related respiratory illness. Short-term effects from PM may include headaches, breathing difficulties, eye irritation, and sore throat. The EPA has concluded that PM_{2.5} are more likely to contribute to health problems than PM₁₀.

Airborne Lead (Pb). Airborne Pb can be inhaled directly or ingested indirectly by consuming Pb-contaminated food, water, or non-food materials such as dust or soil. Fetuses, infants, and children are most sensitive to Pb exposure. Pb has been identified as a factor in high blood pressure and heart disease. Exposure to Pb has declined dramatically in the last 10 years as a result of the reduction of Pb in gasoline and paint, and the elimination of Pb from soldered cans.

Greenhouse Gases (GHGs)

Greenhouse gases (GHGs) trap heat in the earth's atmosphere, affecting climate change and contributing to global warming. Both naturally occurring and anthropogenic (man-made) GHGs include: water vapor, carbon dioxide (CO₂), methane (CH₄), nitric oxide (NO), and O₃. According to guidance from the CEQ, during an analysis of direct effects it is appropriate to: (1) quantify cumulative emissions over the life of the project; (2) discuss measures to reduce GHG emissions, including consideration of reasonable alternatives; and (3) qualitatively discuss the link between such GHG emissions and climate change. However, it is not currently useful for NEPA analysis to attempt to link specific climatological changes, or the environmental impacts

thereof, to the particular project or emissions, as such direct linkage is difficult to isolate and to understand. The estimated level of GHG emissions can serve as a reasonable proxy for assessing potential climate change impacts, and provide decision makers and the public with useful information for a reasoned choice among alternatives. The CEQ suggests the emission indicator of 25,000 metric tons of CO₂-equivalent per year to determine if a federal agency should conduct a GHG emission study on a proposed action (CEQ, 2010). It is not anticipated that the short-term construction emissions associated with implementation of the proposed action would produce GHG emissions at or above the CEQ standard, or emissions at or above NAAQS standards. Once in operation the proposed subdivision would not result in significant GHG emissions. Therefore, a GHG emission study would not be warranted.

Regulatory Setting

The CAA Amendments of 1990 place most of the responsibility to achieve compliance with NAAQS on individual states. The State of Hawai‘i Department of Health (DOH) Clean Air Branch is responsible for air pollution control in the state. The primary services of the branch include: 1) Engineering, which includes engineering analysis and permitting; 2) Monitoring, which performs monitoring and investigations; and 3) Enforcement, in which federal and state air pollution control laws and regulations are enforced.

The EPA requires each state to prepare a State Implementation Plan (SIP). A SIP is a compilation of goals, strategies, schedules, and enforcement actions that would lead the state into compliance with all NAAQS for CO, PM₁₀, PM_{2.5}, SO₂, NO₂, and O₃ to thus reach attainment status. Areas not in compliance with a standard can be declared non-attainment areas by EPA or the appropriate state or local agency. There can be lenience for Exceptional Events, which are defined as “unusual or naturally occurring events that can affect air quality but are not reasonably controllable using techniques that tribal state, or local air agencies may implement in order to attain and maintain the NAAQS” (EPA, 2012). An example of an Exceptional Event is a volcanic eruption, which affects air quality by causing exceedances of NAAQS and cannot be controlled by human intervention.

3.2.6.1 EXISTING CONDITIONS

The average annual temperature on Kaua‘i is 75.9 degrees Fahrenheit, with an annual average total precipitation of 37.44 inches. The months of the year with the most rainfall occur from October through March (Western Region Climate Center, 2015).

The project site is located in Kōloa on the southern coast of the island of Kaua‘i. The annual average maximum temperature is 79.1 degrees Fahrenheit, the annual average minimum temperature is 66.2 degrees Fahrenheit, and the annual average total precipitation is 67.75 inches (Western Region Climate Center, 2015).

The prevailing winds on Kaua‘i (known as trade winds) are from the east-northeast, with a mean wind speed of 13.1 mph (Western Region Climate Center, 2015). The trade winds prevail approximately nine months of the year. Trade winds blow vog (*i.e.*, volcanic fog) from the Big Island of Hawai‘i volcanoes, as well as other air contaminants, to the southwest. During the winter months, winds tend to be less predictable, with longer periods of light and variable winds, and occurrences of strong southerly or “Kona” winds associated with weather fronts and storms.

In addition, when trade winds are absent for prolonged periods, vog travels up the island chain and can affect air health by increasing levels of airborne SO₂ and PM_{2.5}. Although both of these pollutants are regulated by the EPA, Hawai'i's advisories for volcanic SO₂ and PM_{2.5} have been customized for local conditions. Air monitoring stations in communities near Kīlauea Volcano on the Big Island of Hawai'i record regular exceedances of the NAAQS for SO₂ and occasional exceedances of the NAAQS for PM_{2.5}. The EPA considers the volcano a natural, uncontrollable event, and therefore the state requests exclusion from these NAAQS exceedances for attainment/non-attainment determination (DOH, 2012). Shorter exposure time intervals have also been adopted due to variable wind conditions, which can cause volcanic gas concentrations to change rapidly (USGS, 2014b).

The project site is located in EPA attainment zones for CO, NO₂, O₃, PM_{2.5}, PM₁₀, SO₂, and Pb (EPA, 2014). In 2012, Hawai'i was in attainment with NAAQS annual averages of PM₁₀, PM_{2.5}, O₃, CO, and SO₂, based upon three year averages of annual mean values from 12 air quality stations (four on O'ahu, one on Maui, seven on the Big Island of Hawai'i, and one on Kaua'i) that represent the State of Hawai'i. The air quality station positioned closest to the project site is located approximately 13 miles east from the project site in Līhu'e. The annual averages from this air quality station from 2008-2012 indicated that annual averages of NO₂, PM_{2.5}, SO₂, and CO levels in ambient air were well below their respective state (HAR 11-59) and federal (40 CFR Part 50) Standards (DOH, 2012). Levels of PM₁₀ and O₃ were not taken at the Līhu'e air quality station, but annual average levels of PM₁₀ taken from 2008-2012 at the Kapolei air quality station (the station located closest to the project site that captures PM₁₀ levels) were one-third or less than the state and federal standard. Similarly, O₃ Fourth Highest Daily Maximum 8-Hour Averages from the same time period, taken at the Sand Island air quality station (the station located closest to the project site that captures O₃ levels) were two-thirds or less than the federal standard (DOH, 2012).

Approach to Analysis

The 1990 Amendments to the CAA require that federal agency activities conform to the SIP with respect to achieving and maintaining attainment of NAAQS and to addressing air quality impacts. The EPA General Conformity Rule requires that a conformity analysis be performed, which demonstrates that a proposed action does not: 1) cause or contribute to any violation of any NAAQS in the area; 2) interfere with provisions in the SIP for maintenance or attainment of any NAAQS; 3) increase the frequency or severity of any existing violation of any NAAQS; or 4) delay timely attainment of any NAAQS, any interim emission reduction goals, or other milestones included in the SIP. Provisions in the General Conformity Rule allow for exemptions from performing a conformity determination only if total emissions of individual non-attainment area pollutants resulting from a proposed action fall below the *de minimis* threshold values.

3.2.6.2 POTENTIAL IMPACTS AND MITIGATION

No Action Alternative

Under the No Action Alternative, the Koae Workforce Housing Development would not be constructed. The project site would remain unchanged from current conditions. The project site is largely undeveloped with the exception of an old cane haul road bisecting the parcel east to west and KIUC power lines with an accompanying utility easement. No active commercial or residential activities take place at the project site with the exception of regular maintenance

activities associated with the utility easement. Current less than significant fugitive dust and vehicular emissions would continue due to the use of maintenance vehicles at the project site. No additional impacts to air quality would occur under implementation of the No Action Alternative.

Proposed Action

The Proposed Action would result in less than significant short-term impacts to air quality arising from construction activities. Major potential short-term air quality impacts would occur from the generation of fugitive dust during construction activities. The State of Hawai'i Air Pollution Control Regulations prohibit visible emissions of fugitive dust from construction activities at the property line. Applicable BMPs would be implemented during construction activities in order to control fugitive dust emissions. These BMPs would include watering active work areas and unpaved work roads; use of wind screens; establishment of a routine road cleaning and/or tire washing program; paving of parking areas; establishment of landscaping early in the construction schedule; and monitoring dust at the project boundary.

The use of construction equipment and personal vehicles to access the project site could lead to temporary increases in vehicular airborne pollutant concentrations. To reduce vehicle and equipment emissions, carpooling and ensuring that equipment is functioning properly would be included in regular construction work practices. Further, increased vehicular emissions due to disruption of traffic by construction equipment and / or commuting construction workers may occur. These increased vehicular emissions would be alleviated by moving equipment and personnel to the project site during off-peak traffic hours. As a result, short-term impacts to air quality due to construction activities would be considered less than significant.

Direct long-term impacts to air quality due to increased vehicular traffic are not expected to be significant. The Proposed Action would result in minimal increased annual emissions. However, worst-case projected concentrations should remain well within both the state and national ambient air quality standards (below *de minimus* threshold concentrations for all area pollutants). Therefore, indirect long-term impacts to air quality due to the Proposed Action would be considered less than significant.

3.2.7 NOISE

Definition of Resources

Noise is generally defined as unwanted sound. Noise can be any sound that is undesirable because it interferes with communication, is intense enough to damage hearing, or is otherwise annoying. Human responses to noise vary depending on the type and characteristics of the noise, distance between the noise source and receptor, receptor sensitivity, and time of day.

Determination of noise levels are based on: 1) sound pressure level generated (decibels [dB] scale); 2) distance of listener from source of noise; 3) attenuating and propagating effects of the medium between the source and the listener; and 4) period of exposure.

An A-weighted decibel (dBA) sound level is one measurement of noise. The human ear can perceive sound over a range of frequencies, which varies for individuals. In using the A-weighted scale for measurement, only the frequencies heard by most listeners are considered.

This gives a more accurate representation of the perception of noise. The noise measure in a residential area, similar to conditions within the project site, is estimated at approximately 70 dBA. Normal conversational speech at a distance of five to ten feet is approximately 70 dBA. The decibel scale is logarithmic, so, for example, sound at 90 dBA would be perceived to be twice as loud as sound at 80 dBA. Passenger vehicles, motorcycles, and trucks use the roads in the vicinity of the project site. Noise levels generated by vehicles vary based on a number of factors including vehicle type, speed, and level of maintenance. Intensity of noise is attenuated with distance. Some estimates of noise levels from vehicles are listed in Table 3-2 (Cavanaugh and Tocci, 1998).

Table 3-2: Typical Noise Sources

Source	Distance (feet)	Noise Level (dBA)
Automobile, 40 mph	50	72
Automobile Horn	10	95
Light Automobile Traffic	100	50
Truck, 40 mph	50	84
Heavy Truck or Motorcycle	25	90

Source: Cavanaugh and Tocci, 1998.

Regulatory Setting

HAR Title 11, Chapter 46 Community Noise Control sets permissible noise levels in order to provide for the prevention, control, and abatement of noise pollution in the state. The regulation creates noise districts based on land use that dictate acceptable noise levels. The project site is currently zoned for residential use. Therefore, the project site is in a Class B zoning district, as defined by HAR 11-46. The maximum permissible sound level in a Class B district is 60 dBA from 7:00 am-10:00 pm and 50 dBA from 10:00 pm-7:00 am (DOH, 1969).

The EPA has identified a range of yearly day-night sound level (DNL) standards that are sufficient to protect public health and welfare from the effects of environmental noise (EPA, 1977). The EPA has established a goal to reduce exterior environmental noise to a DNL not exceeding 65 dBA and a future goal to further reduce exterior environmental noise to a DNL not exceeding 55 dBA. Additionally, the EPA states that these goals are not intended as regulations as it has no authority to regulate noise levels, but rather they are intended to be viewed as levels below which the general population would not be at risk from any of the identified effects of noise.

The U.S. Occupational Safety and Health Administration (OSHA) has established acceptable noise levels for workers. Table 3-3 shows permissible noise levels for varying exposure times.

Table 3-3: OSHA Permissible Noise Exposures

Duration per day-hours	Sound level dBA slow response
8	90
6	92
4	95
3	97
2	100
1.5	102
1	105
0.5	110
0.25 or less	115

Source: OSHA, 2012

3.2.7.1 EXISTING CONDITIONS

The project site is located on the south side of the island of Kaua‘i approximately seven miles southwest of Līhu‘e town, and less than one mile south of downtown Kōloa. The noise environment within the vicinity of the project site is presently dominated by traffic, wind, birds, occasional distant aircraft flyovers, the Kiahuna Golf Club, and intermittent noise associated with KIUC’s maintenance of power lines located at the project site. Noise receptors within the vicinity of the project site include the Kiahuna Golf Club, a residential subdivision to the north, and Po‘ipū Road.

Approach to Analysis

Noise impact analyses address potential changes to existing noise environments that would result from implementation of a proposed action. Potential changes in the noise environment can be beneficial (*e.g.*, if they reduce the number of sensitive receptors exposed to unacceptable noise levels), negligible (*e.g.*, if the total area exposed to unacceptable noise levels is essentially unchanged), or adverse (*e.g.*, if they result in increased exposure to unacceptable noise levels).

3.2.7.2 POTENTIAL IMPACTS AND MITIGATION

No Action Alternative

Under implementation of the No Action Alternative, the Koae Workforce Housing Development would not be constructed. No construction activity or accompanying noise associated with the use of construction equipment would occur. The proposed project site would remain unchanged

and the noise environment in the project site would continue to be dominated by traffic, wind, birds, occasional distant aircraft flyovers, the Kiahuna Golf Club, and intermittent noise associated with KIUC's maintenance of power lines located at the project site.

Proposed Action

Under the Proposed Action, less than significant short-term noise impacts from construction activities would occur. Development of the project site would involve excavation, grading, and other typical construction activities. The dense vegetation and tall trees bordering the north, east, and southern edges of the project site may aid in limiting construction-related noise to sensitive receptors by acting as a barrier. Furthermore, BMPs (e.g., construction scheduling; insulation/muffling; reduced power options; equipment substitution, selection, retrofit, and maintenance; utilization of staging areas; and non-permanent noise barriers) would be implemented to reduce or eliminate noise and buffer zones between construction activities and residential areas would be created; construction work would be limited to the hours between 7:30 am and 3:30 pm on weekdays. Therefore, the Proposed Action is not expected to significantly impact any existing sensitive noise receptors within the vicinity of the project site (i.e., Kiahuna Golf Club, an existing residential subdivision, and Po'ipū Road).



View of Waikomo Stream bordered by thick brush and trees.

Upon completion, the Proposed Action would have less than significant long-term impacts to noise receptors. The proposed housing development is expected to incorporate stationary mechanical equipment that is typical for residential buildings. Typical stationary mechanical equipment present in housing developments include, but are not limited to, air handling equipment, condensing units, and refrigeration units. These stationary mechanical units are a source of noise that must meet DOH Community Noise Control rules. In order to comply with noise rules and prevent noise impacts to residences, the Proposed Action would incorporate design considerations to control the noise emanating from stationary mechanical sources. Design features that could be incorporated would include sufficient spacing between noise source(s) and receptor(s); and installing measures such as mufflers, silencers, acoustical enclosures, or noise barrier walls.

Noise associated with future traffic volume increases due to the development of the Proposed Action are expected to be less than significant. The Koae subdivision would be designed in

accordance with applicable federal and state noise standards including the Federal Highway Administration and HUD. As a result, long-term impacts to noise generation would be considered less than significant.

3.3 SOCIAL ENVIRONMENT

3.3.1 LAND USE CONSIDERATIONS AND ZONING

Definition of Resources

Land use comprises natural conditions or human-modified activities occurring at a particular location. Human-modified land use categories include residential; commercial; industrial; transportation; communications and utilities; agricultural; institutional; recreational; and other developed use areas.

Management plans and zoning regulations determine the type and extent of land use allowable in specific areas and are often intended to protect specially designated or environmentally sensitive areas.

Regulatory Setting

The Hawai‘i State Land Use Law (HRS Chapter 205) establishes a framework of land use management and regulation in which all lands in the State of Hawai‘i are classified into four land use districts (Urban, Rural, Agricultural, and Conservation). The State Land Use Commission (LUC) was established by the state legislature in order to administer the land use law.

The Council of the County of Kaua‘i adopted an amended Comprehensive Zoning Ordinance (CZO) in 2012. The CZO was adopted for multiple purposes including: “implementing the intent and purpose of the adopted General Plan; regulating the use of buildings, structures, and land for different purposes; regulating location, height, bulk, and size of buildings and structures, the size of yards, courts, and other open spaces to maintain the concept of Kaua‘i as ‘The Garden Isle,’ thus assuring that any growth would be consistent with the unique landscape and environmental character of the island; to insure that all physical growth is carried out so as to maintain the natural ecology of the island to the extent feasible; to provide opportunities for desirable living quarters for all residents in all income levels; [and] to guide and control development to take full advantage of the island’s form, beauty and climate, and preserve the opportunity for an improved quality of life” (County of Kaua‘i, 2012).

3.3.1.1 EXISTING CONDITIONS

Land Use

The project site is located on a 11.2-acre parcel in Kōloa, on the south side of the island of Kaua‘i. The project site was formerly utilized for commercial sugarcane production and is currently zoned for residential use. The project site is vacant, aside from an old cane haul road and overhead electric lines, and was dedicated to the County of Kaua‘i by Alexander & Baldwin (A&B), LLC for the purpose of creating workforce housing (County of Kaua‘i, 2015). Land use activities surrounding the project site include residential, agricultural, commercial, and recreational uses.

Zoning

According to the State LUC district classifications, the project site is located within an Urban District (Figure 7) (Council of the County of Kaua‘i, 2005). The site is zoned for residential use (R-20) under County zoning (Figure 8). According to Section 8-4.2 of the Kaua‘i County Code, the R-20 district allows for 20 housing units per one acre of land. The project site is adjacent to State classified Urban and Agricultural districts; per County zoning, these surrounding parcels are designated as Agricultural, Residential, and Hotel & Resort. The project site is not included within the Important Agricultural Lands (IALs) as defined by the State of Hawai‘i Land Evaluation and Site Assessment Commission (Figure 9). The land parcel zoning information for the project site is summarized in Table 3-4.

Table 3-4: Project Site Land Parcel Information

Tax Map Key (TMK) Number	Parcel Area (acres)	State Land Use District	County Zoning Designation	Fee Owner
(4) 2-6-004:019	11.2	Urban	Residential (R-20)	County of Kaua‘i

Tsunami Hazard Zones

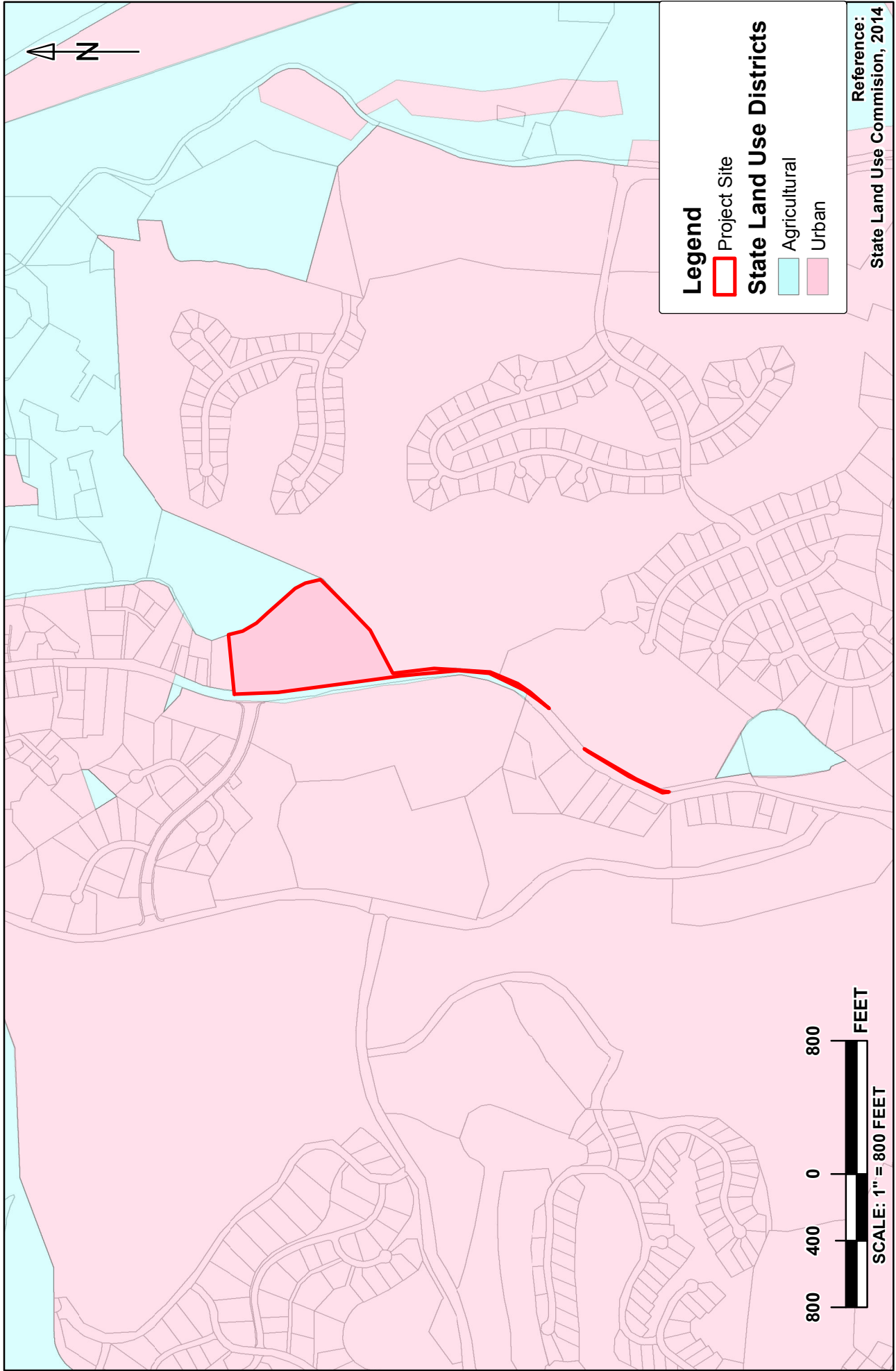
The project site is located outside of the tsunami evacuation zone as determined by the National Oceanic and Atmospheric Administration (NOAA) in partnership with the Hawai‘i State Civil Defense (NOAA, 2015; State of Hawai‘i, 2015).

Coastal Zone Consistency

The entire island of Kaua‘i falls within the coastal zone, and is therefore under the jurisdiction of the CZM Program, which was established in compliance with the Coastal Zone Management Act. The program is administered by the State of Hawai‘i Office of Planning and is intended to provide for the effective management, beneficial use, protection, and development of the coastal zone (HRS 205A).

Approach to Analysis

Significance of potential land use impacts is based on the level of land use sensitivity in areas affected by a proposed action. In general, land use impacts would be significant if they would: 1) be inconsistent or noncompliant with applicable land use plans or policies; 2) preclude the viability of existing land use; 3) preclude continued use or occupation of an area; or 4) be incompatible with adjacent or vicinity land use to the extent that public health or safety is threatened.



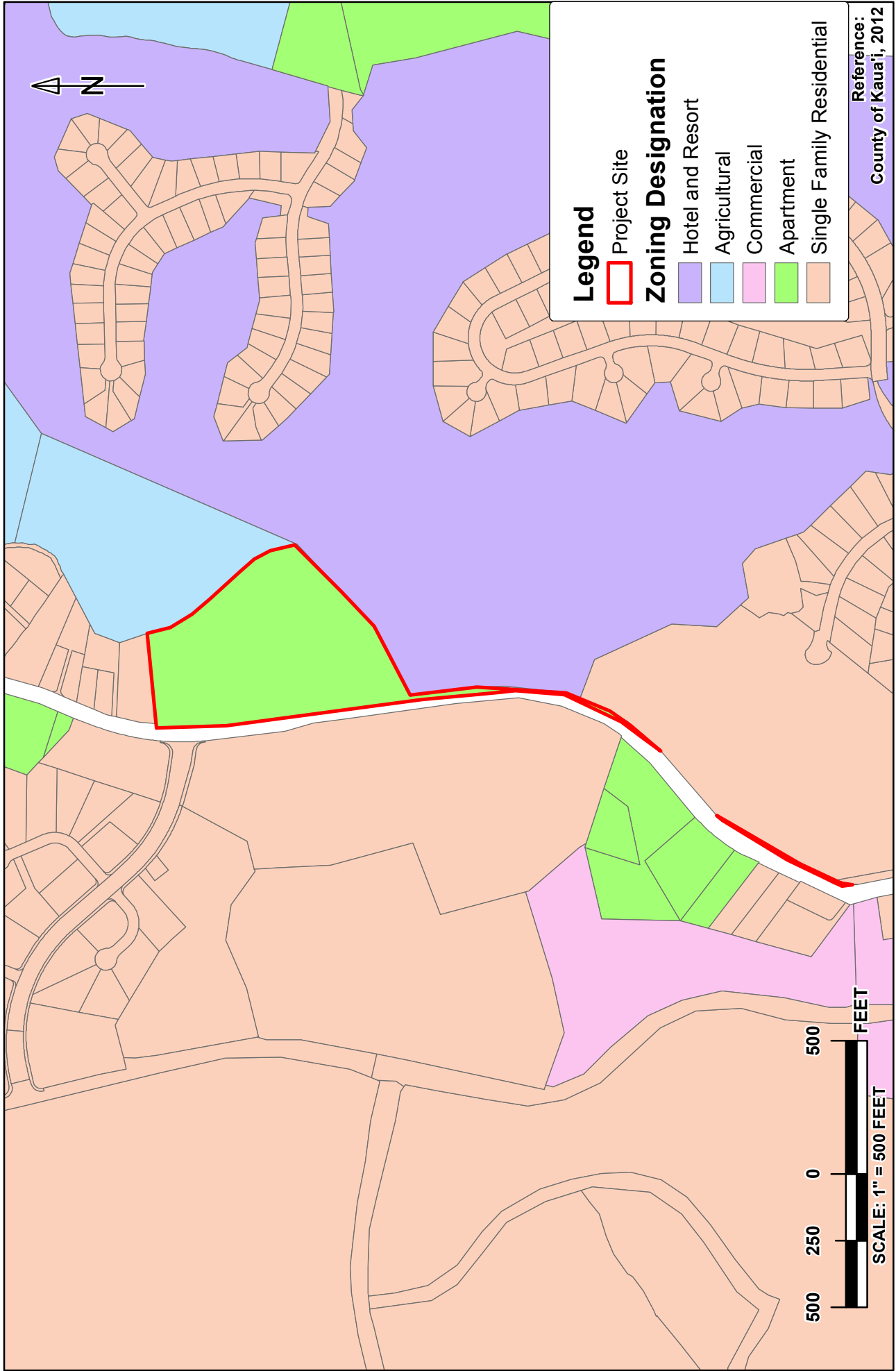
ENVIRONMENTAL ASSESSMENT FOR THE PROPOSED KOAE HOUSING PROJECT

STATE LAND USE DISTRICTS MAP
KŌLOA, KAUAʻI, HAWAII



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Legend

Project Site

Zoning Designation

- Hotel and Resort
- Agricultural
- Commercial
- Apartment
- Single Family Residential

Reference:
County of Kauaʻi, 2012

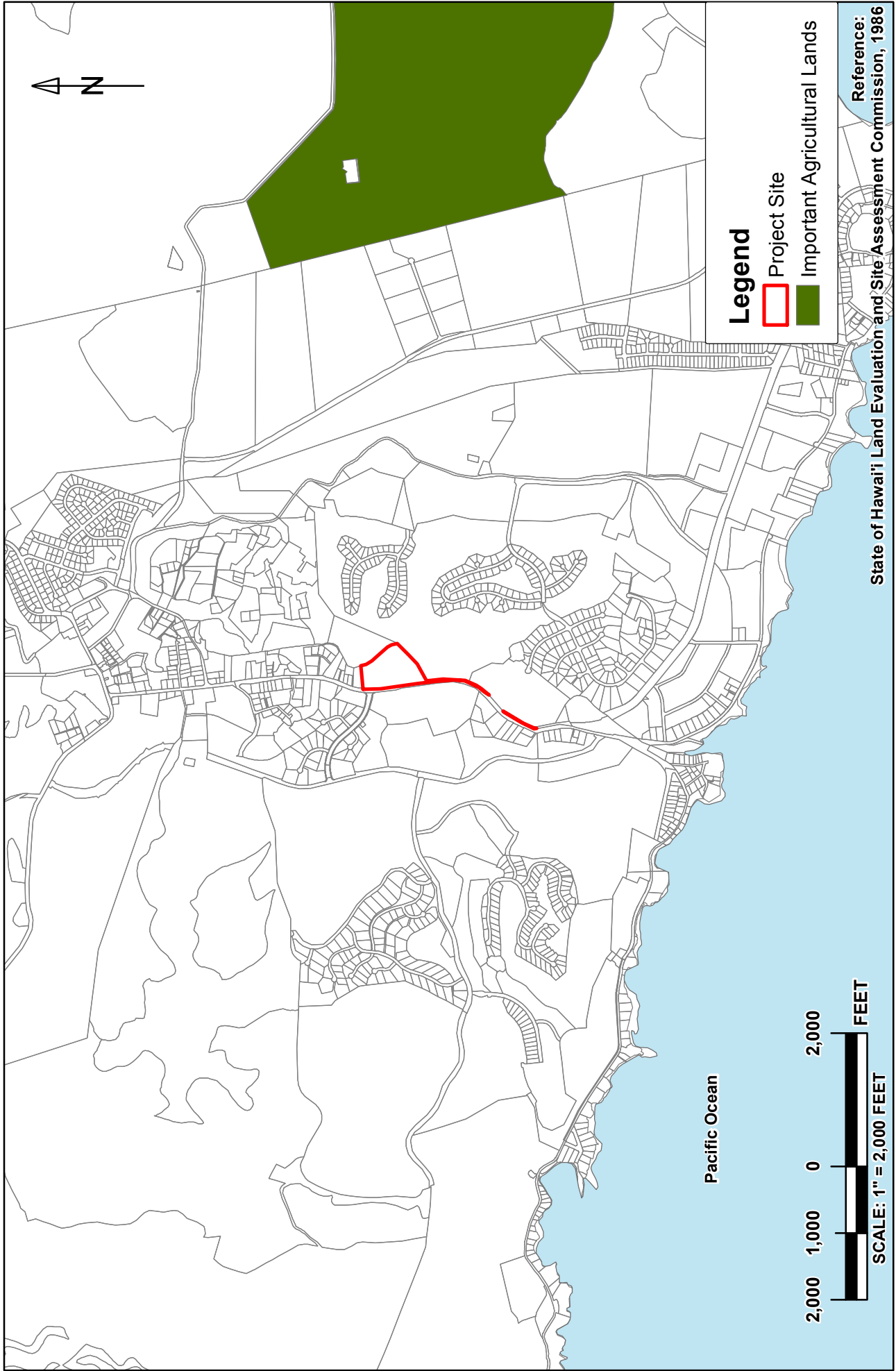
ENVIRONMENTAL ASSESSMENT FOR THE PROPOSED KOAE HOUSING PROJECT

COUNTY ZONING DESIGNATION MAP
KŌLOA, KAUAʻI, HAWAII

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FIGURE
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ENVIRONMENTAL ASSESSMENT FOR THE PROPOSED KOAE HOUSING PROJECT

IMPORTANT AGRICULTURAL LANDS MAP
KŌLOA, KAUAʻI, HAWAII



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3.3.1.2 POTENTIAL IMPACTS AND MITIGATION

No Action Alternative

Under the No Action Alternative, the Koae Workforce Housing Development would not be constructed. No changes to current land use would occur. Therefore, there would be no impact to land use at the project site.

Proposed Action

The Proposed Action would result in less than significant short-term impacts to land use from construction activities. The project site is located east of Po‘ipū Road in the town of Kōloa. Currently there is no public access to the project site since the parcel is a gated lot used only for occasional electrical utility maintenance by KIUC. Access to the project site would not be affected by construction activities and short-term impacts to land use arising from construction activities would be less than significant.

Once developed, the Proposed Action would be considered compatible, consistent, and not in conflict with any of the objectives of the CZM program due to minimal impact to the recreational use and coastal resources. Development of the community would not impact coastal recreation opportunities, impede economic uses, increase coastal hazards, or conflict with development within the coastal zone. Further, the project site is not included in the State of Hawai‘i Special Management Area. Therefore, the Proposed Action would be considered compatible and consistent with the program goals, and would not require a Special Management Area permit. Finally, the State of Hawai‘i Office of Planning would be consulted during the environmental review process for applicable federal CZM consistency review.

The Proposed Action would require obtaining development entitlements, as required by County charter. The project site is zoned for residential use under County zoning regulations and is located in a State LUC Urban District. The proposed project use (residential) would be consistent with both State and County zoning designations. As an affordable housing project, Chapter 7A of the Kaua‘i County Charter and HRS 201H-38 could be used to provide greater flexibility and feasibility by allowing the residential development to vary from zoning regulations, if necessary.

The Proposed Action would meet the criteria established by the County of Kaua‘i General Plan and would be consistent with the General Plan Vision (County of Kaua‘i, 2000). Kaua‘i’s General Plan Vision describes Kaua‘i as a “rural environment of towns separated by broad open spaces,” as well as “a rural place whose population size and economy have been shaped to sustain Kaua‘i’s natural beauty, rural environment and lifestyle.”

The Proposed Action would be consistent with the stated vision by maintaining a rural environment within the project site, and providing the needed development for housing to sustain the environment and lifestyle of Kaua‘i. The General Plan states that preserving Kaua‘i’s rural character is the framework for new development, and that “within that framework, enhancing Kaua‘i’s towns and urban centers and directing new development to towns and urban centers are equally as important as maintaining open space between towns.” The Proposed Action would

benefit the people of Kaua‘i by fulfilling a significant need for affordable housing, while maintaining the qualities of development identified in the General Plan (*i.e.*, developing within the vicinity of established residential and commercial communities).

The development would be an extension of the urban development to the north (Kōloa Town) and would be adjacent to a golf club to the east and a parcel of land designated as residential to the west. As a result, the development would represent continuity with the established urban area, and the Proposed Action would meet the criteria of the General Plan by “focusing development.”

While the Proposed Action would represent a change in land use of the project site, there would be no significant impacts to land use at the project site or the surrounding area. Therefore, long-term impacts to land use from the Proposed Action would be less than significant.

3.3.2 CULTURAL RESOURCES

Definition of Resources

Cultural resources represent and document activities, accomplishments, and traditions of previous civilizations, and link current and former inhabitants of an area. Depending on their conditions and historic uses, these resources may provide insight to living conditions in previous civilizations and may retain cultural and religious significance to modern groups. Traditional cultural resources can include archaeological resources, structures, neighborhoods, prominent topographic features, habitats, plants, animals, and minerals that native Hawaiians or other groups consider essential for the persistence of traditional culture. The term historic properties refers to cultural resources that meet specific eligibility criteria for listing on the National Register of Historic Places (NRHP), such as age (generally at least 50 years old), architectural integrity, and/or significant association with historical events, activities, or developments.

Regulatory Setting

Several federal laws and regulations have been established to manage cultural resources, including the National Historic Preservation Act (NHPA) of 1966, the Archaeological and Historic Preservation Act (1974), and the Archaeological Resource Protection Act (1979).

The DLNR State Historic Preservation Division (SHPD) works to preserve and sustain historical and cultural resources through three branches: History and Culture, Archaeology, and Architecture. The SHPD maintains the statewide inventory of Historic Properties and reviews development projects in order to lessen the effects of change on Hawai‘i’s historical and cultural assets. Administrative rules pertaining to historic preservation in Hawai‘i can be found in HAR Chapters 197-198, 275-284, and 300. Statutes pertaining to historic preservation in Hawai‘i are found in HRS Chapter 6E.

Traditional cultural practices acknowledged in the State of Hawai‘i include rights of access and gathering. Traditional gathering rights have been codified in HRS 1-1 and 7-1, Article 12-7 of the Constitution of the State of Hawai‘i.

Articles IX and XII of the State Constitution of Hawai‘i (HRS Chapter 343) require government agencies to promote and preserve cultural beliefs, practices, and resources of native Hawaiian and other ethnic groups. The “Guidelines for Assessing Cultural Impacts,” adopted by the

Environmental Council of the State of Hawai‘i (1997), identifies the protocol for conducting cultural assessments. Once a cultural resource has been identified, a significance evaluation is conducted in which resources are assessed for scientific or historic research, for the general public, and for traditional cultural groups. In order for a cultural resource to be considered significant, per HAR §13-275-6, it must meet one or more of the following criteria for inclusion on the NRHP:

- A) associated with events that have made a significant contribution to the broad patterns of our history, or be considered a traditional cultural property;
- B) associated with the lives of persons significant in the past;
- C) embody distinctive characteristics of a type, period, or method of construction, or represent a significant and distinguishable entity whose components may lack individual distinction;
- D) has yielded or may be likely to yield, information important in prehistory or history; and/or
- E) have important value to native Hawaiian people or other ethnicities in the state, due to associations with cultural practices and traditional beliefs that were, or still are, carried out.

3.3.2.1 EXISTING CONDITIONS

Regional and Local History

The project site is located on the south side of the island of Kaua‘i approximately seven miles southwest of Līhu‘e town, and less than one mile south of downtown Kōloa. By the end of the 18th century, the project site comprised a portion of an intricate network of taro lo‘i, ‘auwai, and associated habitation sites that stretched across the makai floor of Kōloa ahupua‘a. This network, identified as the Kōloa field system, incorporated unique engineering innovations that allowed otherwise inhospitable lands – at a distance from water sources – to sustain a growing population (Cultural Surveys Hawai‘i, Inc., 2004b).

Nineteenth-century documents – Land Commission Award (LCA) records and historic maps – show that, within the project site, remnants of the traditional Hawaiian settlement pattern survived the first seven decades of western contact. However, by the early decades of the 20th century, western commercial entrepreneurial interests had transformed the project site into a portion of sugarcane fields and pasture lands, and had dispersed the remaining native residents (Cultural Surveys Hawai‘i, Inc., 2004b).

Traditional Cultural Practices

A Cultural Impact Assessment (CIA) was conducted for the project site by Cultural Surveys Hawai‘i in October 2004. The scope of work included an examination of historical documents in order to identify traditional Hawaiian activities; a review of existing archaeological information pertaining to the general region; and the contact of persons knowledgeable about the historic and traditional practices in the general region (Cultural Surveys Hawai‘i, Inc., 2004b).

None of the community contacts and informants questioned for the CIA knew of any cultural sites located within the project site. The community contacts could not recall anyone entering the project site – either in the past or present – for any traditional cultural practice. Based on the

evidence gathered, it was concluded that no contemporary or continuing cultural practices occur within the project site (Cultural Surveys Hawai‘i, Inc., 2004b).

Historic Properties

An Archaeological Inventory Survey (AIS) was conducted for the project site by Cultural Surveys Hawai‘i in September 2004 (Cultural Surveys Hawai‘i, Inc., 2004a). The scope of work included a complete ground survey of the entire project site; limited subsurface testing at the project site; and research on the historic and archaeological background for the project site and general region. Field inspection of the project site confirmed that extensive land modification associated with commercial plantation era agriculture, had greatly impacted the project site. No traditional native Hawaiian sites were observed within the project site. Test excavations conducted at the project site did not locate any subsurface cultural materials. Seven historic properties associated with the commercial plantation era were identified at the project site. All seven of the sites were determined to be significant under HAR §13-275-6 Criteria D, defined as: having yielded or may be likely to yield, information important in pre-history or history (Cultural Surveys Hawai‘i, Inc., 2004a). The seven historic properties are summarized in Table 3-5 below:

Table 3-5: Historic Properties Located at the Project Site

State Site #	# of Features	Form	Function	Significance	Recommendation
50-30-10-3873	1	Mound	Rock Consolidation / Agriculture	D	Sufficient Information Recovered, No Further Work
50-30-10-3874	1	Alignment	Soil Retention / Agriculture	D	Sufficient Information Recovered, No Further Work
50-30-10-3875	1	Alignment	Soil Retention / Agriculture	D	Sufficient Information Recovered, No Further Work
50-30-10-3876	1	Mound	Rock Consolidation / Agriculture	D	Sufficient Information Recovered, No Further Work
50-30-10-3877	1	Mound	Rock Consolidation / Agriculture	D	Sufficient Information Recovered, No Further Work
50-30-10-3878	1	Flume	Irrigation	D	Sufficient Information Recovered, No Further Work
50-30-10-3879	7	--	--	--	Sufficient Information Recovered, No Further Work
50-30-10-3879A	1	Mound	Agriculture	D	Sufficient Information Recovered, No Further Work

State Site #	# of Features	Form	Function	Significance	Recommendation
50-30-10-3879B	1	Berm	Agriculture	D	Sufficient Information Recovered, No Further Work
50-30-10-3879C	1	Flume	Irrigation	D	Sufficient Information Recovered, No Further Work
50-30-10-3879D	1	Berm	Agriculture	D	Sufficient Information Recovered, No Further Work
50-30-10-3879E	1	Alignment	Unknown	D	Sufficient Information Recovered, No Further Work
50-30-10-3879F	1	Berm	Agriculture	D	Sufficient Information Recovered, No Further Work

Source: Cultural Surveys Hawai'i, Inc., 2004a

Approach to Analysis

Analysis of potential impacts to cultural resources considers both direct and indirect impacts. Direct impacts may occur by: 1) physically altering, damaging, or destroying all or part of a resource; 2) altering the characteristics of the surrounding environment that contribute to resource significance; 3) introducing visual, audible, or atmospheric elements that are out of character with the property or alter its setting; or 4) neglecting the resource to the extent that it is deteriorated or destroyed.

Identifying the locations of Proposed Action and determining the exact locations of cultural resources that could be affected can assess direct impacts. Indirect impacts primarily result from the effects of project-induced population increases and the resultant need to develop new housing areas, utilities services, and other support functions necessary to accommodate population growth. These activities and the subsequent use of the facilities can disturb or destroy cultural resources.

3.3.2.2 POTENTIAL IMPACTS AND MITIGATION

No Action Alternative

Under the No Action Alternative, the Koae Workforce Housing Development would not be constructed. The project site would remain unchanged from current conditions and there would be no direct or indirect impacts to any potential cultural resources.

Proposed Action

No contemporary or continuing cultural or traditional practices occur within the project site. As a result, it is not anticipated that implementation of the Proposed Action would have significant short- or long-term impacts on cultural or traditional practices.

The Proposed Action would have short- and long-term impacts on the seven historic properties listed in Table 3-5. However, all seven of the historic features have been properly documented according to state regulations. As a result, no further work is recommended and alteration of the features by the Proposed Action would not represent a significant impact. Consultation with SHPD ~~will be~~ has been initiated to confirm the findings of the CIA and AIS. Correspondence ~~will be included~~ is included in Appendix B of ~~the~~ this Final EA.

Due to the extensive landscape modification associated with commercial plantation era agriculture, the project site and surrounding area has been greatly impacted. No traditional native Hawaiian sites were observed at the project site, and test excavations did not locate any subsurface cultural materials. As a result, it is unlikely that other undocumented historic resources exist within the project site. In the event that any human remains or other significant archaeological subsurface deposits are encountered during the course of development activities, all work in the immediate area would stop and SHPD would be promptly notified.

3.3.3 TRAFFIC AND CIRCULATION

Definition of Resources

Traffic and circulation refer to the movement of vehicles throughout a road or highway network. Primary roads are principal arterials, such as major interstates, designed to move traffic and not necessarily to provide access to all adjacent areas. Secondary roads are arterials such as rural routes and major surface streets, which provide access to residential and commercial areas, hospitals, and schools.

Regulatory Setting

State of Hawai'i Department of Transportation (HDOT) Highway Manual for Sustainable Landscape Maintenance, Chapter 4, Section 645: Work Zone Traffic Control describes the following procedures on:

- 1) Furnishing, installing, maintaining, and subsequently removing work zone traffic control devices and personnel. Work zone traffic control shall include providing flaggers and police officers.
- 2) Keeping roads for public traffic open and in passable condition; providing and maintaining temporary access crossings for trails, businesses, parking lots, garages, residences, farms, parks, and other driveways; taking necessary work precautions for the protection, safety, and convenience of the public; should pedestrian facilities exist, taking necessary measures for the safe and accessible passage, with route information and Americans with Disabilities Act of 1990 Accessible Guidelines compliance, for pedestrians traveling through or near work zone.
- 3) Taking safety and precautionary measures, such as illuminating roadway obstructions during hours of darkness, in accordance with HRS Chapter 286; Title 19, Subtitle 5, Chapters 127, 128, and HAR 129; Manual on Uniform Traffic Control Devices.

Regulations for necessary signs, barricades, traffic delineators, cones, lane closures, advisory signs, and advertisement needed for construction activity shutdowns described in HDOT Section

645 would be adhered to if needed, and a Traffic Control Plan (TCP) would be drafted if construction work extends into the public roadways located adjacent to the project site.

3.3.3.1 EXISTING CONDITIONS

A *Traffic Impact Analysis Report* (TIAR) that presents an analysis of the existing traffic network volumes, as well as was projected traffic volumes resulting from the proposed subdivision, was completed in June, 2015 by Austin, Tsutsumi & Associates, Inc (ATA). The findings of the TIAR are included in the following sections. The full TIAR is included as Appendix D.

Roadway Network

The following roadways were selected as the main vehicular roads that would service and be affected by the proposed project.

Po‘ipū Road is a two-lane, two-way, undivided collector roadway that provides access to the project site and serves as the main vehicular road from the Kaumuali‘i Highway and Kōloa town to the Po‘ipū resort/recreational area to the south of the project site. This roadway begins at the T-intersection with Kōloa Road and is oriented in the north-south direction, until it reaches the roundabout intersection with Ala Kalanikaumaka Road/Lawai Road. Po‘ipū Road then traverses in the east-west direction, terminating as a dirt road near CJM Country Stables. The posted speed limit along this road is typically 25 mph and reduces to 15 mph as it approaches the study roundabout.

Kōloa Road is a generally east-west, two-lane, two-way, undivided collector roadway that begins at Kaumuali‘i Highway to the northwest and terminates at a T-intersection with Waikomo Road, becoming Wailani Road to the east. The posted speed limit along this road is typically 25 mph within the vicinity of the Project.

Lopaka Paipa Boulevard services the 32-lot Kōloa Estates residential subdivision as an eastwest, two-lane, two-way, undivided roadway that extends westward from Po‘ipū Road for approximately 1,300 feet and terminates at a dead-end. The posted speed limit along this roadway is 25 mph.

Lawai Road is a generally east-west, two-lane, two-way, undivided roadway. This roadway begins to the west at the gated entrance to Lawai Bay and terminates to the east at the roundabout intersection with Ala Kalanikaumaka Road / Po‘ipū Road. The posted speed limit on Lawai Road is typically 25 mph and reduces to 15 mph as it approaches the study roundabout. Lawai Road currently services retail, residential, and resort land uses.

Ala Kalanikaumaka Street is a generally north-south, two-lane, two-way collector roadway. This roadway begins to the north at the T-intersection with Kōloa Road and terminates to the south at the roundabout intersection with Lawai Road / Po‘ipū Road. The posted speed limit along this road is typically 25 mph and reduces to 15 mph as it approaches the study roundabout.

The existing traffic levels at the following intersections were analyzed during typical weekday AM and PM peak hours (Figure 10):

- Po‘ipū Road / Kōloa Road (unsignalized);
- Po‘ipū Road / Lopaka Paipa Boulevard (unsignalized); and

- Po‘ipū Road / Lawai Road / Ala Kalanikaumaka Road (roundabout).

Intersection traffic operations were evaluated based on the level of service (LOS) concept. LOS is a qualitative description of an intersection and roadway operation ranging from LOS A to LOS F. LOS A represents free flowing uncongested traffic conditions. LOS F represents highly congested traffic conditions with what is commonly considered unacceptable delay to vehicles on the road segments and at intersections. The intermediate levels of service represent incremental levels of congestion and delay between those two extremes. Table 3-6 shows the projected future year 2020 traffic LOS without the proposed project at these key intersections. All intersections are projected to operate with an acceptable LOS, except for the northbound intersection at Po‘ipū Road / Kōloa Road which is projected to operate at LOS F during both the AM and PM peak hours.

Approach to Analysis

Potential impacts to traffic and circulation patterns are assessed with respect to anticipated disruption or improvement of current transportation patterns and systems, deterioration or improvement of existing levels of service, and changes in existing levels of transportation safety. Beneficial or adverse impacts may arise from physical changes to circulation (e.g., closing, rerouting, or creating roads), construction activity, introduction of construction-related traffic on local roads, or changes in daily or peak-hour traffic volumes created by installation workforce and population changes. Adverse impacts on roadway capacities would be significant if roads with no history of exceeding capacity were forced to operate at or above their full design capacity.

Table 3-6: Future Without Project Traffic Conditions-Year 2020

Intersection	Year 2020 Conditions			
	AM		PM	
	Delay (seconds per vehicle)	LOS	Delay (seconds per vehicle)	LOS
<u>Po‘ipū Road / Kōloa Road</u>				
WB LT	9.6	A	9.0	A
NB LT	111.3	F	100.2	F
NB RT	14.2	B	15.6	C
<u>Po‘ipū Road / Lopaka Paipa Road</u>				
EB LT	12.6	B	18.5	C
EB RT	10.5	B	11.4	B
NB LT/TH	8.0	A	8.4	A



Intersection	Year 2020 Conditions			
	AM		PM	
	Delay (seconds per vehicle)	LOS	Delay (seconds per vehicle)	LOS
<u>Po'ipū Road / Lawai Road / Ala Kalanikaumaka Street</u>				
EB LT/TH/RT	9.4	A	16.1	C
WB LT/TH/RT	6.5	A	23.9	C
NB LT/TH/RT	7.0	A	12.1	B
SB LT/TH/RT	8.7	A	21.4	C
Overall	8.1	A	19.5	C

Source: ATA, 2015

Notes:

EB = east bound
 SB = south bound
 LT = left turn
 TH = through
 NB = north bound
 WB = west bound
 RT = right turn

3.3.3.2 POTENTIAL IMPACTS AND MITIGATION

No Action Alternative

Under implementation of the No Action Alternative, the Koae Workforce Housing Development would not be constructed, and no short-term construction vehicular traffic would be generated. The project site would remain unchanged, and traffic from the surrounding residential and recreational activity would continue without additional impacts associated with the Proposed Action.

However, traffic within the vicinity of the project site would still be adversely impacted long-term cumulative growth from the planned residential, resort, and condominium developments throughout the Po'ipū area, as shown in Table 3-6.

Proposed Action

Implementation of the Proposed Action would result in less than significant, short-term impacts to traffic and circulation during the construction period. Construction activities would need to comply with HDOT construction traffic control measures, and a TCP would be created prior to commencement of construction activities. Negligible direct impacts resulting from additional vehicle trips to and from the project site by construction workers and contractors via the local roadway network would occur during the construction phase. Contractor parking would be provided in the staging areas established for the various phases of construction activities. As

much as possible, the number of vehicles would be reduced through the implementation of vanpooling. As a result, direct and indirect short-term impacts to traffic and circulation due to construction activities would be considered less than significant.

Table 3-7 shows the projected LOS at the key analyzed intersections once the project is completed and contributing to the local traffic network during the target future year 2020.

Table 3-7: Future With Project Traffic Conditions-Year 2020

Intersection	Year 2020 Conditions			
	AM		PM	
	Delay (seconds per vehicle)	LOS	Delay (seconds per vehicle)	LOS
<u>Po'ipū Road / Kōloa Road</u>				
WB LT	9.6	A	9.2	A
NB LT	128.0	F	137.8	F
NB RT	15.0	C	16.1	C
<u>Po'ipū Road / Lopaka Paipa Road</u>				
EB LT	13.0	B	19.8	C
EB RT	10.5	B	11.7	B
NB LT/TH	8.1	A	8.5	A
<u>Po'ipū Road / Lawai Road / Ala Kalanikaumaka Street</u>				
EB LT/TH/RT	9.7	A	16.2	C
WB LT/TH/RT	6.6	A	25.7	D
NB LT/TH/RT	7.1	A	12.4	B
SB LT/TH/RT	9.2	A	21.8	C
Overall	8.4	A	20.4	C

Intersection	Year 2020 Conditions			
	AM		PM	
	Delay (seconds per vehicle)	LOS	Delay (seconds per vehicle)	LOS
<u>Po'ipū Road / Project Access Road</u>				
WB LT/RT	11.4	B	15.5	C
SB LT	7.6	A	8.6	A

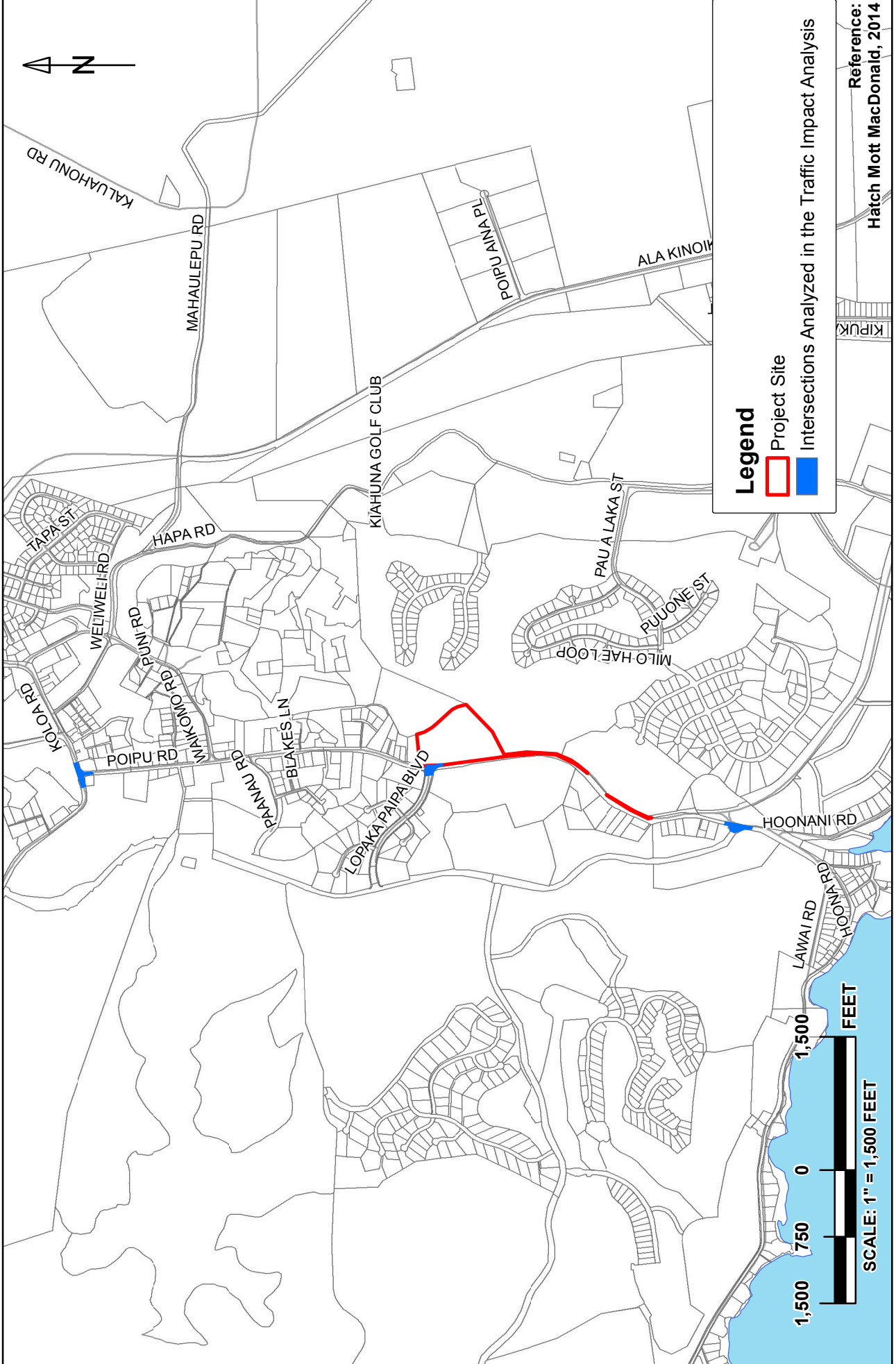
Source: ATA, 2015

Notes:

EB = east bound
 SB = south bound
 LT = left turn
 TH = through
 NB = north bound
 WB = west bound
 RT = right turn

Once completed, the proposed project is anticipated to generate approximately 72 AM peak hour trips and 84 PM peak hour trips. With the build out of the proposed project all study intersections are forecast to operate similar to the Year 2020 without project conditions (Tables 3-6 & 3-7). As a result, the long-term impacts to traffic would be considered less than significant.

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Legend

- Project Site
- Intersections Analyzed in the Traffic Impact Analysis

Reference:
Hatch Mott MacDonald, 2014

ENVIRONMENTAL ASSESSMENT FOR THE PROPOSED KOAE HOUSING PROJECT

TRAFFIC MAP
KŌLOA, KAUA'I, HAWAII

FIGURE
10

Community Planning
and Engineering, Inc.

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3.3.4 SOCIOECONOMICS

Definition of Resources

Socioeconomics are defined as the basic attributes and resources associated with the human environment, particularly population and economic activity. Human population is affected by regional birth and death rates as well as net in- or outmigration. Economic activity typically comprises employment, personal income, and industrial growth. Impacts on these fundamental socioeconomic indicators can also influence other components such as housing availability and public services provision.

Socioeconomic data in this section are presented at the county, state, and national levels to analyze baseline socioeconomic conditions in the context of regional, state, and national trends. Data have been collected from previously published documents issued by federal, state, and local agencies and from state and national databases (e.g., U.S Bureau of Economic Analysis [BEA] Regional Economic Information System).

Regulatory Setting

In 1994, EO 12898, “*Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*,” was issued to focus the attention on human health and environmental conditions in minority and low income communities and to ensure that disproportionately high and adverse human health or environmental effects on these communities are identified and addressed.

Because children may suffer disproportionately from environmental health risks and safety risks, EO 13045, “*Protection of Children from Environmental Health and Safety Risks*,” was introduced in 1997 to prioritize the identification and assessment of environmental health risks and safety risks that may affect children and to ensure that policies, programs, activities, and standards address environmental health risks and safety risks to children.

3.3.4.1 EXISTING CONDITIONS

Social Factors and Community Identity

The project site is located in Census Tract 406.03, which includes the Kōloa and Po‘ipū Census Designated Places (CDPs) within the County of Kaua‘i.

The racial distribution of Census Tract 406.03 includes the following: individuals with one race were 33.4% White, 0.5% Black or African American, 0.1% American Indian and Alaska Native, 44.0% Asian, 7.9% Native Hawaiian and other Pacific Islanders, and 0.4% of some other race. Individuals that consisted of two or more races made up 13.6% of the Census Tract 406.03 population. In addition, 16.7% of the population was either full or part Native Hawaiian and other Pacific Islander, 56% of the population was either full or part Asian, and 43.3% of the population was either full or part White (U.S. Census Bureau, 2014).

According to the 2010 Census, the population of the State of Hawai‘i was 1,360,301, with the population of the County of Kaua‘i accounting for approximately 67,091 of those residents. The

population on Kaua‘i in 2010 was almost 15% more than recorded in the 2000 Census (U.S. Census Bureau, 2014). Census Tract 406.03 had a population of 2,684 residents in 2010; approximately 4% of the total population of Kaua‘i. Persons aged 18 years and over accounted for 77.3% of Kaua‘i’s population, while this age group made up about 84.8% of the Census Tract 406.03 population. Kaua‘i’s 65 years and older population was approximately 9,985, or 14.9% of the island’s population, and this age group consisted of 19.2% of the Census Tract 406.03 population.

The County of Kaua‘i General Plan, updated in 2000, sets forth community values and a vision for Kaua‘i in the year 2020. Community values, formulated by the Citizen’s Advisory Committee using input from 25 outreach meetings with a variety of community, business, and public interest groups, are identified as the following:

- protection, management, and enjoyment of open spaces, unique natural beauty, rural lifestyle, outdoor recreation and parks;
- conservation of fishing grounds and other natural resources, so that individuals and families can support themselves through traditional gathering and agricultural activities;
- access to and along shorelines, waterways, and mountains for all. However, access should be controlled where necessary to conserve natural resources and to maintain the quality of public sites for fishing, hunting, recreation, and wilderness activities valued by the local community;
- recognition that the environment is Kaua‘i’s economy, natural capital, the basis of its economic survival and success;
- balanced management of Kaua‘i’s built environment, clustering new development around existing communities and maintaining the four-story height limit;
- diverse job and business opportunities so that people of all skill levels and capabilities can support themselves and their families;
- government that supports and encourages business;
- balanced economic growth development providing good jobs and a strong economy, without sacrificing Kaua‘i’s environment and or quality of life;
- respect and protection for the values and rights of Kaua‘i’s many cultures, in compliance with the laws and responsibilities as citizens;
- preservation of Kaua‘i’s cultural, historical, sacred and archaeological sites;
- appreciation and support for the traditions of the Native Hawaiian host culture and the many other cultural traditions and values that make up the Kaua‘i community;
- appreciation and support for the visitor industry’s role in preserving and honoring all cultures and their values as Kaua‘i’s leading source of income and as a supporter of community festivals, recreation, arts and culture;
- protection of Kaua‘i’s unique character;
- recognition of the uniqueness of Kaua‘i’s communities, supporting people with roots and history in those communities to continue to live and raise their families there;

- safety for all citizens and visitors;
- support for Kaua‘i’s youth, educating them to succeed; and
- broad participation in the public process.

An essential aspect of the County of Kaua‘i’s vision and one of the driving forces behind the General Plan is to preserve Kaua‘i’s special rural character. “Rural” describes many aspects of Kaua‘i that people value: green, open lands for raising crops for food; small communities where people know each other; the absence of city noise and lights; and not feeling crowded. Some important elements of Kaua‘i’s physical environment that contribute to the “rural” classification are:

- small towns and communities that have a distinct character and are compact rather than spread out;
- wide expanses of open lands – natural areas and lands in active cultivation – provide separation between the towns and communities. The rhythm of communities alternating with open lands is pleasing; and the separation highlights the special identity of each community;
- buildings are relatively small in scale and low in height, complementing rather than dominating the landscape; and
- the relatively small scale of Kaua‘i roads, the presence of natural vegetation along the roads, and the absence of medial concrete barriers also contribute to the rural ambiance.

However, within the policy framework for maintaining rural character in land use and future growth, enhancing Kaua‘i’s towns and urban centers and directing new development is equally important as maintaining open space between towns. The County of Kaua‘i has generated strategies to develop towns and urban centers while keeping its rural profile. Rather than allowing development to sprawl along Kaua‘i’s main roads, the intent is to focus development in a way that supports Urban Centers and Town Centers, while allowing already-existing, outlying residential communities and agricultural communities to build outwards (County of Kaua‘i, 2000).

The County of Kaua‘i has the largest aging population in the state, thus housing needs for elderly households are higher on Kaua‘i than in the other Hawai‘i counties. Units needed to serve elderly households account for 11.4% of total needed units in all Hawai‘i counties except County of Kaua‘i, where they account for 19% of the need. The number of housing units needed to accommodate low and moderate income elderly households in County of Kaua‘i (under 80% of area median income [AMI]) accounts for 82% of the total elderly units needed. In other counties, elderly housing need for the same income range is 60-69% (County of Kaua‘i Housing Agency, 2012).

To address the needs of Kaua‘i’s growing senior population, the Agency on Elderly Affairs launched a Four-Year Area Plan on Aging that spans from 1 October 2011 to 30 September 2015 to assess the needs of the elderly in the community. The plan presents strategies that are focused around principles put forth in the Older Americans Act, which forms the basis for the direction. The plan outlines six major issue areas: activities for disease prevention and social engagement; support for caregivers; in-home and community-based programs and services; access to

information and care options; person-centered approaches for at-risk older adults; and elderly rights and benefits (County of Kaua‘i, 2011).

In addition to the growing need for housing the aging population, there is also an urgent need for housing in general for Central Kaua‘i. According to the Hawai‘i Housing Planning Study, a total of 1,312 housing units are needed on Kaua‘i from 2012 to 2016, 70% of which are needed by households with an annual income of less than or equal to 80% of the area median income (County of Kaua‘i Housing Agency, 2012). The need for additional affordable housing is evident and the County of Kaua‘i views the provision of affordable housing as a fundamental responsibility of local government.

Socioeconomics

The median household annual income for the Census Tract 406.03 was \$76,316 in 2010. This figure is greater than the median household income for the County of Kaua‘i (\$64,752) and the State of Hawai‘i (\$67,492) (U.S. Census Bureau, 2014). According the County of Kaua‘i General Plan, the visitor industry is projected to continue to be the driving force of Po‘ipū’s economy for the foreseeable future (County of Kaua‘i, 2000).

Environmental Justice

In order to comply with EO 12898, ethnicity and poverty status in the vicinity of the project site were examined and compared to regional, state, and national data to determine if any minority or low-income communities could potentially be disproportionately affected by implementation of the Proposed Action.

Based on data contained in the 2010 Census of Population and Housing (1999 model-based estimate), the percentage of the population that includes the project site (Census Tract 406.03) below the poverty level is 3.8%, which is less than the County of Kaua‘i (11%), the State of Hawai‘i (10.8%), and the U.S. national percentage (14.9%).



View of Kōloa Town located to the north of the project site.

The percentage of minority residents in Census Tract 406.03 (66.6%) is less than the percentage of minority residents for the State of Hawai‘i (75.3%) and the County of Kaua‘i (87.9%), but significantly greater than the U.S. national percentage (24.9%).

(U.S. Census Bureau, 2014).

Protection of Children

In order to comply with EO 13045, the number of children under age 18 in the vicinity of the project site was examined and compared to county, state, and national levels. Additionally, locations where populations of children may be concentrated (e.g., child care centers, schools, and parks) were determined to address potentially disproportionate health and safety risks to children that may result from the implementation of the Proposed Action.

In 2010, there were 407 children under the age of 18 in Census Tract 406.03, comprising 15.2% of the overall census tract population. This is less than the 22.7% for the County of Kaua‘i, 21.8% for the State of Hawai‘i, and 23.5% for the U.S. national percentage (U.S. Census Bureau 2014).

The State of Hawai‘i Department of Education (DOE) has a total of eight school districts and 320 public schools statewide. Children living in the vicinity of the project site attend schools in the Kaua‘i School District. Kōloa Elementary, the nearest school to the project site, is located approximately 0.7 miles to the north. The nearest high school to the project site is Kaua‘i High School, located approximately 12.1 miles to the east.

Approach to Analysis

Significance of population and expenditure impacts are assessed in terms of their direct effects on the local economy and related effects on other socioeconomic resources (e.g., housing). The magnitude of potential impacts varies depending on the location of a Proposed Action; for example, an action that creates 20 employment positions may be unnoticed in an urban area, but may have significant impacts in a more rural region. If potential socioeconomic impacts would result in substantial shifts in population trends, or adversely affect regional spending and earning patterns, they would be significant.

3.3.4.2 POTENTIAL IMPACTS AND MITIGATION

No Action Alternative

Under the No Action Alternative, the Koae Workforce Housing Development would not be constructed. There would be fewer construction jobs and new affordable housing units available within the area. As a result, there would be indirect adverse effects on affordable housing availability in the area, as the growing need for affordable housing in the county would remain.

Proposed Action

Under the Proposed Action, beneficial short- and long-term impacts to socioeconomic resources are expected. The project site is located on an undeveloped parcel of land acquired by the County of Kaua‘i for the purpose of providing affordable housing for the Kaua‘i residents. Kōloa Elementary, the nearest school to the project site, is located approximately 0.7 miles to the north. Short-term construction activities are not expected to increase the hazard or risk to children since the construction area would be fenced and inaccessible to the public. Construction activities would result in the short-term creation of jobs and materials spending lasting until project completion. As a result, short-term impacts on socioeconomics on the project site are considered beneficial.

Once completed, the Proposed Action is expected to result in long-term beneficial socioeconomic impacts. Koae would not be a stand-alone development, but one that would create linkages to surrounding existing and future neighborhoods. The interconnection of the new community with the existing Kōloa-Po‘ipū-Kalāheo communities would encourage the interaction and movement of people and resources. The influx of new residents is expected to bring greater economic vitality and civic energy to the area, as well as strengthen the region’s sense of community.

The proposed subdivision would have a positive impact on Environmental Justice, as its primary goal is to design and develop a community that provides a range of affordable housing options. Affordable housing would be made available to households meeting the County of Kaua'i Housing Agency's earning qualifications. As a result, there would be long-term beneficial socioeconomic impacts from the much needed additional affordable housing options that would be available to Kaua'i residents.

In addition, there would be a positive impact to children. The Proposed Action would provide shelter and create a compact neighborhood that is safe and conducive to children. Further, Kōloa Elementary school is located within walking distance to the project site; approximately 0.7 miles to the north.

3.3.5 RECREATIONAL/RESOURCE USE

Definition of Resources

Recreation is comprised of terrestrial and water-based activities associated with the local population or visitors to the island. Recreation may consist of aquatic activities such as swimming, windsurfing, surfing, fishing, jet skiing, kayaking, snorkeling, scuba diving, and water skiing. Terrestrial recreational activities may consist of shopping, indoor shooting ranges, restaurants, hiking trails, biking, jogging, and golfing.

Resource use includes any commitment of natural resources such as aggregate for concrete and petroleum products to fuel construction equipment needed to construct the Proposed Action, as well as to operate and maintain it.

3.3.5.1 EXISTING CONDITIONS

The project site is located on an 11.2-acre parcel in Kōloa, on the southern side of the island of Kaua'i. Kiahuna Golf Club borders the project site to the east and is open daily for golfing, shopping, and dining. The Golf Club also serves as a venue for weddings and other events. Kukui'ula Village Shopping Center is less than one mile southwest of the project site and is a premier shopping and dining destination. The project site is bordered by Po'ipū Road to the west and a residential subdivision to the north, both of which may be frequented by bikers and joggers.

There are several County of Kaua'i Department of Parks and Recreation facilities located within the Kōloa-Kalāheo District. Kōloa Park is an 11.28-acre district park, located approximately 1.4 miles south of the project site. Kōloa Park includes a pavilion, comfort stations, little league baseball fields, a lighted softball field, tennis and basketball courts, and playground equipment. Po'ipū Beach Park is located approximately 1.8 miles southeast of the project site, and includes pavilions, comfort stations, picnic areas, and a lifeguarded beach.

The project site is comprised of a vacant lot used only for the occasional maintenance of KIUC utility poles. Public access to the project site is restricted by gates and the site has no known recreational use.

Approach to Analysis

The significance of potential impacts on recreational activities and resources due to the Proposed Action were assessed. The significance of potential impacts is determined by considering the direct effects of the Proposed Action on the beneficial use of recreational activities and natural resources. Substantial secondary impacts such as population changes or effects on public facilities would also be considered.

3.3.5.2 POTENTIAL IMPACTS AND MITIGATION

No Action Alternative

Under the No Action Alternative, the Proposed Action would not be constructed. There would be no use of additional recreational areas or resources. Therefore, there would be no impact to recreational or resource use within the project site.

Proposed Action

Recreation

Under the Proposed Action, no impacts to short-term recreational use in the project site are expected. There is currently no public access to the project site, as it is a gated, vacant lot used only for the occasional maintenance of KIUC utilities. No known recreational activities take place at the project site.

The recreational activities located closest to the project site include those of the Kiahuna Golf Club, which is directly east and features golfing, dining, and shopping. Kukui‘ula Village Shopping Center is located southwest of the project site, and is a destination for shopping and dining, while Po‘ipū Road and the residential subdivision to the north may be used for biking and jogging. Considering their distance or physical separation from the project site by dense vegetation and trees, as well as the confinement of construction activities to the project site, recreational use in the Kōloa community is not anticipated to be impacted. Therefore, short-term recreational use would not be impacted by construction activities associated with implementation of the Proposed Action.

Under the Proposed Action, no long-term impacts to recreational use within the surrounding area are expected. The project site is a vacant parcel of land unused except for occasional maintenance of KIUC power lines via an associated utility easement. Further, the project site is gated and there is currently no public access. As a result, no long-term recreational uses should be impacted due to construction of the proposed subdivision.

Resource Use

Less than significant impacts to short-term resource use would be anticipated due to construction activities at the project site. The Proposed Action would require the commitment of natural resources such as aggregate for concrete and petroleum products to fuel construction equipment. However, the amount of resources needed to complete the housing development would not represent a significant commitment of resources since the needed resources are available within the county and / or state. Therefore, short-term impacts on resource use in the project site due to construction activities would be considered less than significant.

Less than significant long-term impacts to resource use are also expected. Upon completion of construction, various resources would be used within the community. These resources include gasoline and refuse space needed for trash pickup, park and landscaping services, use of electricity, road and water services to maintain the Proposed Action. The Proposed Action would not result in a significant increase of resource use within the surrounding area. Therefore, the Proposed Action would not represent a significant increase to these resources in the long-term.

3.3.6 VISUAL AND AESTHETIC RESOURCES

Definition of Resources

Visual resources are defined as the natural and manufactured features that comprise the aesthetic qualities of an area. These features form the overall impressions that an observer receives of an area or its landscape character. Landforms, water surfaces, vegetation, and manufactured features are considered characteristic of an area if they are inherent to the structure and function of a landscape.

Regulatory Setting

The County of Kaua‘i General Plan calls for maintaining the rural character of Kaua‘i, including its natural beauty and green open spaces that make it the “Garden Isle.” In order to accomplish that aim, the plan identifies multiple elements for Kaua‘i’s physical environment, including small, compact towns and communities; wide expanses of open land; relatively small and low buildings; and relatively small scaled roads with natural vegetation and no concrete barriers (County of Kaua‘i, 2000).

Certain major roadways and the lands visible from those roadways are identified by the General Plan as Scenic Roadway Corridors. The corridors afford views of Kaua‘i’s scenic features and open space. As stated in the Planning Framework, the open spaces separating Kaua‘i’s towns and communities are crucial to preserving rural character, maintaining the individuality of each town, and preventing the sense of urban sprawl so prevalent in many communities. Equally important are major roadways through urban centers and towns that can be designed and landscaped to maintain a sense of open space. In order to maintain the corridors the General Plan proposes the adoption of various types of programs and land use regulations to conserve the visual quality of key road corridors. The programs include the acquisition of land, development rights, or visual easements; and the administration of corridor regulations as zoning overlay districts (County of Kaua‘i, 2000).

3.3.6.1 EXISTING CONDITIONS

The visual environment at the project site is comprised of a largely undeveloped parcel bisected east to west by power poles with an accompanying utility easement running along an old cane haul road. The project site is bordered by Po‘ipū Road to the west and Waikomo Stream runs north to south along the eastern portion. Elevation at the project site ranges from 150 feet above msl in the north to 100 feet above msl in the south.

According to the County of Kaua‘i General Plan (2000), the project site is located along a stretch of Po‘ipū Road determined to be a Scenic Roadway Corridor. Views from the project site include open areas, the Po‘ipū residential / commercial area, and the Pacific Ocean to the south. An existing residential community and the central Kaua‘i mountains can be viewed to the north. The Kiahuna Golf Course; open areas; Pu‘u Hi, Pu‘u Hunihuni, and Pu‘u Wanawana; and natural topographic features can be viewed to the east. Finally, surrounding open areas can be viewed to the west.

Approach to Analysis

Determination of the significance of impacts to visual resources is based on the level of visual sensitivity in the area. Visual sensitivity is defined as the degree of public interest in a visual resource and concern over adverse changes in the quality of the resource. In general, an impact to a visual resource is significant if implementation of the Proposed Action would result in substantial alterations to an existing sensitive visual setting.

3.3.6.2 POTENTIAL IMPACTS AND MITIGATION

No Action Alternative

Under the No Action Alternative, the Koaie Workforce Housing Development would not be constructed. There would be no change to visual and aesthetic resources at the project site. Therefore, there would be no impact to visual and aesthetic resources under this alternative.

Proposed Action

Under the Proposed Action, short-term, less than significant impacts to visual and aesthetic resources during construction activities are expected to occur. These impacts would be due to the presence of construction equipment within and around the project site. Construction activities related to the Proposed Action would likely span several years. However, construction would likely be broken down into multiple construction phases. As a result, impacts to visual resources would not be continuous at any one location throughout the construction process.

The surrounding area is moderately urbanized and the presence of construction equipment would be limited to the project site. Further, the project site is currently gated and there is no public access. As a result, the Proposed Action would not be placing construction equipment in a special use area such as a park, beach, or scenic vista. Therefore, short-term impacts to visual and aesthetic resources within the project site would be considered less than significant.

The Proposed Action would result in less than significant long-term impacts to visual and aesthetic resources. The project site is bordered directly to the north by an existing residential development and is located along a Scenic Roadway Corridor that encompasses the adjacent stretch of Po‘ipū Road. Due to its location adjacent to an existing residential development, the Proposed Action would not adversely contrast with the existing visual aesthetics of the surrounding area. As a result, long-term impacts to visual and aesthetic resources due to the construction of the Proposed Action are considered less than significant.

3.3.7 PUBLIC INFRASTRUCTURE AND UTILITIES

Definition of Resources

Public infrastructure and utilities comprise functional services provided to a facility by public agencies or by a facility to the community. Such services may include police and fire protection, water and solid waste service, sanitary sewer and wastewater treatment, and recreational facilities. Utilities include infrastructure services that support facility operations, including electricity, natural gas, or telecommunications. On-site utility production, such as power generation or wastewater treatment, occurs at some facilities.

Regulatory Setting

The State of Hawai‘i Public Utilities Commission (PUC) regulates all franchised or certificated public service companies operating in the state. Franchised or certified public service companies operating under PUC regulation include:

- electric providers;
- telecommunication providers;
- motor and water carriers; and
- privately owned water and sewage treatment utilities.

The PUC’s primary purpose is to ensure that regulated companies efficiently and safely provide their customers with adequate and reliable services at just and reasonable rates, while providing regulated companies with a fair opportunity to earn a reasonable rate of return.

3.3.7.1 EXISTING CONDITIONS

There are KIUC power lines that traverse the project site along the utility easement which follows the former cane haul road. The utility easement is utilized by KIUC to conduct regular maintenance on the power lines.

Electricity and Telecommunications

KIUC is a generation, transmission, and distribution cooperative serving more than 32,000 electrical accounts throughout Kaua‘i, including the areas around the project site. The average demand for electricity on KIUC’s system is approximately 75 megawatts; however, KIUC operates an electric generation fleet capable of producing up to 125 megawatts of electricity (KIUC, 2015). KIUC power lines are located along the old cane haul road that bisects the project site from east to west.

Hawaiian Telcom (HT) and Oceanic Time Warner Cable (OTWC) provide telecommunications and cable television service to the surrounding areas.

Potable Water

Water resource and distribution systems for the project site are managed by the County of Kaua‘i DOW. The Kōloa-Po‘ipū system consists of a series of wells, storage tanks and transmission lines. Three of the Kōloa-Po‘ipū system storage tanks are located in the Kōloa area within the vicinity of the project site (Wilson Okamoto Corporation, 2008).

Wastewater

According to the General Plan, the Kalāheo-Kōloa-Po‘ipū planning district does not utilize a County wastewater system, but is instead served by a combination of privately owned treatment plants, such as the Po‘ipū Wastewater Reclamation Facility (WRF), and private cesspools and septic tanks. Additionally, a 1.1 million gallons per day (mgd) aerated lagoon plant owned by A&B aids in wastewater treatment for Kōloa Town. The capacity of the Po‘ipū WRF is an average daily flow of 1.0 mgd, while the current usage of the Kōloa service area is estimated at less than 0.2 mgd (Wilson Okamoto Corporation, 2008).

Storm Water Drainage System

Elevations within the project site range from approximately 150 to 100 feet above msl. The existing surface water runoff path flows generally in a north to south direction. The subsurface soils at the project site have slow runoff and consist of stony heavy silty clay loams and some stony silty clay with rock outcrops covering 3-25% of the surface. The Waikomo stream flows along the eastern portion of the project site and generally directs storm water down gradient in the makai direction.

Roads and Intersections

Po‘ipū Road runs directly along the western border of the project site. At the northwest corner of the project site, Po‘ipū Road is intersected by Lopaka Paipa Boulevard. An old cane haul road bisects the project site west to east and can be accessed from Po‘ipū Road, Ala Kalanikaumaka Street, Hapa Road, and Ala Kinoiki. This road is currently used by KIUC as an easement for utility management.

Solid Waste

Residential solid waste service in the project site is provided by the County of Kaua‘i Refuse Division in accordance with current collection policies.

Law Enforcement

The Kaua‘i Police Department serves as the primary law enforcement agency for Kōloa and the entire island of Kaua‘i. The project site is in the Waimea District, which provides police services for approximately 311 square miles from Kōloa to Kekaha (Kaua‘i Police Department, 2015).

Fire Protection

The Kaua‘i Fire Department protects life and preserves property from all hazards, and enhances the environment of the County of Kaua‘i. There are seven fire stations on Kaua‘i; the nearest to the project site being the Kōloa Fire Station located less than a mile south of the project site (Kaua‘i Fire Department, 2015).



View of KIUC power lines bisecting the project site.

Approach to Analysis

Significance of public services or utilities systems impacts are assessed in terms of their direct effects on the public service or utility providers. The magnitude of potential impacts varies depending on the location of a proposed action; for example, an action that alters existing utility systems infrastructure may be unnoticed in an urban area, but may have significant impacts in a more rural region. If potential public service and utility system impacts would result

in substantial shifts in the amount of services provided, or substantial changes to the utility systems infrastructure, the action would be significant.

3.3.7.2 POTENTIAL IMPACTS AND MITIGATION

No Action Alternative

Under the No Action Alternative, the Koae Workforce Housing Development would not be constructed, and the installation of water, sewer, electric, and telecommunication infrastructure systems and utilities would not occur. Impacts to public infrastructure, and the demand on public services and utilities in the project area are expected due to additional proposed residential, resort, and condominium developments discussed in Section 3.3.8 of this EA.

Proposed Action

The Proposed Action would require connection with various utilities and services, including electricity and telecommunications, potable water, wastewater, and roadways. The Proposed Action is anticipated to have less than significant impacts on public infrastructure and utilities. The details of the projected impacts to public infrastructure and utilities systems from the Proposed Action are described in the following paragraphs.

Electricity and Telecommunications

The Proposed Action would include the connection of electrical and telecommunication services to the proposed housing units. Electrical service by KIUC would be extended overhead or underground into the project site from Po‘ipū Road or the power lines that bisect the parcel. HT and OTWC would be engaged to provide telecommunications and cable television service, if service is feasible within the project site location. Electrical plans and service requests must be submitted to KIUC, HT, and OTWC for design coordination and approval.

The current average demand for electricity on KIUC's system is approximately 75 megawatts and the combined capacities of KIUC facilities are approximately 125 megawatts (KIUC, 2015). The Proposed Action is not expected to generate an electrical demand that would increase the demand for electricity to a level greater than the combined KIUC capacity. As a result, the Proposed Action would not significantly impact the existing KIUC electrical grid.

Potable Water

The Proposed Action would require the design and installation of potable water lines at the project site. Consultation with the County DOW is ongoing to develop assure that the planned development would not adversely impact the existing potable water supply in the area. There would be no significant impacts to potable water resources since the Proposed Action would be located in an area where potable water service is available, and since there would not be anticipated adverse impacts to the existing potable water supply.

Wastewater

Wastewater generated by the Proposed Action would likely be received by a privately-owned treatment plant, since the Kalāheo-Kōloa-Po'ipū planning district is not serviced by a County Wastewater Treatment Plant (WWTP). The Proposed Action would require the design and installation of sewer lines at the project site. Consultation is ongoing with the County Department of Public Works to ensure that the wastewater demand from the Proposed Action would not adversely impact the affected wastewater treatment transmission and treatment system. Therefore, the Proposed Action would have a less than significant impact on the local wastewater system.

Storm Water Drainage System

The Proposed Action would include the construction of additional impervious surfaces (paved roads and sidewalks) that would collect and convey storm water runoff. Therefore an on-site storm water drainage system would be implemented.

The proposed drainage system would be designed in accordance with the County of Kaua'i Department of Public Works Standards. An NPDES permit would be necessary for the construction period of the Proposed Action. With a drainage system in place, the Proposed Action would have less than significant impacts on storm water drainage at the project site, as well as the surrounding environment since the planned drainage system would comply with the provisions of the County of Kaua'i Department of Public Works Standards, as well as provisions of an NPDES permit for construction work.

Solid Waste

During the construction period the contractor would be required to complete and follow a waste minimization plan in order to control construction-related waste generation. The Proposed Action would require residential solid waste service that would be provided by the County of Kaua'i Refuse Division in accordance with current collection policies. Since the Proposed Action would comply with County of Kaua'i Refuse Division policies and procedures, there would be less than significant impacts to the existing county solid waste collection process.

Law Enforcement

The Proposed Action would be included in the patrol area for the Kaua'i Police Department Waimea District, which provides police services from Halfway Bridge on Kaumuali'i Highway to the far west side of the island (Polihale), including Koke'e State Park (Kaua'i Police Department, 2015). Since the Proposed Action would be located within close proximity of existing towns that are currently patrolled (Kōloa), it would not represent a significant impact to existing law enforcement services.

Fire Protection

The Proposed Action would be in the response vicinity of the Kōloa Fire Station, which is located less than a mile from the project site. Since the Proposed Action is in close proximity to an existing fire station and would conform to county fire protection standards, including the installation of fire hydrants and smoke alarms. As a result, it would not represent a significant impact to existing fire protection services.

3.3.8 CUMULATIVE IMPACTS ASSOCIATED WITH THE PROPOSED ACTION

Cumulative impacts on environmental resources result from incremental impacts of the Proposed Action that, when combined with other past, present, and reasonably foreseeable future projects in an affected area, may collectively cause more substantial adverse impacts. Cumulative impacts can result from minor, but collectively substantial, actions undertaken over a period of time by various agencies (federal, state, or local) or persons. In accordance with NEPA and the CEQ memorandum of "Guidance on the Consideration of Past Actions in Cumulative Effects Analysis," a discussion of cumulative impacts resulting from projects which are proposed, under construction, recently completed, or anticipated to be implemented in the near future is required.

There are no other known major public infrastructure or development projects planned within the project site at this time. However, future and ongoing residential subdivision, resort hotel and condominium, and major road projects are planned within the Po'ipū area surrounding the project site. Future and ongoing residential subdivision projects include developments proposed by A&B, Knudsen Trust, Sports Shinko, and the State of Hawai'i. Southwest of the project site, A&B is constructing the Kukui'ula residential community consisting of 2,200 SF and 800 MF units. The 572 acres set aside for this development are designated for urban and residential land use and the 800 MF units have potential for resort use. Southeast of the project site, Knudsen Trust / Sports Shinko are constructing the Kiahuna Golf Village consisting of 130 SF and 700 MF units. Knudsen Trust was established in 1922 to provide stewardship over approximately 3,000 acres of land from Mount Kahili to Po'ipū Beach on the south side of Kaua'i. The 91.6 acres of land set aside for this development are designated for resort land uses and the 700 MF units have the potential for resort or residential land use. Knudsen Trust is also proposing construction of the Po'ipū Lani residential community consisting of 90 SF units. The 180 acres set aside for this development are designated urban and residential and includes a golf course. Finally, the State of Hawaii has proposed the construction of the Weliweli Expansion residential community consisting of 400 SF units. The 66 acres set aside for this development are designated for urban and residential land use (County of Kaua'i, 2000).

Future and ongoing resort hotel and condominium projects adjacent to and in the Po‘ipū area surrounding the project site includes developments proposed by the Po‘ipū Beach Hotel, Marriott Waiohai Beach Club, A&B, Knudsen Trust, and Sports Shinko. The Po‘ipū Beach Hotel proposed the construction of 129 resort units. The units would be constructed on three acres of land designated for resort (RR-20 / O) land use. The Marriott Waiohai Beach Club proposed the construction of 230 timeshare units and 7 hotel units. The units would be constructed on 12.4 acres of land designated for resort (RR-20 / O) land use; and located at the original site of the Waiohai Beach Resort. As stated earlier, A&B is constructing the Kukui‘ūla residential community. The 800 MF units that are part of the proposed subdivision have the potential for resort or residential use. In addition, 500 timeshare units and 200 hotel units located on 97 acres would be constructed on land designated for urban residential / resort land use. Knudsen Trust proposed the construction of 150 MF units planned for resort use. The units would be constructed on 9.7 acres of land designated for resort (RR-20 / O) land use. In addition, Knudsen Trust also proposed 300 MF units planned for resort use. The units would be constructed on 18.8 acres of land designated for resort (R-20) land use. As stated earlier, Knudsen Trust / Sports Shinko is developing the Kiahuna Golf Village which will construct 700 MF units with the potential for resort or residential use (County of Kaua‘i, 2000).

The County of Kaua‘i General Plan proposed seven major roadway improvements for the Po‘ipū area. The proposed improvements include:

- widening Kaumuali‘i Highway to a four lane divided roadway between Kalaheo Town and Kōloa Road;
- widening Kaumuali‘i Highway to a four lane divided roadway between Kōloa Road and the Kuhio Highway / Rice Street intersection;
- constructing a new road two-lane connector road between Port Allen and Po‘ipū;
- constructing a new road two-lane connector road between Po‘ipū and Kipu;
- extending the Po‘ipū connector road from Kipu to Nawiliwili;
- widening the Kōloa Bypass Road to four lanes; and
- widening Po‘ipū Road between Lawai Road and the Kōloa Bypass Road.

These adjacent developments and planned construction projects would contribute to the impacts on the Po‘ipū area. The foreseeable cumulative impacts that would result would be an increase in traffic due to the short-term construction activities and long-term increased population of residents and visitors. Short- and long-term impacts on resource use (*e.g.*, potable water, electricity, and sewer) would also occur. Close coordination between project proponents and the County of Kaua‘i would need to occur in order to avoid cumulative impacts to available resources and traffic flow patterns. Since the Proposed Action is evaluated based on its incremental impact to the existing environment and would be closely coordinated with the community and applicable regulatory agencies, it would not represent a significant incremental impact that would contribute to adverse cumulative impacts.

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4 RELATIONSHIP TO ENVIRONMENTAL REGULATIONS

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The purpose of this section is to summarize the relationship of the relevant plans and policies to project actions. Additionally, the intent is to revisit these plans and policies to qualify any significant effects from actions proposed in this EA.

4.1 FEDERAL REGULATIONS

Clean Water Act (CWA)

The CWA establishes the basic structure for regulating discharges of pollutants into the waters of the U.S. and regulating quality standards for surface waters. Under Section 402 of the CWA, the EPA establishes the NPDES permit program to regulate point source discharges of pollutants into waters of the U.S.

Discussion:

Since the Proposed Action would include disturbance of more than one acre of land an NPDES permit would be required for construction activities, and would be applied for with DOH. No other permits or approvals under the CWA are anticipated for the Proposed Action.

Clean Air Act (CAA)

The CAA (42 U.S.C. 7401) requires the adoption of national ambient air quality standards to protect public health, safety, and welfare from known or anticipated effects of air pollution. The DOH Clean Air Branch is responsible for air pollution control in the state.

Discussion:

The Proposed Action would be in compliance with the provisions of the CAA since its implementation would be subject to approval from DOH. It is not anticipated that the Proposed Action would result in any necessary air quality permits since it would not result in significant or chronic emissions.

Endangered Species Act (ESA) of 1973

The ESA of 1973 provides a legal means by which identified ecosystems that are determined to be essential to the sustainability of an endangered or threatened species can be conserved. Under this act, the USFWS is responsible for all terrestrial and freshwater species, as well as migratory birds. Likewise, the NMFS in the Department of Commerce is responsible for the protection of marine, estuarine, and anadromous species.

Discussion:

The USFWS has jurisdiction over endangered and threatened terrestrial flora, fauna, and birds in the State of Hawai'i. Consultation with USFWS and DLNR is in progress and ~~would~~ will continue during the ~~environmental review~~ project planning process. All correspondence with the USFWS and DLNR ~~will be~~ is included in ~~the~~ this Final EA (Appendix B). Control measures discussed in Section 3.2.3.2 of this EA would reduce potential impacts to endangered species that may be present within the project area.

Coastal Zone Management (CZM) Act of 1972

In 1972, the federal government enacted the CZM Act to protect, preserve, develop, restore, and enhance the resources of the nation's coastal zone for current and future generations. This process is achieved by providing assistance to coastal states, including Hawai'i, to develop and manage Coastal Management Programs. Enforcement authority for the Federal Coastal Management Program (Public Law 104-150, as amended in 1996) has been delegated to the State of Hawai'i (HRS Chapter 205A).

Discussion:

Through the CZM Program promulgated by HRS Chapter 205A, each county is required to establish special management areas and shoreline setbacks within which permits are required for development. The proposed project would comply with HRS Chapter 205A since it is not located on the shoreline or within the special management area.

HUD Environmental Review

HUD regulations promulgated in 24 CFR Part 58 require a separate Environmental Review to be conducted when funding through HUD programs are utilized. Factors to be considered during the review are listed in 24 CFR Part 58 and include documentation that must be provided, public notice and comment requirements, and the process for obtaining environmental clearances.

Discussion:

Since the Proposed Action would utilize potential funding through the HUD programs a separate Environmental Review in accordance with 24 CFR Part 58 procedures must be conducted. The HUD Environmental Review is included in Appendix A.

Migratory Bird Treaty Act

The Migratory Bird Treaty Act of 1918, as amended establishes a Federal prohibition, unless permitted by regulations, to "pursue, hunt, take, capture, kill, attempt to take, capture or kill, possess, offer for sale, sell, offer to purchase, purchase, deliver for shipment, ship, cause to be shipped, deliver for transportation, transport, cause to be transported, carry, or cause to be carried by any means whatever, receive for shipment, transportation or carriage, or export, at any time, or in any manner, any migratory bird, included in the terms of this Convention...for the protection of migratory birds...or any part, nest, or egg of any such bird" (16 U.S.C. 703).

Discussion:

The endangered Hawaiian petrel (*Pterodroma sandwichensis*) and threatened Newell's shearwater (*Puffinus auricularis newelli*), were not observed at the site during a biological survey conducted at the project site, but may fly over the project site at night while traveling to and from their upland nesting sites to the ocean. Both species nest inland in the mountainous interior of Kaua'i, but no suitable nesting sites were identified at the project site. The following control measures are recommended to avoid and minimize light attraction of the endangered Hawaiian petrel and threatened Newell's shearwater to the project site:

- Construction activity should be restricted to daylight hours as much as practicable during the seabird breeding season (April through November) to avoid the use of nighttime lighting that could be an attraction to seabirds.
- All outdoor lights should be shielded to prevent upward radiation at the housing development. This has been shown to reduce the potential for seabird attraction.
- Outside lights that are not needed for security and safety should be turned off from dusk through dawn during the fledgling fallout period (September 15 through December 15).

National Historical Preservation Act

The National Historic Preservation Act (NHPA) (Public Law 89-665; 16 U.S.C. 470 et seq.) is legislation intended to preserve historical and archaeological sites in the U.S. The act created the National Register of Historic Places, the list of National Historic Landmarks, and the State Historic Preservation Offices.

Discussion:

An archaeological inventory survey, as well as a Cultural Impact Analysis were conducted at the project area in order to identify any historical resources. Several historic features associated with the commercial plantation era were identified at the project site. These features were documented and recorded in accordance with applicable regulations. Consultation with SHPD in accordance with Section 106 of the NHPA has been initiated, and will continue during the planning process.

4.2 STATE LAND USE PLANS AND POLICIES

4.2.1 STATE OF HAWAII

Environmental Impact Statements Chapter 343, HRS

Compliance with Chapter 343, HRS is required as previously described in Section 2.1 Scope and Authority.

§343-5 Applicability and Requirements. *(a) Except as otherwise provided, an environmental assessment shall be required for actions that:*

Propose the use of the state or county lands or the use of state or county funds, other than funds to be used for feasibility or planning studies for possible future programs or projects that the agency has not approved, adopted, or funded, or funds to be used for the acquisition of unimproved real property; provided that the agency shall consider environmental factors and available alternatives in its feasibility or planning studies; provided further that an environmental assessment for proposed uses under section [205-2(d)(10)] or [205-4.5(a)(13)] shall only be required pursuant to Section 205-5(b).

HRS, Chapter 343, defines the State of Hawai‘i’s environmental review process by which an environmental impact statement must be conducted to identify any potential impacts that could result from a proposed action involving state or county lands or funds.

Discussion:

The County of Kaua‘i is titled to the land within the project site; therefore, an environmental review under HRS Chapter 343 is required because the project entails the use of county lands. This document has been prepared to meet HRS Chapter 343 requirements and would be processed through the OEQC.

Environmental Impact Statement Rules Title 11, Chapter 200, HAR

HAR Title 11, Chapter 200 provides the procedures, definitions and criteria for completing environmental assessments and environmental impact statements in compliance with HRS 343.

Discussion:

Evaluation of the potential environmental, social and economic impacts from the Proposed Action have followed the applicable procedures, definitions and criteria outlined in HAR 11-200.

Hawai‘i State Plan, Chapter 226, HRS

The Hawai‘i State Plan, Chapter 226, HRS was developed as a guideline for the future growth of the State of Hawai‘i. The State Plan identifies goals, objectives, policies, and priorities for the development and growth of the state. It provides a basis for prioritizing and allocating the limited resources such as public funds, services, human resources, land, energy, and water. The State Plan establishes a system for the formulation and program coordination of state and county plans, policies, programs, projects, and regulatory activities. The State Plan also facilitates the integration of all major state and county activities. The proposed project would be in conformance with the State Plan’s objectives and policies for socio-cultural advancement with regard to housing. Specifically, the proposed project would fulfill the following objectives of the State Plan:

- *Provide 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 non-profit 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.*
- *Effectively accommodate the housing needs of Hawai‘i’s people.*
- *Stimulate and promote feasible approaches that increase housing choices for low-income, moderate-income, and gap-group households.*
- *Increase homeownership and rental opportunities and choices in terms of quality, location, cost, densities, style, and size of housing.*
- *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.*

Historic Preservation Chapter 6E, HRS

Regulatory statutes related to historic preservation issues are provided in Chapter 6E of the HRS, which mandates that the SHPD of the DLNR must review proposed state projects, which may have an impact upon historic and cultural resources that are located within the project site. Further, Chapter 6E also provides procedural guidelines in the event of an inadvertent discovery of burial sites during project development.

Discussion:

Consultation with SHPD is in progress and will continue throughout the ~~environmental review~~ project planning process. Correspondence ~~will be~~ is included in ~~the~~ this Final EA (Appendix B). A historical/cultural survey was conducted in accordance with HRS, Chapter 6E at the project site in order to determine if cultural and/or historical resources are present at the project site.

State of Hawai'i Land Use Law Chapter 205, HRS

Chapter 205, HRS promulgates the State Land Use Law. This law is intended to preserve, protect, and encourage the development of lands in the State of Hawai'i for uses that are best suited to the public health and welfare of its people. The LUC classifies all land into four districts: Urban, Conservation, Agriculture, and Rural.

Discussion:

The project site is designated within the State LUC Urban District. The proposed project would be used for residential purposes; therefore, the Proposed Action would be in accordance with the State LUC designation.

4.3 COUNTY LAND USE PLANS AND POLICIES

4.3.1 COUNTY OF KAUA'I

4.3.1.1 GENERAL PLAN (AMENDED NOVEMBER 2000)

Pursuant to the provisions of the Charter for the County of Kaua'i, the General Plan sets forth policies to govern the future physical development of the county. The General Plan is intended to improve the physical environment of the county and the health, safety and general welfare of Kaua'i's people.

Discussion:

Chapter 6 of the General Plan discusses the enhancement of communities and providing for growth on Kaua'i. The plan states that the Kōloa-Poi'pū-Kalāheo Planning District is home to Kaua'i's largest resort destination as well as some of the most active agricultural businesses. Major planned housing, resort hotel, and condominium projects are already planned for the district. Continued development in this area would contain growth within the existing towns and developed areas and would ultimately reduce sprawl. The Proposed Action would be located

directly adjacent to the established residential community to the north, and *mauka* of the Poi‘pū town center. Therefore, the Proposed Action would be in accordance with the guidance established in the county General Plan.

4.3.1.2 KAUA‘I COUNTY CODE

The Kaua‘i County Code 1987, as amended, was prepared pursuant to the authority of Section 4.05 of the Kaua‘i County Charter, and sets forth guidelines and rules for various County functions, including development standards, taxation, County administration organization, and other matters affecting the general public.

Chapter 8 of the Kaua‘i County Code: CZO

The purpose of the CZO is to provide regulations and standards for land development and the construction of buildings and other structures in the County of Kaua‘i (County of Kaua‘i, 2012). The project site is located in the Urban District.

Discussion:

The project site is currently zoned for residential use under county zoning regulations. The proposed project would be used for residential purposes; therefore, the Proposed Action would be in accordance with county planning goals.

4.3.2 PERMITS AND APPROVALS

4.3.2.1 SECTION 402 NPDES PERMIT

Discharge of pollutants into surface waters of the U.S. are controlled under the NPDES program, pursuant to Section 402 of the CWA. This program is administered by the DOH under HAR Title 11, Chapter 55 Water Pollution Control. This chapter requires submission of a NPDES application or a Notice of Intent for NPDES General Permit coverage, for discharges of regulated pollutants, or for substantially altering the quality of any discharge, or for substantially increasing the quantity of discharge.

The State NPDES General Permit program regulates discharges into Class 2 and AA waters such as Waikomo Stream and the Pacific Ocean, respectively. Any discharges associated with construction activities such as dewatering or hydrotesting must comply with the provisions of HAR Title 11, Chapters 54 and 55.

4.3.2.2 REQUIREMENTS FOR CONSTRUCTION ACTIVITIES

The following County of Kaua‘i permits are associated with construction activities and are expected to be required for the Proposed Action:

- Grading Permit from the Department of Public Works, Building Department;
- Building Permits from the Department of Public Works, Building Department;

- Sewer Connection Approval from the Department of Public Works Wastewater Division; and
- Potable water connected approval from the DOW.

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5 FINDINGS AND DETERMINATIONS

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In accordance with the provisions set forth in HRS Chapter 343 and NEPA, this EA has preliminarily determined that the project would not have significant adverse impacts on the environment. As such, a Finding of No Significant Impact (FONSI) is being issued for the Proposed Action. Anticipated impacts would be temporary and would not adversely impact the environmental quality of the area. Therefore, an Environmental Impact Statement is not required.

A review of the “Significance Criteria” used as a basis for the above determination is presented below. An action is determined to have a significant impact on the environment if it meets any one of the thirteen (13) criteria, as established under HRS Chapter 343.

Involves an irrevocable commitment to loss or destruction of any natural or cultural resources;

The Proposed Action would not provide irrevocable commitment to loss or the destruction of any natural or cultural resources since the research conducted did not reveal any known significant cultural resources that would be adversely affected by the Proposed Action. Control measures relating to construction activities included in the Proposed Action would reduce potential impacts to protected natural resource biological species to a level of insignificance. The details of these control measures are discussed in Section 3.2.3 of this EA.

Curtails the range of beneficial uses of the environment;

The Proposed Action would not curtail the range of beneficial uses of the environment. The project site is currently unused except for regular utility maintenance associated with the KIUC power lines located on-site. The Proposed Action would not curtail beneficial uses of the environment at the project site since all planned development would comply with applicable county and state BMPs that would minimize changes to the existing environmental function.

Conflicts with the state’s long-term environmental policies or goals and guidelines as expressed in Chapter 343, HRS; and any revisions thereof and amendments thereto, court decisions, or executive orders;

The Proposed Action would be in conformance with the Chapter 343 HRS State Environmental Policy, to enhance the quality of life.

Substantially affects the economic or social welfare of the community or state;

The Proposed Action would have a beneficial impact on the economic and social welfare of the community or the state. The proposed project would have short-term beneficial impacts by creating temporary construction jobs for the duration of the construction period, as well as long-term beneficial impacts by providing much needed affordable housing to the residents of Kaua‘i.

Substantially affects public health;

The Proposed Action is not expected to have a substantial effect on public health.

Involves substantial secondary impacts, such as population changes or effects on public facilities;

The Proposed Action would not result in substantial secondary impacts, such as population changes or effects on public facilities. Since there currently is a need for affordable housing for the existing county population, it is not anticipated that the residents of the planned community would represent an increase in overall county population. Rather, the existing population would utilize the planned affordable housing units. Further, the public facilities in the area are not anticipated to be significantly impacted by the community residents.

Involves a substantial degradation of environmental quality;

The Proposed Action would not likely result in a substantial degradation of environmental quality. All construction activities would be implemented in compliance with applicable county and state BMPs/regulations.

Is individually limited, but cumulatively has considerable effect on the environment, or involves a commitment for larger actions;

The Proposed Action is one of several planned residential communities within the area. The Proposed Action would adhere to all applicable county construction BMPs, and would not have an adverse effect on the environment, nor would it involve a commitment for larger actions.

Substantially affects a rare, threatened, or endangered species or its habitat;

The Proposed Action is not anticipated to have substantial effects on a rare, threatened, or endangered species, or any critical habitat. Measures to avoid or minimize impacts to protected species within the vicinity of the project site are included in Section 3.2.3 of this EA.

Detrimentially affects air or water quality or ambient noise levels;

No significant impacts on the long-term air or water quality or ambient noise levels within the affected environment are anticipated to result from the Proposed Action. Construction noise that exceeds DOH guidelines should be controlled to reduce the potential of noise level exceedances. Water quality impacts would be reduced with the use of silt fences and other applicable BMPs, including an NPDES permit during construction activities to contain runoff that may potentially reach receiving waters. Dust abatement measures should be used to reduce potential of impact to air quality during construction. With these measures in place, the project would not detrimentally affect air, water, or noise quality within the affected environment.

Affects or is likely to suffer damage by being located in an environmentally sensitive area, such as a flood plain, tsunami zone, beach, erosion-prone area, geologically hazardous land, estuary, freshwater, or coastal waters;

A portion of the project site is located within a flood plain. However, construction activities will be limited to areas outside of the flood plain. The project site is not located within a tsunami zone, beach, erosion prone area, geologically hazardous land, estuary, freshwater, or coastal waters. As a result, no significant short- or long-term impacts are expected due to the presence of an environmentally sensitive area within a portion of the project site.

Substantially affects scenic vistas and view planes identified in county or state plans or studies; and

The Proposed Action would not substantially affect the visual aesthetics of the area identified in the county or state plans and studies. The residences would adhere to county zoning restrictions and the County of Kaua'i General Plan.

Requires substantial energy consumption.

The Proposed Action would not require substantial energy consumption. The KIUC currently has the capacity to supply the proposed residential community with the needed electricity service. Additionally, the community residences are planned to incorporate energy saving measures, such as solar hot water and photovoltaic electricity panels.

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6 AGENCIES AND ORGANIZATIONS CONSULTED

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The following is a list of agencies and organizations to which pre-assessment letters as well as notices of the availability of for the Draft EA will were be sent. The individual comment and response letters will be are included in Appendix B of this Final EA.

Table 6-1: List of Agencies and Organizations Consulted

	Consulted Agency or Organization	Pre-Assessment Response Received	Draft EA Public Response Received
Federal Agencies	Postmaster - Līhu'e Post Office		
	Postmaster - Kōloa Post Office		
	EPA, Region 9 Pacific Islands Contact Office		
	USFWS Ecological Services	X	
State Agencies	HDOT Highways Division		
	HDOT Kaua'i District		
	DOH Environmental Planning Office	X	X
	DOH-CWB	X	X
	LUC		
	Department of Business, Economic Development & Tourism, Office of Planning		
	Office of Planning	X	
	Office of Hawaiian Affairs	X	
	DOH OEQC	X	
	SHPD-DLNR		
	DOE		
	HDOT Airports, Kaua'i District Office		
	HDOT Airports		
	DFW, DAR-DLNR	X	
	Department of Agriculture		
County of Kaua'i	Agency on Elderly Affairs		
	Kaua'i Fire Department		
	Department of Parks & Recreation	X	

	Consulted Agency or Organization	Pre-Assessment Response Received	Draft EA Public Response Received
	Planning Department		
	Kaua'i Police Department		
	Public Works Department	X	
	Transportation Agency	X	
	Department of Water	X	
	Kaua'i Civil Defense Agency		
	Office of Economic Development		
	Kōloa / Po'ipū Neighborhood Center		
Utility Companies	KIUC		
	Hawaiian Telcom	X	
	Oceanic Time Warner Cable		
Citizen Groups and Individuals	Hui Kaleo'o 'Aina Ho'opulapula		
	Kaua'i/Niihau Island Burial Council		
	Hui Mālama O Kāneiolouma		
	Kawailoa Development, LLP		
	Eric A. Knudsen Trust		
	Kukui'ula Development		
	Po'ipū Beach Resort Association		
	Mālama Kōloa		
	Rotary Club of Po'ipū Beach		
	Kōloa Community Association		
	Royal Order of Kamehameha, Kaumuali'i Chapter III		
Grove Farm			

7 REFERENCES

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APPENDIX A: ENVIRONMENTAL ASSESSMENT FOR HUD-FUNDED PROPOSALS

Environmental Assessment for HUD-funded Proposals

*Recommended format per 24 CFR 58.36, revised March 2005
[Previously recommended EA formats are obsolete].*



Project Identification: Koae Workforce Housing Development

Preparer: Community Planning and Engineering, Inc.

Responsible Entity: Kaua'i County Housing Agency

Month/Year: November 2015

Environmental Assessment

Responsible Entity: Kaua'i County Housing Agency

[24 CFR 58.2(a)(7)]

Certifying Officer: Kamuela Cobb Adams – Housing Director

[24 CFR 58.2(a)(2)]

Project Name: Koae Workforce Housing Development

Project Location: Kōloa, Island of Kaua'i, State of Hawai'i

Estimated Total Project Cost: To be determined

Grant Recipient: Kaua'i County Housing Agency

[24 CFR 58.2(a)(5)]

Recipient Address: Pi'ikoi Building, 4444 Rice Street, Suite 330, Līhu'e, HI 96766

Project Representative: Mr. Gary Mackler, Kaua'i County Housing Agency

Telephone Number: 808-241-4444

Conditions for Approval: (List all mitigation measures adopted by the responsible entity to eliminate or minimize adverse environmental impacts. These conditions must be included in project contracts and other relevant documents as requirements). [24 CFR 58.40(d), 40 CFR 1505.2(c)]

Control measures are anticipated during the construction and operation phase which would include County of Kaua'i construction best management practices (BMPs) and adherence to County drainage, utility and infrastructure standards, along with recommendations to reduce / eliminate potential impacts to special status biological species found island-wide. Improvements to traffic intersections accessing the project site may be recommended to avoid impacts to traffic within the surrounding roadway network.

Hazards, Nuisances including Site Safety

Project construction will increase the possibility of safety issues, hazards and nuisances. The developer(s) / contractor(s) are responsible for controlling these issues through the incorporation of County of Kaua'i construction BMPs. With the control measures in place, the proposed development is not expected to generate hazards or nuisances.

Energy Consumption

Kaua'i Island Utility Cooperative (KIUC) is expected to supply the necessary power to the proposed development. The proposed project will increase the electrical load demand of the local substation and may require utility upgrades to service the proposed development. However, these effects are expected to be insignificant. Any electrical issues shall be resolved prior to development. Once the electrical improvements are conducted, the energy supply should meet the demand of the project site with respect to the surrounding area. Additional energy demand for the proposed project should be accommodated by the KIUC; therefore, no significant impacts to energy consumption are expected to result from the project.

Noise

Construction BMPs to reduce short-term noise impacts would include: insulation/muffling; equipment

substitution, selection, retrofit, and maintenance; utilization of staging areas; and non-permanent noise barriers. Further, buffer zones between construction activities and residential areas would be created, and construction work would be limited to the hours between 7:30 am and 3:30 pm on weekdays.

Air Quality

BMPs to reduce dust emissions during the construction period would include watering active work areas and unpaved work roads; use of wind screens; establishment of a routine road cleaning and/or tire washing program; paving of parking areas; establishment of landscaping early in the construction schedule; and monitoring dust at the project boundary.

Waste Water

Waste water will increase in the general location of the project site as more residents will be using the utilities and infrastructure provided. The waste water system service lines may need to be improved to facilitate the increased use. There is no significant impact expected to result from the changes in waste water production.

Storm Water

The contractor is responsible to comply with National Pollution Discharge Elimination System (NPDES) requirements which include a Contractors Certification of NPDES Compliance including the BMP checklist and a written BMP plan. The State of Hawai'i Department of Health (DOH) will require a NPDES permit during the construction period as the project site is greater than one acre in size. BMPs would include erosion control measures to minimize potential sediment runoff to surface water and potentially groundwater. Any temporary discharge will be treated and / or controlled to the criteria established by the State Water Quality Standards. Additionally, a permanent storm water drainage system for the proposed development will be designed in accordance with the County of Kaua'i Department of Public Works standards. Because these practices will be implemented, no significant impacts from surface water discharge are anticipated under the Proposed Action.

Water Resources

Construction activities should comply with BMPs to reduce the potential of sediment runoff. Runoff at the project site will be controlled by using silt fences and County approved BMPs for reducing the potential of sediment impacts on wetlands or other water resources. Construction activities will implement BMPs including sediment barriers to reduce / eliminate construction related runoff into Waikomo Stream and other surface water bodies in the area, which discharge into the Pacific Ocean. Further, no construction activities will be conducted within Waikomo Stream or the surrounding flood plain.

Vegetation and Wildlife

The threatened Newell's shearwater and the endangered Hawaiian petrel as well as the proposed endangered band-rumped storm petrel are known to traverse the surrounding area when flying between the ocean and mountain nesting sites. Seabirds are vulnerable to collision with above ground objects during their breeding season of March through December. Once grounded, seabirds are vulnerable to predators and are often struck by vehicles along roadways. The United States (U.S.) Fish and Wildlife Service (USFWS) recommends using only essential lights, fully shielding all lights, and avoiding nighttime construction that requires lighting to avoid and minimize potential impacts to seabirds. Nighttime construction is not anticipated.

The endangered Hawaiian hoary bat roosts in exotic native woody vegetation and, while foraging, will leave their young unattended in "nursery" trees and shrubs. If trees and shrubs suitable for bat roosting are cleared during the breeding season, there is a risk that young bats could inadvertently be harmed or killed. As a result, woody plants greater than 15 feet (4.6 meters) tall should not be removed or trimmed from June 1 through September 15.

Although the proposed construction area does not contain suitable nesting or foraging habitat for any endangered waterbirds, the Proposed Action may potentially attract the endangered Hawaiian Duck or Kōloa, Hawaiian Coot, or Common Moorhen. The USFWS and State of Hawai'i Department of Land and

Natural Resources (DLNR) must be consulted prior to site work (i.e. grading, trenching or any earth moving activities) in order to create a construction plan that will avoid or minimize new standing surface water that could attract protected water birds. If these species are observed at the project site during construction, work should cease, and the bird should not be approached. The USFWS and DLNR should be consulted to avoid / minimize impacts to these water bird species.

The protected Hawaiian goose or Nēnē is also present within the vicinity of the project site. In order to minimize impacts to the Nēnē, it is recommended that a qualified biologist survey the project area prior to construction, and after any subsequent delay in work of three or more days (during which birds may attempt nesting). If a Nēnē appears within 100 feet of ongoing work, the bird should not be approached, and all activity should be temporarily suspended until the Nēnē leaves the area of its own accord. All regular onsite staff should be trained to identify the Nēnē and know the appropriate steps to take if the Nēnē is present on site. If a Hawaiian goose nest is found at the project site, work should cease immediately and the USFWS and DLNR should be contacted for further guidance.

The Kaua'i cave wolf spider or blind cave spider and the Kaua'i cave amphipod are protected arthropod species found within the vicinity of the project site. While no known habitat has been documented at the project site, control measures recommended by the USFWS must be followed to minimize potential impacts to these arthropod species.

FINDING: [58.40(g)]

 X

Finding of No Significant Impact

(The project will not result in a significant impact on the quality of the human environment)

Finding of Significant Impact

(The project may significantly affect the quality of the human environment)

Preparer Signature:



Date: 11/25/2015

Name / Title: Max Solmssen/Environmental Planner

RE Approving Official Signature: _____ **Date:** _____

Name/Title/Agency: _____

Statement of Purpose and Need for the Proposal: [40 CFR 1508.9(b)]

The purpose of the Proposed Action is to satisfy the need for affordable housing on the Island of Kaua'i. The Kaua'i County Housing Agency's mission is to provide much needed affordable housing to families on Kaua'i, as the population of Kaua'i's residents is increasing. Facilitating affordable housing opportunities for Kaua'i residents is one of the county's top priorities. Following a rapid increase in housing prices in Kaua'i County in the mid-2000s, a shortage of affordable housing for Kaua'i residents was pervasive; island-wide. In order to address this housing shortage, the Kaua'i County Council has been working to secure suitable lands for affordable housing. The proposed project site was acquired as a suitable location to provide the needed affordable housing to Kaua'i residents.

Description of the Proposal: Include all contemplated actions which logically are either geographically or functionally a composite part of the project, regardless of the source of funding. [24 CFR 58.32, 40 CFR 1508.25]

The Proposed Action is the development of a County of Kaua'i affordable workforce housing project that would provide the growing county population much needed affordable housing. The Koa'e Workforce Housing Development would include a mix of 130 to 150 single-family and multi-family residential units.

Existing Conditions and Trends: Describe the existing conditions of the project area and its surroundings, and trends likely to continue in the absence of the project. [24 CFR 58.40(a)]

The project site includes approximately 11.2 acres of land located on the south side of the island of Kaua'i approximately seven miles southwest of Lihue town, and less than one mile south of downtown Kōloa.

The project site is bound by Po'ipū Road to the west, the Kiahuna Golf Club to the east, and an existing residential subdivision to the north. The project site includes tax map key (TMK) (4) 2-6-004: Parcel 019. The land included within the project site is designated as Urban by the State of Hawai'i Land Use Commission (LUC), and is zoned Residential (R-20) under the County of Kaua'i Comprehensive Zoning Ordinance (CZO). The project site is largely undeveloped with the exception of an old cane haul road bisecting the parcel east to west. KIUC power lines with an accompanying utility easement run along the cane haul road.

Statutory Checklist

[24CFR §58.5]

Record the determinations made regarding each listed statute, executive order or regulation. Provide appropriate source documentation. Note reviews or consultations completed as well as any applicable permits or approvals obtained or required. Note dates of contact or page references. Provide compliance or consistency documentation. Attach additional material as appropriate. Note conditions, attenuation or mitigation measures required.

Factors	Determination and Compliance Documentation
Historic Preservation [36 CFR 800]	An archaeological inventory survey and cultural impact analysis conducted at the project site in 2004 concluded that there were no significant historical or cultural resources present within the project site. Seven historic properties connected with the commercial agricultural era were noted, but not considered significant under applicable regulations (Cultural Surveys Hawai'i, Inc., 2004a). The State of Hawai'i Historic Preservation Division (SHPD) will be consulted during the environmental review period in compliance with applicable state and federal regulations [Exhibit 1] .
Floodplain Management [24 CFR 55, Executive Order 11988]	The majority of the project site is designated as Federal Emergency Management Agency (FEMA) Zone X, which is outside of the 100-year floodplain hazard area. A portion of the project site that includes Waikomo Stream is located within Flood Zone AE, designated as "areas subject to inundation by the 1% annual chance flood event." The area of the project site surrounding Waikomo Stream is located within a Flood Zone subject to a 0.2% annual chance flood event. Sheet flow during rain events likely drains to Waikomo Stream and eventually to the Pacific Ocean. The topography of the project area is gently sloping to the south and site soils provide for adequate drainage across the entire project site. No construction activities are planned to take place within the 100-year floodplain hazard area. As a result, the proposed housing development is not anticipated to have an adverse impact on floodplain function. Additionally, the proposed project should not be impacted by flooding as it would be located outside the designated flood hazard area [Exhibit 2] .
Wetlands Protection [Executive Order 11990]	The USFWS classifies Waikomo Stream as a perennial stream, which is permanently flooded. Loss or destruction of wetlands is not expected because construction activities will not take place within Waikomo Stream or the surrounding flood plain buffer. Runoff produced during construction activities would be controlled using silt fences and County of Kaua'i-approved BMPs to reduce the potential of sediment impact to wetlands [Exhibit 3] .

<p>Coastal Zone Management Act [Sections 307(c), (d)]</p>	<p>The Coastal Zone Management (CZM) Program is promulgated by Chapter 205A, Hawai'i Revised Statutes (HRS). The objectives and policies of the program are administered by the State of Hawai'i Office of Planning. Through the CZM Program, each County is required to establish Special Management Areas (SMAs) and shoreline setbacks within which permits are required for development. CZM regulations such as the SMA and Shoreline Setback provisions, which are administered by the Counties, may apply to U.S. Department of Housing and Urban Development (HUD)-assisted projects. Each County Planning Department should be consulted for the applicability of SMA and Shoreline Setback requirements. The proposed project is not located within the SMA. The proposed project is not anticipated to have an adverse impact on the coastal zone. The County of Kaua'i Planning Department will be consulted during the environmental review process for federal CZM consistency review [Exhibit 4].</p>
<p>Sole Source Aquifers [40 CFR 149]</p>	<p>Based on the U.S. Environmental Protection Agency (EPA) sole source aquifer designation, the Island of Kaua'i does not have any sole source aquifers. The Proposed Action would be closely coordinated with the County of Kaua'i Department of Water (DOW). The availability of water should not be impacted or have adverse impacts on the underlying aquifers. Therefore, no significant impacts to drinking water sources are expected from the Proposed Action [Exhibit 5].</p>
<p>Endangered Species Act [50 CFR 402]</p>	<p>A terrestrial flora and fauna survey was conducted at the project site in order to identify the presence of special status habitats. No state or federally listed threatened, endangered, or candidate plant species, or rare native Hawaiian plant species were observed within the surveyed area, and no designated critical plant habitat occurs within the area. The endangered Hawaiian petrel (<i>Pterodroma sandwichensis</i>) and threatened Newell's shearwater (<i>Puffinus auricularis newelli</i>), may fly over the project site at night while traveling to and from their upland nesting sites to the ocean (Rana Productions, Ltd., 2004).</p> <p>The following control measures are recommended to avoid and minimize light attraction of the endangered Hawaiian petrel and threatened Newell's shearwater to the project site:</p> <ul style="list-style-type: none"> • Construction activity should be restricted to daylight hours as much as practicable during the seabird breeding season (April through November) to avoid the use of nighttime lighting that could be an attraction to seabirds. • All outdoor lights should be shielded to prevent upward radiation at the housing development. This has been shown to reduce the potential for seabird attraction. • Outside lights that are not needed for security and safety should be turned off from dusk through dawn during the fledgling fallout period (September 15

through December 15).

The endangered Hawaiian hoary bat (*Lasiurus cinereus semotus*) was not observed at the project site but has important habitat within the area. To prevent direct impacts to the Hawaiian hoary bat, the following control measures are recommended:

- No trees taller than 15 feet within the project site should be trimmed or removed between June 1 and September 15 when non-volant juvenile bats (bats that cannot fly) may be roosting in the trees.
- Any fences that are erected as part of the Proposed Action should have a barbless top-strand wire to prevent entanglements of the Hawaiian hoary bat on barbed wire. For existing fences at the project site, the top strand of barbed wire should be removed or replaced with barbless wire.

Although the proposed construction area does not contain suitable nesting or foraging habitat for any endangered waterbirds, the Proposed Action may potentially attract the endangered Hawaiian Duck or Kōloa, Hawaiian Coot, or Common Moorhen. The USFWS and State of Hawai'i DLNR must be consulted prior to site work (i.e. grading, trenching or any earth moving activities) in order to create a construction plan that will avoid or minimize new standing surface water that could attract protected water birds. If these species are observed at the project site during construction, work should cease, and the bird should not be approached. The USFWS and DLNR should be consulted to avoid / minimize impacts to these water bird species.

The protected Hawaiian goose or Nēnē is also present within the vicinity of the project site. In order to minimize impacts to the Nēnē, it is recommended that a qualified biologist survey the project area prior to construction, and after any subsequent delay in work of three or more days (during which birds may attempt nesting). If a Nēnē appears within 100 feet of ongoing work, the bird should not be approached, and all activity should be temporarily suspended until the Nēnē leaves the area of its own accord. All regular onsite staff should be trained to identify the Nēnē and know the appropriate steps to take if the Nēnē is present on site. If a Hawaiian goose nest is found at the project site, work should cease immediately and the USFWS and DLNR should be contacted for further guidance.

The Kaua'i cave wolf spider or blind cave spider and the Kaua'i cave amphipod are protected arthropod species found within the vicinity of the project site. While no known habitat has been documented at the project site, control measures recommended by the USFWS must be followed to minimize potential impacts to these arthropod species.

Consultation with USFWS is in progress and will continue

	during the project planning process in compliance with Section 7 of the Endangered Species Act (ESA) [Exhibit 6] .
Wild and Scenic Rivers Act [Sections 7(b), (c)]	There are no designated wild and scenic rivers in the State of Hawai'i. There are no anticipated compliance requirements under the wild and scenic rivers act for the proposed housing development [Exhibit 7] .
Air Quality [Clean Air Act, Sections 176(c) and (d), and 40 CFR 6, 51, 93]	The project site is located within EPA attainment zones for EPA National Ambient Air Quality Standards (NAAQSs) for all criteria pollutants. The proposed project would result in less than significant short-term impacts to air quality arising from construction activities. The major potential short-term air quality impacts would occur from the generation of fugitive dust. Applicable BMPs would be implemented during construction activities in order to control fugitive dust emissions. These BMPs would include watering active work areas and unpaved work roads; use of wind screens; establishment of a routine road cleaning and/or tire washing program; paving of parking areas; establishment of landscaping early in the construction schedule; and monitoring dust at the project boundary.
Farmland Protection Policy Act [7 CFR 658]	The project site is designated an Urban District by the State LUC, but is currently unused with the exception of regular maintenance of KIUC power lines. Agricultural resources would not be significantly impacted by the proposed residential use due to the adequate amount of available agricultural lands within the County of Kaua'i. Additionally, the project site was acquired by the County of Kaua'i for the purpose of providing much needed affordable housing for Kaua'i residents.
Environmental Justice [Executive Order 12898]	The project will provide affordable housing to county residents. The proposed housing development complies with Executive Order 12898 and ensures environmental justice for members of the community, including minority and low-income populations.

HUD Environmental Standards Determination and Compliance Documentation

Noise Abatement and Control [24 CFR 51 B]	Less than significant short-term noise impacts from construction activities would occur. BMPs (<i>e.g.</i> , construction scheduling; insulation / muffling; reduced power options; equipment substitution, selection, retrofit, and maintenance; utilization of staging areas; and non-permanent noise barriers) would be implemented to reduce or eliminate noise. Further, buffer zones between construction activities and residential areas would be created, and construction work would be limited to the hours between 7:30 am and 3:30 pm on weekdays. As a result, short-term impacts from construction activities would be less than significant to the surrounding environment. Less than significant long-term impacts to noise receptors would occur. Stationary mechanical equipment in compliance with DOH Community Noise Control rules may be incorporated in the proposed development (<i>i.e.</i> , air conditioning units). The proposed subdivision would be designed in accordance with applicable federal and state noise standards including the Federal Highway Administration and HUD. As a result, long-term impacts to noise generation
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	would be considered less than significant.
Toxic / Hazardous / Radioactive Materials, Contamination, Chemicals or Gases [24 CFR 58.5(i)(2)]	During construction, there may be the potential of petroleum spillage associated with construction vehicles and equipment. To minimize this hazard, all applicable spill and prevention control BMPs would be implemented to ensure that accidental releases are minimized and contained. For example, vehicles and equipment would be regularly inspected for leaks and adequate performance, and would be maintained accordingly. In the long-term, there is potential for petroleum spillage from residential sources (e.g., vehicle leaks and improper disposal of hazardous materials). These potential impacts would be reduced by adherence to all applicable county and state regulations. As a result, implementation of the Proposed Action is expected to have a less than significant impact from hazardous materials and wastes (Bureau Veritas, 2008 and Clayton Group Services, Inc., 2004).
Siting of HUD-Assisted Projects near Hazardous Operations [24 CFR 51 C]	Surrounding land uses include commercial agriculture, transportation corridors, and residential use. Two Phase I Environmental Site Assessments were performed for the project site in September 2004 and February 2008. The assessments revealed no evidence of any recognized environmental conditions in spite of historical use for commercial agriculture due to no evidence of storage, mixing, or excessive use of agricultural chemicals. Further, no recognized environmental conditions were cited for the surrounding area.
Airport Clear Zones and Accident Potential Zones [24 CFR 51 D]	The project site is located approximately 10.9 miles east of the nearest airstrip and approximately 12.2 miles from the nearest airport. These distances are outside of the potential airport clear zone or accident potential zone of 2,500 ft.

Environmental Assessment Checklist

[Environmental Review Guide HUD CPD 782, 24 CFR 58.40; Ref. 40 CFR 1508.8 & 1508.27]

Evaluate the significance of the effects of the proposal on the character, features and resources of the project area. Enter relevant base data and verifiable source documentation to support the finding. Then enter the appropriate impact code from the following list to make a determination of impact. **Impact Codes:** (1) - No impact anticipated; (2) - Potentially beneficial; (3) - Potentially adverse; (4) - Requires mitigation; (5) - Requires project modification. Note names, dates of contact, telephone numbers and page references. Attach additional material as appropriate. Note conditions or mitigation measures required.

Land Development	Code	Source or Documentation
Conformance with Comprehensive Plans and Zoning	1	The project site is designated an Urban District by the State LUC and zoned Residential (R-20) under the County CZO. Use of the project site for development of a residential subdivision would be in accordance with State law and County charter.
Compatibility and Urban Impact	1	The project site will include the conversion of unused open lands to residential use. However, the Proposed Action would be compatible with surrounding land uses, which include the urban/residential areas of Kōloa Town and Po'ipū.
Slope	1	The project site slopes gently in the <i>makai</i> (seaward) direction from north to south. The project site ranges in elevation from approximately 100 to 150 feet above mean sea level (msl). The project site is bound by Po'ipū Road to the west, the Kiahuna Golf Club to the east, and an existing residential subdivision to the north.
Erosion	1	The project site consists of the Waikomo Series soils. This soil type is characterized by well-drained stony and rocky soils on the uplands of Kaua'i that formed in material weathered from basic igneous rock. Construction BMPs, including silt fences / barriers, and following the site NPDES construction permit, would reduce erosion impacts during the construction period to a level of insignificance.
Soil Suitability	1	A field exploration geotechnical survey conducted in 2004 generally encountered thin horizons of alluvial and residual soils overlying basalt rock formations at relatively shallow depths within the project site. The alluvial and residual soils generally consisted of very stiff brown clayey silts and silty clays; and the basalt rock formation generally consisted of slightly weathered hard to very hard moderately dense basalt with highly weathered seams and saprolitic soils along joints in the formation. Based on the result of the exploration, the project site is generally underlain by competent soil and rock materials and the development is feasible from a geotechnical engineering standpoint (Geolabs, Inc., 2004).
Hazards and Nuisances including Site Safety	1	Project construction will increase the possibility of safety issues, hazards and nuisances. The developer(s) / contractor(s) are responsible for addressing these issues through the incorporation of County of Kaua'i BMPs and adherence to state and federal worker safety regulations, including securing the work site from the public during working and non-working hours.
Energy Consumption	1	KIUC is expected to supply the necessary power to the proposed development. The Proposed Action may require

		the construction of new electrical equipment. The increase in electrical service to the project site would not represent a significant increase in energy use. Once the electrical improvements are conducted, the energy supply will be able to meet the demand of the project site with respect to the surrounding area. KIUC will be consulted during the environmental review period to assure the adequacy of available electricity for the proposed demand from Koa'e Workforce Housing Development. No significant impact to energy consumption is expected to result from the project.
Noise Contribution to Community Noise Levels	1	Under the Proposed Action, less than significant short-term noise impacts from construction activities would occur. Development of the project site would involve excavation, grading, and other typical construction activities. The Proposed Action is not expected to significantly impact any existing sensitive noise receptors within the vicinity of the project site (<i>i.e.</i> , Kiahuna Golf Club, an existing residential subdivision, Poi'pū Road, and adjacent vacant parcels) due to the dense vegetation surrounding the site and the construction BMPs to be implemented during construction activities. Less than significant long-term impacts to noise receptors would occur. Stationary mechanical equipment in compliance with DOH Community Noise Control rules will be incorporated in the proposed development. Further, the proposed subdivision would be designed in accordance with applicable federal and state noise standards including the Federal Highway Administration and HUD. As a result, long-term impacts to noise generation would be considered less than significant.
Air Quality Effects of Ambient Air Quality on Project and Contribution to Community Pollution Levels	1	Dust may be generated during construction activities. Also, increased vehicular traffic to and from the project site is anticipated. Traffic is expected to increase in the long-term with the development of housing and increased population. Small long-term increases in exhaust emissions are anticipated within the vicinity of the project site; however, this does not constitute a significant effect island-wide. Long-term impacts to air quality from increased traffic circulation within the project site are anticipated to be minimal. Overall, potential impacts to air quality resulting from short-term and long-term changes are minimal and not significant.
Environmental Design Visual Quality - Coherence, Diversity, Compatible Use and Scale	1	The Proposed Action would include a residential community that would blend into the adjacent established Kōloa Town, which currently includes residential use directly north of the project site.

Socioeconomic	Code	Source or Documentation
Demographic Character Changes	1	Demographic changes are expected to be insignificant. Increases in population have been steady on Kaua'i and there is a need for additional housing. The proposed housing project would include housing units of varying sizes. This diversity in housing options would likely attract a diverse range of age groups and demographics.
Displacement	1	The project site is currently unused with the exception of

		regular maintenance conducted on KIUC power lines bisecting the parcel. The KIUC easement will be utilized as part of the Proposed Action and there will be no displacement of current land uses.
Employment and Income Patterns	2	The Proposed Action would lead to short-term construction employment during the course of the construction period. Construction activities may take place over a period of several years. There would be no adverse impacts to existing employment and / or income patterns under the Proposed Action.

Community Facilities and Services

	Code	Source or Documentation
Educational Facilities	1	The Proposed Action would likely result in an increase in enrollment at schools within the vicinity of the project site, such as Kōloa Elementary. Since the proposed project is relatively small and expected to cater to the existing population within the surrounding area, it is not anticipated that the increase in school enrollment would significantly affect educational facilities.
Commercial Facilities	2	Businesses in the vicinity of the project site may experience gradual increased economic activity from the additional population. There would be no anticipated adverse impacts to commercial facilities.
Health Care	1	Health care facilities within the vicinity of the project area include Kaua'i Medical Clinic and Kaua'i Veterans Memorial Hospital-Waimea. It is not anticipated that the proposed project would adversely impact these facilities.
Social Services	1	The project site is served by several social service providers in Kaua'i that can meet the demand created by the Proposed Action.
Solid Waste	1	Solid waste disposal services are available in the area through the County of Kaua'i, Division of Solid Waste. The County has a variety of solid waste services that include a landfill, greenwaste diversion, refuse collections, refuse transfer stations, and recycling and waste management programs. The Proposed Action is not anticipated to adversely impact solid waste collection services within the surrounding area.
Waste Water	1	Wastewater generated by the Proposed Action would be serviced by the privately owned Poi'pū Wastewater Reclamation Facility (WRF). The Proposed Action would require the design and installation of sewer lines at the project site. The proposed development would generate an average wastewater flow well within the treatment capacity of the WRF. Therefore, the Proposed Action would have a less than significant impact on the existing wastewater system (Wilson Okamoto Corporation, 2008).
Storm Water	1	The Proposed Action would include the construction of additional impervious surfaces (paved roads and sidewalks) that would collect and convey stormwater runoff. Therefore, an on-site drainage system would be designed and constructed to collect and convey storm water. The storm water drainage system would be designed in

		accordance with the County of Kaua'i Department of Public Works standards. There would be no significant impacts from storm water runoff.
Water Supply	1	The Proposed Action would require the design and installation of potable water lines at the project site. The existing pumping capacity is well in excess of the maximum existing demand, together with the projected demand of the Proposed Action. Coordination with the DOW will continue during the planning process to ensure that the proposed water system is implemented in accordance with County standards.
Public Safety - Police	1	The Proposed Action would be included in the patrol area for the Kaua'i Police Department Waimea District, which provides police services from Halfway Bridge on Kaunualii Highway to the far westside of the island (Polihale), including Koke'e State Park (Kaua'i Police Department, 2015). Since the Proposed Action would be located within close proximity of existing towns that are currently patrolled (Kōloa Town), it would not represent a significant impact to existing law enforcement services.
- Fire	1	The Proposed Action would be in the response vicinity of the Kōloa Fire Station, located less than one mile from the project site. Since the Proposed Action is in close proximity to an existing fire station and would conform to county fire protection standards, including the installation of fire hydrants and smoke alarms, it would not represent a significant impact to existing fire protection services.
- Emergency Medical	1	Emergency medical services are available at Kaua'i Veterans Memorial Hospital in Waimea and Wilcox Memorial Hospital in Līhu'e. It is not anticipated that the Proposed Action would adversely impact these facilities.
Open Space and Recreation - Open Space	1	The Proposed Action would be designed in accordance with the County of Kauai General Plan and all county zoning and subdivision ordinances with respect to use and requirement of open spaces.
- Recreation	1	There are several County Department of Parks and Recreation facilities located within the Kōloa-Kalāheo District. Kōloa Park is an 11.28-acre district park, located approximately 1.4 miles south of the project site. Kōloa Park includes a pavilion, comfort stations, little league baseball fields, a lighted softball field, tennis and basketball courts, and playground equipment. Poi'pū Beach Park is located approximately 1.8 miles southeast of the project site, and includes pavilions, comfort stations, picnic areas, and a lifeguarded beach. Due to their distance from the project site, none of these recreational areas would be adversely affected by the Proposed Action.
- Cultural Facilities	1	There would be no cultural facilities adversely affected by the proposed project since the project site includes unused lands, aside from a KIUC utility easement. There are no cultural practices / facilities at the project site.
Transportation	1	Implementation of the Proposed Action would result in less than significant, short-term impacts to traffic and circulation during the construction period. Therefore, construction activities would need to comply with State of Hawai'i

		Department of Transportation (HDOT) construction traffic control measures. Upon completion, the Proposed Action may generate small long-term traffic and circulation impacts on traffic in the area. In order to address potential project-induced impacts, improvements to the intersections surrounding the project site may need to be implemented. With these control measures implemented, there would be no significant impact to the surrounding roadway network.
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Natural Features	Code	Source or Documentation
Water Resources	1	The Proposed Action is not considered to have any adverse effects on groundwater resources because groundwater is not expected to be encountered and the anticipated potable water demand is not expected to exceed the current county pumping capacity. Surface water will not be affected due to construction of a storm water drainage system in accordance with the County of Kaua'i Department of Public Works standards; utilization of BMPs during construction activities; and construction activities being limited to areas outside of Waikomo Stream and the surrounding flood plain. As a result, the Proposed Action would not result in adverse effects to water resources within the vicinity of the project site.
Surface Water	1	A NPDES permit will be applied for during the construction period. Provisions of the NPDES permit and county construction BMPs would provide controls to reduce / eliminate silt runoff during construction. Long-term surface water would be managed by a storm water drainage system.
Unique Natural Features and Agricultural Lands	1	The project site is designated as Urban by the State LUC. However, the project site is not currently unused aside from a KIUC utility easement. Further, the project site is not included within the Important Agricultural Lands (IALs) as defined by the State of Hawai'i Land Evaluation and Site Assessment Commission. The portion of Waikomo Stream that runs through the project site would not be impacted. Since no development would occur within the stream or the surrounding flood plain. As a result, no unique natural features or agricultural lands will be impacted as part of the Proposed Action.
Vegetation and Wildlife	1	No state or federally listed threatened, endangered, or candidate plant species, or rare native Hawaiian plant species were observed within the project site, and no designated critical plant habitat occurs within the area. The endangered Hawaiian petrel (<i>Pterodroma sandwichensis</i>) and threatened Newell's shearwater (<i>Puffinus auricularis newelli</i>) as well as the proposed endangered band-rumped storm petrel (<i>Oceanodroma castro</i>), may fly over the project site at night while traveling to and from their upland nesting sites to the ocean. The endangered Hawaiian hoary bat (<i>Lasiurus cinereus semotus</i>); the endangered Hawaiian goose or Nēnē (<i>Branta sandvicensis</i>); the endangered water bird species, Hawaiian Duck or Kōloa (<i>Anas wyvilliana</i>), Hawaiian Coot (<i>Fulica alai</i>), or Common

		Moorhen (<i>Gallinula chloropus sandvicensis</i>); the protected arthropod species, Kaua'i cave wolf spider or blind cave spider (<i>Adelocoa anops</i>) and the Kaua'i cave amphipod (<i>Spelaeorchestia koloana</i>) may be present at the project site. To prevent potential impacts to these special status species, control measures stated earlier will be implemented. Consultation with USFWS and DLNR is in progress and will continue during the project planning process [Exhibit 6].
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Other Factors	Code	Source or Documentation
Flood Disaster Protection Act [Flood Insurance] [§58.6(a)]	1	The majority of the project site is designated as FEMA Zone X, outside of the 100 year floodplain hazard area. The portion of the project site corresponding to the Waikomo Stream is located within Flood Zone AE, designated as "areas subject to inundation by the 1% annual chance flood event." The area of the project site surrounding Waikomo Stream is located within the Flood Zone with a 0.2% annual chance flood event. However, construction activities would not be conducted in areas subject to a 1% or greater chance of being flooded in a given year. As a result, flood insurance would be available for the proposed subdivision.
Coastal Barrier Resources Act/ Coastal Barrier Improvement Act [§58.6(c)]	1	The project area is not located within the Coastal Barriers Resource System (CBRS). Currently, there are no CBRS map units established within the State of Hawai'i (http://www.fws.gov/CBRA/Maps/Mapper.html).
Airport Runway Clear Zone or Clear Zone Disclosure [§58.6(d)]	1	The project site is located approximately 10.9 miles east of the nearest airstrip and approximately 12.2 miles from the nearest airport. These distances are outside of the potential airport clear zone or accident potential zone of 2,500 ft.
Other Factors	1	Not applicable.

Summary of Findings and Conclusions

ALTERNATIVES TO THE PROPOSED ACTION

Alternatives and Project Modifications Considered [24 CFR 58.40(e), Ref. 40 CFR 1508.9]

Reasonable courses of action that were considered and not selected, such as other sites, design modifications, or other uses of the subject site. Describe the benefits and adverse impacts to the human environment of each alternative and the reasons for rejecting it.)

The County of Kaua'i has considered the possibility of developing other sites within the County. However, the selection of alternate sites is not a viable alternative to the Proposed Action, due to the high cost of land within the county and scarce availability of lands for development. After a detailed review of options, the project site was considered the most viable site to provide diverse quality housing options to the most people at an affordable price.

No Action Alternative [24 CFR 58.40(e)]

(Discuss the benefits and adverse impacts to the human environment of not implementing the preferred alternative).

Under the No Action Alternative, the affordable housing development project would not be constructed. There would be no disturbance of the existing environment; however, additional needed affordable housing would not be provided to residents of the Island of Kaua'i. There is a substantial need for additional affordable housing in the area and the Kaua'i County Housing Agency's mission is to facilitate affordable housing opportunities to the residents of Kaua'i.

Mitigation Measures Recommended [24 CFR 58.40(d), 40 CFR 1508.20]

(Recommend feasible ways in which the proposal or its external factors should be modified in order to minimize adverse environmental impacts and restore or enhance environmental quality.)

Mitigation measures may include roadway intersection improvements to address potential traffic impacts. These measures are described in this document, as well as the accompanying Environmental Assessment (EA).

Additional Studies Performed

(Attach studies or summaries)

- Traffic Impact Analysis to document existing transportation roadway and intersection conditions, as well as anticipated impacts from the proposed project.
- Archaeological/Cultural Impact Analysis to document any existing archaeological/cultural resources within the project area.
- Biological Surveys to document existing avian and terrestrial mammalian species within the project area.

List of Sources, Agencies and Persons Consulted [40 CFR 1508.9(b)]

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- Cultural Surveys Hawai'i, Inc., 2004b. Cultural Impact Assessment for a 9.4-Acre Parcel Along Waikomo Stream, Kōloa Ahupua'a, Kona District, Island of Kaua'i. TMK 2-6-04: por. 19. Prepared for Kukui'Ula Development Company (Hawai'i), LLC. October.
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**Exhibit 1: State Historic Preservation Division
Letter**



June 19, 2015

Mr. Alan Downer
Administrator, State Historic Preservation Division
Department of Land and Natural Resources
601 Kamokila Boulevard, Suite 555
Kapolei, Hawai'i 96707

Subject: Pre-Consultation for the Koae Affordable Housing Development
TMK No. (4) 2-6-004:019
Kōloa, Kaua'i, Hawai'i

Dear Mr. Downer:

Community Planning and Engineering, Inc. (CP&E) on behalf of the County of Kaua'i, is in the process of preparing a Chapter 343 Hawai'i Revised Statutes (HRS) Environmental Assessment (EA) and associated Title 11, Chapter 200 Hawai'i Administrative Rules (HAR) for the proposed workforce housing development located at Tax Map Key (TMK) (4) 2-6-004:019 (the Site). The EA is also compliant with the National Environmental Protection Act (NEPA) and 24 Code of Federal Regulations (CFR) Part 58. The proposed project site is located in the town of Kōloa on the Island of Kaua'i (please see the enclosed Area of Potential Effect [APE] Map). The EA is being prepared in order to evaluate the potential environmental, social, and economic consequences associated with the proposed project.

As part of the environmental review process, and in accordance with Section 106 of the National Historic Preservation Act (NHPA), we are seeking early consultation to determine if any documented historic or culturally significant resources exist at, or within close proximity to the subject parcel. Section 106 consultation under the NHPA is triggered due to potential project funding from the United States Department of Housing and Urban Development (HUD). The County of Kaua'i would represent HUD as the responsible federal agency requesting consultation under Section 106 of the NHPA.

Approximately 130-150 residential single family detached units and multi-family attached units are planned to be built on the subject parcel. We are enclosing the following reference documents to assist with your review: an APE Map and an archaeological inventory survey and cultural impact assessment that were previously conducted for the Site in September 2004 and October 2004, respectively.



Please respond with comments within 30 days. If you have any questions or need clarification, please contact me at (808) 531-4252, ext. 1040 or by email at fcamacho@cpe-hawaii.com. All response letters can be sent to the following address:

CP&E
C/O Frank Camacho, Project Manager
1286 Queen Emma Street
Honolulu, HI 96813

We appreciate your timely review and response to this request.

Sincerely,

A handwritten signature in black ink, appearing to read 'F. Camacho', is written in a cursive style.

Frank Camacho
Project Manager

CC: Kanani Fu
Kaua'i County Housing Agency

Exhibit 2: FEMA Map

NOTES TO USERS

use in administering the National Flood Insurance Program. It only identifies areas subject to flooding, particularly from local or small size. The community map repository should be able updated or additional flood hazard information.

Detailed information in areas where Base Flood Elevations have been determined. Users are encouraged to consult Floodway Data and/or Summary of Stillwater Elevations within the Flood Insurance Study (FIS) report that accompanies this map. These BFEs are intended for flood insurance only and should not be used as the sole source of flood information. Accordingly, flood elevation data presented in the FIS is utilized in conjunction with the FIRM for purposes of floodplain management.

Flood Elevations shown on this map apply only to landward of the Pacific Ocean. Users of the FIRM should be aware that coastal flood is provided in the Summary of Stillwater Elevations tables in the FIS report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations tables should be used for construction and floodplain zones when they are higher than the elevations shown on this map.

Flowways were computed at cross sections and interpolated sections. The flowways were based on hydraulic considerations requirements of the National Flood Insurance Program. Floodway permit flowway data are provided in the Flood Insurance Study report.

In Special Flood Hazard Areas may be protected by flood levees. Refer to Section 2.4 "Flood Protection Measures" of the Study report for information on flood control structures for this jurisdiction.

In the preparation of this map was Universal Transverse Zone 4. The horizontal datum was NAD 83. ORS100 spherical datum, spherical projection or UTM zones used in the production of this map may result in slight positional differences in map jurisdiction boundaries. These differences do not affect the FIRM.

In this map are referenced to the Local Tidal Datum. These flood elevations are compared to structure and ground elevations referenced to a datum. For information regarding conversion between the Local Tidal Datum of 1929 and the North American Vertical Datum, visit the National Geospatial Survey website at 388.992 or contact the National Geospatial Survey at the FEMA.

Services
Survey
highway 200 10-3282

1 elevation, description, and/or location information for bench marks in this map, please contact the Information Services Branch Geospatial Survey at (301) 713-3242, or visit its website at 88.926.

ation shown on this FIRM was derived from mosaicked 2-foot satellite imagery that meets 1:12,000 scale horizontal accuracy and by Digital Globe and the United States Department of Resources Conservation Service. This information was July 2002 and January 2004.

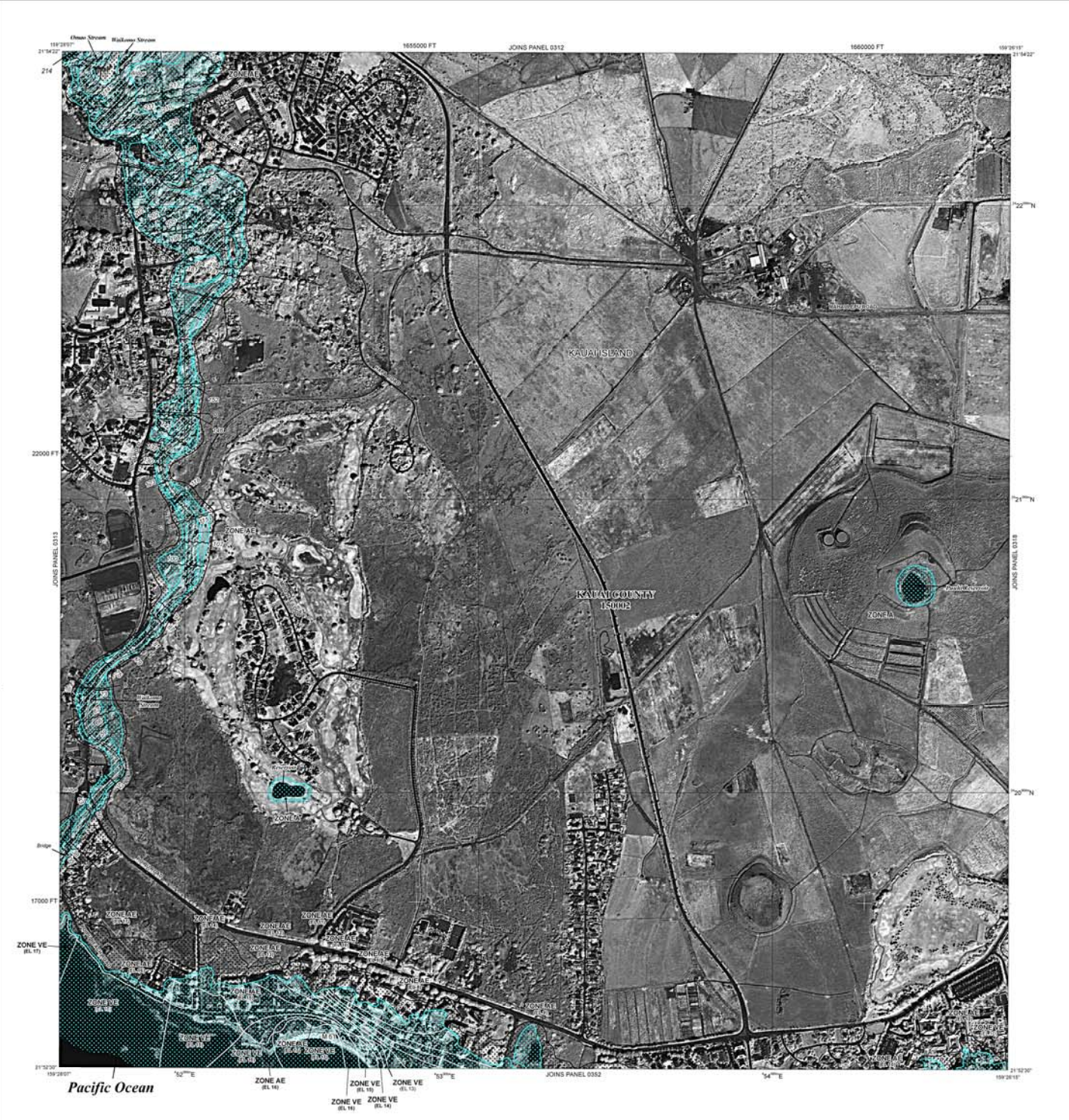
more detailed and up-to-date stream channel configurations on the previous FIRM for this jurisdiction. The flowlines and are transferred from the previous FIRM may have been adjusted per new stream channel configurations. As a result, the Flood way Data tables in the Flood Insurance Study Report (which use hydraulic data) may reflect stream channel distances that shown on this map.

shown on this map are based on the best data available at the time this map was published. Map users should contact appropriate agency to verify current corporate limit locations.

se separately printed Map Index for an overview map showing panels for this jurisdiction.

1 Map information exchange at 1-877-335-2627 for information and associated with this FIRM. Available products may include Letters of Map Change, a Flood Insurance Study report, and/or this map. The FEMA Map Information exchange may also be 1-800-368-8202 and its website at <http://www.fema.gov>.

ions about this map or questions concerning the National Flood Insurance Program, please call 1-877-FEMA-MAP (1-877-336-2627) or visit at www.fema.gov/business.



LEGEND

SPECIAL FLOOD HAZARD AREAS SUBJECT TO BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual flood (100-year flood), also known as the base flood, is the flood of a return period of 100 years or greater. The Special Flood Hazard Areas are subject to flooding by the 1% annual chance flood. Areas of Special Flood Zones A, AE, AH, AO, AV, VE, and VFE. The base flood elevation is elevation of the 1% annual chance flood.

- ZONE A** No Base Flood Elevations determined.
- ZONE AE** Base Flood Elevations determined.
- ZONE AH** Flood depths of 1 to 3 feet (lowly areas of joint elevations determined).
- ZONE AO** Flood depths of 1 to 3 feet (lowly areas of joint elevations determined). For areas of annual flow determined.
- ZONE AV** Special Flood Hazard Area formerly protected from the flood by a flood control system that was subsequently evaluated that the former flood control system is being protected from the 1% annual chance or greater flood.
- ZONE AVS** Area to be protected from 1% annual chance flood (system under construction); to be determined.
- ZONE VE** Coastal flood zone with velocity hazard (wave action elevations determined).
- ZONE VFE** Coastal flood zone with velocity hazard (wave action elevations determined).

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas the of encroachment so that the 1% annual chance flood can be carried without a in flood heights.

OTHER FLOOD AREAS

- ZONE X** Areas of 0.2% annual chance flood; areas of 2% annual average depth of less than 1 foot or with velocities less than 1 square mile, and areas protected by levees from 1% a

OTHER AREAS

- ZONE X** Areas determined to be outside the 0.2% annual chance
- ZONE D** Areas in which flood hazards are undetermined, but poss

COASTAL BARRIER RESOURCES SYSTEM (CBRS)

CBRS areas and CBRS are normally located within or adjacent to Special Flood

- 1% annual chance floodplain boundary
- 0.2% annual chance floodplain boundary
- Floodway boundary
- Zone D boundary
- CBRS and CBRS boundary
- Boundary dividing Special Flood Hazard
- Boundary dividing Special Flood Hazard Area
- Flood Elevations, flood depths or flood widths
- Base Flood Elevation line and value, elevation
- Base Flood Elevation value where uniform wit
- (EL. 987)

* Referenced to the LOCAL TIDAL DATUM

- Cross section line
- Traversed line
- 87°07'45" 32°22'30"
- Geographic coordinates referenced in the
- of 1983 (NAD 83), Western Hemisphere
- "76" 1000-meter Universal Transverse Mercator gn
- 600000 FT
- 1000-foot grid values: Hawaii State Plane con
- zone 4 (SPSZONE 1104), Transverse Mercator
- DK5610
- Bench mark (see explanation in Notes to Use
- (FIRM notes)
- Flow line

MAP REPOSITORY:
Department of Public Works, Engineering Division, 301 One State Ln.,
Hawaii (available for reference only, not for distribution.)

INITIAL MAP DATE:
December 20, 1974

FLOOD HAZARD BOUNDARY MAP REVISIONS:
December 20, 1974

FLOOD INSURANCE RATE MAP EFFECTIVE:
November 4, 1981

FLOOD INSURANCE RATE MAP REVISIONS:
March 4, 1987; September 20, 1988; October 18, 2002; September 16, 2009.
For description of revision, see Index to Flood Insurance Study User page in the
Insurance Study report.

To determine if flood insurance is available in this community, contact
agent or call the National Flood Insurance Program at 1-800-638-6020.

MAP SCALE 1" = 500'

0 250 500 1000 FE
0 100 200 300 METERS

NATIONAL FLOOD INSURANCE PROGRAM PANEL 0314

FIRM FLOOD INSURANCE

KAUAI COUNTY, HAWAII

PANEL 314 OF 500
(SEE MAP INDEX FOR FIRM P
CONTAINS)
COMMUNITY NUMBER
KAUAI COUNTY 15002

Notice to User: The Map Number or
used when placing map orders. The
shown above should be used on maps
supplied community.

NOVEMBER
Federal Emergency Manag

Exhibit 3: Wetlands Map

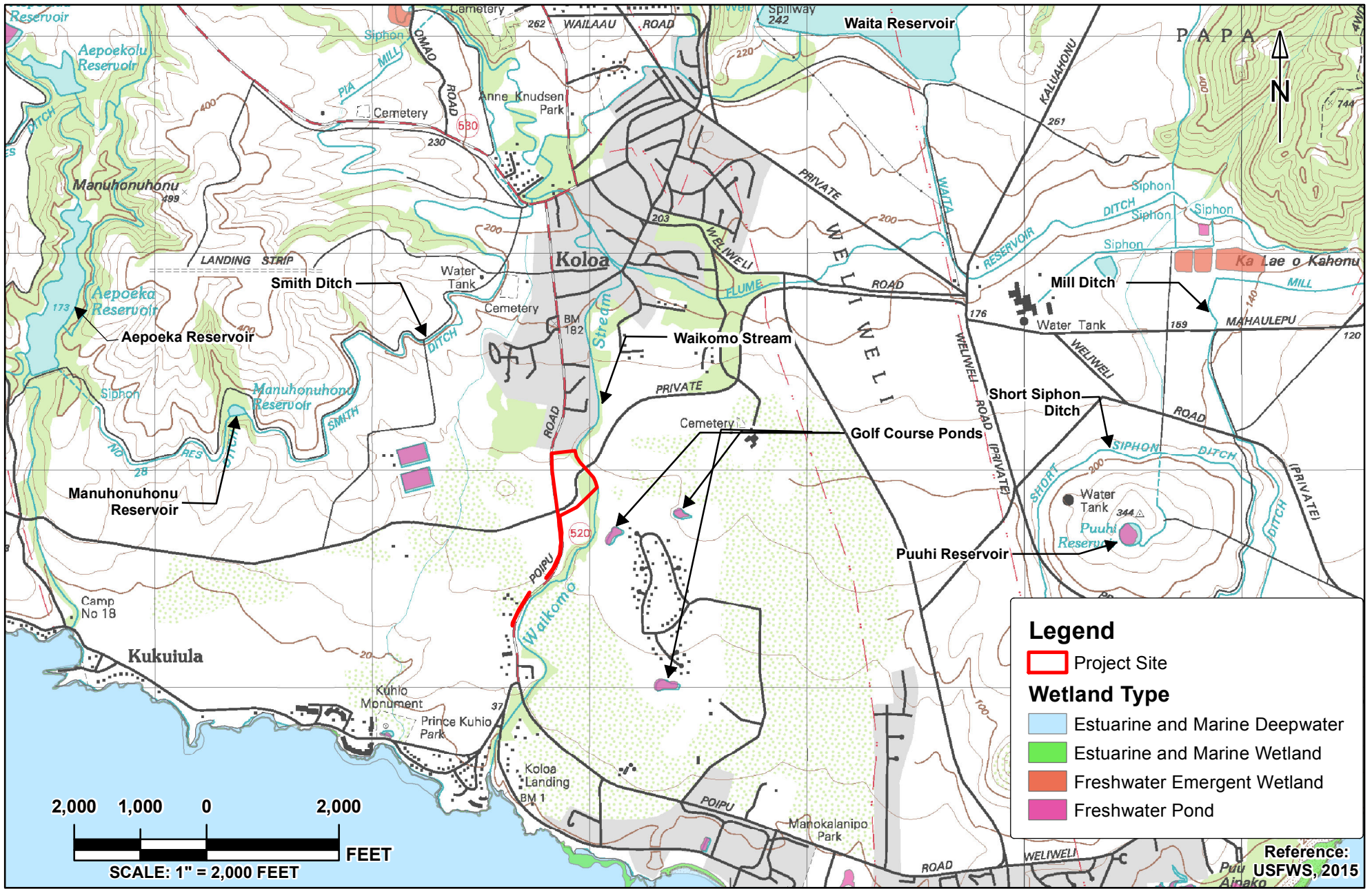


Exhibit 4: Coastal Zone Management Consistency Letter



June 19, 2015

Mr. Michael Dahilig, Director
County of Kaua'i Planning Department
4444 Rice Street, Suite A473
Līhu'e, Hawai'i 96766

Subject: Pre-consultation for the Koae Workforce Housing Development
TMK No. (4) 2-6-004:019
Kōloa, Kaua'i, Hawai'i

Dear Mr. Dahilig:

Community Planning and Engineering, Inc. (CP&E) on behalf of the County of Kaua'i, is in the process of preparing a Chapter 343 Hawai'i Revised Statutes (HRS) Environmental Assessment (EA) and associated Title 11, Chapter 200 Hawai'i Administrative Rules (HAR) for the proposed workforce housing development located at Tax Map Key (TMK) (4) 2-6-004:019 (the Site). The EA is also compliant with the National Environmental Protection Act (NEPA) and 24 Code of Federal Regulations (CFR) Part 58. The proposed project site is located in the town of Kōloa on the Island of Kaua'i (please see the enclosed Location Map). The EA is being prepared in order to evaluate the potential environmental, social, and economic consequences associated with the proposed project.

The purpose of the proposed project is to help the County of Kaua'i and the State of Hawai'i meet its goal to provide much needed affordable housing to its elderly residents and workforce housing for families. The proposed project site comprises approximately 11 acres and would include approximately 130-150 housing units. Planned housing types include single family detached units, as well as multi-family attached units. The County of Kaua'i acquired the Site in order for the County to develop much needed workforce housing for Kaua'i residents. We are seeking your input to identify potential environmental and/or social and economic impacts associated with the proposed project.



Additionally, a finding of compliance with the requirements of the Farmland Protection Policy Act of 1981 (7 United States [U.S.] Code [U.S.C] 4201 et seq.) must be made for U.S. Department of Housing and Urban Development (HUD)-assisted new construction activities. The County of Kaua‘i is required to provide HUD with a finding from the local planning agency if the proposed site includes prime or unique farmland, or other farmland of statewide or local importance, as identified by the U.S. Department of Agriculture, Natural Resources Conservation Service (NRCS). According to the County of Kaua‘i, the subject parcel is zoned Residential (R-20). The State of Hawai‘i Land Use Commission zoning for the subject parcel is Urban. Your concurrence that the subject parcel does not include important farmlands is requested.

HUD also requires that HUD funded projects undergo a Coastal Zone Management (CZM) review as authorized by the Coastal Zone Management Act of 1972. In Hawai‘i the Special Management Area (SMA) permitting system is part of the CZM Program approved by Federal and State agencies. Therefore, concurrence from your office that the proposed project is not located within the SMA is requested.

In conjunction with this work, we are requesting any written comments and/or information with respect to your area(s) of concern. Please send your written comments to the following address within 30 days.

CP&E
C/O Frank Camacho, Project Manager
1286 Queen Emma Street
Honolulu, HI 96813

Phone: (808) 531-4252, ext. 1040
E-mail: fcamacho@cpe-hawaii.com



We appreciate your timely review and response to this request.

Sincerely,

A handwritten signature in black ink, appearing to read 'F. Camacho', is written in a cursive style.

Frank Camacho
Project Manager

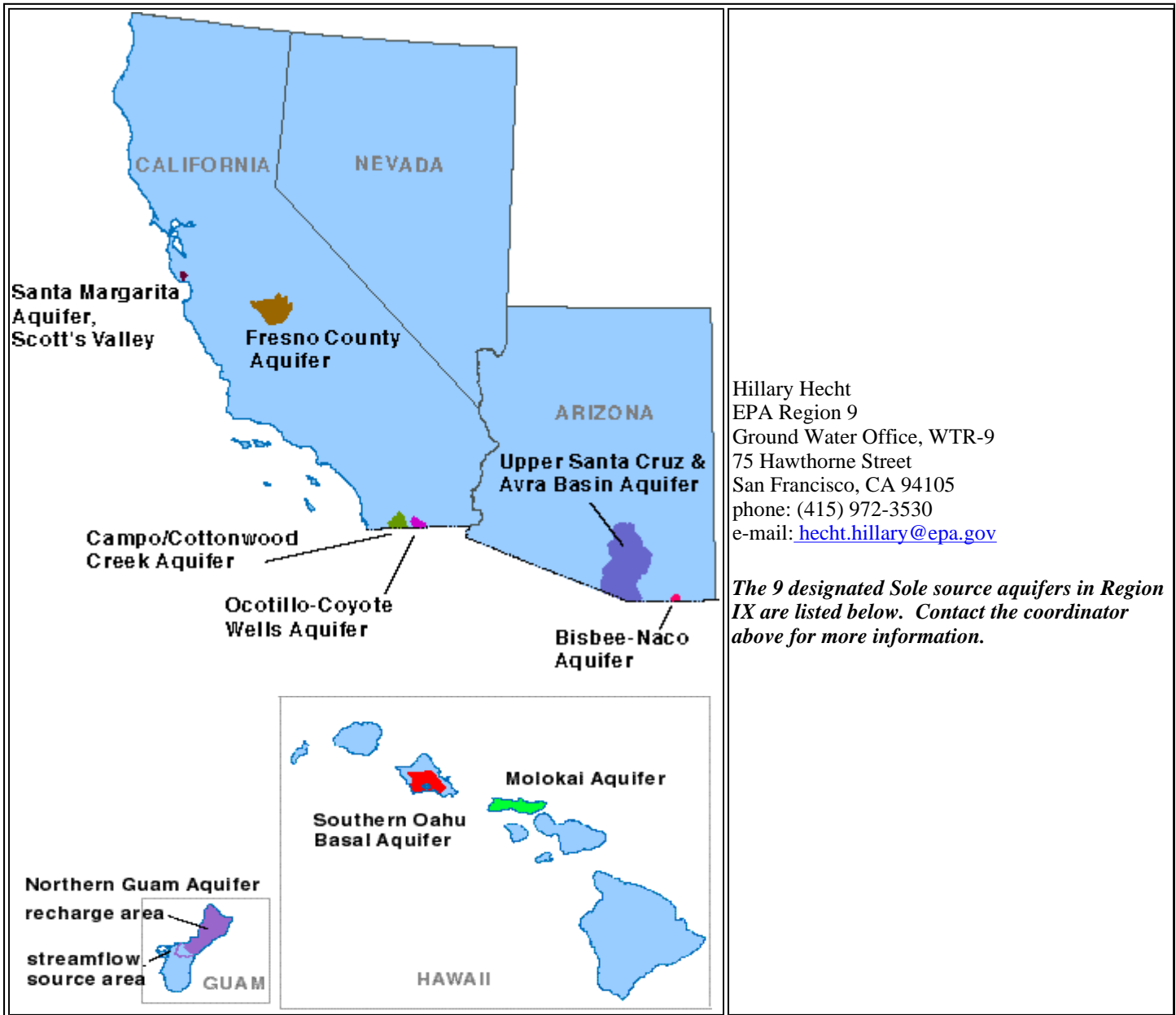
CC: Kanani Fu
Kaua'i County Housing Agency

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Exhibit 5: Sole Source Aquifer Designation

Designated Sole Source Aquifers in EPA Region IX

Arizona, California, Hawaii, Nevada, Guam, and American Samoa



DESIGNATED SOLE SOURCE AQUIFERS IN REGION IX:

State	Sole Source Aquifer Name	Federal Reg. Cit.	Publ. Date	GIS map
AZ	Upper Santa Cruz & Avra Basin Aquifer	49 FR 2948	01/24/84	yes (PDF)
AZ	Bisbee-Naco Aquifer	53 FR 38337	09/30/88	yes (PDF)
CA	Fresno County Aquifer	44 FR 52751	09/10/79	yes (PDF)
CA	Santa Margarita Aquifer, Scotts Valley	50 FR 2023	01/14/85	yes (PDF)
CA	Campo/Cottonwood Creek	58 FR 31024	05/28/93	yes (PDF)
CA	Ocotillo-Coyote Wells Aquifer	61 FR 47752	09/10/96	yes (PDF)
GU	Northern Guam Aquifer System	43 FR 17867	04/26/78	yes (PDF)
HI	Southern Oahu Basal Aquifer	52 FR 45496	11/30/87	yes (PDF)

Return to: [Sole Source Aquifer program home page](#)

Exhibit 6: United States Fish and Wildlife Service Consultation Letter



June 19, 2015

Ms. Kristi Young
U.S. Fish and Wildlife Service
Pacific Islands Fish and Wildlife Office
300 Ala Moana Boulevard, Suite 3-122
Honolulu, Hawai'i 96850

Subject: Pre-consultation for the Koae Affordable Housing Development
TMK No. (4) 2-6-004:019
Kōloa, Kaua'i, Hawai'i

Dear Ms. Young:

Community Planning and Engineering, Inc. (CP&E) on behalf of the County of Kaua'i, is in the process of preparing a Chapter 343 Hawai'i Revised Statutes (HRS) Environmental Assessment (EA) and associated Title 11, Chapter 200 Hawai'i Administrative Rules (HAR) for the proposed workforce housing development located at Tax Map Key (TMK) (4) 2-6-004:019 (the Site). The EA is also compliant with the National Environmental Protection Act (NEPA) and 24 Code of Federal Regulations (CFR) Part 58. The proposed project site is located in the town of Kōloa on the Island of Kaua'i (please see the enclosed Project Location Map). The EA is being prepared in order to evaluate the potential environmental, social, and economic consequences associated with the proposed project.

Approximately 130-150 residential single family detached units and multi-family attached units are planned to be built on the subject parcel. We are enclosing a Project Location Map for your reference and review, as well as a biological survey that was completed at the Site.

As part of the environmental review process, we are requesting early consultation to determine if any special status or endangered species habitats exist at, or within close proximity to the subject parcel at the Site. If deemed necessary, formal consultation under Section 7 of the Endangered Species Act (ESA) will be initiated at a later date in compliance with NEPA. The County of Kaua'i would represent the United States Department of Housing and Urban Development (HUD) as the responsible federal agency requesting a determination under Section 7 of the ESA if HUD funding is requested.



Please respond with comments within 30 days. If you have any questions or need clarification, please contact me at (808) 531-4252, ext. 1040 or by email at fcamacho@cpe-hawaii.com. All response letters can be sent to the following address:

CP&E
C/O Frank Camacho, Project Manager
1286 Queen Emma Street
Honolulu, HI 96813

We appreciate your timely review and response to this request.

Sincerely,

A handwritten signature in black ink, appearing to read 'F. Camacho', is written in a cursive style.

Frank Camacho
Project Manager

CC: Kanani Fu
Kaua'i County Housing Agency

Exhibit 7: Wild and Scenic Rivers Designation



- HOME
- NATIONAL SYSTEM
- MANAGEMENT
- RESOURCES
- PUBLICATIONS
- CONTACT US
- KID'S SITE

S

HAWAII

Hawaii has approximately 3,905 miles of river, but no designated wild & scenic rivers.

Hawaii does not have any designated rivers.

Choose a State ▼	Go
Choose a River ▼	Go

Dark and foreboding one minute, sun-drenched and exploding with color the next, tropical rivers span every mood.

- NATIONWIDE RIVERS INVENTORY
- KID'S SITE
- CONTACT US
- PRIVACY NOTICE
- Q & A SEARCH ENGINE
- SITE MAP

Designated Rivers

National System

River Management

Resources

[About WSR Act](#)
[State Listings](#)
[Profile Pages](#)

[WSR Table](#)
[Study Rivers](#)
[Stewardship](#)
[WSR Act Legislation](#)

[Council](#)
[Agencies](#)
[Management Plans](#)
[GIS Mapping](#)

[Q & A Search](#)
[Bibliography](#)
[Publications](#)
[GIS Mapping](#)
[Logo & Sign Standards](#)
[Display](#)

**APPENDIX B: ~~DRAFT~~ EA COMMENT LETTERS AND
RESPONSES**



June 19, 2015

Mr. Rupert Rowe
Hui Mālama O Kāneiolouma
P.O. Box 244
Kōloa, Hawaii 96756

Subject: Pre-Consultation for the Koae Affordable Housing Development
TMK No. (4) 2-6-004:019
Kōloa, Kauaʻi, Hawaiʻi

Dear Mr. Rowe:

Community Planning and Engineering, Inc. (CP&E) on behalf of the County of Kauaʻi, is in the process of preparing a Chapter 343 Hawaiʻi Revised Statutes (HRS) Environmental Assessment (EA) and associated Title 11, Chapter 200 Hawaiʻi Administrative Rules (HAR) for the proposed workforce housing development located at Tax Map Key (TMK) (4) 2-6-004:019 (the Site). The EA is also compliant with the National Environmental Protection Act (NEPA) and 24 Code of Federal Regulations (CFR) Part 58. The proposed project site is located in the town of Kōloa on the Island of Kauaʻi (please see the enclosed Area of Potential Effect [APE] Map). The EA is being prepared in order to evaluate the potential environmental, social, and economic consequences associated with the proposed project.

As part of the environmental review process, and in accordance with Section 106 of the National Historic Preservation Act (NHPA), we are seeking early consultation to determine if any documented historic or culturally significant resources exist at, or within close proximity to the subject parcel. Section 106 consultation under the NHPA is triggered due to potential project funding from the United States Department of Housing and Urban Development (HUD). The County of Kauaʻi would represent HUD as the responsible federal agency requesting consultation under Section 106 of the NHPA.

Approximately 130-150 residential single family detached units and multi-family attached units are planned to be built on the subject parcel. We are enclosing the following reference documents to assist with your review: an APE Map and an archaeological inventory survey and cultural impact assessment that were previously conducted for the Site in September 2004 and October 2004, respectively.



Please respond with comments within 30 days. If you have any questions or need clarification, please contact me at (808) 531-4252, ext. 1040 or by email at fcamacho@cpe-hawaii.com. All response letters can be sent to the following address:

CP&E
C/O Frank Camacho, Project Manager
1286 Queen Emma Street
Honolulu, HI 96813

We appreciate your timely review and response to this request.

Sincerely,

A handwritten signature in black ink, appearing to read 'F. Camacho', is written over a light gray rectangular background.

Frank Camacho
Project Manager

CC: Kanani Fu
Kaua'i County Housing Agency



June 19, 2015

Louis Abrams
Kōloa Community Association
P.O. Box 1313
Koloa, HI 96756

Subject: Pre-consultation for the Koae Workforce Housing Development
TMK No. (4) 2-6-004:019
Kōloa, Kauaʻi, Hawaiʻi

Aloha Mr. Abrams:

Community Planning and Engineering, Inc. (CP&E) on behalf of the County of Kauaʻi, is in the process of preparing a Chapter 343 Hawaiʻi Revised Statutes (HRS) Environmental Assessment (EA) and associated Title 11, Chapter 200 Hawaiʻi Administrative Rules (HAR) for the proposed workforce housing development located at Tax Map Key (TMK) (4) 2-6-004:019 (the Site). The EA is also compliant with the National Environmental Protection Act (NEPA) and 24 Code of Federal Regulations (CFR) Part 58. The proposed project site is located in the town of Kōloa on the Island of Kauaʻi (please see the enclosed Location Map). The EA is being prepared in order to evaluate the potential environmental, social, and economic consequences associated with the proposed project.

The purpose of the proposed project is to help the County of Kauaʻi and the State of Hawaiʻi meet its goal to provide much needed affordable housing to its elderly residents and workforce housing for families. The proposed project site comprises approximately 11 acres and would include approximately 130-150 housing units. Planned housing types include single family detached units, as well as multi-family attached units. The County of Kauaʻi acquired the Site in order for the County to develop much needed workforce housing for Kauaʻi residents. We are seeking your input to identify potential environmental and/or social and economic impacts associated with the proposed project.



Community Planning and Engineering, Inc.

In conjunction with this work, we are requesting any written comments and/or information with respect to your area(s) of concern. Please send your written comments to the following address within 30 days.

CP&E
C/O Frank Camacho, Project Manager
1286 Queen Emma Street
Honolulu, HI 96813

Phone: (808) 531-4252, ext. 1040
E-mail: fcamacho@cpe-hawaii.com

We appreciate your timely review and response to this request.

Sincerely,

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Frank Camacho
Project Manager

CC: Kanani Fu
Kaua'i County Housing Agency



June 19, 2015

Ms. Kealoha Takahashi
Executive on Aging, County of Kaua'i Agency on Elderly Affairs
4444 Rice Street, Suite 330
Līhu'e, Hawai'i 96766

Subject: Pre-consultation for the Koae Workforce Housing Development
TMK No. (4) 2-6-004:019
Kōloa, Kaua'i, Hawai'i

Dear Ms. Takahashi:

Community Planning and Engineering, Inc. (CP&E), on behalf of the County of Kaua'i, is in the process of preparing a Chapter 343 Hawai'i Revised Statutes (HRS) Environmental Assessment (EA) and associated Title 11, Chapter 200 Hawai'i Administrative Rules (HAR) for the proposed workforce housing development located at Tax Map Key (TMK) (4) 2-6-004:019 (the Site). The EA is also compliant with the National Environmental Protection Act (NEPA) and 24 Code of Federal Regulations (CFR) Part 58. The proposed project site is located in the town of Kōloa on the Island of Kaua'i (please see the enclosed Location Map). The EA is being prepared in order to evaluate the potential environmental, social and economic consequences associated with the proposed project.

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C/O Frank Camacho, Project Manager
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Honolulu, HI 96813

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E-mail: fcamacho@cpe-hawaii.com

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Frank Camacho
Project Manager

CC: Kanani Fu
Kaua'i County Housing Agency



June 19, 2015

Mr. Elton Ushio
Emergency Management Administrative Officer
Kaua'i Civil Defense Agency
3990 Ka'ana Street, Suite 100
Līhu'e, Hawai'i 96766

Subject: Pre-consultation for the Koa'e Workforce Housing Development
TMK No. (4) 2-6-004:019
Kōloa, Kaua'i, Hawai'i

Dear Mr. Ushio:

Community Planning and Engineering, Inc. (CP&E) on behalf of the County of Kaua'i, is in the process of preparing a Chapter 343 Hawai'i Revised Statutes (HRS) Environmental Assessment (EA) and associated Title 11, Chapter 200 Hawai'i Administrative Rules (HAR) for the proposed workforce housing development located at Tax Map Key (TMK) (4) 2-6-004:019 (the Site). The EA is also compliant with the National Environmental Protection Act (NEPA) and 24 Code of Federal Regulations (CFR) Part 58. The proposed project site is located in the town of Kōloa on the Island of Kaua'i (please see the enclosed Location Map). The EA is being prepared in order to evaluate the potential environmental, social, and economic consequences associated with the proposed project.

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C/O Frank Camacho, Project Manager
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Honolulu, HI 96813

Phone: (808) 531-4252, ext. 1040
E-mail: fcamacho@cpe-hawaii.com

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Frank Camacho
Project Manager

CC: Kanani Fu
Kaua'i County Housing Agency

June 19, 2015

Mel Rapozo
Kaua'i County Council, Council Chair
4396 Rice Street, Suite 209
Līhu'e, Hawai'i 96766

Subject: Pre-consultation for the Koae Workforce Housing Development
TMK No. (4) 2-6-004:019
Kōloa, Kaua'i, Hawai'i

Dear Mr. Rapozo,

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Frank Camacho
Project Manager

CC: Kanani Fu
Kaua'i County Housing Agency



June 19, 2015

Mr. Kirk Saiki
Manager and Chief Engineer
County of Kaua'i Department of Water
4398 Pua Loke Street
Līhu'e, Hawai'i 96766

Subject: Pre-consultation for the Koae Workforce Housing Development
TMK No. (4) 2-6-004:019
Kōloa, Kaua'i, Hawai'i

Dear Mr. Saiki:

Community Planning and Engineering, Inc. (CP&E) on behalf of the County of Kaua'i, is in the process of preparing a Chapter 343 Hawai'i Revised Statutes (HRS) Environmental Assessment (EA) and associated Title 11, Chapter 200 Hawai'i Administrative Rules (HAR) for the proposed workforce housing development located at Tax Map Key (TMK) (4) 2-6-004:019 (the Site). The EA is also compliant with the National Environmental Protection Act (NEPA) and 24 Code of Federal Regulations (CFR) Part 58. The proposed project site is located in the town of Kōloa on the Island of Kaua'i (please see the enclosed Location Map). The EA is being prepared in order to evaluate the potential environmental, social, and economic consequences associated with the proposed project.

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1286 Queen Emma Street
Honolulu, HI 96813

Phone: (808) 531-4252, ext. 1040
E-mail: fcamacho@cpe-hawaii.com

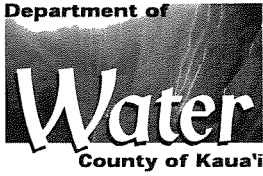
We appreciate your timely review and response to this request.

Sincerely,

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Frank Camacho
Project Manager

CC: Kanani Fu
Kaua'i County Housing Agency

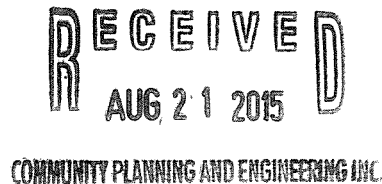


Water has no substitute.....Conserve it

August 18, 2015

UID #6351

Mr. Frank Camacho
Community Planning and Engineering, Inc.
1286 Queen Emma Street
Honolulu, HI 96813



Dear Mr. Camacho:

Subject: Pre-Consultation for the Koae Workforce Housing Developments, TMK: 2-6-04:019,
Poipu Road, Koloa, Kauai

This is in regard to your request letter received on June 22, 2015.

Prior to the Department of Water (DOW) recommending water meter service, building permit, and subdivision approval for the proposed 150 housing units on TMK: 2-6-04:019, the applicant must:

1. Prepare and receive DOW's approval of a Kukui'ula Water Master Plan Addendum for the proposed development. Include an approved revised Kukui'ula Water Tracking Matrix.

Be made aware that the Facilities Reserve Charge and the adequacy of the source, storage, and transmission facilities for the proposed development will be dependent on the approval of the Kukui'ula Water Master Plan Addendum.
2. Submit detailed water demand (both domestic and irrigation) calculations along with the proposed water meter size for our review and approval. Water demand calculations submitted by your engineer or architect should also include fixture count and water meter sizing worksheets. The Department's comments may change depending on the approved water demand calculations.
3. Prepare and receive DOW's approval of construction drawings for the necessary water system facilities and construct said facilities. These facilities shall include but not be limited to:
 - a) A mainline extension 12-inch in diameter. The new waterline shall connect to the existing 12-inch water line located on Lopaka Road and continue to the proposed development.
 - b) The domestic service connection(s).
 - c) The fire service connection(s).
 - d) The interior plumbing with the appropriate backflow prevention device(s).
4. Pay the applicable charges in effect at the time of payment to the Department. At the present time, these charges shall include but not be limited to the Facilities Reserve Charge (FRC).

See Item 1 above
5. Receive a "Certification of Completion" for the construction of the necessary water system facilities from the DOW.

Mr. Frank Camacho

Community Planning and Engineering, Inc.

Subject: Pre-Consultation for the Koae Workforce Housing Developments, TMK: 2-6-04:019, Poipu Road,
Koloa, Kauai


August 18, 2015

Page 2

This conditional approval is valid for a period of one (1) year from the date of this letter. All conditions in this approval are subject to the Rules and Regulations of the DOW as amended or as will be amended. After this one year period, this conditional approval shall be null and void and the applicant may re-apply to the Department for water service. Any request for water service will be dependent on the adequacy of the source, storage, and transmission facilities existing at that time.

If you have any questions concerning the construction drawings, please contact Mr. Roman Silvestre at (808) 245-5412. For questions concerning the Certification of Completion, please contact Mr. Dustin Moises at (808) 245-5459. For other questions, please contact Ms. Regina Flores at (808) 245-5418.

Sincerely,



Edward Doi

Chief of Water Resources and Planning Division

RF:loo

2-6-04-019, T-17227, Camacho



June 19, 2015

Mr. Larry Dill
County Engineer, County of Kaua'i Public Works Department
4444 Rice Street, Suite 275
Līhu'e, Hawai'i 96766

Subject: Pre-consultation for the Koa'e Workforce Housing Development
TMK No. (4) 2-6-004:019
Kōloa, Kaua'i, Hawai'i

Dear Mr. Dill:

Community Planning and Engineering, Inc. (CP&E) on behalf of the County of Kaua'i, is in the process of preparing a Chapter 343 Hawai'i Revised Statutes (HRS) Environmental Assessment (EA) and associated Title 11, Chapter 200 Hawai'i Administrative Rules (HAR) for the proposed workforce housing development located at Tax Map Key (TMK) (4) 2-6-004:019 (the Site). The EA is also compliant with the National Environmental Protection Act (NEPA) and 24 Code of Federal Regulations (CFR) Part 58. The proposed project site is located in the town of Kōloa on the Island of Kaua'i (please see the enclosed Location Map). The EA is being prepared in order to evaluate the potential environmental, social, and economic consequences associated with the proposed project.

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In conjunction with this work, we are requesting any written comments and/or information with respect to your area(s) of concern. Please send your written comments to the following address within 30 days.

CP&E
C/O Frank Camacho, Project Manager
1286 Queen Emma Street
Honolulu, HI 96813

Phone: (808) 531-4252, ext. 1040
E-mail: fcamacho@cpe-hawaii.com

We appreciate your timely review and response to this request.

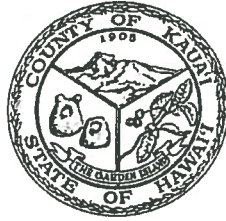
Sincerely,

A handwritten signature in black ink, appearing to read 'F. Camacho', is positioned above the printed name.

Frank Camacho
Project Manager

CC: Kanani Fu
Kaua'i County Housing Agency

Bernard P. Carvalho, Jr.
Mayor



Larry Dill, P.E.
County Engineer

Nadine K. Nakamura
Managing Director

Lyle Tabata
Deputy County Engineer

DEPARTMENT OF PUBLIC WORKS

County of Kauai, State of Hawaii

4444 Rice Street, Suite 275, Lihu'e, Hawaii i 96766
TEL (808) 241-4992 FAX (808) 241-6604

August 10, 2015

CP&E
C/O Frank Camacho, Project Manager
1286 Queen Emma Street
Honolulu, Hawaii i 96813-4307

SUBJECT: Pre-consultation for the Koae Workforce Development Housing
TMK: (4) 2-6-004: 019
Koloa, Kauai, Hawaii

PW 06.15.108

Dear Mr. Camacho:

The Engineering Division of the Department of Public Works (DPW) received the subject pre-consultation letter dated June 19, 2015. The letter requested input to identify potential environmental and/or social and economic impacts associated with the proposed project.

DPW requests that discussion and evaluation be included in the Draft Environmental Assessment (DEA) for:

1. Short term construction activities including but not limited to grading and grubbing.
2. Traffic impacts to include possible roadway improvements along Po'ipū Road.
3. Drainage and storm water runoff concerns due to increased generation of runoff and changes in runoff patterns.
4. Flooding concerns since portions of the project are located in areas identified on the National Flood Insurance Rate Maps (FIRM) as Special Flood Hazard Areas.

Thank you for providing this opportunity for consultation on this pending project. We look forward to receipt of the DEA. If you have any questions or need additional information, please contact Stanford Iwamoto, Engineering Division at (808) 241-4896.

Very truly yours,

MICHAEL MOULE, P.E.
Chief, Engineering Division

RECEIVED
AUG 24 2015

COMMUNITY PLANNING AND ENGINEERING INC.



June 19, 2015

Mr. Robert Westerman
Fire Chief, County of Kaua'i Fire Department
4444 Rice Street, Suite 315
Līhu'e, Hawai'i 96766

Subject: Pre-consultation for the Koa'e Workforce Housing Development
TMK No. (4) 2-6-004:019
Kōloa, Kaua'i, Hawai'i

Dear Mr. Westerman,

Community Planning and Engineering, Inc. (CP&E) on behalf of the County of Kaua'i, is in the process of preparing a Chapter 343 Hawai'i Revised Statutes (HRS) Environmental Assessment (EA) and associated Title 11, Chapter 200 Hawai'i Administrative Rules (HAR) for the proposed workforce housing development located at Tax Map Key (TMK) (4) 2-6-004:019 (the Site). The EA is also compliant with the National Environmental Protection Act (NEPA) and 24 Code of Federal Regulations (CFR) Part 58. The proposed project site is located in the town of Kōloa on the Island of Kaua'i (please see the enclosed Location Map). The EA is being prepared in order to evaluate the potential environmental, social, and economic consequences associated with the proposed project.

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C/O Frank Camacho, Project Manager
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Honolulu, HI 96813

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E-mail: fcamacho@cpe-hawaii.com

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Sincerely,

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Frank Camacho
Project Manager

CC: Kanani Fu
Kaua'i County Housing Agency



June 19, 2015

Mr. Andra Ota
Center Manager
Kōloa/Po'ipū Neighborhood Center
3461 Weliweli Road
Kōloa, Hawai'i 96756

Subject: Pre-consultation for the Koaie Workforce Housing Development
TMK No. (4) 2-6-004:019
Kōloa, Kaua'i, Hawai'i

Dear Mr. Ota:

Community Planning and Engineering, Inc. (CP&E) on behalf of the County of Kaua'i, is in the process of preparing a Chapter 343 Hawai'i Revised Statutes (HRS) Environmental Assessment (EA) and associated Title 11, Chapter 200 Hawai'i Administrative Rules (HAR) for the proposed workforce housing development located at Tax Map Key (TMK) (4) 2-6-004:019 (the Site). The EA is also compliant with the National Environmental Protection Act (NEPA) and 24 Code of Federal Regulations (CFR) Part 58. The proposed project site is located in the town of Kōloa on the Island of Kaua'i (please see the enclosed Location Map). The EA is being prepared in order to evaluate the potential environmental, social, and economic consequences associated with the proposed project.

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Frank Camacho
Project Manager

CC: Kanani Fu
Kaua'i County Housing Agency



June 19, 2015

Mr. George K. Costa
Director, County of Kaua'i Office of Economic Development
4444 Rice Street, Suite 200
Līhu'e, Hawai'i 96766

Subject: Pre-consultation for the Koae Workforce Housing Development
TMK No. (4) 2-6-004:019
Kōloa, Kaua'i, Hawai'i

Dear Mr. Costa:

Community Planning and Engineering, Inc. (CP&E) on behalf of the County of Kaua'i, is in the process of preparing a Chapter 343 Hawai'i Revised Statutes (HRS) Environmental Assessment (EA) and associated Title 11, Chapter 200 Hawai'i Administrative Rules (HAR) for the proposed workforce housing development located at Tax Map Key (TMK) (4) 2-6-004:019 (the Site). The EA is also compliant with the National Environmental Protection Act (NEPA) and 24 Code of Federal Regulations (CFR) Part 58. The proposed project site is located in the town of Kōloa on the Island of Kaua'i (please see the enclosed Location Map). The EA is being prepared in order to evaluate the potential environmental, social, and economic consequences associated with the proposed project.

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Frank Camacho
Project Manager

CC: Kanani Fu
Kaua'i County Housing Agency



June 19, 2015

Mr. Lenny Rapozo
Director, City of Kaua'i Department of Parks and Recreation
4444 Rice Street, Suite 105
Līhu'e, Hawai'i 96766

Subject: Pre-consultation for the Koa'e Workforce Housing Development
TMK No. (4) 2-6-004:019
Kōloa, Kaua'i, Hawai'i

Dear Mr. Rapozo:

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E-mail: fcamacho@cpe-hawaii.com

We appreciate your timely review and response to this request.

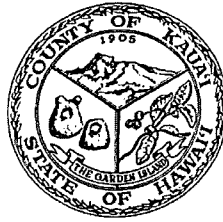
Sincerely,

A handwritten signature in black ink, appearing to read 'F. Camacho', is written in a cursive style.

Frank Camacho
Project Manager

CC: Kanani Fu
Kaua'i County Housing Agency

Bernard P. Carvalho, Jr.
Mayor



Leonard A. Rapozo, Jr.
Director

Nadine K. Nakamura
Managing Director

Ian K. Costa
Deputy Director

DEPARTMENT OF PARKS & RECREATION

County of Kaua'i, State of Hawai'i

4444 Rice Street, Suite 105, Līhu'e, Hawai'i 96766
TEL (808) 241-4460 FAX (808) 241-5126

July 21, 2015

Frank Camacho, Project Manager
CP&E
1286 Queen Emma Street
Honolulu, Hawai'i 96813

Dear Mr. Camacho,

The County of Kauai, Department of Parks and Recreation (DOPR) received your letter regarding the development of Koae Workforce Housing Development. DOPR supports this project and would like to comment on the potential social impacts that it may cause to the parks in the area. The additional housing units will potentially bring young families into the area which typically more park users. Currently, it is the belief of this writer that the programs in the Koloa area will be able to sustain the additional users to the area.

Should you have any questions please do not hesitate to contact me at (808) 241-4456.

Sincerely,

Leonard A. Rapozo, Jr.
Director

cc: Kanani Fu, Kaua'i County Housing Agency



June 19, 2015

Mr. Michael Dahilig, Director
County of Kaua'i Planning Department
4444 Rice Street, Suite A473
Līhu'e, Hawai'i 96766

Subject: Pre-consultation for the Koae Workforce Housing Development
TMK No. (4) 2-6-004:019
Kōloa, Kaua'i, Hawai'i

Dear Mr. Dahilig:

Community Planning and Engineering, Inc. (CP&E) on behalf of the County of Kaua'i, is in the process of preparing a Chapter 343 Hawai'i Revised Statutes (HRS) Environmental Assessment (EA) and associated Title 11, Chapter 200 Hawai'i Administrative Rules (HAR) for the proposed workforce housing development located at Tax Map Key (TMK) (4) 2-6-004:019 (the Site). The EA is also compliant with the National Environmental Protection Act (NEPA) and 24 Code of Federal Regulations (CFR) Part 58. The proposed project site is located in the town of Kōloa on the Island of Kaua'i (please see the enclosed Location Map). The EA is being prepared in order to evaluate the potential environmental, social, and economic consequences associated with the proposed project.

The purpose of the proposed project is to help the County of Kaua'i and the State of Hawai'i meet its goal to provide much needed affordable housing to its elderly residents and workforce housing for families. The proposed project site comprises approximately 11 acres and would include approximately 130-150 housing units. Planned housing types include single family detached units, as well as multi-family attached units. The County of Kaua'i acquired the Site in order for the County to develop much needed workforce housing for Kaua'i residents. We are seeking your input to identify potential environmental and/or social and economic impacts associated with the proposed project.



Additionally, a finding of compliance with the requirements of the Farmland Protection Policy Act of 1981 (7 United States [U.S.] Code [U.S.C] 4201 et seq.) must be made for U.S. Department of Housing and Urban Development (HUD)-assisted new construction activities. The County of Kaua‘i is required to provide HUD with a finding from the local planning agency if the proposed site includes prime or unique farmland, or other farmland of statewide or local importance, as identified by the U.S. Department of Agriculture, Natural Resources Conservation Service (NRCS). According to the County of Kaua‘i, the subject parcel is zoned Residential (R-20). The State of Hawai‘i Land Use Commission zoning for the subject parcel is Urban. Your concurrence that the subject parcel does not include important farmlands is requested.

HUD also requires that HUD funded projects undergo a Coastal Zone Management (CZM) review as authorized by the Coastal Zone Management Act of 1972. In Hawai‘i the Special Management Area (SMA) permitting system is part of the CZM Program approved by Federal and State agencies. Therefore, concurrence from your office that the proposed project is not located within the SMA is requested.

In conjunction with this work, we are requesting any written comments and/or information with respect to your area(s) of concern. Please send your written comments to the following address within 30 days.

CP&E
C/O Frank Camacho, Project Manager
1286 Queen Emma Street
Honolulu, HI 96813

Phone: (808) 531-4252, ext. 1040
E-mail: fcamacho@cpe-hawaii.com



We appreciate your timely review and response to this request.

Sincerely,

A handwritten signature in black ink, appearing to read 'F. Camacho', is written in a cursive style.

Frank Camacho
Project Manager

CC: Kanani Fu
Kaua'i County Housing Agency

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June 19, 2015

Mr. Darryl D. Perry
Chief of Police, Kaua'i Police Department
3990 Ka'ana Street, Suite 200
Līhu'e, Hawai'i 96766

Subject: Pre-consultation for the Koa'e Workforce Housing Development
TMK No. (4) 2-6-004:019
Kōloa, Kaua'i, Hawai'i

Dear Mr. Perry:

Community Planning and Engineering, Inc. (CP&E) on behalf of the County of Kaua'i, is in the process of preparing a Chapter 343 Hawai'i Revised Statutes (HRS) Environmental Assessment (EA) and associated Title 11, Chapter 200 Hawai'i Administrative Rules (HAR) for the proposed workforce housing development located at Tax Map Key (TMK) (4) 2-6-004:019 (the Site). The EA is also compliant with the National Environmental Protection Act (NEPA) and 24 Code of Federal Regulations (CFR) Part 58. The proposed project site is located in the town of Kōloa on the Island of Kaua'i (please see the enclosed Location Map). The EA is being prepared in order to evaluate the potential environmental, social, and economic consequences associated with the proposed project.

The purpose of the proposed project is to help the County of Kaua'i and the State of Hawai'i meet its goal to provide much needed affordable housing to its elderly residents and workforce housing for families. The proposed project site comprises approximately 11 acres and would include approximately 130-150 housing units. Planned housing types include single family detached units, as well as multi-family attached units. The County of Kaua'i acquired the Site in order for the County to develop much needed workforce housing for Kaua'i residents. We are seeking your input to identify potential environmental and/or social and economic impacts associated with the proposed project.



In conjunction with this work, we are requesting any written comments and/or information with respect to your area(s) of concern. Please send your written comments to the following address within 30 days.

CP&E
C/O Frank Camacho, Project Manager
1286 Queen Emma Street
Honolulu, HI 96813

Phone: (808) 531-4252, ext. 1040
E-mail: fcamacho@cpe-hawaii.com

We appreciate your timely review and response to this request.

Sincerely,

A handwritten signature in black ink, appearing to read 'F. Camacho', is positioned above the printed name.

Frank Camacho
Project Manager

CC: Kanani Fu
Kaua'i County Housing Agency



June 19, 2015

Ms. Celia Wooten-Mahikoa
Executive on Transportation, County of Kaua'i Transportation Agency
3220 Ho'olako Street
Līhu'e, Hawai'i 96766

Subject: Pre-consultation for the Koae Workforce Housing Development
TMK No. (4) 2-6-004:019
Kōloa, Kaua'i, Hawai'i

Dear Ms. Wooten-Mahikoa:

Community Planning and Engineering, Inc. (CP&E) on behalf of the County of Kaua'i, is in the process of preparing a Chapter 343 Hawai'i Revised Statutes (HRS) Environmental Assessment (EA) and associated Title 11, Chapter 200 Hawai'i Administrative Rules (HAR) for the proposed workforce housing development located at Tax Map Key (TMK) (4) 2-6-004:019 (the Site). The EA is also compliant with the National Environmental Protection Act (NEPA) and 24 Code of Federal Regulations (CFR) Part 58. The proposed project site is located in the town of Kōloa on the Island of Kaua'i (please see the enclosed Location Map). The EA is being prepared in order to evaluate the potential environmental, social, and economic consequences associated with the proposed project.

The purpose of the proposed project is to help the County of Kaua'i and the State of Hawai'i meet its goal to provide much needed affordable housing to its elderly residents and workforce housing for families. The proposed project site comprises approximately 11 acres and would include approximately 130-150 housing units. Planned housing types include single family detached units, as well as multi-family attached units. The County of Kaua'i acquired the Site in order for the County to develop much needed workforce housing for Kaua'i residents. We are seeking your input to identify potential environmental and/or social and economic impacts associated with the proposed project.



Community Planning and Engineering, Inc.

In conjunction with this work, we are requesting any written comments and/or information with respect to your area(s) of concern. Please send your written comments to the following address within 30 days.

CP&E
C/O Frank Camacho, Project Manager
1286 Queen Emma Street
Honolulu, HI 96813

Phone: (808) 531-4252, ext. 1040
E-mail: fcamacho@cpe-hawaii.com

We appreciate your timely review and response to this request.

Sincerely,

A handwritten signature in black ink, appearing to read 'F. Camacho', is written over a light blue horizontal line.

Frank Camacho
Project Manager

CC: Kanani Fu
Kaua'i County Housing Agency

Bernard P. Carvalho, Jr.
Mayor



Celia M. Mahikoa
Executive on Transportation

Nadine K. Nakamura
Managing Director

TRANSPORTATION AGENCY
County of Kaua'i, State of Hawai'i
3220 Ho'olako Street, Lihu'e, Hawai'i 96766
TEL (808) 246-8110 FAX (808) 241-6417

July 9, 2015

Mr. Frank Camacho, Project Manager
Community Planning & Engineering, Inc.
1286 Queen Emma Street
Honolulu, Hawai'i 96813

Dear Mr. Camacho,

The County of Kaua'i, Transportation Agency appreciates the opportunity to comment on the Koae Workforce Housing Development in respect to our area of concern. We are in full support of the project and look forward to participating in the review of the development plans as they progress along. At this early stage, we have a few general comments in relation to the operation of the public transit system and the Koae Workforce Housing Development that have been bullet pointed below:

- ❖ With the proposed quantity and types of housing units proposed for this development we strongly believe that transit oriented development would be a critical element of the long term success for the project and the community at large.
- ❖ We would like to continue to be addressed as a consultant to the plans as they are developed to address any areas of concern to the operation of the transit system and to intersect with other entities on transit related topics.

If you have any questions or comments, please feel free to contact us immediately. Mahalo for the ongoing support of The Kaua'i Bus.

Sincerely,

Celia Mahikoa
Executive on Transportation



RECEIVED

JUN 22 2015

County of Kauai
Transportation Agency

June 19, 2015

Ms. Celia Wooten-Mahikoa
Executive on Transportation, County of Kaua'i Transportation Agency
3220 Ho'olako Street
Līhu'e, Hawai'i 96766

Subject: Pre-consultation for the Koae Workforce Housing Development
TMK No. (4) 2-6-004:019
Kōloa, Kaua'i, Hawai'i

Dear Ms. Wooten-Mahikoa:

Community Planning and Engineering, Inc. (CP&E) on behalf of the County of Kaua'i, is in the process of preparing a Chapter 343 Hawai'i Revised Statutes (HRS) Environmental Assessment (EA) and associated Title 11, Chapter 200 Hawai'i Administrative Rules (HAR) for the proposed workforce housing development located at Tax Map Key (TMK) (4) 2-6-004:019 (the Site). The EA is also compliant with the National Environmental Protection Act (NEPA) and 24 Code of Federal Regulations (CFR) Part 58. The proposed project site is located in the town of Kōloa on the Island of Kaua'i (please see the enclosed Location Map). The EA is being prepared in order to evaluate the potential environmental, social, and economic consequences associated with the proposed project.

The purpose of the proposed project is to help the County of Kaua'i and the State of Hawai'i meet its goal to provide much needed affordable housing to its elderly residents and workforce housing for families. The proposed project site comprises approximately 11 acres and would include approximately 130-150 housing units. Planned housing types include single family detached units, as well as multi-family attached units. The County of Kaua'i acquired the Site in order for the County to develop much needed workforce housing for Kaua'i residents. We are seeking your input to identify potential environmental and/or social and economic impacts associated with the proposed project.



Community Planning and Engineering, Inc.

In conjunction with this work, we are requesting any written comments and/or information with respect to your area(s) of concern. Please send your written comments to the following address within 30 days.

CP&E
C/O Frank Camacho, Project Manager
1286 Queen Emma Street
Honolulu, HI 96813

Phone: (808) 531-4252, ext. 1040
E-mail: fcamacho@cpe-hawaii.com

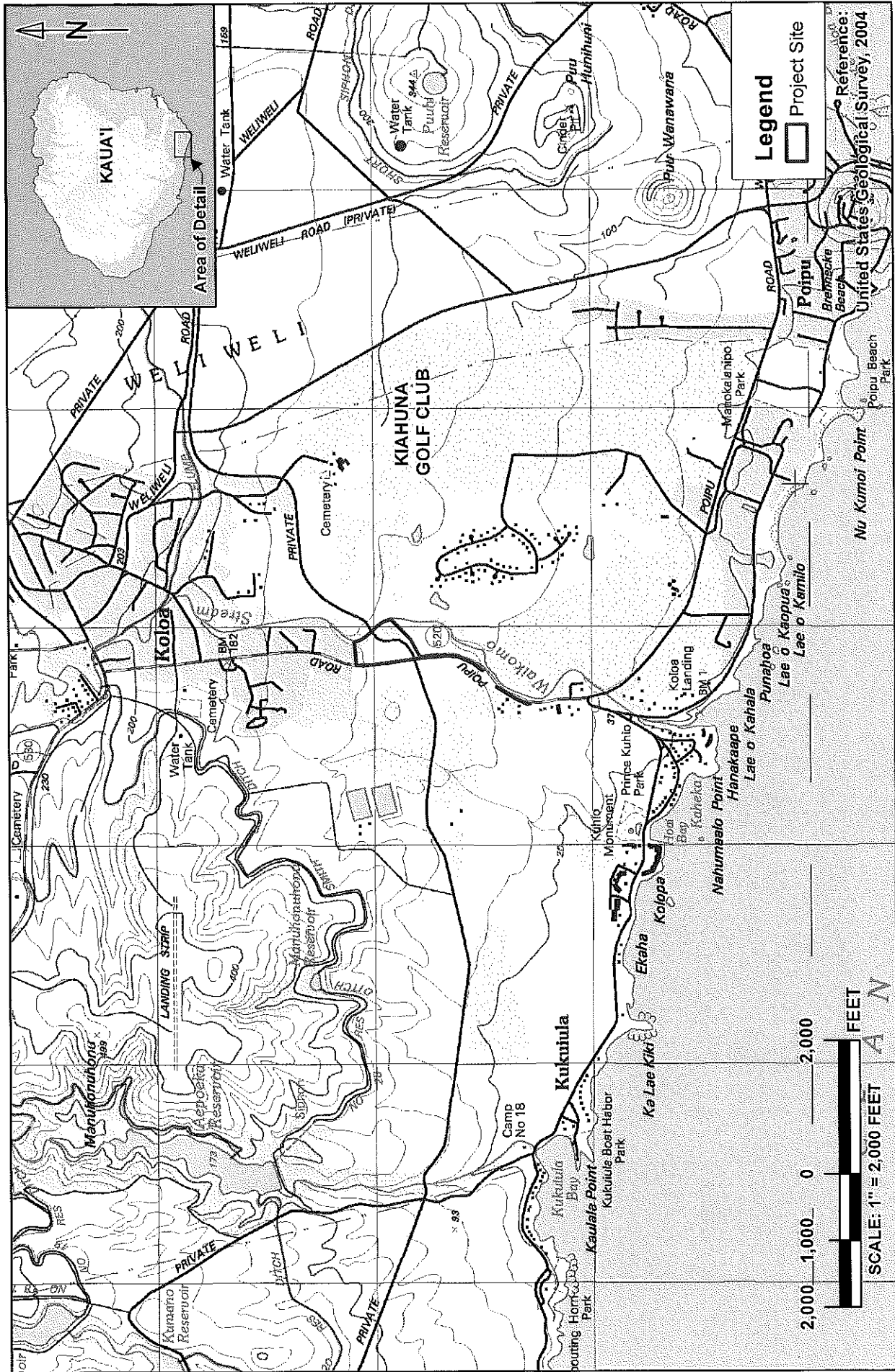
We appreciate your timely review and response to this request.

Sincerely,

A handwritten signature in black ink, appearing to read 'F. Camacho', is written over a light gray rectangular background.

Frank Camacho
Project Manager

CC: Kanani Fu
Kaua'i County Housing Agency



DRAFT ENVIRONMENTAL ASSESSMENT FOR THE PROPOSED KOAE HOUSING PROJECT

PROJECT LOCATION MAP
 KŌLOA, KAUAI, HAWAII



Community Planning
 and Engineering, Inc.

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June 19, 2015

Ms. Lisa Hadway
Administrator
State of Hawai'i Department of Land and Natural Resources
Division of Forestry and Wildlife
Kalanimoku Building
1151 Punchbowl St. Room 325
Honolulu, HI 96813

Subject: Pre-consultation for the Koa'e Affordable Housing Development
TMK No. (4) 2-6-004:019
Kōloa, Kaua'i, Hawai'i

Dear Ms. Hadway:

Community Planning and Engineering, Inc. (CP&E) on behalf of the County of Kaua'i, is in the process of preparing a Chapter 343 Hawai'i Revised Statutes (HRS) Environmental Assessment (EA) and associated Title 11, Chapter 200 Hawai'i Administrative Rules (HAR) for the proposed workforce housing development located at Tax Map Key (TMK) (4) 2-6-004:019 (the Site). The EA is also compliant with the National Environmental Protection Act (NEPA) and 24 Code of Federal Regulations (CFR) Part 58. The proposed project site is located in the town of Kōloa on the Island of Kaua'i (please see the enclosed Project Location Map). The EA is being prepared in order to evaluate the potential environmental, social, and economic consequences associated with the proposed project.

Approximately 130-150 residential single family detached units and multi-family attached units are planned to be built on the subject parcel. We are enclosing a Project Location Map for your reference and review, as well as a biological survey that was completed at the Site.

As part of the environmental review process, we are requesting early consultation to determine if any special status or endangered species habitats exist at, or within close proximity to the subject parcel at the Site. If deemed necessary, formal consultation under Section 7 of the Endangered Species Act (ESA) will be initiated at a later date in compliance with NEPA. The County of Kaua'i would represent the United States Department of Housing and Urban Development (HUD) as the responsible federal agency requesting a determination under Section 7 of the ESA if HUD funding is requested.



Please respond with comments within 30 days. If you have any questions or need clarification, please contact me at (808) 531-4252, ext. 1040 or by email at fcamacho@cpe-hawaii.com. All response letters can be sent to the following address:

CP&E
C/O Frank Camacho, Project Manager
1286 Queen Emma Street
Honolulu, HI 96813

We appreciate your timely review and response to this request.

Sincerely,

A handwritten signature in black ink, appearing to read 'F. Camacho', is written over a white background.

Frank Camacho
Project Manager

CC: Kanani Fu
Kaua'i County Housing Agency

DAVID Y. IGE
GOVERNOR OF HAWAII



SUZANNE D. CASE
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE
MANAGEMENT

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

August 6, 2015

Community Planning
and Engineering, Inc.
Attn: Frank Camacho, Project Manager
1286 Queen Emma Street
Honolulu, HI 96813

via email: fcamacho@cpe-hawaii.com

Dear Mr. Camacho,

SUBJECT: Pre-Consultation for the Koae Workforce Housing Development

Thank you for the opportunity to review and comment on the subject matter. In addition to the comments sent to you dated July 15, 2015, enclosed are additional comments from the Division of Forestry & Wildlife on the subject matter. Should you have any questions, please feel free to call Supervising Land Agent Steve Molmen at (808) 587-0439. Thank you.

Sincerely,

A handwritten signature in blue ink, appearing to read "Russell Y. Tsuji".

Russell Y. Tsuji
Land Administrator

Enclosure(s)



STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

June 24, 2015

MEMORANDUM

TO:

DLNR Agencies:

- Div. of Aquatic Resources
- Div. of Boating & Ocean Recreation
- Engineering Division
- Div. of Forestry & Wildlife
- Div. of State Parks
- Commission on Water Resource Management
- Office of Conservation & Coastal Lands
- Land Division – Kauai District
- Historic Preservation

FROM:

Russell Y. Tsuji, Land Administrator

SUBJECT:

Pre-consultation for the Koa Workforce Housing Development

LOCATION:

TMK No. (4) 2-6-004:019; Koloa, Kauai, Hawaii

APPLICANT:

County of Kauai by its consultant, Community Planning and Engineering, Inc.

Transmitted for your review and comment on the above-referenced document. We would appreciate your comments on this document.

Please submit any comments by **July 14, 2015**. If no response is received by this date, we will assume your agency has no comments. If you have any questions about this request, please contact Supervising Land Agent Steve Molmen at (808) 587-0439. Thank you.

Attachments

- We have no objections.
- We have no comments.
- Comments are attached.

Signed: _____

Print Name: _____

Date: _____

David A. Smith

7/2/15

RECEIVED
LAND DIVISION
2015 AUG -5 PM 4: 14
DEPT. OF LAND &
NATURAL RESOURCES
STATE OF HAWAII

DAVID Y. IGE
GOVERNOR OF HAWAII



STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
DIVISION OF FORESTRY AND WILDLIFE
1151 PUNCHBOWL STREET, ROOM 325
HONOLULU, HAWAII 96813

SUZANNE D. CASE
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

KEKOA KALUHIWA
FIRST DEPUTY

W. ROY HARDY
ACTING 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

July 20, 2015

MEMORANDUM

To: Russell Y. Tsuji, Land Administrator
DLNR, Land Division

From: David Smith, Acting Administrator *DES*
DLNR, Division of Forestry and Wildlife (DOFAW)

Subject: Comments on Pre-consultation for the Koae Workforce Housing Development,
Kōloa, Kauai

RECEIVED
LAND DIVISION
2015 AUG -5 PM 3:03
DEPT. OF LAND &
NATURAL RESOURCES
STATE OF HAWAII

Thank you for the memo received on June 24, 2015 and the opportunity to comment on the Pre-consultation for the Koae Workforce Housing Development. The proposed action includes the construction of between 130 and 150 housing units on 11 acres of land in the Kōloa District, Island of Kaua'i. The project is proposed by the Kukui'Ula Development Company, LLC.

The Waikomo Stream is adjacent to the proposed project area, and could be home to populations of state and federally-listed threatened and endangered waterbirds including the Hawaiian coot (*Fulica alai*), Hawaiian Stilt (*Himantopus mexicanus knudseni*), Hawaiian moorhen (*Gallinula chloropus sandvicensis*), and Hawaiian duck or koloa (*Anas wyvilliana*). No waterbirds were documented by the Avian and Terrestrial Mammal Survey accompanying the pre-consultation notice; however, the survey was conducted in 2004 and circumstances may have changed. DOFAW staff members visiting the site on July 13, 2015 observed two koloa along the stream bank. DOFAW strongly recommends conducting updated surveys to ensure that current environmental conditions are considered.

The proposed project is also located adjacent to the Kiahuna Golf Course. The Hawaiian goose or nēnē (*Branta sandvicensis*) is commonly found at golf courses throughout the state, as the short, lush grasses are an attractive source of food, and nēnē have been observed at Kiahuna in the past. Construction efforts have the potential to impact nēnē via disturbance or collision with vehicles and construction equipment. DOFAW recommends conducting additional avian surveys at the project site, and initiating consultation with DOFAW and the US Fish & Wildlife Service (USFWS) to explore potential ways to avoid and/or minimize impacts of this nature.

DOFAW agrees with the statements made on Page 7 of the Avian and Terrestrial Mammal Survey that Hawaiian petrel (*Pterodroma sandwichensis*) and Newell's shearwater (*Puffinus auricularis newelli*) have the potential to fly over the proposed site during seabird breeding season, roughly late April to early November. DOFAW supports the recommendation that external lights be minimized to the greatest extent practicable, and shielded to prevent potential attraction of fledglings that may become disoriented and fall to the ground. DOFAW is happy to work with Kukui'Ula to devise the most effective and seabird friendly lighting design. We would also encourage you to work with the Kaua'i Island Utility Cooperative to address the potential for seabird collisions with any new powerlines that would be constructed as a result of the project. DOFAW recommends undergrounding lines to the maximum extent practicable, and installing bird diverters where appropriate.

The Hawaiian hoary bat (*Lasiurus cinereus semotus*) also has the potential to occur in the vicinity of the proposed project. Hawaiian hoary bats roost in both exotic and native trees. If any trees are planned for removal during the bat breeding season there is a risk of injury or mortality to juvenile bats. To minimize the potential for impacts to this species, removal of woody plants greater than 15 feet in height should not occur between June 1 and September 15, which encompasses the bat birthing and pupping season. If the pupping season cannot be avoided, then DOFAW should be consulted. Any observations of Hawaiian hoary bats in the project area should be reported to DOFAW. DOFAW also recommends avoiding any use of barbed wire, as Hawaiian hoary bat mortalities have been documented as a result of becoming entangled on barbed wire during flight.

Finally, there is known Kaua'i cave wolf spider (*Adelocoa anops*; also known as the blind cave spider) habitat in the vicinity of the proposed project area. Cave spiders inhabit old lava tubes, so if there is any potential for impacts to this type of habitat, we recommend consulting with DOFAW's entomologists to determine if a survey is necessary.

DOFAW recommends that Kukui'Ula Development Company consult with DOFAW and USFWS throughout the planning process to determine if a threatened or endangered species is likely to be impacted by this project. DOFAW appreciates the opportunity to provide comments on this project and requests that Land Division continue to seek input from DOFAW on impacts to wildlife.

If you have any questions, please contact James Cogswell, Wildlife Program Manager, at 808-587-4187.

cc: Thomas Ka'iakapu, Wildlife Manager, DOFAW Kaua'i Branch

From: Max Solmssen
To: ["Thomas.J.Kaiakapu@hawaii.gov"](mailto:Thomas.J.Kaiakapu@hawaii.gov)
Subject: RE: Biological Consultation-County of Kaua'i Workforce Housing Project, Koloa, Kaua'i
Date: Monday, August 24, 2015 10:54:00 AM
Attachments: [image001.png](#)
[image002.png](#)
[image007.png](#)
[image008.png](#)
[image009.png](#)
[image010.png](#)

Hi Thomas,

Thank you for your efforts helping identify a qualified biologist (either a private company or someone in your office) to complete the updated survey at the site. Let me know if any other mitigation measures, besides those cited in the two consultation letters sent by your office and USFWS, would be recommended.

Mahalo


Max Solmssen

PROJECT MANAGER T/ 808.833.2225 EXT.1012 C/ 808.756.0870 F/ 808.833.2231 E/
MSOLMSEN@ENVIRONETINC.COM
ENVIRONET, INC. 1286 QUEEN EMMA STREET, HONOLULU, HAWAII 96813

- www.vironetinc.com

HUBZone & SBA Certified Small Business / Native Hawaiian and Veteran-Owned



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From: Thomas.J.Kaiakapu@hawaii.gov [mailto:Thomas.J.Kaiakapu@hawaii.gov]
Sent: Monday, August 24, 2015 10:43 AM
To: Max Solmssen
Subject: Re: Biological Consultation-County of Kaua'i Workforce Housing Project, Koloa, Kaua'i

Aloha Max,

I will get back to you if I have a qualified biologist willing to do the surveys and a monitor during the construction phase. Thanks.

Thomas J. Ka'iakapu
Kauai Wildlife Manager
Department of Land & Natural Resources
Division of Forestry and Wildlife
3060 Eiwa Street, Room 306
Lihue, HI. 96766-1875
tel: (808) 274-3433

fax: (808) 274-3438

From: Max Solmssen <MSolmssen@environetinc.com>
To: "thomas.j.kaiakapu@hawaii.gov" <thomas.j.kaiakapu@hawaii.gov>,
Date: 08/24/2015 10:16 AM
Subject: Biological Consultation-County of Kaua'i Workforce Housing Project, Koloa, Kaua'i

Hi Thomas,

I tried to call you this morning but we had a bad connection. We are working for the County of Kaua'i Housing Agency to complete an Environmental Assessment of a planned affordable housing development located within an 11 acre parcel located along Poipu Road in Koloa at TMK No. (4) 2-6-004:019 (attached location map). Also attached are two response to consultation letters; one from your agency and the other is from the USFWS. In the attached letter from David Smith at DOFAW, it is recommended that an updated Avian and Terrestrial Mammal survey be completed at the site, and that DOFAW's entomologist should be consulted regarding any needed mitigation measures for potential impacts to the Kaua'i cave wolf spider that inhabits the area.

In response to this letter, we reached out to James Cogswell at DOFAW. He told me to contact you regarding consultation for the Kaua'i cave wolf spider. In the attached response letter from the USFWS, it is stated that the closest known cave wolf spider habitat is located approximately 150m from the proposed project site, and that a biological monitor should be implemented during construction in order to assure that potential subsurface lava tube/cave habitat is not significantly impacted.

Could you let me know if any additional actions are recommended besides the USFWS recommendation for having a qualified biological monitor during construction for the Kaua'i cave wolf spider? I also wanted to see if you have a recommendation for a qualified biologist to complete an updated Avian and Terrestrial Mammal survey at the site. We greatly appreciate your assistance in assuring that the proposed affordable housing development is completed without impacts to the important biological resources in the area.

Mahalo

Max Solmssen 

PROJECT MANAGER T/ 808.833.2225 EXT.1012 C/ 808.756.0870 F/ 808.833.2231 E/ MSOLMSEN@ENVIRONETINC.COM
Environet, Inc. 1286 Queen Emma Street, Honolulu, Hawaii 96813

www.environetinc.com

HUBZone & SBA Certified Small Business / Native Hawaiian and Veteran-Owned



CONFIDENTIALITY: This communication, including attachments, is for the exclusive use of the addressee(s) and may contain proprietary, confidential or privileged information. If you are not the intended recipient, any use, copying, disclosure, or distribution or the taking of any action in reliance upon this information is strictly prohibited. If you are not the intended recipient, please notify the sender immediately, delete this communication and destroy all copies.

[attachment "Figure 2 - Site Map.pdf" deleted by Thomas J Kaiakapu/DLNR/StateHiUS] [attachment



June 19, 2015

Pacific Islands Contact Office
United States Environmental Protection Agency
Region 9, Hawai'i Office
P.O. Box 50003
Honolulu, Hawai'i 96850

Subject: Pre-consultation for the Koae Workforce Housing Development
TMK No. (4) 2-6-004:019
Kōloa, Kaua'i, Hawai'i

Aloha,

Community Planning and Engineering, Inc. (CP&E) on behalf of the County of Kaua'i, is in the process of preparing a Chapter 343 Hawai'i Revised Statutes (HRS) Environmental Assessment (EA) and associated Title 11, Chapter 200 Hawai'i Administrative Rules (HAR) for the proposed workforce housing development located at Tax Map Key (TMK) (4) 2-6-004:019 (the Site). The EA is also compliant with the National Environmental Protection Act (NEPA) and 24 Code of Federal Regulations (CFR) Part 58. The proposed project site is located in the town of Kōloa on the Island of Kaua'i (please see the enclosed Location Map). The EA is being prepared in order to evaluate the potential environmental, social, and economic consequences associated with the proposed project.

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In conjunction with this work, we are requesting any written comments and/or information with respect to your area(s) of concern. Please send your written comments to the following address within 30 days.

CP&E
C/O Frank Camacho, Project Manager
1286 Queen Emma Street
Honolulu, HI 96813

Phone: (808) 531-4252, ext. 1040
E-mail: fcamacho@cpe-hawaii.com

We appreciate your timely review and response to this request.

Sincerely,

A handwritten signature in black ink, appearing to read 'F. Camacho', is written in a cursive style.

Frank Camacho
Project Manager

CC: Kanani Fu
Kaua'i County Housing Agency



June 19, 2015

Kaua'i Postmaster
Kōloa Post Office
5485 Kōloa Road
Kōloa, Hawai'i 96576

Subject: Pre-consultation for the Koae Workforce Housing Development
TMK No. (4) 2-6-004:019
Kōloa, Kaua'i, Hawai'i

Aloha,

Community Planning and Engineering, Inc. (CP&E) on behalf of the County of Kaua'i, is in the process of preparing a Chapter 343 Hawai'i Revised Statutes (HRS) Environmental Assessment (EA) and associated Title 11, Chapter 200 Hawai'i Administrative Rules (HAR) for the proposed workforce housing development located at Tax Map Key (TMK) (4) 2-6-004:019 (the Site). The EA is also compliant with the National Environmental Protection Act (NEPA) and 24 Code of Federal Regulations (CFR) Part 58. The proposed project site is located in the town of Kōloa on the Island of Kaua'i (please see the enclosed Location Map). The EA is being prepared in order to evaluate the potential environmental, social, and economic consequences associated with the proposed project.

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Frank Camacho
Project Manager

CC: Kanani Fu
Kaua'i County Housing Agency

June 19, 2015

Kaua'i Postmaster
Līhu'e Post Office
4441 Rice Street
Līhu'e, Hawai'i 96766

Subject: Pre-consultation for the Koae Workforce Housing Development
TMK No. (4) 2-6-004:019
Kōloa, Kaua'i, Hawai'i

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Frank Camacho
Project Manager

CC: Kanani Fu
Kaua'i County Housing Agency



June 19, 2015

Ms. Marisa Sandbloom
Grove Farm
P.O. Box 1631
Līhue, HI 96766

Subject: Pre-consultation for the Koae Workforce Housing Development
TMK No. (4) 2-6-004:019
Kōloa, Kaua‘i, Hawai‘i

Dear Ms. Sandbloom:

Community Planning and Engineering, Inc. (CP&E) on behalf of the County of Kaua‘i, is in the process of preparing a Chapter 343 Hawai‘i Revised Statutes (HRS) Environmental Assessment (EA) and associated Title 11, Chapter 200 Hawai‘i Administrative Rules (HAR) for the proposed workforce housing development located at Tax Map Key (TMK) (4) 2-6-004:019 (the Site). The EA is also compliant with the National Environmental Protection Act (NEPA) and 24 Code of Federal Regulations (CFR) Part 58. The proposed project site is located in the town of Kōloa on the Island of Kaua‘i (please see the enclosed Location Map). The EA is being prepared in order to evaluate the potential environmental, social, and economic consequences associated with the proposed project.

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Community Planning and Engineering, Inc.

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Honolulu, HI 96813

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Frank Camacho
Project Manager

CC: Kanani Fu
Kaua'i County Housing Agency

June 19, 2015

Mr. Jun Fukada
General Manager
Kawailoa Development, LLP
P.O. Box 369
Kōloa, Hawai‘i 96756

Subject: Pre-consultation for the Koaie Workforce Housing Development
TMK No. (4) 2-6-004:019
Kōloa, Kaua‘i, Hawai‘i

Dear Mr. Fukada:

Community Planning and Engineering, Inc. (CP&E), on behalf of the County of Kaua‘i, is in the process of preparing a Chapter 343 Hawai‘i Revised Statutes (HRS) Environmental Assessment (EA) and associated Title 11, Chapter 200 Hawai‘i Administrative Rules (HAR) for the proposed workforce housing development located at Tax Map Key (TMK) (4) 2-6-004:019 (the Site). The EA is also compliant with the National Environmental Protection Act (NEPA) and 24 Code of Federal Regulations (CFR) Part 58. The proposed project site is located in the town of Kōloa on the Island of Kaua‘i (please see the enclosed Location Map). The EA is being prepared in order to evaluate the potential environmental, social and economic consequences associated with the proposed project.

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Honolulu, HI 96813

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Frank Camacho
Project Manager

CC: Kanani Fu
Kaua'i County Housing Agency



June 19, 2015

Mr. Max Graham
Eric A. Knudsen Trust
P.O. Box 160
Kōloa, HI 96756

Subject: Pre-consultation for the Koae Workforce Housing Development
TMK No. (4) 2-6-004:019
Kōloa, Kauaʻi, Hawaiʻi

Dear Mr. Graham:

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Community Planning and Engineering, Inc.

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Honolulu, HI 96813

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Frank Camacho
Project Manager

CC: Kanani Fu
Kaua'i County Housing Agency



June 19, 2015

Mr. Lindsey Crawford
Kukui'ula Development
2829 Ala Kalanikaumaka Suite A-101
Koloa, HI 96756

Subject: Pre-consultation for the Koa'e Workforce Housing Development
TMK No. (4) 2-6-004:019
Kōloa, Kaua'i, Hawai'i

Dear Mr. Crawford:

Community Planning and Engineering, Inc. (CP&E) on behalf of the County of Kaua'i, is in the process of preparing a Chapter 343 Hawai'i Revised Statutes (HRS) Environmental Assessment (EA) and associated Title 11, Chapter 200 Hawai'i Administrative Rules (HAR) for the proposed workforce housing development located at Tax Map Key (TMK) (4) 2-6-004:019 (the Site). The EA is also compliant with the National Environmental Protection Act (NEPA) and 24 Code of Federal Regulations (CFR) Part 58. The proposed project site is located in the town of Kōloa on the Island of Kaua'i (please see the enclosed Location Map). The EA is being prepared in order to evaluate the potential environmental, social, and economic consequences associated with the proposed project.

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Frank Camacho
Project Manager

CC: Kanani Fu
Kaua'i County Housing Agency



June 19, 2015

Mr. Ted K. Blake
Mālama Kōloa
P.O. Box 1686
Koloa, HI 96756

Subject: Pre-consultation for the Koae Workforce Housing Development
TMK No. (4) 2-6-004:019
Kōloa, Kauaʻi, Hawaiʻi

Dear Mr. Blake:

Community Planning and Engineering, Inc. (CP&E) on behalf of the County of Kauaʻi, is in the process of preparing a Chapter 343 Hawaiʻi Revised Statutes (HRS) Environmental Assessment (EA) and associated Title 11, Chapter 200 Hawaiʻi Administrative Rules (HAR) for the proposed workforce housing development located at Tax Map Key (TMK) (4) 2-6-004:019 (the Site). The EA is also compliant with the National Environmental Protection Act (NEPA) and 24 Code of Federal Regulations (CFR) Part 58. The proposed project site is located in the town of Kōloa on the Island of Kauaʻi (please see the enclosed Location Map). The EA is being prepared in order to evaluate the potential environmental, social, and economic consequences associated with the proposed project.

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Frank Camacho
Project Manager

CC: Kanani Fu
Kaua'i County Housing Agency



June 19, 2015

Ms. Jody Kjeldsen
Po'ipū Beach Resort Association
PO Box 730
Kōloa, HI 96756

Subject: Pre-consultation for the Koae Workforce Housing Development
TMK No. (4) 2-6-004:019
Kōloa, Kaua'i, Hawai'i

Dear Ms. Kjeldsen:

Community Planning and Engineering, Inc. (CP&E) on behalf of the County of Kaua'i, is in the process of preparing a Chapter 343 Hawai'i Revised Statutes (HRS) Environmental Assessment (EA) and associated Title 11, Chapter 200 Hawai'i Administrative Rules (HAR) for the proposed workforce housing development located at Tax Map Key (TMK) (4) 2-6-004:019 (the Site). The EA is also compliant with the National Environmental Protection Act (NEPA) and 24 Code of Federal Regulations (CFR) Part 58. The proposed project site is located in the town of Kōloa on the Island of Kaua'i (please see the enclosed Location Map). The EA is being prepared in order to evaluate the potential environmental, social, and economic consequences associated with the proposed project.

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Frank Camacho
Project Manager

CC: Kanani Fu
Kaua'i County Housing Agency



June 19, 2015

Mr. Monroe Richmond
Rotary Club of Po'ipū Beach
P.O. Box 995
Kōloa, HI 96756

Subject: Pre-consultation for the Koae Workforce Housing Development
TMK No. (4) 2-6-004:019
Kōloa, Kaua'i, Hawai'i

Dear Mr. Richmond:

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Frank Camacho
Project Manager

CC: Kanani Fu
Kaua'i County Housing Agency



June 19, 2015

Mr. Peter Kea Jr.
Royal Order of Kamehameha,
Kaumuali'i Chapter III
P.O. Box 1381
Lihu'e, HI 96766

Subject: Pre-Consultation for the Koae Affordable Housing Development
TMK No. (4) 2-6-004:019
Kōloa, Kaua'i, Hawai'i

Dear Mr. Kea:

Community Planning and Engineering, Inc. (CP&E) on behalf of the County of Kaua'i, is in the process of preparing a Chapter 343 Hawai'i Revised Statutes (HRS) Environmental Assessment (EA) and associated Title 11, Chapter 200 Hawai'i Administrative Rules (HAR) for the proposed workforce housing development located at Tax Map Key (TMK) (4) 2-6-004:019 (the Site). The EA is also compliant with the National Environmental Protection Act (NEPA) and 24 Code of Federal Regulations (CFR) Part 58. The proposed project site is located in the town of Kōloa on the Island of Kaua'i (please see the enclosed Area of Potential Effect [APE] Map). The EA is being prepared in order to evaluate the potential environmental, social, and economic consequences associated with the proposed project.

As part of the environmental review process, and in accordance with Section 106 of the National Historic Preservation Act (NHPA), we are seeking early consultation to determine if any documented historic or culturally significant resources exist at, or within close proximity to the subject parcel. Section 106 consultation under the NHPA is triggered due to potential project funding from the United States Department of Housing and Urban Development (HUD). The County of Kaua'i would represent HUD as the responsible federal agency requesting consultation under Section 106 of the NHPA.

Approximately 130-150 residential single family detached units and multi-family attached units are planned to be built on the subject parcel. We are enclosing the following reference documents to assist with your review: an APE Map and an archaeological inventory survey and cultural impact assessment that were previously conducted for the Site in September 2004 and October 2004, respectively.



Community Planning and Engineering, Inc.

Please respond with comments within 30 days. If you have any questions or need clarification, please contact me at (808) 531-4252, ext. 1040 or by email at fcamacho@cpe-hawaii.com. All response letters can be sent to the following address:

CP&E
C/O Frank Camacho, Project Manager
1286 Queen Emma Street
Honolulu, HI 96813

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Frank Camacho
Project Manager

CC: Kanani Fu
Kaua'i County Housing Agency



June 19, 2015

Mr. Alan Downer
Administrator, State Historic Preservation Division
Department of Land and Natural Resources
601 Kamokila Boulevard, Suite 555
Kapolei, Hawai'i 96707

Subject: Pre-Consultation for the Koae Affordable Housing Development
TMK No. (4) 2-6-004:019
Kōloa, Kaua'i, Hawai'i

Dear Mr. Downer:

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Honolulu, HI 96813

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Frank Camacho
Project Manager

CC: Kanani Fu
Kaua'i County Housing Agency



June 19, 2015

Mr. Leo R. Asuncion, Jr.
Acting Director
State of Hawai'i DBET – Office of Planning
P. O. Box 2359
Honolulu, Hawai'i 96804

Subject: Pre-consultation for the Koae Workforce Housing Development
TMK No. (4) 2-6-004:019
Kōloa, Kaua'i, Hawai'i

Dear Mr. Asuncion:

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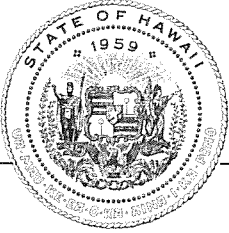
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Frank Camacho
Project Manager

CC: Kanani Fu
Kaua'i County Housing Agency



OFFICE OF PLANNING STATE OF HAWAII

235 South Beretania Street, 6th Floor, Honolulu, Hawaii 96813
Mailing Address: P.O. Box 2359, Honolulu, Hawaii 96804

Telephone: (808) 587-2846
Fax: (808) 587-2824
Web: <http://planning.hawaii.gov/>

DAVID Y. IGE
GOVERNOR

LEO R. ASUNCION
ACTING DIRECTOR
OFFICE OF PLANNING

Ref. No. P-14832

July 21, 2015

RECEIVED
JUL 24 2015

COMMUNITY PLANNING AND ENGINEERING INC.

Mr. Frank Camacho
Project Manager
Community Planning and Engineering, Inc.
1286 Queen Emma Street
Honolulu, Hawaii 96813

Dear Mr. Camacho:

Subject: Pre-consultation for the Proposed Koa'e Workforce Housing Development, Koloa, Kauai, Hawaii; TMK: (4) 2-6-004:019

Thank you for the opportunity to provide comments on the pre-consultation request for a Draft Environmental Assessment (Draft EA) for the Koa'e Workforce Housing Development being proposed by the County of Kauai Housing Agency. The pre-consultation review material was transmitted to our office by letter, dated June 19, 2015.

It is our understanding that the County of Kauai Housing Agency proposes to build approximately 130-150 affordable housing units for its elderly and workforce population. The housing types will consist of both single family detached units and multi-family attached units, on 11 acres of land in Koloa, Kauai.

The Office of Planning (OP) has reviewed the transmitted material and has the following comments to offer:

1. Pursuant to the Hawaii Administrative Rules § 11-200-17(h) – land use plans, policies, and controls – this housing project must demonstrate that it is consistent with a number of state environmental, social, and economic goals and policies for land-use and housing development. OP provides technical assistance to state and county agencies in administering the statewide planning system in Hawaii Revised Statutes (HRS) Chapter 226, the Hawaii State Plan. The Hawaii State Plan provides goals, objectives, policies, and priority guidelines for growth, development, and the allocation of resources throughout the State. The Hawaii State Plan includes diverse objectives and policies of state interest including but not limited to the economy, agriculture, the visitor industry, federal expenditure, the physical environment, facility systems, socio-cultural advancement, climate change adaptation, and sustainability.

The Draft EA should include an analysis that addresses whether the proposed project conforms or is in conflict with the goals, objectives, policies, and priority guidelines listed in the Hawaii State Plan.

2. The coastal zone management 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” see HRS § 205A-1 (definition of "coastal zone management area").

HRS Chapter 205A requires all State and county agencies to enforce the coastal zone management (CZM) objectives and policies. The Draft EA should include an assessment as to how the proposed project conforms to the CZM objectives and its supporting policies set forth in HRS § 205A-2. The assessment on compliance with HRS Chapter 205A is an important component for satisfying the requirements of HRS Chapter 343. These objectives and policies include: recreational resources, historic resources, scenic and open space resources, coastal ecosystems, economic uses, coastal hazards, managing development, public participation, beach protection, and marine resources.

3. Although the project site is a considerable distance from the coastline, it is adjacent to environmentally sensitive land and water resources (riverine wetlands and perennial streams) that ultimately connect to nearshore waters. Additionally, the entire island of Kauai can experience heavy seasonal inundation and unstable weather. In order to ensure the coastal waters and marine environment nearest to the project site remain protected, the negative effects of stormwater runoff should be considered and mitigated. The Draft EA should summarize the area’s classification in the State Land Use Districts, County of Kauai zoning as they relate to density and erosion controls, and this housing project’s relation to wetlands, perennial streams, tsunami evacuation zone, and flood zone. These items, as well as the nearshore water quality classification, should be considered when developing mitigation measures to protect the coastal ecosystem.

OP has a number of resources available to assist in the development of projects which ensure sediment and stormwater control on land, thus protecting the nearshore environment. OP recommends consulting these guidance documents and stormwater evaluative tools when developing strategies to address polluted runoff. They offer useful techniques to keep soil and sediment in place and prevent contaminating nearshore waters, while considering the practices best suited for each project. These three evaluative tools that should be used during the design process include:

Mr. Frank Camacho
July 21, 2015
Page 3

- Hawaii Watershed Guidance provides direction on site-appropriate methods to safeguard Hawaii's watersheds and implement watershed plans
[http://files.hawaii.gov/dbedt/op/czm/initiative/nonpoint/Hi Watershed Guidance Final.pdf](http://files.hawaii.gov/dbedt/op/czm/initiative/nonpoint/Hi_Watershed_Guidance_Final.pdf)
- Stormwater Impact Assessments can be used to identify and evaluate information on hydrology, stressors, sensitivity of aquatic and riparian resources, and management measures to control runoff, as well as consider secondary and cumulative impacts to the area
[http://files.hawaii.gov/dbedt/op/czm/initiative/stomwater_imapct/final_storm water_impact_assessments_guidance.pdf](http://files.hawaii.gov/dbedt/op/czm/initiative/stomwater_imapct/final_storm_water_impact_assessments_guidance.pdf)
- Low Impact Development (LID), A Practitioners Guide covers a range of structural best management practices (BMP's) for stormwater control management, roadway development, and urban layout that minimizes negative environmental impacts
http://files.hawaii.gov/dbedt/op/czm/initiative/lid/lid_guide_2006.pdf

If you have any questions regarding this comment letter, please contact Josh Hekekoa of our office at (808) 587-2845.

Sincerely,



Leo R. Asuncion
Acting Director

c: Kanani Fu, County of Kauai Housing Agency



June 19, 2015

Ms. Suzanne Case, Chairperson
Department of Land and Natural Resources
Kalanimoku Building, 1151 Punchbowl Street
Honolulu, Hawai'i, 96813

Subject: Pre-consultation for the Koae Workforce Housing Development
TMK No. (4) 2-6-004:019
Kōloa, Kaua'i, Hawai'i

Dear Ms. Case,

Community Planning and Engineering, Inc. (CP&E) on behalf of the County of Kaua'i, is in the process of preparing a Chapter 343 Hawai'i Revised Statutes (HRS) Environmental Assessment (EA) and associated Title 11, Chapter 200 Hawai'i Administrative Rules (HAR) for the proposed workforce housing development located at Tax Map Key (TMK) (4) 2-6-004:019 (the Site). The EA is also compliant with the National Environmental Protection Act (NEPA) and 24 Code of Federal Regulations (CFR) Part 58. The proposed project site is located in the town of Kōloa on the Island of Kaua'i (please see the enclosed Location Map). The EA is being prepared in order to evaluate the potential environmental, social, and economic consequences associated with the proposed project.

The purpose of the proposed project is to help the County of Kaua'i and the State of Hawai'i meet its goal to provide much needed affordable housing to its elderly residents and workforce housing for families. The proposed project site comprises approximately 11 acres and would include approximately 130-150 housing units. Planned housing types include single family detached units, as well as multi-family attached units. The County of Kaua'i acquired the Site in order for the County to develop much needed workforce housing for Kaua'i residents. We are seeking your input to identify potential environmental and/or social and economic impacts associated with the proposed project.



In conjunction with this work, we are requesting any written comments and/or information with respect to your area(s) of concern. Please send your written comments to the following address within 30 days.

CP&E
C/O Frank Camacho, Project Manager
1286 Queen Emma Street
Honolulu, HI 96813

Phone: (808) 531-4252, ext. 1040
E-mail: fcamacho@cpe-hawaii.com

We appreciate your timely review and response to this request.

Sincerely,

A handwritten signature in black ink, appearing to read 'F. Camacho', is positioned above the printed name.

Frank Camacho
Project Manager

CC: Kanani Fu
Kaua'i County Housing Agency

DAVID Y. IGE
GOVERNOR OF HAWAII



SUZANNE D. CASE
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE
MANAGEMENT

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

July 15, 2015

Community Planning
and Engineering, Inc.
1286 Queen Emma Street
Honolulu, HI 96813

via email: fcamacho@cpe-hawaii.com

Dear Mr. Camacho,

SUBJECT: Pre-Consultation for the Koaie Workforce Housing Development

Thank you for the opportunity to review and comment on the subject matter. The Department of Land and Natural Resources' (DLNR) Land Division distributed or made available a copy of your report pertaining to the subject matter to DLNR Divisions for their review and comments.

At this time, enclosed are comments from (1) Land Division – Kauai District; (2) Engineering Division; and (3) Division of Aquatic Resources. No other comments were received as of our suspense date. Should you have any questions, please feel free to call Supervising Land Agent Steve Molmen at 587-0439. Thank you.

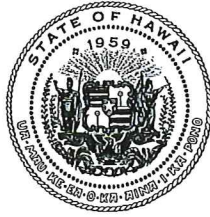
Sincerely,

A handwritten signature in blue ink, appearing to read "Russell Y. Tsuji".

Russell Y. Tsuji
Land Administrator

Enclosure(s)

DAVID Y. IGE
GOVERNOR OF HAWAII



SUZANNE D. CASE
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE
MANAGEMENT

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

June 24, 2015

MEMORANDUM

TO: *Steve Molmen*

DLNR Agencies:

- Div. of Aquatic Resources
- Div. of Boating & Ocean Recreation
- Engineering Division
- Div. of Forestry & Wildlife
- Div. of State Parks
- Commission on Water Resource Management
- Office of Conservation & Coastal Lands
- Land Division – Kauai District
- Historic Preservation

FROM: *KOLO*
SUBJECT:
LOCATION:
APPLICANT:

~~Russell Y. Tsuji, Land Administrator~~
Pre-consultation for the Koae Workforce Housing Development
TMK No. (4) 2-6-004:019; Koloa, Kauai, Hawaii
County of Kauai by its consultant, Community Planning and Engineering, Inc.

Transmitted for your review and comment on the above-referenced document. We would appreciate your comments on this document.

Please submit any comments by **July 14, 2015**. If no response is received by this date, we will assume your agency has no comments. If you have any questions about this request, please contact Supervising Land Agent Steve Molmen at (808) 587-0439. Thank you.

Attachments

- We have no objections.
- We have no comments.
- Comments are attached.

Signed: *Marvin Milcasa*
Print Name: MARVIN MILCASA
Date: JULY 1, 2015

RECEIVED
LAND DIVISION
2015 JUL 14 AM 11:06
DEPT. OF LAND & NATURAL RESOURCES
STATE OF HAWAII

DAVID Y. IGE
GOVERNOR OF HAWAII

SUZANNE D. CASE
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE
MANAGEMENT



STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

June 24, 2015

MEMORANDUM

TO: FR:

- DLNR Agencies:**
- Div. of Aquatic Resources
 - Div. of Boating & Ocean Recreation
 - Engineering Division**
 - Div. of Forestry & Wildlife
 - Div. of State Parks
 - Commission on Water Resource Management
 - Office of Conservation & Coastal Lands
 - Land Division – Kauai District
 - Historic Preservation

FROM: TO:
SUBJECT:
LOCATION:
APPLICANT:

Russell Y. Tsuji, Land Administrator
Pre-consultation for the Koae Workforce Housing Development
TMK No. (4) 2-6-004:019; Koloa, Kauai, Hawaii
County of Kauai by its consultant, Community Planning and Engineering, Inc.

RECEIVED
LAND DIVISION
2015 JUL -9 AM 10:54
DEPT. OF LAND &
NATURAL RESOURCES
STATE OF HAWAII
15 JUN 25 AM 10:44 ENGINEERING

Transmitted for your review and comment on the above-referenced document. We would appreciate your comments on this document.

Please submit any comments by **July 14, 2015**. If no response is received by this date, we will assume your agency has no comments. If you have any questions about this request, please contact Supervising Land Agent Steve Molmen at (808) 587-0439. Thank you.

Attachments

- We have no objections.
- We have no comments.
- Comments are attached.

Signed:
Print Name: Cary S. Chong, Chief Engineer
Date: 7/1/15

DEPARTMENT OF LAND AND NATURAL RESOURCES
ENGINEERING DIVISION

LD/ Russell Y. Tsuji

REF: Pre-Consultation for the Koae Workforce Housing Development, Koloa
Kauai.011

COMMENTS

- () We confirm that the project site, according to the Flood Insurance Rate Map (FIRM), is located in Flood Zone ____.
- (X) **Please take note that the project site, according to the Flood Insurance Rate Map (FIRM), is located in Flood Zones AE, AEF, XS, and X. The National Flood Insurance Program regulates developments within Zones AE, AEF, and XS as indicated in bold letters below, but not Zone X.**
- () Please note that the correct Flood Zone Designation for the project site according to the Flood Insurance Rate Map (FIRM) is ____.
- (X) **Please note that the project site must comply with the rules and regulations of the National Flood Insurance Program (NFIP) presented in Title 44 of the Code of Federal Regulations (44CFR), whenever development within a Special Flood Hazard Area is undertaken. If there are any questions, please contact the State NFIP Coordinator, Ms. Carol Tyau-Beam, of the Department of Land and Natural Resources, Engineering Division at (808) 587-0267.**

Please be advised that 44CFR indicates the minimum standards set forth by the NFIP. Your Community's local flood ordinance may prove to be more restrictive and thus take precedence over the minimum NFIP standards. If there are questions regarding the local flood ordinances, please contact the applicable County NFIP Coordinators below:

- () Mr. Mario Siu Li at (808) 768-8098 of the City and County of Honolulu, Department of Planning and Permitting.
- () Mr. Carter Romero (Acting) at (808) 961-8943 of the County of Hawaii, Department of Public Works.
- () Mr. Carolyn Cortez at (808) 270-7253 of the County of Maui, Department of Planning.
- (X) **Mr. Stanford Iwamoto at (808) 241-4896 of the County of Kauai, Department of Public Works.**
- () The applicant should include project water demands and infrastructure required to meet water demands. Please note that the implementation of any State-sponsored projects requiring water service from the Honolulu Board of Water Supply system must first obtain water allocation credits from the Engineering Division before it can receive a building permit and/or water meter.
- () The applicant should provide the water demands and calculations to the Engineering Division so it can be included in the State Water Projects Plan Update.

() Additional Comments: _____

() Other: _____

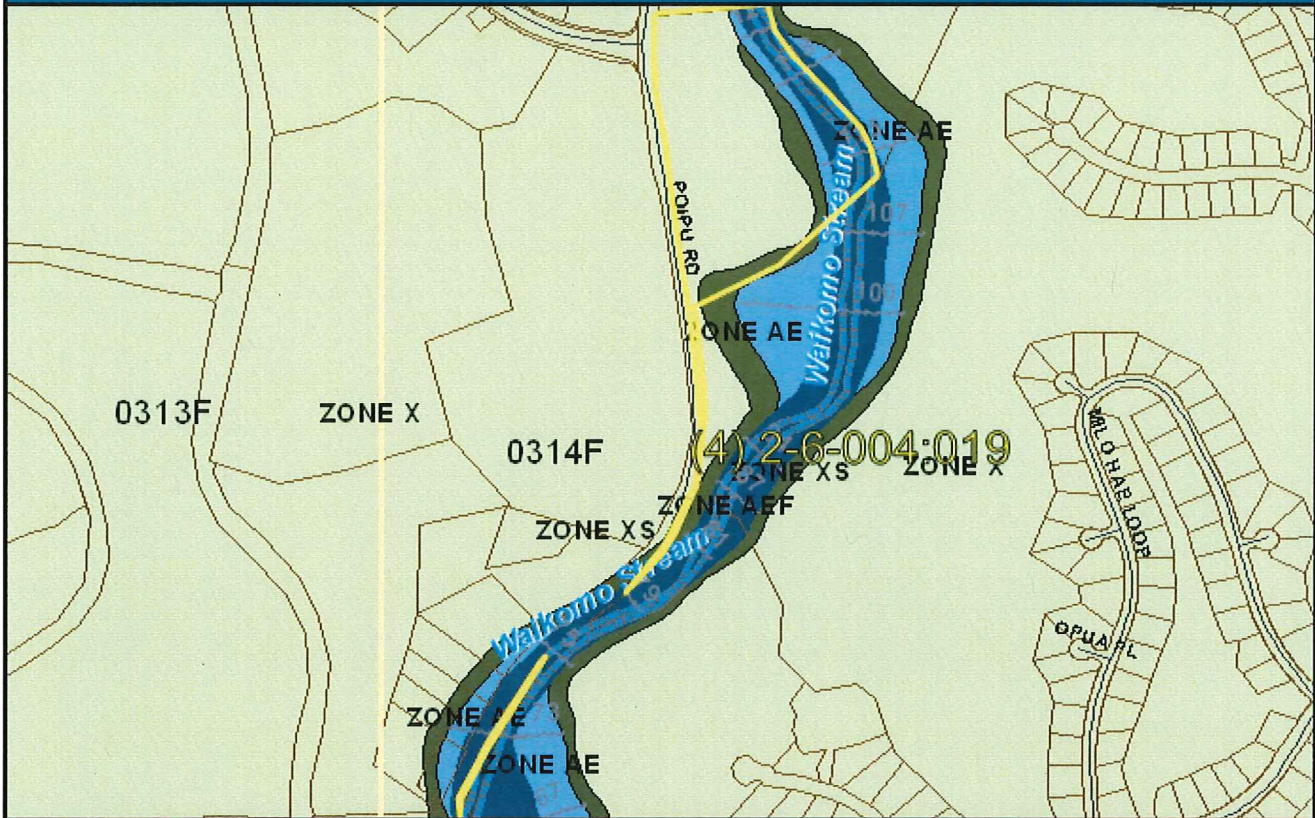
Should you have any questions, please call Mr. Dennis Imada of the Planning Branch at 587-0257.

Signed: _____
CARTY S. CHANG, CHIEF ENGINEER

Date: _____



FLOOD HAZARD ASSESSMENT REPORT



NATIONAL FLOOD INSURANCE PROGRAM

FLOOD ZONE DEFINITIONS

SPECIAL FLOOD HAZARD AREAS SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD – The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zone A, AE, AH, AO, V, and VE. The Base Flood Elevation (BFE) is the water-surface elevation of the 1% annual chance flood. Mandatory flood insurance purchase applies in these zones:

- Zone A:** No BFE determined.
- Zone AE:** BFE determined.
- Zone AH:** Flood depths of 1 to 3 feet (usually areas of ponding); BFE determined.
- Zone AO:** Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined.
- Zone V:** Coastal flood zone with velocity hazard (wave action); no BFE determined.
- Zone VE:** Coastal flood zone with velocity hazard (wave action); BFE determined.
- Zone AEF:** Floodway areas in Zone AE. The floodway is the channel of stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without increasing the BFE.

NON-SPECIAL FLOOD HAZARD AREA – An area in a low-to-moderate risk flood zone. No mandatory flood insurance purchase requirements apply, but coverage is available in participating communities.

- Zone XS (X shaded):** Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.
- Zone X:** Areas determined to be outside the 0.2% annual chance floodplain.

OTHER FLOOD AREAS

- Zone D:** Unstudied areas where flood hazards are undetermined, but flooding is possible. No mandatory flood insurance purchase requirements apply, but coverage is available in participating communities.

PROPERTY INFORMATION

COUNTY: KAUAI
TMK NO: (4) 2-6-004-019
PARCEL ADDRESS:
FIRM INDEX DATE: NOVEMBER 26, 2010
LETTER OF MAP CHANGE(S): NONE
FEMA FIRM PANEL(S): 1500020314F
PANEL EFFECTIVE DATE: NOVEMBER 26, 2010

PARCEL DATA FROM: JANUARY 2012
IMAGERY DATA FROM: MAY 2005

IMPORTANT PHONE NUMBERS

County NFIP Coordinator
 County of Kauai
 Stanford Iwamoto, P.E. (808) 241-4896
State NFIP Coordinator
 Carol Tyau-Beam, P.E., CFM (808) 587-0267

Disclaimer: The Department of Land and Natural Resources (DLNR) assumes no responsibility arising from the use of the information contained in this report. Viewers/Users are responsible for verifying the accuracy of the information and agree to indemnify the DLNR from any liability, which may arise from its use.

If this map has been identified as 'PRELIMINARY' or 'UNOFFICIAL', please note that it is being provided for informational purposes and is not to be used for official/legal decisions, regulatory compliance, or flood insurance rating. Contact your county NFIP coordinator for flood zone determinations to be used for compliance with local floodplain management regulations.

DAVID Y. IGE
GOVERNOR OF HAWAII



RECEIVED
LAND DIVISION

2015 JUL 15 PM 2:30



SUZANNE D. CASE
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE
MANAGEMENT

DEPT. OF LAND &
NATURAL RESOURCES
STATE OF HAWAII

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

June 24, 2015

MEMORANDUM



DAR # 5134

TO:

DLNR Agencies:

- Div. of Aquatic Resources
- Div. of Boating & Ocean Recreation
- Engineering Division
- Div. of Forestry & Wildlife
- Div. of State Parks
- Commission on Water Resource Management
- Office of Conservation & Coastal Lands
- Land Division – Kauai District
- Historic Preservation

JK ✓
GH ✓
BK ✓

FROM:

Russell Y. Tsuji, Land Administrator

SUBJECT:

Pre-consultation for the Koaie Workforce Housing Development

LOCATION:

TMK No. (4) 2-6-004:019; Koloa, Kauai, Hawaii

APPLICANT:

County of Kauai by its consultant, Community Planning and Engineering, Inc.

Transmitted for your review and comment on the above-referenced document. We would appreciate your comments on this document.

Please submit any comments by **July 14, 2015**. If no response is received by this date, we will assume your agency has no comments. If you have any questions about this request, please contact Supervising Land Agent Steve Molmen at (808) 587-0439. Thank you.

Attachments

- We have no objections.
- We have no comments.
- Comments are attached. GRH

Signed: Alton Miyasaka
Print Name: Alton Miyasaka, Acting Administrator
Date: 7-14-15

DAVID Y. IGE
GOVERNOR OF HAWAII



SUZANNE D. CASE
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

KEKOA KALUHIWA
FIRST DEPUTY

W. ROY HARDY
ACTING 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
DEPARTMENT OF LAND AND NATURAL RESOURCES
DIVISION OF AQUATIC RESOURCES
1151 PUNCHBOWL STREET, ROOM 330
HONOLULU, HAWAII 96813

July 14, 2015

Date: 7/14/15
DAR # 5134

MEMORANDUM

TO: Alton Miyasaka, Acting Administrator *Alton Miyasaka*
DATE: 7-14-15
FROM: Glenn Higashi, Aquatic Biologist *GRH*

SUBJECT: Request for Comments: Pre-consultation for the Koaie Workforce Housing Development, Koloa, Kauai

Comment	Date Request	Receipt	Referral	Due Date
	6/24/15	6/25/15	6/25/15	7/14/15

Requested by: Russell Y. Tsuji, Land Administrator

Summary of Proposed Project

Title: Request for Comments: Pre-consultation for the Koaie Workforce Housing Development, Tax Map Key No. (4) 2-6-004:019; Koloa, Kauai

Project by: County of Kauai by its consultant Community Planning and Engineering, Inc.

Location: Koloa, Kauai

Brief Description:

Community Planning and Engineering, Inc. on behalf of the County of Kauai, is in the process of preparing a Chapter 343 Hawaii Revised Statutes (HRS) Environmental Assessment (EA) and associated Title 11, Chapter 200 Hawaii Administrative Rules (HAR) for the proposed workforce housing development located at Tax Map Key (TMK) (4) 2-6-004:019, The EA is also compliant with the National Environmental Protection Act (NEPA) and 24 Code of Federal Regulations (CPR) Part 58. The proposed project site is located in the town of Koloa on the island of Kauai. The EA is being prepared in order to evaluate the potential environmental, social, and economic consequences associated with the project.

The purpose of the project is to help the County of Kauai and State of Hawaii meet its goal to provide much needed affordable housing to its elderly residents and workforce housing for families. The proposed project site comprises approximately 11 acres and would include approximately 130-150 housing units. Planned housing types include single family detached units, as well as multi-family attached units.

The proposed development site encompasses approximately 10 acres of land which is bound on the west by Poipu Road, residential development on the north, Waikomo Stream on the east and the Kiahuna Golf Course on the south. There is a small fruit stand and attendant parking lot on the southwest corner of the site and a paved haul-cane road which transects the site from the southeast corner to the northeast corner. The majority of the site was formerly sugar cane, but is now covered by Guinea grass (*Panicum maximum*) and koa haole (*Leucaena leucocephala*) scrubland. The habitat along the stream consists of koa haole and a mix of alien tree species including Java plum (*Syzygium cumini*), Chinese banyan (*Ficus microcarpa*), and hau (*Hibiscus tiliaceus*). In areas along the stream banks where the tree canopy is relatively open there are thick stands of umbrella sedge (*Cyperus alternifolius*) and wedelia (*Sphagneticola trilobata*) along with other alien shrubs and weedy species.

Comments:

Based on the information provided, it cannot be determined whether the proposed project will have a significant impact on the aquatic resource values in this area. Because the northeast boundary of the proposed project site is adjacent to Waikomo Stream design plans for the proposed project need to be provided in order to determine what impacts this project may or may not have to aquatic resources in this area. Plans and construction procedures should incorporate eco-friendly designs/techniques and Best Management Practices (BMPs) to minimize the stream impacts from erosion, siltation and pollution.

Mitigative measures should include:

- 1) lands and stream banks denuded of vegetation should be planted or covered as quickly as possible to prevent erosion and sediment from falling into the stream/estuary environment;
- 2) scheduling site work during periods of minimal rainfall;
- 3) prevent construction materials, petroleum products, debris and landscaping products from falling, blowing or leaching into the aquatic environment;
- 4) use of native vegetation in new landscaped areas where possible; and,
- 5) design/use of structures to minimize impermeability of surfaces and decrease runoff.

Thank you for providing DAR the opportunity to review and comment on the proposed project. Should design plans for the proposed project become available, DAR requests the opportunity to review and comment on those plans.



June 19, 2015

Mr. W. Roy Hardy
Acting Deputy Director
Department of Land and Natural Resources, Water Resource Management
P.O. Box 621
Honolulu, Hawai'i 96809

Subject: Pre-consultation for the Koa'e Workforce Housing Development
TMK No. (4) 2-6-004:019
Kōloa, Kaua'i, Hawai'i

Dear Mr. Hardy,

Community Planning and Engineering, Inc. (CP&E) on behalf of the County of Kaua'i, is in the process of preparing a Chapter 343 Hawai'i Revised Statutes (HRS) Environmental Assessment (EA) and associated Title 11, Chapter 200 Hawai'i Administrative Rules (HAR) for the proposed workforce housing development located at Tax Map Key (TMK) (4) 2-6-004:019 (the Site). The EA is also compliant with the National Environmental Protection Act (NEPA) and 24 Code of Federal Regulations (CFR) Part 58. The proposed project site is located in the town of Kōloa on the Island of Kaua'i (please see the enclosed Location Map). The EA is being prepared in order to evaluate the potential environmental, social, and economic consequences associated with the proposed project.

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In conjunction with this work, we are requesting any written comments and/or information with respect to your area(s) of concern. Please send your written comments to the following address within 30 days.

CP&E
C/O Frank Camacho, Project Manager
1286 Queen Emma Street
Honolulu, HI 96813

Phone: (808) 531-4252, ext. 1040
E-mail: fcamacho@cpe-hawaii.com

We appreciate your timely review and response to this request.

Sincerely,

A handwritten signature in black ink, appearing to read 'F. Camacho', is written over a light blue horizontal line.

Frank Camacho
Project Manager

CC: Kanani Fu
Kaua'i County Housing Agency



June 19, 2015

Mr. Bill Arakaki
Superintendent
State of Hawai'i Department of Education
3060 Eiwa Street, Suite 305
Līhu'e, Hawai'i 96766

Subject: Pre-consultation for the Koae Workforce Housing Development
TMK No. (4) 2-6-004:019
Kōloa, Kaua'i, Hawai'i

Dear Mr. Arakaki:

Community Planning and Engineering, Inc. (CP&E) on behalf of the County of Kaua'i, is in the process of preparing a Chapter 343 Hawai'i Revised Statutes (HRS) Environmental Assessment (EA) and associated Title 11, Chapter 200 Hawai'i Administrative Rules (HAR) for the proposed workforce housing development located at Tax Map Key (TMK) (4) 2-6-004:019 (the Site). The EA is also compliant with the National Environmental Protection Act (NEPA) and 24 Code of Federal Regulations (CFR) Part 58. The proposed project site is located in the town of Kōloa on the Island of Kaua'i (please see the enclosed Location Map). The EA is being prepared in order to evaluate the potential environmental, social, and economic consequences associated with the proposed project.

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CP&E
C/O Frank Camacho, Project Manager
1286 Queen Emma Street
Honolulu, HI 96813

Phone: (808) 531-4252, ext. 1040
E-mail: fcamacho@cpe-hawaii.com

We appreciate your timely review and response to this request.

Sincerely,

A handwritten signature in black ink, appearing to read 'F. Camacho', is positioned above the printed name.

Frank Camacho
Project Manager

CC: Kanani Fu
Kaua'i County Housing Agency



June 19, 2015

Dr. Dileep G. Bal, M.D., M.A., MPH, Chief
District Environmental Health Program - Kaua'i
State of Hawai'i Department of Health
3040 Umi Street
Līhu'e, Hawai'i 96766

Subject: Pre-consultation for the Koae Workforce Housing Development
TMK No. (4) 2-6-004:019
Kōloa, Kaua'i, Hawai'i

Dear Dr. Bal:

Community Planning and Engineering, Inc. (CP&E) on behalf of the County of Kaua'i, is in the process of preparing a Chapter 343 Hawai'i Revised Statutes (HRS) Environmental Assessment (EA) and associated Title 11, Chapter 200 Hawai'i Administrative Rules (HAR) for the proposed workforce housing development located at Tax Map Key (TMK) (4) 2-6-004:019 (the Site). The EA is also compliant with the National Environmental Protection Act (NEPA) and 24 Code of Federal Regulations (CFR) Part 58. The proposed project site is located in the town of Kōloa on the Island of Kaua'i (please see the enclosed Location Map). The EA is being prepared in order to evaluate the potential environmental, social, and economic consequences associated with the proposed project.

The purpose of the proposed project is to help the County of Kaua'i and the State of Hawai'i meet its goal to provide much needed affordable housing to its elderly residents and workforce housing for families. The proposed project site comprises approximately 11 acres and would include approximately 130-150 housing units. Planned housing types include single family detached units, as well as multi-family attached units. The County of Kaua'i acquired the Site in order for the County to develop much needed workforce housing for Kaua'i residents. We are seeking your input to identify potential environmental and/or social and economic impacts associated with the proposed project.



In conjunction with this work, we are requesting any written comments and/or information with respect to your area(s) of concern. Please send your written comments to the following address within 30 days.

CP&E
C/O Frank Camacho, Project Manager
1286 Queen Emma Street
Honolulu, HI 96813

Phone: (808) 531-4252, ext. 1040
E-mail: fcamacho@cpe-hawaii.com

We appreciate your timely review and response to this request.

Sincerely,

A handwritten signature in black ink, appearing to read 'F. Camacho', is written over a light blue horizontal line.

Frank Camacho
Project Manager

CC: Kanani Fu
Kaua'i County Housing Agency

June 19, 2015

Ms. Laura McIntyre, Manager
State of Hawai'i Department of Health Environmental Planning Office
919 Ala Moana Boulevard
Honolulu, Hawai'i 96814

Subject: Pre-consultation for the Koaie Workforce Housing Development
TMK No. (4) 2-6-004:019
Kōloa, Kaua'i, Hawai'i

Dear Ms. McIntyre:

Community Planning and Engineering, Inc. (CP&E) on behalf of the County of Kaua'i, is in the process of preparing a Chapter 343 Hawai'i Revised Statutes (HRS) Environmental Assessment (EA) and associated Title 11, Chapter 200 Hawai'i Administrative Rules (HAR) for the proposed workforce housing development located at Tax Map Key (TMK) (4) 2-6-004:019 (the Site). The EA is also compliant with the National Environmental Protection Act (NEPA) and 24 Code of Federal Regulations (CFR) Part 58. The proposed project site is located in the town of Kōloa on the Island of Kaua'i (please see the enclosed Location Map). The EA is being prepared in order to evaluate the potential environmental, social, and economic consequences associated with the proposed project.

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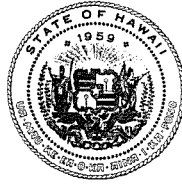
Sincerely,

A handwritten signature in black ink, appearing to read 'F. Camacho', is written in a cursive style.

Frank Camacho
Project Manager

CC: Kanani Fu
Kaua'i County Housing Agency

DAVID Y. IGE
GOVERNOR OF HAWAII



VIRGINIA PRESSLER, M.D.
DIRECTOR OF HEALTH

STATE OF HAWAII
DEPARTMENT OF HEALTH
P. O. BOX 3378
HONOLULU, HI 96801-3378

In reply, please refer to:
File:

EPO 15-145

July 10, 2015

Mr. Frank Camacho, Project Manager
Community Planning and Engineering, Inc.
1286 Queen Emma Street
Honolulu, Hawaii 96813
Via email: fcamacho@cpe-hawaii.com

Dear Mr. Camacho:

**SUBJECT: Pre-consultation for Draft Environmental Assessment (PC DEA) for the
Koae Workforce Housing Development
TMK: (4) 2-6-004:019, Koloa, Kauai**

The Department of Health (DOH), Environmental Planning Office (EPO), acknowledges receipt of your PC DEA to our office on June 22, 2015. Thank you for allowing us to review and comment on the proposed project. The PC was routed to the District Health Office on Kauai, and the Clean Water branch. They will provide specific comments to you if necessary. EPO recommends that you review the standard comments and available strategies to support sustainable and healthy design provided at: <http://health.hawaii.gov/epo/home/landuse-planning-review-program>. Projects are required to adhere to all applicable standard comments.

We encourage you to examine and utilize the Hawaii Environmental Health Portal. The portal provides links to our e-Permitting Portal, Environmental Health Warehouse, Groundwater Contamination Viewer, Hawaii Emergency Response Exchange, Hawaii State and Local Emission Inventory System, Water Pollution Control Viewer, Water Quality Data, Warnings, Advisories and Postings. The Portal is continually updated. Please visit it regularly at: <https://eha-cloud.doh.hawaii.gov>

You may also wish to review the revised Water Quality Standards Maps that have been updated for all islands. The Water Quality Standards Maps can be found at: <http://health.hawaii.gov/cwb/site-map/clean-water-branch-home-page/water-quality-standards>

We request that you utilize all of this information on your proposed project to increase sustainable, innovative, inspirational, transparent and healthy design.

Mahalo nui loa,

A handwritten signature in black ink, appearing to read "Laura Leialoha Phillips McIntyre".

Laura Leialoha Phillips McIntyre, AICP
Program Manager, Environmental Planning Office

c: DHO Kauai, CWB {via email only}

RECEIVED
JUL 16 2015

COMMUNITY PLANNING AND ENGINEERING INC.



STATE OF HAWAII
DEPARTMENT OF HEALTH
P. O. BOX 3378
HONOLULU, HI 96801-3378

In reply, please refer to:
File:

EPO 15-244

September 24, 2015

Mr. Kamuela Cobb-Adams
Director
County of Kauai
Piikoi Building
4444 Rice Street, Suite 330
Lihue, Hawaii 96766

Dear Mr. Cobb-Adams:

**SUBJECT: Draft Environmental Assessment (DEA) for Koaie Workforce Housing Development
Koloa, Kauai
TMK: (4) 2-6-004:019**

The Department of Health (DOH), Environmental Planning Office (EPO), acknowledges receipt of your DEA to our office via the OEQC link:

http://oeqc.doh.hawaii.gov/Shared%20Documents/EA_and_EIS_Online_Library/Kauai/2010s/2015-09-23-KA-5B-DEA-Koaie-Workforce-Housing-Development.pdf

EPO strongly recommends that you review the standard comments and available strategies to support sustainable and healthy design provided at: <http://health.hawaii.gov/epo/landuse>. Projects are required to adhere to all applicable standard comments.

We suggest you review the requirements for the National Pollutant Discharge Elimination System (NPDES) permit. We recommend contacting the Clean Water Branch at (808) 586-4309 or cleanwaterbranch@doh.hawaii.gov after relevant information is reviewed at:

1. <http://health.hawaii.gov/cwb>
2. <http://health.hawaii.gov/cwb/site-map/clean-water-branch-home-page/standard-npdes-permit-conditions>
3. <http://health.hawaii.gov/cwb/site-map/clean-water-branch-home-page/forms>

Please note that all wastewater plans must conform to applicable provisions of the Department of Health's Administrative Rules, Chapter 11-62, "Wastewater Systems". We do reserve the right to review the detailed wastewater plans for conformance to applicable rules. Should you have any questions, please review online guidance at: <http://health.hawaii.gov/wastewater> and contact the Planning and Design Section of the Wastewater Branch at 586-4294.

RECEIVED
OCT - 1 2015

Mr. Kamuela Cobb-Adams
Page 2
September 24, 2015

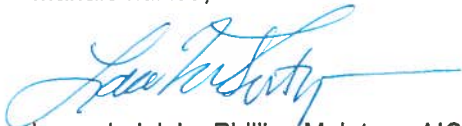
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<http://health.hawaii.gov/cwb/site-map/clean-water-branch-home-page/water-quality-standards>

In order to better protect public health and the environment, the U.S. Environmental Protection Agency (EPA) has developed a new environmental justice (EJ) mapping and screening tool called EJSCREEN. It is based on nationally consistent data and combines environmental and demographic indicators in maps and reports. EPO encourages you to explore, launch and utilize this powerful tool in planning your project. The EPA EJSCREEN tool is available at: <http://www2.epa.gov/ejscreen>

We request that you utilize all of this information on your proposed project to increase sustainable, innovative, inspirational, transparent and healthy design.

Mahalo nui loa,



Laura Leialoha Phillips McIntyre, AICP
Program Manager, Environmental Planning Office

Attachment: U.S. EPA EJSCREEN 3 page report

c: Anson Murayama, P.E., Community Planning and Engineering
DOH: DHO Kauai, CWB, WWB (via email only)

Save as PDF

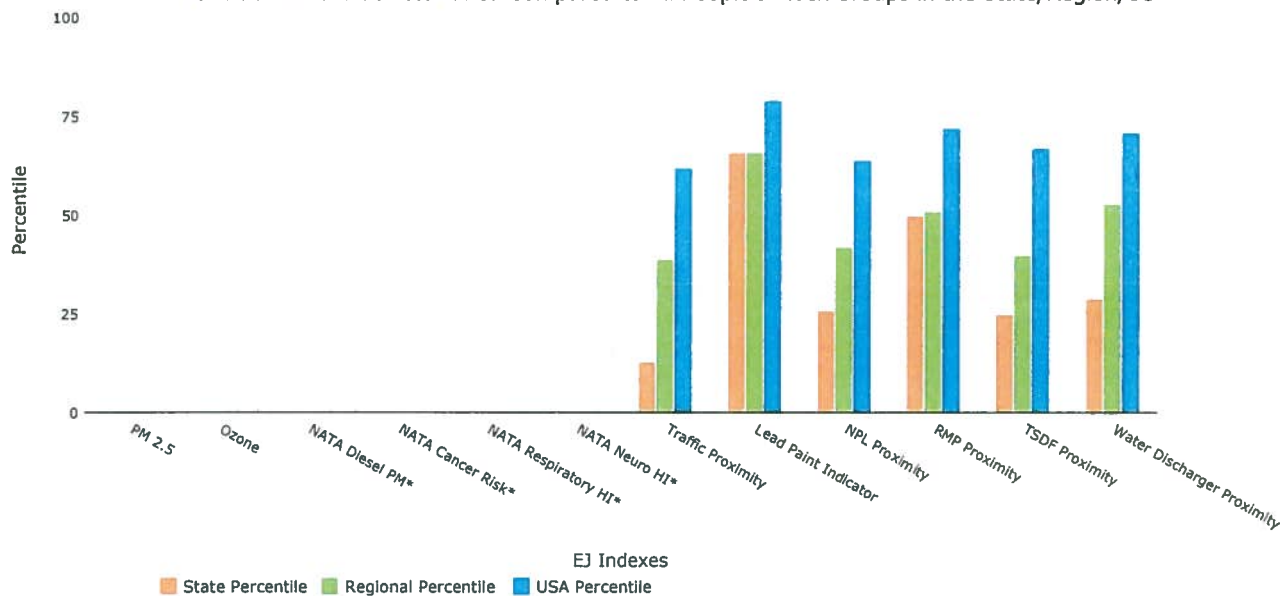


EJSCREEN Report for the User Specified Area
HAWAII, EPA Region 9
Approximate Population: 1947



Selected Variables	Percentile in State	Percentile in EPA Region	Percentile in USA
EJ Indexes			
EJ Index for Particulate Matter (PM 2.5)	N/A	N/A	N/A
EJ Index for Ozone	N/A	N/A	N/A
EJ Index for NATA Diesel PM*	N/A	N/A	N/A
EJ Index for NATA Air Toxics Cancer Risk*	N/A	N/A	N/A
EJ Index for NATA Respiratory Hazard Index*	N/A	N/A	N/A
EJ Index for NATA Neurological Hazard Index*	N/A	N/A	N/A
EJ Index for Traffic Proximity and Volume	13	39	62
EJ Index for Lead Paint Indicator	66	66	79
EJ Index for NPL Proximity	26	42	64
EJ Index for RMP Proximity	50	51	72
EJ Index for TSDF Proximity	25	40	67
EJ Index for Water Discharger Proximity	29	53	71

EJ Index for the Selected Area Compared to All People's Block Groups in the State/Region/US

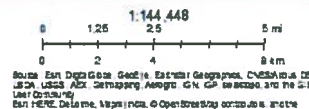


This report shows environmental, demographic, and EJ indicator values. It shows environmental and demographic raw data (e.g., the estimated concentration of ozone in the air), and also shows what percentile each raw data value represents. These percentiles provide perspective on how the selected block group or buffer area compares to the entire state, EPA region, or nation. For example, if a given location is at the 95th percentile nationwide, this means that only 5 percent of the US population has a higher block group value than the average person in the location being analyzed. The years for which the data are available, and the methods used, vary across these indicators. Important caveats and uncertainties apply to this screening-level information, so it is essential to understand the limitations on appropriate interpretations and applications of these indicators. Please see EJSCREEN documentation for discussion of these issues before using reports.



September 24, 2015

Digitized Polygon

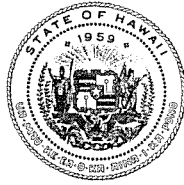


Selected Variables	Raw data	State Average	%ile in State	EPA Region Average	%ile in EPA Region	USA Average	%ile in USA
Environmental Indicators							
Particulate Matter (PM 2.5 in $\mu\text{g}/\text{m}^3$)	N/A	N/A	N/A	9.95	N/A	9.78	N/A
Ozone (ppb)	N/A	N/A	N/A	49.7	N/A	46.1	N/A
NATA Diesel PM ($\mu\text{g}/\text{m}^3$)*	N/A	N/A	N/A	N/A	N/A	N/A	N/A
NATA Air Toxics Cancer Risk (risk per MM)*	N/A	N/A	N/A	N/A	N/A	N/A	N/A
NATA Respiratory Hazard Index*	N/A	N/A	N/A	N/A	N/A	N/A	N/A
NATA Neurological Hazard Index*	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Traffic Proximity and Volume (daily traffic count/distance to road)	3.4	280	4	190	4	110	8
Lead Paint Indicator (% pre-1980s housing)	0.21	0.17	64	0.25	56	0.3	50
NPL Proximity (site count/km distance)	0.0061	0.092	24	0.11	6	0.096	2
RMP Proximity (facility count/km distance)	0.099	0.18	51	0.41	22	0.31	34
TSDF Proximity (facility count/km distance)	0.006	0.092	21	0.12	2	0.054	13
Water Discharger Proximity (count/km)	0.074	0.33	18	0.19	26	0.25	23
Demographic Indicators							
Demographic Index	51%	51%	50	46%	59	35%	75
Minority Population	80%	77%	45	57%	71	36%	85
Low Income Population	23%	25%	51	35%	36	34%	36
Linguistically Isolated Population	8%	6%	75	9%	59	5%	80
Population with Less Than High School Education	13%	10%	72	18%	48	14%	56
Population under Age 5	5%	6%	43	7%	39	7%	42
Population over Age 64	16%	14%	60	12%	76	13%	70

*The National-Scale Air Toxics Assessment (NATA) environmental indicators and EJ indexes, which include cancer risk, respiratory hazard, neurodevelopment hazard, and diesel particulate matter will be added into EJSCREEN during the first full public update after the soon-to-be-released 2011 dataset is made available. The National-Scale Air Toxics Assessment (NATA) is EPA's ongoing, comprehensive evaluation of air toxics in the United States. EPA developed the NATA to prioritize air toxics, emission sources, and locations of interest for further study. It is important to remember that NATA provides broad estimates of health risks over geographic areas of the country, not definitive risks to specific individuals or locations. More information on the NATA analysis can be found at: <http://www.epa.gov/ttn/atw/natamain/index.html>.

For additional information, see: www.epa.gov/environmentaljustice

EJSCREEN is a screening tool for pre-decisional use only. It can help identify areas that may warrant additional consideration, analysis, or outreach. It does not provide a basis for decision-making, but it may help identify potential areas of EJ concern. Users should keep in mind that screening tools are subject to substantial uncertainty in their demographic and environmental data, particularly when looking at small geographic areas. Important caveats and uncertainties apply to this screening-level information, so it is essential to understand the limitations on appropriate interpretations and applications of these indicators. Please see EJSCREEN documentation for discussion of these issues before using reports. This screening tool does not provide data on every environmental impact and demographic factor that may be relevant to a particular location. EJSCREEN outputs should be supplemented with additional information and local knowledge before taking any action to address potential EJ concerns.



STATE OF HAWAII
DEPARTMENT OF HEALTH
P. O. BOX 3378
HONOLULU, HI 96801-3378

In reply, please refer to:
File:

08023PCTM.15

August 17, 2015

Mr. Frank Camacho
Project Manager
CP&E, Inc.
1286 Queen Emma Street
Honolulu, Hawaii 96813

RECEIVED
AUG 20 2015

COMMUNITY PLANNING AND ENGINEERING DIV

Dear Mr. Camacho:

SUBJECT: Comments on the Pre-consultation for Draft Environmental Assessment (DEA) for the Koa'e Workforce Housing Development, TMK (4) 2-6-004:019 Koloa, Island of Kauai, Hawaii

The Department of Health (DOH), Clean Water Branch (CWB), acknowledges receipt of your letter, dated July 10, 2015, requesting comments on your project. The DOH-CWB has reviewed the subject document and offers these comments. Please note that our review is based solely on the information provided in the subject document and its compliance with the Hawaii Administrative Rules (HAR), Chapters 11-54 and 11-55. You may be responsible for fulfilling additional requirements related to our program. We recommend that you also read our standard comments on our website at: <http://health.hawaii.gov/epo/files/2013/05/Clean-Water-Branch-Std-Comments.pdf>

1. Any project and its potential impacts to State waters must meet the following criteria:
 - a. Antidegradation policy (HAR, Section 11-54-1.1), which requires that the existing uses and the level of water quality necessary to protect the existing uses of the receiving State water be maintained and protected.
 - b. Designated uses (HAR, Section 11-54-3), as determined by the classification of the receiving State waters.
 - c. Water quality criteria (HAR, Sections 11-54-4 through 11-54-8).
2. You may be required to obtain National Pollutant Discharge Elimination System (NPDES) permit coverage for discharges of wastewater, including storm water runoff, into State surface waters (HAR, Chapter 11-55).

For NPDES general permit coverage, a Notice of Intent (NOI) form must be submitted at least 30 calendar days before the commencement of the discharge. An application for a NPDES individual permit must be submitted at least 180 calendar days before the commencement of the discharge. To request NPDES permit coverage, you must submit the applicable form ("CWB Individual NPDES Form" or "CWB NOI Form") through the e-Permitting Portal and the hard copy certification statement with the respective filing fee (\$1,000 for an individual NPDES permit or \$500 for a Notice of General Permit Coverage). Please open the e-Permitting Portal website located at: <https://eha-cloud.doh.hawaii.gov/epermit/>. You will be asked to do a one-time registration to obtain your login and password. After you register, click on the Application Finder tool and locate the appropriate form. Follow the instructions to complete and submit the form.

3. If your project involves work in, over, or under waters of the United States, it is highly recommended that you contact the Army Corp of Engineers, Regulatory Branch (Tel: 835-4303) regarding their permitting requirements.

Pursuant to Federal Water Pollution Control Act [commonly known as the "Clean Water Act" (CWA)], Paragraph 401(a)(1), a Section 401 Water Quality Certification (WQC) is required for "[a]ny applicant for Federal license or permit to conduct any activity including, but not limited to, the construction or operation of facilities, which may **result** in any discharge into the navigable waters..." (emphasis added). The term "discharge" is defined in CWA, Subsections 502(16), 502(12), and 502(6); Title 40 of the Code of Federal Regulations, Section 122.2; and Hawaii Administrative Rules (HAR), Chapter 11-54.

4. Please note that all discharges related to the project construction or operation activities, whether or not NPDES permit coverage and/or Section 401 WQC are required, must comply with the State's Water Quality Standards. Noncompliance with water quality requirements contained in HAR, Chapter 11-54, and/or permitting requirements, specified in HAR, Chapter 11-55, may be subject to penalties of \$25,000 per day per violation.
5. It is the State's position that all projects must reduce, reuse, and recycle to protect, restore, and sustain water quality and beneficial uses of State waters. Project planning should:
 - a. Treat storm water as a resource to be protected by integrating it into project planning and permitting. Storm water has long been recognized as a source of irrigation that will not deplete potable water resources. What is often overlooked is that storm water recharges ground water supplies and feeds streams and estuaries; to ensure that these water cycles are not disrupted, storm water cannot be relegated as a waste product of impervious surfaces. Any project planning must recognize storm water as an asset that sustains and protects natural ecosystems and traditional beneficial uses of State waters, like

community beautification, beach going, swimming, and fishing. The approaches necessary to do so, including low impact development methods or ecological bio-engineering of drainage ways must be identified in the planning stages to allow designers opportunity to include those approaches up front, prior to seeking zoning, construction, or building permits.

- b. Clearly articulate the State's position on water quality and the beneficial uses of State waters. The plan should include statements regarding the implementation of methods to conserve natural resources (e.g. minimizing potable water for irrigation, gray water re-use options, energy conservation through smart design) and improve water quality.
- b. Consider storm water Best Management Practice (BMP) approaches that minimize the use of potable water for irrigation through storm water storage and reuse, percolate storm water to recharge groundwater to revitalize natural hydrology, and treat storm water which is to be discharged.
- c. Consider the use of green building practices, such as pervious pavement and landscaping with native vegetation, to improve water quality by reducing excessive runoff and the need for excessive fertilization, respectively.
- e. Identify opportunities for retrofitting or bio-engineering existing storm water infrastructure to restore ecological function while maintaining, or even enhancing, hydraulic capacity. Particular consideration should be given to areas prone to flooding, or where the infrastructure is aged and will need to be rehabilitated.

If you have any questions, please visit our website at: <http://health.hawaii.gov/cwb/>, or contact the Engineering Section, CWB, at (808) 586-4309.

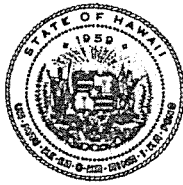
Sincerely,

Handwritten signature of ALEC WONG in cursive, with initials 'TH & AW' written to the right.

ALEC WONG, P.E., CHIEF
Clean Water Branch

CTM:ay

DAVID Y. IGE
GOVERNOR OF HAWAII



VIRGINIA PRESSLER, M.D.
DIRECTOR OF HEALTH

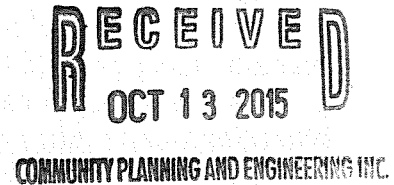
STATE OF HAWAII
DEPARTMENT OF HEALTH
P. O. BOX 3378
HONOLULU, HI 96801-3378

In reply, please refer to:
EMD/CWB

10019PJF.15

October 7, 2015

Mr. Kamuela Cobb-Adams
Director
County of Kauai
Piikoi Building
4444 Rice Street, Suite 330
Lihue, Hawaii 96766



Dear Mr. Cobb-Adams:

**SUBJECT: Draft Environmental Assessment (DEA) for
Koae (Kauai) Workforce Housing Development Project
TMK: (4) 2-6-004:019
Koloa, Island of Kauai, Hawaii**

The Department of Health (DOH), Clean Water Branch (CWB), acknowledges receipt of your letter, dated September 8, 2015, requesting comments on your project. The DOH-CWB has reviewed the subject document and offers these comments. Please note that our review is based solely on the information provided in the subject document and its compliance with the Hawaii Administrative Rules (HAR), Chapters 11-54 and 11-55. You may be responsible for fulfilling additional requirements related to our program. We recommend that you also read our standard comments on our website at: <http://health.hawaii.gov/epo/files/2013/05/Clean-Water-Branch-Std-Comments.pdf>.

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natural ecosystems and traditional beneficial uses of State waters, like community beautification, beach going, swimming, and fishing. The approaches necessary to do so, including low impact development methods or ecological bio-engineering of drainage ways must be identified in the planning stages to allow designers opportunity to include those approaches up front, prior to seeking zoning, construction, or building permits.

- b. Clearly articulate the State's position on water quality and the beneficial uses of State waters. The plan should include statements regarding the implementation of methods to conserve natural resources (e.g., minimizing potable water for irrigation, gray water re-use options, energy conservation through smart design) and improve water quality.
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- d. Consider the use of green building practices, such as pervious pavement and landscaping with native vegetation, to improve water quality by reducing excessive runoff and the need for excessive fertilization, respectively.
- e. Identify opportunities for retrofitting or bio-engineering existing storm water infrastructure to restore ecological function while maintaining, or even enhancing, hydraulic capacity. Particular consideration should be given to areas prone to flooding, or where the infrastructure is aged and will need to be rehabilitated.

If you have any questions, please visit our website at: <http://health.hawaii.gov/cwb/>, or contact the Engineering Section, CWB, at (808) 586-4309.

Sincerely,


for
ALEC WONG, P.E., CHIEF
Clean Water Branch

JF:ay

- c: DOH-EPO [via e-mail only]
Mr. Anson Murayama, Community Planning and Engineering, Inc.
EPO # 15-244



June 19, 2015

Mr. Alvin Takeshita, P.E.
Highways Administrator
HDOT Highways Division
869 Punchbowl Street, Room 513
Honolulu, Hawai'i 96813

Subject: Pre-consultation for the Koae Workforce Housing Development
TMK No. (4) 2-6-004:019
Kōloa, Kaua'i, Hawai'i

Dear Mr. Takeshita:

Community Planning and Engineering, Inc. (CP&E) on behalf of the County of Kaua'i, is in the process of preparing a Chapter 343 Hawai'i Revised Statutes (HRS) Environmental Assessment (EA) and associated Title 11, Chapter 200 Hawai'i Administrative Rules (HAR) for the proposed workforce housing development located at Tax Map Key (TMK) (4) 2-6-004:019 (the Site). The EA is also compliant with the National Environmental Protection Act (NEPA) and 24 Code of Federal Regulations (CFR) Part 58. The proposed project site is located in the town of Kōloa on the Island of Kaua'i (please see the enclosed Location Map). The EA is being prepared in order to evaluate the potential environmental, social, and economic consequences associated with the proposed project.

The purpose of the proposed project is to help the County of Kaua'i and the State of Hawai'i meet its goal to provide much needed affordable housing to its elderly residents and workforce housing for families. The proposed project site comprises approximately 11 acres and would include approximately 130-150 housing units. Planned housing types include single family detached units, as well as multi-family attached units. The County of Kaua'i acquired the Site in order for the County to develop much needed workforce housing for Kaua'i residents. We are seeking your input to identify potential environmental and/or social and economic impacts associated with the proposed project.



In conjunction with this work, we are requesting any written comments and/or information with respect to your area(s) of concern. Please send your written comments to the following address within 30 days.

CP&E
C/O Frank Camacho, Project Manager
1286 Queen Emma Street
Honolulu, HI 96813

Phone: (808) 531-4252, ext. 1040
E-mail: fcamacho@cpe-hawaii.com

We appreciate your timely review and response to this request.

Sincerely,

A handwritten signature in black ink, appearing to read 'F. Camacho', is positioned above the printed name.

Frank Camacho
Project Manager

CC: Kanani Fu
Kaua'i County Housing Agency



June 19, 2015

Mr. Raymond J. McCormick, P.E.
District Engineer
State of Hawai'i Department of Transportation – Kaua'i District
1720 Haleukana Street
Līhu'e, Hawai'i 96766

Subject: Pre-consultation for the Koae Workforce Housing Development
TMK No. (4) 2-6-004:019
Kōloa, Kaua'i, Hawai'i

Dear Mr. McCormick:

Community Planning and Engineering, Inc. (CP&E) on behalf of the County of Kaua'i, is in the process of preparing a Chapter 343 Hawai'i Revised Statutes (HRS) Environmental Assessment (EA) and associated Title 11, Chapter 200 Hawai'i Administrative Rules (HAR) for the proposed workforce housing development located at Tax Map Key (TMK) (4) 2-6-004:019 (the Site). The EA is also compliant with the National Environmental Protection Act (NEPA) and 24 Code of Federal Regulations (CFR) Part 58. The proposed project site is located in the town of Kōloa on the Island of Kaua'i (please see the enclosed Location Map). The EA is being prepared in order to evaluate the potential environmental, social, and economic consequences associated with the proposed project.

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Frank Camacho
Project Manager

CC: Kanani Fu
Kaua'i County Housing Agency



June 19, 2015

Chief Librarian
Kōloa Public Library
3451 Po'ipū Road
Kōloa, Hawai'i 96716

Subject: Pre-consultation for the Koae Workforce Housing Development
TMK No. (4) 2-6-004:019
Kōloa, Kaua'i, Hawai'i

Aloha,

Community Planning and Engineering, Inc. (CP&E) on behalf of the County of Kaua'i, is in the process of preparing a Chapter 343 Hawai'i Revised Statutes (HRS) Environmental Assessment (EA) and associated Title 11, Chapter 200 Hawai'i Administrative Rules (HAR) for the proposed workforce housing development located at Tax Map Key (TMK) (4) 2-6-004:019 (the Site). The EA is also compliant with the National Environmental Protection Act (NEPA) and 24 Code of Federal Regulations (CFR) Part 58. The proposed project site is located in the town of Kōloa on the Island of Kaua'i (please see the enclosed Location Map). The EA is being prepared in order to evaluate the potential environmental, social, and economic consequences associated with the proposed project.

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C/O Frank Camacho, Project Manager
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Honolulu, HI 96813

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E-mail: fcamacho@cpe-hawaii.com

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Sincerely,

A handwritten signature in black ink, appearing to read 'F. Camacho', is written over a light blue horizontal line.

Frank Camacho
Project Manager

CC: Kanani Fu
Kaua'i County Housing Agency



June 19, 2015

Mr. Daniel E. Orodener
Executive Officer
State of Hawai'i Land Use Commission
235 S. Beretania Street, #406
Honolulu, Hawai'i 96813

Subject: Pre-consultation for the Koae Workforce Housing Development
TMK No. (4) 2-6-004:019
Kōloa, Kaua'i, Hawai'i

Dear Mr. Orodener:

Community Planning and Engineering, Inc. (CP&E) on behalf of the County of Kaua'i, is in the process of preparing a Chapter 343 Hawai'i Revised Statutes (HRS) Environmental Assessment (EA) and associated Title 11, Chapter 200 Hawai'i Administrative Rules (HAR) for the proposed workforce housing development located at Tax Map Key (TMK) (4) 2-6-004:019 (the Site). The EA is also compliant with the National Environmental Protection Act (NEPA) and 24 Code of Federal Regulations (CFR) Part 58. The proposed project site is located in the town of Kōloa on the Island of Kaua'i (please see the enclosed Location Map). The EA is being prepared in order to evaluate the potential environmental, social, and economic consequences associated with the proposed project.

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Honolulu, HI 96813

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E-mail: fcamacho@cpe-hawaii.com

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Frank Camacho
Project Manager

CC: Kanani Fu
Kaua'i County Housing Agency



June 19, 2015

Ms. Jessica Wooley, Director
State of Hawai'i Department of Health
Office of Environmental Quality Control
235 South Beretania Street, Suite 702
Honolulu, Hawai'i 96813

Subject: Pre-consultation for the Koa'e Workforce Housing Development
TMK No. (4) 2-6-004:019
Kōloa, Kaua'i, Hawai'i

Dear Ms. Wooley:

Community Planning and Engineering, Inc. (CP&E) on behalf of the County of Kaua'i, is in the process of preparing a Chapter 343 Hawai'i Revised Statutes (HRS) Environmental Assessment (EA) and associated Title 11, Chapter 200 Hawai'i Administrative Rules (HAR) for the proposed workforce housing development located at Tax Map Key (TMK) (4) 2-6-004:019 (the Site). The EA is also compliant with the National Environmental Protection Act (NEPA) and 24 Code of Federal Regulations (CFR) Part 58. The proposed project site is located in the town of Kōloa on the Island of Kaua'i (please see the enclosed Location Map). The EA is being prepared in order to evaluate the potential environmental, social, and economic consequences associated with the proposed project.

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Honolulu, HI 96813

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E-mail: fcamacho@cpe-hawaii.com

We appreciate your timely review and response to this request.

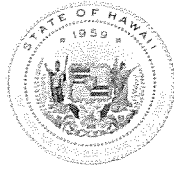
Sincerely,

A handwritten signature in black ink, appearing to read 'F. Camacho', is positioned above the printed name.

Frank Camacho
Project Manager

CC: Kanani Fu
Kaua'i County Housing Agency

DAVID Y. IGE
GOVERNOR OF HAWAII



JESSICA E. WOOLEY
DIRECTOR

STATE OF HAWAII
OFFICE OF ENVIRONMENTAL QUALITY CONTROL

Department of Health

235 South Beretania Street, Suite 702
Honolulu, Hawai'i 96813
Telephone (808) 586-4185
Facsimile (808) 586-4186
Email: oeqchawaii@doh.hawaii.gov

July 24, 2015

RECEIVED
JUL 29 2015

COMMUNITY PLANNING AND ENGINEERING INC.

Community Planning & Engineering, Inc.
C/O: Frank Camacho, Project Manager
1286 Queen Emma St.
Honolulu, Hawai'i 96816

Dear Mr. Camacho

SUBJECT: Early Consultation Request re: Draft Environmental Assessment (EA) for proposed Koae Workforce Housing Development, Koloa, Kaua'i

Our Office of Environmental Quality Control has reviewed the information contained in your June 19, 2015, letter about the subject project, and we offer the following comments for your consideration. We apologize for the delay in responding to your letter.

Pursuant to Chapter 343, Hawai'i Revised Statutes, and the provisions of Chapter 11-200, Hawai'i Administrative Rules, as an Agency Action presumably by the County of Kaua'i Housing Agency, this agency would be considered the "Proposing and Determination agency" that implements the environmental review process for this project by either 1) anticipating a Finding of No Significant Impact and then preparing a Draft EA for public review and comment, or 2) based on their judgment and experience, deciding to by-pass the EA step and proceeding directly to the Environmental Impact Statement (EIS) Preparation Notice step if significant effects may or will occur from the project. In the event that the agency makes a determination to prepare an EIS, either initially or if significant impacts are identified in the Final EA, then the Mayor, as the "accepting authority," would determine the acceptability of the subsequent Final EIS.

Since your letter does not provide much information about the project, we will reserve any substantive comments until we've had an opportunity to review the Draft EA for the project.

As you prepare to submit documents for publication and public review in The Environmental Notice, we appreciate your diligence in using the correct and recently revised publication forms available online. If you have any questions as you navigate this

Mr. Frank Camacho
July 24, 2015
Page 2 of 2

process, please consult our website at <http://health.hawaii.gov/oeqc> (see in particular the link to the Environmental Assessment Preparation Toolkit on the right panel) or contact our office at (808) 586-4185.

Sincerely,

A handwritten signature in black ink that reads "Tom Eisen". The letters are cursive and slightly slanted to the right.

Tom Eisen
Planner



June 19, 2015

State of Hawai'i Office of Hawaiian Affairs
Kaua'i Office
4405 Kukui Grove Street, Suite 103
Līhu'e, Hawai'i 96766

Subject: Pre-consultation for the Koae Workforce Housing Development
TMK No. (4) 2-6-004:019
Kōloa, Kaua'i, Hawai'i

Aloha,

Community Planning and Engineering, Inc. (CP&E) on behalf of the County of Kaua'i, is in the process of preparing a Chapter 343 Hawai'i Revised Statutes (HRS) Environmental Assessment (EA) and associated Title 11, Chapter 200 Hawai'i Administrative Rules (HAR) for the proposed workforce housing development located at Tax Map Key (TMK) (4) 2-6-004:019 (the Site). The EA is also compliant with the National Environmental Protection Act (NEPA) and 24 Code of Federal Regulations (CFR) Part 58. The proposed project site is located in the town of Kōloa on the Island of Kaua'i (please see the enclosed Area of Potential Effect [APE] Map). The EA is being prepared in order to evaluate the potential environmental, social, and economic consequences associated with the proposed project.

As part of the environmental review process, and in accordance with Section 106 of the National Historic Preservation Act (NHPA), we are seeking early consultation to determine if any documented historic or culturally significant resources exist at, or within close proximity to the subject parcel. Section 106 consultation under the NHPA is triggered due to potential project funding from the United States Department of Housing and Urban Development (HUD). The County of Kaua'i would represent HUD as the responsible federal agency requesting consultation under Section 106 of the NHPA.

Approximately 130-150 residential single family detached units and multi-family attached units are planned to be built on the subject parcel. We are enclosing the following reference documents to assist with your review: an APE Map and an archaeological inventory survey and cultural impact assessment that were previously conducted for the Site in September 2004 and October 2004, respectively.



Community Planning and Engineering, Inc.

Please respond with comments within 30 days. If you have any questions or need clarification, please contact me at (808) 531-4252, ext. 1040 or by email at fcamacho@cpe-hawaii.com. All response letters can be sent to the following address:

CP&E
C/O Frank Camacho, Project Manager
1286 Queen Emma Street
Honolulu, HI 96813

Phone: (808) 531-4252, ext. 1040
E-mail: fcamacho@cpe-hawaii.com

We appreciate your timely review and response to this request.

Sincerely,

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Frank Camacho
Project Manager

CC: Kanani Fu
Kaua'i County Housing Agency



STATE OF HAWAII
OFFICE OF HAWAIIAN AFFAIRS
560 N. NIMITZ HWY., SUITE 200
HONOLULU, HAWAII 96817

HRD15-7515

August 5, 2015

Frank Camacho
Project Manager
Community Planning and Engineering, Inc.
1286 Queen Emma Street
Honolulu, HI 96813

RECEIVED
AUG 13 2015

COMMUNITY PLANNING AND ENGINEERING INC.

Re: Pre-consultation for the Proposed Workforce Housing Development
Tax Map Key (TMK): (4) 2-6-004:019
Kōloa Ahupua'a, Kona Moku, Kaua'i Moku

Aloha e Mr. Camacho:

The Office of Hawaiian Affairs (OHA) is in receipt of your request for comments ahead of the preparation of an environmental assessment (EA) for the proposed workforce housing development located at TMK (4) 2-6-004:019 in Kōloa Ahupua'a, Kona Moku, Kaua'i. The preparation of the EA is to satisfy requirements of the National Environmental Policy Act (NEPA), the National Historic Preparation Act (NHPA) and Chapter 343 Hawai'i Revised Statutes and associated Title 11, Chapter 200 Hawai'i Administrative Rules. According to your submission, you are seeking early consultation on the potential environmental, social, and economic consequences associated with the proposed project on behalf of the County of Kaua'i.

The proposed project consists of the development of 130-150 residential, single-family detached units and multi-family units on the 9.4 acre subject parcel. No additional information on the proposed development was provided. Enclosed with your submission was a map of the Area of Potential Effect (APE), an Archaeological Inventory Survey (AIS) prepared in 2004, and a Cultural Impact Assessment (CIA) also prepared in 2004.

The AIS and CIA provide some details on the background and the traditional and historical use of the project area, which is part of a large landscape of sites and features, known commonly as the Kōloa Field System. The Waikomo Stream, which borders the project area, was the primary source of water for the development of this vast landscape. According to the

Mr. Frank Camacho
August 5, 2015
Page 2

reports and testimonies from the claimants of two Land Commission Awards, the area was used for habitation (house sites) and agriculture (primarily lo'i kalo). Irrigated lo'i were fed by an extensive 'auwai system directed from the Waikomo Stream. The ingenuity of this network of 'auwai created a flourishing landscape of both wet and dry agriculture in Kōloa and allowed the traditional Hawaiian population to flourish.

The AIS did not identify any traditional cultural or archaeological sites within the project area during the one day field inspection. The report states that ground surface visibility was limited based on tall grasses and surveyors were spaced twenty to thirty feet apart. Seven historic period sites related to commercial agriculture were identified. The lack of traditional cultural sites in the project area was attributed to the large-scale land clearing and modifications associated with commercial sugar cane cultivation in the area of the proposed project. The three knowledgeable individuals interviewed in the CIA did not provide specific locational data for cultural sites or any information related to cultural practices in the project area.

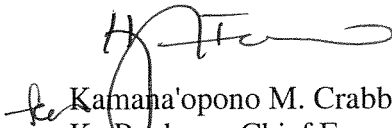
We recommend that the applicant conduct NEPA/NHPA Section 106 consultation with the following individuals:

- Ted Kawahinehelelani Blake (Executive Director of Mālama Kōloa);
- Rupert Rowe (Hui Mālama O Kāneiolouma);
- Chipper Wichman (National Tropical Botanical Gardens-Lāwa'i);
- Liberta Albao (Queen Deborah Kapule Hawaiian Civic Club); and
- Kaliko Santos (OHA Community Outreach Coordinator Kaua'i)

We have no additional comments on the information submitted for the proposed project at this time. We request that a copy of the Draft EA be sent to our office for review once it has been prepared and we may be able to provide additional comments at that time.

Should you have any questions, please contact Lauren Morawski (808-594-1997 or laurenm@oha.org) of our Kia'i Kānāwai (Compliance Enforcement) division.

'O wau iho nō me ka 'oia 'i 'o,


Kamana'opono M. Crabbe, Ph.D.
Ka Pōuhana, Chief Executive Officer

KC:lm

CC: Kaliko Santos OHA Kaua'i Community Outreach Coordinator (via email)
Mary Jane Naone SHPD Kaua'i Archaeologist (via email)

June 19, 2015

Surfrider Foundation-Kaua'i Chapter
Blue Water Task Force
P.O. Box 819
Waimea, Hawai'i 96796

Subject: Pre-consultation for the Koae Workforce Housing Development
TMK No. (4) 2-6-004:019
Kōloa, Kaua'i, Hawai'i

Aloha:

Community Planning and Engineering, Inc. (CP&E), on behalf of the County of Kaua'i, is in the process of preparing a Chapter 343 Hawai'i Revised Statutes (HRS) Environmental Assessment (EA) and associated Title 11, Chapter 200 Hawai'i Administrative Rules (HAR) for the proposed workforce housing development located at Tax Map Key (TMK) (4) 2-6-004:019 (the Site). The EA is also compliant with the National Environmental Protection Act (NEPA) and 24 Code of Federal Regulations (CFR) Part 58. The proposed project site is located in the town of Kōloa on the Island of Kaua'i (please see the enclosed Location Map). The EA is being prepared in order to evaluate the potential environmental, social and economic consequences associated with the proposed project.

The purpose of the proposed project is to help the County of Kaua'i and the State of Hawai'i meet its goal to provide much needed affordable housing to its elderly residents and workforce housing for families. The proposed project site comprises approximately 11 acres and would include approximately 130-150 housing units. Planned housing types include single family detached units, as well as multi-family attached units. The County of Kaua'i acquired the Site in order for the County to develop much needed workforce housing for Kaua'i residents. We are seeking your input to identify potential environmental and/or social and economic impacts associated with the proposed project.



In conjunction with this work, we are requesting any written comments and/or information with respect to your area(s) of concern. Please send your written comments to the following address within 30 days.

CP&E
C/O Frank Camacho, Project Manager
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Honolulu, HI 96813

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Sincerely,

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Frank Camacho
Project Manager

CC: Kanani Fu
Kaua'i County Housing Agency

June 19, 2015

Ms. Kristi Young
U.S. Fish and Wildlife Service
Pacific Islands Fish and Wildlife Office
300 Ala Moana Boulevard, Suite 3-122
Honolulu, Hawai'i 96850

Subject: Pre-consultation for the Koae Affordable Housing Development
TMK No. (4) 2-6-004:019
Kōloa, Kaua'i, Hawai'i

Dear Ms. Young:

Community Planning and Engineering, Inc. (CP&E) on behalf of the County of Kaua'i, is in the process of preparing a Chapter 343 Hawai'i Revised Statutes (HRS) Environmental Assessment (EA) and associated Title 11, Chapter 200 Hawai'i Administrative Rules (HAR) for the proposed workforce housing development located at Tax Map Key (TMK) (4) 2-6-004:019 (the Site). The EA is also compliant with the National Environmental Protection Act (NEPA) and 24 Code of Federal Regulations (CFR) Part 58. The proposed project site is located in the town of Kōloa on the Island of Kaua'i (please see the enclosed Project Location Map). The EA is being prepared in order to evaluate the potential environmental, social, and economic consequences associated with the proposed project.

Approximately 130-150 residential single family detached units and multi-family attached units are planned to be built on the subject parcel. We are enclosing a Project Location Map for your reference and review, as well as a biological survey that was completed at the Site.

As part of the environmental review process, we are requesting early consultation to determine if any special status or endangered species habitats exist at, or within close proximity to the subject parcel at the Site. If deemed necessary, formal consultation under Section 7 of the Endangered Species Act (ESA) will be initiated at a later date in compliance with NEPA. The County of Kaua'i would represent the United States Department of Housing and Urban Development (HUD) as the responsible federal agency requesting a determination under Section 7 of the ESA if HUD funding is requested.



Please respond with comments within 30 days. If you have any questions or need clarification, please contact me at (808) 531-4252, ext. 1040 or by email at fcamacho@cpe-hawaii.com. All response letters can be sent to the following address:

CP&E
C/O Frank Camacho, Project Manager
1286 Queen Emma Street
Honolulu, HI 96813

We appreciate your timely review and response to this request.

Sincerely,

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Frank Camacho
Project Manager

CC: Kanani Fu
Kaua'i County Housing Agency



United States Department of the Interior



FISH AND WILDLIFE SERVICE
Pacific Islands Fish and Wildlife Office
300 Ala Moana Boulevard, Room 3-122
Honolulu, Hawai'i 96850

In Reply Refer To:
2015-TA-0329

JUL 14 2015

Mr. Frank Camacho
Community Planning and Engineering, Inc.
1286 Queen Emma Street
Honolulu, Hawaii 96813

Subject: Technical Assistance for the Koa'e Affordable Housing Development, Kauai

Dear Mr. Camacho:

The U.S. Fish and Wildlife Service (Service) received your letter, dated June 22, 2015, requesting a list of federally threatened and endangered species, candidate species, plants and animals of special concern, and critical habitats in the vicinity of the proposed projects. The County of Kauai (County) proposes to construct a workforce housing development located at Tax Map Key (TMK) 4-2-6-004:019 in Koloa on the island of Kauai. The housing development involves construction of approximately 130 to 150 residential single family and multi-family units including associated facilities and infrastructure. The proposed project may potentially be funded by the United States Department of Housing and Urban Development (HUD). Community Planning and Engineering, Inc. on behalf of the County, is preparing a draft Environmental Assessment (EA), in accordance with Hawaii Revised Statutes 343 and the National Environmental Policy Act. The following comments are provided in accordance with the Endangered Species Act of 1973 (ESA), as amended (16 U.S.C 1531 *et seq.*).

We reviewed information in our files, including data compiled by the Hawaii Biodiversity and Mapping Program, as it pertains to federally listed species and designated critical habitat. The following species are known to occur or transit through the proposed project area: the endangered Hawaiian black-necked stilt (*Himantopus mexicanus knudseni*), Hawaiian moorhen (*Gallinula chloropus sandvicensis*), Hawaiian coot (*Fulica alai*), Hawaiian duck (*Anas wyvilliana*) (hereafter collectively referred to as Hawaiian waterbirds); the endangered Hawaiian goose (*Branta sandvicensis*); the endangered Hawaiian hoary bat (*Lasiurus cinereus semotus*); and the endangered Hawaiian petrel (*Pterodroma sandwichensis*), the threatened Newell's shearwater (*Puffinus auricularis newelli*), and a candidate for listing the band-rumped storm-petrel (*Oceanodroma castro*) (hereafter collectively referred to as seabirds). The proposed project area is in the vicinity of designated critical habitat for the following species: two endangered arthropods, the Kauai cave wolf spider (*Adelocosa anops*) and the Kauai cave amphipod (*Spelaeorchestia koloana*) (hereafter collectively referred to as arthropods). We provide the following recommendations to avoid and minimize project impacts to listed species, candidate species, and critical habitat.

Hawaiian Waterbirds

Hawaiian waterbirds are known to utilize water features in the vicinity of the project area. Our information suggests that site preparation and grading activities associated with the proposed project may result in standing water or creation of open water, thus attracting Hawaiian waterbirds to the project site. Hawaiian waterbirds attracted to sub-optimal habitat may suffer adverse impacts, such as predation and reduced reproductive success, and thus the project may create an attractive nuisance. We recommend you work with our office during project planning so that we may assist you in developing measures to avoid and minimize impacts to Hawaiian waterbirds.

Hawaiian Goose

In order to avoid impacts to Hawaiian geese, we recommend a biologist familiar with the nesting behavior of the Hawaiian goose survey the area prior to the initiation of any work, or after any subsequent delay in work of three or more days (during which birds may attempt nesting). If a nest is discovered, work should cease immediately and our office should be contacted for further guidance. Furthermore, all on-site project personnel should be apprised that Hawaiian geese may be in the vicinity of the project at any time during the year. If a Hawaiian goose (or geese) appears within 100 feet of ongoing work, all activity should be temporarily suspended until the Hawaiian goose (or geese) leaves the area of its own accord.

Hawaiian Hoary Bat

The Hawaiian hoary bat roosts in both exotic and native woody vegetation and, while foraging, will leave young unattended in "nursery" trees and shrubs when they forage. If trees or shrubs suitable for bat roosting are cleared during the breeding season, there is a risk that young bats could inadvertently be harmed or killed. To minimize impacts to the endangered Hawaiian hoary bat, woody plants greater than 15 feet (4.6 meters) tall should not be disturbed, removed, or trimmed during the bat birthing and pup rearing season (June 1 through September 15). Site clearing should be timed to avoid disturbance to Hawaiian hoary bats in the project area.

Seabirds

Seabirds, including the Newell's shearwater, Hawaiian petrel, and band-rumped storm petrel fly at night and are attracted to artificially-lighted areas resulting in disorientation and subsequent fallout due to exhaustion. Seabirds are also susceptible to collision with objects that protrude above the vegetation layer, such as utility lines, guy-wires, and communication towers. Additionally, once grounded, they are vulnerable to predators and are often struck by vehicles along roadways. We recommend the following avoidance and minimization measures be incorporated into your project description:

- Construction activities should only occur during daylight hours. Any increase in the use of nighttime lighting, particularly during peak fallout period (September 15 through December 15), could result in additional seabird injury or mortality.
- If exterior facility lights cannot be eliminated due to safety or security concerns, then they should be positioned low to the ground, be motion-triggered, and be shielded and/or full cut-off. Effective light shields should be completely opaque, sufficiently large, and positioned so that the bulb is only visible from below.

- If feasible, we recommend undergrounding utility lines or installing lines at or below the vegetation layer in the proposed project area. If this is not feasible, we recommend you work with our office during project planning so that we may assist you in developing other measures to minimize the potential for seabird collision (e.g., vertical versus horizontal arrays, etc.).

Arthropods

The Kauai cave wolf spider and the Kauai cave amphipod are found only on the island of Kauai in the Koloa area from four to six caves respectively. They occur in small, subterranean spaces, voids, cracks, and mesocaverns, requiring a high humidity microclimate. Habitat of these cave arthropods are threatened by development activities including clearing of vegetation, blasting, excavation, and filling. Other development activities, such as the covering of areas with artificial surfaces and diversion of rain water, reduce local ground water recharge which greatly decreases humidity levels within subterranean habitat. Cave ecosystems are threatened by contamination from surface sources of toxic chemicals from spills, household insecticides, pesticides, and waste disposal which enter caves via streams and/or ground-water seepage.

The proposed project site is located within approximately 150 m to seven hectares of critical habitat occupied by arthropods. Additional information on the proposed construction activities, including the extent of any blasting or excavation, are necessary to evaluate impacts to critical habitat due to ground vibrations during construction such as the potential for collapse or filling of subterranean spaces from the loosening of sediments or bedrock. We recommend the following measures be incorporated into your project description to minimize other impacts to critical habitat:

- Heavy use of chemical herbicides, insecticides, and fungicides should be avoided in the project area.
- The project should be designed with permeable surfacing, such as pavers, instead of asphalt or other limited or non-permeable surfacing, and other Best Management Practices (BMPs) to minimize runoff and allow ground water recharge in the project area.

Additionally, a biological monitor(s) should be present on the project site during all construction activities. In the event that heavy equipment punctures the ceiling of a cave or lava tube during construction, the biological monitor should halt all construction activities. The Service should be notified immediately with the location of the previously undetected cave or lava tube and any relevant information. Upon notification, we may provide further assistance with ESA compliance.


Under section 7 of the ESA, it is the Federal agency's (or their non-Federal designee) responsibility to make the determination of whether or not the proposed project "may affect" federally listed species or designated critical habitat. A "may affect, not likely to adversely affect" determination is appropriate when effects to federally listed species are expected to be discountable (*i.e.*, unlikely to occur), insignificant (minimal in size), or completely beneficial. This conclusion requires written concurrence from the Service. If a "may affect" determination

is made, then the Federal agency must initiate formal consultation with the Service. Projects that are determined to have “no effect” on federally listed species and/or critical habitat do not require additional coordination or consultation.

We also recommend you incorporate the attached BMPs into your project description to avoid and minimize impacts to water resources that have the potential to occur during construction activities.

We appreciate your efforts to conserve federally listed species and designated critical habitat. Please contact Adam Griesemer, Endangered Species Biologist (phone: 808-285-8261, email: adam_griesemer@fws.gov) should you have any questions pertaining to this response.

Sincerely,

A handwritten signature in black ink, appearing to read "Aaron Nadig". The signature is fluid and cursive, with the first name "Aaron" written in a larger, more prominent script than the last name "Nadig".

Aaron Nadig
Island Team Manager
Oahu, Kauai, Northwestern Hawaiian
Islands, and American Samoa

cc: Kanani Fu, County of Kauai
Max Solmssen, Environet, Inc.

U.S. Fish and Wildlife Service Recommended Standard Best Management Practices

The U.S. Fish and Wildlife Service (USFWS) recommends the following measures to be incorporated into project planning to avoid or minimize impacts to fish and wildlife resources. Best Management Practices (BMPs) include the incorporation of procedures or materials that may be used to reduce either direct or indirect negative impacts to aquatic habitats that result from project construction-related activities. These BMPs are recommended in addition to, and do not over-ride any terms, conditions, or other recommendations prepared by the USFWS, other federal, state or local agencies. If you have questions concerning these BMPs, please contact the USFWS Aquatic Ecosystems Conservation Program at 808-792-9400.

1. Authorized dredging and filling-related activities that may result in the temporary or permanent loss of aquatic habitats should be designed to avoid indirect, negative impacts to aquatic habitats beyond the planned project area.
2. Dredging/filling in the marine environment should be scheduled to avoid coral spawning and recruitment periods, and sea turtle nesting and hatching periods. Because these periods are variable throughout the Pacific islands, we recommend contacting the relevant local, state, or federal fish and wildlife resource agency for site specific guidance.
3. Turbidity and siltation from project-related work should be minimized and contained within the project area by silt containment devices and curtailing work during flooding or adverse tidal and weather conditions. BMPs should be maintained for the life of the construction period until turbidity and siltation within the project area is stabilized. All project construction-related debris and sediment containment devices should be removed and disposed of at an approved site.
4. All project construction-related materials and equipment (dredges, vessels, backhoes, silt curtains, etc.) to be placed in an aquatic environment should be inspected for pollutants including, but not limited to; marine fouling organisms, grease, oil, etc., and cleaned to remove pollutants prior to use. Project related activities should not result in any debris disposal, non-native species introductions, or attraction of non-native pests to the affected or adjacent aquatic or terrestrial habitats. Implementing both a litter-control plan and a Hazard Analysis and Critical Control Point plan (HACCP – see <http://www.haccp-nrm.org/Wizard/default.asp>) can help to prevent attraction and introduction of non-native species.
5. Project construction-related materials (fill, revetment rock, pipe, etc.) should not be stockpiled in, or in close proximity to aquatic habitats and should be protected from erosion (*e.g.*, with filter fabric, etc.), to prevent materials from being carried into waters by wind, rain, or high surf.
6. Fueling of project-related vehicles and equipment should take place away from the aquatic environment and a contingency plan to control petroleum products accidentally spilled during the project should be developed. The plan should be retained on site with the person responsible for compliance with the plan. Absorbent pads and containment booms should be stored on-site to facilitate the clean-up of accidental petroleum releases.
7. All deliberately exposed soil or under-layer materials used in the project near water should be protected from erosion and stabilized as soon as possible with geotextile, filter fabric or native or non-invasive vegetation matting, hydro-seeding, etc.

From: [Griesemer, Adam](#)
To: [Max Solmssen](#)
Cc: [Frank J. Camacho](#)
Subject: Re: Koa'e Affordable Housing Development
Date: Wednesday, July 08, 2015 9:35:23 AM
Attachments: [image003.png](#)
[image001.png](#)
[image004.png](#)
[image002.png](#)

Thanks Max.

On Tue, Jul 7, 2015 at 1:37 PM, Max Solmssen <MSolmssen@environetinc.com> wrote:

Hi Adam,

We are working with Frank and CP&E to complete the environmental assessment for the proposed affordable housing project in Kaua'i. Attached is the biological survey completed at the Site for your review. Please let me know if you need anything else or have any questions or concerns.

Mahalo

Max Solmssen



PROJECT MANAGER T/ 808.833.2225 EXT.1012 C/ 808.756.0870 F/ 808.833.2231 E/
MSOLMSEN@ENVIRONETINC.COM

ENVIRONET, INC. 1286 QUEEN EMMA STREET, HONOLULU, HAWAII 96813

www.environetinc.com

HUBZone & SBA Certified Small Business / Native Hawaiian and Veteran-Owned



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From: Frank J. Camacho
Sent: Tuesday, July 07, 2015 1:33 PM
To: Max Solmssen
Subject: FW: Koae Affordable Housing Development

Here is a response from fish and wildlife.

Frank J. Camacho, P.E.

Project Engineer

Community Planning and Engineering, Inc.

1286 Queen Emma Street

Honolulu, HI 96813

Phone: [\(808\) 531-4252 ext. 1040](tel:(808)531-4252)

Fax: [\(808\) 526-2476](tel:(808)526-2476)

fcamacho@cpe-hawaii.com

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From: Griesemer, Adam [mailto:adam_griesemer@fws.gov]
Sent: Tuesday, July 07, 2015 12:42 PM
To: Frank J. Camacho
Subject: Koae Affordable Housing Development

Hi Frank,

We are in receipt of your request for a species list for the Koae Affordable Housing project.

Can you please email me a pdf of the biological survey completed for the project? My apologies, perhaps it was misplaced by our office.

Your timely assistance is greatly appreciated.

Regards, Adam

Adam Griesemer

Endangered Species Biologist

U.S. Fish and Wildlife Service

Pacific Islands Fish and Wildlife Office

7370-K Kuamoo Rd., Kapaa, HI 96746

Office: (808) 822-2175

Cell: (808) 285-8261

--

Adam Griesemer

Endangered Species Biologist

U.S. Fish and Wildlife Service

Pacific Islands Fish and Wildlife Office

7370-K Kuamoo Rd., Kapaa, HI 96746

Office: (808) 822-2175

Cell: (808) 285-8261

June 19, 2015

Mr. James Sone
Lead Network Engineer
Hawaiian Telcom
4040 Halau Street
Līhu‘e, Hawai‘i 96766

Subject: Pre-consultation for the Koae Workforce Housing Development
TMK No. (4) 2-6-004:019
Kōloa, Kaua‘i, Hawai‘i

Dear Mr. Sone:

Community Planning and Engineering, Inc. (CP&E) on behalf of the County of Kaua‘i, is in the process of preparing a Chapter 343 Hawai‘i Revised Statutes (HRS) Environmental Assessment (EA) and associated Title 11, Chapter 200 Hawai‘i Administrative Rules (HAR) for the proposed workforce housing development located at Tax Map Key (TMK) (4) 2-6-004:019 (the Site). The EA is also compliant with the National Environmental Protection Act (NEPA) and 24 Code of Federal Regulations (CFR) Part 58. The proposed project site is located in the town of Kōloa on the Island of Kaua‘i (please see the enclosed Location Map). The EA is being prepared in order to evaluate the potential environmental, social, and economic consequences associated with the proposed project.

The purpose of the proposed project is to help the County of Kaua‘i and the State of Hawai‘i meet its goal to provide much needed affordable housing to its elderly residents and workforce housing for families. The proposed project site comprises approximately 11 acres and would include approximately 130-150 housing units. Planned housing types include single family detached units, as well as multi-family attached units. The County of Kaua‘i acquired the Site in order for the County to develop much needed workforce housing for Kaua‘i residents. We are seeking your input to identify potential environmental and/or social and economic impacts associated with the proposed project.



In conjunction with this work, we are requesting any written comments and/or information with respect to your area(s) of concern. Please send your written comments to the following address within 30 days.

CP&E
C/O Frank Camacho, Project Manager
1286 Queen Emma Street
Honolulu, HI 96813

Phone: (808) 531-4252, ext. 1040
E-mail: fcamacho@cpe-hawaii.com

We appreciate your timely review and response to this request.

Sincerely,

A handwritten signature in black ink, appearing to read 'F. Camacho', is positioned above the printed name.

Frank Camacho
Project Manager

CC: Kanani Fu
Kaua'i County Housing Agency



June 26, 2015

Mr. Frank Camacho
Project Manager
Community Planning and Engineering, Inc.
1286 Queen Emma St.
Honolulu, HI 96813
Via email: fcamacho@cpe-hawaii.com

Dear Mr. Camacho:

**Subject: Pre-consultation for the Koa'e Workforce Housing Development
TMK No. (4) 2-6-004:019
Koloa, Kauai, Hawaii**

Thank you for the opportunity to provide comments related to the Koa'e Workforce Housing development per your letter dated June 19, 2015.

Hawaiian Telcom intends to service the proposed development with fiber optic technology. Besides land line phone service, fiber optic technology provides a variety of bandwidth offerings for high speed internet. These services will likely originate from cable facilities along the Poipu Rd. pole line in the vicinity of the project site.

Should you have any questions, please do not hesitate to contact me at 241-5052 or email jimmy.sone@hawaiiantel.com

Sincerely,



James 'Jimmy' Sone P.E.
Lead Network Engineer
OSP Engineering - Kauai

C: File



June 19, 2015

Mr. David Bissell
President & CEO
Kaua'i Island Utility Cooperative
4463 Pahe'e Street, Suite 1
Līhu'e, Hawai'i 96766

Subject: Pre-consultation for the Koae Workforce Housing Development
TMK No. (4) 2-6-004:019
Kōloa, Kaua'i, Hawai'i

Dear Mr. Bissell:

Community Planning and Engineering, Inc. (CP&E) on behalf of the County of Kaua'i, is in the process of preparing a Chapter 343 Hawai'i Revised Statutes (HRS) Environmental Assessment (EA) and associated Title 11, Chapter 200 Hawai'i Administrative Rules (HAR) for the proposed workforce housing development located at Tax Map Key (TMK) (4) 2-6-004:019 (the Site). The EA is also compliant with the National Environmental Protection Act (NEPA) and 24 Code of Federal Regulations (CFR) Part 58. The proposed project site is located in the town of Kōloa on the Island of Kaua'i (please see the enclosed Location Map). The EA is being prepared in order to evaluate the potential environmental, social, and economic consequences associated with the proposed project.

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Community Planning and Engineering, Inc.

In conjunction with this work, we are requesting any written comments and/or information with respect to your area(s) of concern. Please send your written comments to the following address within 30 days.

CP&E
C/O Frank Camacho, Project Manager
1286 Queen Emma Street
Honolulu, HI 96813

Phone: (808) 531-4252, ext. 1040
E-mail: fcamacho@cpe-hawaii.com

We appreciate your timely review and response to this request.

Sincerely,

A handwritten signature in black ink, appearing to read 'F. Camacho', is written in a cursive style.

Frank Camacho
Project Manager

CC: Kanani Fu
Kaua'i County Housing Agency



June 19, 2015

Mr. Brian Baligad
Plant Supervisor
Oceanic Time Warner
3022 Peleke Street, Suite 8
Līhu'e, Hawai'i 96766

Subject: Pre-consultation for the Koae Workforce Housing Development
TMK No. (4) 2-6-004:019
Kōloa, Kaua'i, Hawai'i

Dear Mr. Baligad:

Community Planning and Engineering, Inc. (CP&E) on behalf of the County of Kaua'i, is in the process of preparing a Chapter 343 Hawai'i Revised Statutes (HRS) Environmental Assessment (EA) and associated Title 11, Chapter 200 Hawai'i Administrative Rules (HAR) for the proposed workforce housing development located at Tax Map Key (TMK) (4) 2-6-004:019 (the Site). The EA is also compliant with the National Environmental Protection Act (NEPA) and 24 Code of Federal Regulations (CFR) Part 58. The proposed project site is located in the town of Kōloa on the Island of Kaua'i (please see the enclosed Location Map). The EA is being prepared in order to evaluate the potential environmental, social, and economic consequences associated with the proposed project.

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In conjunction with this work, we are requesting any written comments and/or information with respect to your area(s) of concern. Please send your written comments to the following address within 30 days.

CP&E
C/O Frank Camacho, Project Manager
1286 Queen Emma Street
Honolulu, HI 96813

Phone: (808) 531-4252, ext. 1040
E-mail: fcamacho@cpe-hawaii.com

We appreciate your timely review and response to this request.

Sincerely,

A handwritten signature in black ink, appearing to read 'F. Camacho', is written over a light blue horizontal line.

Frank Camacho
Project Manager

CC: Kanani Fu
Kaua'i County Housing Agency

APPENDIX C: BIOLOGICAL SURVEYS

**A Survey of Avian and Terrestrial Mammalian
Species: Kukui‘Ula Gap/Employee Housing Site,
Kōloa District, Island of Kaua‘i.**

Prepared for:

Kukui‘Ula Development Company (Hawaii), LLC.
P.O. Box 280
Kōloa, Hawai‘i 96756

Prepared by:

Reginald E. David
Rana Productions, Ltd.
P.O. Box 1371
Kailua-Kona, Hawai‘i 96745

August 2004

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Introduction:

This report summarizes the findings of an ornithological and mammalian survey of an approximately 10-acre parcel of land identified as TMK: 2-6-04: 19 located in the Kōloa District, Island of Kaua'i. The Kukui'Ula Development Company (Hawaii), LLC is proposing to develop a minimum of 75 gap/employee priced single-family and/or multi-family housing units on this parcel. The site is located along Poipū Road, directly across from the proposed Kukui'Ula Community Park. Fieldwork was conducted on August 12th 2004.

The primary purpose of the survey was to determine if there were any federally listed endangered, threatened, proposed, or candidate avian or mammalian species on, or in the immediate vicinity of, the proposed development site. Federal and State of Hawai'i listed species status follows species detailed in the following referenced documents (DLNR, 1998, Federal Register, 1999a, 1999b, 2001, 2002, 2004).

Avian phylogenetic order and nomenclature follows *The American Ornithologist's Union Checklist of North American Birds 7th Edition* (American Ornithologist's Union, 1998), and the 42nd through the 45th supplements to *Check-list of North American Birds* (American Ornithologist's Union, 2000, Banks et al. 2002, 2003, 2004). Mammal scientific names follow *Mammals in Hawaii* (Tomich, 1986). Plant names follow *Manual of the Flowering Plants of Hawai'i* (Wagner et al., 1990). Place names follow *Place names of Hawaii* (Pukui et al., 1974).

General Site Description:

The proposed development site encompasses approximately 10-acres of land which is bound on the west by Poipū Road, residential development on the north, Waikomo Stream on the east and the Kiahuna Golf Course on the south. There is a small fruit stand and attendant parking lot on the southwest corner of the site and a paved haul-cane road which transects the site from the southeast corner to the northeast corner. The majority of the site was formerly under sugar cane (*Saccharum officinarum*) cultivation. The current habitat present on the site can be loosely divided into two major habitat types; Guines grass/Shrubland, and Mixed Alien Forest/Thicket (Char 2004). The bulk of the site is covered with a Guinea grass (*Panicum maximum*) mixed *koa haole* (*Leucaena leucocephala*) scrubland. Most of this habitat has been mowed numerous times. In the areas where the Guinea grass is less dense or there is open ground, other commonly occurring, predominately alien weedy species are present. The habitat along Waikomo stream consists of *koa haole* and a mix of alien tree species including Java plum (*Syzygium cumini*), Chinese banyan (*Ficus microcarpa*), and *hau* (*Hibiscus tiliaceus*). In areas along the stream banks where the tree canopy is relatively open there are thick stands of umbrella sedge (*Cyperus alternifolius*) and wedelia (*Sphagneticola trilobata*) along with other alien shrubs and weedy species.

Mammalian Survey Methods:

With the exception of the endangered Hawaiian hoary bat (*Lasiurus cinereus semotus*), or 'āpe'ape'a as it is known locally, all terrestrial mammals currently found on the Island of Kaua'i are alien species. Most are ubiquitous. No trapping program was proposed or undertaken to quantify the use of the study site by alien mammalian species. The survey of mammals was limited to visual and auditory detection, coupled with visual observation of scat, tracks, and other animal sign. A running tally was kept of all vertebrate species observed and heard within the project area.

Avian Survey Methods:

Six avian count stations were evenly spaced within the project site. Six-minute variable circular plot (VCP) counts were made at each station. Stations were each counted once. Field observations were made with the aid of Leitz 10 X 42 binoculars and by listening for vocalizations. Counts were concentrated in the early morning hours, the peak of daily bird activity.

Mammalian Survey Results:

No mammals were seen during the course of this survey. Horse (*Equus c. caballus*) scat was encountered along the paved haul-cane road, and numerous giant African snail (*Achatina fulica*) shells showing rat (*Rattus* sp.) teeth marks were found throughout the site.

Avian Survey Results:

A total of 143 individual birds of 17 species, representing 14 separate families, were recorded during VCP station counts (Table 1). One species detected, the Black-crowned Night-Heron (*Nycticorax nycticorax hoactli*), or 'auku'u, is a relatively common indigenous (i.e., native to Hawai'i but also found elsewhere naturally) breeding species. One 'auku'u was flushed from the banks of Waikomo Stream. The other 16 avian species detected during station counts are regularly encountered alien species common in the low to mid elevation areas on the Island of Kaua'i.

Avian diversity and densities were relatively low. Two species, Japanese White-eye (*Zosterops japonicus*) and Common myna (*Acridotheres tristis*) accounted for 38% of the total number of all birds recorded during VCP station counts. The most common avian species recorded was the Japanese White-Eye, which accounted for 25% of the total number of individual birds recorded. An average of 24 birds were detected per VCP station count.

Table 1.

Avian Species Detected: Kukui‘Ula Gap/Employee Housing Site

Common Name	Scientific Name	ST	RA
PHEASANTS & ALLIES – Phasianidae			
Red Junglefowl	<i>Gallus gallus.</i>	A	2.17
HERONS - Ardeidae			
Cattle Egret	<i>Bubulcus ibis.</i>	A	1.67
Black-crowned Night-Heron	<i>Nycticorax nycticorax hoactli</i>	I	0.17
PIGEONS & DOVES - Columbidae			
Spotted Dove	<i>Streptopelia chinensis</i>	A	1.33
Zebra Dove	<i>Geopelia striata</i>	A	2.00
OLD WORLD WARBLERS – Sylviidae			
Japanese Bush-Warbler	<i>Cettia diphone</i>	A	0.17
THRUSHES - Turdidae			
White-rumped Shama	<i>Copsychus malabaricus indicus</i>	A	1.00
BABBLERS - Timaliidae			
Hwamei	<i>Garrulax canorus</i>	A	0.17
WHITE-EYES – Zosteropidae			
Japanese White-Eye	<i>Zosterops japonicus</i>	A	6.00
STARLINGS – Sturnidae			
Common Myna	<i>Acridotheres tristis</i>	A	3.17
BLACKBIRDS & ALLIES - Icteridae			
Western Meadowlark	<i>Sturnella neglecta</i>	A	1.50
EMBERIZIDS – Emberizidae			
Red-crested Cardinal	<i>Paroaria coronata</i>	A	0.67
SALTATORS, CARDINALS & ALLIES – Cardinalidae			
Northern Cardinal	<i>Cardinalis cardinalis</i>	A	1.33
CARDULINE FINCHES & ALLIES – Fringillidae			
House Finch	<i>Carpodacus mexicanus frontalis</i>	A	1.67
OLD WORLD SPARROWS – Passeridae			
House Sparrow	<i>Passer d. domesticus</i>	A	1.00
WAXBILLS & ALLIES – Estrildidae			
Common Waxbill	<i>Estrilda a. astrild</i>	A	2.17
Chestnut Munia	<i>Lonchura atricapilla</i>	A	1.50

Key to Table 1.

- ST Status
 A Alien species
 I Indigenous (i.e., native to Hawai‘i but also found elsewhere naturally)
 RA Relative Abundance: Number of birds detected divided by the number of count stations (6)

No avian species protected under either the Federal Endangered Species Act of 1973, as amended, or under the State of Hawai'i endangered species program were detected during the course of this survey (DLNR, 1998, Federal Register, 1999a, 1999b, 2001, 2002, 2004).

Discussion:

A one-time survey cannot provide a total picture of the wildlife using any given area. Certain species will not be detected for one reason or another. Seasonal variations in populations, coupled with seasonal availability and use of resources, will cause different use patterns throughout a year and, in fact, over a number of years. Coupling the results of a one-time survey with the results of previous surveys conducted in similar habitats and locations, greatly expands the value of the information gathered.

The findings of the mammalian survey are consistent with the results of other recent survey conducted in the general project area (David, 2002a, 2003a), and other surveys undertaken in lowland areas on Kaua'i (David, 1995, 1998, 1999a, 1999b, 2000, 2001a, 2001b, 2002b, 2003b, 2004). Although no Hawaiian hoary bats were detected foraging above the site it is likely that this endangered species utilizes resources along the Waikomo Stream. Hawaiian hoary bats are regularly seen in and around Kōloa and the Po'ipū area, as well as within most of the lowland areas on the Island of Kaua'i (Tomich, 1986; David, 1995, 1999b, 2001a, 2001b, 2002b, 2003b, 2004).

Unlike nocturnally flying seabirds, which often collide with man-made structures, bats are uniquely adapted to avoid collision with obstacles, man-made or natural. They navigate and locate their prey primarily by using ultrasonic echolocation, which is sensitive enough to allow them to locate and capture small volant insects at night.

Although no live rodents were detected during the course of this survey, we did find sign of an unidentified rat species on the site. It is likely that roof rats (*Rattus r. rattus*), Norway rats (*Rattus norvegicus*), European house mice (*Mus domesticus*) and possibly Polynesian rats (*Rattus exulans hawaiiensis*) use various resources found within the proposed development site. Without conducting a trapping program, it is difficult to assess the population densities of these often hard-to-see mammals. All of these introduced rodents are deleterious to native ecosystems and the native faunal species dependant on them.

The findings of the avian survey are consistent with the findings of other recent surveys conducted within the general project area (David, 2002a, 2003a), and within other alien species dominated habitats in lowland areas on Kaua'i (David, 1995, 1998, 1999a, 1999b, 2000, 2001a, 2001b, 2002b, 2003b, 2004). That only one indigenous species was detected, namely the Black-crowned Night-Heron, reflects the degraded nature of the habitat present within the proposed development site. The banks of Waikomo Stream are

currently heavily overgrown with Guinea grass, and shaded by *koa haole*, Java plum, Chinese banyan and *hau*. It is possible that if the vegetation is cleared along the stream bank and the stream “opened” up, that one or more of the following three endangered waterbird species; Hawaiian Duck (*Anas wyvilliana*), or *koloa*, Hawaiian Coot (*Fulica alai*), or *'alea ke'ok'eo*, and Common Moorhen (*Gallinula chloropus sandvicensis*), or *'alea'ula* may be attracted to the stream. Should this occur, a consultation with the USFWS under the endangered Species Act of 1973, as amended (16 U.S.C. 1531-1544, § 884) may be required.

Although neither the endangered Hawaiian Petrel (*Pterodroma sandwichensis*), or *'ua'u*, nor the threatened Newell's Shearwater (*Puffinus auricularis newelli*), or *'a'o* were detected over-flying the site; it is likely that both species over-fly the proposed development site between late April and the end of November each year. Both species have been well documented crossing the northern, eastern and southern coastline of Kaua'i across a broad front and in relatively large numbers during the breeding season (Cooper and Day 1995, 1998; Day and Cooper 1995, 1999, 2001; Day et al., 2000, 2001a, 2001b, 2003; David et al., 2002, Morgan et al., 2003, 2004).

Both species of seabirds, especially fledging birds, can become disoriented by exterior lighting on their way to sea in the Fall. When disoriented, these seabirds often collide with manmade and naturally occurring physical features. If the downed birds are not killed outright, the dazed and/or injured birds become easy targets of opportunity for feral mammals (Reed et al., 1985; Telfer et al., 1987). The primary cause of mortality in both species is thought to be predation by alien mammalian species in the nesting colonies (Ainley et al., 2001; Day and Cooper, 1998; Cooper and Day, 1995). There are no nesting colonies, nor appropriate nesting habitat, for either seabird species within the proposed development site. The closest Newell's Shearwater colony is located at Kaluahonu some eight kilometers east-south-east of the study area. This colony may no longer be active, due to major habitat changes caused by invasive alien plant species (David et al., 2002, David, 2003c).

Recommendations:

To reduce the possibility that the nocturnally flying Hawaiian Petrels and Newell's Shearwaters may be disoriented by external lights and collide with man-made structures, it is recommended that any external lighting planned in conjunction with this development be shielded (Reed et al., 1985; Telfer et al., 1987).

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November 6, 2015

Max Solmssen
Community Planning and Engineering, Inc.
1286 Queen Emma Street
Honolulu, Hawai'i 96813

RE: Koae Workforce Housing Development Supplemental Avian Survey

Dear Mr. Solmssen,

Community Planning and Engineering, Inc. has contracted SWCA Environmental Consultants (SWCA) to conduct an avian survey for the proposed Koae Workforce Housing Development project. The survey area is within an approximately 11-acre (4.5-hectare [ha]) parcel along Poipu Road on the Island of Kaua'i. Only a portion of the survey area (approximately 7 acres [2.8 ha]) would be developed for this project (hereafter referred to as proposed construction limits).

A biological survey, including an avian component, was conducted in the survey area in 2004 (Rana Productions, Ltd. 2004), and a draft environmental assessment (EA) was published for the project in August 2015 (Community Planning and Engineering, Inc. 2004). The Hawai'i Department of Land and Natural Resources has formally requested an updated avian survey particularly to address the potential presence of the following avian species within the survey area (Figure 1):

- Endangered waterbirds Hawaiian coot ('ālae ke'oke'o [*Fulica alai*]), Hawaiian duck (koloa [*Anas wyvilliana*]), Hawaiian gallinule ('ālae 'ula [*Gallinula galeata sandvicensis*]), and Hawaiian stilt (ae'o [*Himantopus mexicanus knudseni*]).
- Endangered Hawaiian goose or nēnē (*Branta sandvicensis*).

This survey was conducted to supplement the previous biological survey conducted by Rana Productions, Ltd. in 2004.

Methods

Before conducting the field survey, SWCA reviewed the draft EA (Community Planning and Engineering, Inc. 2015) and the report from the 2004 biological survey (Rana Productions, Ltd. 2004). SWCA Biologist James Breeden conducted the survey on November 2, 2015. The avian survey consisted of a meandering pedestrian survey in the morning (from 08:00 to 11:30), when birds were most likely active. All visual and auditory observations were noted and included in the survey results. Most of the survey was conducted in the riparian area along Waikomo Stream, because it is where the endangered waterbirds are most likely to occur. The Old Cane Haul Road was walked up to the intersection of Waikomo Stream, and the stream was walked to the southeast to the survey area boundary. The location, habitat, and vegetation were evaluated for suitability for the endangered bird species.

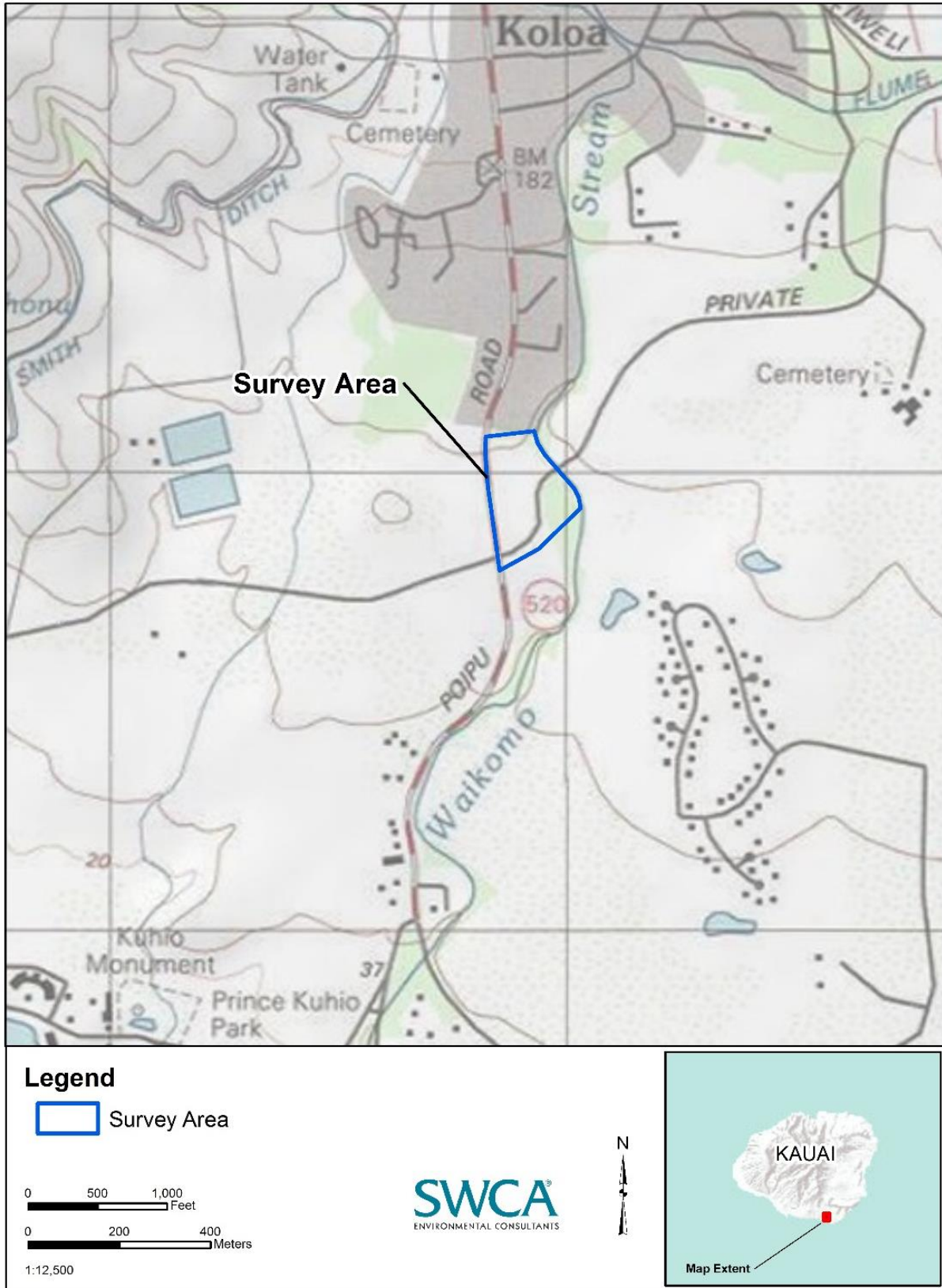


Figure 1. Survey area.

Results

Birds Observed

Birds observed in the survey area are species typically found in disturbed lowlands of Kaua‘i. Eleven bird species were documented, including the federally and state endangered nēnē. Three nēnē were seen flying over the southern boundary of the proposed construction limits heading west. Nēnē was the only native species observed during the survey. Ten non-native birds were observed in the survey area (Table 1).

Table 1. Birds Observed by SWCA in and near the Survey Area

Common Name	Scientific Name	Status*	Protected by the Migratory Bird Treaty Act
Common myna	<i>Acridotheres tristis</i>	NN	
Grey francolin	<i>Francolinus pondicerianus</i>	NN	
House finch	<i>Haemorhous mexicanus</i>	NN	
Hwamei	<i>Garrulax canorus</i>	NN	
Red junglefowl	<i>Gallus gallus</i>	NN	
Japanese white-eye	<i>Zosterops japonicus</i>	NN	
Hawaiian goose (nēnē)	<i>Branta sandvicensis</i>	E	X
Northern cardinal	<i>Cardinalis cardinalis</i>	NN	X
Spotted dove	<i>Streptopelia chinensis</i>	NN	
White-rumped shama	<i>Copsychus malabaricus</i>	NN	
Zebra dove	<i>Geopelia striata</i>	NN	
Total		11	2

* E = Endangered, NN = non-native permanent resident.

The only observed species protected by the MBTA are the Hawaiian goose (nēnē) and northern cardinal. The nēnē is discussed in detail below. Construction in the survey area may temporarily displace the northern cardinal, but long-term impacts are not expected. This bird species (likely limited to a few individuals inhabiting the survey area) is expected to find abundant foraging and nesting habitat nearby. The temporary displacement of individuals of this species in the survey area is not expected to affect the individuals' survival or the overall species' populations.

Habitat

The survey area is primarily overgrown with koa haole (*Leucaena leucocephala*) and Guinea grass (*Megathyrsus maximus*) (Figure 2). Waikomo Stream along the eastern edge of the survey area contains surface water with no emergent vegetation (Figure 3). The riparian area along Waikomo Stream consist of an understory of low lying shrubs, vines, and sedges, with an approximately 25-foot-high (7.6-m [m]-high) closed canopy composed of non-native trees (Figure 4). The adjacent Kiahuna Golf Club golf course creates edge habitat where the grass of the golf course meets the riparian area (Figure 5).



Figure 2. Koa haole and Guinea grass in the survey area.

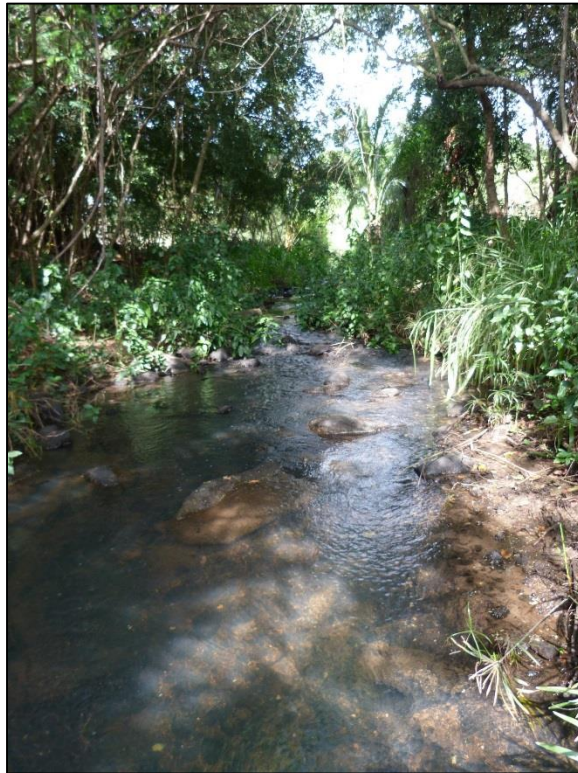


Figure 3. Potential open water foraging area in Waikomo Stream for the Hawaiian goose and Hawaiian duck.



Figure 4. Potential nesting habitat for Hawaiian goose and Hawaiian duck in riparian plant community along Waikomo Stream.



Figure 5. Hawaiian goose foraging area at adjacent Kiahuna Golf Club.

Hawaiian Goose (nēnē)

Nēnē occupy and nest in various habitat types, including beach strand, shrubland, grassland (such as golf courses), and lava rock at elevations ranging from coastal lowlands to alpine areas (U.S. Fish and Wildlife Service [USFWS] 2004). Nēnē eat plant material, and the composition of their diet depends largely on the vegetative composition of their surrounding habitats. Nēnē feed on leaves, sedge and grass seeds, leaves and flowers of various herbaceous composites, and fruits of several species of shrubs (Banko et al. 1999; Black et al. 1994). They are opportunistic in their choice of food plants as long as the plants meet their nutritional demands (Banko et al. 1999; Woog and Black 2001).

The survey area is within the known distribution of nēnē (USFWS 2004), and nēnē occur at the adjacent Kiahuna Golf Club (see Figure 5) (Kiahuna Golf Club 2015). Based on current distribution and habitat requirements, nēnē may use the southwestern corner of the proposed construction limits for nesting and foraging (Figure 6). Nēnē also have a high potential of nesting and foraging within the plant communities in the riparian portion of the survey area (east of the proposed construction limits) (see Figures 4 and 6). The open (non-covered) areas of the portion of Waikomo Stream that occurs in the survey area could also be used by nēnē for foraging (see Figure 3). Hydroseeding could also attract nēnē to the area.

Waterbirds

The survey area is within the known distribution of the four endangered waterbirds (USFWS 2011). These waterbirds are found in a variety of wetlands and waterways such as freshwater marshes and ponds, coastal estuaries and ponds, artificial reservoirs, kalo or taro (*Colocasia esculenta*) lo‘i or patches, irrigation ditches, sewage treatment ponds, and in the case of the Hawaiian duck, montane streams and marshlands (USFWS 2011). All four waterbird species have been detected approximately 1.5 miles (2.4 kilometers) away from the survey area at the Waita Reservoir (USFWS 2011) and may be attracted to the water features at the adjacent Kiahuna Golf Club golf course, which is adjacent to the survey area. The Hawaiian stilt and Hawaiian gallinule are known to occur at the Kiahuna Golf Club (Kiahuna Golf Club 2015).

The Hawaiian duck is the only endangered waterbird species with potential to occur in the survey area; however, no foraging or nesting habitat for the duck occurs within the proposed construction limits. The Hawaiian duck population was estimated at 2,525 individuals in 2002 with approximately 2,000 occurring on Kaua‘i and Ni‘ihau (USFWS 2014). Hawaiian ducks may use a variety of wetland habitats for nesting and foraging, including freshwater marshes, flooded grasslands, coastal ponds, streams, montane pools, and forest swamplands at elevations ranging from sea level to 9,900 feet (3,000 m) (USFWS 2011). Nests occur on the ground near water, but little else is known of specific nesting habits (USFWS 2011). This species may be attracted to the water features and plant communities at the adjacent Kiahuna Golf Club (see Figure 5). Based on current distribution and habitat requirements, the Hawaiian duck has a high potential of using the plant communities in the riparian portion of the survey area for nesting and foraging (east of the proposed construction limits) (see Figures 3 and 6). The open (non-covered) areas of the portion of Waikomo Stream that occurs in the survey area could also be used by Hawaiian duck for foraging (see Figure 3).



Figure 6. Potential nesting area for the Hawaiian goose and Hawaiian duck.
Note: DAR = Division of Aquatic Resources, NWI = National Wetlands Inventory

The Hawaiian gallinule is only found on O‘ahu and Kaua‘i. The Kaua‘i population is found in lowland wetlands and valleys (USFWS 2014). This species favors dense emergent vegetation near open water, floating or barely emergent mats of vegetation, and water depths of less than 3 feet (1 m). It prefers freshwater over saline or brackish water. Nests are typically constructed in areas with standing freshwater less than 2 feet (0.6 m) deep by folding emergent vegetation over into a platform. In areas where emergent vegetation is lacking, nests can be made on the ground if tall vegetative cover is nearby (USFWS 2011). Because of the closed canopy along the riparian corridor, it is unlikely that Hawaiian gallinule would occur in the survey area (including within the proposed construction limits).

Hawaiian stilt numbers varied between 1,100 and 1,783 individuals from 1997 to 2007, with fewer than 500 occurring on Kaua‘i (USFWS 2014, 2011). Hawaiian stilts use a variety of aquatic habitats, but prefer to loaf in open mudflats, sparsely vegetated pickleweed mats, and open pasturelands. Specific water depths of 5 inches (12.7 centimeters) are required for optimal foraging. Nest sites are frequently separated from feeding sites and are adjacent to or on low islands within bodies of fresh, brackish, or salt water. Because of the closed canopy along the riparian corridor, it is unlikely that Hawaiian stilt would occur within the survey area (including within the proposed construction limits).

The Hawaiian coot occurs on all main Hawaiian Islands except Kaho‘olawe, with an estimated population of 1,000–2,000 individuals. On Kaua‘i, the Hawaiian coot is usually found in lowland valleys (USFWS 2014). This species is associated with emergent freshwater and brackish water marsh habitat in lowland valleys, reservoirs, and occasionally in high-elevation plunge pools (USFWS 2011). Hawaiian coots forage in mud, sand, and on the water surface; can dive in water up to 4 feet (120 cm) deep; and may graze at grassy sites adjacent to wetlands (USFWS 2011). Nests are typically built on floating aquatic vegetation or in clumps or wetland vegetation, although nests have been documented on shorelines and rocky islets (USFWS 2011). Because of the closed canopy along the riparian corridor, it is unlikely that Hawaiian coot would occur in the survey area (including within the proposed construction limits).

Seabirds

Three federally and state-listed seabirds— the proposed endangered band-rumped storm petrel (‘akē‘akē [*Oceanodroma castro*]), endangered Hawaiian petrel (‘ua‘u [*Pterodroma sandwichensis*]), and threatened Newell’s shearwater (‘a‘o [*Puffinus auricularis newelli*])—occur on Kaua‘i. The types of habitat used for seabird nesting are diverse and range from xeric environments with little or no vegetation, such as at Haleakalā National Park on Maui, to wet forests dominated by ‘ōhi‘a (*Metrosideros polymorpha*) with uluhe (*Dicranopteris linearis*) understory, such as those found on Kaua‘i (Mitchell et al. 2005). Nests are located in various naturally occurring features such as lava tubes, cracks in tumuli (fractured hills on the surface of pāhoehoe flows), spaces created by uplift of pāhoehoe slabs, and other miscellaneous natural features (Hu et al. 2001; Mitchell et al. 2005; Pyle and Pyle 2009). All three seabird species may fly over the survey area en route to inland nesting sites. However, seabirds are not likely to land in the survey area because nesting and foraging habitat does not occur.

Recommendations

The following sections provide recommendations for measures that should be taken during construction to minimize and avoid impacts to the listed avian wildlife discussed in this report.

Hawaiian Goose (nēnē)

- All regular on-site staff should be trained to identify nēnē and know the appropriate steps to take if nēnē are present on-site.

If a nēnē is found in the area during ongoing activities, all activities within 100 feet (30 m) of the bird should cease, and the bird should not be approached. If a nest is discovered, USFWS should be contacted. If a nest is not discovered, work may continue after the bird leaves the area of its own accord.

Waterbirds

- If an endangered Hawaiian waterbird is present or flies into the area during ongoing activities, all activities within 100 feet (30 m) of the bird should cease, and the bird should also not be approached. Work may continue after the bird leaves the area of its own accord.
- Standing water should not be created due to the potential to attract waterbirds.

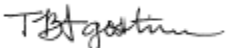
Seabirds

- Construction activity should be restricted to daylight hours during the seabird peak fallout period (September 15–December 15) to avoid the use of nighttime lighting that could attract seabirds.
- All outdoor lights will be shielded to prevent upward radiation. This has been shown to reduce the potential for seabird attraction (Reed et al. 1985; Telfer et al. 1987).
- Outside lights that are not needed for security and safety should be turned off from dusk through dawn during the fledgling fallout period (September 15–December 15).

Conclusion

In conclusion, residential land development will only occur within the proposed construction limits (see Figure 6) of the survey area. This area does not contain suitable habitat nesting or foraging habitat for listed waterbirds, including the Hawaiian duck; however, suitable nesting and foraging habitat for the Hawaiian duck does occur to the east of the proposed construction limits in the vicinity of Waikomo Stream. Nēnē may use the southwestern corner of the proposed construction limits for nesting and foraging. Nēnē are also likely to use areas in the vicinity of Waikomo Stream and the nearby Kiahuna Golf Club. If the above recommendations are followed, it is unlikely that any impacts will occur to nēnē, waterbirds, or seabirds.

Sincerely,



Tiffany Bovino Agostini
Natural Resources Team Lead - Pacific Islands

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APPENDIX D: TRAFFIC IMPACT ANALYSIS

TRAFFIC IMPACT ANALYSIS REPORT

KOAE AFFORDABLE HOUSING

KOLOA, KAUAI, HAWAII

June 29, 2015

Prepared for:

Community Planning and Engineering, Inc.
1286 Queen Emma Street
Honolulu, Hawaii 96813



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TRAFFIC IMPACT ANALYSIS REPORT
KOAE AFFORDABLE HOUSING

Koloa, Kauai, Hawaii

Prepared for

Community Planning and Engineering, Inc.

Prepared by

Austin, Tsutsumi & Associates, Inc.

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June 29, 2015

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KOAE AFFORDABLE HOUSING TRAFFIC IMPACT ANALYSIS REPORT

Koloa, Kauai, Hawaii

1. INTRODUCTION

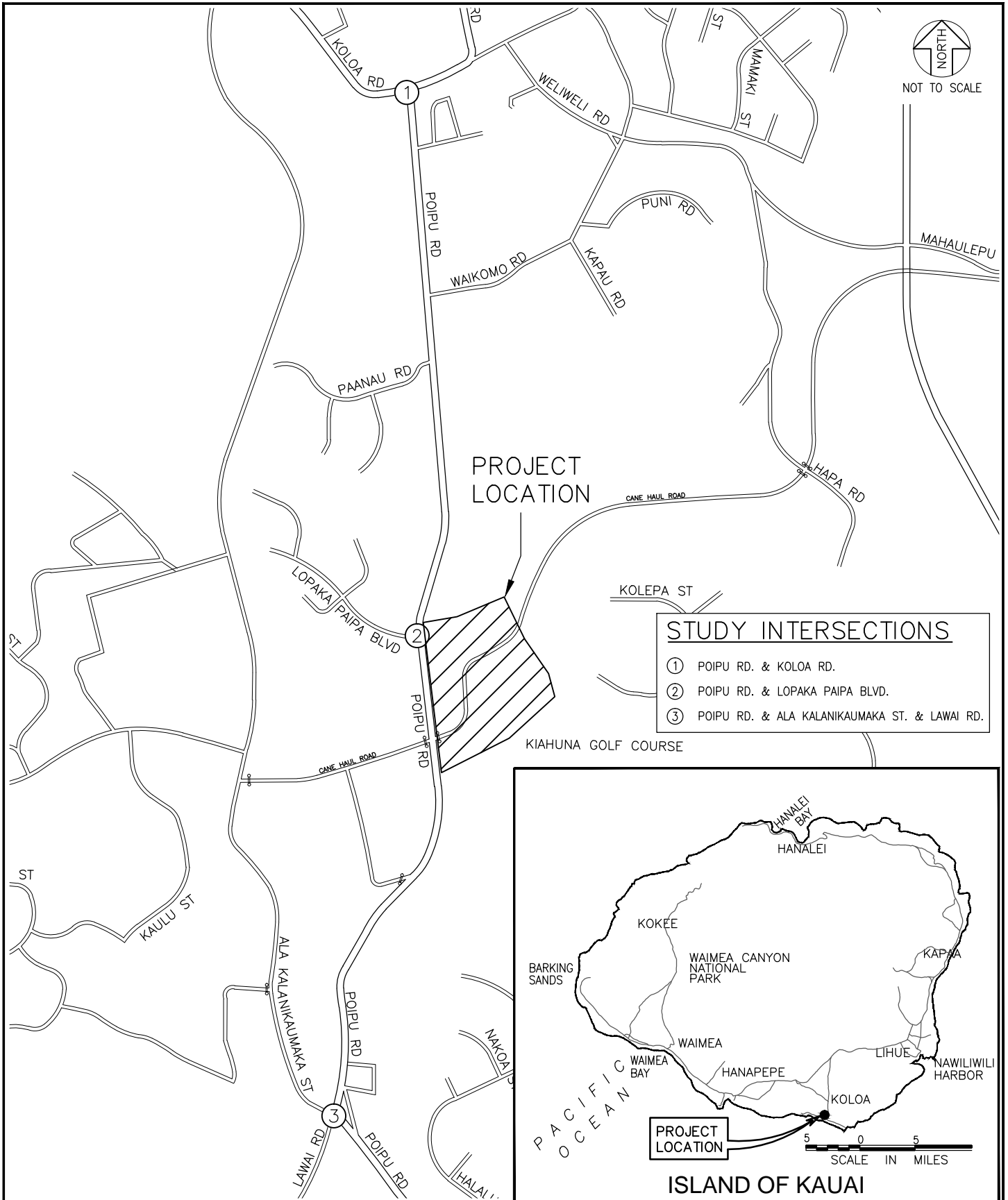
This report documents the findings of a traffic study conducted by Austin, Tsutsumi & Associates, Inc. (ATA) to evaluate the potential traffic impacts resulting from the proposed Koae Affordable Housing development (hereinafter referred to as the “Project”).

1.1 Location

The Project site is located in Koloa, east of Poipu Road and west of the Kiahuna Golf Course. An existing unnamed road, hereinafter referred to as “Cane Haul Road”, traverses through the site but is currently gated at its intersection at Poipu Road and unavailable for use to the general public. The Project site is more specifically identified as TMK: (4) 2-6-004:019. See Figure 1.1 for the Project location and Figure 1.2 for the Project site plan.

1.2 Project Description

The Project proposes to construct a maximum of 150 multi-family residential units on approximately 11 acres of land. The Project also proposes to provide one (1) new vehicular access along Poipu Road between Lopaka Paipa Boulevard and Cane Haul Road. The Project is anticipated to be complete by Year 2020.



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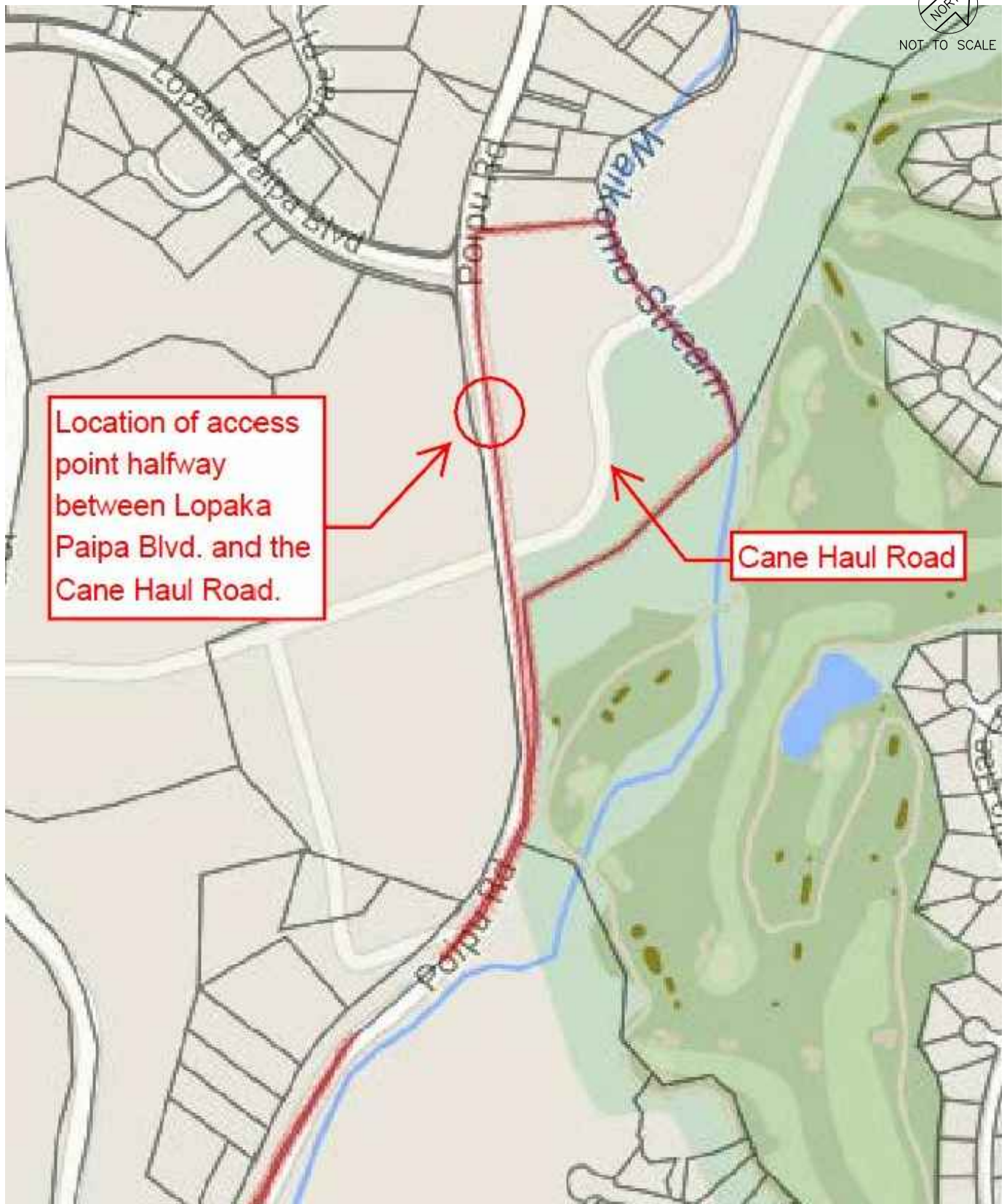
FIGURE

PROJECT LOCATION

1.1



NOT TO SCALE



Location of access point halfway between Lopaka Paipa Blvd. and the Cane Haul Road.

Cane Haul Road

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FIGURE

1.2

PROJECT SITE PLAN



2. STUDY METHODOLOGY

Level of Service (LOS) is a qualitative measure used to describe the conditions of traffic flow at intersections, with values ranging from free-flow conditions at LOS A to congested conditions at LOS F. The Highway Capacity Manual (HCM), dated 2010, methods for calculating volume to capacity ratios, delays and corresponding Levels of Service were utilized in this study. LOS definitions for signalized and unsignalized intersections are provided in Appendix B.

2.1 Intersection Analysis

For applicable intersections as determined in Section 2.2, intersection analysis was performed using the traffic analysis software Synchro, which prepares Highway Capacity Manual (HCM) reports. The reports contain quantitative delay results, as based on intersection lane geometry, signal timing (including coordination and actuated minimums and maximums), roundabouts, and hourly traffic volume.

Based on the vehicular delay, reserve capacity and critical gaps at the intersection, a LOS is assigned (see Appendix B) as a qualitative measure of performance. These results constitute the technical analysis that will form the basis of the recommendations outlined in this report.

2.2 Study Area Intersection Analysis

Intersection analysis within the study area was performed on the following intersections due to their proximity to the Project:

- Poipu Road/Koloa Road (Unsignalized)
- Poipu Road/Lopaka Paipa Boulevard (Unsignalized)
- Poipu Road/Lawai Road/Ala Kalanikaumaka Road (Roundabout)

3. EXISTING TRAFFIC CONDITIONS

3.1 Roadway Network

The following are brief descriptions of the existing roadways studied within the vicinity of the Project:

Poipu Road is a generally two-lane, two-way, undivided collector roadway. This roadway begins at the T-intersection with Koloa Road and is oriented in the north-south direction, until it reaches the roundabout intersection with Ala Kalanikaumaka Road/Lawai Road. Poipu Road then traverses in the east-west direction, terminating as a dirt road near CJM Country Stables. The posted speed limit along this road is typically 25 miles per hour (mph) and reduces to 15 mph as it approaches the study roundabout.

Koloa Road is a generally east-west, two-lane, two-way, undivided collector roadway that begins at Kaunualii Highway to the northwest and terminates at a T-intersection with Waikomu Road, becoming Wailani Road to the east. The posted speed limit along this road is typically 25 mph within the vicinity of the Project.



Lopaka Paipa Boulevard services the 32-lot Koloa Estates residential subdivision as an east-west, two-lane, two-way, undivided roadway that extends westward from Poipu Road for approximately 1,300 feet and terminates at a dead-end. The posted speed limit along this roadway is 25 mph.

Lawai Road is a generally east-west, two-lane, two-way, undivided roadway. This roadway begins to the west at the gated entrance to Lawai Bay and terminates to the east at the roundabout intersection with Ala Kalanikaumaka Road/Poipu Road. The posted speed limit on Lawai Road is typically 25 mph and reduces to 15 mph as it approaches the study roundabout. Lawai Road currently services retail, residential, and resort land uses.

Ala Kalanikaumaka Street is a generally north-south, two-lane, two-way collector roadway. This roadway begins to the north at the T-intersection with Koloa Road and terminates to the south at the roundabout intersection with Lawai Road/Poipu Road. The posted speed limit along this road is typically 25 mph and reduces to 15 mph as it approaches the study roundabout.

3.2 Existing Traffic Volumes

The existing traffic volumes data utilized in this report were collected on Wednesday, April 1 and Thursday, April 2, 2015. Based on the traffic count data, the weekday AM peak hour of traffic was determined to occur between 7:00 AM and 8:00 AM, while the weekday PM peak hour of traffic was determined to occur between 3:30 PM and 4:30 PM. The traffic count data is provided in Appendix A for the existing intersections studied.

3.3 Existing Traffic Conditions Analysis and Observations

Poipu Road/Koloa Road is an unsignalized T-intersection, with exclusive turning lanes on most approaches that includes a stop-control for the northbound left-turn movement, and a channelized yield control for the northbound right-turn movement. The northbound left-turn movement currently operates at LOS F during the AM peak hour of traffic and at LOS E during the PM peak hour of traffic. However, due to relatively light mainline through traffic along Koloa Road, the northbound left-turn and right-turn movements were not observed to experience lengthy delays or queues. Vehicular queues typically ranged between just 1-2 vehicles long and occasionally extended for three (3) vehicles. Gaps along Koloa Road usually allowed turning movements to clear and not create frequent congestive conditions. All other movements currently operate at LOS B or better during the AM and PM peak hours of traffic.

Poipu Road/Lopaka Paipa Boulevard is a stop controlled T-intersection which includes exclusive eastbound left-turn and right-turn lanes, a shared northbound left-through lane, and a shared southbound through-right lane. All movements at this intersection currently operate at LOS C or better with minimal delay and queuing during the AM and PM peak hours of traffic.

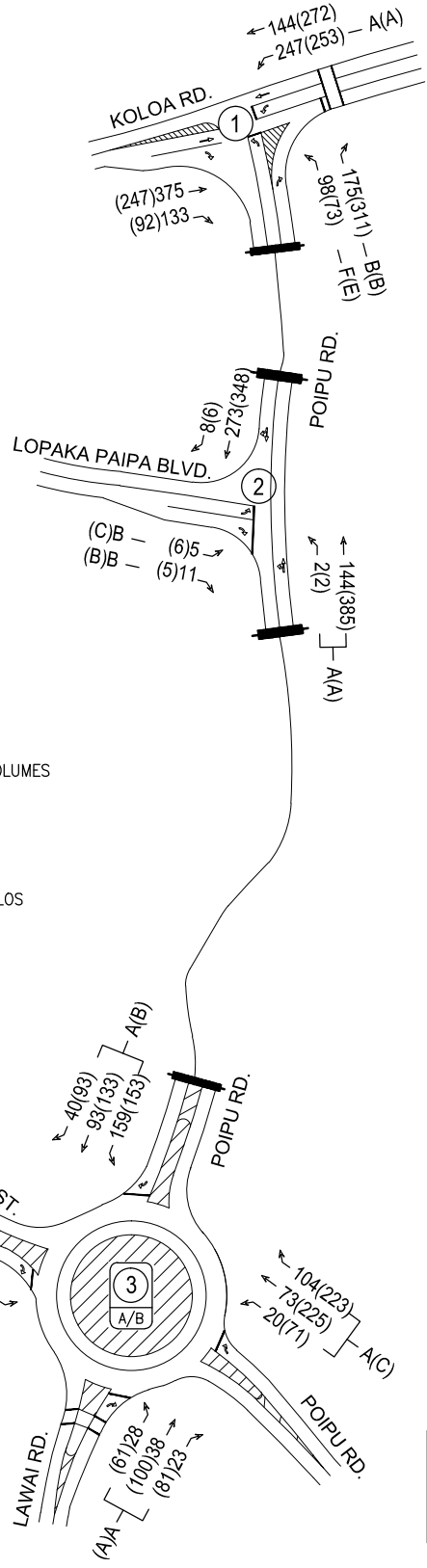
Poipu Road/Lawai Road/Ala Kalanikaumaka Road is a single lane roundabout. Based on Synchro's HCM 2010 methodology, this roundabout currently operates at overall LOS B or better with all movements operating at LOS C or better during the AM and PM peak hours of traffic. Based on observations, vehicles at this intersection generally experience minimal delay and queuing during the AM and PM peak hours of traffic.



Figure 3.1 illustrates the existing lane configuration, existing traffic volumes, and LOS for each study intersection. Table 3.1 summarizes the existing LOS at the study intersections. LOS worksheets are provided in Appendix C.



NOT TO SCALE



LEGEND

##(##) - AM(PM) PEAK HOUR OF TRAFFIC VOLUMES

X(X) - AM(PM) LOS



- ROUNDABOUT INTERSECTION Y
ROUNDABOUT AM(PM) PEAK HOUR LOS



- UNSIGNALIZED INTERSECTION Y

DATE OF COUNTS:
April 1 & 2, 2015

AM PEAK HOUR:
7:00 AM - 8:00 AM

PM PEAK HOUR:
3:30 PM - 4:30 PM

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FIGURE

EXISTING LANE CONFIGURATION,
TRAFFIC VOLUMES, AND LOS

3.1

Table 3.1: Existing Conditions LOS

Intersection	Existing Conditions					
	AM			PM		
	HCM Delay	v/c Ratio	LOS	HCM Delay	v/c Ratio	LOS
Poipu Road & Koloa Road						
WB LT	9.1	0.23	A	8.5	0.21	A
NB LT	50.5	0.59	F	39.6	0.44	E
NB RT	12.9	0.30	B	13.3	0.44	B
Poipu Road & Lopaka Paipa Road						
EB LT	11.5	0.01	B	15.5	0.02	C
EB RT	10.0	0.02	B	10.5	0.01	B
NB LT/TH	7.9	0.00	A	8.1	0.00	A
Poipu Road/Lawai Road & Ala Kalanikaumaka Street						
EB LT/TH/RT	7.6	0.29	A	10.5	0.43	B
WB LT/TH/RT	5.5	0.21	A	15.0	0.66	C
NB LT/TH/RT	6.0	0.13	A	9.2	0.35	A
SB LT/TH/RT	7.1	0.33	A	13.4	0.55	B
Overall	6.7	--	A	12.7	--	B



4. BASE YEAR 2020 TRAFFIC CONDITIONS

4.1 Defacto Growth Rate

The defacto growth rate for Base Year 2020 was determined by comparing the ATA traffic count data with the Kauai Regional Travel Demand Model (KRTDM) forecast for year 2020. The resulting growth rate along Poipu Road, Koloa Road, Ala Kalanikaumaka Street and Lawai Road was estimated to be approximately one (1) percent per year.

4.2 Traffic Forecasts for Known Developments

By year 2020, the following developments are anticipated to have transportation impacts on the study intersections and were included in the 2020 Base Year traffic projections:

- **The Village at Koloa Town** – This proposed mixed-use development will include 45,000 square feet (SF) of retail/restaurant/office/medical space and 34 residential duplex cottages. This development is anticipated to generate approximately 70 trips during the AM peak hour and 137 trips during the PM peak hour based upon the Institute of Transportation Engineers (ITE) Trip Generation Manual, 9th Edition. The Village at Koloa Town is proposed to be located on a vacant lot, south of Koloa Road, east of Weliweli Road and west of Waikomo Road. Vehicle access will likely be provided via a new driveway access along Weliweli Road.
- **The Shops at Kukuiula (Longs Drugs Store)** – The Longs Drugs store is proposed to be a standalone building on a vacant lot within the Shops at Kukuiula shopping center. Based on Google Earth, the store is conservatively estimated to be approximately 10,000 SF. Including the vacant Longs Drugs store lot, The Shops at Kukuiula is estimated to have a current vacancy rate of approximately 25 percent. Based on the Hawaii Retail MarketView report by CBRE Group, Inc., the average vacancy rate for Kauai retail centers in the third quarter of 2014 was approximately 8.7 percent.

In order to account for the future Longs Drugs store and potentially increased occupancy at The Shops at Kukuiula, the overall occupied square footage of the shopping center was increased by approximately 14,000 SF to match the 8.7 percent vacancy rate for the island of Kauai. Based on this assumption, The Shops at Kukuiula is anticipated to generate approximately 15 trips during the AM peak hour and 63 trips during the PM peak hour in addition to trips currently generated. The Shops at Kukuiula is generally located west of the Ala Kalanikaumaka Street/Poipu Road/Lawai Road roundabout. Vehicle access to the Project will likely occur via all existing driveways for the Shops at Kukuiula.

- **Island Country Markets at Kukuiula** – This proposed development will include a market, retail space, and other commercial land use. These land uses are anticipated to generate approximately 179 new trips during the AM peak hour and 249 new trips during the PM peak hour, based on the Island Country Markets at Kukuiula TIAR, dated August 5, 2014, prepared by ATA. The Project is proposed to be located on a vacant lot north of the Ala Kalanikaumaka Street/Poipu Road/Lawai Road roundabout. Vehicle access to the Project may occur via driveway(s) along Ala Kalanikaumaka Street and Poipu Road

Table 4.1 shows the trips generated by these other known developments. Based on the schedule of completion for the above developments, it was conservatively assumed that all three (3) projects will be fully built-out by Year 2020.

Table 4.1: Peak Hour Trips Generated by Other Known Developments

Background Projects	AM Peak Hour			PM Peak Hour		
	Enter	Exit	Total	Enter	Exit	Total
The Village at Koloa Town	36	34	70	65	72	137
The Shops at Kukuiula (Longs Drugs Store)	9	6	15	30	33	63
Island Country Markets at Kukuiula	94	84	178	127	121	248
BASE YEAR 2020 TOTAL	139	124	263	222	226	448

4.3 Planned Roadway Projects

Currently, no roadway widening improvements are planned for the study roadways within the vicinity of the Project according to the State of Hawaii Department of Transportation (SDOT) Statewide Transportation Improvement Program (STIP) revised in March 2015.

4.4 Base Year 2020 Analysis

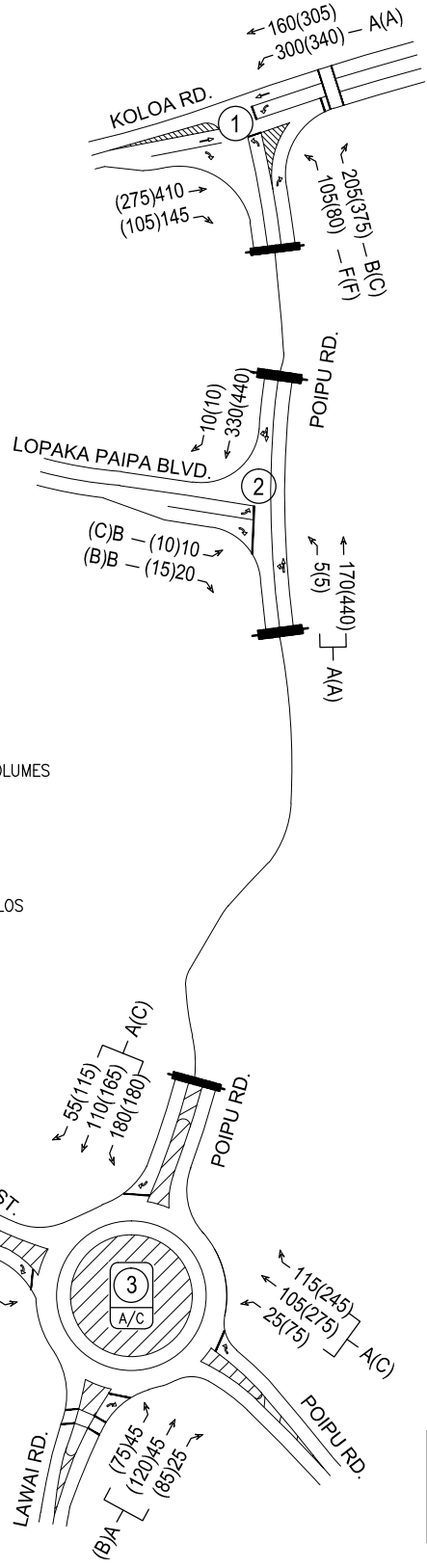
All study intersections are forecast to operate with LOS similar to existing conditions, with all movements operating at LOS C or better during AM and PM peak hour conditions except at the following location:

Poipu Road/Koloa Road - The northbound left-turn movement is forecast to continue operating at LOS F during the AM peak hour and worsen from LOS E to LOS F during the PM peak hour by year 2020 without the Project. Traffic at the intersection is anticipated to increase by approximately 16 percent from existing conditions primarily due to forecast traffic generated by the above three (3) other known developments. Based on Synchro traffic simulations at the intersection, the northbound left-turn movement should continue operating with an average queue of about 2 vehicles long, similar to existing conditions, but peak queues may occasionally increase by an additional 5-6 vehicles due to longer delays. A traffic signal is not anticipated to be warranted based on the Four-Hour Vehicular Volume warrant (see Appendix D) for the AM and PM peak periods. However, if lengthy queues occur, a westbound median acceleration lane could be considered, dependent upon County approval to implement changes to the intersection roadway striping, to allow northbound left-turners to cross eastbound and westbound traffic separately, potentially reducing delays and limiting northbound left-turn queues. All other movements at the study intersections are forecast to continue operating at LOS C or better, with all movements operating below capacity.

Figure 4.1 illustrates the Base Year 2020 forecast traffic volumes and LOS for the study intersection movements. Table 4.2 summarizes the Base Year 2020 LOS at the study intersections. LOS worksheets are provided in Appendix C.



NOT TO SCALE



LEGEND

##(##) - AM(PM) PEAK HOUR OF TRAFFIC VOLUMES

X(X) - AM(PM) LOS



- ROUNDABOUT INTERSECTION Y
ROUNDABOUT AM(PM) PEAK HOUR LOS



- UNSIGNALIZED INTERSECTION Y

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**BASE YEAR 2020 LANE CONFIGURATION,
TRAFFIC VOLUMES, AND LOS**

FIGURE

4.1

Table 4.2: Base Year 2020 Conditions LOS

Intersection	Base Year 2020 Conditions					
	AM			PM		
	HCM Delay	v/c Ratio	LOS	HCM Delay	v/c Ratio	LOS
Poipu Road & Koloa Road						
WB LT	9.6	0.29	A	9.0	0.29	A
NB LT	111.3	0.87	F	100.2	0.76	F
NB RT	14.2	0.36	B	15.6	0.55	C
Poipu Road & Lopaka Paipa Road						
EB LT	12.6	0.02	B	18.5	0.04	C
EB RT	10.5	0.03	B	11.4	0.03	B
NB LT/TH	8.0	0.01	A	8.4	0.01	A
Poipu Road/Lawai Road & Ala Kalanikaumaka Street						
EB LT/TH/RT	9.4	0.38	A	16.1	0.61	C
WB LT/TH/RT	6.5	0.27	A	23.9	0.80	C
NB LT/TH/RT	7.0	0.18	A	12.1	0.46	B
SB LT/TH/RT	8.7	0.41	A	21.4	0.73	C
Overall	8.1	--	A	19.5	--	C



5. FUTURE YEAR 2020 TRAFFIC CONDITIONS

The Future Year 2020 scenario represents the traffic conditions within the Project study area with the full build-out of the Project.

5.1 Background

The proposed Project plans to develop a maximum of 150 multi-family residential units on approximately 11 acres of land to the east of Poipu Road. Vehicular access to the Project will be provided by a new access intersection located between Lopaka Paipa Blvd and the Cane Haul Road.

5.2 Travel Demand Estimations

5.2.1 Trip Generation

The Institute of Transportation Engineers (ITE) publishes a book based on empirical data compiled from a body of more than 4,250 trip generation studies submitted by public agencies, developers, consulting firms, and associations. This publication, titled Trip Generation Manual, 9th Edition, provides trip rates and/or formulae based on graphs that correlate vehicular trips with independent variables. The independent variable can range from Dwelling Units (DU) for single-family attached homes to Gross Floor Area (GFA) for commercial and office development. See Tables 5.1 and 5.2 for Trip Generation formulae and projections for the Project.

Table 5.1: Project Trip Generation Rates

Land Use Type	Independent Variable	AM Peak Hour		PM Peak Hour	
		Rate	% Enter	Rate	% Enter
Residential Condo/Townhouse (ITE 230)	Dwelling Units (DU)	[a]	17%	[b]	67%

[a] $\ln(T) = 0.80 \cdot \ln(X) + 0.26$

[b] $\ln(T) = 0.82 \cdot \ln(X) + 0.32$

Table 5.2: New Project-Generated Trips

Land Use Type	Quantity	AM Peak Hour			PM Peak Hour		
		Enter	Exit	Total	Enter	Exit	Total
Residential Condo/Townhouse (ITE 230)	150 DU	12	60	72	56	28	84



5.2.2 Trip Distribution

Trips generated by the Project were assigned throughout the study area generally based upon existing travel patterns within the vicinity of the Project. The traffic generated by the Project was added to the forecast Base Year 2020 traffic volumes within the vicinity of the Project to constitute the traffic volumes for the Future Year 2020 traffic conditions. Figure 5.1 illustrates the Project-generated trip distribution.

5.3 Future Year 2020 Analysis

Upon completion of the Project, all study intersections are forecast to operate with LOS similar to Base Year 2020 conditions, with all movements operating at LOS D or better during the AM and PM peak hours of traffic with the exception of the northbound left-turn movement at the Poipu Road/Koloa Road intersection. This movement is forecast to continue operating at the same LOS F and below capacity condition, similar to the Base Year 2020 scenario. The Project will only increase total traffic at the intersection by approximately 3.6 percent, with the more critical northbound left-turn movement volumes only increasing by approximately 6 percent during the AM(PM) peak hours of traffic. Synchro traffic simulation indicates that the average queues during the peak hours will remain similar to existing and Base Year 2020 conditions, at about 2 vehicles long, but peak queues may occasionally extend by an additional 1-2 vehicles long due to increased delays.

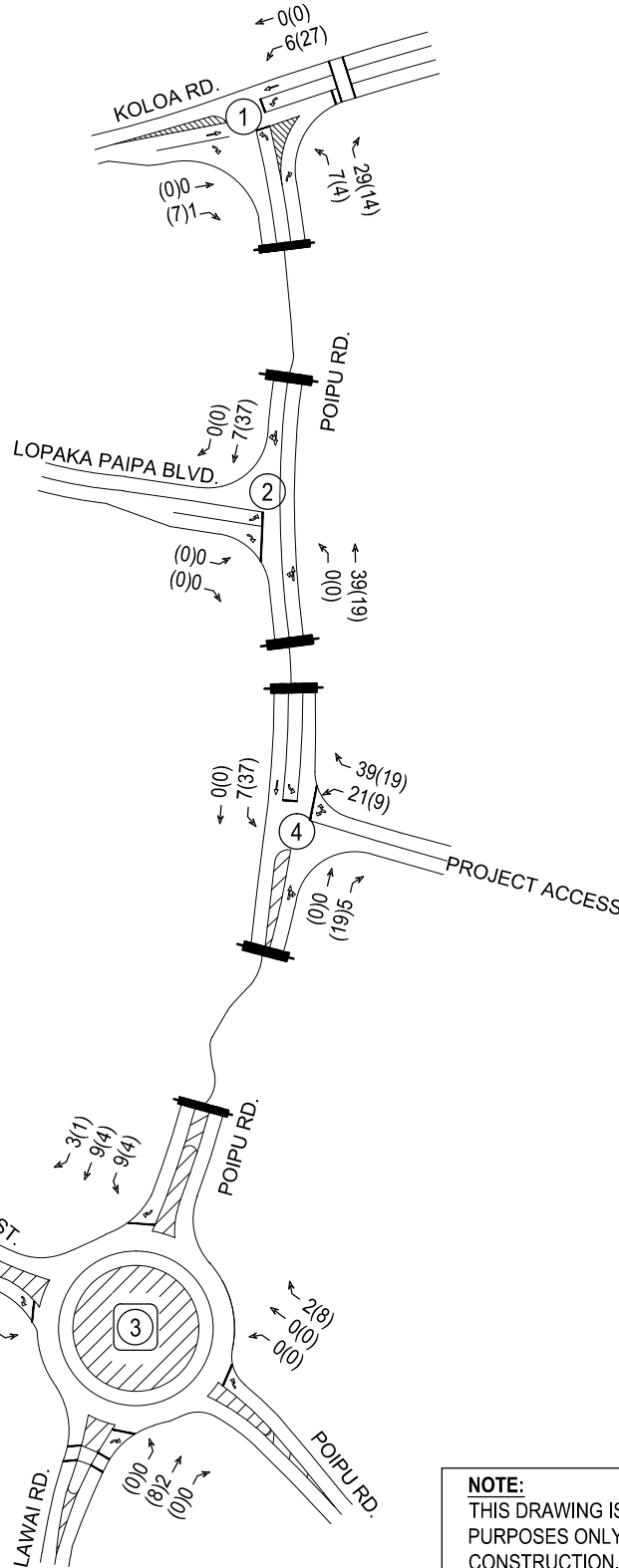
Based on the Four-Hour Vehicular Volume traffic signal warrant for the AM and PM peak periods, a traffic signal warrant would most likely not be warranted (See Appendix D). As discussed in Section 4.4 if lengthy queues occur, a westbound median acceleration lane could be considered, dependent upon County approval to implement changes to the intersection roadway striping, to allow northbound left-turners to cross eastbound and westbound traffic separately, potentially reducing delays and limiting northbound left-turn queues.

At the Project access, analyzed as a T-intersection with stop control on the westbound approach, future PM peak hour traffic volumes are forecast to result in approximately 40 vehicles, or 7.5 percent, of the 520 southbound approaching vehicles at the Project site making left-turns against an opposing volume of 470 vehicles. Based on Table 9-3 from the NCHRP 457 Report published by the Transportation Research Board in 2001, these volumes warrant a dedicated southbound left-turn lane from Poipu Road (See Appendix E). The southbound left-turn lane should provide for at least 50 feet of storage based on the AASHTO Policy on Geometric Design of Highways and Streets, 2011.

Figure 5.2 illustrates the Future Year 2020 forecast traffic volumes and LOS for the study intersection movements. Table 5.3 summarizes the Future Year 2020 LOS at the study intersections. LOS worksheets are provided in Appendix C.



NOT TO SCALE



LEGEND

##(##) - PROJECT GENERATED AM(PM) PEAK HOUR OF TRAFFIC VOLUMES



- ROUNDABOUT INTERSECTION Y



- UNSIGNALIZED INTERSECTION Y

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PROJECT GENERATED TRAFFIC VOLUMES

FIGURE

5.1



NOT TO SCALE

LEGEND

##(##) - AM(PM) PEAK HOUR OF TRAFFIC VOLUMES

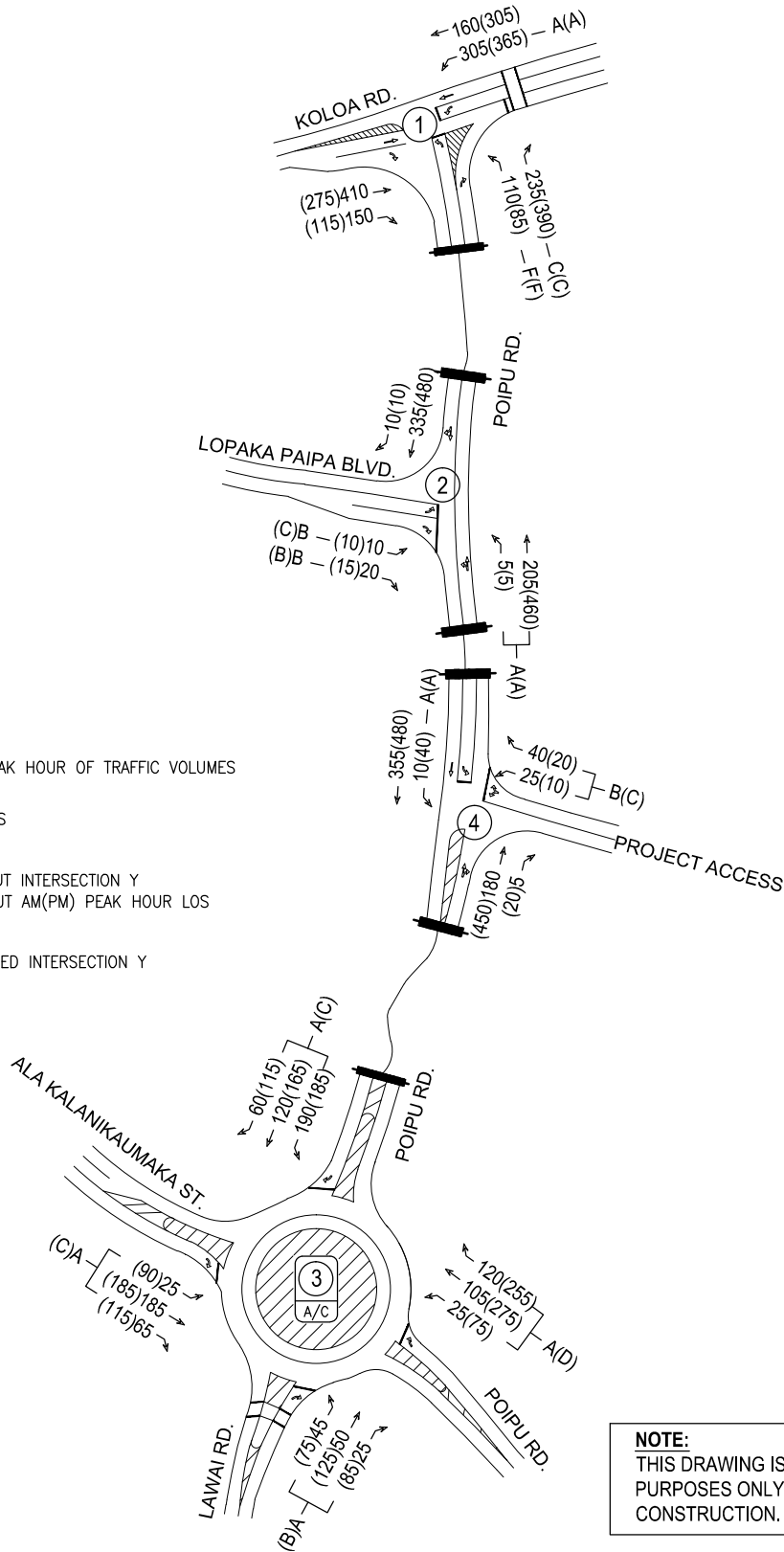
X(X) - AM(PM) LOS



- ROUNDABOUT INTERSECTION Y
ROUNDABOUT AM(PM) PEAK HOUR LOS



- UNSIGNALIZED INTERSECTION Y



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FUTURE YEAR 2020 LANE CONFIGURATION,
TRAFFIC VOLUMES, AND LOS

FIGURE

5.2

Table 5.3: Future Year 2020 Conditions LOS

Intersection	Future Year 2020 Conditions					
	AM			PM		
	HCM Delay	v/c Ratio	LOS	HCM Delay	v/c Ratio	LOS
Poipu Road & Koloa Road						
WB LT	9.6	0.30	A	9.2	0.31	A
NB LT	128.0	0.93	F	137.8	0.90	F
NB RT	15.0	0.42	C	16.1	0.57	C
Poipu Road & Lopaka Paipa Road						
EB LT	13.0	0.02	B	19.8	0.04	C
EB RT	10.5	0.03	B	11.7	0.03	B
NB LT/TH	8.1	0.01	A	8.5	0.01	A
Poipu Road/Lawai Road & Ala Kalanikaumaka Street						
EB LT/TH/RT	9.7	0.39	A	16.2	0.61	C
WB LT/TH/RT	6.6	0.28	A	25.7	0.82	D
NB LT/TH/RT	7.1	0.18	A	12.4	0.47	B
SB LT/TH/RT	9.2	0.44	A	21.8	0.73	C
<i>Overall</i>	8.4	--	A	20.4	--	C
Poipu Road & Project Access						
WB LT/RT	11.4	0.11	B	15.5	0.09	C
SB LT	7.6	0.01	A	8.6	0.04	A



6. CONCLUSIONS

The Project proposes to construct a maximum of 150 multi-family residential units on approximately 11 acres of land on a vacant lot east of Poipu Road and west of the Kiahuna Golf Course. The Project also proposes to provide one (1) new access intersection on Poipu Road between Lopaka Paipa Boulevard and Cane Haul Road with completion by Year 2020.

6.1 Existing Conditions

All movements at the study intersections currently operate at LOS C or better during the AM and PM peak hours of traffic with the exception of the northbound left-turn movement at the Poipu Road/Koloa Road intersection. This movement operates at LOS F during the AM peak hour of traffic and LOS E during the PM peak hour of traffic. Vehicular queues typically ranged between 1-2 vehicles with occasional queues of up to three (3) vehicles. No other significant queuing or delays were observed along the study roadways in the vicinity of the Project.

6.2 Base Year 2020 without the Project

Traffic growth in the study area was estimated for Year 2020 by using the KRTDM and anticipated to grow by approximately 1 percent per year. Nearby future developments such as The Village at Koloa Town, Longs Drugs store at The Shops at Kukuiula and Island Country Markets were also included in the Base Year 2020 projections.

All study intersections are forecast to operate with LOS similar to existing conditions, with all movements operating at LOS D or better during the AM and PM peak hours except at the following location:

Poipu Road/Koloa Road - The northbound left-turn movement is forecast to continue operating at LOS F during the AM peak hour and worsen from LOS E to LOS F during the PM peak hour by year 2020 without the Project. Traffic at the intersection is anticipated to increase by approximately 16 percent from existing conditions primarily due to background growth and forecast traffic generated by the three (3) other known developments in the area. The average northbound left-turn queues are forecast to continue to extend about 2 vehicles long, similar to existing conditions, but peak queues may occasionally increase by an additional 5-6 vehicles due to longer delays based on Synchro traffic simulations. A traffic signal is not anticipated to be warranted based on the Four-Hour Vehicular Volume warrant for the AM/PM peak periods.

6.3 Future Year 2020 with the Project

The Project is anticipated to generate approximately 72 AM peak hour trips and 84 PM peak hour trips. Due to minimal impacts generated by the Project, all study intersections are forecast to operate similar to Base Year 2020 conditions.

The northbound left-turn movement at the Poipu Road/Koloa Road intersection is forecast to continue operating at LOS F and below capacity, with all other study intersection movements operating at LOS D or better. Average northbound left-turn volumes are anticipated to increase by only six (6) percent and queues are forecast to continue to extend about 2 vehicles long, similar to Base Year conditions, but peak queues may occasionally increase by an additional 1-2 vehicles due to longer delays. A traffic signal is not anticipated to be warranted based on the Four-Hour Vehicular Volume warrant for the AM and PM peak periods.



7. RECOMMENDATIONS

Base Year 2020

- At the Poipu Road/Koloa Road intersection, if lengthy northbound left-turn queues occur, a westbound median acceleration lane could be considered, dependent upon County approval to implement changes to the intersection roadway striping. This would allow northbound left-turners to cross eastbound and westbound traffic separately, potentially reducing delays and limiting northbound left-turn queues.

Future Year 2020

- At the Project access intersection, a southbound left-turn lane from Poipu Road with at least 50 feet of storage length is recommended.



8. REFERENCES

1. AASHTO, Policy on Geometric Design of Highways and Streets, 2011.
2. Austin, Tsutsumi & Associates, Inc., TIAR for Island Country Markets at Kukuiula, August 5, 2014.
3. CBRE Global Research and Consulting, Hawaii Retail MarketView Report, 2014.
4. Institute of Transportation Engineers, Trip Generation, 9th Edition, 2012.
5. Transportation Research Board, Highway Capacity Manual, 2010.
6. Transportation Research Board, NCHRP Report 457, 2001.



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APPENDICES



APPENDIX A

TRAFFIC COUNT DATA

Austin Tsutsumi & Associates

501 Sumner Street, Suite 521
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Phone: (808) 533-3646 Fax: (808) 526-1267

File Name : AM_Poipu Rd - Koloa Rd
Site Code : 00000000
Start Date : 4/2/2015
Page No : 1

Groups Printed- Unshifted

Start Time	POIPU ROAD From North				KOLOA ROAD From East				POIPU ROAD From South				KOLOA ROAD From West				Int. Total
	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	
07:00 AM	0	0	0	0	0	36	47	0	38	0	16	0	21	119	0	0	277
07:15 AM	0	0	0	0	0	42	64	0	41	0	18	0	27	110	0	0	302
07:30 AM	0	0	0	0	0	37	78	0	43	0	28	0	57	74	0	0	317
07:45 AM	0	0	0	0	0	29	58	0	53	0	36	0	28	72	0	0	276
Total	0	0	0	0	0	144	247	0	175	0	98	0	133	375	0	0	1172
08:00 AM	0	0	0	0	0	32	62	0	45	0	15	0	18	42	0	0	214
08:15 AM	0	0	0	0	0	46	56	0	36	0	12	0	12	43	0	0	205
08:30 AM	0	0	0	0	0	38	41	0	46	0	15	0	23	35	0	0	198
08:45 AM	0	0	0	0	0	34	42	0	46	0	12	0	16	45	0	0	195
Total	0	0	0	0	0	150	201	0	173	0	54	0	69	165	0	0	812
Grand Total	0	0	0	0	0	294	448	0	348	0	152	0	202	540	0	0	1984
Apprch %	0	0	0	0	0	39.6	60.4	0	69.6	0	30.4	0	27.2	72.8	0	0	
Total %	0	0	0	0	0	14.8	22.6	0	17.5	0	7.7	0	10.2	27.2	0	0	

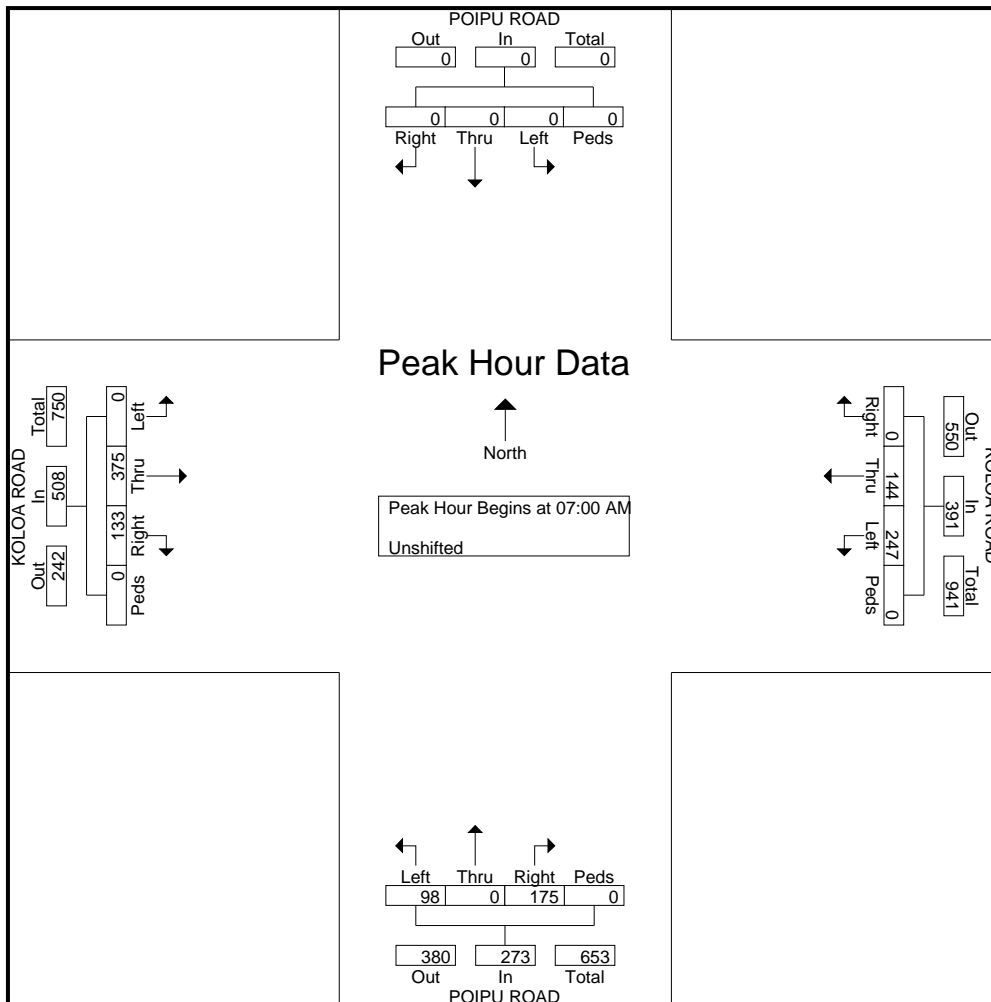
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Phone: (808) 533-3646 Fax: (808) 526-1267

File Name : AM_Poipu Rd - Koloa Rd
Site Code : 00000000
Start Date : 4/2/2015
Page No : 2

Start Time	POIPU ROAD From North					KOLOA ROAD From East					POIPU ROAD From South					KOLOA ROAD From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:00 AM																					
07:00 AM	0	0	0	0	0	0	36	47	0	83	38	0	16	0	54	21	119	0	0	140	277
07:15 AM	0	0	0	0	0	0	42									57	74	0	0	131	317
07:30 AM	0	0	0	0	0	0	37	78	0	115	43	0	28	0	71	57	74	0	0	131	317
07:45 AM	0	0	0	0	0	0	29	58	0	87	53		36	0	89	28	72	0	0	100	276
Total Volume	0	0	0	0	0	0	144	247	0	391	175	0	98	0	273	133	375	0	0	508	1172
% App. Total	0	0	0	0	0	0	36.8	63.2	0		64.1	0	35.9	0		26.2	73.8	0	0		
PHF	.000	.000	.000	.000	.000	.000	.857	.792	.000	.850	.825	.000	.681	.000	.767	.583	.788	.000	.000	.907	.924



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Start Date : 4/2/2015

Page No : 1

Groups Printed- Unshifted

Start Time	LOPAKA PAIPA BOULEVARD Eastbound				LOPAKA PAIPA BOULEVARD Westbound				POIPU ROAD Northbound				POIPU ROAD Southbound				Int. Total
	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	
07:00 AM	0	0	2	0	0	0	0	0	1	28	0	0	0	58	2	0	91
07:15 AM	2	0	4	0	0	0	0	0	1	31	0	0	0	65	1	0	104
07:30 AM	1	0	2	0	0	0	0	0	0	48	0	0	0	74	1	0	126
07:45 AM	2	0	3	0	0	0	0	0	0	37	0	0	0	76	4	0	122
Total	5	0	11	0	0	0	0	0	2	144	0	0	0	273	8	0	443
08:00 AM	2	0	1	0	0	0	0	0	1	31	0	0	0	66	1	0	102
08:15 AM	0	0	1	0	0	0	0	0	1	39	0	0	0	57	2	0	100
08:30 AM	1	0	2	0	0	0	0	0	1	50	0	0	0	59	3	0	116
08:45 AM	1	0	1	0	0	0	0	0	0	53	0	0	0	56	1	0	112
Total	4	0	5	0	0	0	0	0	3	173	0	0	0	238	7	0	430
Grand Total	9	0	16	0	0	0	0	0	5	317	0	0	0	511	15	0	873
Apprch %	36	0	64	0	0	0	0	0	1.6	98.4	0	0	0	97.1	2.9	0	
Total %	1	0	1.8	0	0	0	0	0	0.6	36.3	0	0	0	58.5	1.7	0	

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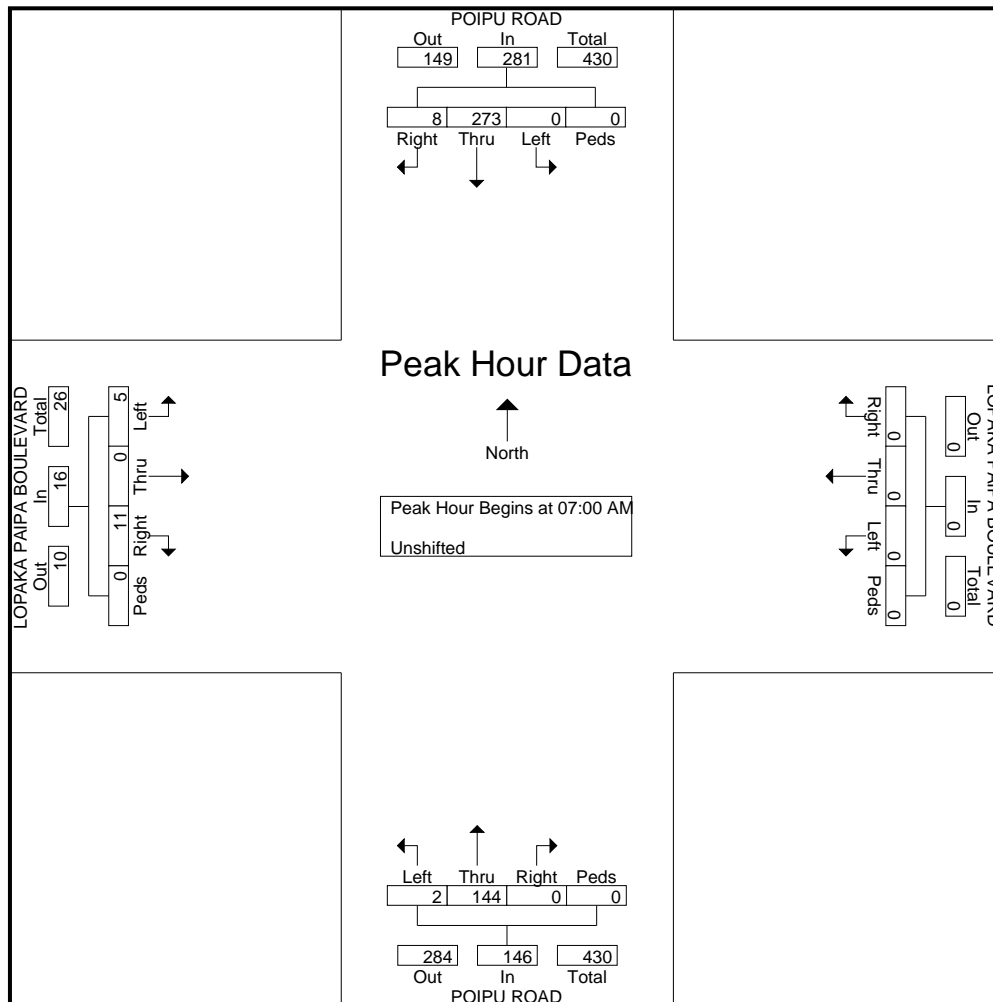
File Name : AM_Poipu Rd - Lopaka Paipa Blvd

Site Code : 00000000

Start Date : 4/2/2015

Page No : 2

Start Time	LOPAKA PAIPA BOULEVARD Eastbound					LOPAKA PAIPA BOULEVARD Westbound					POIPU ROAD Northbound					POIPU ROAD Southbound					Int. Total
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	
Peak Hour Analysis From 07:00 AM to 07:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:00 AM																					
07:00 AM	0	0	2	0	2	0	0	0	0	0	1	28	0	0	29	0	58	2	0	60	91
07:15 AM	2	0	4	0	6	0	0	0	0	0	1	31	0	0	32	0	65	1	0	66	104
07:30 AM	1	0	2	0	3	0	0	0	0	0	0	48	0	0	48	0	74	1	0	75	126
07:45 AM	2	0	3	0	5	0	0	0	0	0	0	37	0	0	37	0	76	4	0	80	122
Total Volume	5	0	11	0	16	0	0	0	0	0	2	144	0	0	146	0	273	8	0	281	443
% App. Total	31.2	0	68.8	0		0	0	0	0		1.4	98.6	0	0		0	97.2	2.8	0		
PHF	.625	.000	.688	.000	.667	.000	.000	.000	.000	.000	.500	.750	.000	.000	.760	.000	.898	.500	.000	.878	.879



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Site Code : 00000000

Start Date : 4/2/2015

Page No : 1

Groups Printed- Unshifted

Start Time	ALA KALANIKAUMAKA RD Eastbound				POIPU RD Westbound				LAWAI RD Northbound				POIPU ROAD Southbound				Int. Total
	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	
06:30 AM	4	24	4	0	0	11	13	0	2	6	6	0	20	7	3	0	100
06:45 AM	4	39	12	0	1	10	25	0	5	7	5	0	36	13	9	0	166
Total	8	63	16	0	1	21	38	0	7	13	11	0	56	20	12	0	266
07:00 AM	2	26	10	0	2	19	25	0	7	3	4	0	24	23	9	0	154
07:15 AM	4	42	11	0	2	16	27	0	4	11	4	0	44	11	8	0	184
07:30 AM	2	48	13	0	8	11	27	0	10	12	10	0	37	28	13	0	219
07:45 AM	6	37	19	0	8	27	25	0	7	12	5	0	54	31	10	0	241
Total	14	153	53	0	20	73	104	0	28	38	23	0	159	93	40	0	798
08:00 AM	3	33	18	0	7	17	21	0	8	13	6	0	43	17	7	0	193
08:15 AM	7	34	9	0	7	18	24	0	9	19	6	0	38	20	2	0	193
08:30 AM	4	21	15	0	8	17	38	0	6	17	13	0	32	19	13	0	203
08:45 AM	8	38	13	0	10	32	43	0	8	18	7	0	34	24	11	0	246
Total	22	126	55	0	32	84	126	0	31	67	32	0	147	80	33	0	835
Grand Total	44	342	124	0	53	178	268	0	66	118	66	0	362	193	85	0	1899
Apprch %	8.6	67.1	24.3	0	10.6	35.7	53.7	0	26.4	47.2	26.4	0	56.6	30.2	13.3	0	
Total %	2.3	18	6.5	0	2.8	9.4	14.1	0	3.5	6.2	3.5	0	19.1	10.2	4.5	0	

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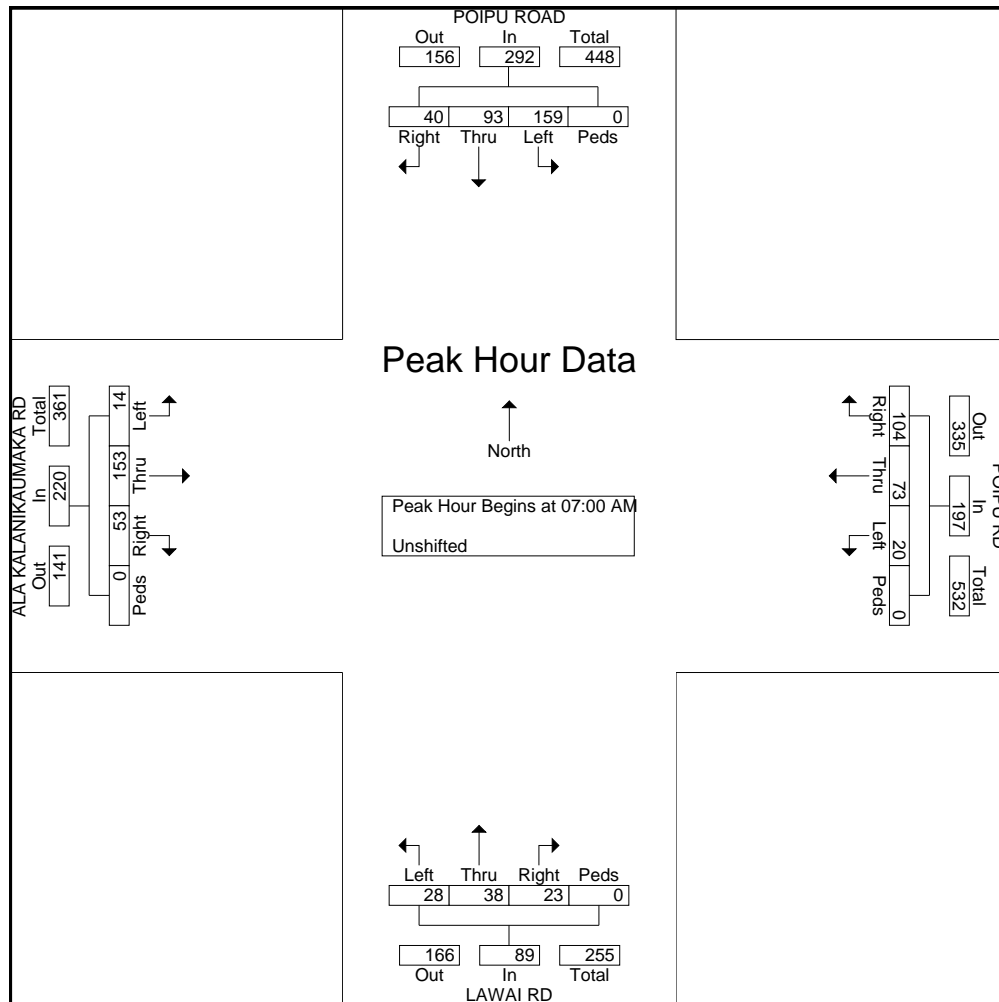
File Name : AM_Poipu Rd - Lawai Rd - Ala Kalanikaumaka Rd

Site Code : 00000000

Start Date : 4/2/2015

Page No : 2

Start Time	ALA KALANIKAUMAKA RD Eastbound					POIPU RD Westbound					LAWAI RD Northbound					POIPU ROAD Southbound					Int. Total
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	
Peak Hour Analysis From 07:00 AM to 07:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:00 AM																					
07:00 AM	2	26	10	0	38	2	19	25	0	46	7	3	4	0	14	24	23	9	0	56	154
07:15 AM	4	42	11	0	57	2	16	27	0	45	4	11	4	0	19	44	11	8	0	63	184
07:30 AM	2	48	13	0	63	8	11	27	0	46	10	12	10	0	32	37	28	13	0	78	219
07:45 AM	6	37	19	0	62	8	27	25	0	60	7	12	5	0	24	54	31	10	0	95	241
Total Volume	14	153	53	0	220	20	73	104	0	197	28	38	23	0	89	159	93	40	0	292	798
% App. Total	6.4	69.5	24.1	0		10.2	37.1	52.8	0		31.5	42.7	25.8	0		54.5	31.8	13.7	0		
PHF	.583	.797	.697	.000	.873	.625	.676	.963	.000	.821	.700	.792	.575	.000	.695	.736	.750	.769	.000	.768	.828



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File Name : PM_Poipu Rd - Koloa Rd
Site Code : 00000000
Start Date : 4/1/2015
Page No : 1

Groups Printed- Unshifted

Start Time	POIPU ROAD From North				KOLOA ROAD From East				POIPU ROAD From South				KOLOA ROAD From West				Int. Total
	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	
03:00 PM	0	0	0	0	0	54	68	0	51	0	18	0	23	60	0	0	274
03:15 PM	0	0	0	0	0	47	60	0	70	0	31	0	25	76	0	0	309
03:30 PM	0	0	0	0	0	64	68	0	80	0	17	0	21	63	0	0	313
03:45 PM	0	0	0	0	0	53	63	0	78	0	16	0	26	57	0	0	293
Total	0	0	0	0	0	218	259	0	279	0	82	0	95	256	0	0	1189
04:00 PM	0	0	0	0	0	87	56	0	79	0	17	0	20	54	0	0	313
04:15 PM	0	0	0	0	0	68	66	0	74	0	23	0	25	73	0	0	329
04:30 PM	0	0	0	0	0	54	59	0	61	0	20	0	19	54	0	0	267
04:45 PM	0	0	0	0	0	60	60	0	78	0	29	0	23	44	0	0	294
Total	0	0	0	0	0	269	241	0	292	0	89	0	87	225	0	0	1203
Grand Total	0	0	0	0	0	487	500	0	571	0	171	0	182	481	0	0	2392
Apprch %	0	0	0	0	0	49.3	50.7	0	77	0	23	0	27.5	72.5	0	0	
Total %	0	0	0	0	0	20.4	20.9	0	23.9	0	7.1	0	7.6	20.1	0	0	

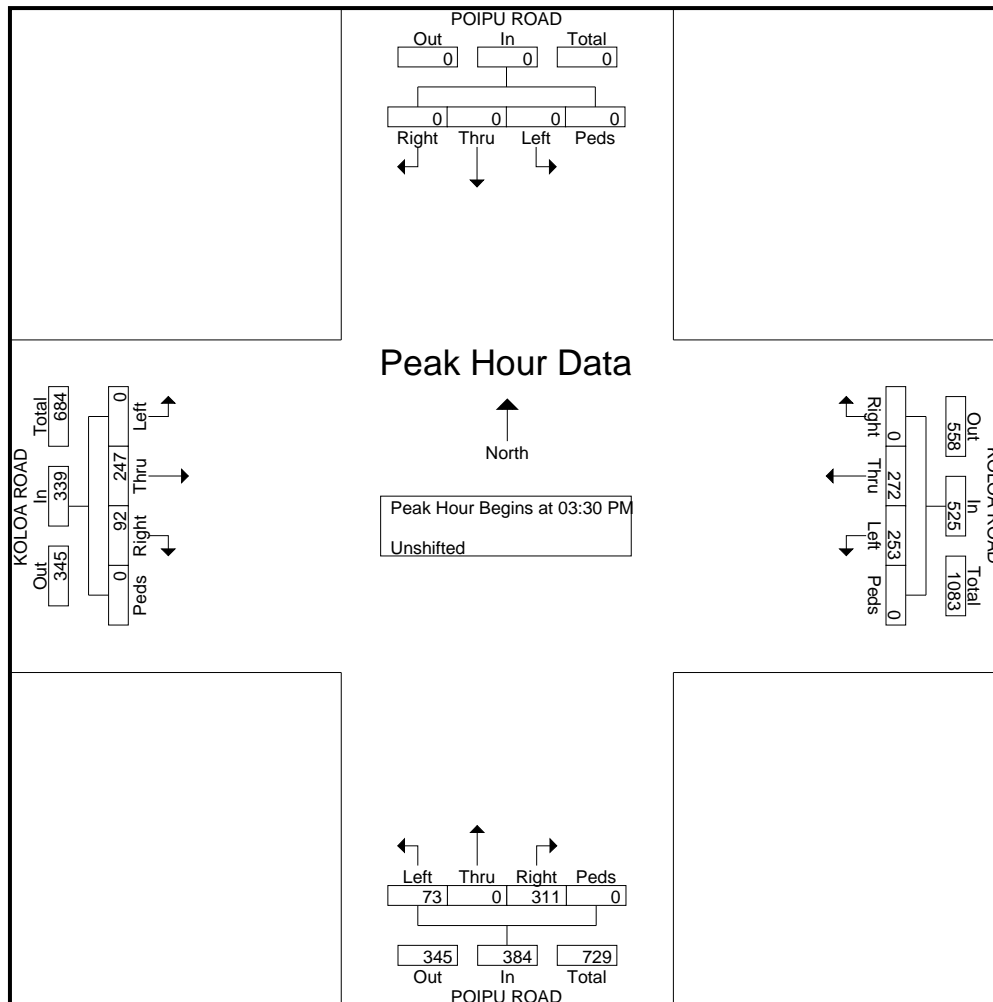
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File Name : PM_Poipu Rd - Koloa Rd
Site Code : 00000000
Start Date : 4/1/2015
Page No : 2

Start Time	POIPU ROAD From North					KOLOA ROAD From East					POIPU ROAD From South					KOLOA ROAD From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
Peak Hour Analysis From 03:00 PM to 04:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 03:30 PM																					
03:30 PM	0	0	0	0	0	0	64	68	0	116	80	0	0	0	97	21	63	0	0	84	313
03:45 PM	0	0	0	0	0	0	53	63	0	116	78	0	16	0	94	26	0	0	0	0	313
04:00 PM	0	0	0	0	0	0	87	56	0	143	79	0	17	0	96	20	54	0	0	74	313
04:15 PM	0	0	0	0	0	0	68	66	0	134	74	0	23	0	97	25	73	0	0	98	329
Total Volume	0	0	0	0	0	0	272	253	0	525	311	0	73	0	384	92	247	0	0	339	1248
% App. Total	0	0	0	0	0	0	51.8	48.2	0	100	81	0	19	0	100	27.1	72.9	0	0	100	100
PHF	.000	.000	.000	.000	.000	.000	.782	.930	.000	.918	.972	.000	.793	.000	.990	.885	.846	.000	.000	.865	.948



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File Name : PM_Poipu Rd - Lopaka Paipa Blvd

Site Code : 00000000

Start Date : 4/1/2015

Page No : 1

Groups Printed- Unshifted

Start Time	LOPAKA PAIPA BOULEVARD Eastbound				LOPAKA PAIPA BOULEVARD Westbound				POIPU ROAD Northbound				POIPU ROAD Southbound				Int. Total
	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	
03:00 PM	1	0	0	0	0	0	0	0	0	81	0	0	0	93	1	0	176
03:15 PM	1	0	2	0	0	0	0	0	2	74	0	0	0	97	2	0	178
03:30 PM	3	0	1	0	0	0	0	0	0	104	0	0	0	95	4	0	207
03:45 PM	3	0	1	0	0	0	0	0	1	83	0	0	0	91	2	0	181
Total	8	0	4	0	0	0	0	0	3	342	0	0	0	376	9	0	742
04:00 PM	0	0	2	0	0	0	0	0	1	112	0	0	0	82	0	0	197
04:15 PM	0	0	1	0	0	0	0	0	0	86	0	0	0	80	0	0	167
04:30 PM	0	0	1	0	0	0	0	0	0	96	0	0	0	82	0	0	179
04:45 PM	1	0	3	0	0	0	0	0	2	98	0	0	0	73	1	0	178
Total	1	0	7	0	0	0	0	0	3	392	0	0	0	317	1	0	721
Grand Total	9	0	11	0	0	0	0	0	6	734	0	0	0	693	10	0	1463
Apprch %	45	0	55	0	0	0	0	0	0.8	99.2	0	0	0	98.6	1.4	0	
Total %	0.6	0	0.8	0	0	0	0	0	0.4	50.2	0	0	0	47.4	0.7	0	

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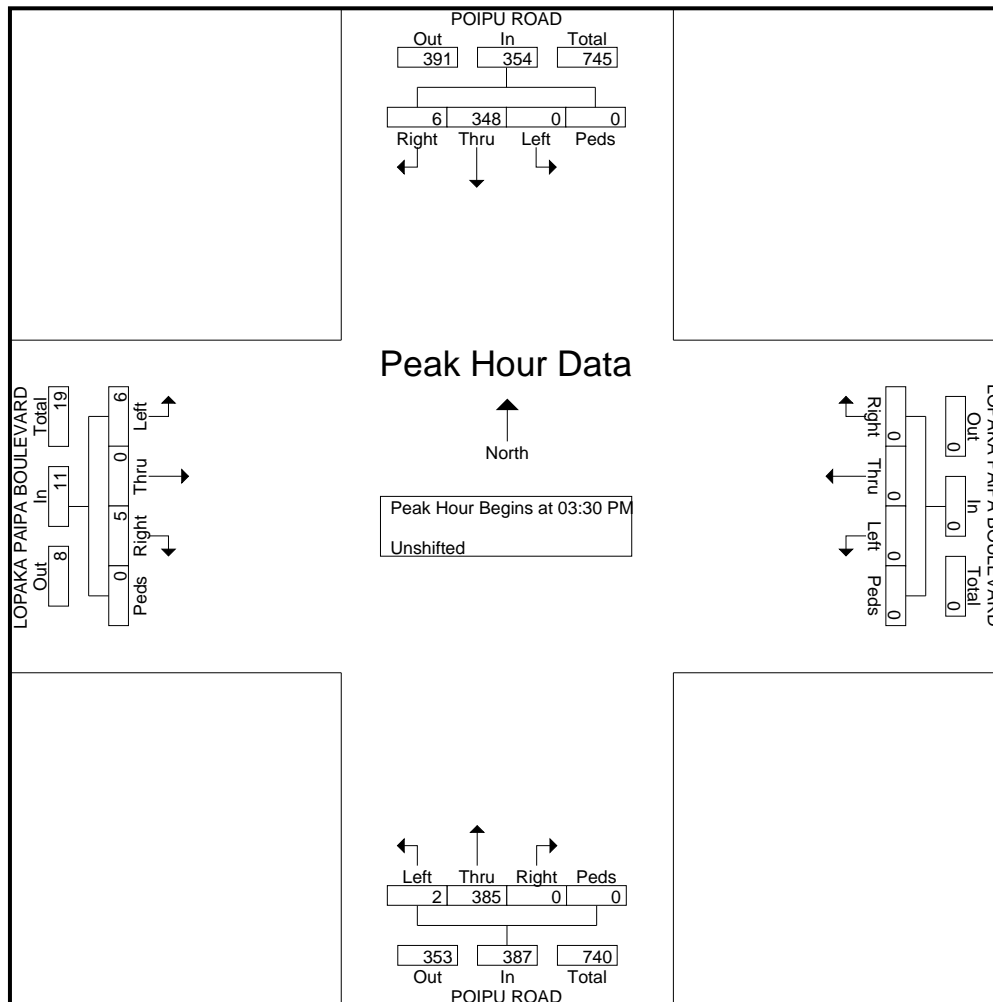
File Name : PM_Poipu Rd - Lopaka Paipa Blvd

Site Code : 00000000

Start Date : 4/1/2015

Page No : 2

Start Time	LOPAKA PAIPA BOULEVARD Eastbound					LOPAKA PAIPA BOULEVARD Westbound					POIPU ROAD Northbound					POIPU ROAD Southbound					Int. Total
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	
Peak Hour Analysis From 03:30 PM to 04:15 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 03:30 PM																					
03:30 PM	3	0	1	0	4	0	0	0	0	0	0	104	0	0	104	0	95	4	0	99	207
03:45 PM	3	0	1	0	4	0	0	0	0	0	1	83	0	0	84	0	91	2	0	93	181
04:00 PM	0	0	2	0	2	0	0	0	0	0	1	112	0	0	113	0	82	0	0	82	197
04:15 PM	0	0	1	0	1	0	0	0	0	0	0	86	0	0	86	0	80	0	0	80	167
Total Volume	6	0	5	0	11	0	0	0	0	0	2	385	0	0	387	0	348	6	0	354	752
% App. Total	54.5	0	45.5	0		0	0	0	0		0.5	99.5	0	0		0	98.3	1.7	0		
PHF	.500	.000	.625	.000	.688	.000	.000	.000	.000	.000	.500	.859	.000	.000	.856	.000	.916	.375	.000	.894	.908



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Site Code : 00000000

Start Date : 4/1/2015

Page No : 1

Groups Printed- Unshifted

Start Time	ALA KALANIKAUMAKA RD Eastbound				POIPU RD Westbound				LAWAI RD Northbound				POIPU ROAD Southbound				Int. Total
	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	
03:00 PM	7	27	14	1	10	50	46	1	19	19	22	0	37	33	17	0	303
03:15 PM	9	26	18	0	25	49	50	0	11	17	22	0	46	28	19	0	320
03:30 PM	11	35	23	0	13	51	55	0	15	21	25	0	51	32	15	0	347
03:45 PM	20	31	20	0	28	56	50	0	12	23	16	0	37	37	34	0	364
Total	47	119	75	1	76	206	201	1	57	80	85	0	171	130	85	0	1334
04:00 PM	25	38	25	0	18	62	68	0	15	32	22	0	42	31	17	0	395
04:15 PM	10	33	23	0	12	56	50	0	19	24	18	0	23	33	27	0	328
04:30 PM	16	35	26	0	24	58	57	0	13	31	26	0	45	34	16	0	381
04:45 PM	19	23	26	0	15	62	61	0	14	30	15	0	29	35	17	0	346
Total	70	129	100	0	69	238	236	0	61	117	81	0	139	133	77	0	1450
Grand Total	117	248	175	1	145	444	437	1	118	197	166	0	310	263	162	0	2784
Apprch %	21.6	45.8	32.3	0.2	14.1	43.2	42.6	0.1	24.5	41	34.5	0	42.2	35.8	22	0	
Total %	4.2	8.9	6.3	0	5.2	15.9	15.7	0	4.2	7.1	6	0	11.1	9.4	5.8	0	

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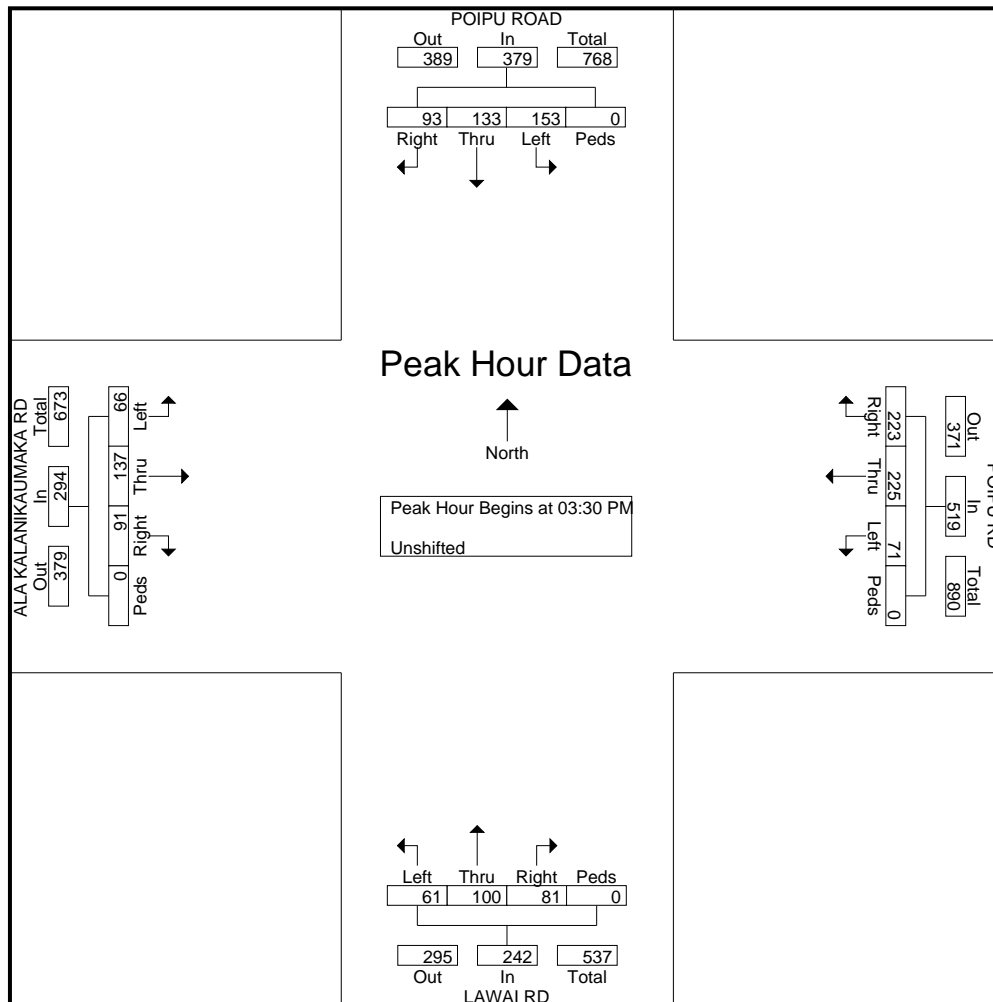
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Site Code : 00000000

Start Date : 4/1/2015

Page No : 2

Start Time	ALA KALANIKAUMAKA RD Eastbound					POIPU RD Westbound					LAWAI RD Northbound					POIPU ROAD Southbound					Int. Total
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	
Peak Hour Analysis From 03:30 PM to 04:15 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 03:30 PM																					
03:30 PM	11	35	23	0	69	13	51	55	0	119	15	21	25	0	61	51	32	15	0	98	347
03:45 PM	20	31	20	0	71	28	56	50	0	134	12	23	16	0	51	37	37	34	0	108	364
04:00 PM	25	38	25	0	88	18	62	68	0	148	15	32	22	0	69	42	31	17	0	90	395
04:15 PM	10	33	23	0	66	12	56	50	0	118	19	24	18	0	61	23	33	27	0	83	328
Total Volume	66	137	91	0	294	71	225	223	0	519	61	100	81	0	242	153	133	93	0	379	1434
% App. Total	22.4	46.6	31	0		13.7	43.4	43	0		25.2	41.3	33.5	0		40.4	35.1	24.5	0		
PHF	.660	.901	.910	.000	.835	.634	.907	.820	.000	.877	.803	.781	.810	.000	.877	.750	.899	.684	.000	.877	.908





APPENDIX B

LEVEL OF SERVICE CRITERIA

APPENDIX B – LEVEL OF SERVICE (LOS) CRITERIA

VEHICULAR LEVEL OF SERVICE FOR SIGNALIZED INTERSECTIONS (HCM 2010)

Level of service for vehicles at signalized intersections is directly related to delay values and is assigned on that basis. Level of Service is a measure of the acceptability of delay values to motorists at a given intersection. The criteria are given in the table below.

Level-of Service Criteria for Signalized Intersections

Level of Service	Control Delay per Vehicle (sec./veh.)
A	< 10.0
B	>10.0 and ≤ 20.0
C	>20.0 and ≤ 35.0
D	>35.0 and ≤ 55.0
E	>55.0 and ≤ 80.0
F	> 80.0

Delay is a complex measure, and is dependent on a number of variables, including the quality of progression, the cycle length, the green ratio, and the v/c ratio for the lane group or approach in question.

VEHICULAR LEVEL OF SERVICE CRITERIA FOR UNSIGNALIZED INTERSECTIONS (HCM 2010)

The level of service criteria for vehicles at unsignalized intersections is defined as the average control delay, in seconds per vehicle.

LOS delay threshold values are lower for two-way stop-controlled (TWSC) and all-way stop-controlled (AWSC) intersections than those of signalized intersections. This is because more vehicles pass through signalized intersections, and therefore, drivers expect and tolerate greater delays. While the criteria for level of service for TWSC and AWSC intersections are the same, procedures to calculate the average total delay may differ.

Level of Service Criteria for Two-Way Stop-Controlled Intersections

Level of Service	Average Control Delay (sec/veh)
A	≤ 10
B	>10 and ≤15
C	>15 and ≤25
D	>25 and ≤35
E	>35 and ≤50
F	> 50



APPENDIX C

LEVEL OF SERVICE CALCULATIONS



APPENDIX C

LEVEL OF SERVICE CALCULATIONS

- Existing AM Peak
-
-

Lanes and Geometrics
1: Poipu Road & Koloa Road

Koae Affordable Housing
6/4/2015

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑	↑	↑	↑	↑	↑
Traffic Volume (vph)	375	133	247	144	98	175
Future Volume (vph)	375	133	247	144	98	175
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)		75	150		0	100
Storage Lanes		1	1		1	1
Taper Length (ft)			25		25	
Link Speed (mph)	25			25	25	
Link Distance (ft)	183			855	2544	
Travel Time (s)	5.0			23.3	69.4	
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Shared Lane Traffic (%)						
Lane Group Flow (vph)	408	145	268	157	107	190
Intersection Summary						
Area Type:	Other					

HCM 2010 TWSC
1: Poipu Road & Koloa Road

Koae Affordable Housing
6/4/2015

Intersection						
Int Delay, s/veh	8.1					
Movement						
	EBT	EBR	WBL	WBT	NBL	NBR
Traffic Vol, veh/h	375	133	247	144	98	175
Future Vol, veh/h	375	133	247	144	98	175
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	Yield
Storage Length	-	75	150	-	0	100
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	408	145	268	157	107	190

Major/Minor	Major1	Major2	Minor1	Minor2	Minor3
Conflicting Flow All	0	0	408	0	1101
Stage 1	-	-	-	-	408
Stage 2	-	-	-	-	693
Critical Hdwy	-	-	4.12	-	6.42
Critical Hdwy Stg 1	-	-	-	-	5.42
Critical Hdwy Stg 2	-	-	-	-	5.42
Follow-up Hdwy	-	-	2.218	-	3.518
Pot Cap-1 Maneuver	-	-	1151	-	235
Stage 1	-	-	-	-	671
Stage 2	-	-	-	-	496
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1151	-	180
Mov Cap-2 Maneuver	-	-	-	-	180
Stage 1	-	-	-	-	671
Stage 2	-	-	-	-	381

Approach	EB	WB	NB
HCM Control Delay, s	0	5.7	26.4
HCM LOS			D

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	180	643	-	-	1151	-
HCM Lane V/C Ratio	0.592	0.296	-	-	0.233	-
HCM Control Delay (s)	50.5	12.9	-	-	9.1	-
HCM Lane LOS	F	B	-	-	A	-
HCM 95th %tile Q(veh)	3.2	1.2	-	-	0.9	-

Lanes and Geometrics
2: Poipu Road & Lopaka Paipa Blvd

Koae Affordable Housing
6/4/2015



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔	↔		↔	↔	
Traffic Volume (vph)	5	11	2	144	273	8
Future Volume (vph)	5	11	2	144	273	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)	0	75	0			0
Storage Lanes	1	1	0			0
Taper Length (ft)	25		25			
Link Speed (mph)	25			25	25	
Link Distance (ft)	1299			1029	1495	
Travel Time (s)	35.4			28.1	40.8	
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Shared Lane Traffic (%)						
Lane Group Flow (vph)	5	12	0	159	306	0
Intersection Summary						
Area Type:	Other					

HCM 2010 TWSC
2: Poipu Road & Lopaka Paipa Blvd

Koae Affordable Housing
6/4/2015

Intersection						
Int Delay, s/veh	0.4					
Movement						
	EBL	EBR	NBL	NBT	SBT	SBR
Traffic Vol, veh/h	5	11	2	144	273	8
Future Vol, veh/h	5	11	2	144	273	8
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	75	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	5	12	2	157	297	9

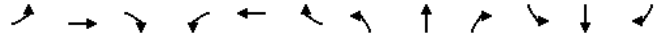
Major/Minor	Minor2	Major1	Major2	Minor1	Minor2
Conflicting Flow All	462	301	305	0	0
Stage 1	301	-	-	-	-
Stage 2	161	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-
Pot Cap-1 Maneuver	558	739	1256	-	-
Stage 1	751	-	-	-	-
Stage 2	868	-	-	-	-
Platoon blocked, %					
Mov Cap-1 Maneuver	557	739	1256	-	-
Mov Cap-2 Maneuver	557	-	-	-	-
Stage 1	751	-	-	-	-
Stage 2	866	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	10.5	0.1	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1256	-	557	739	-	-
HCM Lane V/C Ratio	0.002	-	0.01	0.016	-	-
HCM Control Delay (s)	7.9	0	11.5	10	-	-
HCM Lane LOS	A	A	B	B	-	-
HCM 95th %tile Q(veh)	0	-	0	0	-	-

Lanes and Geometrics
3: Lawai Road & Ala Kalanikaumaka & Poipu Road

Koae Affordable Housing
6/4/2015



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	14	153	53	20	73	104	28	38	23	159	93	40
Future Volume (vph)	14	153	53	20	73	104	28	38	23	159	93	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	25		25		25		25		25		25	
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		358			536			604			800	
Travel Time (s)		9.8			14.6			16.5			21.8	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
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
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	239	0	0	214	0	0	96	0	0	317	0

Intersection Summary	
Area Type:	Other

HCM 2010 Roundabout
3: Lawai Road & Ala Kalanikaumaka & Poipu Road

Koae Affordable Housing
6/4/2015

Intersection	
Intersection Delay, s/veh	6.7
Intersection LOS	A

Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	239	214	96	317
Demand Flow Rate, veh/h	243	218	99	323
Vehicles Circulating, veh/h	301	88	360	134
Vehicles Exiting, veh/h	156	370	184	172
Follow-Up Headway, s	3.186	3.186	3.186	3.186
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	7.6	5.5	6.0	7.1
Approach LOS	A	A	A	A

Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Critical Headway, s	5.193	5.193	5.193	5.193
Entry Flow, veh/h	243	218	99	323
Cap Entry Lane, veh/h	836	1035	788	988
Entry HV Adj Factor	0.982	0.984	0.971	0.981
Flow Entry, veh/h	239	214	96	317
Cap Entry, veh/h	821	1018	766	970
V/C Ratio	0.291	0.211	0.126	0.327
Control Delay, s/veh	7.6	5.5	6.0	7.1
LOS	A	A	A	A
95th %ile Queue, veh	1	1	0	1



APPENDIX C

LEVEL OF SERVICE CALCULATIONS

- Existing PM Peak
-
-

Lanes and Geometrics
1: Poipu Road & Koloa Road

Koae Affordable Housing
6/4/2015

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑	↑	↑	↑	↑	↑
Traffic Volume (vph)	247	92	253	272	73	311
Future Volume (vph)	247	92	253	272	73	311
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)		75	150		0	100
Storage Lanes		1	1		1	1
Taper Length (ft)			25		25	
Link Speed (mph)	25			25	25	
Link Distance (ft)	183			855	2544	
Travel Time (s)	5.0			23.3	69.4	
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Shared Lane Traffic (%)						
Lane Group Flow (vph)	268	100	275	296	79	338
Intersection Summary						
Area Type:	Other					

HCM 2010 TWSC
1: Poipu Road & Koloa Road

Koae Affordable Housing
6/4/2015

Intersection						
Int Delay, s/veh	7.4					
Movement						
	EBT	EBR	WBL	WBT	NBL	NBR
Traffic Vol, veh/h	247	92	253	272	73	311
Future Vol, veh/h	247	92	253	272	73	311
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	Yield
Storage Length	-	75	150	-	0	100
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	268	100	275	296	79	338

Major/Minor	Major1	Major2	Minor1	Minor2	Minor3
Conflicting Flow All	0	0	268	0	1114
Stage 1	-	-	-	-	268
Stage 2	-	-	-	-	846
Critical Hdwy	-	-	4.12	-	6.42
Critical Hdwy Stg 1	-	-	-	-	5.42
Critical Hdwy Stg 2	-	-	-	-	5.42
Follow-up Hdwy	-	-	2.218	-	3.518
Pot Cap-1 Maneuver	-	-	1296	-	230
Stage 1	-	-	-	-	777
Stage 2	-	-	-	-	421
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1296	-	181
Mov Cap-2 Maneuver	-	-	-	-	181
Stage 1	-	-	-	-	777
Stage 2	-	-	-	-	332

Approach	EB	WB	NB
HCM Control Delay, s	0	4.1	18.3
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	181	771	-	-	1296	-
HCM Lane V/C Ratio	0.438	0.438	-	-	0.212	-
HCM Control Delay (s)	39.6	13.3	-	-	8.5	-
HCM Lane LOS	E	B	-	-	A	-
HCM 95th %tile Q(veh)	2	2.2	-	-	0.8	-

Lanes and Geometrics
2: Poipu Road & Lopaka Paipa Blvd

Koae Affordable Housing
6/4/2015



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↖	↗		↖	↗	
Traffic Volume (vph)	6	5	2	385	348	6
Future Volume (vph)	6	5	2	385	348	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)	0	75	0			0
Storage Lanes	1	1	0			0
Taper Length (ft)	25		25			
Link Speed (mph)	25			25	25	
Link Distance (ft)	1299			1029	1495	
Travel Time (s)	35.4			28.1	40.8	
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Shared Lane Traffic (%)						
Lane Group Flow (vph)	7	5	0	420	385	0

Intersection Summary

Area Type: Other

HCM 2010 TWSC
2: Poipu Road & Lopaka Paipa Blvd

Koae Affordable Housing
6/4/2015

Intersection						
Int Delay, s/veh	0.2					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Traffic Vol, veh/h	6	5	2	385	348	6
Future Vol, veh/h	6	5	2	385	348	6
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	75	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	7	5	2	418	378	7

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	805	382	385 0
Stage 1	382	-	- -
Stage 2	423	-	- -
Critical Hdwy	6.42	6.22	4.12 -
Critical Hdwy Stg 1	5.42	-	- -
Critical Hdwy Stg 2	5.42	-	- -
Follow-up Hdwy	3.518	3.318	2.218 -
Pot Cap-1 Maneuver	352	665	1173 -
Stage 1	690	-	- -
Stage 2	661	-	- -
Platoon blocked, %			- -
Mov Cap-1 Maneuver	351	665	1173 -
Mov Cap-2 Maneuver	351	-	- -
Stage 1	690	-	- -
Stage 2	660	-	- -

Approach	EB	NB	SB
HCM Control Delay, s	13.2	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1173	-	351	665	-	-
HCM Lane V/C Ratio	0.002	-	0.019	0.008	-	-
HCM Control Delay (s)	8.1	0	15.5	10.5	-	-
HCM Lane LOS	A	A	C	B	-	-
HCM 95th %tile Q(veh)	0	-	0.1	0	-	-

Lanes and Geometrics
3: Lawai Road & Ala Kalanikaumaka & Poipu Road

Koae Affordable Housing
6/4/2015



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	66	137	91	71	225	223	61	100	81	153	133	93
Future Volume (vph)	66	137	91	71	225	223	61	100	81	153	133	93
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	25		25		25		25		25		25	
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		358			536			604			800	
Travel Time (s)		9.8			14.6			16.5			21.8	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
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
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	320	0	0	564	0	0	263	0	0	412	0

Intersection Summary												
Area Type:	Other											

HCM 2010 Roundabout
3: Lawai Road & Ala Kalanikaumaka & Poipu Road

Koae Affordable Housing
6/4/2015

Intersection				
Intersection Delay, s/veh	12.7			
Intersection LOS	B			
Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	320	564	263	412
Demand Flow Rate, veh/h	326	576	268	420
Vehicles Circulating, veh/h	396	251	394	396
Vehicles Exiting, veh/h	420	411	328	431
Follow-Up Headway, s	3.186	3.186	3.186	3.186
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	10.5	15.0	9.2	13.4
Approach LOS	B	C	A	B

Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Critical Headway, s	5.193	5.193	5.193	5.193
Entry Flow, veh/h	326	576	268	420
Cap Entry Lane, veh/h	760	879	762	760
Entry HV Adj Factor	0.982	0.979	0.981	0.981
Flow Entry, veh/h	320	564	263	412
Cap Entry, veh/h	747	861	747	746
V/C Ratio	0.429	0.655	0.352	0.552
Control Delay, s/veh	10.5	15.0	9.2	13.4
LOS	B	C	A	B
95th %ile Queue, veh	2	5	2	3



APPENDIX C

LEVEL OF SERVICE CALCULATIONS

- Base Year 2020 AM Peak
-
-

Lanes and Geometrics
1: Poipu Road & Koloa Road

Koae Affordable Housing
6/4/2015

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑	↑	↑	↑	↑	↑
Traffic Volume (vph)	410	145	300	160	105	205
Future Volume (vph)	410	145	300	160	105	205
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)		75	150		0	100
Storage Lanes		1	1		1	1
Taper Length (ft)			25		25	
Link Speed (mph)	25			25	25	
Link Distance (ft)	183			855	2544	
Travel Time (s)	5.0			23.3	69.4	
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Shared Lane Traffic (%)						
Lane Group Flow (vph)	446	158	326	174	114	223
Intersection Summary						
Area Type:	Other					

HCM 2010 TWSC
1: Poipu Road & Koloa Road

Koae Affordable Housing
6/4/2015

Intersection						
Int Delay, s/veh	13.2					
Movement						
	EBT	EBR	WBL	WBT	NBL	NBR
Traffic Vol, veh/h	410	145	300	160	105	205
Future Vol, veh/h	410	145	300	160	105	205
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	Yield
Storage Length	-	75	150	-	0	100
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	446	158	326	174	114	223

Major/Minor	Major1	Major2	Minor1	Minor2	Minor3
Conflicting Flow All	0	0	446	0	1272
Stage 1	-	-	-	-	446
Stage 2	-	-	-	-	826
Critical Hdwy	-	-	4.12	-	6.42
Critical Hdwy Stg 1	-	-	-	-	5.42
Critical Hdwy Stg 2	-	-	-	-	5.42
Follow-up Hdwy	-	-	2.218	-	3.518
Pot Cap-1 Maneuver	-	-	1114	-	185
Stage 1	-	-	-	-	645
Stage 2	-	-	-	-	430
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1114	-	131
Mov Cap-2 Maneuver	-	-	-	-	131
Stage 1	-	-	-	-	645
Stage 2	-	-	-	-	304

Approach	EB	WB	NB
HCM Control Delay, s	0	6.2	47.1
HCM LOS			E

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	131	612	-	-	1114	-
HCM Lane V/C Ratio	0.871	0.364	-	-	0.293	-
HCM Control Delay (s)	111.3	14.2	-	-	9.6	-
HCM Lane LOS	F	B	-	-	A	-
HCM 95th %tile Q(veh)	5.6	1.7	-	-	1.2	-

Lanes and Geometrics
2: Poipu Road & Lopaka Paipa Blvd

Koae Affordable Housing
6/4/2015



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↖	↗		↖	↗	
Traffic Volume (vph)	10	20	5	170	330	10
Future Volume (vph)	10	20	5	170	330	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)	0	75	0			0
Storage Lanes	1	1	0			0
Taper Length (ft)	25		25			
Link Speed (mph)	25			25	25	
Link Distance (ft)	1299			1029	1495	
Travel Time (s)	35.4			28.1	40.8	
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Shared Lane Traffic (%)						
Lane Group Flow (vph)	11	22	0	190	370	0

Intersection Summary

Area Type: Other

HCM 2010 TWSC
2: Poipu Road & Lopaka Paipa Blvd

Koae Affordable Housing
6/4/2015

Intersection						
Int Delay, s/veh	0.7					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Traffic Vol, veh/h	10	20	5	170	330	10
Future Vol, veh/h	10	20	5	170	330	10
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	75	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	11	22	5	185	359	11

Major/Minor	Minor2	Major1	Major2		
Conflicting Flow All	560	364	370	0	- 0
Stage 1	364	-	-	-	- -
Stage 2	196	-	-	-	- -
Critical Hdwy	6.42	6.22	4.12	-	- -
Critical Hdwy Stg 1	5.42	-	-	-	- -
Critical Hdwy Stg 2	5.42	-	-	-	- -
Follow-up Hdwy	3.518	3.318	2.218	-	- -
Pot Cap-1 Maneuver	489	681	1189	-	- -
Stage 1	703	-	-	-	- -
Stage 2	837	-	-	-	- -
Platoon blocked, %					- -
Mov Cap-1 Maneuver	487	681	1189	-	- -
Mov Cap-2 Maneuver	487	-	-	-	- -
Stage 1	703	-	-	-	- -
Stage 2	833	-	-	-	- -

Approach	EB	NB	SB
HCM Control Delay, s	11.2	0.2	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1189	-	487	681	-	-
HCM Lane V/C Ratio	0.005	-	0.022	0.032	-	-
HCM Control Delay (s)	8	0	12.6	10.5	-	-
HCM Lane LOS	A	A	B	B	-	-
HCM 95th %tile Q(veh)	0	-	0.1	0.1	-	-

Lanes and Geometrics
3: Lawai Road & Ala Kalanikaumaka & Poipu Road

Koae Affordable Housing
6/4/2015



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	25	185	65	25	105	115	45	45	25	180	110	55
Future Volume (vph)	25	185	65	25	105	115	45	45	25	180	110	55
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	25		25		25		25		25		25	
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		358			536			604			800	
Travel Time (s)		9.8			14.6			16.5			21.8	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
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
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	299	0	0	266	0	0	125	0	0	376	0

Intersection Summary	
Area Type:	Other

HCM 2010 Roundabout
3: Lawai Road & Ala Kalanikaumaka & Poipu Road

Koae Affordable Housing
6/4/2015

Intersection				
Intersection Delay, s/veh	8.1			
Intersection LOS	A			
Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	299	266	125	376
Demand Flow Rate, veh/h	305	272	128	383
Vehicles Circulating, veh/h	350	128	433	194
Vehicles Exiting, veh/h	227	433	222	205
Follow-Up Headway, s	3.186	3.186	3.186	3.186
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	9.4	6.5	7.0	8.7
Approach LOS	A	A	A	A
Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Critical Headway, s	5.193	5.193	5.193	5.193
Entry Flow, veh/h	305	272	128	383
Cap Entry Lane, veh/h	796	994	733	931
Entry HV Adj Factor	0.980	0.977	0.977	0.981
Flow Entry, veh/h	299	266	125	376
Cap Entry, veh/h	781	971	716	913
V/C Ratio	0.383	0.274	0.175	0.412
Control Delay, s/veh	9.4	6.5	7.0	8.7
LOS	A	A	A	A
95th %ile Queue, veh	2	1	1	2



APPENDIX C

LEVEL OF SERVICE CALCULATIONS

- Base Year 2020 PM Peak
-
-

Lanes and Geometrics
1: Poipu Road & Koloa Road

Koae Affordable Housing
6/4/2015

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑	↑	↑	↑	↑	↑
Traffic Volume (vph)	275	105	340	305	80	375
Future Volume (vph)	275	105	340	305	80	375
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)		75	150		0	100
Storage Lanes		1	1		1	1
Taper Length (ft)			25		25	
Link Speed (mph)	25			25	25	
Link Distance (ft)	183			855	2544	
Travel Time (s)	5.0			23.3	69.4	
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Shared Lane Traffic (%)						
Lane Group Flow (vph)	299	114	370	332	87	408

Intersection Summary

Area Type: Other

HCM 2010 TWSC
1: Poipu Road & Koloa Road

Koae Affordable Housing
6/4/2015

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Intersection						
Int Delay, s/veh	11.5					
Traffic Vol, veh/h	275	105	340	305	80	375
Future Vol, veh/h	275	105	340	305	80	375
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	Yield
Storage Length	-	75	150	-	0	100
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	299	114	370	332	87	408

Major/Minor	Major1	Major2	Minor1	Minor2
Conflicting Flow All	0	0	299	0
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Critical Hdwy	-	-	4.12	-
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-
Follow-up Hdwy	-	-	2.218	-
Pot Cap-1 Maneuver	-	-	1262	-
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Platoon blocked, %	-	-	-	-
Mov Cap-1 Maneuver	-	-	1262	-
Mov Cap-2 Maneuver	-	-	-	-
Stage 1	-	-	-	-
Stage 2	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	4.8	30.5
HCM LOS			D

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	114	741	-	-	1262	-
HCM Lane V/C Ratio	0.763	0.55	-	-	0.293	-
HCM Control Delay (s)	100.2	15.6	-	-	9	-
HCM Lane LOS	F	C	-	-	A	-
HCM 95th %tile Q(veh)	4.3	3.4	-	-	1.2	-

Lanes and Geometrics
2: Poipu Road & Lopaka Paipa Blvd

Koae Affordable Housing
6/4/2015



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↖	↗		↖	↗	
Traffic Volume (vph)	10	15	5	440	440	10
Future Volume (vph)	10	15	5	440	440	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)	0	75	0			0
Storage Lanes	1	1	0			0
Taper Length (ft)	25		25			
Link Speed (mph)	25			25	25	
Link Distance (ft)	1299			1029	1495	
Travel Time (s)	35.4			28.1	40.8	
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Shared Lane Traffic (%)						
Lane Group Flow (vph)	11	16	0	483	489	0
Intersection Summary						
Area Type:	Other					

HCM 2010 TWSC
2: Poipu Road & Lopaka Paipa Blvd

Koae Affordable Housing
6/4/2015

Intersection						
Int Delay, s/veh	0.4					
Movement						
	EBL	EBR	NBL	NBT	SBT	SBR
Traffic Vol, veh/h	10	15	5	440	440	10
Future Vol, veh/h	10	15	5	440	440	10
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	75	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	11	16	5	478	478	11

Major/Minor	Minor2	Major1	Major2		
Conflicting Flow All	973	484	489	0	- 0
Stage 1	484	-	-	-	- -
Stage 2	489	-	-	-	- -
Critical Hdwy	6.42	6.22	4.12	-	- -
Critical Hdwy Stg 1	5.42	-	-	-	- -
Critical Hdwy Stg 2	5.42	-	-	-	- -
Follow-up Hdwy	3.518	3.318	2.218	-	- -
Pot Cap-1 Maneuver	280	583	1074	-	- -
Stage 1	620	-	-	-	- -
Stage 2	616	-	-	-	- -
Platoon blocked, %					- -
Mov Cap-1 Maneuver	278	583	1074	-	- -
Mov Cap-2 Maneuver	278	-	-	-	- -
Stage 1	620	-	-	-	- -
Stage 2	612	-	-	-	- -

Approach	EB	NB	SB
HCM Control Delay, s	14.2	0.1	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1074	-	278	583	-	-
HCM Lane V/C Ratio	0.005	-	0.039	0.028	-	-
HCM Control Delay (s)	8.4	0	18.5	11.4	-	-
HCM Lane LOS	A	A	C	B	-	-
HCM 95th %tile Q(veh)	0	-	0.1	0.1	-	-

Lanes and Geometrics
3: Lawai Road & Ala Kalanikaumaka & Poipu Road

Koae Affordable Housing
6/4/2015



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	90	185	115	75	275	245	75	120	85	180	165	115
Future Volume (vph)	90	185	115	75	275	245	75	120	85	180	165	115
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		358			536			604			800	
Travel Time (s)		9.8			14.6			16.5			21.8	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
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
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	424	0	0	647	0	0	304	0	0	500	0

Intersection Summary												
Area Type:	Other											

HCM 2010 Roundabout
3: Lawai Road & Ala Kalanikaumaka & Poipu Road

Koae Affordable Housing
6/4/2015

Intersection				
Intersection Delay, s/veh	19.5			
Intersection LOS	C			
Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	424	647	304	500
Demand Flow Rate, veh/h	433	660	311	511
Vehicles Circulating, veh/h	467	317	505	473
Vehicles Exiting, veh/h	516	499	394	504
Follow-Up Headway, s	3.186	3.186	3.186	3.186
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	16.1	23.9	12.1	21.4
Approach LOS	C	C	B	C
Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Critical Headway, s	5.193	5.193	5.193	5.193
Entry Flow, veh/h	433	660	311	511
Cap Entry Lane, veh/h	708	823	682	704
Entry HV Adj Factor	0.979	0.980	0.979	0.979
Flow Entry, veh/h	424	647	304	500
Cap Entry, veh/h	694	807	667	690
V/C Ratio	0.611	0.802	0.456	0.726
Control Delay, s/veh	16.1	23.9	12.1	21.4
LOS	C	C	B	C
95th %ile Queue, veh	4	9	2	6



APPENDIX C

LEVEL OF SERVICE CALCULATIONS

- Future Year 2020 AM Peak
-
-

Lanes and Geometrics
1: Poipu Road & Koloa Road

Koae Affordable Housing
6/22/2015

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑	↑	↑	↑	↑	↑
Traffic Volume (vph)	410	150	305	160	110	235
Future Volume (vph)	410	150	305	160	110	235
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)		75	150		0	100
Storage Lanes		1	1		1	1
Taper Length (ft)			25		25	
Link Speed (mph)	25			25	25	
Link Distance (ft)	183			855	2544	
Travel Time (s)	5.0			23.3	69.4	
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Shared Lane Traffic (%)						
Lane Group Flow (vph)	446	163	332	174	120	255
Intersection Summary						
Area Type:	Other					

HCM 2010 TWSC
1: Poipu Road & Koloa Road

Koae Affordable Housing
6/22/2015

Intersection						
Int Delay, s/veh	15					
Movement						
	EBT	EBR	WBL	WBT	NBL	NBR
Traffic Vol, veh/h	410	150	305	160	110	235
Future Vol, veh/h	410	150	305	160	110	235
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	Yield
Storage Length	-	75	150	-	0	100
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	446	163	332	174	120	255

Major/Minor	Major1	Major2	Minor1	Minor2	Minor3
Conflicting Flow All	0	0	446	0	1283
Stage 1	-	-	-	-	446
Stage 2	-	-	-	-	837
Critical Hdwy	-	-	4.12	-	6.42
Critical Hdwy Stg 1	-	-	-	-	5.42
Critical Hdwy Stg 2	-	-	-	-	5.42
Follow-up Hdwy	-	-	2.218	-	3.518
Pot Cap-1 Maneuver	-	-	1114	-	182
Stage 1	-	-	-	-	645
Stage 2	-	-	-	-	425
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1114	-	128
Mov Cap-2 Maneuver	-	-	-	-	128
Stage 1	-	-	-	-	645
Stage 2	-	-	-	-	298

Approach	EB	WB	NB
HCM Control Delay, s	0	6.3	51
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	128	612	-	-	1114	-
HCM Lane V/C Ratio	0.934	0.417	-	-	0.298	-
HCM Control Delay (s)	128	15	-	-	9.6	-
HCM Lane LOS	F	C	-	-	A	-
HCM 95th %tile Q(veh)	6.2	2.1	-	-	1.3	-

Lanes and Geometrics
2: Poipu Road & Lopaka Paipa Blvd

Koae Affordable Housing
6/22/2015



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔	↔		↔	↔	
Traffic Volume (vph)	10	20	5	205	335	10
Future Volume (vph)	10	20	5	205	335	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)	0	75	0			0
Storage Lanes	1	1	0			0
Taper Length (ft)	25		25			
Link Speed (mph)	25			25	25	
Link Distance (ft)	1299			412	1495	
Travel Time (s)	35.4			11.2	40.8	
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Shared Lane Traffic (%)						
Lane Group Flow (vph)	11	22	0	228	375	0
Intersection Summary						
Area Type:	Other					

HCM 2010 TWSC
2: Poipu Road & Lopaka Paipa Blvd

Koae Affordable Housing
6/22/2015

Intersection						
Int Delay, s/veh	0.7					
Movement						
	EBL	EBR	NBL	NBT	SBT	SBR
Traffic Vol, veh/h	10	20	5	205	335	10
Future Vol, veh/h	10	20	5	205	335	10
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	75	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	11	22	5	223	364	11

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	604	370	375 0
Stage 1	370	-	- -
Stage 2	234	-	- -
Critical Hdwy	6.42	6.22	4.12 -
Critical Hdwy Stg 1	5.42	-	- -
Critical Hdwy Stg 2	5.42	-	- -
Follow-up Hdwy	3.518	3.318	2.218 -
Pot Cap-1 Maneuver	461	676	1183 -
Stage 1	699	-	- -
Stage 2	805	-	- -
Platoon blocked, %			- -
Mov Cap-1 Maneuver	459	676	1183 -
Mov Cap-2 Maneuver	459	-	- -
Stage 1	699	-	- -
Stage 2	801	-	- -

Approach	EB	NB	SB
HCM Control Delay, s	11.3	0.2	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1183	-	459	676	-	-
HCM Lane V/C Ratio	0.005	-	0.024	0.032	-	-
HCM Control Delay (s)	8.1	0	13	10.5	-	-
HCM Lane LOS	A	A	B	B	-	-
HCM 95th %tile Q(veh)	0	-	0.1	0.1	-	-

Lanes and Geometrics
3: Lawai Road & Ala Kalanikaumaka & Poipu Road

Koae Affordable Housing
6/18/2015



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	25	185	65	25	105	120	45	50	25	190	120	60
Future Volume (vph)	25	185	65	25	105	120	45	50	25	190	120	60
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	25		25		25		25		25		25	
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		358			536			604			800	
Travel Time (s)		9.8			14.6			16.5			21.8	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
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
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	299	0	0	271	0	0	130	0	0	402	0

Intersection Summary												
Area Type:	Other											

HCM 2010 Roundabout
3: Lawai Road & Ala Kalanikaumaka & Poipu Road

Koae Affordable Housing
6/18/2015

Intersection				
Intersection Delay, s/veh	8.4			
Intersection LOS	A			
Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	299	271	130	402
Demand Flow Rate, veh/h	305	277	133	410
Vehicles Circulating, veh/h	372	133	444	194
Vehicles Exiting, veh/h	232	444	233	216
Follow-Up Headway, s	3.186	3.186	3.186	3.186
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	9.7	6.6	7.1	9.2
Approach LOS	A	A	A	A

Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Critical Headway, s	5.193	5.193	5.193	5.193
Entry Flow, veh/h	305	277	133	410
Cap Entry Lane, veh/h	779	989	725	931
Entry HV Adj Factor	0.980	0.977	0.977	0.981
Flow Entry, veh/h	299	271	130	402
Cap Entry, veh/h	764	967	708	913
V/C Ratio	0.392	0.280	0.183	0.441
Control Delay, s/veh	9.7	6.6	7.1	9.2
LOS	A	A	A	A
95th %ile Queue, veh	2	1	1	2

Lanes and Geometrics
4: Poipu Road & Project Access

Koae Affordable Housing
6/22/2015



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↑		↑		↑	↑
Traffic Volume (vph)	25	40	180	5	10	355
Future Volume (vph)	25	40	180	5	10	355
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%		0%			0%
Storage Length (ft)	0	0		0	50	
Storage Lanes	1	0		0	1	
Taper Length (ft)	25			25		
Link Speed (mph)	30		25			25
Link Distance (ft)	186		617			412
Travel Time (s)	4.2		16.8			11.2
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%		0%			0%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	70	0	201	0	11	386

Intersection Summary

Area Type: Other

HCM 2010 TWSC
4: Poipu Road & Project Access

Koae Affordable Housing
6/22/2015

Intersection						
Int Delay, s/veh	1.3					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Vol, veh/h	25	40	180	5	10	355
Future Vol, veh/h	25	40	180	5	10	355
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	50	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	27	43	196	5	11	386

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	606	198	0
Stage 1	198	-	-
Stage 2	408	-	-
Critical Hdwy	6.42	6.22	4.12
Critical Hdwy Stg 1	5.42	-	-
Critical Hdwy Stg 2	5.42	-	-
Follow-up Hdwy	3.518	3.318	2.218
Pot Cap-1 Maneuver	460	843	1371
Stage 1	835	-	-
Stage 2	671	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	456	843	1371
Mov Cap-2 Maneuver	456	-	-
Stage 1	835	-	-
Stage 2	666	-	-

Approach	WB	NB	SB
HCM Control Delay, s	11.4	0	0.2
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	636	1371
HCM Lane V/C Ratio	-	-	0.111	0.008
HCM Control Delay (s)	-	-	11.4	7.6
HCM Lane LOS	-	-	B	A
HCM 95th %tile Q(veh)	-	-	0.4	0



APPENDIX C

LEVEL OF SERVICE CALCULATIONS

- Future Year 2020 PM Peak
-
-

Lanes and Geometrics
1: Poipu Road & Koloa Road

Koae Affordable Housing
6/22/2015

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑	↑	↑	↑	↑	↑
Traffic Volume (vph)	275	115	365	305	85	390
Future Volume (vph)	275	115	365	305	85	390
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)		75	150		0	100
Storage Lanes		1	1		1	1
Taper Length (ft)			25		25	
Link Speed (mph)	25			25	25	
Link Distance (ft)	183			855	2544	
Travel Time (s)	5.0			23.3	69.4	
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Shared Lane Traffic (%)						
Lane Group Flow (vph)	299	125	397	332	92	424
Intersection Summary						
Area Type:	Other					

HCM 2010 TWSC
1: Poipu Road & Koloa Road

Koae Affordable Housing
6/22/2015

Intersection						
Int Delay, s/veh	13.9					
Movement						
	EBT	EBR	WBL	WBT	NBL	NBR
Traffic Vol, veh/h	275	115	365	305	85	390
Future Vol, veh/h	275	115	365	305	85	390
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	Yield
Storage Length	-	75	150	-	0	100
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	299	125	397	332	92	424
Major/Minor						
	Major1		Major2		Minor1	
Conflicting Flow All	0	0	299	0	1424	299
Stage 1	-	-	-	-	299	-
Stage 2	-	-	-	-	1125	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1262	-	150	741
Stage 1	-	-	-	-	752	-
Stage 2	-	-	-	-	310	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1262	-	103	741
Mov Cap-2 Maneuver	-	-	-	-	103	-
Stage 1	-	-	-	-	752	-
Stage 2	-	-	-	-	212	-
Approach						
	EB		WB		NB	
HCM Control Delay, s	0		5		37.9	
HCM LOS					E	
Minor Lane/Major Mvmt						
	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	103	741	-	-	1262	-
HCM Lane V/C Ratio	0.897	0.572	-	-	0.314	-
HCM Control Delay (s)	137.8	16.1	-	-	9.2	-
HCM Lane LOS	F	C	-	-	A	-
HCM 95th %tile Q(veh)	5.3	3.7	-	-	1.4	-

Lanes and Geometrics
2: Poipu Road & Lopaka Paipa Blvd

Koae Affordable Housing
6/22/2015



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔	↔		↔	↔	
Traffic Volume (vph)	10	15	5	460	480	10
Future Volume (vph)	10	15	5	460	480	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)	0	75	0			0
Storage Lanes	1	1	0			0
Taper Length (ft)	25		25			
Link Speed (mph)	25			25	25	
Link Distance (ft)	1299			412	1495	
Travel Time (s)	35.4			11.2	40.8	
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Shared Lane Traffic (%)						
Lane Group Flow (vph)	11	16	0	505	533	0
Intersection Summary						
Area Type:	Other					

HCM 2010 TWSC
2: Poipu Road & Lopaka Paipa Blvd

Koae Affordable Housing
6/22/2015

Intersection						
Int Delay, s/veh	0.4					
Movement						
	EBL	EBR	NBL	NBT	SBT	SBR
Traffic Vol, veh/h	10	15	5	460	480	10
Future Vol, veh/h	10	15	5	460	480	10
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	75	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	11	16	5	500	522	11

Major/Minor	Minor2	Major1	Major2		
Conflicting Flow All	1038	527	533	0	- 0
Stage 1	527	-	-	-	- -
Stage 2	511	-	-	-	- -
Critical Hdwy	6.42	6.22	4.12	-	- -
Critical Hdwy Stg 1	5.42	-	-	-	- -
Critical Hdwy Stg 2	5.42	-	-	-	- -
Follow-up Hdwy	3.518	3.318	2.218	-	- -
Pot Cap-1 Maneuver	256	551	1035	-	- -
Stage 1	592	-	-	-	- -
Stage 2	602	-	-	-	- -
Platoon blocked, %					- -
Mov Cap-1 Maneuver	254	551	1035	-	- -
Mov Cap-2 Maneuver	254	-	-	-	- -
Stage 1	592	-	-	-	- -
Stage 2	598	-	-	-	- -

Approach	EB	NB	SB
HCM Control Delay, s	14.9	0.1	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1035	-	254	551	-	-
HCM Lane V/C Ratio	0.005	-	0.043	0.03	-	-
HCM Control Delay (s)	8.5	0	19.8	11.7	-	-
HCM Lane LOS	A	A	C	B	-	-
HCM 95th %tile Q(veh)	0	-	0.1	0.1	-	-

Lanes and Geometrics
3: Lawai Road & Ala Kalanikaumaka & Poipu Road

Koae Affordable Housing
6/18/2015



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	90	185	115	75	275	255	75	125	85	185	165	115
Future Volume (vph)	90	185	115	75	275	255	75	125	85	185	165	115
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		358			536			604			800	
Travel Time (s)		9.8			14.6			16.5			21.8	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
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
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	424	0	0	658	0	0	310	0	0	505	0

Intersection Summary												
Area Type:	Other											

HCM 2010 Roundabout
3: Lawai Road & Ala Kalanikaumaka & Poipu Road

Koae Affordable Housing
6/18/2015

Intersection				
Intersection Delay, s/veh	20.4			
Intersection LOS	C			
Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	424	658	310	505
Demand Flow Rate, veh/h	433	672	317	516
Vehicles Circulating, veh/h	472	323	510	473
Vehicles Exiting, veh/h	516	504	394	522
Follow-Up Headway, s	3.186	3.186	3.186	3.186
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	16.2	25.7	12.4	21.8
Approach LOS	C	D	B	C
Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Critical Headway, s	5.193	5.193	5.193	5.193
Entry Flow, veh/h	433	672	317	516
Cap Entry Lane, veh/h	705	818	679	704
Entry HV Adj Factor	0.979	0.979	0.979	0.979
Flow Entry, veh/h	424	658	310	505
Cap Entry, veh/h	690	801	664	690
V/C Ratio	0.614	0.821	0.467	0.733
Control Delay, s/veh	16.2	25.7	12.4	21.8
LOS	C	D	B	C
95th %ile Queue, veh	4	9	2	6

Lanes and Geometrics
4: Poipu Road & Project Access

Koae Affordable Housing
6/22/2015



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↑		↑		↑	↑
Traffic Volume (vph)	10	20	450	20	40	480
Future Volume (vph)	10	20	450	20	40	480
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%		0%			0%
Storage Length (ft)	0	0		0	50	
Storage Lanes	1	0		0	1	
Taper Length (ft)	25				25	
Link Speed (mph)	30		25			25
Link Distance (ft)	186		617			412
Travel Time (s)	4.2		16.8			11.2
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%		0%			0%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	33	0	511	0	43	522

Intersection Summary

Area Type: Other

HCM 2010 TWSC
4: Poipu Road & Project Access

Koae Affordable Housing
6/22/2015

Intersection						
Int Delay, s/veh	0.8					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Vol, veh/h	10	20	450	20	40	480
Future Vol, veh/h	10	20	450	20	40	480
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	50	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	11	22	489	22	43	522

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	1109	500	0
Stage 1	500	-	-
Stage 2	609	-	-
Critical Hdwy	6.42	6.22	4.12
Critical Hdwy Stg 1	5.42	-	-
Critical Hdwy Stg 2	5.42	-	-
Follow-up Hdwy	3.518	3.318	2.218
Pot Cap-1 Maneuver	232	571	1054
Stage 1	609	-	-
Stage 2	543	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	223	571	1054
Mov Cap-2 Maneuver	223	-	-
Stage 1	609	-	-
Stage 2	521	-	-

Approach	WB	NB	SB
HCM Control Delay, s	15.5	0	0.7
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	SBL	SBT
Capacity (veh/h)	-	376	1054	-
HCM Lane V/C Ratio	-	0.087	0.041	-
HCM Control Delay (s)	-	15.5	8.6	-
HCM Lane LOS	-	C	A	-
HCM 95th %tile Q(veh)	-	0.3	0.1	-



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CIVIL ENGINEERS • SURVEYORS

APPENDIX D

TRAFFIC SIGNAL 4-HOUR WARRANT

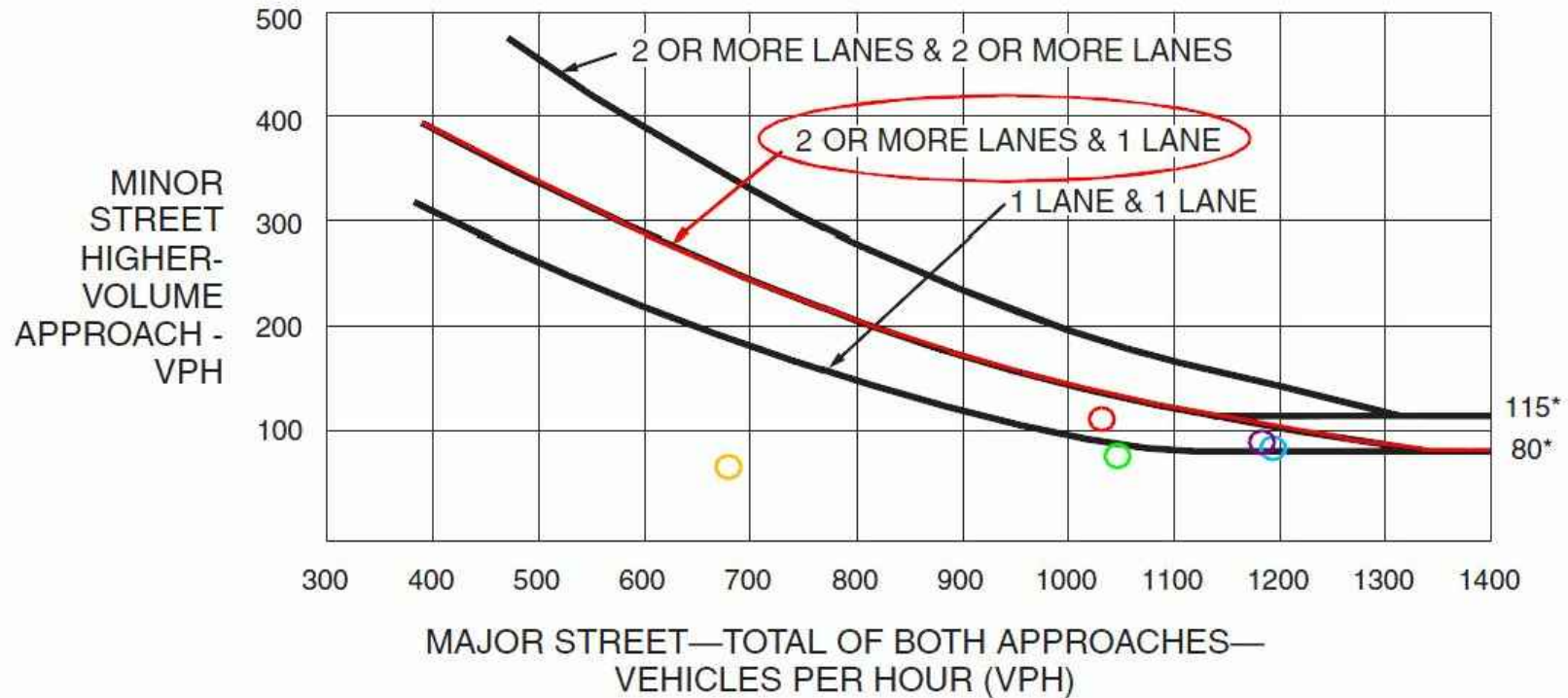
Future Year 2020 With Project Forecast Volumes
Poipu Road/Koloa Road Intersection

MUTCD
2009 Edition

	Major, Minor	Major, Minor
7AM	○ 1025, 110	2PM ○ 1045, 80*
8AM	○ 675, 65	3PM ○ 1195, 85
		4PM ○ 1185, 95

*-Volumes estimated based upon HDOT 24-hour traffic data.

Figure 4C-1. Warrant 2, Four-Hour Vehicular Volume



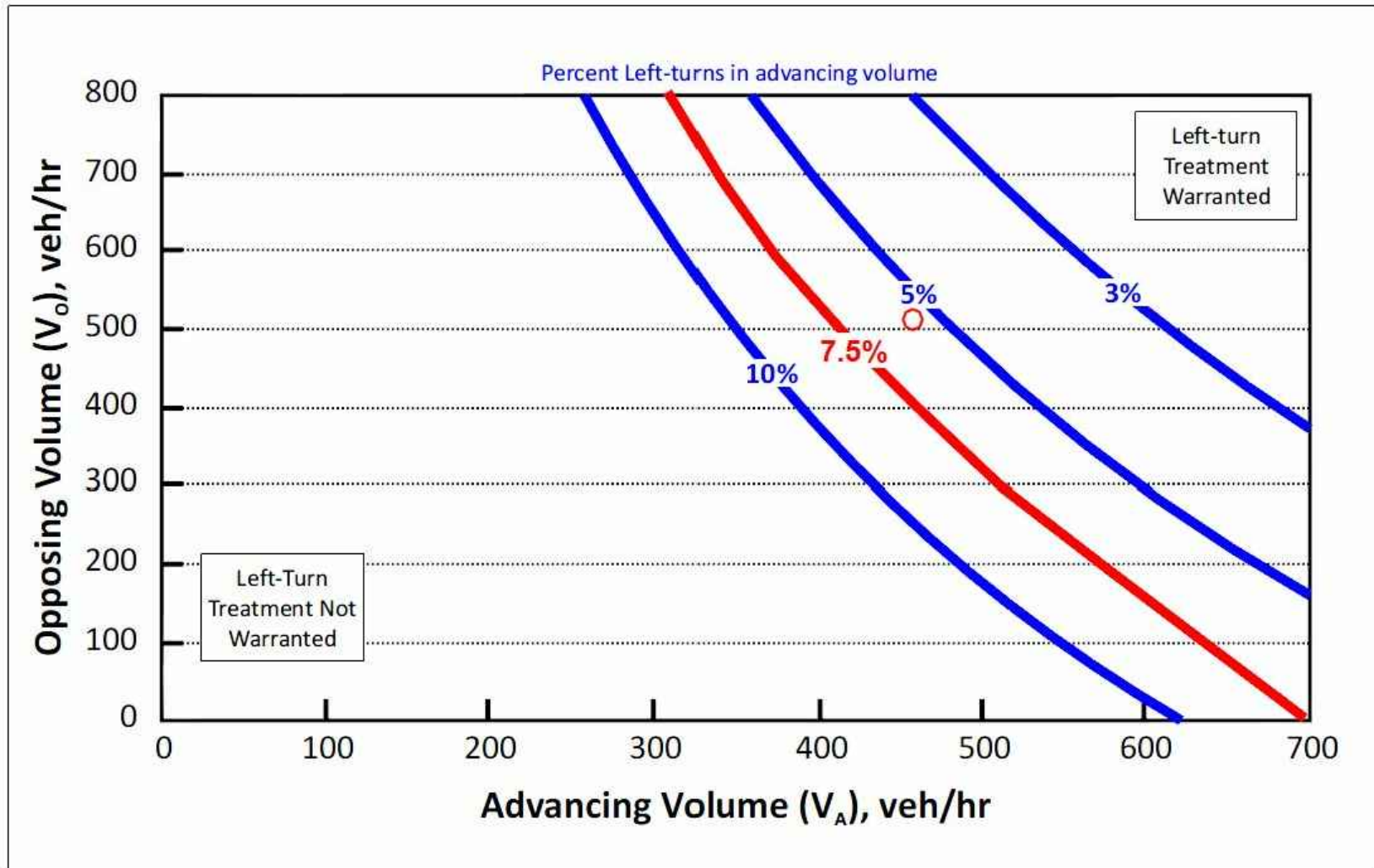
*Note: 115 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 80 vph applies as the lower threshold volume for a minor-street approach with one lane.



APPENDIX E

LEFT-TURN LANE WARRANT

PROJECT SITE ACCESS AT POIPU ROAD



Source: NCHRP 457 Figure 2-5 Guideline for Determining the need for a major road left-turn bay at a two-way stop-controlled intersection.

APPENDIX E: CULTURAL IMPACT ASSESSMENT

Cultural Impact Assessment
For a 9.4-Acre Parcel Along Waikomo Stream,
Kōloa Ahupua‘a, Kona District, Island of Kaua‘i
TMK 2-6-04: por. 19

by
Auli‘i Mitchell, B.A.,
Rodney Chiogioji, B.A.,
and
Hallett H. Hammatt, Ph.D.

for
Kukui ‘Ula Development Company (Hawaii), LLC

Cultural Surveys Hawai‘i
October 2004

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October 2004

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I. INTRODUCTION

A. Project Description

At the request of Kukui'Ula Development Company (Hawaii), LLC., (the proposed owner of the parcel), Cultural Surveys Hawai'i conducted a Cultural Impact Assessment for a 9.4-acre project area bordered by Pō'ipū Road to the west and Waikomo Stream to the east (TMK 2-6-04: por. 19) (Figures 1 & 2). The present owners of the project area are Alexander & Baldwin Inc. and McBryde Sugar Company, Limited. The project area is bisected by a cane haul road, with existing housing to the north and an undeveloped parcel to the south.

B. Scope of Work

The scope of work included:

- 1) Examination of historical documents, Land Commission Awards, and historic maps, with the specific purpose of identifying traditional Hawaiian activities including gathering of plant, animal and other resources or agricultural pursuits as may be indicated in the historic record.
- 2) A review of the existing archaeological information pertaining to the general region as it may allow us to reconstruct traditional land use activities and identify and describe the cultural resources, practices, and beliefs associated with the area prior to construction.
- 3) Contact persons knowledgeable about the historic and traditional practices in the project area and region by letter and telephone. Conduct interviews with persons knowledgeable about the historic and traditional practices in the project area.
- 4) Preparation of a report on items 1-3 summarizing the information gathered related to traditional practices and land use. The report will assess the impact of the proposed action on the cultural practices and any features identified.

C. Work Accomplished

Historical documents, maps, and photographs were researched at: the Kaua'i Historical Society, the Hawai'i State Archives; the Survey Office of the Department of Accounting and General Services; the Hawai'i State Library; the Bernice Pauahi Bishop Museum archives and library; Hamilton Library at the University of Hawai'i at Mānoa; the Mission Houses Museum Library; the State Historic Preservation Division (SHPD) library; and the library of Cultural Surveys Hawai'i.

Hawaiian organizations, government agencies, community members and cultural and lineal descendants with ties to Kōloa were contacted to: (1) identify potentially knowledgeable individuals with cultural expertise and knowledge of the project area and the surrounding vicinity, and (2) identify cultural concerns and potential impacts within the project area. Results of the community contact process are presented in Section V.

Three *kama'āina* and *kūpuna* with long ties to Kōloa were interviewed for this assessment: Albert Carbonel, Nani Higa, and Louis Jacintho. Their interviews are presented in Section VI.

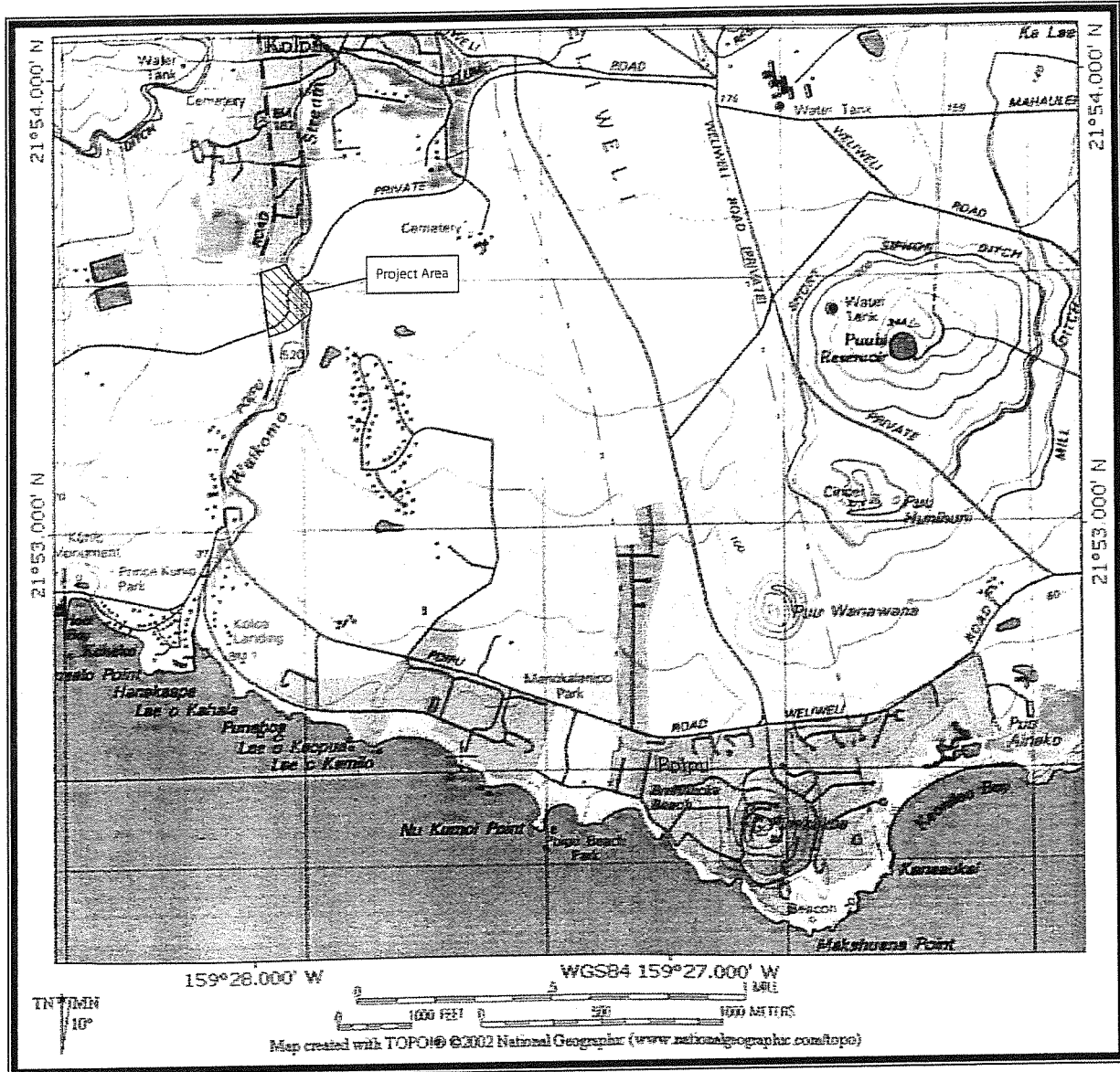


Figure 1. U.S. Geological Survey Kōloa map showing, location of project area (hatched area)

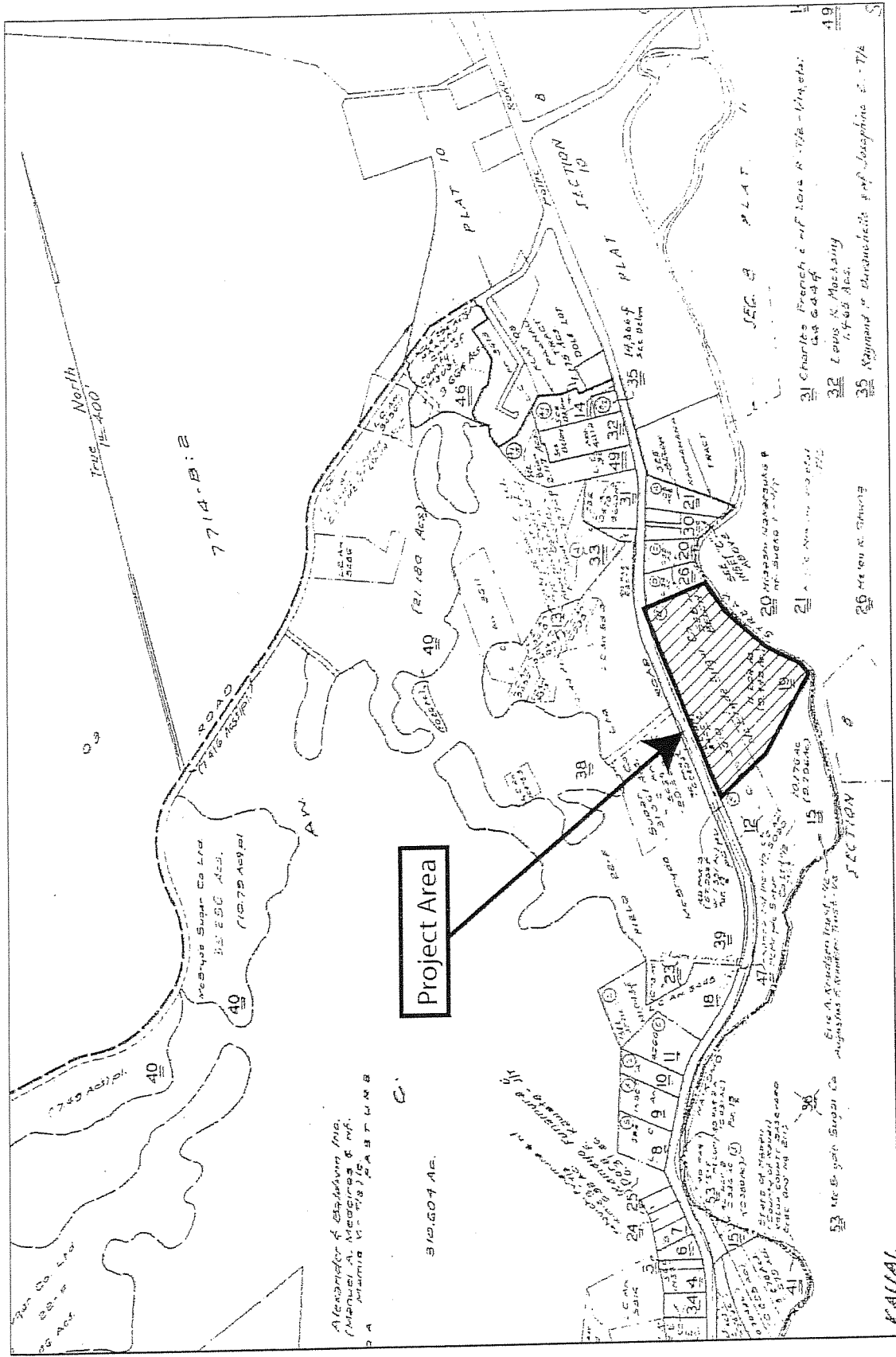


Figure 2. TMK 2-6-04, showing the location of the project area (hatched area)

II. TRADITIONAL AND LEGENDARY ASSOCIATIONS OF KŌLOA AHUPUA'A

Kōloa was a particularly important *ahupua'a* in traditional Hawaiian times. That at least fourteen *heiau* of varying sizes and functions have been documented in the Kōloa area (Thrum 1907, Bennett 1931) and the association of legendary-historic figures such as Kawelo and Aikanaka with the *heiau*, suggests a heightened cultural richness of the *ahupua'a*.

Further confirmation of a rich traditional life within Kōloa is the presence of a *hōlua* slide on the slopes of Pu'u o Hewa in the *mauka* reaches of the *ahupua'a* and by the myriad legends attached to Maulili Pool, a sacred place once located in the present Kōloa Town. J. K. Farley (1907) describes the pool and its legendary associations:

The pool of Maulili, on Waikomo stream...is a few hundred feet south of the Maulili road bridge. The gods Kāne, and his brother, Kanaloa, are said to have once slept above it, on its eastern bank and left the impress of their forms as can be seen in the *apapa*...The *apapa* in this vicinity is called an 'Unu' and a 'Heiau,' but was never walled in, it is said. [This *heiau* may be the Maulili Heiau described by Makea above.] On the nights of Kāne the drums are heard to beat there, also at the sacred rocks, or *umu*'s, of Opuokahaku and Kānemilohae, near the beach of Po'ipū...

In the Maulili pool lived a large *Mo'io*, named 'Kihawahine'...The eastern wall of the pool, just below the resting places of Kāne and Kanaloa, for a short distance, only, is called the 'Pali of Kōloa.' The District of Kōloa is named for this *Pali*, we are told by old Hawaiians. To the south of the Pali o Kōloa, in the wall is a rock named 'Waihanau'...as one of their *meles* has it:

"*Aloha wale ka Pali o Kōloa,*

Ke Ala huli i Waihānau e, hānau."

To the south of Waihānau is a projecting rock named 'Ke elelo o ka Hawai'i' -- the tongue of Hawai'i, said to have been wrested and brought from Hawai'i by the Kaua'i warrior Kawelo, of Wailua.

At the southern end of the Maulili pool started two large '*auwai*'s, that watered the land east and west of Kōloa (Farley 1907:93).

Thus, this sacred legend-imbued locus was the source that gave life to the lowland taro patches of Kōloa. These special associations would not have been lost on the Hawaiians of Kōloa who were dependent upon those waters.

III. CULTURAL AND HISTORICAL BACKGROUND

A. Historical Setting: Pre-Contact Kōloa

The project area is in the *ahupua'a* of Kōloa in the Kona District on the island of Kaua'i. Few records exist that document traditional Hawaiian life in Kōloa Ahupua'a. While settlement by westerners with religious and commercial interests make the area a focus of documentation after the first quarter of the nineteenth century, the accounts generated generally focus on the lives and concerns of the westerners themselves, with only anecdotal references to the Hawaiian population. Two nineteenth century documents (Boundary Commission Testimony of 1874 and a Lahainaluna manuscript of 1885), however, did provide two Hawaiians an opportunity to speak for themselves and thus offer a possible insight into the life of Kōloa before the arrival of westerners.

A dispute over the northern boundary of Kōloa Ahupua'a in 1874 led to a hearing before Duncan McBryde, the Commissioner of Boundaries for Kaua'i. One native witness, Nao (who describes himself as born in Kōloa but presently living in Ha'ikū), in order to show that Hoaea (the area in dispute) was indeed at the northern boundary of Kōloa, testifies: "At Hoaea tea [sic] leaves were hung up to show that there were battles going on" (Boundary Commission, Kaua'i, vol. 1, 1874:124). That there was a traditional "warning system" --well-known to all natives-- suggests that Kōloa, throughout its history, may well have been the scene of some serious conflicts--serious enough and perhaps often enough to warrant devising such a system.

Additional evidence of a rich history within Kōloa is offered in a Lahainaluna document produced eleven years later. This document appears to be based on an oral historical project. On September 7, 1885 a student from Lahainaluna Schools (HMS 43 #17) interviewed Makea -- "a native who is well acquainted with Kōloa" -- and recorded "what she said about the well-known places in the olden times." More than sixty-four years after the abolition of the *kapu* system and almost as many years of contact with westerners, Makea was able to describe in detail fourteen *heiau* within the Kōloa area; for example:

Maulili was the first *heiau* of south Kōloa. Kapulauki was the first chief of Kōloa, Kiha came next. That is the chief I know of. He was a ruling chief of Kaua'i in the olden days, when the *heiau* was standing there. It had already been built and men had been sacrificed on its altars. This Kiha was called Kiha-of-the-luxuriant-hair. Another name for him was Kakae and another was Ka-pueo-maka-walu (Right-eyed-owl).

This *heiau* was also famous for this reason -- it was the first *heiau* to which Kawelo was carried after he had swooned in Wahiawa, in the battle where stones were used as missiles.

The location of this *heiau* was not known, but a deaf mute knew and it was he who pointed it out to the chiefs, and that is how it was rediscovered in the olden days.

Kiha lived on the eastern side of the *heiau* and Aikanaka lived on the northeastern side. This chief, Aikanaka, was the one with whom Kawelo fought and he was the owner of this *heiau* at that time.

Bernice Judd, writing in 1935, summarizes most of what was known -- into the first decades of this century -- of the traditional Hawaiian life of Kōloa before western contact:

In the old days two large *'auwai* or ditches left the southern end of the Maulili pool to supply the taro patches to the east and west. On the *kuaunas* or embankments the natives grew bananas and sugar cane for convenience in irrigating. Along the coast they had fish ponds and salt pans, ruins of which are still to be seen. Their dry land farming was done on the *kula*, where they raised sweet potatoes, of which both the tubers and the leaves were good to eat. The Hawaiians planted *pia* (arrowroot) as well as *wauke* (mulberry) in patches in the hills wherever they would grow naturally with but little cultivation. In the uplands they also gathered the leaves of the *hala* for mats and the nuts of the *kukui* for light (Judd 1935:53).

It appears that the relatively good situation for the development of irrigated agriculture (the Kōloa Field System) focused agriculture and habitation at elevations below the present project area.

B. Early Historic Period

Accounts by visitors and settlers at Kōloa Ahupua'a focus on these westerners' own concerns--religious and commercial--as these concerns appropriate the historical record of Kōloa in the 1800's. However, scattered throughout the accounts are occasional references to the Hawaiians of the *ahupua'a*, which may give some insights into their lives.

The American Board of Commissioners for Foreign Missions (ABCFM) missionary Samuel Whitney described, in an article in the *Missionary Herald* (June 1827:12), a visit to Kōloa with Kaikio'ewa, the governor of Kaua'i, in 1826:

The people of this place were collected in front of the house where the old chief lodged in order to hear his instructions. After a ceremony of shaking hands with men, women, and children they retired...

Our company consisted of more than a hundred persons of all ranks. The wife of the chief, with her train of female attendants, went before. The governor, seated on a large white mule with a Spaniard to lead him, and myself by his side, followed next. A large company of *aipupu*, [*'ā'īpu'upu'u*] cooks, attendants came on in the rear (p. 284).

Whitney's account suggests something of the deference paid to the *ali'i* by the local populations and the scale at which the *ali'i* carried out their functions. An even grander view of that deference is provided in an account of a later visit by an *ali'i* to Kōloa. John Townsend, a naturalist staying in Kōloa in 1834, described a visit by Kamehameha III (In Palama and Stauder 1973:18):

In the afternoon, the natives from all parts of the island began to flock to the king's temporary residence. The petty chiefs, and head men of the villages, were mounted upon all sorts of horses from the high-headed and high-mettled California steed, to the shaggy and diminutive poney [sic] raised on their natives hills; men, women, and children were running on foot, laden with pigs, calabashes of Poe [sic], and every production of the soil; and though last certainly not least, in the evening there came the troops of the island, with fife and drum, and 'tinkling cymbal' to form a body guard for his majesty, the king. Little houses were put up all around the vicinity, and thatched in an incredibly short space of time, and when Mr. Nuttall, and myself visited the royal mansion, after nightfall, we found the whole neighborhood metamorphosed; a beautiful little village had sprung up as by magic, and the retired studio of the naturalists had been transformed into a royal banquet hall... (In Palama and Stauder 1973:18)

On December 31, 1834, Peter Gulick and his family arrived in Kōloa. Apparently the first foreigners to settle in the *ahupua'a*, they initiated the process of rapid change that would reshape the life of Kōloa in the nineteenth century. In 1835, a 30 by 60 ft. grass house was erected as a meeting house and school (probably located at Kōloa Town). Mr. Gulick initiated sugar cane cultivation and collected a cattle herd for the Protestant Mission. In 1837, a 45 by 90 ft. adobe church was built (probably at the same ABCFM site) and the first mission doctor, Thomas Lafon, arrived to assist Mr. Gulick (Damon 1931:179, 187). The Kōloa mission station apparently flourished immediately; Charles Wilkes, a member of the U.S. Exploring Expedition visiting Kōloa in 1840, recorded:

The population in 1840, was one thousand three hundred and forty-eight. There is a church with one hundred and twenty-six members, but no schools. The teachers set apart for this service were employed by the chiefs, who frequently make use of them to keep their accounts, gather in their taxes &c [and for similar tasks]. The population is here again increasing partly by immigration, whence it was difficult to ascertain its ratio (Wilkes 1845:64).

Other sources, however, give different population figures for Kōloa during the first half of the nineteenth century. In 1834, according to a report by missionaries on Kaua'i, the inhabitants of the *ahupua'a* numbered 2,166. An article in the *Pacific Commercial Advertiser* of December 21, 1867 estimated that the population in 1838 was about 3,000 (though, by 1867, it had been reduced to a third of that number). James Jackson Jarves, who visited Kōloa and Kaua'i for nine months during the early 1840's, recorded:

Kōloa is now a flourishing village. A number of neat cottages, prettily situated amid shrubbery have sprung up, within two years past. The population of the place, also, has been constantly increasing, by emigration from other parts of the island. It numbers, now, about two thousand people, including many foreigners, among whom are stationed a missionary preacher, and physician, with their families (Jarves 1844:100).

The arrival of "many foreigners" was the cause of, and the native immigration to Kōloa was the result of, the many commercial activities that burgeoned beginning in the 1830's. In 1835, Ladd and Company gained from the king and local chiefs the lease of about one thousand acres at Kōloa for 50 years at \$300 a year and "allowed the use of the waterfall and an adjoining mill

site at Maulili pool, not far from the thousand acres, together with the right to build roads, the privilege of unrestricted buying and selling and freedom from local harbor dues" (Judd 1935:57). Ladd and Company was not the first to mill sugar cane in the area: there was a Chinese-operated granite roller mill in operation at Māhā'ulepū, Kōloa, in 1830; it was, however, the first plantation-organized industry in Hawai'i (Damon 1931:176, 198). Judd notes the following:

The company was permitted to hire natives to work on the plantation provided they paid Kauikeaouli, the king, and Kaikio'ewa, the governor of Kaua'i, a tax for each man employed and paid the men satisfactory wages. The workers were to be exempt from all taxation except the tax paid by their employers (Judd 1935:57).

Judd further described the revolutionary implication of this arrangement: "The significance of Ladd & Co.'s lease lay in the fact that it was the first public admission by the Hawaiian chiefs that their subjects had rights of personal property backed with a guaranty of protection to that property" (Judd 1935:58). Local chiefs, fearful of an usurpation of their power, resisted the company's first efforts to recruit workers, forcing the king's intervention.

Another missionary, Dr. James W. Smith, who was stationed at Kōloa for forty-five years, beginning in 1842, mentioned in his journal a visit to "the school at Kukui'ula." If there was a second school in Kōloa outside the population center of Kōloa Town, Kukui'ula may have warranted the placing of a school there because of a sufficiently large population in the area.

A long-known history of severe flooding in the central flood plain of Kōloa provided an impetus for the native Hawaiians to develop an irrigated field network well off that plain. In a typical Hawaiian valley such as Pō'ele'ele it is difficult to get off the flood plain and in Kōloa a large percentage of homes and agricultural fields are located in the large volcanic terrace surrounding the project area that is not susceptible to flooding. Thus, the extensive *lo'i* network within the *makai* portion of Kōloa may have been, in part, a clearly thought-out use of a fortuitous land configuration to avoid the force of occasional floods that might, elsewhere on the island, have had disastrous effects.

C. Mid-1800's (Land Commission Awards)

The Māhele records of Kōloa give a picture of what had evolved by the middle of the nineteenth century when Kōloa Ahupua'a--8,620 acres--was awarded (LCA 7714-B) to Moses Kekūāiwa, the brother of Alexander Liholiho (Kamehameha IV), Lot Kapuāiwa (Kamehameha V), and Victoria Kamāmalu. (The awarding of the *ahupua'a* to Kekūāiwa was an outcome of an event twenty-five years in the past: the crushing - by forces loyal to Kamehameha II - of the 1824 revolt on Kaua'i when Kaua'i lands were divided up among the chiefs of the other islands.)

Eighty-eight other *kuleana* awards were given to individuals within Kōloa Ahupua'a. The majority of these Land Commission Awards (LCAs) were located in or around Kōloa Town itself. This concentration of awards around the town area may reflect both the traditional land settlement pattern, a focus on the resources of Maulili Pool and Waikomo Stream (a permanent stream), and a more recent movement of the populace to the plantation and missionary centers.

Two LCAs are located within the present project area. The two are discussed in Section E below.

D. Later 1800's To Present

Kōloa became the scene of the confrontation of the traditional social structure with commercially-impelled forces of change. The cane growing activity of Ladd and Company would inevitably affect the lives of the inhabitants of the rest of the *ahupua'a*. Traditional settlement patterns (e.g. permanent and temporary habitation interspersed throughout the irrigated agricultural fields near the coastal zone and traditional farming along streams) would have been distorted by a shift to settlement in Kōloa Town where sugar cane milling activities were located, and a shift to cash crops other than taro.

Although Ladd and Company would go bankrupt in 1845, its earlier success was an impetus for other entrepreneurial attempts within Kōloa. Silkworm farming, oil extraction from *kukui* nuts, cigar manufacturing, sago raising, and tapioca manufacturing were all attempted with varied success during the middle third of the nineteenth century.

Another major area of commercial enterprise was associated with the whaling industry at Kōloa Landing. Accounts of visitors suggest that the inhabitants of Kōloa took advantage of their nearness to the landing to participate in the booming trade of the port. An article in the *Pacific Commercial Advertiser* of Feb. 19, 1857 described the salient characteristics of the port at mid-century and mentions:

From the landing there is a good carriage road to the town, distant about two miles. Large quantities of firewood, bullocks and sweet potatoes are furnished to whalers in this port, and these chattels can nowhere be procured cheaper or better. It is estimated that 10,000 barrels of sweet potatoes are cultivated annually here, which are thought to be the best on the islands. Nearly all the potatoes furnished for the California market are produced here...Sweet potatoes, sugar and molasses constitute the chief trade of the port.

Kōloa became the official port of entry for Kaua'i in the 1850's and participated in the profitable trade with the whaling industry whose peak years ran from the 1830's to the 1860's. It seems likely the demand for firewood, bullocks, sweet potatoes, sugar and molasses at Kōloa Landing was met to at least some small degree by activities in the *mauka* regions of Kōloa in the vicinity of the present project area.

Kōloa Landing was phased out around 1925 when McBryde Sugar Company and Kōloa Sugar Company began using Port Allen. Soon after, McBryde ceased to use several of the Kōloa fields.

E. Historic and Modern Documentation of the Present Project Area

Records of the mid-nineteenth century *Mahele* provide the first specific documentation of traditional Hawaiian activities, practices and land use within the project area. As noted above, two Land Commission Awards were granted for *'āpana* (parcels) within the project area. The two are LCA 3610 awarded to Kaane and LCA 3409 awarded to Piliwale (Figure 3, Note: the 1891 map of Kōloa erroneously reports the number of the LCA to Kaane).

Piliwale claimed and was awarded two *'āpana* in LCA 3409. *'Āpana* 1 comprised "three *lo'i* and a *kula*" located near the seashore of Kōloa (Native Register vol. 9, pg. 26). *'Āpana* 2 is located *mauka* of *'Āpana* 1 and is within the present project area. In the *Mahele* documents, *'Āpana* 2 is described as "two *lo'i* and a *Kula* also, at Waikomo" (*Ibid.*) which are bounded:

Mauka by land of Kaumahana [*i.e.* another Kōloa resident]

Puna by Koloa River

Makai by 'ili of Kapuna

Hanapēpē by highway [*i.e.* the present road to Pō'ipu] (Foreign Testimony vol.13, pg. 24)

Piliwale "received his land from Governor Kanoa about 1845" (*Ibid.*).

Kaane claimed and was awarded one 'āpana in LCA 3610. A portion of the 'āpana is located in the present project area. In the Mahele documents, the 'āpana is described as "a small piece of *kula*, a house lot and one *lo'i* in one piece" which are bounded:

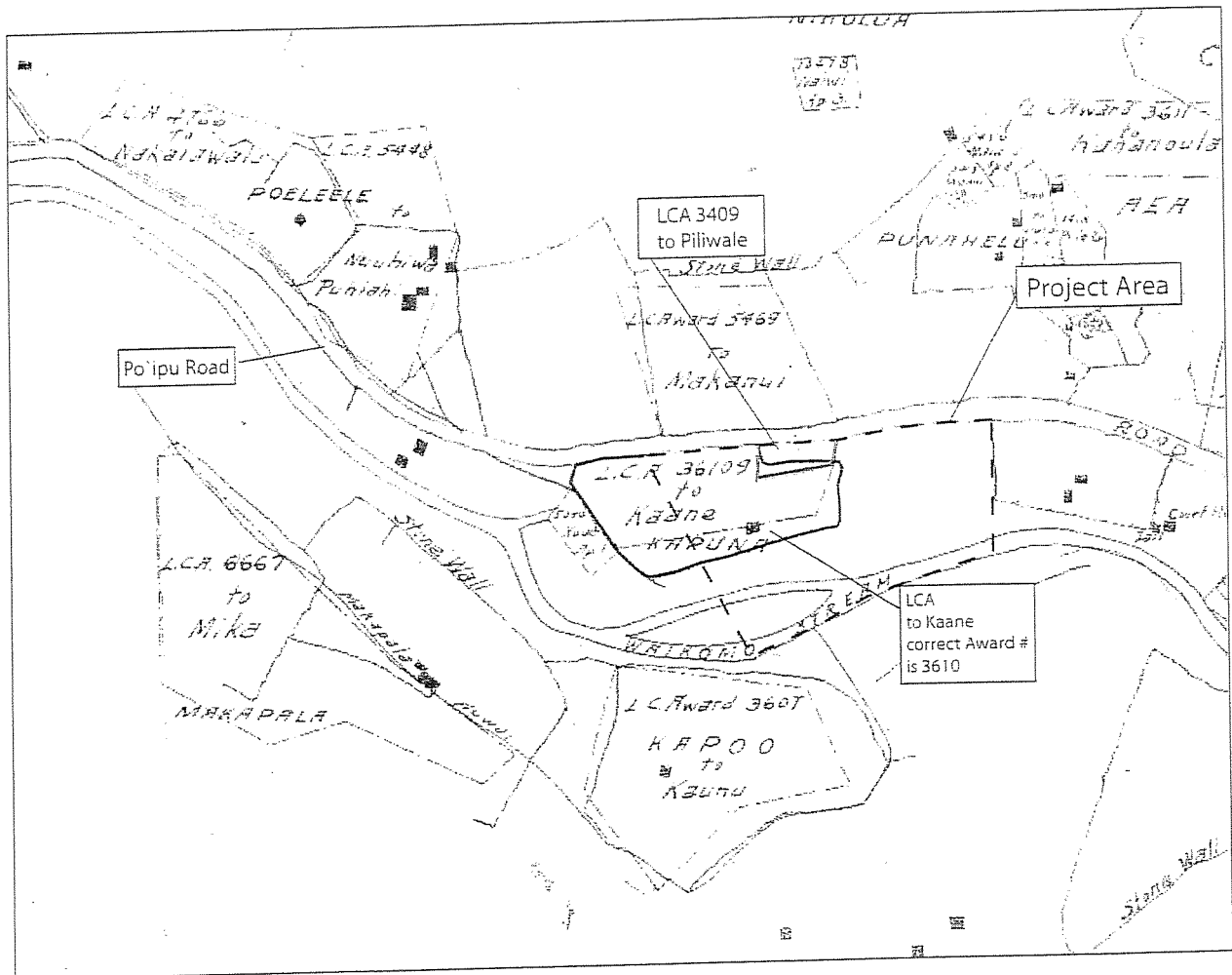


Figure 3. Portion of 1891 map of Kōloa by M.D. Monsarratt showing locations of Land Commission Awards in project area

Mauka by the *‘ili* of Waikomo

Puna by Koloa creek

Makai by Kaia’s cane field

Hanapēpē by road leading to Kōloa beach. (Native Register vol. 9, pg. 72).

Kaane “received this land from Gov. Kanoa in the year 1844 or 1845” (*Ibid.*).

The *Mahele* documents indicate that, within the present project area, land usage and activity by the mid-nineteenth century included habitation, pasturage, and taro cultivation. This may reflect the continuation into that century of traditional Hawaiian land use within the project area.

Further documentation of the project area during the second half of the nineteenth century is found on a map hand-drawn by a *kama ‘āina* Kōloa resident. Most likely in 1938, Judge Henry Kawahinehelelani Blake of Kōloa (1874-1948) drew a colored map of “Koloa Village” depicting what the area looked like in 1888 when he was a boy of fourteen. The approximate location of the present project area has been plotted on Judge Blake’s map (Figure 4). The map indicates that the project area was then surrounded by taro *lo ‘i*, house lots, and a pool in Waikomo Stream. The majority of the project area may have comprised open *kula* land in the 1880’s.

By the first decades of the twentieth century, cane fields of the Koloa Sugar Company and McBryde Sugar Company spanned the landscape of Kōloa. A portion of a 1918 map of Koloa Sugar Company lands indicates Field 41 in the vicinity of the present project area (Figure 5). While the boundaries of individual fields are not clearly delineated on the map, it is possible that portions of the project area are within Field 41.

A second map drawn by Henry Kawahinehelelani Blake shows “Kōloa Village” in 1938 (Figure 6). The map was likely drawn by Judge Blake in 1938 along with the map of the village in 1888 to record a “then and now” portrait of Kōloa. The approximate location of the present project area has been plotted on the 1938 map. The map indicates “cane lands” and “pasture” in the vicinity of the project area. House sites are located *mauka* and *makai* of the project area. The taro *lo ‘i* that characterized the Kōloa landscape in the 1880s are no longer present.

A 1951 aerial photograph of Kōloa shows that, by mid-twentieth century, the present project area comprised areas of open pasture, sugar cane, and brush along the banks of Waikomo Stream (Figure 7). No structures appear in the project area.

An aerial photograph taken on April 30, 2000 indicates that, at the end of the twentieth century, active sugar cane cultivation had ceased in the project area (Figure 8). The area now comprises open land and brush along the banks of Waikomo Stream. A former cane haul road courses through the project area. This road was constructed sometime following the early 1970s.

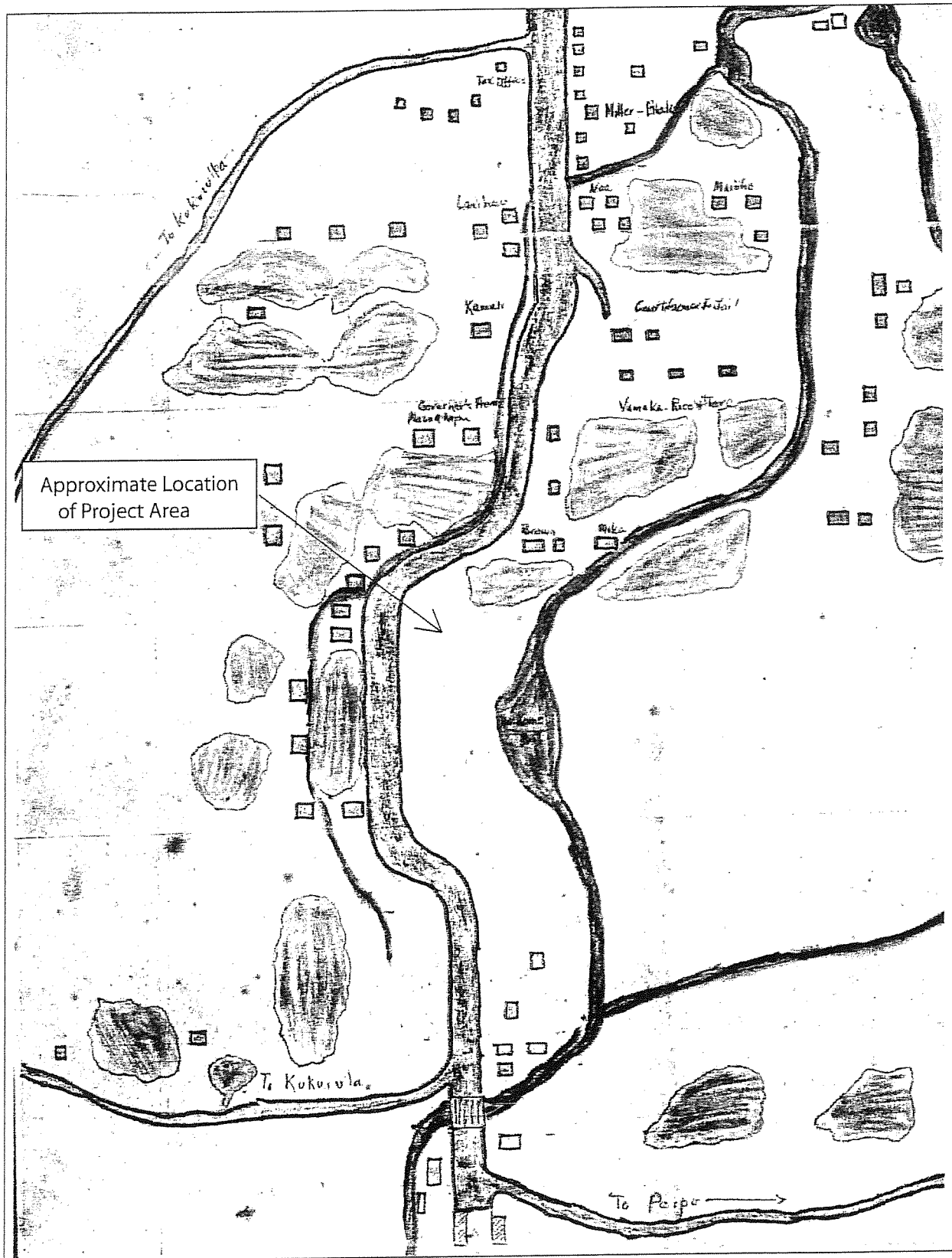


Figure 4. Portion of map drawn by Henry Kawahinehelelani Blake (1874-1948) depicting “Koloa Village” in 1888

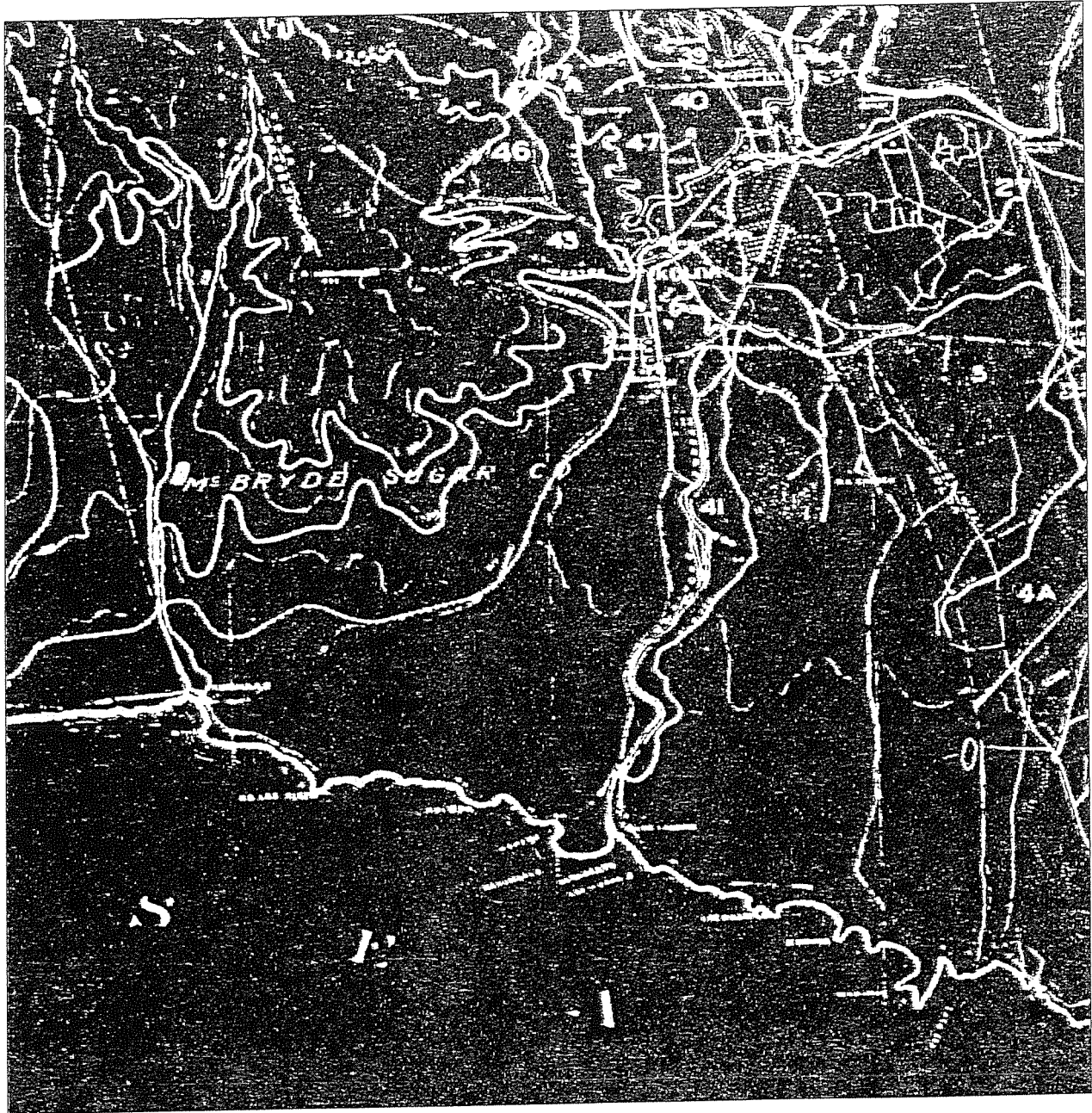


Figure 5. Portion of 1918 map of Koloa Sugar Company lands

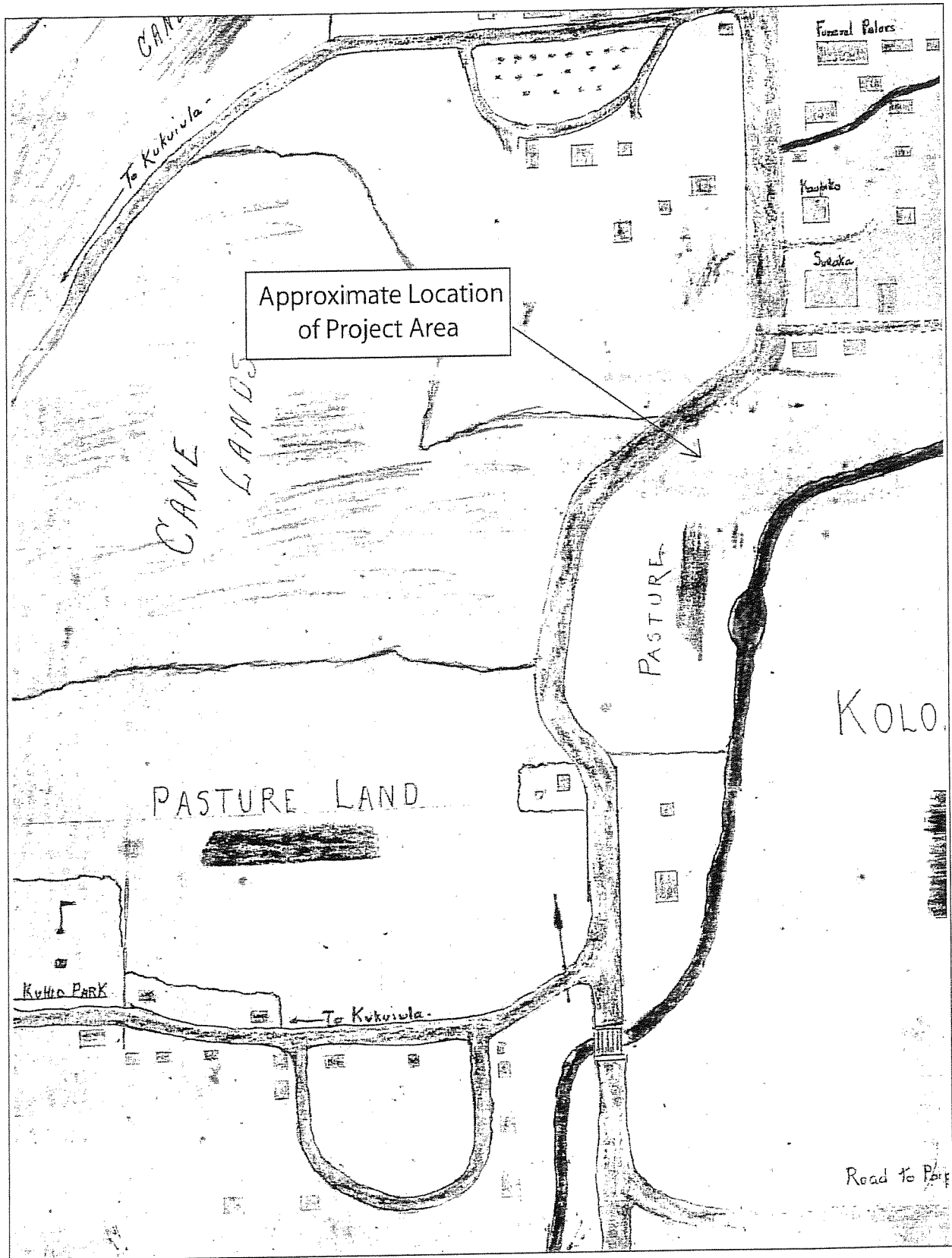


Figure 6. Portion of map drawn by Henry Kawahinehelelani Blake (1874-1948) depicting Kōloa in 1938

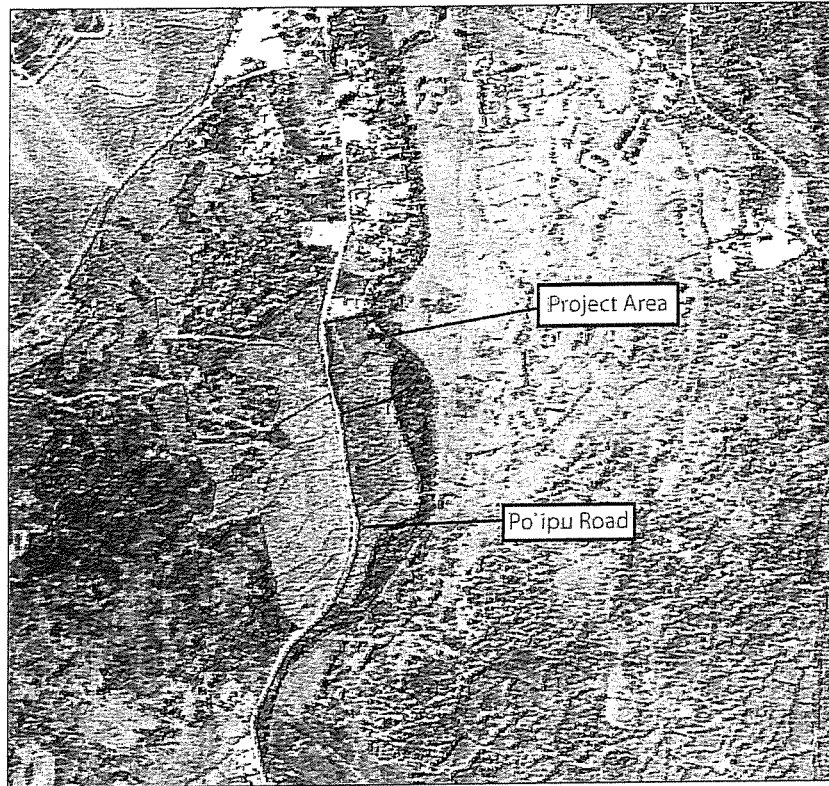


Figure 7. A 1951 aerial photograph of Kōloa

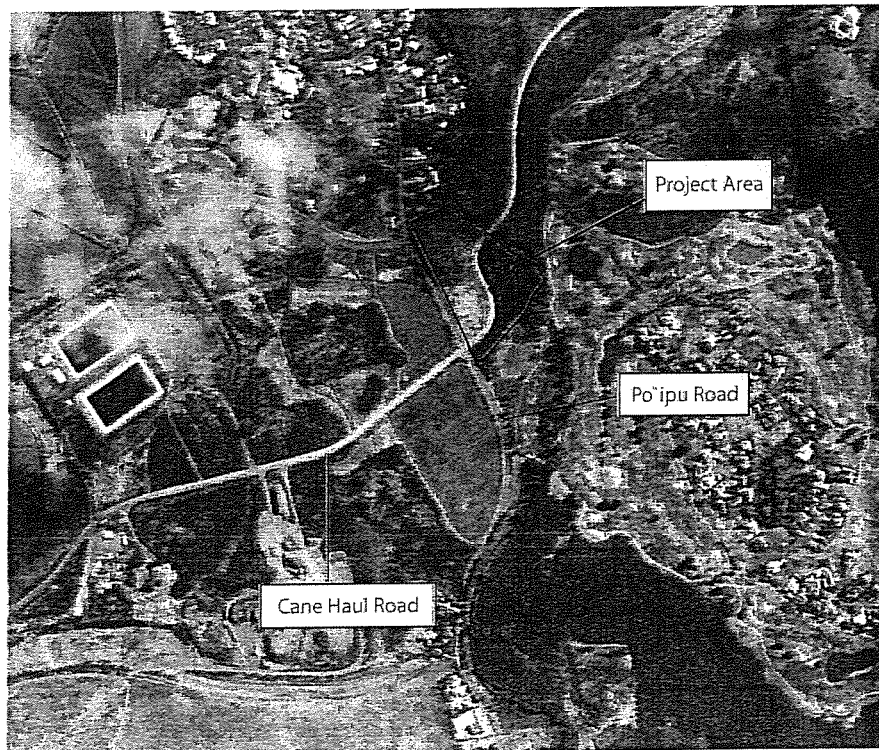


Figure 8. A 2000 aerial photograph of Kōloa

IV. ARCHAEOLOGICAL RESEARCH IN KŌLOA

A. Archaeological Studies

Table 1 lists the archaeological investigations conducted in Kōloa Ahupua'a (Figure 9).

The earliest systematic archaeological survey on the island of Kaua'i was conducted by Wendell Bennett in the late 1920's. Bennett examined and recorded 202 sites on the island. The following are sites recorded within Kōloa Ahupua'a (see Bennett 1931:116-117, 120):

Site 72	Niu Kapukapu Heiau - on the top of Niu Kapukapu Hill on the east bluff of Lāwa'i Valley.
Site 73	Stone work on the hill just in-land from Site 72
Site 74	Fishing shelter on the shore near the mouth of Kukui'ula valley.
Site 75	Kūhiō Park, west of Waikomo Stream with taro patches, a small <i>heiau</i> , an oven, paved house platform, fish pond, game ground with seats and a fishing shrine.
Site 76	Salt pans east of Waikomo Stream
[Sites 77-84]	Located east of Kōloa Ahupua'a
Site 85	Walls, enclosures and house sites in the cactus covered country around the Kōloa reservoir and extending to the sea.
Site 86	House site in the area described in Site 85

None of these seven sites are within the current project area. However, site 85 has been documented within a large area including the presently adjacent golf course to the east and *makai* (Hammatt, Bordner and Tomonari-Tuggle:1978).

William Kikuchi (1963) conducted a general survey of the Kona District of Kaua'i including all *ahupua'a* from Hanapēpē, eastward to Kīpū Kai. Information from Thrum (1907), Bennett (1931), a Lahainaluna School manuscript (1885), and other sources was instrumental in helping to locate major archaeological sites during the field survey. Kikuchi's survey was selective since it was not designed to be a complete inventory, and generally focused on larger or more coastal sites. No sites were noted by Kikuchi in the present study area.

Palama and Stauder (1973) conducted a reconnaissance survey along the route of the then-proposed main cane haul road to the Kōloa mill site. The proposed new section of road extended from Weliweli Road, southwestward across Po'ipū Road, connecting to an existing cane haul road. The section west of Po'ipū Road is approximately 3,000 ft. long with a north/south oriented branch approximately 1,500 ft. long. The road corridor crosses the *makai* portion of the current project area. A total of 18 sites were recorded along the road corridor; none are located within the current project area. Although the Palama and Stauder study was limited in scope to the proposed road right of way, it included a short but thorough historical summary of the place of archaeological sites within the context of the Kōloa and Weliweli Ahupua'a. An extensive *'auwai* system was observed east of Po'ipū Road. The following comments on this system and the sites in general are relevant to understanding the archaeological significance of the area as a whole, and the historic processes at work:

Table of previous archaeological research in Kōloa

AUTHOR(S)	YEAR	LOCATION	STUDY TYPE
Bennett	1931	Kukui'ula Valley, Prince Kūhiō Park	General Survey
Kikuchi	1963	Kona District	General Survey
Kikuchi	1973	Hawaiian Fishponds	General Survey
Palama and Stauder	1973	Cane Haul Road-Kōloa Mill	Reconnaissance Survey
Sinoto	1975	Knudsen Trust Lands	Reconnaissance Survey
Bordner	1977	Kukui'ula 'auwai, Site 50-39-10-1934	Reconnaissance Survey
Hammatt, Bordner and Tomonari-Tuggle	1978	Kīahuna Complex	General Survey
Kikuchi	1979	Sheraton Kauai Hotel	Survey and Subsurface Testing
Connolly	1982	Kōloa-Po'ipū Bypass Road	Reconnaissance Survey
Ching	1983	Kukui'ula-Kualu, Alexander and Baldwin Lands	Reconnaissance Survey
Landrum	1984	Kukui'ula-Kualu, Alexander and Baldwin Lands	Reconnaissance Survey
Hammatt, Borthwick and Shideler	1985	Kōloa-Po'ipū Bypass Road	Survey and Subsurface Testing
Kikuchi	1985	Shoreline Improvements, Waiohai Hotel, Kiha Houna Heiau	Reconstruction
Kikuchi	1988	Pa'anau Sugar Camp	Reconnaissance Survey
Hammatt et al.	1988	Kukui'ula Bay Planned Community	Inventory Survey
McMahon	1989	Kaua'i Fishponds	General Survey
Hammatt	1990	Pa'anau Housing Project	Inventory Survey
Hammatt	1991	Pō'ele'ele Stream – Waterline crossing	Archaeological Reconnaissance
Hammatt, Folk, and Stride	1991	Po'ipulani Golf Course	Inventory Survey
Hammatt	1992a	Kīahuna	Inventory Survey
Hammatt	1992b	Po'ipū Road and Lāwa'i Road Junction	Archaeological Reconnaissance
Hammatt, Ida and Folk	1993a	Po'ipū Road 7.6-acre Parcel	Inventory Survey
Hammatt et al.	1993b	Po'ipū Beach Park	Subsurface Testing and Monitoring

AUTHOR(S)	YEAR	LOCATION	STUDY TYPE
Creed, Ida and Hammatt	1995	Po'ipū Road	Inventory Survey
Bushnell and Hammatt	1996	'Ōma'ō Bridge, 'Ōma'ō Homestead	Archaeological Investigation
Hammatt, Creed, and Ida	1996	Waiohai Resort	Assessment Survey
McMahon	1996	Sheraton Kauai Hotel	Reconnaissance Survey
Ida, Creed, and Hammatt	1997	Po'ipū Bypass Road	Inventory Survey
Hammatt et al.	1998	Kukui'ula Planned Community Phase I	Data Recovery
Hammatt et al.	1999	Kukui'ula Planned Community Phase II	Data Recovery
Jones et al.	2002	260-acre parcel along Pō'ele'ele Stream at 'Ōma'ō	Inventory Survey
Yorck, Shideler, and Hammatt 2002	2002	Well Sites and Appurtenances near Piwai Reservoir, Alexander and Baldwin Properties	Inventory Survey
O'Hare, Shideler, and Hammatt	2003	Sheraton Kauai Resort	Archaeological Assessment
Tulchin and Hammatt	2003	Knudsen Trust Lands <i>mauka</i> of Po'ipū Road	Archaeological Assessment
Tulchin and Hammatt	2003	Northern Leg of the Western Bypass Road	Inventory Survey
Yorck, Shideler & Hammatt	2003	Kukui'Ula, Kōloa	Data Recovery

Our reconnaissance revealed that the most significant archaeological feature located within the study area is the extensive *'auwai* system. Remnants of this irrigation system were observed on both sides of the Waikomo Stream. ...[This] network of watering canals proved to be the key to the success of the prehistoric Hawaiian Culture in turning these marginal lands into flourishing wet and dry agricultural fields. From information gathered from local informants and preliminary historical investigation of this area it is evident that the early commercial growers of sugar cane utilized the existing *'auwai* system. Gradually as more and more fields came under sugar cane production these replaced the wet and dry fields of an earlier day. Today the archaeological sites remaining stand as islands as these marginal cane lands were taken out of production and turned into pasture (Palama and Stauder 1973:4).

Bordner and Ching (1977) conducted a one-day reconnaissance survey of a specific *'auwai* located in Kukui'ula and corresponding to the major *'auwai* system assigned State Site # 50-30-10-1934. The *'auwai* traverses Kukui'ula from northeast to southwest and includes a number of associated remnant fields. A portion of this *'auwai*, the raised "aqueduct" type section, is slated for preservation (Hammatt et al. 1998).

Hammatt et al. (1978), as part of Archaeological Research Center of Hawaii (ARCH), reported on a general survey of 460 acres for the then proposed Kīahuna Golf Village located on the east side of Waikomo Stream and Po'ipū Road. The Kīahuna survey recorded 583 archaeological sites including 175 stone enclosures and 108 stone house platforms, some of which are clustered as family compounds. The water channels (*'auwai*), ponded fields, terrace plots, and mound fields all indicate extensive wet and dry land agriculture (Hammatt et al. 1978:5). The water source for this highly integrated agricultural system was Waikomo Stream which was tapped upstream. Additional sites included 10 occupation caves and a *heiau*. Sites were located during this survey on the opposite side of Waikomo Stream from the current project area. These sites included *'auwai*, cattle walls and a historic house site.

William Kikuchi (1981) conducted a reconnaissance survey of Weliweli Tract in the *ahupua'a* of Weliweli, abutting the *ahupua'a* of Kōloa. The survey included the railroad causeway, which "historically connected the Kōloa Sugar Mill to Kōloa Landing" (Kikuchi 1981:2), *'auwai*, walls, terraces, alignments, and habitation sites. Kikuchi states that "the sites...were probably an extension of the vast, prehistoric habitation and agricultural sites of the adjacent Kīahuna property" (1981:17).

Connolly (1982) conducted a reconnaissance survey of sections (310 acres) in the *ahupua'a* of Kōloa and Weliweli in 1982 for the Kōloa-Po'ipū Bypass Road. The sites that Connolly encountered were predominantly wall remnants, a few rock mounds, a hole, two complexes, a railway causeway, and an enclosure.

Francis Ching (1983) conducted a reconnaissance survey, and an historical investigation of sections of the *ahupua'a* of Kōloa and Lāwa'i. According to Ching, three-fourths of the study area was bulldozed and rocks re-located, however, remnants of walls, *lo'i*, *'auwai*, flumes, terraces, *kula* and an historic railroad berm were still discernable. These remnants are evidence of the expansiveness of the Kōloa Field System.

James Landrum (1984), of the Bishop Museum, conducted a reconnaissance survey of a 200+ acre portion of Kukui'ula. Landrum recognized that his survey area was once part of an

extensive irrigated agricultural complex developed in the prehistoric period with superimposed historic-era occupation (Landrum 1984:24).

Hammatt, et al. (1985) conducted a survey with subsurface testing for the proposed Kōloa-Po'ipū Bypass Road which extends 9,000 ft. along the boundary of Kōloa and Weliweli Ahupua'a. The road corridor was proposed to connect Po'ipū Road (the beach road) to Weliweli Road, southeast of Kōloa Town. A total of 47 archaeological features were located along the corridor. These were concentrated at the *makai* or southern end of the corridor and included the southeastern portion of the "Kīahuna Complex" documented by Hammatt et al. in 1978 (see above).

William Kikuchi (1988) conducted a reconnaissance level survey of the former Pa'anau Sugar Camp. The camp was located just *makai* (south) of the present day Kōloa Elementary School. The survey recorded a number of cement foundations, ditches, and portable historic artifacts. Kikuchi states that archaeologically the site is interesting because it contains remnants of an early (1910-1950) plantation camp, even though the vast majority of its structures have been destroyed or removed.

Hammatt, et al. (1988) conducted an inventory survey on approximately 1000 acres within the *makai* portion of Kōloa Ahupua'a for the proposed Kukui'ula Bay development project. A total of 58, both prehistoric and historic, archaeological sites were located and described. The prehistoric sites are described as remnants of the former extensive irrigated agricultural complex that stretched eastward from Lāwai Valley to Weliweli. Site types included 'auwai, fields, house sites, shelters, burial features, occupied lava tubes, and *heiau*. Historic era sites included cattle walls, abandoned cane fields, a house site, and a railroad berm. The southern portion of the current project corridor extends into the Kukui'ula survey area.

Hallett Hammatt (1990) conducted an inventory survey of a 4.6 acre parcel at the west end of Pa'anau Road, Kōloa. The historical segment of this report indicates the previous existence of the Pa'anau Camp, and a railroad and 'auwai irrigation ditch which traversed the study area.

Hallett Hammatt (1991) carried out an archaeological reconnaissance for a proposed waterline stream crossing of Pō'ele'ele Stream noting extensive modern land modification and no significant findings.

Hammatt et al. (1991) conducted an archaeological inventory survey of 160 ac. within Kōloa along the Kōloa-Weliweli *ahupua'a* boundary. This study located, mapped, described, and evaluated a total of 75 sites and observed a wide range of site types. The survey study concluded that the (never built) Po'ipūlani project area was associated with what is referred to as the Kōloa Field System.

Hallett Hammatt (1992a) carried out an Archaeological Inventory Survey of a 3.8-acre Property at Kīahuna, but the entire parcel had been previously graded and there were no significant findings.

Hallett Hammatt (1992b) carried out an Archaeological Reconnaissance of the Po'ipū Road and Lāwa'i Road Junction, but again there were no significant findings owing to prior land disturbance.

Hallett H. Hammatt et al. (1993) conducted an inventory survey, with limited subsurface testing, of 7.6 ac. (TMK 2-8-14:30) in the Kīahuna area, *mauka* of Po'ipū Road. Site 3758 was re-mapped from the original survey of 1978, and three new sites were recorded. According to

Hammatt et al., these sites are remnants of traditional *'auwai*, walls, fields, enclosures and habitation platforms, and appear to be a part of the larger Kōloa Field System which encompassed over 1000 acres (Hammatt et al. 1993:21).

Hammatt et al. (1993) conducted an assessment survey, subsurface testing and monitoring at Po'ipū Beach Park in the *ahupua'a* of Kōloa. Wave action during Hurricane 'Iniki in 1992 had exposed a cultural layer (Site 50-30-10-745) which needed to be preserved and monitored during the reconstruction and restoration of the park. Auger testing (1993:11) revealed charcoal, and both traditional and historic midden and artifacts (i.e. basalt flakes and fragments, nails, glass, *kukui* shells, and mollusk shells). A cemetery (State Site 50-30-10-1871), located in the middle of Po'ipū Beach Park, and other sections of the buried cultural layer beneath the park, were also monitored during the removal of several cement slabs, remnants of a pavilion, picnic tables, and barbecues. The rich cultural layer, supported by radiocarbon dating, indicates that this shoreline occupation is contemporaneous with the development of the Kōloa Field System. This cultural layer is the "single largest coastal beach deposit in the *ahupua'a* of Kōloa" (Hammatt et al. 1993:65, 66) and greatly contributes to the information bank regarding the cultural development of the Kōloa district.

Creed et al. (1995) reported on an inventory survey within a 1.4-mile corridor along Po'ipū Road (TMK 2-8-15, 16, 17 & 18) in the *ahupua'a* of Kōloa and Weliweli. Three sites, including enclosures, a terrace, and the Kōloa-Weliweli boundary wall, survived previous bulldozing of the area and were understood as components of the Kōloa Field System.

Tina Bushnell and Hallett H. Hammatt (1996) carried out an archaeological investigation of 'Ōma'o Bridge in 'Ōma'o Homestead, however the only objects of historical interest noted were the existing bridge and features associated with an old railroad.

Hammatt et al. (1996) conducted an assessment survey of an exposed cultural layer in undisturbed sand deposits at Waiohai Hotel. This layer was disturbed by high wave action during Hurricane 'Iniki which completely destroyed the associated reconstructed Kiha Houana Heiau (Site 50-30-10-80). The exposed cultural layer supports the conclusion that there was habitation associated with major ceremonial structures along the shoreline (Hammatt et al. 1996:39)

Nancy McMahon (1996), at the time an independent archaeological consultant, completed a reconnaissance survey of TMK 2-08-16:3 (8.444 acres), property known as Sheraton Kaua'i in the *ahupua'a* of Kōloa. No surface sites or cultural deposits were reported.

Ida et al. (1997) conducted a reconnaissance survey on a 1.2 mile corridor of a proposed bypass road within the *ahupua'a* of Kōloa and Weliweli (TMK 2-8-02:3, 2-8-03:1, 2-8-04:1, 2-8-05:2) that had previously been bulldozed. This survey did not reveal any archaeological sites, and further study was not recommended.

Cultural Surveys Hawai'i, Inc. (Hammatt et al. 1998) reported on data recovery of the Kukui'ula Planned Community Project Phase 1 area encompassing approximately 219 acres. The current project corridor passes through a portion of the Kukui'ula Phase 1 data recovery area. The project included excavations at 20 different sites that encompassed 64 individual features. There was a total of 212 excavation units (212 m²) and 19 backhoe trenches (only 14 backhoe trenches were chosen for study). Large quantities of midden (approx. 23.7 kg.) and artifacts (10,635 items) were recovered and are reported on. The artifacts include a wide range of types with both indigenous (2,592 items) and historic (8,043 items) represented. Radiocarbon (C14)

dates range from ca. A.D. 1050 onward. The earliest date comes from the habitation/burial cave Site 50-30-10-1927A. In addition to the habitation sites and features dated, seven (7) dating samples from agricultural features were also analyzed.

Cultural Surveys Hawai'i, Inc. (Hammatt et al. 1999) reported on data recovery work just *makai* and southwest of Kōloa Town on the west side of Waikomo Stream in the northeastern portion of the Kukui'ula Planned Community Phase II Area. The study area is comprised of approximately 33 ac. and has been used as a buffer zone between cane lands/pastures and the residential lots bordering Po'ipū Road. While some ten Land Commission Awards lie partially or entirely within the project area, most of these properties were bulldozed in the course of sugar cane cultivation. There were however, areas that appeared undisturbed by sugar cane cultivation or heavy machinery. Excavations were conducted within five archaeological sites (thirteen features). These excavations yielded 264.8 g. of midden; 53 indigenous artifacts (including 43 volcanic glass flakes, 9 basalt flakes, and one coral manuport); and 877 late-historic artifacts (e.g. glass, metal, ceramics, plastic, leather, and slate). Twelve charcoal samples were dated indicating prehistoric habitation post dating 1200 AD.

Cultural Surveys Hawai'i Inc. (Jones et al. 2002) conducted an archaeological inventory survey with subsurface testing on an approximately 260 acre parcel (TMK 2-7-03:5) along Pō'ele'ele Stream at 'Ōma'o just seaward of Kaumuali'i Highway. Two sites were identified, terrace remnants of LCA 3229 awarded to Eke 'Opunui for the cultivation of taro and sugar cane and a sugar plantation irrigation ditch feature. Two carbon dates are reported of ca. A.D. 1010 - 1180 understood to shortly predate wall construction.

Cultural Surveys Hawai'i Inc. (Yorck et al. 2002) conducted an archaeological inventory survey in support of a project including well sites and appurtenances such as an access corridor in the vicinity of Piwai Reservoir. No significant sites were observed.

Cultural Surveys Hawai'i Inc. (O'Hare et al. 2003) conducted an archaeological assessment of the Sheraton Kaua'i Resort parcel. Although heavily impacted by modern development, some traditional surface sites were documented. Historic research indicated traditional agriculture (*lo'i*) quite close to the coast.

Cultural Surveys Hawai'i Inc. (Tulchin and Hammatt 2003a) conducted an archaeological assessment of certain Knudsen Trust lands *mauka* of Pō'ipū Road. The project area was previously covered as part of the Kīahuna and Poipulani projects. Most of the extensive previously recorded sites were reported to be still intact.

Cultural Surveys Hawai'i, Inc. (Hammatt and Shideler 2003) conducted an archaeological inventory of an approximately 35-acre parcel for the Kaua'i Bible Church, just *makai* (south) of the Piwai Reservoir. No archaeological sites were identified in the project area or vicinity.

Tulchin and Hammatt (2003b) conducted an inventory survey of the northern leg of the Western Bypass Road. This portion of the Western Bypass Road is *mauka* of Kōloa Road and extends northeast to Maluhia Road. Extensive land modification associated with both sugar cane cultivation and the establishment of a macadamia nut / banana farm appears to have greatly impacted the area. No archaeological sites were identified in the project area or vicinity.

B. Summary

Previous archaeological work concerning the Kōloa district has, until recently, been mostly surface surveys. The Kōloa area began to be documented by subsurface testing of sub-surface cultural deposits within the proposed Kīāhuna Golf Course area in 1979. Information gleaned from intensive excavations in the *ahupua'a* of Kōloa, Weliweli, and Pa'a, combined with the inventory surveys in these *ahupua'a*, clearly indicate an expansive irrigated agricultural complex and associated temporary and permanent habitation features. The focus of this integrated Kōloa Field System was Waikomo Stream which was utilized as the main source of irrigation. However, the full extent of the Kōloa Field System is hard to estimate because of the widespread historic land modifications (mainly for sugar cane).

Chronological analysis from the neighboring three *ahupua'a* suggests an early initial occupation within the Pa'a Ahupua'a ca. A.D. 535 (Walker and Rosendahl 1990b:131). No coinciding early dates have been found within Kōloa Ahupua'a, since most of the shoreline area of Kōloa has been heavily impacted by commercial, residential, and resort development. Initial occupation probably was characterized by temporary and/or recurrent occupation developed into permanent settlement within an integrated (both irrigated and *kula* or dryland) agricultural system by ca. A.D. 1200 (Walker and Rosendahl 1990b). Portions of this Kōloa Field System functioned well into historic times (ca. 1880's) and co-existed with commercial sugar cane cultivation.

Relatively little archaeological study has been conducted in the *mauka* portions of Kōloa Ahupua'a (*mauka* of Kōloa Town). Recent archaeological investigations in these *mauka* areas (Hammatt 1991; Bushnell and Hammatt 1996; Yorck et al. 2002; Hammatt and Shideler 2003; Tulchin and Hammatt) noted substantial historic land modification, with no significant archaeological findings. However, a recent Cultural Surveys Hawai'i Inc. (Jones et al. 2002) archaeological inventory survey on an approximately 260-acre parcel at Ōma'o does indicate the potential for locating pre-contact sites in these heavily modified *mauka* lands of Kōloa Ahupua'a.

V. RESULTS OF COMMUNITY CONTACT PROCESS

Throughout the course of this assessment, an effort was made to contact and consult with Hawaiian cultural organizations, government agencies, and individuals who might have knowledge of and/or concerns about traditional cultural practices specifically related to the project area. This effort was made by letter, e-mail, telephone and in person contact. In the majority of cases, letters along with a map of the project area were mailed with the following text:

At the request of the Kukui'ula Development Company, LLC, Cultural Surveys Hawai'i, Inc. (CSH) is conducting a cultural impact assessment for an approximately 9.4-Acre parcel of land located east of Pō'ipū Road, Koloa, Kaua'i Island (TMK: 2-3-04:19). This 9.4-Acre parcel is proposed for the future development in association with the adjacent 1,000 acre Kukui'ula Development Project. The purpose of the cultural study is to assess potential impacts to traditional cultural practices. This study is meant to satisfy requirements related to Chapter 343 HRS Articles IX and XII and Act 50 and their applicability to the project area.

We are seeking your input regarding the following issues:

Identification of traditional Hawaiian activities including gathering of native plants, animals and other resources.

Identification of existing archaeological or cultural sites, trails, burials etc., which may be impacted by the proposed study.

Cultural associations with the study area through legends, traditional use or otherwise.

The individuals, organizations, and agencies attempted to be contacted and the results of any consultations are presented in the table below.

Mrs. Nani Higa consented to be interviewed (see Section VI). Mr. John Kruse noted that the project area has already been heavily impacted by modern activities. Ms. La France Kapaka-Arboleda cautioned that, in the unlikely event that burials are encountered during future development of the project area, proper mitigation measures should be undertaken.

Community Contact Table

Name	Organization, Affiliation	Comments
Burgess, Stella	Hyatt Hotels & Resorts, Cultural Specialist	No comment.
Carney, Mary	State Historic Preservation Division Burials Facilitator	Referred to the Kaua'i/Ni'ihau Burial Council.
Higa, Nani	Hālau Hula O Nani, Kumu Hula	Consented to be interviewed. Referred to Albert Carbonel.

Name	Organization, Affiliation	Comments
Kapaka-Arboleda, La France	Office of Hawaiian Affairs, Kaua'i Office, Community Resource Coordinator; Chair, Kaua'i/Ni'ihau Burial Council	"Considering the previous development of this proposed project area, it is unlikely that SHPD will require various test pits along the project proposed. I hope the process will still be the standing notification: if something is found the burial council will be asked for their recommendation etc. I am not privy to any burial sites in the area."
Kruse, John	Kaua'i/Ni'ihau Burial Council, Koloa District	"In the 1930s and 40s the project area was pretty much trashed. There should be no cultural concerns in that area. Pineapple was cultivated in the vicinity."
Lauretta, Mike	Department of Land and Natural Resources-Kaua'i Land Division	"DLNR has no input to offer regarding traditional Hawaiian activities; archaeological or cultural sites; nor cultural associations that could be recommended as they affect the project area."
McMahon, Nancy	State Historic Preservation Division Kaua'i Archaeologists	No immediate concerns in the project area.
Perry, Warren	Royal Order of Kamehameha, Kaumuali'i Chapter No. 3	No comment
Rogers, Nani	Hui Ho'okipa o Kaua'i	No comment
Tsuchiya, Rick	Kaua'i Historic Preservation Review Commission	Referred to the Historic Preservation Review Commission. meetings held every month.

VI. KAMA'ĀINA AND KŪPUNA INTERVIEWS

Kama āina and *kūpuna* with knowledge of Kōloa and the present project area were interviewed for this assessment. Mr. Albert Carbonel and Mrs. Nani Higa participated in informal in-person "talk-story" sessions with Cultural Surveys Hawai'i. Mr. Louis Jacintho was interviewed by telephone.

To assist in the discussion of natural and cultural resources, and traditional cultural practices within Kōloa and the project area, the informants were questioned on a range of topics that included: burials, trails, native gathering practices, marine and aquatic resources, and cultural sites.

Presented below are summaries of the backgrounds of the three informants, followed by excerpts from their interviews. The excerpts focus on the information most pertinent to land uses and traditional cultural resources, practices and beliefs within the present project area and the broader Kōloa Ahupua'a context.

A. Albert Carbonel

Albert Carbonel was interviewed by CSH on August 24, 2004 at the Queen Lili'uokalani Trust Center (QLCC) in Līhue, Kaua'i. Mr. Carbonel was born in Līhue in 1958, the son of Alfredo and Ida Carbonel. He currently resides in Omao where he propagates native Hawaiian plants in his yard. His interest in native Hawaiian plants stems from his teacher, Kauhana Morton, a chief propagator for the Waimea Falls Park on O'ahu. (Mr. Morton is now the cultural specialist for the Kokio Development Project in Hoonounau on the island of Hawai'i.) Mr. Carbonel is an employee of QLCC for the past eight years as their facility maintenance person and grounds keeper for the many native Hawaiian plants surrounding the center.

Interview excerpts:

"In the area below [the present project area], they call 'Koloa Landing'. It was once a fishing village. They used to store canoes there. These were canoes made by the immigrants to the area. The canoes had double hauls. They used to go to Mahaulepu, and then stay overnight and row back in the morning. My father used to do that as well. We, my brother and I, used to have to wait at the landing and make a fire so they knew where to come in. The immigrants who used these boats were Filipino and Japanese. Our family and others used the coast for fishing. They used to throw net, spear bottom fish, troll. They also caught *o'opu*, talapia in the fresh water streams and ditches."

"Up in Waikomo Stream there is a place towards Koloa that they call "Green Pond". The stories we heard as children is that the pond was haunted. There are still houses back there. We used to go and swim in the pond, but today the water is bad."

“In the [present project area] I know there are no traditional plants to gather. It was all sugar cane grown up there. People used to make gardens up along Waikomo Stream. They grew pumpkin. The pumpkin grew wild, but you can see that someone took the time to plant them and care for them. A lot of plantation workers worked up there.”

“Today people, myself included, practice planting native plants in our yard. I grow *maile*, *‘ilima*, *koki‘o*, *palapalai*, *hapu‘u*, *laua‘e*, *koa*, *iliahi*, *alula*, and *poha*.”

“There are said to be some lava tubes in [the vicinity of the project area]. The only trails I know of are man-made trails. We used to take the trails up in that area when we were young. I don’t think you can find them today. I mentioned before there was a fishing village at Koloa Landing, there may be more cultural sites down there.”

“I don’t know any traditional legends [placed in the vicinity of the project area] other than the pond they say was haunted.”

“I do not see any impact to the 10-acre parcel. The area was pretty much sugar cane as long as I can remember.”

B. Nani Higa

Cultural Surveys Hawai‘i interviewed Beverly Nani Higa on August 24, 2004 at the Kaua‘i Sands Hotel in Kapa‘a, Kaua‘i. Mrs. Higa was born in Hilo on January 14, 1935 and presently lives in Ōma‘o. She is Kumu Hula of Hula O Nani in Ōma‘o. She came to Kaua‘i in 1971 and opened her *hula halau* in 1976.

Interview excerpts:

“I have taught hula to my students since 1976. We dance about the travels of Pele’s sister Hi‘iaka on her journey to Kaua‘i to bring back Pele’s lover Lohiau. I do not know of any traditional practices in the project area other than it was cane fields worked by immigrants.”

“All of our gathering of plants was taken from other areas away from the project area. We used to gather *lauhala* south of the project area nearer the coast. *Mauka* is where we gather the *hau* or cordage to make our hula skirts. Since they closed the cane haul road the area is hard to get to.”

“The practice of fishing is south along the coast. We gather *limu* along the shore. Men throw nets and pole fish.”

“I am not familiar with any trails in the area. I have heard there are a lot of lava tubes in the area. The project area was all sugar cane fields so I doubt if there are any burials to be concerned with.”

“I am only familiar with the hula stories of Hi‘iaka and her association with the Wailua area.”

"I have no cultural concerns regarding the project area. I can refer you to a young man whose family grew up in that area. His name is Albert Carbonel. Albert works at the Queen Lili'uokalani's Children Center in Lihue. He practices agriculture in his yard with Hawai'i's native plants. He tends to all the plants on the grounds at the center."

C. Louis Jacintho

Cultural Surveys Hawai'i conducted a telephone interview with Louis Jacintho on September 13, 2004. Mr. Jacintho was born in Kōloa's Portuguese Camp in 1924. In 1939 he began working for Kōloa Sugar Company. He continued to work in Kōloa sugar after Grove Farm took over Kōloa Plantation in 1948 and McBryde Sugar took over Grove Farm's lands in 1974. He retired in 1986.

Interview excerpts:

"Long before never had much of anything. Had cane fields even by the golf course. Where the Catholic Church is was the center of population in my time. Years ago had houses in that area, [former] plantation houses."

"It was very rocky land. Had piles of rocks here and there, and cane fields all around. Even where the road is today."

"East of that area by the cemetery was pineapple during the war time."

"I don't think you're going to find burials because only had cane fields. Only had plantation workers for the fields at that time."

"I don't remember us picking anything from over there [where there were] only cane fields. I don't know of any legends."

VII. TRADITIONAL CULTURAL LANDSCAPE OF KŌLOA AHUPUA‘A AND THE PROJECT AREA

Late 18th-century accounts by European navigators record well-maintained agricultural systems above the southern coast of Kaua‘i. The evidence suggests that, by the beginnings of western contact, the Hawaiian inhabitants of Kōloa were well-versed in the agricultural arts, maintaining fields that included taro, sugarcane, and sweet potatoes. The extensive agricultural systems of the region would have supported a substantial population. Even in 1833, following the depredations of diseases and social disruption introduced by decades of western contact, the population of the Kōloa district (from Wahiawa to Kalapaki) was 2,166.

Fourteen *heiau* in Kōloa were documented in an early oral history project of the 1880s. The variety of class and function – including *luakini* and *po‘okanaka* class heiau, and heiau related to fishing, medicine, and agriculture – illustrate the range of the traditional Hawaiian belief system established in Kōloa.

Discussions of specific aspects of traditional Hawaiian culture as they may relate to the project area are presented below. The concluding discussion examines resources and practices identified within the project area in the broader context of the encompassing Kōloa Ahupua‘a landscape.

A. Hawaiian Habitation and Agriculture

Based on archaeological studies and historical accounts, habitation and intensive irrigated agriculture were widespread in central and coastal Kōloa utilizing the opportunity to develop an extensive irrigated complex – the Kōloa Field System – off of Waikomo Stream.

The present project area – located adjacent to Waikomo Stream – was likely part of the pre-contact Kōloa Field System. As noted in the documentation of two Land Commission Awards (LCAs) – 3610 and 3409 – (see Section III above) agricultural growing areas, including *lo‘i*, were present within the project area in the mid-19th century. Also identified in the LCA documents were a house site and pasture land.

It is likely that the habitation and agricultural activity recorded in the documents reflect the continuation into the 19th century of the primary traditional Hawaiian land use and cultural activity within the project area and vicinity.

However, subsequent 19th and early 20th century land modification associated with sugar cane cultivation in the project area would have destroyed virtually all surface sites and features associated with traditional Hawaiian life.

B. Gathering for Plant Resources

No specific native Hawaiian gathering practices for plant resources were identified within the project area in the historical documentation, archaeological investigations, or community interviews. The 20th century sugarcane planting and related modern developments have effectively eliminated traditional plant resource areas within the project area, and have restricted the project area from cultural usage. None of the community informants identified any ongoing native gathering practices within the project area.

C. Aquatic Resources

Native stream animals supplied the Hawaiian diet with a rich source of protein. Waikomo Stream, along the east boundary of the project area, would have given Hawaiian inhabitants of the project area and vicinity access to native fish, shrimp, and mollusks including: 'o'opu, 'ōpae, and hihiwai. The incorporation of the project area and surrounding lands into sugarcane plantation lands in the late 19th and early 20th centuries would have also restricted access to Waikomo Stream for cultural usage in this portion of Kōloa. None of the community informants identified any ongoing fishing activities within Waikomo Stream in the vicinity of the project area.

D. Traditional Hawaiian Sites

Historical documentation and archaeological study have not identified any traditional Hawaiian sites within the project area. None of the community contacts or interviewees were aware of any traditional sites.

E. Burials

No specific documentation was found regarding 'iwi (ancestral remains) in the project area. None of the community contacts or interviewees were aware of known burials in the project area.

F. Native Hawaiian Hunting Practices

No specific native Hawaiian hunting practices were identified within the project area in the historic documentation, archaeological investigations, or community informants.

Game animals hunted on Kaua'i include pigs, goats, black-tailed deer and a variety of game birds. Black-tailed deer were introduced in 1961 and are not found near the project area. The vicinity of the project area is not shown to have either concentrated or sparse densities of either pigs or goats on species range maps (Van Riper and Van Riper III 1982: 25, 34). No hunting of game birds (all exotic introductions) has been reported within the project area.

G. Hawaiian Trails

Trails served to connect the various settlements throughout the *ahupua'a* and districts of the Hawaiian Islands in traditional times. No traditional trails were identified within the present project area on historic maps or by community informants.

H. *Wahi pana* (Storied Places)

While areas – such as Maulili Pond – of Waikomo Stream, which runs to the east of the project area, were *wahi pana* associated with Hawaiian traditions, no other storied places were identified in the immediate vicinity of the project area.

I. The Project Area within the Kōloa Ahupua'a Context

Kōloa Ahupua'a follows the typical *ahupua'a* pattern, extending *mauka* from the coast to the upland forest areas. Within the *ahupua'a* can be found a wide variety of cultural practices and resources, depending on location within this broad *makai* to *mauka* context. One agricultural practice that has been well documented for Kōloa is taro cultivation extending inland along existing streams and their tributaries. Forest areas miles inland would have been utilized for a variety of purposes, especially gathering of timber, avian resources, medicinal plants, and famine

food resources. Presently the *mauka* portions of Kōloa Ahupua‘a are in the forest reserve. It is probable that botanical resources traditionally used in Hawaiian culture still exist in these forest areas that, unlike the present project area, were never subject to commercial agriculture. In the *makai* areas of Kōloa Ahupua‘a, fishing and marine resource gathering practices continue to occur along the coast areas, as have been documented in the past.

The habitation and agricultural activities – documented by Land Commission Award records – within the present project area identify it as the land base of a Hawaiian community sustained by the extensive agricultural field system that stretched across the central Kōloa landscape.

VIII. SUMMARY OF FINDINGS

Reviewing the information provided by the elements of this cultural impact assessment – historical documentation, archaeological research, community contacts, and *kāma'āina* and *kūpuna* interviews – there emerges a more detailed picture of the traditional landscape of Kōloa Ahupua'a and the present project area. By the end of the 18th century, the project area comprised a portion of an intricate network of taro *lo'i*, *'auwai*, and associated habitation sites that stretched across the *makai* floor of Kōloa Ahupua'a. This network, identified by Cultural Surveys Hawai'i as the Kōloa field system, incorporated unique engineering innovations that allowed otherwise inhospitable lands – at a distance from water sources – to sustain a growing population.

Nineteenth-century documents – Land Commission Award records and historic maps – show that, within the project area, remnants of the traditional Hawaiian settlement pattern survived the first seven decades of western contact. However, by the early decades of the 20th century, western commercial entrepreneurial interests had transformed the project area into a portion of sugarcane fields and pasture lands, and had dispersed remaining native residents.

As confirmed by historical records and community informants, sugarcane cultivation was the dominating land use activity within the project area throughout the 20th century. This activity – and the sense that the project area was private property – restricted access inside the project area to sugar company employees.

None of the community contacts and informants questioned for this assessment knew of any cultural sites in the project area, or could recall anyone entering the project area – either in the past or present – for any traditional cultural practice. Based on the evidence gathered, at present no contemporary or continuing cultural practices occur within the project area.

Consequently, development of the project area will have minimal impact upon native Hawaiian cultural resources, beliefs and practices. It should be noted, however, that subsurface properties associated with former traditional Hawaiian activities in the project area, such as artifacts and cultural layers, may be present despite the decades of sugar cultivation activities. As a precautionary measure, personnel involved in future development activities in the area should be informed of the possibility of inadvertent cultural finds, and should be made aware of the appropriate notification measures to follow (including consultation with the State Historic Preservation Division and, as may be appropriate, with Kaua'i community cultural organizations).

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APPENDIX F: ARCHAEOLOGICAL INVENTORY SURVEY

ARCHAEOLOGICAL INVENTORY SURVEY
OF A 9.4 ACRE PARCEL ALONG WAIKOMO STREAM
KŌLOA AHUPUA‘A, KONA DISTRICT, ISLAND OF KAUA‘I

TMK 2-6-04: por. 19

by

Jesse Yorck, B.A.,
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I. INTRODUCTION

A. Project Background

At the request of Kukui'Ula Development Company (Hawaii), LLC (the proposed developer of the parcel), Cultural Surveys Hawai'i performed an archaeological inventory survey for a 9.4-acre parcel bordered by Poi'pū Road to the west and Waikomo Stream to the east. The project area, presently owned by Alexander & Baldwin, Inc. and McBryde Sugar Company, Limited, is dissected by a cane haul road, with existing housing to the north and an undeveloped parcel to the south (Figures 1-3).

B. Scope of Work

The agreed upon scope of work for the archaeological inventory survey was as follows:

1. A complete ground survey of the entire project area for the purpose of site inventory. All sites would be located, described, and mapped with evaluation of function, interrelationships, and significance. Documentation will include photographs and scale drawings of selected sites and complexes. All sites will be assigned State site numbers.
2. Limited subsurface testing to determine if subsurface deposits are located in the project area, and, if so, evaluate their significance. If appropriate samples from these excavations are found, they will be analyzed for chronological and paleoenvironmental information.
3. Research on historic and archaeological background, including search of historic maps, written records, and Land Commission Award documents. This research will focus on the specific area with general background on the *ahupua'a* and district and will emphasize settlement patterns.
4. Preparation of a survey report which, will include the following:
 - A topographic map, if available, of the survey area showing all archaeological sites and site areas;
 - Description of all archaeological sites with selected photographs, scale drawings, and discussions of function;
 - Historical and archaeological background sections summarizing prehistoric and historic land use as they relate to the archaeological features;
 - A summary of site categories and their significance in an archaeological and historic context;
 - Recommendations based on all information generated which will specify what steps should be taken to mitigate impact of development on archaeological resources - such as data recovery (excavation) and reservation of specific areas. These recommendations will be developed in consultation with the client and the State agencies.

This scope of work also includes full coordination with the State Historic Preservation Division and County of Kaua'i relating to archaeological matters.

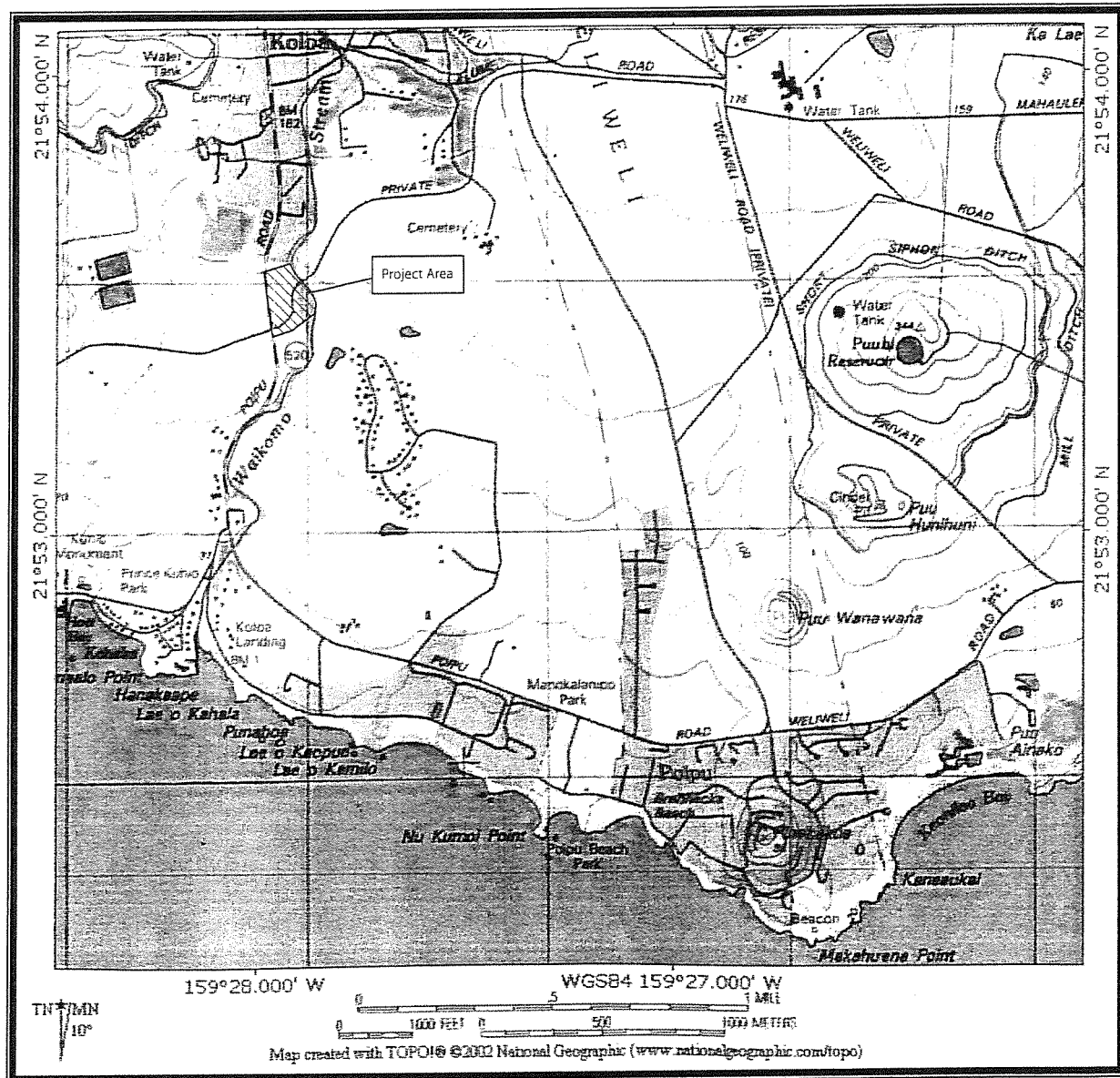


Figure 1. U. S. Geological Survey Kōloa quad map showing, location of project area (hatched area)

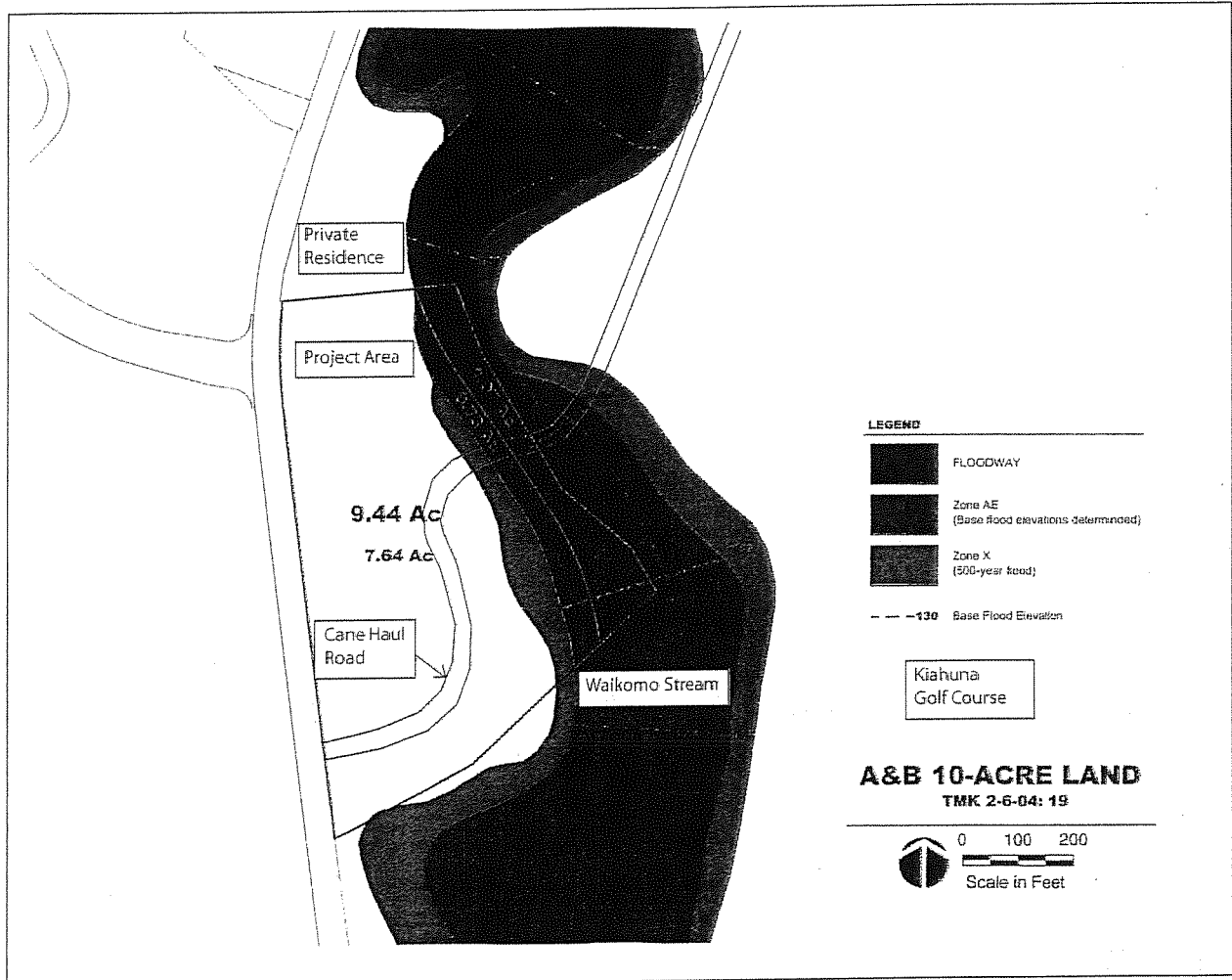


Figure 3. Project area map (shaded area) showing the location of the project area in relation to Waikomo Steam and Pō'ipū Road (provided by Kukui'Ula Development Company (Hawaii), LLC)

C. Project Area Description

The project area is located in the *ahupua'a* of Kōloa, in the Kona District of the island of Kaua'i. Kōloa is a fairly large *ahupua'a* (9,500 ac.), bounded on the east by Weliweli Ahupua'a, and on the west by Lāwa'i Ahupua'a. The perennial Waikomo Stream, which abuts the project area to the East, traverses most of Kōloa *Ahupua'a*. The project area, currently owned by Alexander & Baldwin, Inc. and McBryde Sugar Company, Limited, contains a portion of a cane haul road.

The elevation within the project area ranges from approximately 45-70 m (150-230 ft) A.M.S.L. The soils within the project area consist predominantly of Waikomo Stony Silty Clay (Ws) and Waikomo Very Rocky Silty Clay (Wt). (Foote et al. 1972). Soils of the Waikomo Series are described as "well-drained, stony and rocky soils on uplands on the island of Kauai" (Foote et al. 1972:113). The project area receives approximately 1,000 mm (39.7 inches) of annual rainfall (Giambelluca et al. 1986).

The project area consists almost entirely of former pineapple and sugar cane fields. The land is currently overgrown with exotic grasses reaching over 2 meters. Vegetation also consisted of *koa haole* (*Leucaena leucocephala*), *klu* (*Acacia farnesiana*), java plum (*Syzygium cumini*), *lantana* (*Lantana camara*) *guava* (*Psidium guajava*) and a variety of noxious weeds and vines.

D. Methods

Background research included a review of previous archaeological studies on file at the State Historic Preservation Division of the Department of Land and Natural Resources, a review of geology and cultural history documents at Hamilton Library at the University of Hawai'i, the Hawai'i State Archives, the Mission House Museum Library, the Hawai'i Public Library, and the Archives of the Bishop Museum. Further research included a study of historic photographs at the Hawai'i State Archives and the Archives of the Bishop Museum, a study of historic maps at the Hawai'i State Archives and the Archives of the Bishop Museum, and a study of historic maps at the Survey Office of the Department of Accounting and General Services. Information on Land Commission Awards was accessed through Waihona Aina Corporation's Māhele Data Base (Waihona Aina Corporation <www.waihona.com>).

Consultation with knowledgeable local informants was made as part of an accompanying Cultural Impact Assessment conducted by Cultural Surveys Hawai'i. None of the informants knew of any significant traditional Hawaiian or historic sites in the vicinity of the project area.

A complete pedestrian inspection of the project area was accomplished on July 19, 2004 by three Cultural Surveys Hawai'i archaeologists, including Jesse Yorck, B.A., Nancine Kamai, B.A., and Stephen Ftaclas, under the overall supervision of Hallett H. Hammatt, Ph.D. As part of the background research for the project area, it was ascertained that much of Kōloa had undergone extensive land modification associated with pineapple and sugar cane cultivation, and thus remnants of any archaeological value were likely to have been destroyed, or modified beyond recognition. The survey was conducted by traversing the project area with a 10-15 m spacing between the three archaeologists. The grass groundcover made for limited visibility.

Subsurface testing with the use of a backhoe was conducted on July 21, 2004. Test trenches were excavated in the vicinity of LCA's 3610, and 3409. Excavations were undertaken within and at the western boundary of the LCA's (Figures 4 & 11). This was done to address the possibility of encountering cultural materials associated with the known occupation of the area.

II. HISTORICAL BACKGROUND

A. Historical Setting: Pre-Contact Kōloa

The project area is in the *ahupua'a* of Kōloa in the Kona District on the island of Kaua'i. Few records exist that document traditional Hawaiian life in Kōloa Ahupua'a. While settlement by westerners with religious and commercial interests make the area a focus of documentation after the first quarter of the nineteenth century, the accounts generated generally focus on the lives and concerns of the westerners themselves, with only anecdotal references to the Hawaiian population. Two nineteenth century documents (Boundary Commission Testimony of 1874 and a Lahainaluna manuscript of 1885), however, did provide two Hawaiians an opportunity to speak for themselves and thus offer a possible insight into the life of Kōloa before the arrival of westerners.

A dispute over the northern boundary of Kōloa Ahupua'a in 1874 led to a hearing before Duncan McBryde, the Commissioner of Boundaries for Kaua'i. One native witness, Nao (who describes himself as born in Kōloa but presently living in Ha'ikū), in order to show that Hoaea (the area in dispute) was indeed at the northern boundary of Kōloa, testifies: "At Hoaea tea [sic] leaves were hung up to show that there were battles going on" (Boundary Commission, Kaua'i, vol. 1, 1874:124). That there was a traditional "warning system" --well-known to all natives-- suggests that Kōloa, throughout its history, may well have been the scene of some serious conflicts--serious enough and perhaps often enough to warrant devising such a system.

Additional evidence of a rich history within Kōloa is offered in a Lahainaluna document produced eleven years later. This document appears to be based on an oral historical project. On September 7, 1885 a student from Lahainaluna Schools (HMS 43 #17) interviewed Makea -- "a native who is well acquainted with Kōloa" -- and recorded "what she said about the well-known places in the olden times." More than sixty-four years after the abolition of the *kapu* system and almost as many years of contact with westerners, Makea was able to describe in detail fourteen *heiau* within the Kōloa area; for example:

Maulili was the first *heiau* of south Kōloa. Kapulauki was the first chief of Kōloa, Kiha came next. That is the chief I know of. He was a ruling chief of Kaua'i in the olden days, when the *heiau* was standing there. It had already been built and men had been sacrificed on its altars. This Kiha was called Kiha-of-the-luxuriant-hair. Another name for him was Kakae and another was Ka-pueo-maka-walu (Right-eyed-owl).

This *heiau* was also famous for this reason -- it was the first *heiau* to which Kawelo was carried after he had swooned in Wahiawa, in the battle where stones were used as missiles.

The location of this *heiau* was not known, but a deaf mute knew and it was he who pointed it out to the chiefs, and that is how it was rediscovered in the olden days.

Kiha lived on the eastern side of the *heiau* and Aikanaka lived on the northeastern side. This chief, Aikanaka, was the one with whom Kawelo fought and he was the owner of this *heiau* at that time.

B. Mythological and Traditional Accounts

Clearly Kōloa was a particularly important *ahupua'a* in traditional Hawaiian times. That at least fourteen *heiau* – of varying sizes and functions—have been documented in the Kōloa area (Thrum 1907, Bennett 1931) and the association of legendary-historic figures such as Kawelo and Aikanaka with the *heiau*, suggests a heightened cultural richness of the *ahupua'a*.

Further confirmation of a rich traditional life within Kōloa is furnished by the presence of a *hōlua* slide on the slopes of Pu'u o Hewa in the *mauka* reaches of the *ahupua'a* and by the myriad legends attached to Maulili Pool, a sacred place once located in the present Kōloa Town. J. K. Farley (1907) describes the pool and its legendary associations:

The pool of Maulili, on Waikomo stream...is a few hundred feet south of the Maulili road bridge. The gods Kāne, and his brother, Kanaloa, are said to have once slept above it, on its eastern bank and left the impress of their forms as can be seen in the *apapa*...The *apapa* in this vicinity is called an 'Unu' and a 'Heiau,' but was never walled in, it is said. [This *heiau* may be the Maulili Heiau described by Makea above.] On the nights of Kāne the drums are heard to beat there, also at the sacred rocks, or *unu's*, of Opuokahaku and Kānemilohae, near the beach of Po'ipū...

In the Maulili pool lived a large *Mo'o*, named 'Kihawahine'...The eastern wall of the pool, just below the resting places of Kāne and Kanaloa, for a short distance, only, is called the 'Pali of Kōloa' The District of Kōloa is named for this *Pali*, we are told by old Hawaiians. To the south of the Pali o Kōloa, in the wall is a rock named 'Waihanau'...as one of their *meles* has it:

"Aloha wale ka Pali o Kōloa,

Ke Ala huli i Waihānau e, hānau."

To the south of Waihānau is a projecting rock named 'Ke elelo o ka Hawai'i' -- the tongue of Hawai'i, said to have been wrested and brought from Hawai'i by the Kaua'i warrior Kawelo, of Wailua.

At the southern end of the Maulili pool started two large '*auwai's*, that watered the land east and west of Kōloa (Farley 1907:93).

Thus, this sacred legend-imbued locus was the source that gave life to the lowland taro patches of Kōloa. These special associations would not have been lost on the Hawaiians dependent upon those waters. While taro would have been essential to the life of the *ahupua'a*, other resources were available. Bernice Judd, writing in 1935, summarizes most of what was known -- into the first decades of this century -- of the traditional Hawaiian life of Kōloa:

In the old days two large '*auwai* or ditches left the southern end of the Maulili pool to supply the taro patches to the east and west. On the *kuaunas* or embankments the natives grew bananas and sugar cane for convenience in irrigating. Along the coast they had fish ponds and salt pans, ruins of which are still to be seen. Their dry land farming was done on the *kula*, where they raised sweet potatoes, of which both the tubers and the leaves were good to eat. The Hawaiians planted *pia* (arrowroot) as well as *wauke* (mulberry) in patches in the hills wherever they would grow naturally with but little cultivation. In the uplands they also gathered the leaves of the *hala* for mats and the nuts of the *kukui* for light (Judd 1935:53).

It appears that the relatively good situation for the development of irrigated agriculture (the Kōloa Field System) focused agriculture and habitation at elevations below the present project area.

C. Early Historic Period

Accounts by visitors and settlers at Kōloa Ahupua'a focus on these westerners' own concerns--religious and commercial--as these concerns appropriate the historical record of Kōloa in the 1800's. However, scattered throughout the accounts are occasional references to the Hawaiians of the *ahupua'a*, which may give some insights into their lives.

The American Board of Commissioners for Foreign Missions (ABCFM) missionary Samuel Whitney described, in an article in the *Missionary Herald* (June 1827:12), a visit to Kōloa with Kaikio'ewa, the governor of Kaua'i, in 1826:

The people of this place were collected in front of the house where the old chief lodged in order to hear his instructions. After a ceremony of shaking hands with men, women, and children they retired...

Our company consisted of more than a hundred persons of all ranks. The wife of the chief, with her train of female attendants, went before. The governor, seated on a large white mule with a Spaniard to lead him, and myself by his side, followed next. A large company of aipupu, [*ā'īpu'upu'u*] cooks, attendants came on in the rear (p. 284).

Whitney's account suggests something of the deference paid to the *ali'i* by the local populations and the scale at which the *ali'i* carried out their functions. An even grander view of that deference is provided in an account of a later visit by an *ali'i* to Kōloa. John Townsend, a naturalist staying in Kōloa in 1834, described a visit by Kamehameha III (In Palama and Stauder 1973:18):

In the afternoon, the natives from all parts of the island began to flock to the king's temporary residence. The petty chiefs, and head men of the villages, were mounted upon all sorts of horses from the high-headed and high-mettled California steed, to the shaggy and diminutive poney [sic] raised on their natives hills; men, women, and children were running on foot, laden with pigs, calabashes of Poe [sic], and every production of the soil; and though last certainly not least, in the evening there came the troops of the island, with fife and drum, and 'tinkling cymbal' to form a body guard for his majesty, the king. Little houses were put up all around the vicinity, and thatched in an incredibly short space of time, and when Mr. Nuttall, and myself visited the royal mansion, after nightfall, we found the whole neighborhood metamorphosed; a beautiful little village had sprung up as by magic, and the retired studio of the naturalists had been transformed into a royal banquet hall... (In Palama and Stauder 1973:18)

On December 31, 1834, Peter Gulick and his family arrived in Kōloa. Apparently the first foreigners to settle in the *ahupua'a*, they initiated the process of rapid change that would reshape the life of Kōloa in the nineteenth century. In 1835, a 30 by 60 ft. grass house was erected as a meeting house and school (probably located at Kōloa Town). Mr. Gulick initiated sugar cane cultivation and collected a cattle herd for the Protestant Mission. In 1837, a 45 by 90 ft. adobe

church was built (probably at the same ABCFM site) and the first mission doctor, Thomas Lafon, arrived to assist Mr. Gulick (Damon 1931:179, 187). The Kōloa mission station apparently flourished immediately; Charles Wilkes, a member of the U.S. Exploring Expedition visiting Kōloa in 1840, recorded:

The population in 1840, was one thousand three hundred and forty-eight. There is a church with one hundred and twenty-six members, but no schools. The teachers set apart for this service were employed by the chiefs, who frequently make use of them to keep their accounts, gather in their taxes &c [and for similar tasks]. The population is here again increasing partly by immigration, whence it was difficult to ascertain its ratio (Wilkes 1845:64).

Other sources, however, give different population figures for Kōloa during the first half of the nineteenth century. In 1834, according to a report by missionaries on Kauaʻi, the inhabitants of the *ahupuaʻa* numbered 2,166. An article in the *Pacific Commercial Advertiser* of December 21, 1867 estimated that the population in 1838 was about 3,000 (though, by 1867, it had been reduced to a third of that number). James Jackson Jarves, who visited Kōloa and Kauaʻi for nine months during the early 1840's, recorded:

Kōloa is now a flourishing village. A number of neat cottages, prettily situated amid shrubbery have sprung up, within two years past. The population of the place, also, has been constantly increasing, by emigration from other parts of the island. Its numbers, now, about two thousand people, including many foreigners, among whom are stationed a missionary preacher, and physician, with their families (Jarves 1844:100).

The arrival of "many foreigners" was the cause of, and the native immigration to Kōloa was the result of, the many commercial activities that burgeoned beginning in the 1830's. In 1835, Ladd and Company gained from the king and local chiefs the lease of about one thousand acres at Kōloa for 50 years at \$300 a year and "allowed the use of the waterfall and an adjoining mill site at Maulili pool, not far from the thousand acres, together with the right to build roads, the privilege of unrestricted buying and selling and freedom from local harbor dues" (Judd 1935:57). Ladd and Company was not the first to mill sugar cane in the area: there was a Chinese-operated granite roller mill in operation at Māhāʻulepū, Kōloa, in 1830; it was, however, the first plantation-organized industry in Hawaiʻi (Damon 1931:176, 198). Judd notes the following:

The company was permitted to hire natives to work on the plantation provided they paid Kauikeaouli, the king, and Kaikioʻewa, the governor of Kauaʻi, a tax for each man employed and paid the men satisfactory wages. The workers were to be exempt from all taxation except the tax paid by their employers (Judd 1935:57).

Judd further described the revolutionary implication of this arrangement: "The significance of Ladd & Co.'s lease lay in the fact that it was the first public admission by the Hawaiian chiefs that their subjects had rights of personal property backed with a guaranty of protection to that property" (Judd 1935:58). Local chiefs, fearful of an usurpation of their power, resisted the company's first efforts to recruit workers, forcing the king's intervention.

Another missionary, Dr. James W. Smith, who was stationed at Kōloa for forty-five years, beginning in 1842, mentioned in his journal a visit to "the school at Kukuiʻula." If there was a

second school in Kōloa outside the population center of Kōloa Town, Kukui'ula may have warranted the placing of a school there because of a sufficiently large population in the area.

A long-known history of severe flooding in the central flood plain of Kōloa provided an impetus for the native Hawaiians to develop an irrigated field network well off that plain. In a typical Hawaiian valley such as Pō'ele'ele it is difficult to get off the flood plain and in Kōloa a large percentage of homes and agricultural fields are located in the large volcanic terrace surrounding the project area that is not susceptible to flooding. Thus, the extensive *lo'i* network within the *makai* portion of Kōloa may have been, in part, a clearly thought-out use of a fortuitous land configuration to avoid the force of occasional floods that might, elsewhere on the island, have had disastrous effects.

D. Mid-1800's (Land Commission Awards)

The Mahele records of Kōloa give a picture of what had evolved by the middle of the nineteenth century when Kōloa Ahupua'a--8,620 acres--was awarded (LCA 7714-B) to Moses Kekūāiwa, the brother of Alexander Liholiho (Kamehameha IV), Lot Kapuāiwa (Kamehameha V), and Victoria Kamāmalu. (The awarding of the *ahupua'a* to Kekūāiwa was an outcome of an event twenty-five years in the past: the crushing - by forces loyal to Kamehameha II - of the 1824 revolt on Kaua'i when Kaua'i lands were divided up among the chiefs of the other islands.)

Eighty-eight other *kuleana* awards were given to individuals within Kōloa Ahupua'a. The majority of these Land Commission Awards (LCAs) were located in or around Kōloa Town itself. This concentration of awards around the town area may reflect both the traditional land settlement pattern, a focus on the resources of Maulili Pool and Waikomo Stream (a permanent stream), and a more recent movement of the populace to the plantation and missionary centers.

Two LCAs are located within the present project area. The two are discussed in Section F below.

E. Later 1800's To Present

Kōloa became the scene of the confrontation of the traditional social structure with commercially-impelled forces of change. The cane growing activity of Ladd and Company would inevitably affect the lives of the inhabitants of the rest of the *ahupua'a*. Traditional settlement patterns (e.g. permanent and temporary habitation interspersed throughout the irrigated agricultural fields near the coastal zone and traditional farming along streams) would have been distorted by a shift to settlement in Kōloa Town where sugar cane milling activities were located, and a shift to cash crops other than taro.

Although Ladd and Company would go bankrupt in 1845, its earlier success was an impetus for other entrepreneurial attempts within Kōloa. Silkworm farming, oil extraction from *kukui* nuts, cigar manufacturing, sago raising, and tapioca manufacturing were all attempted with varied success during the middle third of the nineteenth century.

Another major area of commercial enterprise was associated with the whaling industry at Kōloa Landing. Accounts of visitors suggest that the inhabitants of Kōloa took advantage of their nearness to the landing to participate in the booming trade of the port. An article in the *Pacific Commercial Advertiser* of Feb. 19, 1857 described the salient characteristics of the port at mid-century and mentions:

From the landing there is a good carriage road to the town, distant about two miles. Large quantities of firewood, bullocks and sweet potatoes are furnished to whalers in this port, and these chattels can nowhere be procured cheaper or better. It is estimated that 10,000 barrels of sweet potatoes are cultivated annually here, which are thought to be the best on the islands. Nearly all the potatoes furnished for the California market are produced here...Sweet potatoes, sugar and molasses constitute the chief trade of the port.

Kōloa became the official port of entry for Kaua'i in the 1850's and participated in the profitable trade with the whaling industry whose peak years ran from the 1830's to the 1860's. It seems likely the demand for firewood, bullocks, sweet potatoes, sugar and molasses at Kōloa Landing was met to at least some small degree by activities in the *mauka* regions of Kōloa in the vicinity of the present project area.

Kōloa Landing was phased out around 1925 when McBryde Sugar Company and Kōloa Sugar Company began using Port Allen. Soon after, McBryde ceased to use several of the Kōloa fields.

F. Historic and Modern Documentation of the Present Project Area

Records of the mid-nineteenth century Mahele provide the first specific documentation of traditional Hawaiian activities, practices and land use within the project area. As noted above, two Land Commission Awards were granted for 'āpana (parcels) within the project area. The two are LCA 3610 awarded to Kaane and LCA 3409 awarded to Piliwale (Figure 4, Note: the 1891 Koloa map erroneously reports the number of Kaane's LCA).

Piliwale claimed and was awarded two 'āpana in LCA 3409. 'Āpana 1 comprised "three *lo'i* and a *kula*" located near the seashore of Kōloa (Native Register vol. 9, pg. 26). 'Āpana 2 is located *mauka* of 'Āpana 1 and is within the present project area. In the *Māhele* documents, 'āpana 2 is described as "two *lo'i* and a *Kula* also, at Waikomo" (*Ibid.*) which are bounded:

Mauka by land of Kaumahana [*i.e.* another Kōloa resident]

Puna by Koloa River

Makai by 'ili of Kapuna

Hanapēpē by highway [*i.e.* the present road to Po'ipū] (Foreign Testimony vol.13, pg. 24)

Piliwale "received his land from Governor Kanoa about 1845" (*Ibid.*).

Kaane claimed and was awarded one 'āpana in LCA 3610. A portion of the 'āpana is located in the present project area. In the Mahele documents, the 'āpana is described as "a small piece of *kula*, a house lot and one *lo'i* in one piece" which are bounded:

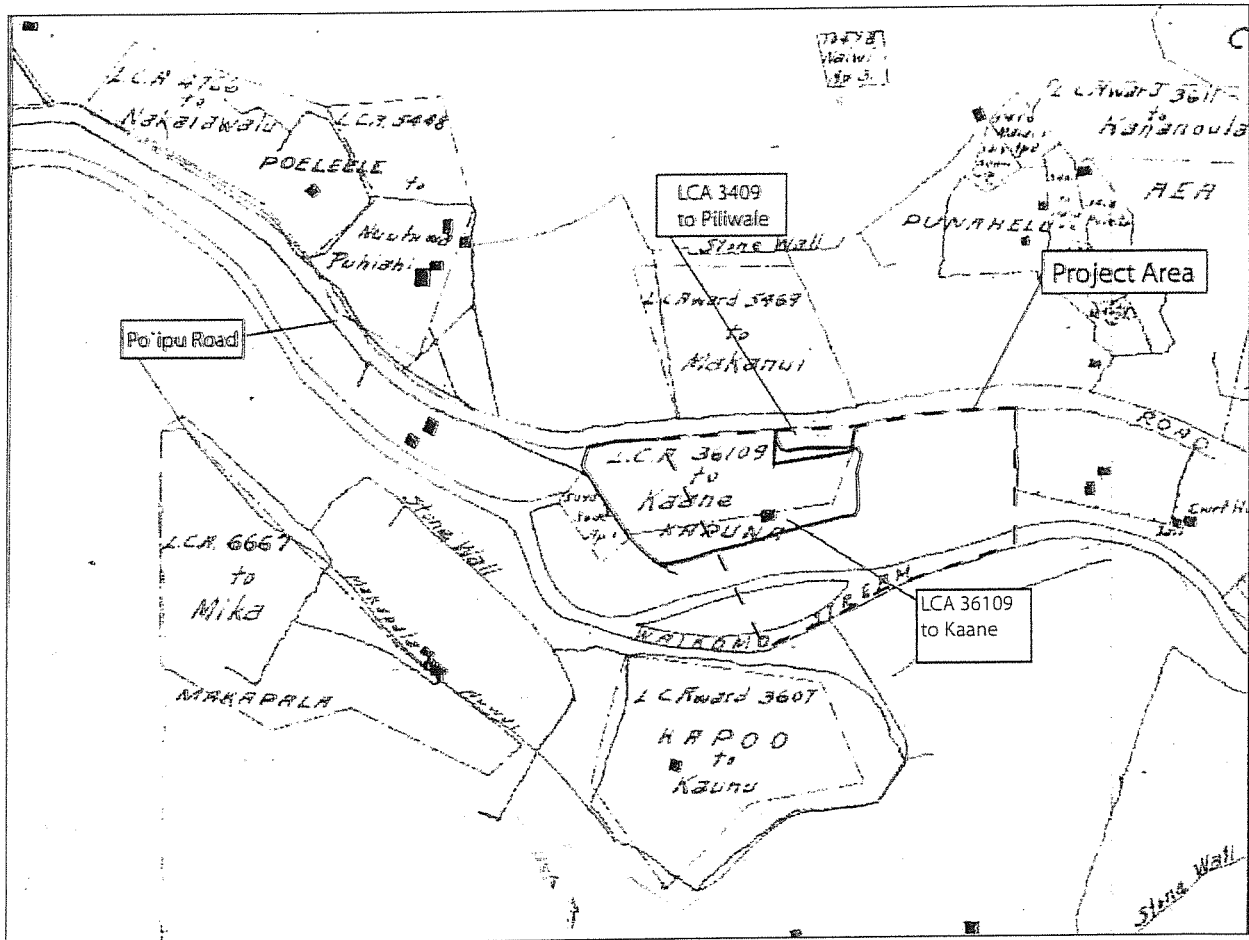


Figure 4. Portion of 1891 map of Kōloa by M.D. Monsarratt showing locations of Land Commission Awards in project area

Mauka by the *‘ili* of Waikomo

Puna by Koloa creek

Makai by Kaia’s cane field

Hanapēpē by road leading to Koloa beach. (Native Register vol. 9, pg. 72).

Kaane “received this land from Gov. Kanoa in the year 1844 or 1845” (*Ibid.*).

The Mahele documents indicate that, within the present project area, land usage and activity by the mid-nineteenth century included habitation, pasturage, and taro cultivation. This may reflect the continuation into that century of traditional Hawaiian land use within the project area.

Further documentation of the project area during the second half of the nineteenth century is found on a map hand-drawn by a *kama ‘āina* Kōloa resident. Most likely in 1938, Judge Henry Kawahinehelelani Blake of Kōloa (1874-1948) drew a colored map of “Koloa Village” depicting what the area looked like in 1888 when he was a boy of fourteen. The approximate location of the present project area has been plotted on Judge Blake’s map (Figure 5). The map indicates that the project area was then surrounded by taro *lo ‘i* house lots, and a pool in Waikomo Stream. The majority of the project area may have comprised open *kula* land in the 1880’s.

By the first decades of the twentieth century, cane fields of the Koloa Sugar Company and McBryde Sugar Company spanned the landscape of Kōloa. A portion of a 1918 map of Koloa Sugar Company lands indicates Field 41 in the vicinity of the present project area (Figure 6). While the boundaries of individual fields are not clearly delineated on the map, it is possible that portions of the project area are within Field 41.

A second map drawn by Henry Kawahinehelelani Blake shows “Kōloa Village” in 1938 (Figure 7). The map was likely drawn by Judge Blake in 1938 along with the map of the village in 1888 to record a “then and now” portrait of Kōloa. The approximate location of the present project area has been plotted on the 1938 map. The map indicates “cane lands” and “pasture” in the vicinity of the project area. House sites are located *mauka* and *makai* of the project area. The taro *lo ‘i* that characterized the Kōloa landscape in the 1880s are no longer present.

A 1951 aerial photograph of Kōloa shows that, by mid-twentieth century, the present project area comprised areas of open pasture, sugar cane, and brush along the banks of Waikomo Stream (Figure 8). No structures appear in the project area.

An aerial photograph taken on April 30, 2000 indicates that, at the end of the twentieth century, active sugar cane cultivation had ceased in the project area (Figure 9). The area now comprises open land and brush along the banks of Waikomo Stream. A former cane haul road courses through the project area. This road was constructed sometime following the early 1970s.

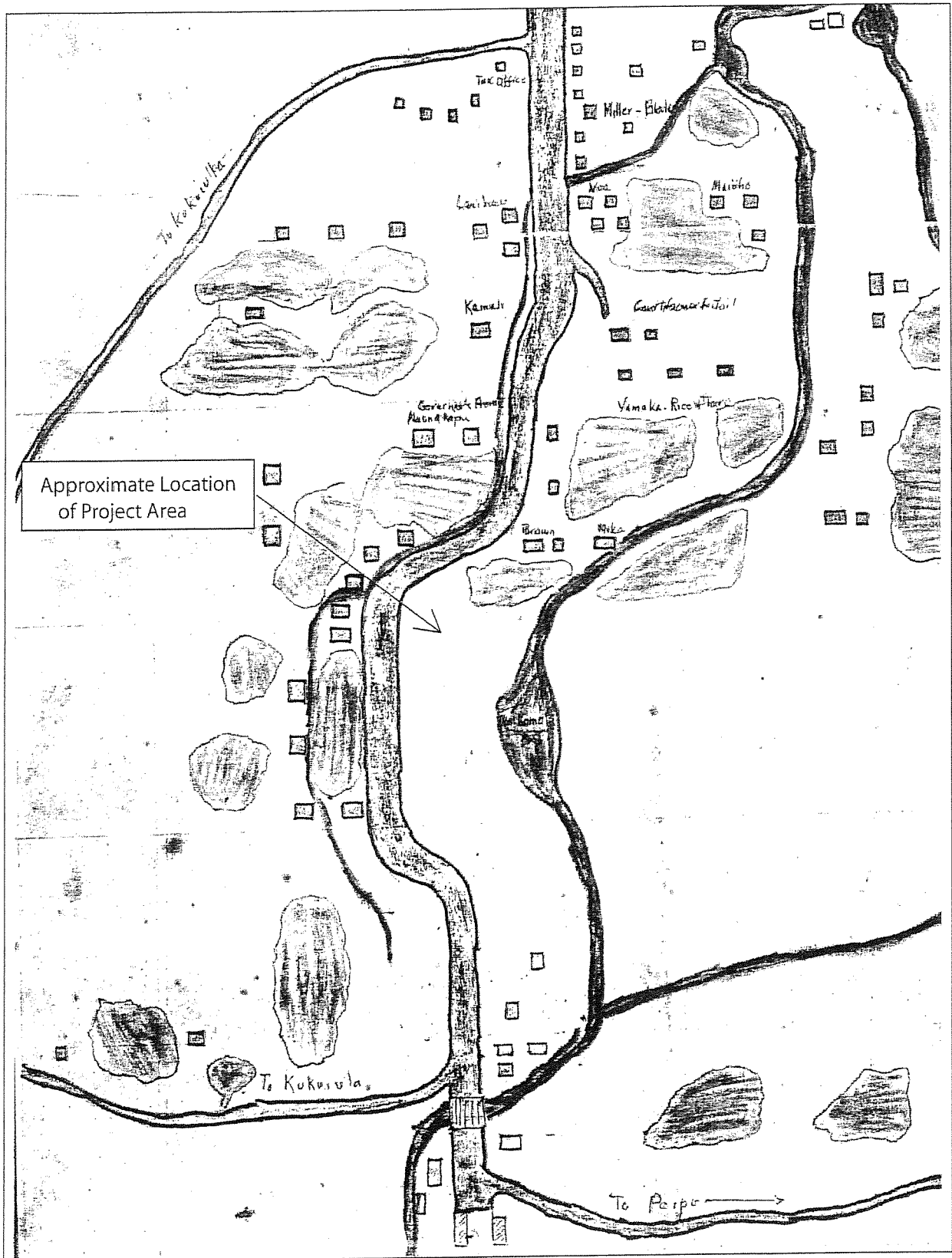


Figure 5. Portion of map drawn by Henry Kawahinehelelani Blake (1874-1948) depicting "Koloa Village" in 1888

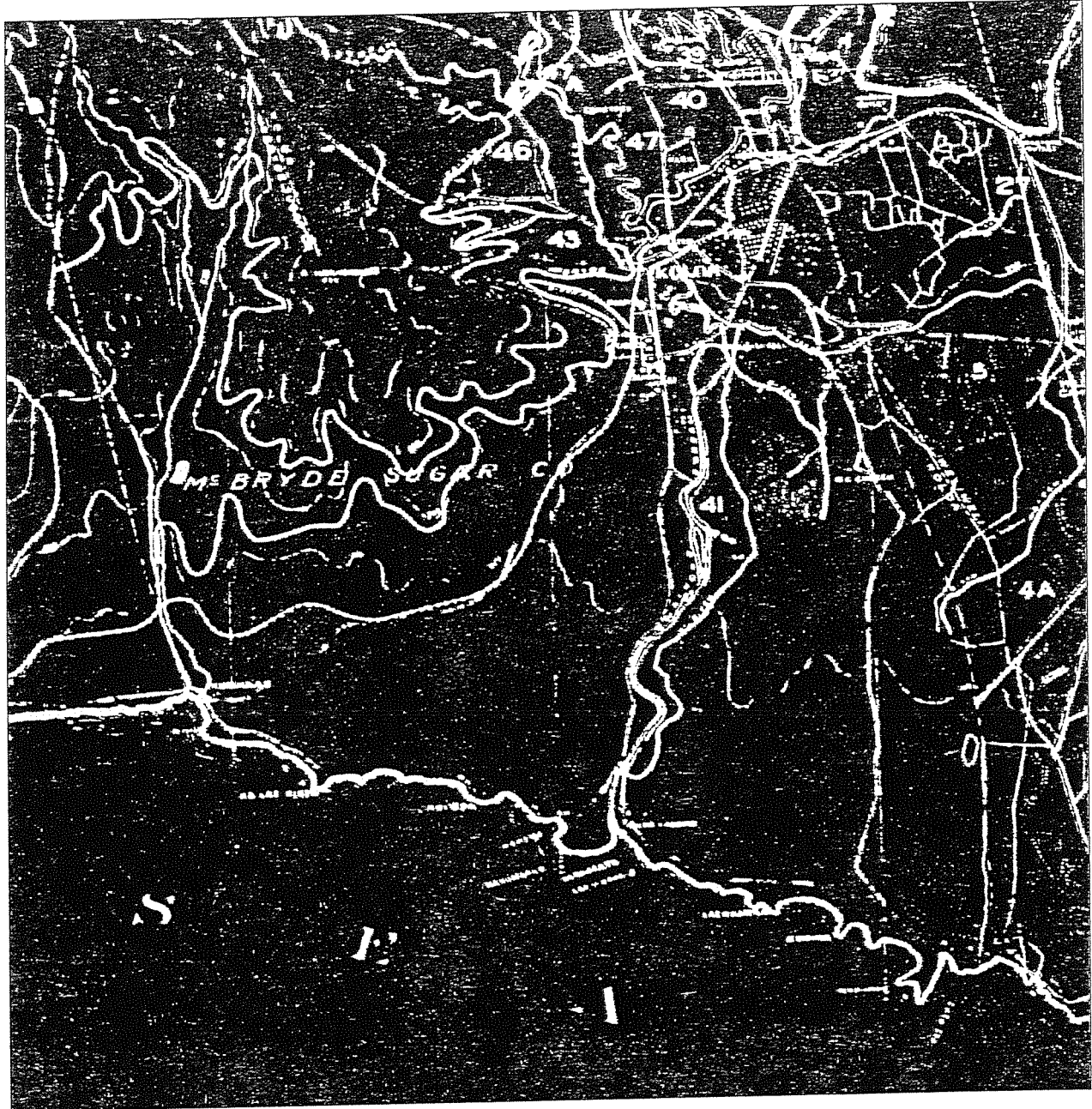


Figure 6. Portion of 1918 map of Koloa Sugar Company lands

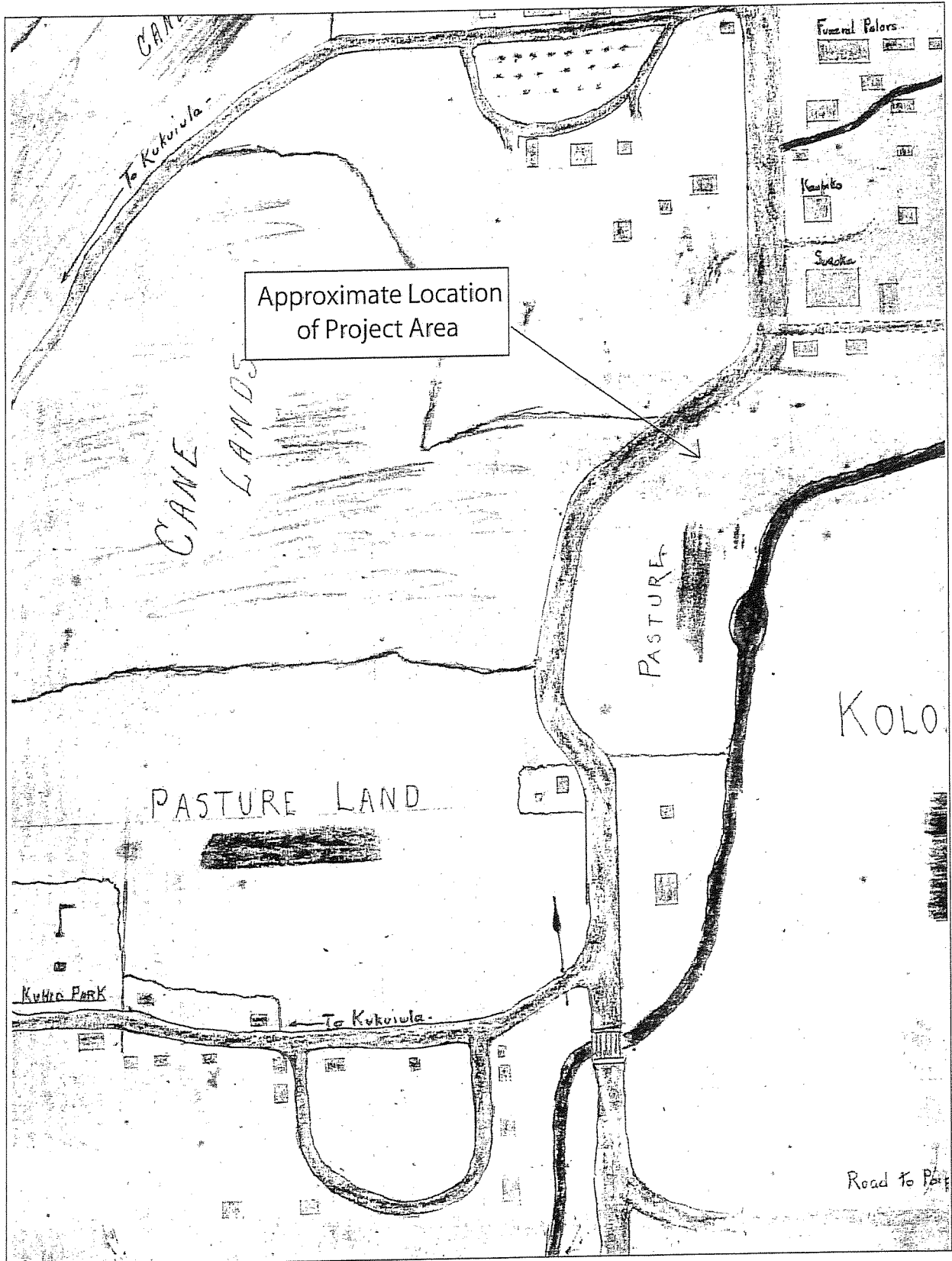


Figure 7. Portion of map drawn by Henry Kawahinehelelani Blake (1874-1948) depicting Kōloa in 1938

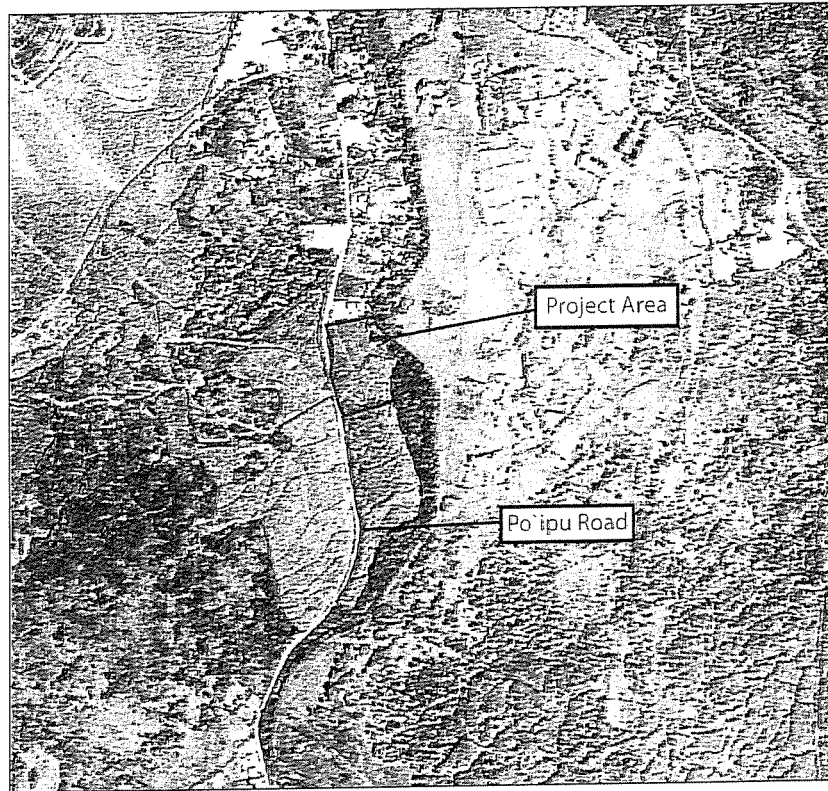


Figure 8. A 1951 aerial photograph of Kōloa

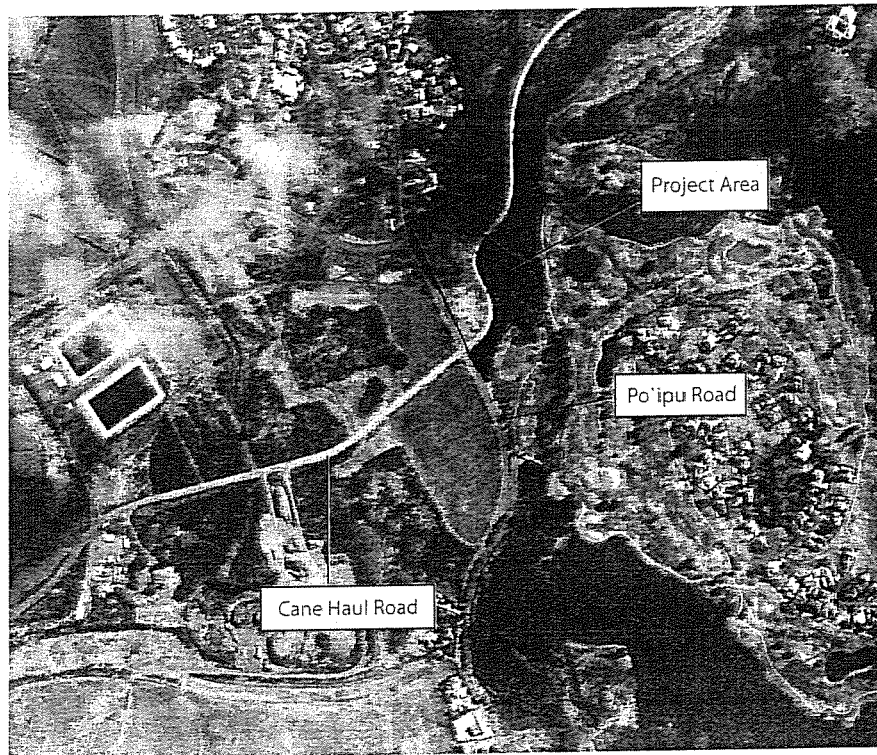


Figure 9. A 2000 aerial photograph of Kōloa

G. Summary of Historical Background

Although much of the seaward portion of Kōloa is a relatively dry area with approximately 30 in. (760 mm) of annual rainfall, the perennially flowing streams provided a resource for the development of an expansive agricultural system. Accounts of the early history of Kōloa (Farley 1907; Jarves 1844; Townsend 1839; and Judd 1935) describe in the lands *mauka* of Kōloa Town a seemingly continuous, well-maintained, agricultural complex of taro, yams, sweet potato, and sugar cane that was irrigated by an extensive *'auwai* system siphoned off of Waikomo and Pō'ele'ele streams. This system had a significant influence on later commercial endeavors in Kōloa.

Kōloa is the site of the first organized sugar plantation in Hawaii. Ladd and Company leased about a thousand acres for the sole purpose of growing sugar cane (Palama and Stauder 1973:18, from Judd 1935). The commercialization of sugar cane in Kōloa had widespread social effects. The traditional view of the *'āina* being a responsibility of the *ali'i* was being transformed.

Kōloa Town and Kōloa Landing, at the mouth of Waikomo Stream, became prominent commercial centers during the mid to late 1800's, exporting a variety of products such as sweet potatoes, sugar, and molasses. Whalers also stopped for provisions of squash, salt, salt beef, pigs, and cattle (Palama and Stauder 1973:20). This heightened activity dramatically altered the social structure and landscape of Kōloa.

Kōloa soon reflected the effects of a traditional social structure in conflict with commercially-impelled forces of change. Traditional settlement patterns (e.g. permanent and temporary habitation interspersed throughout the irrigated agricultural fields near the coastal zone and along streams in the steeper valleys inland) would have been significantly changed by a flux to Kōloa Town where sugar cane milling activities were located.

III. PREVIOUS ARCHAEOLOGICAL RESEARCH

A. Previous Studies

Table 1 lists the previous archaeology conducted in Kōloa and vicinity (Figure 10). Wendell Bennett carried out the earliest systematic archaeological survey on the island of Kaua'i in the late 1920's. Bennett examined and recorded 202 sites on the island. The following are sites recorded within Kōloa Ahupua'a (see Bennett 1931:116-117, 120):

- Site 72 Niu Kapukapu Heiau - on the top of Niu Kapukapu Hill on the east bluff of Lāwa'i Valley.
- Site 73 Stone work on the hill just in-land from Site 72
- Site 74 Fishing shelter on the shore near the mouth of Kukui'ula valley.
- Site 75 Kūhiō Park, west of Waikomo Stream with taro patches, a small *heiau*, an oven, paved house platform, fish pond, game ground with seats and a fishing shrine.
- Site 76 Salt pans east of Waikomo Stream
- [Sites 77-84] Located east of Kōloa Ahupua'a
- Site 85 Walls, enclosures and house sites in the cactus covered country around the Kōloa reservoir and extending to the sea.
- Site 86 House site in the area described in Site 85

None of these seven sites are within the current project area. However, site 85 has been documented within a large area including the presently adjacent golf course to the east and *makai* (Hammatt, Bordner and Tomonari-Tuggle:1978).

William Kikuchi (1963) conducted a general survey of the Kona District of Kaua'i including all *ahupua'a* from Hanapēpē, eastward to Kīpū Kai. Information from Thrum (1907), Bennett (1931), a Lahainaluna School manuscript (1885), and other sources was instrumental in helping to locate major archaeological sites during the field survey. Kikuchi's survey was selective since it was not designed to be a complete inventory, and generally focused on larger or more coastal sites. Kikuchi noted no sites in the present study area.

Palama and Stauder (1973) conducted a reconnaissance survey along the route of the then-proposed main cane haul road to the Kōloa mill site. The proposed new section of road extended from Weliweli Road, southwestward across Po'ipū Road, connecting to an existing cane haul road. The section west of Po'ipū Road is approximately 3,000 ft. long with a north/south oriented branch approximately 1,500 ft. long. The road corridor crosses the *makai* portion of the current project area. A total of 18 sites were recorded along the road corridor; none are located within the current project area. Although the Palama and Stauder study was limited in scope to the proposed road right of way, it included a short but thorough historical summary of the place of archaeological sites within the context of the Kōloa and Weliweli Ahupua'a. An extensive *auwai* system was observed east of Po'ipū Road. The following comments on this system and the sites in general are relevant to understanding the archaeological significance of the area as a whole, and the historic processes at work:

Table 1. Previous archaeological research in Kōloa and vicinity

AUTHOR(S)	YEAR	LOCATION	STUDY TYPE
Bennett	1931	Kukui'ula Valley, Prince Kūhiō Park	General Survey
Kikuchi	1963	Kona District	General Survey
Kikuchi	1973	Hawaiian Fishponds	General Survey
Palama and Stauder	1973	Cane Haul Road-Kōloa Mill	Reconnaissance Survey
Sinoto	1975	Knudsen Trust Lands	Reconnaissance Survey
Bordner	1977	Kukui'ula 'auwai, Site 50-39-10-1934	Reconnaissance Survey
Hammatt, Bordner and Tomonari-Tuggle	1978	Kīahuna Complex	General Survey
Kikuchi	1979	Sheraton Kauai Hotel	Survey and Subsurface Testing
Connolly	1982	Kōloa-Po'ipū Bypass Road	Reconnaissance Survey
Ching	1983	Kukui'ula-Kualu, Alexander and Baldwin Lands	Reconnaissance Survey
Landrum	1984	Kukui'ula-Kualu, Alexander and Baldwin Lands	Reconnaissance Survey
Hammatt, Borthwick and Shideler	1985	Kōloa-Po'ipū Bypass Road	Survey and Subsurface Testing
Kikuchi	1985	Shoreline Improvements, Waiohai Hotel, Kiha Houna Heiau	Reconstruction
Kikuchi	1988	Pa'anau Sugar Camp	Reconnaissance Survey
Hammatt et al.	1988	Kukui'ula Bay Planned Community	Inventory Survey
McMahon	1989	Kaua'i Fishponds	General Survey
Hammatt	1990	Pa'anau Housing Project	Inventory Survey
Hammatt	1991	Pō'ele'ele Stream – Waterline crossing	Archaeological Reconnaissance
Hammatt, Folk, and Stride	1991	Po'ipulani Golf Course	Inventory Survey
Hammatt	1992a	Kīahuna	Inventory Survey
Hammatt	1992b	Po'ipū Road and Lāwa'i Road Junction	Archaeological Reconnaissance
Hammatt, Ida and Folk	1993a	Po'ipū Road 7.6-acre Parcel	Inventory Survey

AUTHOR(S)	YEAR	LOCATION	STUDY TYPE
Hammatt et al.	1993b	Po'ipū Beach Park	Subsurface Testing and Monitoring
Creed, Ida and Hammatt	1995	Po'ipū Road	Inventory Survey
Bushnell and Hammatt	1996	Ōma'ō Bridge, Ōma'ō Homestead	Archaeological Investigation
Hammatt, Creed, and Ida	1996	Waiohai Resort	Assessment Survey
McMahon	1996	Sheraton Kauai Hotel	Reconnaissance Survey
Ida, Creed, and Hammatt	1997	Po'ipū Bypass Road	Inventory Survey
Hammatt et al.	1998	Kukui'ula Planned Community Phase I	Data Recovery
Hammatt et al.	1999	Kukui'ula Planned Community Phase II	Data Recovery
Jones et al.	2002	260-acre parcel along Pō'ele'ele Stream at Ōma'ō	Inventory Survey
Yorck, Shideler, and Hammatt 2002	2002	Well Sites and Appurtenances near Piwai Reservoir, Alexander and Baldwin Properties	Inventory Survey
O'Hare, Shideler, and Hammatt	2003	Sheraton Kauai Resort	Archaeological Assessment
Tulchin and Hammatt	2003	Knudsen Trust Lands <i>mauka</i> of Po'ipū Road	Archaeological Assessment
Tulchin and Hammatt	2003	Northern Leg of the Western Bypass Road	Inventory Survey
Yorck, Shideler & Hammatt	2003	Kukui'Ula, Kōloa	Data Recovery

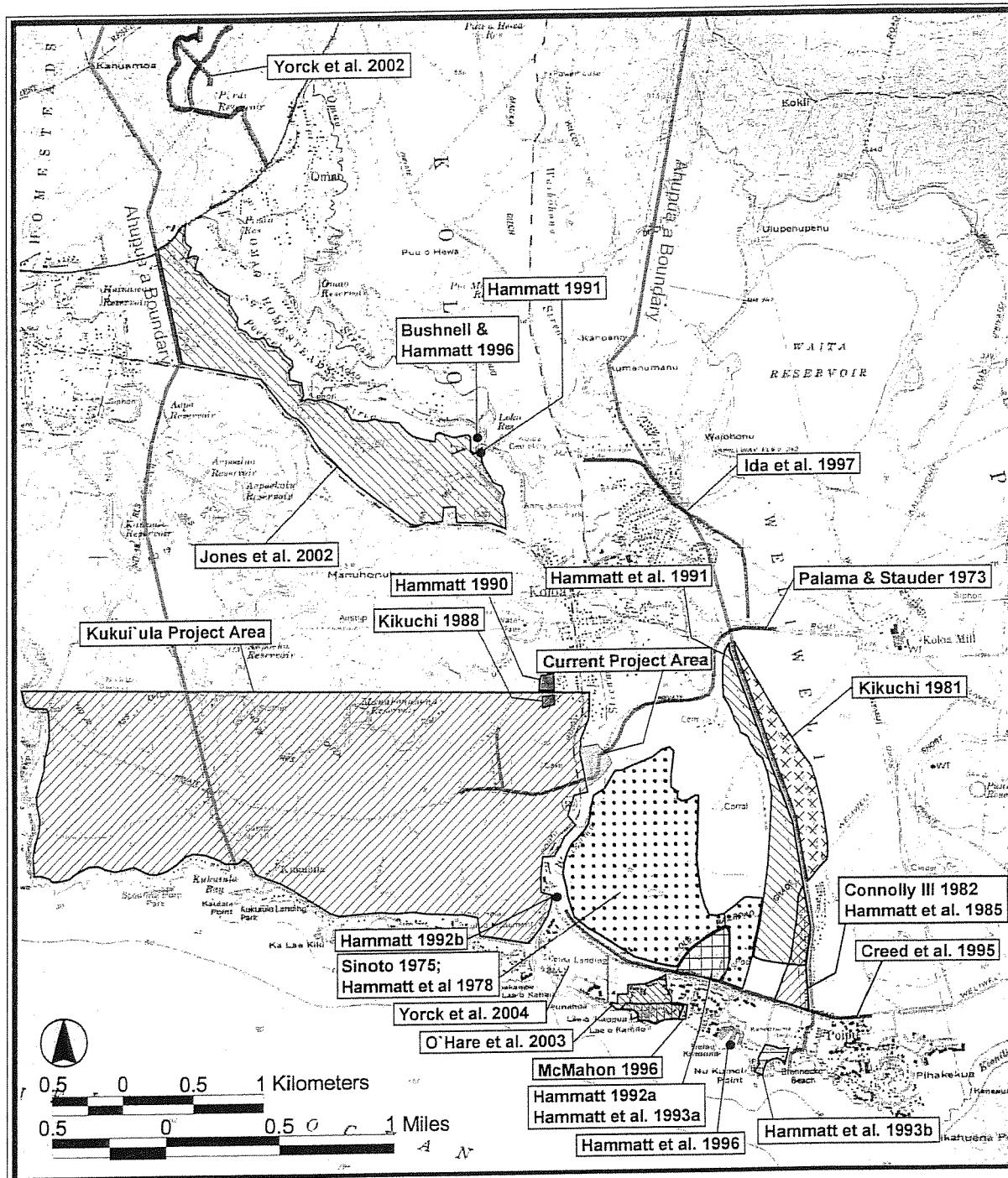


Figure 10. Previous archaeological studies in Kōloa

Our reconnaissance revealed that the most significant archaeological feature located within the study area is the extensive 'auwai system. Remnants of this irrigation system were observed on both sides of the Waikomo Stream. ...[This] network of watering canals proved to be the key to the success of the prehistoric Hawaiian Culture in turning these marginal lands into flourishing wet and dry agricultural fields. From information gathered from local informants and preliminary historical investigation of this area it is evident that the early commercial growers of sugar cane utilized the existing 'auwai system. Gradually as more and more fields came under sugar cane production these replaced the wet and dry fields of an earlier day. Today the archaeological sites remaining stand as islands as these marginal cane lands were taken out of production and turned into pasture (Palama and Stauder 1973:4).

Bordner and Ching (1977) conducted a one-day reconnaissance survey of a specific 'auwai located in Kukui'ula and corresponding to the major 'auwai system assigned State Site # 50-30-10-1934. The 'auwai traverses Kukui'ula from northeast to southwest and includes a number of associated remnant fields. A portion of this 'auwai, the raised "aqueduct" type section, is slated for preservation (Hammatt et al. 1998).

Hammatt et al. (1978), as part of Archaeological Research Center of Hawaii (ARCH), reported on a general survey of 460 acres for the then proposed Kīahuna Golf Village located on the east side of Waikomo Stream and Po'ipū Road. The Kīahuna survey recorded 583 archaeological sites including 175 stone enclosures and 108 stone house platforms, some of which are clustered as family compounds. The water channels ('auwai), ponded fields, terrace plots, and mound fields all indicate extensive wet and dry land agriculture (Hammatt et al. 1978:5). The water source for this highly integrated agricultural system was Waikomo Stream which was tapped upstream. Additional sites included 10 occupation caves and a *heiau*. Sites were located during this survey on the opposite side of Waikomo Stream from the current project area. These sites included 'auwai, cattle walls and a historic house site.

William Kikuchi (1981) conducted a reconnaissance survey of Weliweli Tract in the *ahupua'a* of Weliweli, abutting the *ahupua'a* of Kōloa. The survey included the railroad causeway, which "historically connected the Kōloa Sugar Mill to Kōloa Landing" (Kikuchi 1981:2), 'auwai, walls, terraces, alignments, and habitation sites. Kikuchi states that "the sites...were probably an extension of the vast, prehistoric habitation and agricultural sites of the adjacent Kīahuna property" (1981:17).

Connolly (1982) conducted a reconnaissance survey of sections (310 acres) in the *ahupua'a* of Kōloa and Weliweli in 1982 for the Kōloa-Po'ipū Bypass Road. The sites that Connolly encountered were predominantly wall remnants, a few rock mounds, a hole, two complexes, a railway causeway, and an enclosure.

Francis Ching (1983) conducted a reconnaissance survey, and an historical investigation of sections of the *ahupua'a* of Kōloa and Lāwa'i. According to Ching, three-fourths of the study area was bulldozed and rocks re-located, however, remnants of walls, *lo'i*, 'auwai, flumes, terraces, *kula* and an historic railroad berm were still discernable. These remnants are evidence of the expansiveness of the Kōloa Field System.

James Landrum (1984), of the Bishop Museum, conducted a reconnaissance survey of a 200+ acre portion of Kukui'ula. Landrum recognized that his survey area was once part of an extensive irrigated agricultural complex developed in the prehistoric period with superimposed historic-era occupation (Landrum 1984:24).

Hammatt, et al. (1985) conducted a survey with subsurface testing for the proposed Kōloa-Po'ipū Bypass Road which extends 9,000 ft. along the boundary of Kōloa and Weliweli Ahupua'a. The road corridor was proposed to connect Pō'ipū Road (the beach road) to Weliweli Road, southeast of Kōloa Town. A total of 47 archaeological features were located along the corridor. These were concentrated at the *makai* or southern end of the corridor and included the southeastern portion of the "Kīahuna Complex" documented by Hammatt et al. in 1978 (see above).

William Kikuchi (1988) conducted a reconnaissance level survey of the former Pa'anau Sugar Camp. The camp was located just *makai* (south) of the present day Kōloa Elementary School. The survey recorded a number of cement foundations, ditches, and portable historic artifacts. Kikuchi states that archaeologically the site is interesting because it contains remnants of an early (1910-1950) plantation camp, even though the vast majority of its structures have been destroyed or removed.

Hammatt, et al. (1988) conducted an inventory survey on approximately 1000 acres within the *makai* portion of Kōloa Ahupua'a for the proposed Kukui'ula Bay development project. A total of 58, both prehistoric and historic, archaeological sites were located and described. The prehistoric sites are described as remnants of the former extensive irrigated agricultural complex that stretched eastward from Lāwa'i Valley to Weliweli. Site types included *'auwai*, fields, house sites, shelters, burial features, occupied lava tubes, and *heiau*. Historic era sites included cattle walls, abandoned cane fields, a house site, and a railroad berm. The southern portion of the current project corridor extends into the Kukui'ula survey area.

Hallett Hammatt (1990) conducted an inventory survey of a 4.6 ac. parcel at the west end of Pa'anau Road, Kōloa. The historical segment of this report indicates the previous existence of the Pa'anau Camp, and a railroad and *'auwai* irrigation ditch which traversed the study area.

Hallett Hammatt (1991) carried out an archaeological reconnaissance for a proposed waterline stream crossing of Pō'ele'ele Stream noting extensive modern land modification and no significant findings.

Hammatt et al. (1991) conducted an archaeological inventory survey of 160 ac. within Kōloa along the Kōloa-Weliweli *ahupua'a* boundary. This study located, mapped, described, and evaluated a total of 75 sites and observed a wide range of site types. The survey study concluded that the (never built) Po'ipūlani project area was associated with what is referred to as the Kōloa Field System.

Hallett Hammatt (1992a) carried out an Archaeological Inventory Survey of a 3.8-acre property at Kīahuna, but the entire parcel had been previously graded and there were no significant findings.

Hallett Hammatt (1992b) carried out an Archaeological Reconnaissance of the Po'ipū Road and Lāwa'i Road Junction, but again there were no significant findings owing to prior land disturbance.

Hallett H. Hammatt et al. (1993) conducted an inventory survey, with limited subsurface testing, of 7.6 ac. (TMK 2-8-14:30) in the Kīahuna area, *mauka* of Po'ipū Road. Site 3758 was re-mapped from the original survey of 1978, and three new sites were recorded. According to Hammatt et al., these sites are remnants of traditional *auwai*, walls, fields, enclosures and habitation platforms, and appear to be a part of the larger Kōloa Field System which encompassed over 1000 acres (Hammatt et al. 1993:21).

Hammatt et al. (1993) conducted an assessment survey, subsurface testing and monitoring at Po'ipū Beach Park in the *ahupua'a* of Kōloa. Wave action during Hurricane 'Iniki in 1992 had exposed a cultural layer (Site 50-30-10-745) which needed to be preserved and monitored during the reconstruction and restoration of the park. Auger testing (1993:11) revealed charcoal, and both traditional and historic midden and artifacts (i.e. basalt flakes and fragments, nails, glass, *kukui* shells, and mollusk shells). A cemetery (State Site 50-30-10-1871), located in the middle of Po'ipū Beach Park, and other sections of the buried cultural layer beneath the park, were also monitored during the removal of several cement slabs, remnants of a pavilion, picnic tables, and barbecues. The rich cultural layer, supported by radiocarbon dating, indicates that this shoreline occupation is contemporaneous with the development of the Kōloa Field System. This cultural layer is the "single largest coastal beach deposit in the *ahupua'a* of Kōloa" (Hammatt et al. 1993:65, 66) and greatly contributes to the information bank regarding the cultural development of the Kōloa district.

Creed et al. (1995) report on an inventory survey within a 1.4-mile corridor along Po'ipū Road (TMK 2-8-15, 16, 17 & 18) in the *ahupua'a* of Kōloa and Weliweli. Three sites, including enclosures, a terrace, and the Kōloa-Weliweli boundary wall, survived previous bulldozing of the area and were understood as components of the Kōloa Field System.

Tina Bushnell and Hallett H. Hammatt (1996) carried out an archaeological investigation of 'Ōma'o Bridge in 'Ōma'o Homestead, however the only objects of historical interest noted were the existing bridge and features associated with an old railroad.

Hammatt et al. (1996) conducted an assessment survey of an exposed cultural layer in undisturbed sand deposits at Waiohai Hotel. This layer was disturbed by high wave action during Hurricane 'Iniki which completely destroyed the associated reconstructed Kiha Houna Heiau (Site 50-30-10-80). The exposed cultural layer supports the conclusion that there was habitation associated with major ceremonial structures along the shoreline (Hammatt et al. 1996:39)

Nancy McMahan (1996), at the time an independent archaeological consultant, completed a reconnaissance survey of TMK 2-08-16:3 (8.444 acres), property known as Sheraton Kaua'i in the *ahupua'a* of Kōloa. No surface sites or cultural deposits were reported.

Ida et al. (1997) conducted a reconnaissance survey on a 1.2 mile corridor of a proposed bypass road within the *ahupua'a* of Kōloa and Weliweli (TMK 2-8-02:3, 2-8-03:1, 2-8-04:1, 2-8-05:2) that had previously been bulldozed. This survey did not reveal any archaeological sites, and further study was not recommended.

Cultural Surveys Hawai'i, Inc. (Hammatt et al. 1998) reported on data recovery of the Kukui'ula Planned Community Project Phase 1 area encompassing approximately 219 acres. The current project corridor passes through a portion of the Kukui'ula Phase 1 data recovery area. The project included excavations at 20 different sites that encompassed 64 individual features. There was a total of 212 excavation units (212 m²) and 19 backhoe trenches (only 14 backhoe

trenches were chosen for study). Large quantities of midden (approx. 23.7 kg.) and artifacts (10,635 items) were recovered and are reported on. The artifacts include a wide range of types with both indigenous (2,592 items) and historic (8,043 items) represented. Radiocarbon (C14) dates range from ca. A.D. 1050 onward. The earliest date comes from the habitation/burial cave Site 50-30-10-1927A. In addition to the habitation sites and features dated, seven (7) dating samples from agricultural features were also analyzed.

Cultural Surveys Hawai'i, Inc. (Hammatt et al. 1999) reported on data recovery work just *makai* and southwest of Kōloa Town on the west side of Waikomo Stream in the northeastern portion of the Kukui'ula Planned Community Phase II Area. The study area is comprised of approximately 33 ac. and has been used as a buffer zone between cane lands/pastures and the residential lots bordering Po'ipū Road. While some ten land commission awards lie partially or entirely within the project area, most of these properties were bulldozed in the course of sugar cane cultivation. There were however, areas that appeared undisturbed by sugar cane cultivation or heavy machinery. Excavations were conducted within five archaeological sites (thirteen features). These excavations yielded 264.8 g. of midden; 53 indigenous artifacts (including 43 volcanic glass flakes, 9 basalt flakes, and one coral manuport); and 877 late-historic artifacts (e.g. glass, metal, ceramics, plastic, leather, and slate). Twelve charcoal samples were dated indicating prehistoric habitation post dating 1200 AD.

Cultural Surveys Hawai'i Inc. (Jones et al. 2002) conducted an archaeological inventory survey with subsurface testing on an approximately 260 acre parcel (TMK 2-7-03:5) along Pō'ele'ele Stream at 'Ōma'o just seaward of Kaunua'i Highway. Two sites were identified, terrace remnants of LCA 3229 awarded to Eke 'Opunui for the cultivation of taro and sugar cane and a sugar plantation irrigation ditch feature. Two carbon dates are reported of ca. A.D. 1010 - 1180 understood to shortly predate wall construction.

Cultural Surveys Hawai'i Inc. (Yorck et al. 2002) conducted an archaeological inventory survey in support of a project involving well sites and appurtenances including an access corridor in the vicinity of Piwai Reservoir. No significant sites were observed.

Cultural Surveys Hawai'i Inc. (O'Hare et al. 2003) conducted an archaeological assessment of the Sheraton Kaua'i Resort parcel. Although heavily impacted by modern development, some traditional surface sites were documented. Historic research indicated traditional agriculture (*lo'i*) quite close to the coast.

Cultural Surveys Hawai'i Inc. (Tulchin and Hammatt 2003a) conducted an archaeological assessment of certain Knudsen Trust lands *mauka* of Po'ipū Road. The project area was previously covered as part of the Kīahuna and Poipulani projects. Most of the extensive previously recorded sites were reported to be still intact.

Cultural Surveys Hawai'i, Inc. (Hammatt and Shideler 2003) conducted an archaeological inventory of an approximately 35-acre parcel for the Kaua'i Bible Church, just *makai* (south) of the Piwai Reservoir. No archaeological sites were identified in the project area or vicinity.

Tulchin and Hammatt (2003b) conducted an inventory survey of the northern leg of the Western Bypass Road. This portion of the Western Bypass Road is *mauka* of Koloa Road and extends northeast to Maluhia Road. Extensive land modification associated with both sugar cane cultivation and the establishment of a macadamia nut / banana farm appears to have greatly impacted the area. No archaeological sites were identified in the project area or vicinity.

Cultural Surveys Hawai'i, Inc. (Yorck Shideler & Hammatt 2003) carried out data recovery studies at five sites at Kukui'Ula, Kōloa addressing the chronology of irrigated agriculture and habitation.

B. Previous Archaeology Summary

Previous archaeological work concerning the Kōloa district has, until recently, been mostly surface surveys. The Kōloa area began to be documented by subsurface testing of sub-surface cultural deposits within the proposed Kīahuna Golf Course area in 1979. Information gleaned from intensive excavations in the *ahupua'a* of Kōloa, Weliweli, and Pa'a, combined with the inventory surveys in these *ahupua'a*, clearly indicate an expansive irrigated agricultural complex and associated temporary and permanent habitation features. The focus of this integrated Kōloa Field System was Waikomo Stream which was utilized as the main source of irrigation. However, the full extent of the Kōloa Field System is hard to estimate because of the widespread historic land modifications (mainly for sugar cane).

Chronological analysis from the neighboring three *ahupua'a* suggests an early initial occupation within the Pa'a Ahupua'a ca. A.D. 535 (Walker and Rosendahl 1990b:131). No coinciding early dates have been found within Kōloa Ahupua'a, since most of the shoreline area of Kōloa has been heavily impacted by commercial, residential, and resort development. Initial occupation probably was characterized by temporary and/or recurrent occupation developed into permanent settlement within an integrated (both irrigated and *kula* or dryland) agricultural system by ca. A.D. 1200 (Walker and Rosendahl 1990b). Portions of this Kōloa Field System functioned well into historic times (ca. 1880's) and co-existed with commercial sugar cane cultivation.

Relatively little archaeological study has been conducted in the *mauka* portions of Kōloa Ahupua'a (*mauka* of Kōloa Town). Recent archaeological investigations in these *mauka* areas (Hammatt 1991; Bushnell and Hammatt 1996; Yorck et al. 2002; Hammatt and Shideler 2003; Tulchin and Hammatt) noted substantial historic land modification, with no significant archaeological findings. However, the recent Cultural Surveys Hawai'i Inc. (Jones et al. 2002) archaeological inventory survey on an approximately 260-acre parcel at 'Ōma'o, immediately *mauka* of the current project area, does indicate the potential of locating pre-contact sites in these heavily modified *mauka* lands of Kōloa Ahupua'a.

C. Predictive Model

From previous archaeological studies and historic accounts, it appears that habitation and intensive irrigated agriculture were widespread in central and coastal Kōloa utilizing the opportunity to develop an extensive irrigated complex (the Kōloa Field System) off of Waikomo Stream. North of the project area, evidence of intensive traditional Hawaiian use of lands *mauka* of Kōloa Town is generally lacking. Remnants of irrigated agriculture including terraces or *'auwai* off of Waikomo Stream, or temporary field shelters associated with gardening or gathering and processing of forest resources are certainly possible.

The present project area was likely part of the pre-contact Kōloa Field System. However, extensive grading of the Kōloa area was completed in support of commercial agricultural plantations. This land modification often resulted in small "islands" of archaeology including mounds, modified outcrops *'auwai* and wall segments, and other large structures that proved too

difficult to fully dismantle. As noted in the documentation of LCA's 3610 and 3409, agricultural growing areas, including *lo'i*, occurred within the project area in the mid nineteenth century (Figure 4). However, extensive land modification associated with sugar cane cultivation in the area would have destroyed virtually all surface archaeological features and possibly disturbed subsurface deposits associated with these LCA's. It is very unlikely that traditional Hawaiian cultural deposits have survived the many years of cane cultivation within the project area.

IV. INVENTORY SURVEY RESULTS

Pedestrian survey of the project area was accomplished on July 19, 2004 by Cultural Surveys Hawai'i archaeologists Jesse Yorck, B.A., Nancine Kamai, B.A., and Stephen Ftaclas, under the overall supervision of Hallett H. Hammatt, Ph.D. A surface inspection of the 9.4-acre parcel was completed at 100% coverage involving pedestrian sweeps with spacing 20 to 30 feet apart.

Tall grasses, reaching two meters, throughout the project area made for limited visibility. Conditions observed during the pedestrian inspection of the project area exemplified the extensive land modification associated with commercial agriculture and road building. The area appeared to be graded and very few surface stones were observed.

No traditional Hawaiian sites were observed during the field inspection. Any indigenous structures that existed were likely dismantled and demolished during the years when much of this portion of Kōloa was heavily modified to accommodate large-scale commercial agriculture. No surface features associated with LCA's 3610 and 3409 were observed. Seven historic era agricultural properties (Site 50-30-10-3873 through -3979) were located and documented (Figures 11 & 13-25). All of these properties are associated with historic era and modern plantation agriculture and consist of two irrigation flumes, four rock clearance mounds, three stone clearance alignments and three soil and rock berms. The flumes represent remnants of the once widespread open ditch plantation water irrigation system which preceded the more modern drip irrigation system which operated from plastic pipes and tubes. The other features are the result of field clearing with heavy equipment. Some of the larger rocks have steel cable scars along the circumference. These scars indicate that the fields cleared of larger rocks with steam driven winches as early as the 1870s (Hammatt et al.1988:5-8; Donohugh 2001:95). Because these features probably have their origin in the 1920s and 30s, in the heyday of the McBryde Sugar Company, Limited, they are considered at least worthy of recording as historic properties even though their significance is limited.

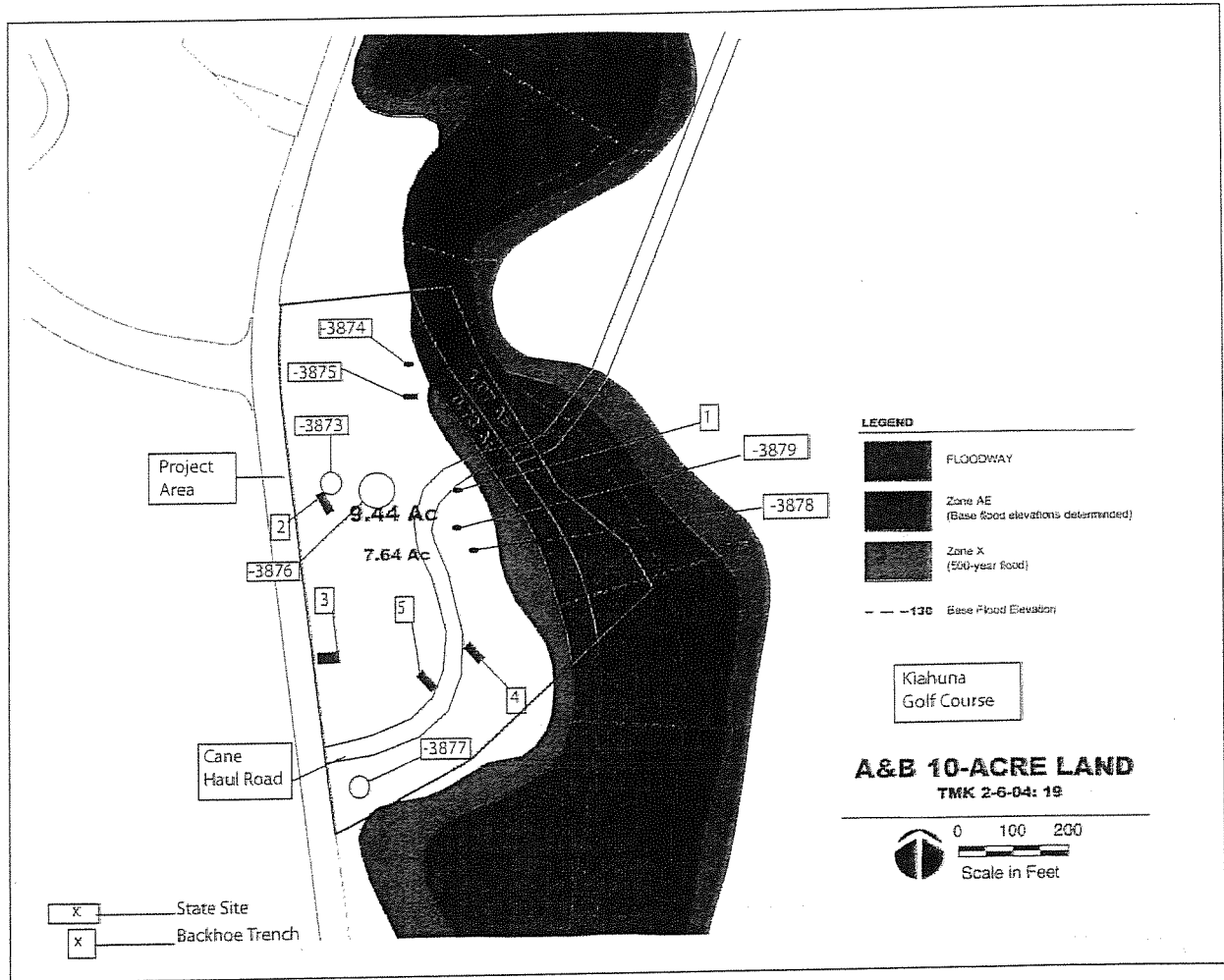


Figure 11. Kukui'Ula Development Company (Hawaii), LLC. map of the project area with overlay of sites and backhoe trenches

A. SIHP # 50-30-10-3873
FUNCTION: Rock consolidation/Agriculture
SITE TYPE: Mound
TOTAL FEATURES: 1
DIMENSIONS: 10.7 m by 9.6 m

DESCRIPTION: State Site 50-30-10-3873 is a clearing mound consisting of medium-to-large basalt boulders; the boulders range in size from 30cm x 20cm through 3m x 1.5m in size. The clearing mound, which is unevenly stacked with very large boulders, is an historic era site and was created during agricultural modifications of the area. A modern rusted pipe is located at the northeast of the site. The clearing mound is in fair condition, but has a very limited potential for excavation.

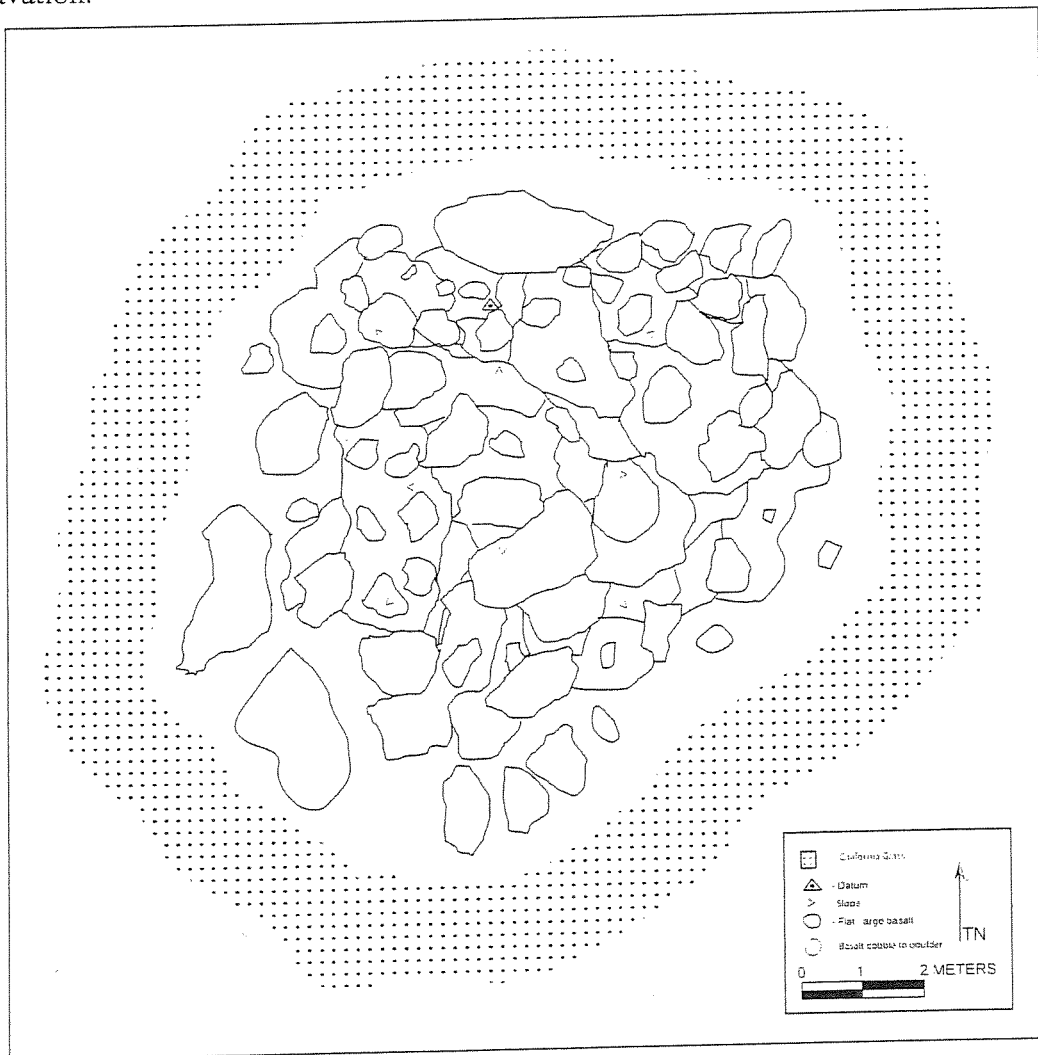


Figure 12. Plan view of State Site 50-30-10-3873



Figure 13. Photograph of a portion of State Site 50-30-10-3873, view east

B. SIHP # 50-30-10-3874
FUNCTION: Soil retention/Agriculture
SITE TYPE: Alignment
TOTAL FEATURES: 1
DIMENSIONS: 1.8 m

DESCRIPTION: State Site 50-30-10-3874 is a discontinuous, 3 boulder, alignment lining the west end of the Waikomo Stream floodway. The site is a single tier, single course, remnant portion of a soil retaining terrace, wall or berm. The alignment is in poor condition and has a very limited potential for excavation.

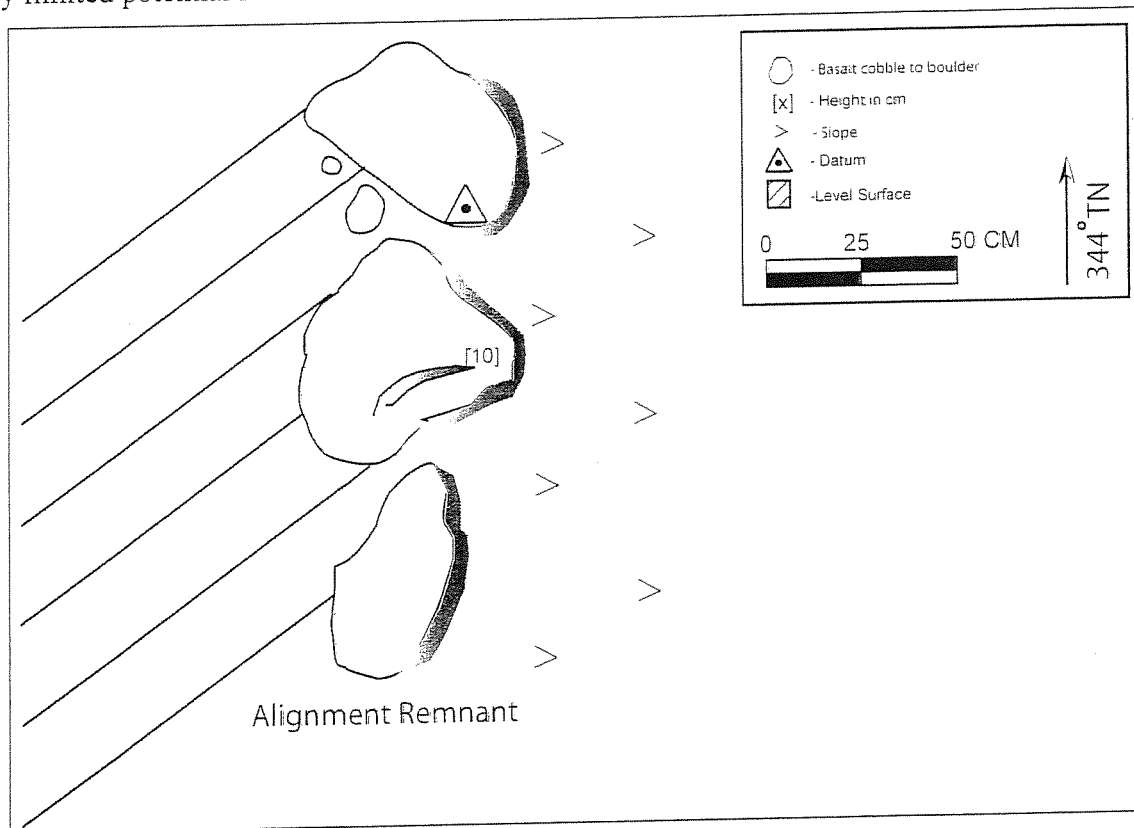


Figure 14. Plan view of State Site 50-30-10 3874



Figure 15. Photo of State Site 50-30-10 3874, view east

C. SIHP # 50-30-10-3875
FUNCTION: Soil retention/Agriculture
SITE TYPE: Alignment
TOTAL FEATURES: 1
DIMENSIONS: 0.9 m–1.6 m tall, 2 m wide, 14 meters long

DESCRIPTION: State Site 50-30-10-3875 is a terrace retaining wall separating two constructed levels of the floodplain of Waikomo Stream. The site consists of large to very large boulders naturally situated on the floodway boundary of Waikomo Stream. Hand-stacked boulders have been added to the feature creating an alignment. The site is in fair condition and has a very limited potential for excavation.

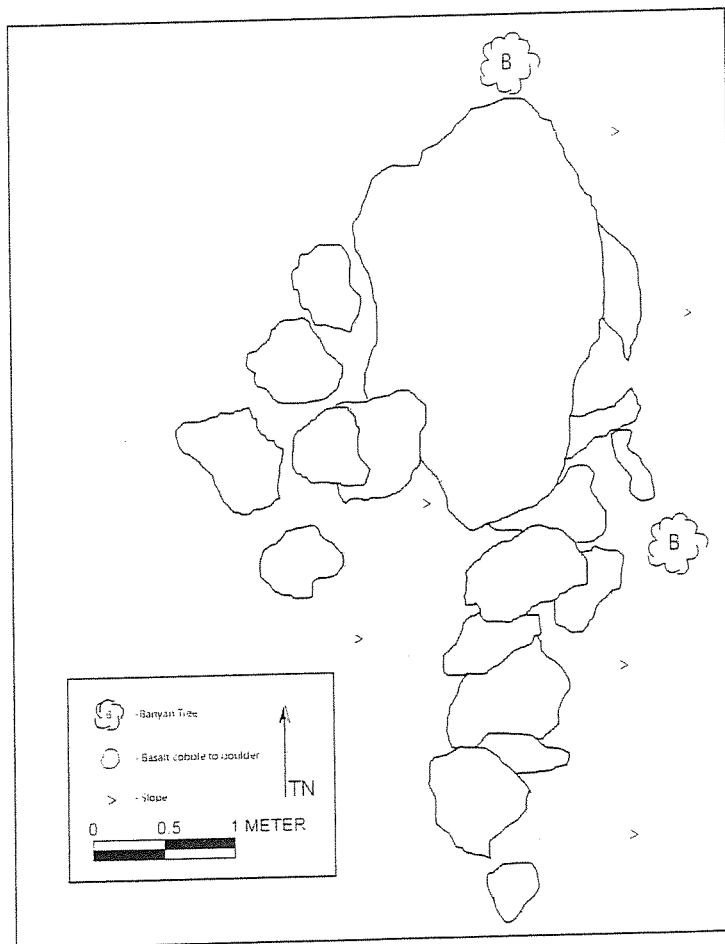


Figure 16. Plan view of State Site 50-30-10-3875



Figure 17. Photo of a portion of State Site 50-30-10-3875, view southwest

SIHP # 50-30-10-3876
FUNCTION: Rock consolidation/Agriculture
SITE TYPE: Mound
TOTAL FEATURES: 1
DIMENSIONS: 8.4 m by 8.1 m

DESCRIPTION: State Site 50-30-10-3876 is a clearing mound constructed mainly of large to very large basalt boulders. This site is very similar in construction to sites -3873 and -3877 and in close proximity to -3873. The clearing mound is in fair condition, but has a very limited potential for excavation.

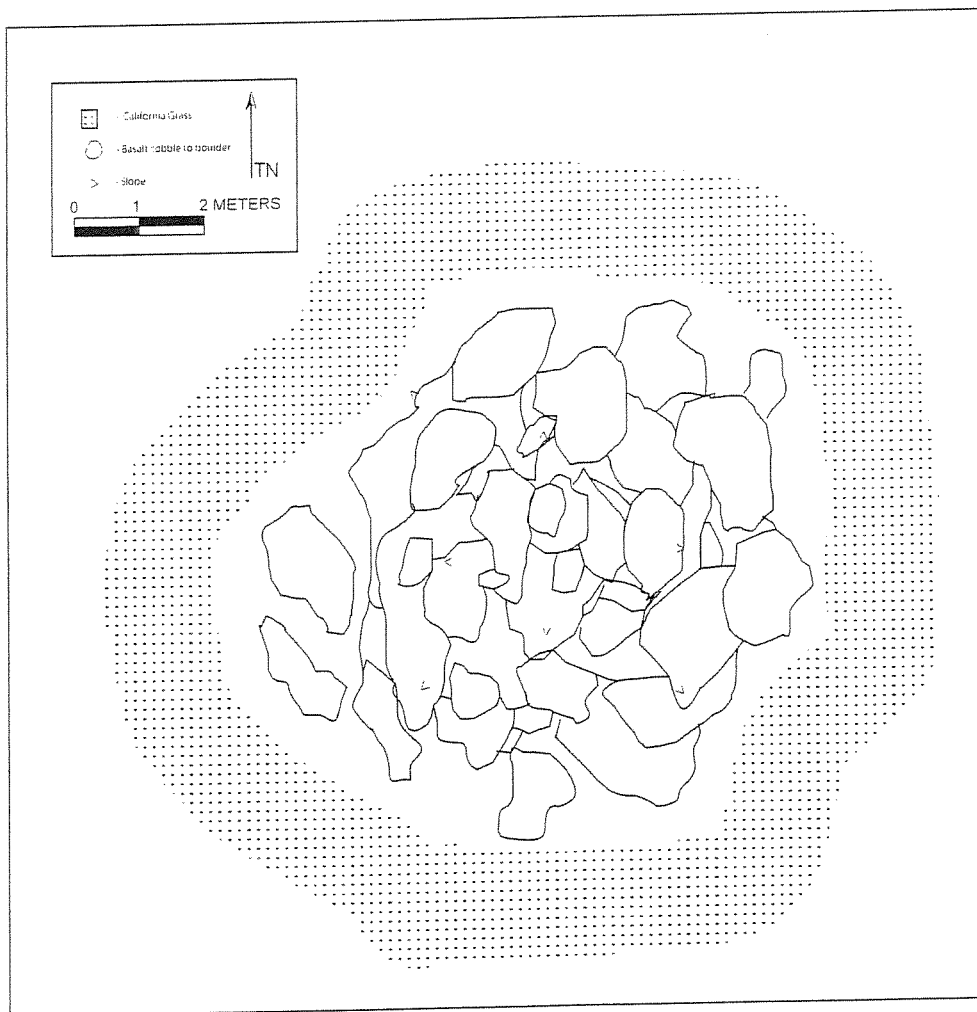


Figure 18. Plan view of State Site 50-30-10-3876

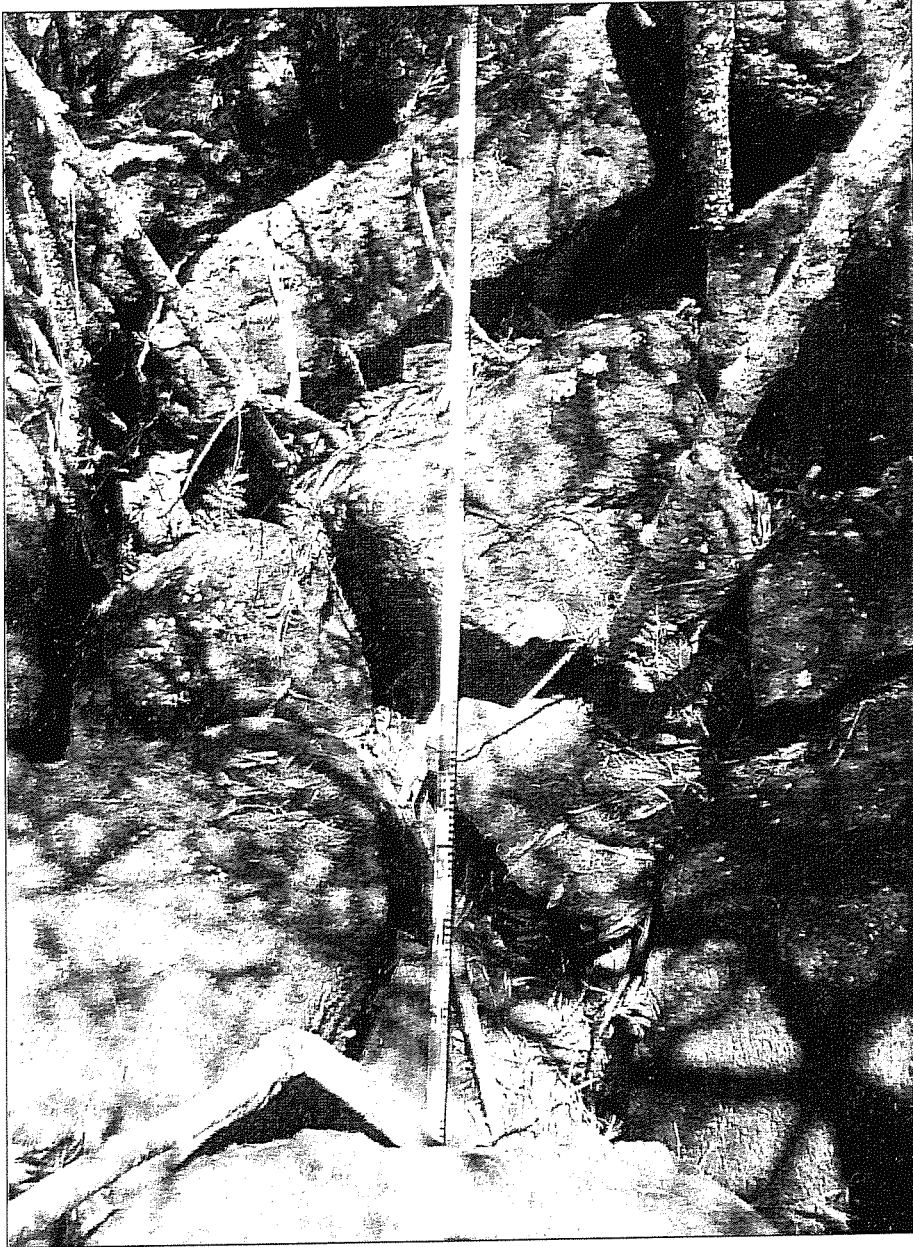


Figure 19. Photo of a portion of State Site 50-30-10-3876, view east



Figure 21. Photo of a portion of State Site 50-30-10-3877, view east

E. SIHP # 50-30-10-3878
 FUNCTION: Irrigation
 SITE TYPE: Flume
 TOTAL FEATURES: 1
 DIMENSIONS: 1.51 m by .58 m

DESCRIPTION: State Site 50-30-10-3878 consists of a concrete-lined flume with interior cobble paving. The use of wood framing in the construction is evidenced by the relief of the concrete surface. An iron "I" beam, now highly oxidized, reinforces the structure. State Site 50-30-10-3878 is an historic flume that was used to divert water to nearby agricultural fields. The flume is in fair condition, but has a very limited potential for excavation.

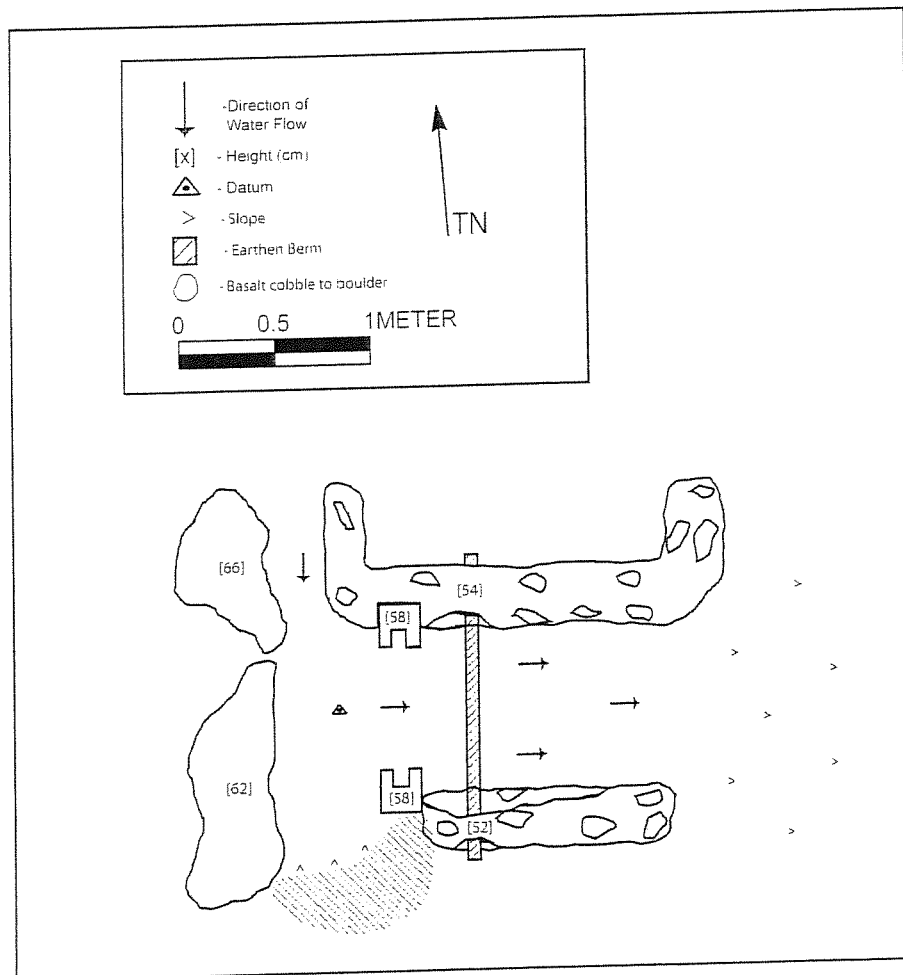


Figure 22. Plan view of State Site 50-30-10-3878



Figure 23. Photo of State Site 50-30-10-3878, view west

SIHP # 50-30-10-3879
FUNCTION: Agriculture/Ranching
SITE TYPE: Berms, Flume, Mound, Alignment
TOTAL FEATURES: 6
DIMENSIONS: 19 m by 7.5 m

DESCRIPTION: State Site 50-30-10-3879 is an historic agricultural complex. Bulldozing scars (Feature F), a cut basalt boulder (Feature D) and large earthen and boulder berms (Features B, D and F) indicate that the site construction dates to the historic era.

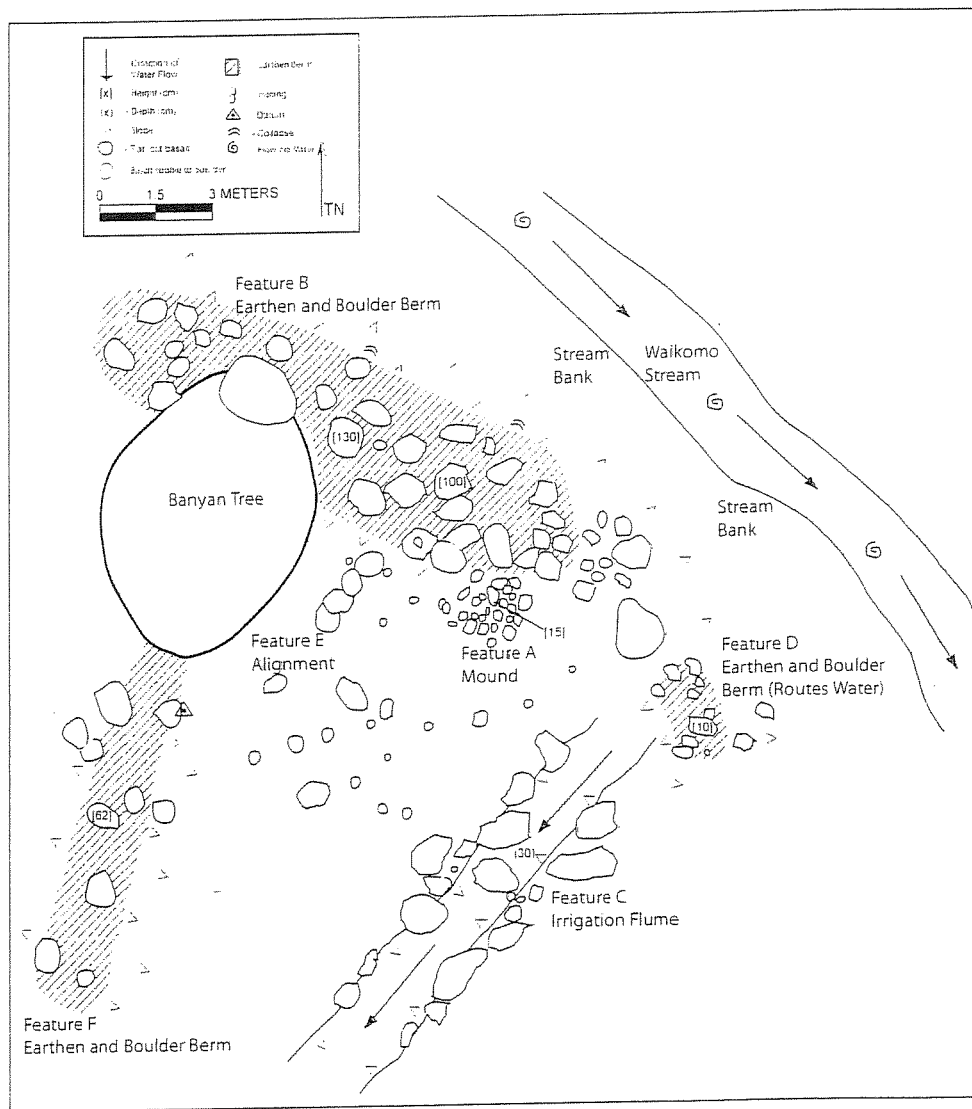


Figure 24. Plan view of State Site 50-30-10-3879 (A-F)

DESCRIPTION: State Site 50-30-10-3879A is a collapsed mound measuring 2.8 m by 2 m; it is located 30 cm South of Feature B. and is constructed of a single course of basalt boulders and cobbles with a maximum height of 44 cm. It is likely, due to the sites proximity to several historic agricukltural features, that the mound was constructed in support of plantation agriculture. State Site 50-30-10-3879A is in poor condition and has limited potential for excavation.



Figure 25. Photo of State Site 50-30-10-3879A, view east

DESCRIPTION: State Site 50-30-10-3879B is an earthen and boulder berm measuring 14 m by 4 m, and rising to 1.3 m in height. The feature is located at the northern end of the complex and runs parallel to Waikomo Stream. The historic berm was constructed as part of a water retention (dam) process that would feed the nearby flume (Feature C) with flowing water. State Site 50-30-10-3879B is in fair condition and has a very limited potential for excavation.



Figure 26. Photo of State Site 50-30-10-3879B, view east

DESCRIPTION: State Site 50-30-10-3879 C is located 3.3 m Southeast of Feature A and traverses Feature D, north into Waikomo stream. The feature, measuring 19.5 m by 1.4 m, is an irrigation ditch constructed in the the historic plantation era. The flume contains a "swale-like" depression and is lined on either side with medium-to-large basalt boulders and cobbles. Some boulders have collapsed to the into the center of the feature. State Site 50-30-10-3879 C is in fair condition but has limited excavation potential.



Figure 27. Photo of State Site 50-30-10-3879C, view northeast

DESCRIPTION: State Site 50-30-10-3879D is a berm measuring 2.8 m by 1.4 m. It is constructed of basalt cobbles and boulders and has a maximum height of 0.1 m. At the northwest end of the berm is a large, flat, dressed basalt boulder. The boulder measures 1.25 m by 1.16 m with a height of 0.11 m and is marked by a gradual concave groove either worn by the flow of water or ground for structural purposes. The berm seems to have functioned as both a barrier against the overflowing of Waikomo Steam (similar to Feature B), and to channel water from Waikomo Stream into the intake flume (Feature C). State Site 50-30-10-3879D is in fair condition but has a very limited potential for excavation.



Figure 28. Photo of State Site 50-30-10-3879D, view northeast

DESCRIPTION: Feature E is a single course alignment constructed of 5 large basalt boulders with a maximum height of 0.56m. It measures 2.55 m by .8 m. The feature abutts Feature B at it's northern end. The function of Feature E is unknown. The alignment has a very limited potential for excavation.



Figure 29. Photo of State Site 50-30-10-3879E, view south

DESCRIPTION: State Site 50-30-10-3879F consists of a raised oval-shaped earthen and boulder berm running roughly north-to-south, perpendicular to Waikomo Stream. The berm measures 10 m by 3.5 m. The height of the feature varies 1.2 m. to 0.8m. Some boulders display bulldozers scarring. State Site 50-30-10-3879 C is in fair condition but has a very limited potential for excavation.



Figure 30. Photo of State Site 50-30-10-3879F, view south

V. SUBSURFACE TESTING RESULTS

Subsurface testing was conducted on July 21, 2004 by two CSH archaeologists, Jesse Yorck, B.A. and Stephen Ftaclas. Testing consisted of five backhoe trenches (see Figure 11). Backhoe trench 3 was excavated in the vicinity of LCA 3610 due to the possibility of encountering cultural materials within the former LCA. Excavations were also conducted in the vicinity of Sites -3873 and -3879 (Trenches 1&2). Detailed trench descriptions and summaries follow:

A. Excavations Within the Project Area

Profiles of the five test trenches are shown as Figures 26-30. Each trench was roughly 5-6 m long and 90 cm wide. Test trenches were excavated until bedrock was encountered. Stratigraphic profiles of the excavated trenches revealed a disturbed surface layer (Str. I) associated with bulldozing or road construction. Underlying sediment layers (Str. II-III) consisted of dark brown to reddish brown silty loam and clay soils. Bedrock was encountered as shallow as 50 cmbs (Trench 1), and as deep as 130 cmbs (Trench 2); indicating an undulating bedrock topography consisting of floodplain alluvium (generally Stratum II) overlying deposits consisting of *in situ* weathered bedrock (generally Stratum III). No cultural material was observed. Detailed sediment descriptions including average depths are presented below.

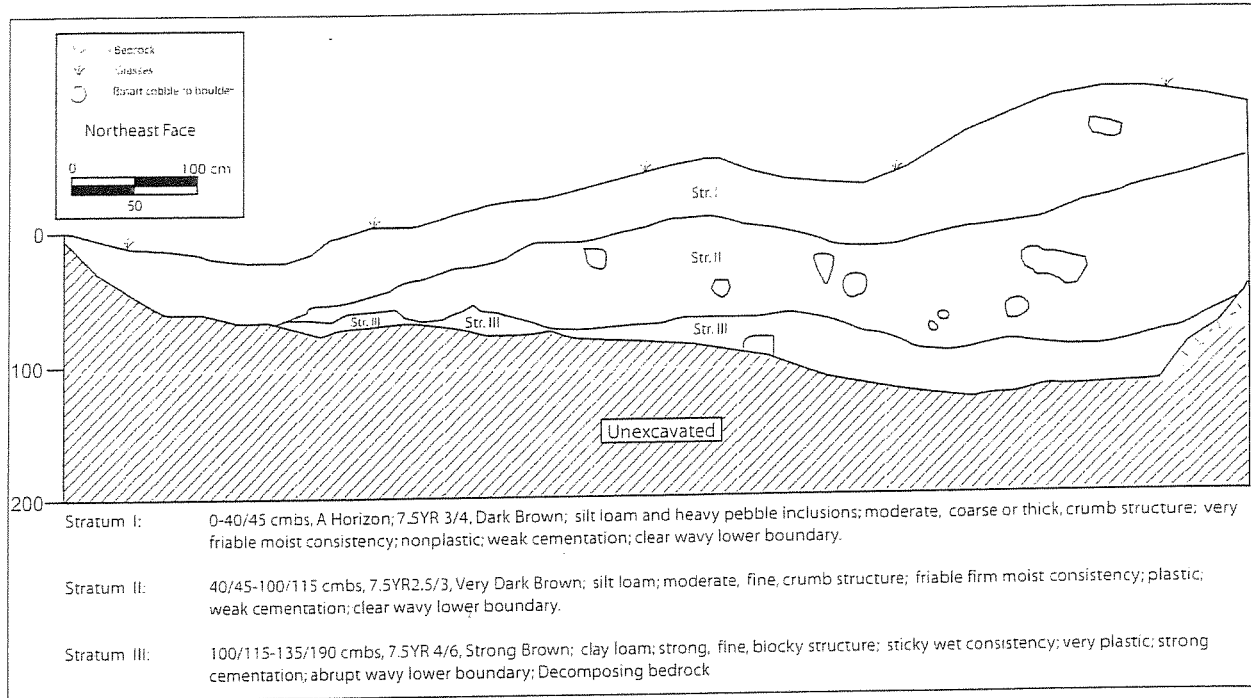


Figure 31. Backhoe Trench 1, northeast face

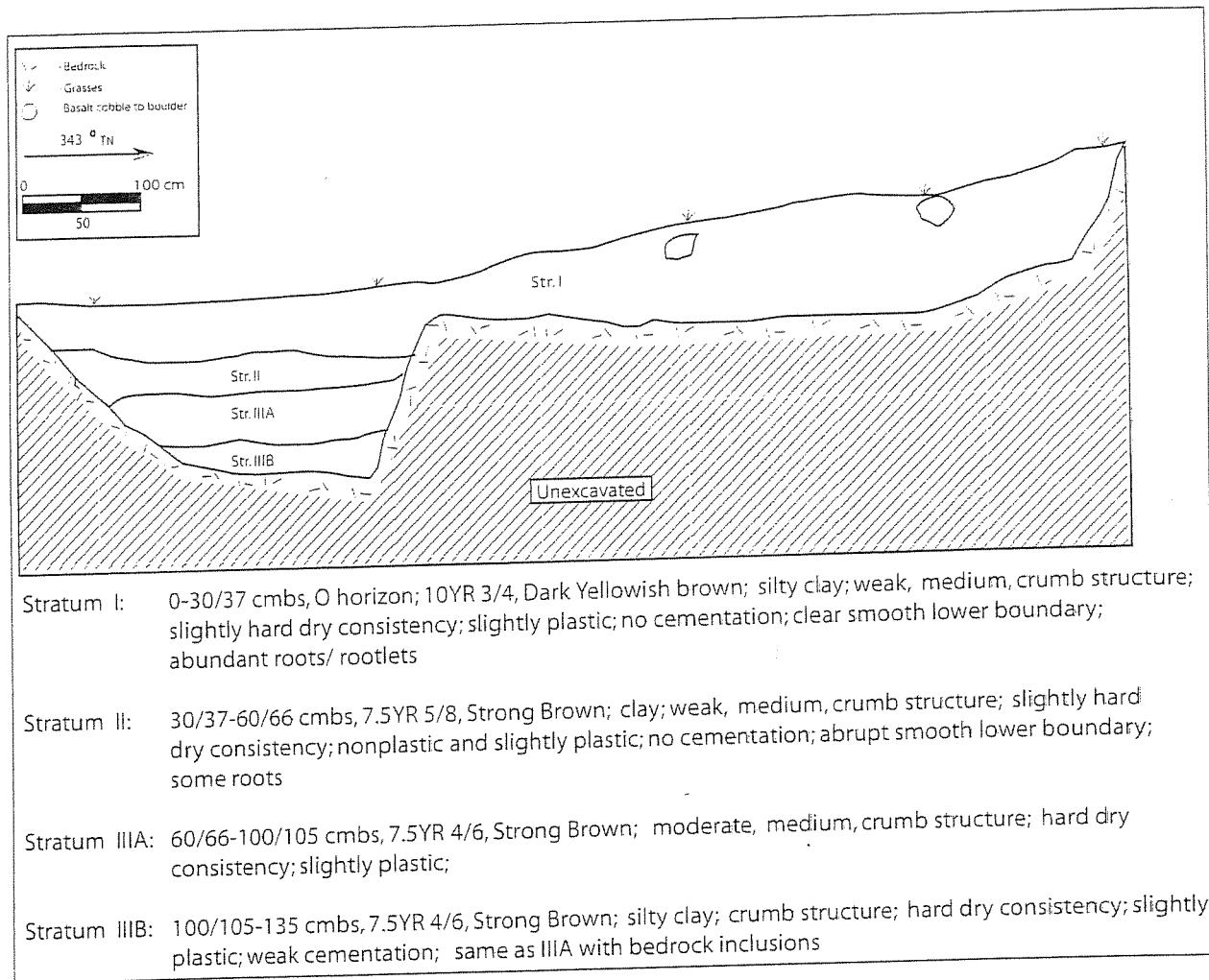


Figure 32. Backhoe Trench 2, west face

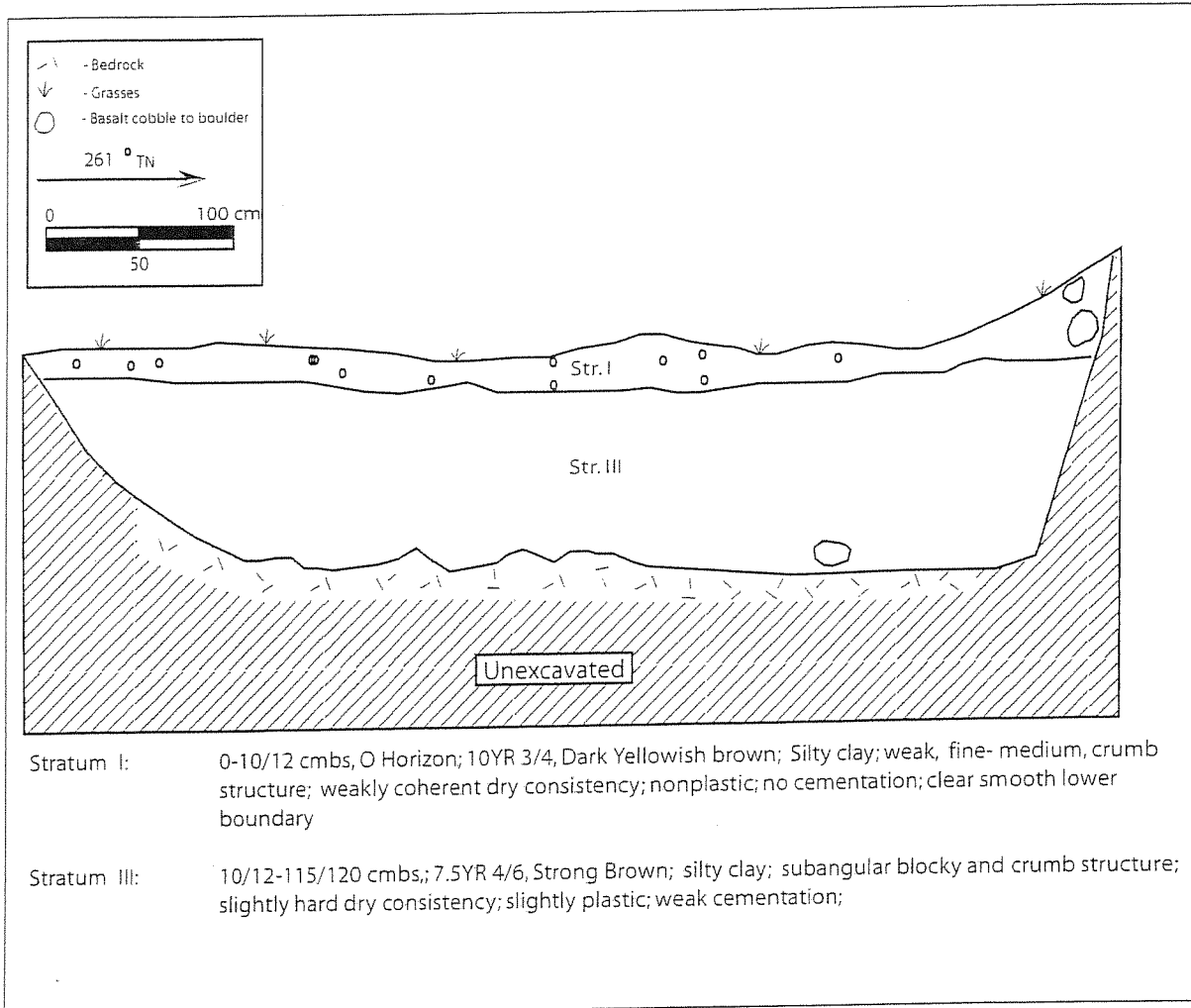


Figure 33. Backhoe Trench 3, south face

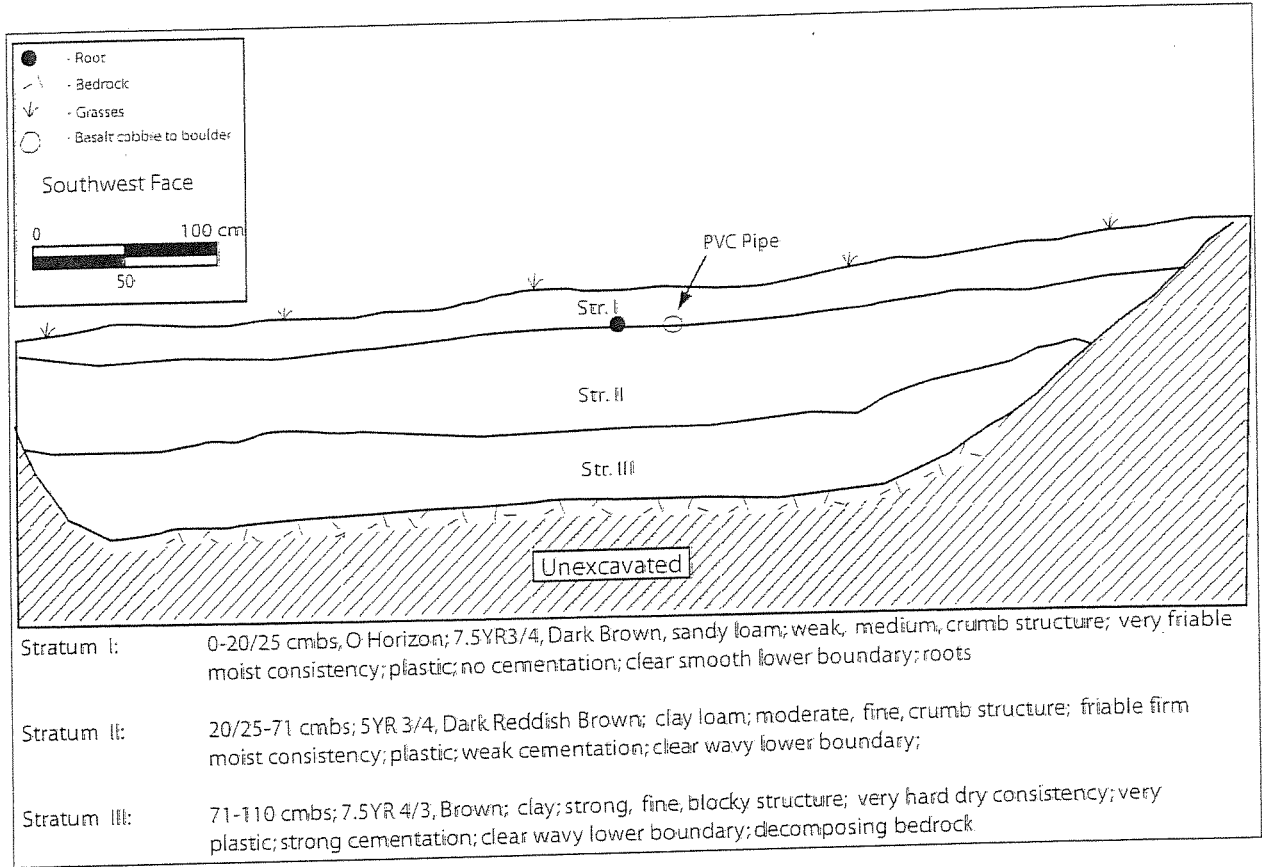


Figure 34. Backhoe Trench 4, southwest face

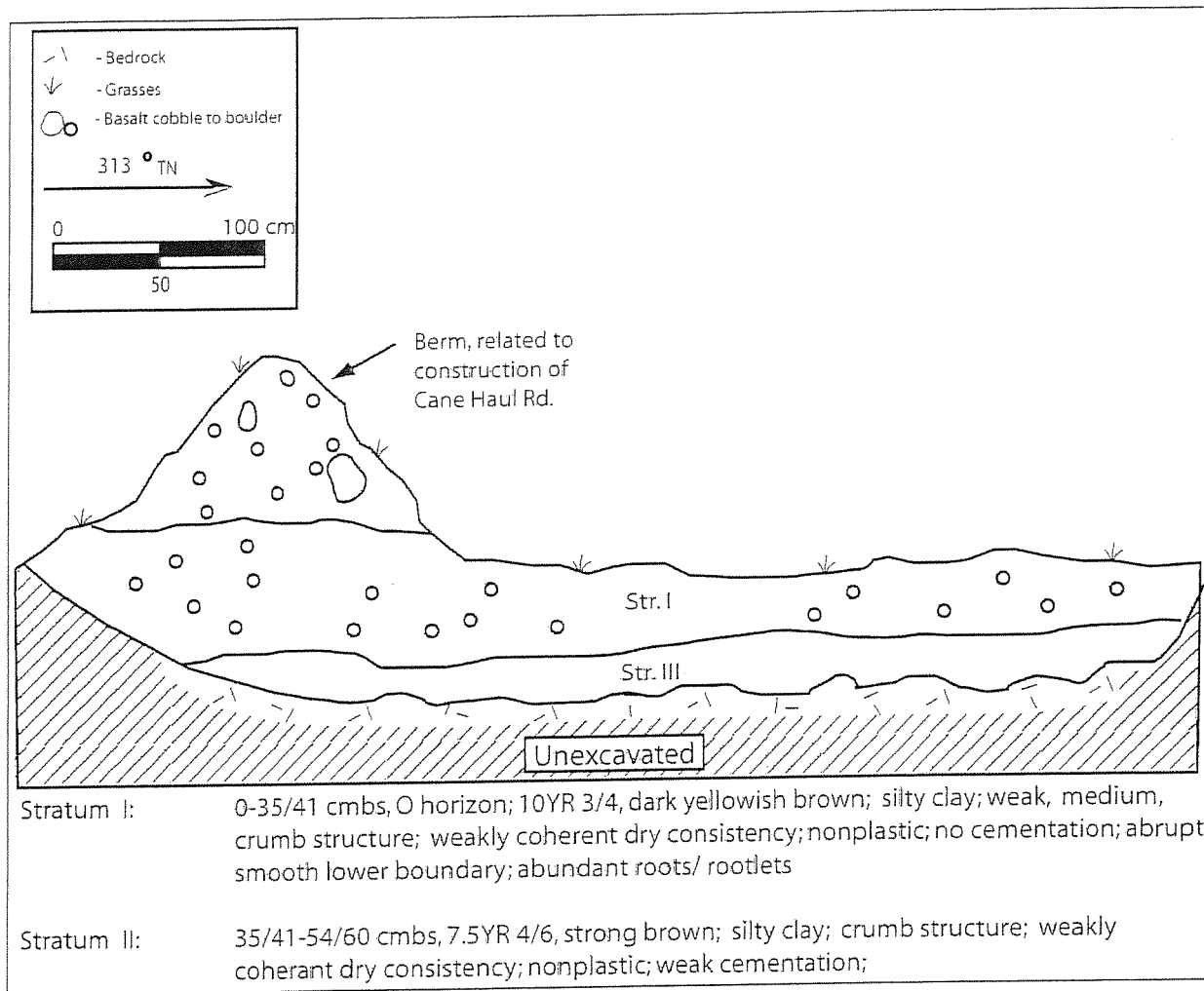


Figure 35. Backhoe Trench 5, southwest face

VI. SIGNIFICANCE AND RECOMMENDATIONS

Field inspection of the project area confirmed that extensive land modification associated with commercial plantation era agriculture, had greatly impacted the project area. No traditional Hawaiian sites were observed within the project area. Test excavations made in the vicinity of LCA 3610 and Sites 3873 and 3879 did not locate any subsurface cultural materials.

A. Significance Evaluation

To be considered significant, a historic property shall possess integrity of location, design, setting, materials, workmanship, feeling, and association and shall meet on or more of the following criterion

1. Criterion "A"- Be associated with events that have made an important contribution to the broad patterns of our history;
2. Criterion "B"- Be associated with the lives of persons important in our past;
3. Criterion "C"- Embody the distinctive characteristics of a type, period, or method of construction, represent the work of a master, or possess high artistic value;
4. Criterion "D"- Have yielded, or is likely to yield, information important for research on prehistory or history; or
5. Criterion "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 [Hawaii Administrative Rules 13:13:275:6].

Table 2. Significance and recommendations for State Sites 50-30-10-3873 through 3879

State Site # 50-30-10	# of Features	Form	Function	Significance	Recommendation
50-30-10-3873	1	Mound	Rock consolidation / Ag.	D	Sufficient information recovered, no further work
-3874	1	Alignment	Soil retention/ Ag	D	Sufficient information recovered, no further work
-3875	1	Alignment	Soil retention/ Ag.	D	Sufficient information recovered, no further work
-3876	1	Mound	Rock consolidation / Ag.	D	Sufficient information recovered, no further work

State Site # 50-30-10	# of Features	Form	Function	Significance	Recommendation
-3877*	1	Mound	Rock consolidation / Ag.	D	Sufficient information recovered, no further work
-3878	1	Flume	Irrigation	D	Sufficient information recovered, no further work
-3879	7				Sufficient information recovered, no further work
-3879A	1	Mound	Agriculture	D	“ “
-3879B	1	Berm	Agriculture	D	“ “
-3879C	1	Flume	Irrigation	D	“ “
-3879D	1	Berm	Agriculture	D	“ “
-3879E	1	Alignment	Unknown	D	“ “
-3879F	1	Berm	Agriculture	D	“ “

B. Recommendations

All of the seven sites were determined to be significant under criterion “D” for their information content. It is the opinion of Cultural Surveys Hawai‘i that sufficient documentation of the sites has been completed and no further work is recommended. As always, if in the unlikely event that any human remains or other significant subsurface deposits are encountered during the course of development activities, all work in the immediate area should stop and the State Historic Preservation Division should be promptly notified.

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