



UNIVERSITY
OF HAWAII
HILO

FILE COPY

OCT 23 2013

October 8, 2013

Ms. Genevieve Salmonson, Director
Office of Environmental Quality Control
Department of Health, State of Hawai'i
235 S. Beretania Street, Room 702
Honolulu, Hawai'i 96813

RECEIVED
13 OCT -8 P3:56
OFFICE OF ENVIRONMENTAL
QUALITY CONTROL

Dear Ms. Salmonson:

With this letter, the University of Hawai'i hereby transmits the draft environmental assessment and anticipated finding of no significant impact (DEA-AFONSI) for the Proposed Disposition of State Land to the University of Hawai'i for the Expansion of UH-Hilo situated at Tax Map Keys (3) 2-4-001: 024; 2-4-056: 014; 2-4-056: 016, in the South Hilo District on the island of Hawai'i for publication in the next available edition of the Environmental Notice.

Enclosed is a completed OEQC Publication Form, two copies of the DEA-AFONSI, 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 Harry Yada at (808) 933-3267.

Sincerely,

Marcia Sakai
Vice Chancellor Administrative Affairs

Enclosures

ADMINISTRATION *Administrative Affairs*

200 W. Kāwili St. Hilo, HI 96720-4091 • Phone: (808) 974-7750 • Fax: (808) 974-7542 • www.uhh.hawaii.edu

An Equal Opportunity/Affirmative Action Institution

**AGENCY ACTIONS
SECTION 343-5(B), HRS
PUBLICATION FORM (FEBRUARY 2013 REVISION)**

Project Name: Proposed Disposition of State Land to the University of Hawai'i for the Expansion of UH-Hilo
Island: Hawai'i
District: South Hilo
TMK: (3) 2-4-001: 024; 2-4-056: 014 and 016

Anticipated Permits/Approvals:

To finalize State land disposition to UH:

Lease Execution for Parcels (3) 2-4-001:024 and 2-4-056:014, Lease Approval for Parcel 2-4-056:016

Approvals Anticipated to implement LRDP Uses for the Project Area:

General Plan LUPAG Amendment, Rezoning, Plan Approval, Grading/Building Permits, ADA Accessibility, Approval for Sewer Connection, Permit to Work within County Right-of-Way, NPDES Permit

Proposing/Determination Agency contact:

University of Hawai'i
ATTN: Mr. Harry Yada, Director
Real Property
200 West Kawili Street
Hilo, Hawai'i 96720-4091
Phone: (808) 933-9911

Accepting Authority:

(for EIS submittals only)

Consultant contact:

PBR HAWAII & Associates, Inc.
ATTN: Roy Takemoto
1001 Bishop Street, Suite 650
Honolulu, Hawai'i 96813
Telephone: (808) 521-5631
Fax: (808) 523-1402

Status (check one only):

x 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.

OFFICE OF ENVIRONMENTAL
QUALITY CONTROL

13 OCT -8 3:56

RECEIVED

- __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 Board of Land & Natural Resources has approved to lease two of the parcels (TMK 2-4-001:24 and 2-4-056:014) to the University of Hawai'i, but requires an environmental assessment to complete the process. For the third parcel (2-4-056: 016), the federal government presently leases the parcel to the University of Hawai'i and intends to decommission and revert ownership of this parcel to the State. Upon reversion to the State, the University of Hawai'i intends to request a lease on the former Army Reserve facility from the Board of Land & Natural Resources for use by the University. All three parcels will be included in the UHH's Long-Range Development Plan (LRDP) to determine the best use for university-related purposes.

The specific plan for the Project Area will be determined through the UHH's Long-Range Development (LRDP). The last LRDP for UHH, completed in March 1996, did not include the Project Area. Since 1996, the student population has grown and the addition of the proposed parcels will allow UHH to accommodate future student population growth. The 1996 LRDP is being updated and will include proposed uses for the Project Area as well as recent and proposed new buildings for the entire campus.

PROPOSED DISPOSITION OF STATE LAND
TO THE UNIVERSITY OF HAWAI'I FOR THE
EXPANSION OF UH-HILO
DRAFT ENVIRONMENTAL ASSESSMENT AND
ANTICIPATED FINDING OF NO SIGNIFICANT IMPACT

Prepared for:

University of Hawai'i at Hilo

Prepared by:



October 2013

Summary

Project Name:	Proposed Disposition of State Land to the University of Hawai'i for the Expansion of UH-Hilo
Location:	Waiākea, South Hilo District, Island and County of Hawai'i
Tax Map Key (TMK):	(3) 2-4-001: 024; 2-4-056: 014 and 016 ("Project Area")
Land Area:	Approximately 46.332 acres
Proposing Agency:	University of Hawai'i
Landowner:	TMK (3) 2-4-001: 024 and 2-4-056: 014 are owned by the State of Hawai'i. TMK (3) 2-4-056: 016 is presently owned by the U.S. Army and leased to the University of Hawai'i.
Existing Use:	TMK (3) 2-4-001: 024 and 2-4-056: 014 are undeveloped. TMK 2-4-056: 016 is developed with buildings and parking (formerly utilized by the Army Reserve).
Proposed Action:	The Board of Land & Natural Resources has approved to lease two of the parcels (TMK 2-4-001:24 and 2-4-056: 014) to the University of Hawai'i, but requires an environmental assessment to complete the process. For the third parcel (2-4-056: 016), the federal government presently leases the parcel to the University of Hawai'i and intends to decommission and revert ownership of this parcel to the State. Upon reversion to the State, the University of Hawai'i intends to request a lease on the former Army Reserve facility from the Board of Land & Natural Resources for use by the University of Hawai'i at Hilo (UHH). All three parcels will be included in the UHH's Long-Range Development Plan (LRDP), presently being updated, to determine the best use for university-related purposes. An Environmental Impact Statement (EIS) will be prepared for the UHH LRDP.
Current Land Use Designations:	<i>State Land Use:</i> Urban <i>County General Plan LUPAG:</i> Low Density Urban <i>County Zoning:</i> Residential (RS-10) <i>Special Management Area:</i> Not in SMA
Permits and Approvals Required:	<i>To finalize State land disposition to UH:</i> <ul style="list-style-type: none">• Lease Execution for Parcels (3) 2-4-001: 024 and 2-4-056: 014 (Department of Land and Natural Resources)• Lease Approval for Parcel 2-4-056: 016 (Board of Land & Natural Resources) <i>Approvals Anticipated to implement LRDP Uses for the Project Area:</i> <ul style="list-style-type: none">• General Plan LUPAG Amendment (County Council)• Rezoning (County Council)

- Plan Approval (Planning Department)
- Grading/Building Permits (Department of Public Works)
- ADA Accessibility (Disability and Communication Access Board)
- Approval for Sewer Connection (Department of Environmental Management)
- Permit to Work within County Right-of-Way (Department of Public Works)
- NPDES Permit (Department of Health)

Alternatives Considered:

Two alternatives were considered:

- No action. No action means the Project Area would not be available to the UH, resulting in higher density development on the currently available UHH lands to accommodate long-range development plans.
- Alternative site. There are no other unencumbered State lands in comparable proximity to the UHH campus of sufficient size. Private lands in proximity could be acquired resulting in higher costs and extended time; or, existing users of State land in proximity of the campus could be displaced; or, offsite unencumbered State lands could be sought resulting in greater operational costs, energy consumption, and inefficiencies.

Potential Impacts and Mitigation Measures:

The Project Area is suitable for university uses that would be enabled by the proposed lease. Although the endangered Hawaiian hoary bat has been detected within the Project Area, the bat's habitat is widespread and impacts can be mitigated. The Project Area has no other environmentally sensitive resources or areas (e.g., floodplains; rare, endangered, or threatened species; archaeological sites; natural beauty sites). Infrastructure can be made available with adequate capacity (e.g., water, sewer, power, communications), and response times for fire, police, and emergency medical services are excellent. There are no impacts related to the proposed lease action that require mitigation. Section 4.17 summarizes suggested mitigation measures to consider in the development of the LRDP for the Project Area should the lease be consummated.

Determination:

Anticipated Finding of No Significant Impact

PROPOSED DISPOSITION OF STATE LAND TO UH FOR THE EXPANSION OF UH-HILO
Draft Environmental Assessment and Anticipated Finding of No Significant Impact

TABLE OF CONTENTS

1.0	INTRODUCTION	1
1.1	PROPOSING AGENCY	1
1.3	LOCATION AND OWNERSHIP	1
1.2	BACKGROUND	1
1.6	EXISTING AND SURROUNDING USES	5
2.0	PROJECT DESCRIPTION	7
2.1	PROPOSED ACTION—DESCRIPTION, PURPOSE AND NEED	7
2.2	PHASING AND TIMING OF ACTION AND COSTS	7
3.0	LAND USE CONFORMANCE	9
3.1	STATE OF HAWAI‘I	9
3.1.1	Chapter 205, Hawai‘i Revised Statutes - State Land Use Law	9
3.1.2	Chapter 226, Hawai‘i Revised Statutes - Hawai‘i State Plan	9
3.1.3	Section 205A-2, Hawai‘i Revised Statutes - Coastal Zone Management Program ...	11
3.2	COUNTY OF HAWAI‘I	15
3.2.1	General Plan	15
3.2.2	County Zoning	16
3.2.3	Special Management Area	16
3.3	APPROVALS AND PERMITS REQUIRED	16
4.0	DESCRIPTION OF THE AFFECTED ENVIRONMENT, POTENTIAL IMPACTS OF THE PROPOSED ACTION, AND MITIGATION MEASURES	19
4.1	CLIMATE	19
4.1.1	Existing Conditions	19
4.1.2	Potential Impacts and Mitigation Measures	19
4.2	TOPOGRAPHY	19
4.2.1	Existing Conditions	19
4.2.2	Potential Impacts and Mitigation Measures	19
4.3	SOILS	19
4.3.1	Existing Conditions	19
4.3.2	Potential Impacts and Mitigation Measures	20
4.4.1	Existing Conditions	22
4.4.2	Potential Impacts and Mitigation Measures	22
4.5	NATURAL HAZARDS & HAZARDOUS MATERIALS	24
4.5.1	Existing Conditions	24
4.5.2	Potential Impacts and Mitigation Measures	24
4.6	FLORA	24
4.6.1	Existing Conditions	24
4.6.2	Potential Impacts and Mitigation Measures	25
4.7	FAUNA	25
4.7.1	Existing Conditions	25
4.7.2	Potential Impacts and Mitigation Measures	27
4.8	CULTURAL, ARCHAEOLOGICAL AND HISTORIC RESOURCES	27
4.8.1	Existing Conditions	27
4.8.1.1	Cultural Assessment	27
4.8.1.2	Archaeological and Historical Assessment	28
4.8.2	Potential Impacts and Mitigative Measures	29
4.8.2.1	Cultural Impact Assessment	29

PROPOSED DISPOSITION OF STATE LAND TO UH FOR THE EXPANSION OF UH-HILO

Draft Environmental Assessment and Anticipated Finding of No Significant Impact

	4.8.2.2 Archaeological and Historical Impact Assessment	29
4.9	ROADS AND TRAFFIC	29
	4.9.1 Existing Conditions	29
	4.9.2 Potential Impacts and Mitigation Measures	30
4.10	AIR QUALITY	30
	4.10.1 Existing Conditions	30
	4.10.2 Potential Impacts and Mitigation Measures	30
4.11	NOISE	31
	4.11.1 Existing Conditions	31
	4.11.2 Potential Impacts and Mitigation Measures	31
4.12	VISUAL RESOURCES	31
	4.12.1 Existing Conditions	31
	4.12.2 Potential Impacts and Mitigation Measures	32
4.13	SOCIAL AND EMPLOYMENT CHARACTERISTICS	32
	4.13.1 Existing Conditions	32
	4.13.2 Potential Impacts and Mitigation Measures	32
4.14	ECONOMIC FACTORS/GOVERNMENT REVENUES	32
	4.14.1 Existing Conditions	32
	4.14.2 Potential Impacts and Mitigation Measures	32
4.15	INFRASTRUCTURE	32
	4.15.1 Water System	32
	4.15.1.1 Existing Conditions	32
	4.15.1.2 Potential Impacts and Mitigation Measures	33
	4.15.2 Wastewater System	33
	4.15.2.1 Existing Conditions	33
	4.15.2.2 Potential Impacts and Mitigation Measures	33
	4.15.4 Solid Waste	33
	4.15.4.1 Existing Conditions	33
	4.15.4.2 Potential Impacts and Mitigation Measures	33
	4.15.5 Electrical /Telephone	33
	4.15.5.1 Existing Conditions	33
	4.15.5.2 Potential Impacts and Mitigation Measures	33
4.16	PUBLIC SERVICES	34
	4.16.1 Police Protection Services	34
	4.16.1.1 Existing Conditions	34
	4.16.1.2 Potential Impacts and Mitigation Measures	34
	4.16.2 Fire Protection Services	34
	4.16.2.1 Existing Conditions	34
	4.16.2.2 Potential Impacts and Mitigation Measures	34
	4.16.3 Medical Services	34
	4.16.3.1 Existing Conditions	34
	4.16.3.2 Potential Impacts and Mitigation Measures	34
	4.16.4 Recreational Facilities	35
	4.16.4.1 Existing Conditions	35
	4.16.4.2 Potential Impacts and Mitigation Measures	35
4.17	SUMMARY OF MITIGATION MEASURES	35
5.0	ALTERNATIVES TO THE PROPOSED ACTION	37
	5.1 NO ACTION ALTERNATIVE	37
	5.2 ALTERNATIVE SITES	37

PROPOSED DISPOSITION OF STATE LAND TO UH FOR THE EXPANSION OF UH-HILO
Draft Environmental Assessment and Anticipated Finding of No Significant Impact

6.0 DETERMINATION, FINDINGS, AND REASONS FOR SUPPORTING DETERMINATION.....39
 6.1 SIGNIFICANCE CRITERIA.....39
 6.2 ANTICIPATED DETERMINATION.....41
7.0 CONSULTED PARTIES.....43
8.0 REFERENCES45

PROPOSED DISPOSITION OF STATE LAND TO UH FOR THE EXPANSION OF UH-HILO
Draft Environmental Assessment and Anticipated Finding of No Significant Impact

LIST OF FIGURES

Figure 1. Regional Location	2
Figure 2. Tax Map	3
Figure 3. Kapi‘olani Street Extension Roadway Lot Subdivision (Sub. No. 10-000989).....	4
Figure 4. Surrounding Uses	6
Figure 5. State Land Use Districts.....	10
Figure 6. General Plan LUPAG Map	17
Figure 7. County Zoning	18
Figure 8. Soil Survey Map.....	21
Figure 9. Flood Insurance Rate Map	23

APPENDICES

Appendix A	Pre-Assessment Consultation Letters and Responses
Appendix B	Flora/Fauna Survey
Appendix C	Archaeological Inventory Survey
Appendix D	Cultural Impact Assessment

PROPOSED DISPOSITION OF STATE LAND TO UH FOR THE EXPANSION OF UH-HILO
Draft Environmental Assessment and Anticipated Finding of No Significant Impact

1.0 INTRODUCTION

This Draft Environmental Assessment (DEA) and Anticipated Finding of No Significant Impact (AFONSI) has been prepared in compliance with *Hawai'i Revised Statutes* (HRS) Chapter 343 and Hawai'i Administrative Rules (HAR), Title 11, Chapter 200. The proposed use of State lands triggers the applicability of HRS Chapter 343.

1.1 PROPOSING AGENCY

The proposing agency is the University of Hawai'i (UH), who has requested a lease from the Board of Land & Natural Resources. The contact information on behalf of the University of Hawai'i is provided below:

Mr. Harry Yada
Director - Real Property
University of Hawai'i at Hilo
200 West Kawili Street
Hilo, Hawai'i 96720-4091

1.3 LOCATION AND OWNERSHIP

The parcels identified as TMK (3) 2-4-001:024 and 2-4-056:014 are owned by the State of Hawai'i. The UH has approval for a lease of these two parcels from the State Board of Land and Natural Resources. The UH anticipates requesting a lease of a third parcel (2-4-056:016) that will soon revert from the Army to the State. The three parcels total 46.332 acres ("Project Area"). The Project Area is located in Waiākea, South Hilo District, Island and County of Hawai'i (see Figure 1 and Figure 2). The Project Area is in proximity to the University of Hawai'i at Hilo campus and would be incorporated into that campus.

1.2 BACKGROUND

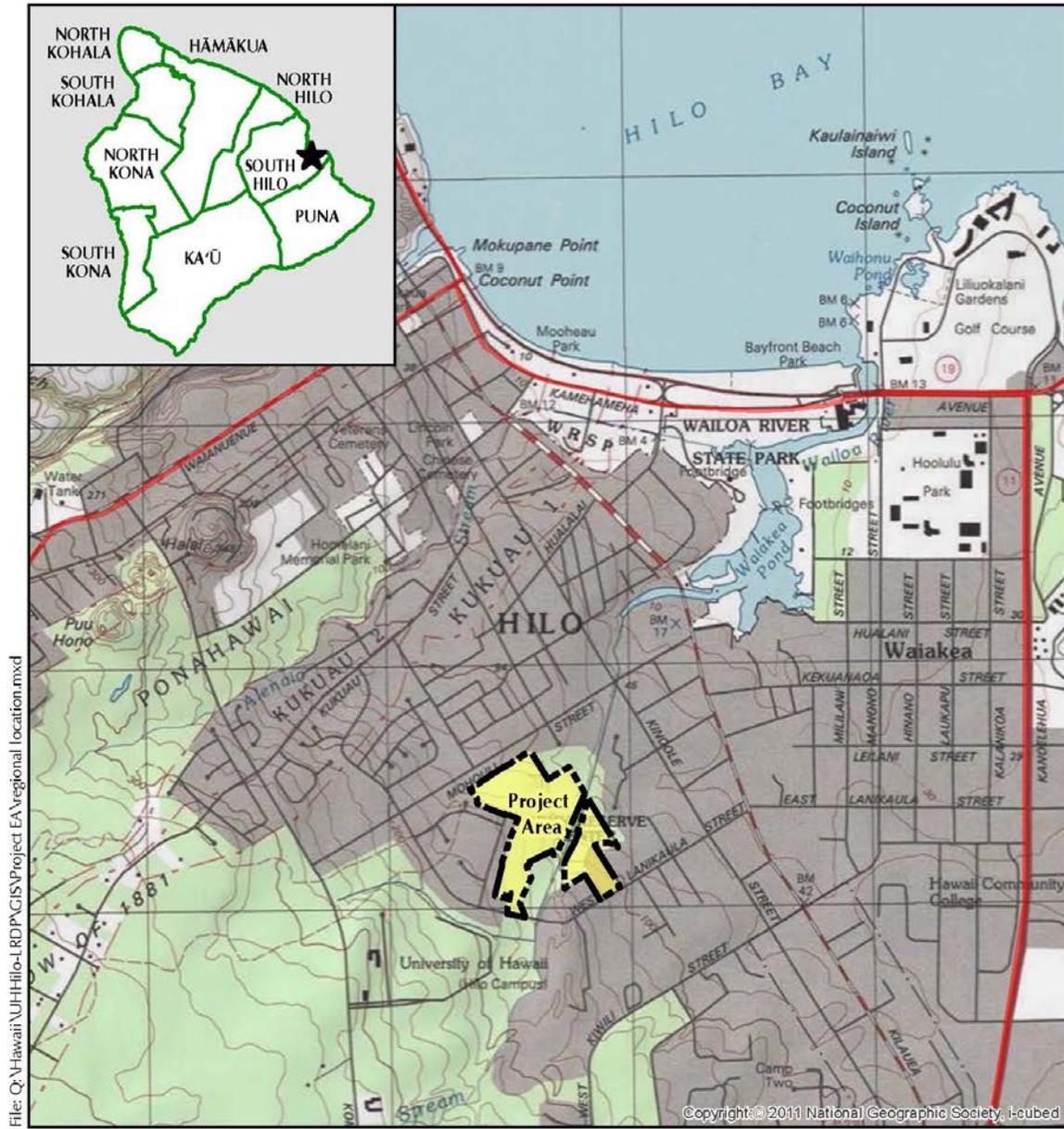
The Board of Land and Natural Resources, at its meeting held on May 12, 2006, approved to lease parcels 2-4-001:024 and 2-4-056:014 to the University of Hawai'i for a 65-year term. The Board has the authority pursuant to HRS 171-95 to lease State lands to other government agencies without public auction. The Department of Land and Natural Resources requires an Environmental Assessment or Environmental Impact Statement to complete the lease transaction when a lease could change the use of the property.

The U.S. Army, who currently holds title to parcel 2-4-056:016 (3.7 acres), intends to decommission the Army Reserve facility as part of an overall restructuring. Upon decommissioning, the property will revert back to the State of Hawai'i. In the interim, until the completion of the decommissioning process, the Army has leased parcel 2-4-056:016 to the University of Hawai'i. Although the UH has informally expressed its interest in this parcel for university purposes, the request cannot be presented to the Board of Land and Natural Resources until the decommissioning process is complete.

Pursuant to the condition imposed by the Board of Land and Natural Resources in its approval of the lease to the University, the University has recently subdivided the Project Area parcels for the extension of Kapi'olani Street. The subdivision for the roadway lot (Subdivision No. 10-000989) redefined the boundaries of parcels 2-4-001:024 and 2-4-056:014 to its present configuration (see Figure 3).

PROPOSED DISPOSITION OF STATE LAND TO UH FOR THE EXPANSION OF UH-HILO
Draft Environmental Assessment and Anticipated Finding of No Significant Impact

Figure 1. Regional Location



File: Q:\hawaii\UH\Hilo-LRDP\CJIS\Project EA\regional location.mxd

Copyright © 2011 National Geographic Society. I-cubed
 DATE: 9/5/2012

LEGEND

 Project Area

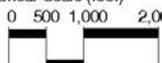
Source: ESRI Online Basemap
 County of Hawaii

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

FIGURE 1

Regional Location Map

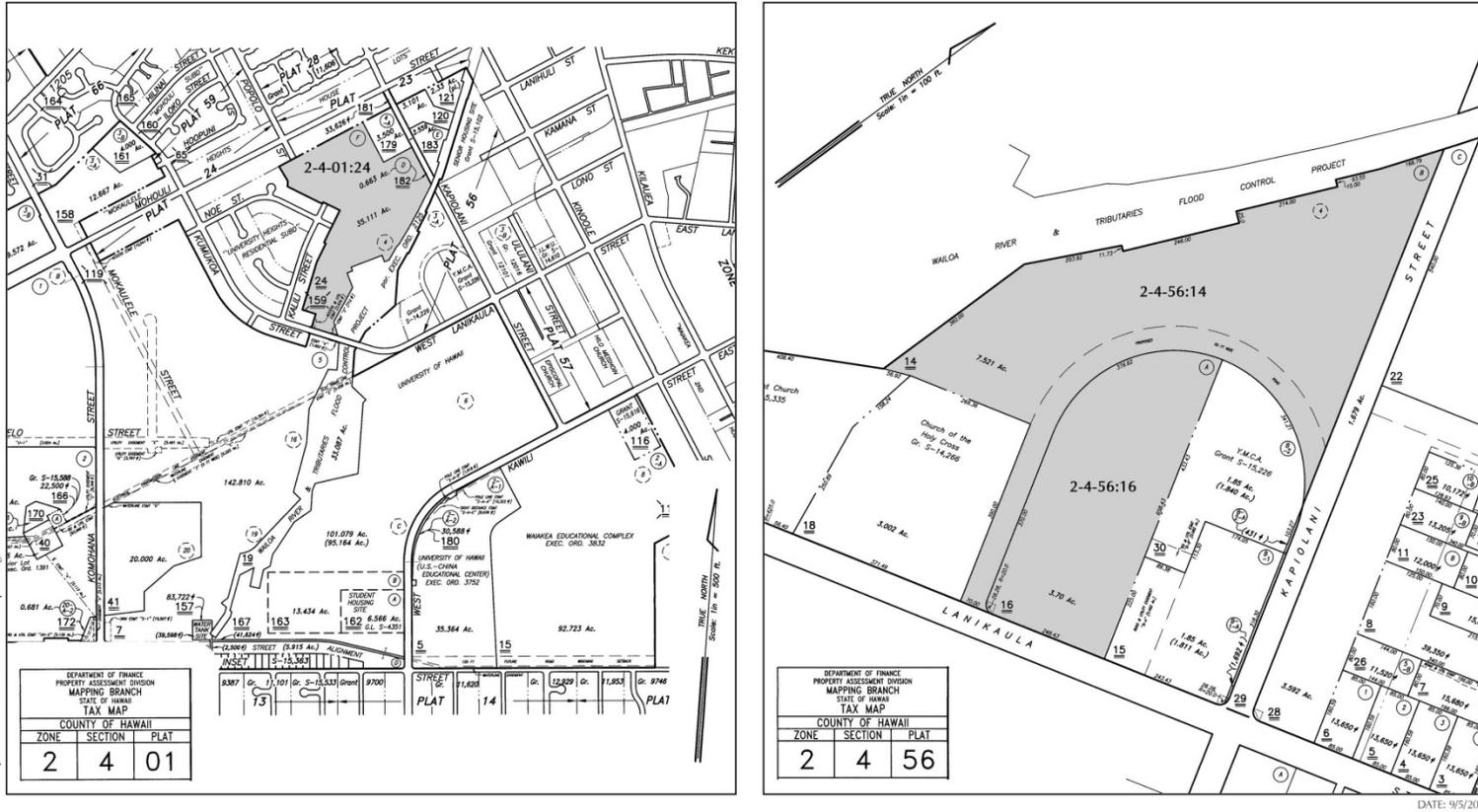
UHH Land Disposition

University of Hawai'i at Hilo Hilo, Hawai'i
 North Linear Scale (feet)
 0 500 1,000 2,000
 

PROPOSED DISPOSITION OF STATE LAND TO UH FOR THE EXPANSION OF UH-HILO

Draft Environmental Assessment and Anticipated Finding of No Significant Impact

Figure 2. Tax Map



LEGEND

Project Area (TMKs 2-4-01:24 and 2-4-56:14 and 16)

Source: County of Hawaii Tax Maps (Zone 2 Section 4 Plat 01 and Zone 2 Section 4 Plat 56)

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

FIGURE 2
TMK Map

UHH Land Disposition
University of Hawaii at Hilo, Hawaii



PROPOSED DISPOSITION OF STATE LAND TO UH FOR THE EXPANSION OF UH-HILO
Draft Environmental Assessment and Anticipated Finding of No Significant Impact

1.6 EXISTING AND SURROUNDING USES

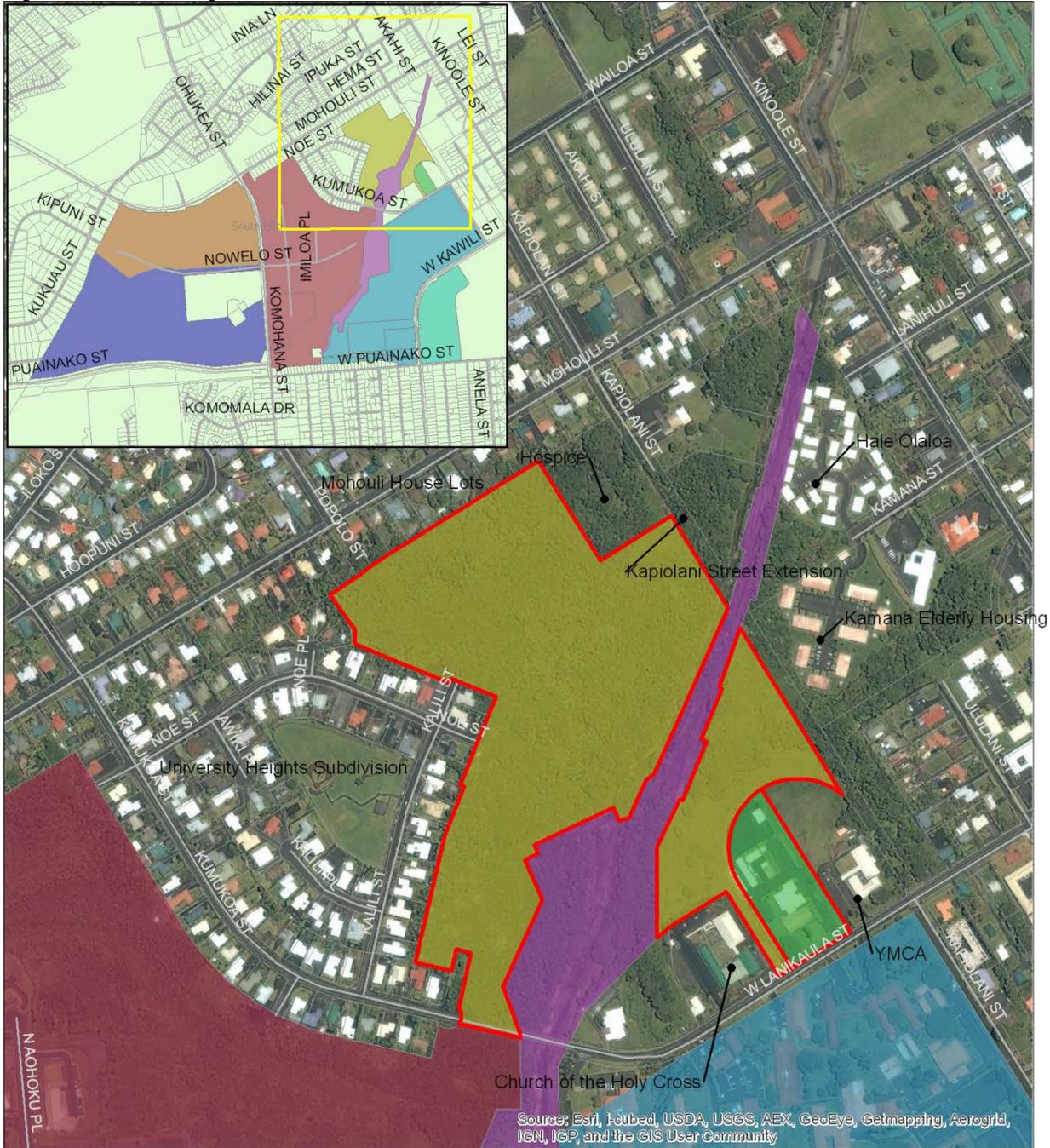
TMK 2-4-056:016 is developed with buildings and parking (formerly utilized by the Army Reserve). The other two parcels (TMK 2-4-001:024 and TMK 2-4-056:014) are undeveloped and heavily vegetated.

The Project Area is bisected by Wailoa River Flood Control Project. The northern portion (TMK 2-4-001:024) is surrounded on the west by the University Heights Residential Subdivision, to the north by the Mohouli Heights House Lots and the Hospice facility, to the east by the planned (but yet-to-be-built) Kapi‘olani Street, Kamana Elderly Housing, and Hale Olaloa (elderly public housing), and to the south by Waiākea Stream. The southern portion (TMK 2-4-056: 014 and 016) is bordered on the west by the Church of the Holy Cross, to the north by Waiākea Stream, to the east by the planned (but yet-to-be-built) Kapi‘olani Street and YMCA, and to the south by West Lanikaula Street and the main UHH campus across West Lanikaula Street (see Figure 4).

The Project Area will be incorporated into the update of the UH Hilo Long-Range Development Plan.

PROPOSED DISPOSITION OF STATE LAND TO UH FOR THE EXPANSION OF UH-HILO
Draft Environmental Assessment and Anticipated Finding of No Significant Impact

Figure 4. Surrounding Uses



LEGEND

- Project Area
- UHH LRDP**
- Main Campus
- University Park
- University Village (fka UH-China Center)
- University Park Expansion
- Army Reserve Expansion
- Mohouli Expansion
- HCC Future Campus

State Land Disposition

University of Hawai'i ISLAND OF HAWAII

NORTH

LINEAL SCALE

0 250 500 1,000

Feet

PBR HAWAII & ASSOCIATES, INC.
April 2010

2.0 PROJECT DESCRIPTION

2.1 PROPOSED ACTION—DESCRIPTION, PURPOSE AND NEED

The UH proposes to acquire the Project Area by lease for future expansion of the University of Hawai'i at Hilo (UHH). The UHH is one of ten campuses that comprise the University of Hawai'i system and began as the Hawai'i Vocational School in 1941. In 1970, the school was organized under its present name. The UHH is a four-year public university.

Located on the eastern side of the island of Hawai'i, UHH is located just minutes away from downtown Hilo, Hilo International Airport, and Hilo Bay. The main campus is bounded by Lanikaula, Kapi'olani, Kāwili and Puāinako Streets. The Wailoa Flood Control Channel along Waiākea Stream bisects the campus including the Project Area.

The specific plans proposed for the Project Area will be determined through the UHH's Long-Range Development (LRDP). The last LRDP for UHH, completed in March 1996 (over 16 years ago), did not include the Project Area. Since 1996, the student population has grown and the addition of the proposed parcels will allow UHH to accommodate future student population growth. The 1996 LRDP is being updated and will include proposed uses for the Project Area as well as recent and proposed new buildings for the entire campus. An environmental impact statement (EIS) will be prepared for the LRDP Update.

2.2 PHASING AND TIMING OF ACTION AND COSTS

The finalization of the lease for parcels 2-4-001:024 and 2-4-056:014 can occur upon filing the Final EA-FONSI. The timing to lease or transfer parcel 2-4-056:016 will depend upon the Army's schedule to decommission the former Army Reserve facility. Until that parcel reverts to the State, the Army has leased the parcel to the UH for the remaining term of the Army's ownership. The lease or transfer from the State is still necessary for a long-term commitment of that parcel to the UHH. The State does not charge lease rents to the UH.

The Draft EIS for the UHH LRDP Update is anticipated to be filed in latter 2014.

PROPOSED DISPOSITION OF STATE LAND TO UH FOR THE EXPANSION OF UH-HILO
Draft Environmental Assessment and Anticipated Finding of No Significant Impact

This page intentionally left blank.

3.0 LAND USE CONFORMANCE

Relevant State of Hawai‘i and County of Hawai‘i land use plans, policies, and ordinances are described below.

3.1 STATE OF HAWAI‘I

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

The State Land Use Law (Chapter 205, Hawai‘i Revised Statutes) establishes the State Land Use Commission (LUC), which has the authority to designate all lands in the State into one of four districts: Urban, Rural, Agricultural, and Conservation. The Project Area is located on land classified as Urban (U) (see Figure 5). The Urban classification generally includes land characterized by a city-like concentration of people, structures and services, including vacant areas for future development. Any new buildings in the Project Area would thus be consistent with the existing State Urban designation. Since the counties primarily have jurisdiction over Urban lands through their land use ordinances and regulations, the county ultimately determines the permissible uses by county zoning.

3.1.2 Chapter 226, Hawai‘i Revised Statutes - Hawai‘i State Plan

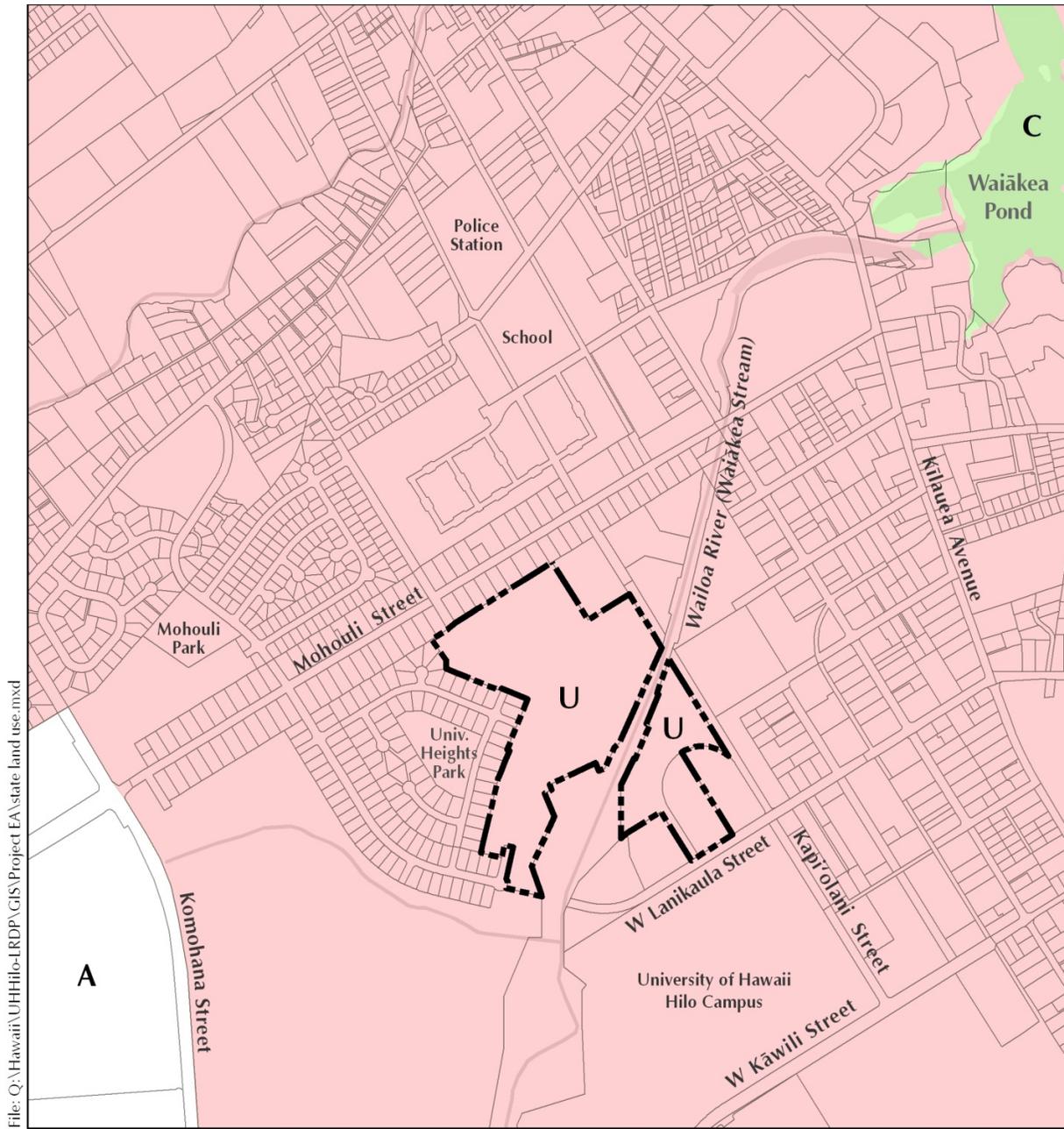
The *Hawai‘i State Plan* (Chapter 226, HRS) serves as a guide for the future long-range development within the State. It identifies goals, objectives, policies, and priorities for the State and provides a basis for determining priorities and allocating limited resources, such as public funds, services, human resources, land, energy, water, and other resources. The *Hawai‘i State Plan* also improves the coordination of Federal, State, and County plans, policies, programs, projects, and regulatory activities, and establishes a system for the planning, coordination, and integration of major state and county activities. Part I of the Plan lists the State’s long-range goals, objectives, policies and priorities. Part II establishes a statewide planning system to coordinate and implement the plan. Part III establishes priority guidelines to address areas of statewide concern. Applicable sections are discussed below.

Section 226-21 Objective and Policies for Socio-Cultural Advancement—Education.

- (a) *Planning for the State’s socio-cultural advancement with regard to education shall be directed towards achievement of the objective of the provision of a variety of educational opportunities to enable individuals to fulfill their needs, responsibilities, and aspiration.*
- (b) *To achieve the educational objective, it shall be the policy of the State to:*
 - (2) *Ensure the provision of adequate and accessible educational services and facilities that are designed to meet individual and community needs.*
 - (5) *Provide higher educational opportunities that enable Hawai‘i’s people to adapt to changing employment demands.*
 - (9) *Support research programs and activities that enhance the education programs of the State.*

PROPOSED DISPOSITION OF STATE LAND TO UH FOR THE EXPANSION OF UH-HILO
Draft Environmental Assessment and Anticipated Finding of No Significant Impact

Figure 5. State Land Use Districts



File: Q:\Hawaii\UHHilo-IRDP\GIS\Project EA\state land use.mxd

DATE: 9/17/2012

LEGEND

- A-Agricultural
- C-Conservation
- R-Rural
- U-Urban
- Project Area

Source: State Land Use Commission (2011)
 Disclaimer: This Graphic has been prepared for general planning purposes only and should not be used for boundary interpretations or other spatial analysis.

State Land Use District Boundary Map

UHH Land Disposition

University of Hawai'i at Hilo Hilo, Hawai'i

North Linear Scale (feet)

0 250 500 1,000

PROPOSED DISPOSITION OF STATE LAND TO UH FOR THE EXPANSION OF UH-HILO

Draft Environmental Assessment and Anticipated Finding of No Significant Impact

Discussion: The lease of the Project Area to the University will allow the expansion of the educational facilities of the UHH campus, and provide better and additional higher education opportunities.

Section 226-103 Economic Priority Guidelines.

- (a) *Priority guidelines to stimulate economic growth and encourage business expansion and development to provide needed jobs for Hawai‘i’s people and achieve a stable and diversified economy:*
- (2) *Encourage expansion of technological research to assist industry development and commercialization of technological advancements.*

Discussion: The lease of the Project Area to the University will allow the expansion of the educational facilities of the UHH campus and as a result, will support the growth of quality jobs in Hawai‘i.

Section 226-107 Quality Education.

Priority guidelines to promote quality education:

- (6) *Pursue the establishment of Hawai‘i’s public and private universities and colleges as research and training centers of the Pacific.*

Discussion: The lease of the Project Area to the University will allow the expansion of the educational facilities of the UHH campus and as a result, will directly or indirectly support this objective.

3.1.3 Section 205A-2, Hawai‘i Revised Statutes - Coastal Zone Management Program

The objectives of the Coastal Zone Management (CZM) Program (HRS §205A-2) are to provide the public with recreational opportunities, protect historic and prehistoric resources, protect scenic and open space resources, protect coastal ecosystems, provide facilities for economic development, reduce hazards, and manage development.

Since all lands in the State come under the definition of the “coastal zone management area” (HRS §205A-1), a discussion of the CZM Program objectives applicable to the Project Area is presented below.

1. Recreational Resources

Objective:

Provide coastal recreational opportunities accessible to the public.

Policies:

- 1.b. Provide adequate, accessible and diverse recreational opportunities in the coastal zone management area by:*
 - iii. Providing and managing adequate public access, consistent with conservation of natural resources, to and along shorelines with recreational value;*
 - iv. Adopting water quality standards and regulating point and non-point sources of pollution to protect, and where feasible, restore the recreational value of coastal waters;*

Discussion: In as much as the Project Area is located well inland from the coastline, access to coastal resources will not be impacted by any UHH development of the Project Area. In addition, UHH will

PROPOSED DISPOSITION OF STATE LAND TO UH FOR THE EXPANSION OF UH-HILO

Draft Environmental Assessment and Anticipated Finding of No Significant Impact

institute Best Management Practices (BMPs) to ensure there will be no impact to downstream areas greater than current conditions from the Project Area. All discharges related to any future construction or operation activities will comply with the State's Water Quality Standards.

2. Historic Resources

Objective:

Protect, preserve, and where desirable, restore those natural and man made historic and pre-historic resources in the coastal zone management area that are significant in Hawaiian and American history and culture.

Policies:

- 2.a. *Identify and analyze significant archaeological resources;*
- 2.b. *Maximize information retention through preservation of remains and artifacts or salvage operations; and*
- 2.c. *Support state goals for protection, restoration, interpretation and display of historic resources.*

Discussion: Based on the recent archaeological inventory survey for the Project Area, no significant archaeological resources were found on the Project Area. However, should any archaeological remains be uncovered during the construction phases of development, their treatment will be conducted in strict compliance with the requirements of SHPD.

3. Scenic and Open Space Resources

Objective:

Protect, preserve, and where desirable, restore or improve the quality of coastal scenic and open space resources.

Policies:

- 3.a. *Identify valued scenic resources in the coastal zone management area;*
- 3.b. *Ensure that new developments are compatible with their visual environment by designing and locating such developments to minimize the alteration of natural landforms and existing public views to and along the shoreline; and*
- 3.d. *Encourage those developments which are not coastal dependent to locate in inland areas.*

Discussion: Coastal scenic resources will not be significantly affected since all of the Project Area is located approximately 8,000 feet from the shoreline and outside of the Special Management Area. Applicable zoning regulations will restrict heights and density of development. No significant natural landforms will be altered. There are very limited opportunities for views towards the shoreline from this area because of the distance from the ocean, the moderate slopes and the abundant vegetation between the shoreline and the Project Area.

4. Coastal Ecosystems

Objective:

Protect valuable coastal ecosystems from disruption and minimize adverse impacts on all coastal ecosystems.

PROPOSED DISPOSITION OF STATE LAND TO UH FOR THE EXPANSION OF UH-HILO

Draft Environmental Assessment and Anticipated Finding of No Significant Impact

Policies:

- 4.a. *Improve the technical basis for natural resource management;*
- 4.b. *Preserve valuable coastal ecosystems of significant biological or economic importance.*
- 4.d. *Promote water quantity and quality planning and management practices which reflect the tolerance of fresh water and marine ecosystems and prohibit land and water uses which violate state water quality standards.*

Discussion: The Project Area is located far from the shoreline. However, any major development of the Project Area will need to incorporate measures necessary to mitigate any water quality impacts from surface run-off in accordance with applicable governmental regulations. Drainage improvements will be designed to control the quantity and quality of surface water to keep runoff to off-site areas to current levels. This will mitigate potential impacts to coastal resources by improving water quality before runoff leaves the Project Area and by restricting the quantity of runoff to current levels. Similarly, construction related impacts will be mitigated by the implementation of best management practices to control waterborne erosion. All discharges related to the project construction or operation activities will comply with the State's Water Quality Standards.

5. Economic Uses

Objective:

Provide public or private facilities and improvements important to the State's economy in suitable locations.

Policies:

- 5.a. *Concentrate coastal dependent development in appropriate areas;*
- 5.b. *Ensure that coastal dependent development such as harbors and ports, visitor industry facilities and energy generating facilities are located, designed and constructed to minimize adverse social, visual and environmental impacts in the coastal zone management area; and*
- 5.c. *Direct the location and expansion of coastal dependent developments to areas presently designated and used for such developments and permit reasonable long-term growth at such areas, and permit coastal dependent development outside presently designated areas when:*
 - ii. *Adverse environmental effects are minimized.*
 - iii. *The development is important to the State's economy.*

Discussion: The Project Area will not include coastal dependent development. Consequently, all the land uses planned for the Project Area will be located well in-land from coastal areas and are appropriate for the property. Therefore, existing coastal areas, and the economic activities associated with the Hilo bayfront will be unaffected by the project.

6. Coastal Hazards

Objective:

Reduce hazard to life and property from tsunami, storm waves, stream flooding, erosion, subsidence, and pollution.

Policies:

- 6.b. *Control development in areas subject to storm wave, tsunami, flood, erosion and subsidence.*

PROPOSED DISPOSITION OF STATE LAND TO UH FOR THE EXPANSION OF UH-HILO
Draft Environmental Assessment and Anticipated Finding of No Significant Impact

- 6.c. *Ensure that developments comply with the requirements of the Federal Flood Insurance Program.*

Discussion: The Project Area is not located in an area subject to tsunami runup, storm waves, stream flooding, erosion, subsidence or pollution.

7. Managing Development

Objective:

Improve the development review process, communication and public participation in the management of coastal resources and hazards.

Policies:

- 7.a. *Use, implement, and enforce existing law effectively to the maximum extent possible in managing present and future coastal zone development.*
7.b. *Facilitate timely processing of application for development permits and resolve overlapping or conflicting permit requirements.*
7.c. *Communicate the potential short- and long-term impacts of proposed significant coastal developments early in their life-cycle and in terms understandable to the general public to facilitate public participation in the planning and review process.*

Discussion: The UHH LRDP EIS will describe the environmental impacts of development of the Project Area and will be reviewed by both County and State land use Planning agencies, and the general public.

8. Public Participation

Objective:

Stimulate public awareness, education, and participation in coastal management.

Policies:

- 8.a. *Maintain a public advisory body to identify coastal management problems and to provide policy advice and assistance to the coastal zone management program;*
8.b. *Disseminate information on coastal management issues by means of educational materials, published reports, staff contact, and public workshops for persons and organizations concerned with coastal-related issues, developments, and government activities; and*
8.c. *Organize workshops, policy dialogues, and site-specific mediation to respond to coastal issues and conflicts.*

Discussion: The pre-assessment consultation and public review processes of this environmental assessment provide public awareness and education of the proposed project.

9. Beach Protection

Objective:

Protect beaches for public use and recreation.

Policies:

- 9.a. *Locate new structure inland from the shoreline setback to conserve open space and to minimize loss of improvements due to erosion;*

PROPOSED DISPOSITION OF STATE LAND TO UH FOR THE EXPANSION OF UH-HILO

Draft Environmental Assessment and Anticipated Finding of No Significant Impact

- 9.b. *Prohibit construction of private erosion-protection structures seaward of the shoreline, except when they result in improved aesthetic and engineering solutions to erosion at the sites and do not interfere with existing recreational and waterline activities; and*
- 9.c. *Minimize the construction of public erosion-protection structures seaward of the shoreline.*

Discussion: The Project Area is located well inland of the shoreline and is not subject to beach erosion.

10. Marine Resources

Objective:

Promote the protection, use, and development of marine and coastal resources to assure their sustainability.

Policies:

- 10.a. *Ensure that the use and development of marine and coastal resources are ecologically and environmentally sound and economically beneficial;*
- 10.b. *Coordinate the management of marine and coastal resources and activities management to improve effectiveness and efficiency;*
- 10.c. *Assert and articulate the interests of the State as a partner with federal agencies in the sound management of ocean resources within the United States exclusive economic zone;*
- 10.d. *Promote research, study, and understanding of ocean processes, marine life, and other ocean resources in order to acquire and inventory information necessary to understand how ocean development activities relate to and impact upon ocean and coastal resources; and*
- 10.e. *Encourage research and development of new, innovative technologies for exploring, using, or protecting marine and coastal resources.*

Discussion: The Project Area is located 8,000 feet inland of the shoreline and is not anticipated to have any effect on coastal or marine resources.

3.2 COUNTY OF HAWAI‘I

County of Hawai‘i land use policies and plans related to the proposed project include the Land Use Pattern Allocation Guide (LUPAG) map in the *County of Hawai‘i General Plan* (General Plan) and the Hawai‘i County Zoning Code. The Project Area is located well outside of the Special Management Area (SMA).

3.2.1 General Plan

The General Plan (February 2005 as amended) is a policy document for the long-range comprehensive development of the Island of Hawai‘i. The plan provides direction for the future growth of the County and offers policy statements that embody the expressed goals for present and future generations. The General Plan provides the legal basis for all subdivision, zoning, and related ordinances and for the initiation and authorization of all public improvements and projects.

The General Plan states courses of action for each of the island’s districts. For South Hilo, the general course of action is encouragement of commercial endeavors. The General Plan LUPAG designates the Project Area as “Low Density Urban” (see Figure 6). Therefore, the General Plan LUPAG designation for the Project Area will need to be amended to “University Use” to be consistent with the LUPAG

PROPOSED DISPOSITION OF STATE LAND TO UH FOR THE EXPANSION OF UH-HILO

Draft Environmental Assessment and Anticipated Finding of No Significant Impact

designation for the UHH main campus across the street. The General Plan also encourages development of UHH, with the acknowledgement that development relies on State funds which will be subject to competition from other counties.

Several courses of action apply to the proposed project:

Economic Development. The General Plan directs the County to encourage the State to provide necessary funding for the development of the university complex, and to provide necessary support services and facilities to aid the development of these complexes.

Public Facilities. The General Plan directs the County to support the expansion of the university system, specifically as related to the campus master plan.

3.2.2 County Zoning

The Project Area is zoned RS-10, Residential (see Figure 7). Sections 25-5-1 through 25-5-8 of the Hawai‘i County Code provide development standards for this zoning district. Although public uses are permitted in any district by Plan Approval (Hawai‘i County Code §25-4-11), the UHH would have greater flexibility (e.g., height limits, parking requirements) rezoning the Project Area to the University zoning district.

3.2.3 Special Management Area

The Special Management Area was established to protect coastal resources in areas extending inland of the shoreline. The Project Area is not in the Special Management Area (SMA).

3.3 APPROVALS AND PERMITS REQUIRED

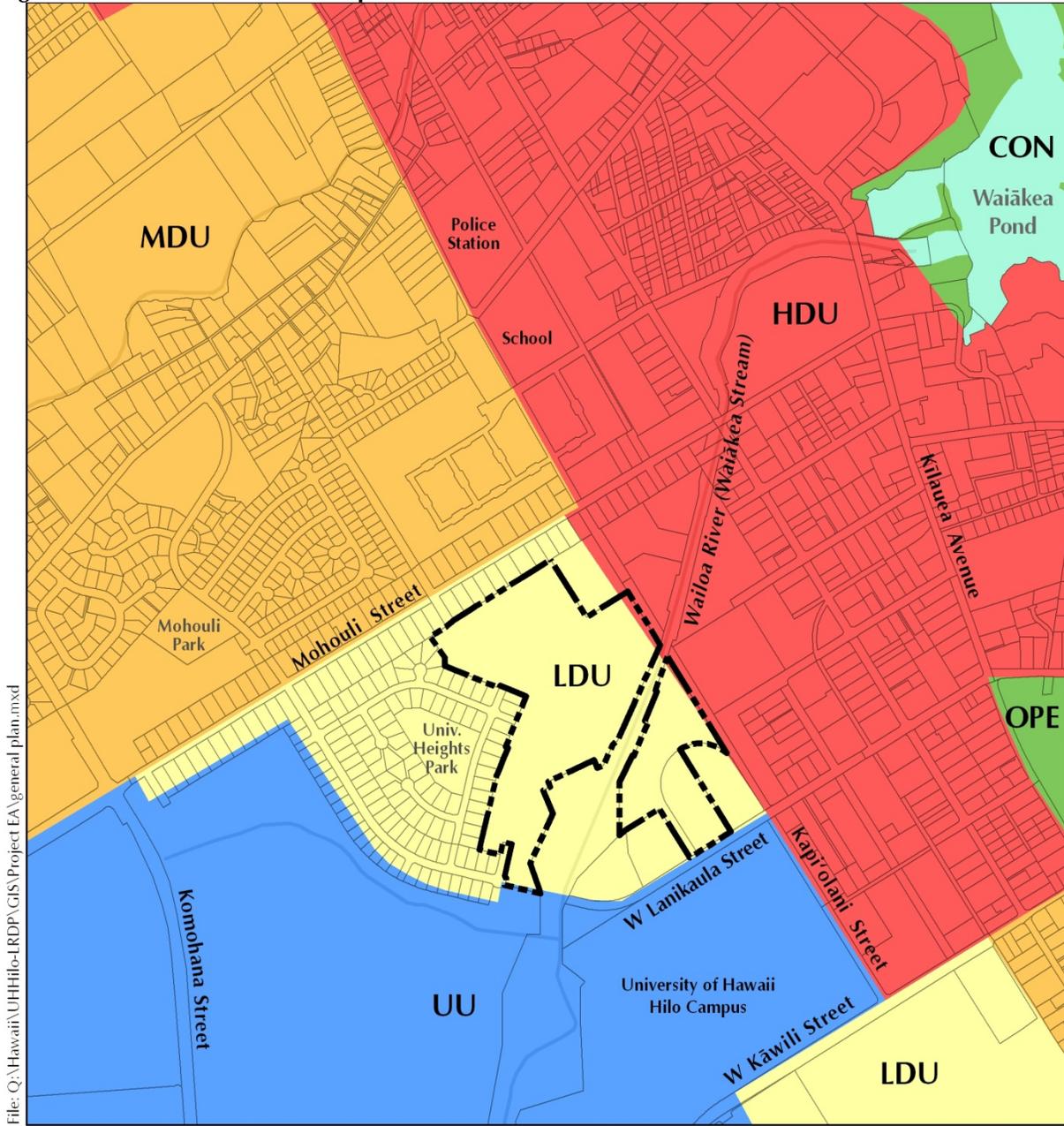
During the implementation stages of the project, UHH will be working with the State and County review agencies for examination and approval of project plans and specifications.

While the ultimate use of the Project Area will not be determined until the UHH LRDP is finalized, based on typical permits/approvals for university facilities, the following permits and approvals may be required:

<u>Permit/Approval</u>	<u>Authority</u>
<i>To finalize State land disposition to UH:</i>	
Lease Execution for Parcels (3) 2-4-001: 024 and 2-4-056: 014	Department of Land and Natural Resources
Lease Approval for Parcel 2-4-056: 016	Board of Land & Natural Resources
<i>Approvals Anticipated to implement LRDP Uses for the Project Area:</i>	
General Plan LUPAG Amendment	County of Hawai‘i, County Council
Rezoning	County of Hawai‘i, County Council
Plan Approval	County of Hawai‘i, Planning Department
Grading/Building Permits	County of Hawai‘i, Department of Public Works
ADA Accessibility	Disability and Communication Access Board
Approval for Sewer Connection	County of Hawai‘i, Department of Environmental Management
Permit to Work within County Right-of-Way	County of Hawai‘i, Department of Public Works
NPDES Permit	State of Hawai‘i, Department of Health

PROPOSED DISPOSITION OF STATE LAND TO UH FOR THE EXPANSION OF UH-HILO
Draft Environmental Assessment and Anticipated Finding of No Significant Impact

Figure 6. General Plan LUPAG Map



File: Q:\Hawaii\UHHilo-LRDP\GIS\Project EA\general plan.mxd

DATE: 9/17/2012

LEGEND

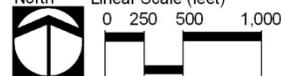
- LDU-Low Density Urban
- MDU-Medium Density Urban
- HDU-High Density Urban
- UU-University Use
- OPE-Open Area
- CON-Conservation
- Project Area

Source: County of Hawaii (2005)
 Disclaimer: This Graphic has been prepared for general planning purposes only and should not be used for boundary interpretations or other spatial analysis.

General Plan Map

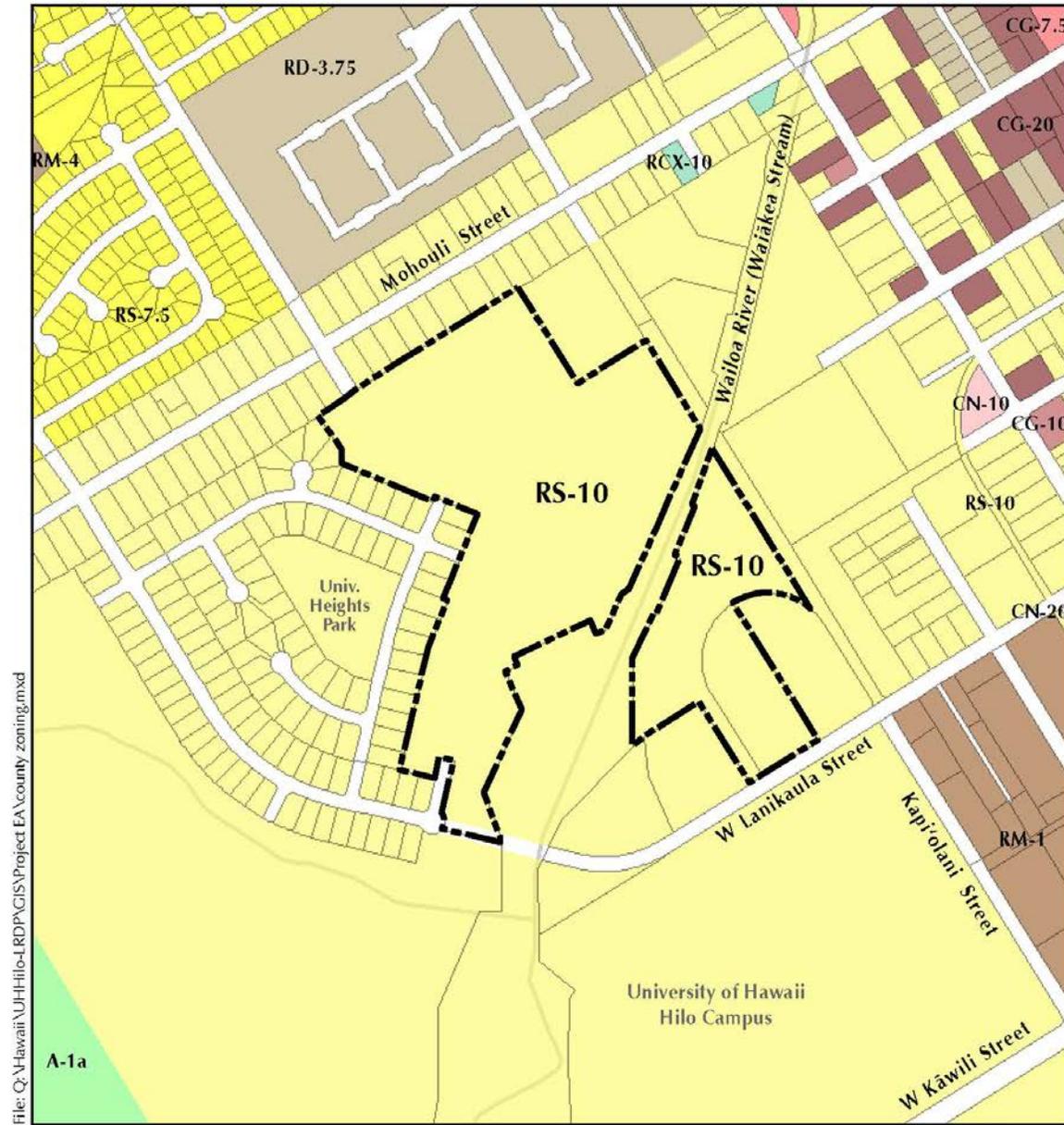
UHH Land Disposition

University of Hawai'i at Hilo Hilo, Hawai'i
 North Linear Scale (feet)



PROPOSED DISPOSITION OF STATE LAND TO UH FOR THE EXPANSION OF UH-HILO
Draft Environmental Assessment and Anticipated Finding of No Significant Impact

Figure 7. County Zoning



File: Q:\Hawaii\UH\Hilo-LRDP\GIS\Project EA\county zoning.mxd

DATE: 9/17/2012

LEGEND

- | | | |
|---|---|--------------|
| RS-7.5 Residential | RCX-10 Res./Com.Mix | Project Area |
| RS-10 Residential | CG-10 Commercial | |
| RD-3.75 Residential | CG-20 Commercial | |
| RM-1 Residential | CG-7.5 Commercial | |
| RM-4 Residential | CN-10 Commercial | |
| A-1a Agricultural | CN-20 Commercial | |

Source: County of Hawaii (2010)
 Disclaimer: This Graphic has been prepared for general planning purposes only and should not be used for boundary interpretations or other spatial analysis.

FIGURE 5

County Zoning Map

UHH Land Disposition

University of Hawai'i at Hilo Hilo, Hawai'i

North Linear Scale (feet)

0 150 300 600

4.0 DESCRIPTION OF THE AFFECTED ENVIRONMENT, POTENTIAL IMPACTS OF THE PROPOSED ACTION, AND MITIGATION MEASURES

This chapter discusses the existing environment of the Project Area, including physical, biological, social, economic, and infrastructure conditions. It also identifies potential impacts that may result from the project and provides mitigation measures that may be implemented.

4.1 CLIMATE

4.1.1 Existing Conditions

The climate in Hilo is very moderate, with average daytime temperatures ranging from 66 (low) to 82 (high) degrees Fahrenheit. Temperatures at night range from the low 60's to the upper 70's. Mean annual rainfall averages about 130 inches. Although the wet season usually occurs from October through April, rain falls approximately 280 days of the year. Northeast trade winds typically occur during the day, while winds from the southwest typically occur during the night due to cold air drainage from the mountains. The mean annual wind speed recorded at the Hilo International Airport (about two miles northeast of the UHH main campus) is about 8 miles per hour (mph) and usually varies between about 4 and 12 mph during the day.

4.1.2 Potential Impacts and Mitigation Measures

No use is currently proposed for the Project Area, thus the proposed land lease of the Project Area to the University will not pose any impacts on the climate. While the ultimate UHH use of the Project Area is unknown at this time, it is unlikely that any proposed building design will be approved that will have a negative impact on the climate.

4.2 TOPOGRAPHY

4.2.1 Existing Conditions

The elevation of the Project Area ranges from approximately 80 feet to 180 feet above mean sea level (MSL). The topography of the Project Area averages approximately 8 percent in a northerly direction.

4.2.2 Potential Impacts and Mitigation Measures

The relatively level site is suitable for university uses. While the ultimate use of the Project Area is unknown until the LRDP is finalized, it is likely the construction of any new buildings, landscaped areas, parking or playfields will require vegetation removal, earthwork, and grading. All grading operations will be conducted in full compliance with dust, erosion control and other governmental requirements. All construction activities will comply with the provisions of Chapter 11-60.1, Hawai'i Administrative Rules, on fugitive dust. A grading permit is required.

4.3 SOILS

4.3.1 Existing Conditions

Soil types within the subject parcel are identified in the U.S. Department of Agriculture Natural Resources Conservation Service Soil Survey as Keaukaha highly decomposed plant material, 2 to 10

PROPOSED DISPOSITION OF STATE LAND TO UH FOR THE EXPANSION OF UH-HILO

Draft Environmental Assessment and Anticipated Finding of No Significant Impact

percent slopes Keaukaha Extremely Rocky Muck (rKFD) (6 - 20 percent slopes) and Papai Extremely Stony Muck (rPAE) (3 – 25 percent slopes) (see Figure 8). The descriptions of the two series of soils types are provided below:

The Keaukaha component makes up 45 percent of the map unit. Slopes are 2 to 10 percent. This component is on pahoehoe lava flows on shield volcanoes on islands. The parent material consists of organic material over pahoehoe lava. Depth to a root restrictive layer, bedrock, lithic, is 2 to 10 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is low. Available water to a depth of 60 inches is very low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 60 percent. Non-irrigated land capability classification is 7s. Irrigated land capability classification is 7s.

The Panaewa component makes up 45 percent of the map unit. Slopes are 2 to 10 percent. This component is on ash fields on pahoehoe lava flows on shield volcanoes on islands. The parent material consists of basic volcanic ash over pahoehoe lava. Depth to a root restrictive layer, bedrock, lithic, is 4 to 20 inches. The natural drainage class is moderately well drained. Water movement in the most restrictive layer is low. Available water to a depth of 60 inches is very low. Shrink-swell potential is low. This soil is not flooded. It is occasionally ponded. A seasonal zone of water saturation is at 6 inches during October, November. Organic matter content in the surface horizon is about 8 percent. Non-irrigated land capability classification is 6s. Irrigated land capability classification is 6s. This soil does not meet hydric criteria.

4.3.2 Potential Impacts and Mitigation Measures

The soils do not seem to pose any constraints for the proposed university use. The soils are well-drained (not “hydric” wetlands), not highly erodible, and have low suitability for agriculture.

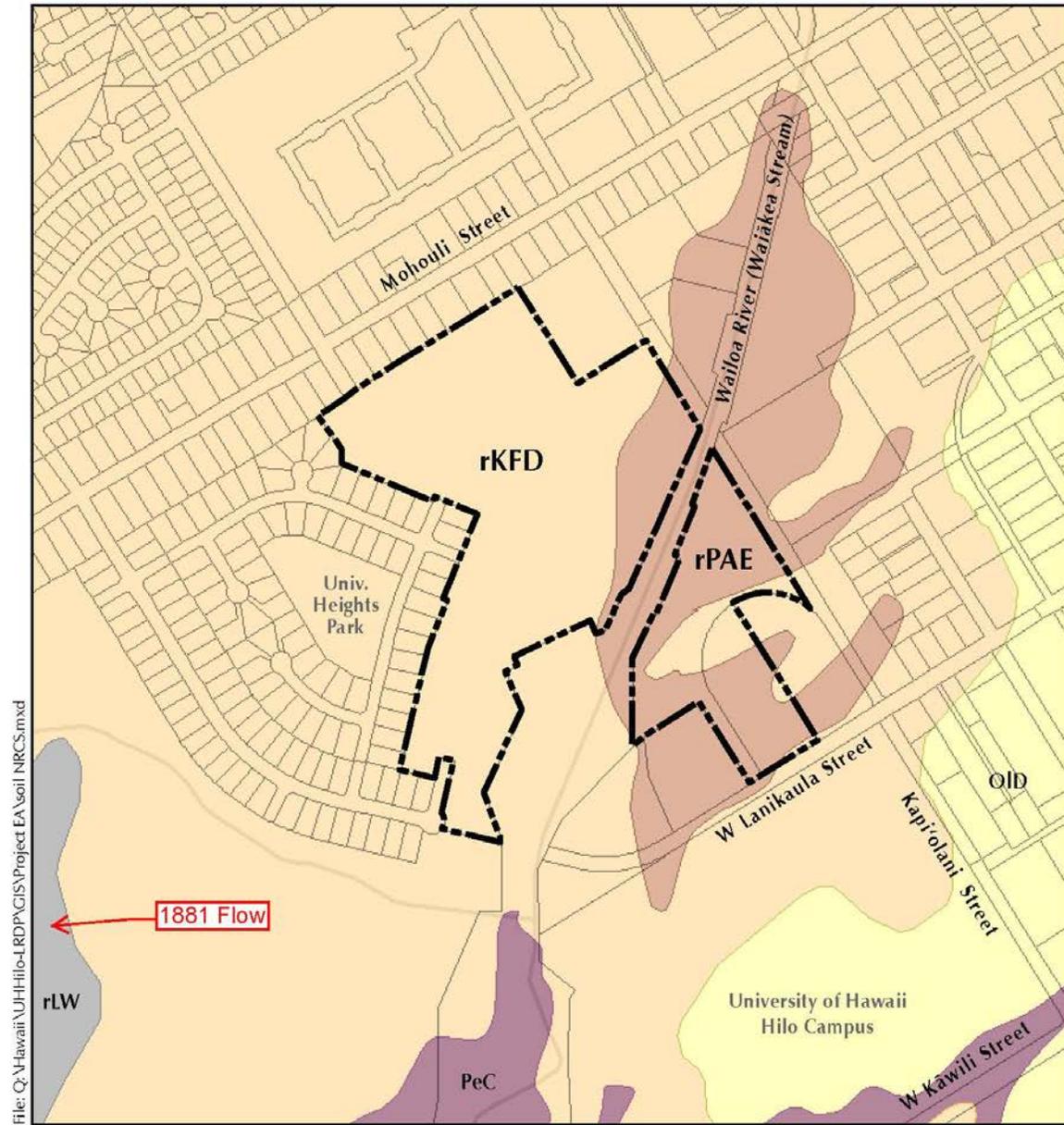
The LRDP EIS will address potential impacts of the ultimate use of the Project Area in more detail. The potential for soil erosion may increase during construction and decrease after development of the Project Area. Generally, because of light wind conditions, the potential of wind-borne soil erosion is relatively low. An increase in soil erosion potential will result from removal of existing vegetation during the construction period. However, all contractors will be required to institute best management practices (BMPs) to minimize soil erosion and degradation of water quality. Soil erosion potential after development will be reduced due to the establishment of permanent landscaping (e.g., streamside buffers) and drainage improvements.

Geotechnical investigations will be conducted at the time a specific project is proposed to verify soil types and the foundation requirements for construction. Erosion control plans will be prepared for all construction work. The erosion control plan will identify specific BMPs which will be employed to minimize erosion and runoff from the Project Area. In addition, construction activities will be subject to conditions of the National Pollutant Discharge Elimination System (NPDES) permit for discharge of storm water associated with construction activities. Minimizing Project Area erosion and associated sediment transport to State waters is a primary objective of this permit.

Mitigation measures may include hydro-mulching with seeds or placement of erosion control matting to stabilize slopes and exposed surfaces, and construction of a graveled ingress/egress for use by construction vehicles at the entrance of the Project Area to minimize the tracking of debris onto paved streets. Silt fences, berms, temporary siltation basins and other means of protecting water quality may be employed to prevent direct discharge of sediment-laden storm runoff to municipal storm drains.

PROPOSED DISPOSITION OF STATE LAND TO UH FOR THE EXPANSION OF UH-HILO
Draft Environmental Assessment and Anticipated Finding of No Significant Impact

Figure 8. Soil Survey Map



File: Q:\Hawaii\UH\Hilo-LRDP\GIS\Project EA\Soil_NRCS.mxd

DATE: 9/17/2012

LEGEND

- OId-Olaa extremely stony silty clay loam, 0-20% slopes
- PeC-Panaewa very rocky silty clay loam, 0-10% slopes
- rKFD-Keaukaha extremely rocky muck, 6-20% slopes
- rLW-Lava flows, pahoehoe
- rPAE-Papai extremely stony muck, 3-25% slopes

Project Area

Source: U.S. Department of Agriculture Natural Resources Conservation Service (2007)
 Disclaimer: This Graphic has been prepared for general planning purposes only and should not be used for boundary interpretations or other spatial analysis.

Soil Survey Map

UHH Land Disposition

University of Hawai'i at Hilo Hilo, Hawai'i

North Linear Scale (feet)

0 150 300 600

4.4 HYDROLOGY AND DRAINAGE

4.4.1 Existing Conditions

The Project Area is bisected by Waiākea Stream, an ephemeral stream that flows only during heavy rainfall. Waiākea Stream is tributary to Wailoa River. Waiākea Stream itself has several branches. Although some of these branches may be perennial in their upper reaches, the branch that flows through the Project Area has discontinuous flows in the middle and lower reaches. The 1881 lava flow has buried some segments of the stream and forced flow underground (AECOS 2012).

The portion of the Lower Waiākea Stream that flows through the UH Hilo and Project Area is partially channelized. It is fully channelized from approximately 100' mauka of the intersection of Mohouli and Kinoole Streets to the mouth of the stream where it empties into Wailoa Pond. The 100-year flood zone for this stream is defined on the Flood Insurance Rate Map. This 100-year flood zone is within a separate parcel (TMK 2-1-001:019). The parcel generally encompasses a buffer area where no development would be permitted in proximity to the stream (see Figure 9). Fieldwork by a biologist and consultation of U.S. Geological Survey maps and U.S. Fish and Wildlife Service National Wetland Inventory maps indicate that there are no wetlands within the Project Area.

The Department of Health has included Waiākea Stream on its 2006 list of impaired waters pursuant to the Clean Water Act §303(d) (DOH 2008). Based on visual observations, the listing indicates that Waiākea Stream may not meet Hawai'i water quality standards for certain parameters.

4.4.2 Potential Impacts and Mitigation Measures

The Project Area excludes the parcel that encompasses the Waiākea Stream. The LRDP EIS would address any necessary mitigation measures for specific uses of the Project Area.

Depending on the ultimate use of the Project Area (as determined through the LRDP process) development may increase the percentage of impervious surfaces within the Project Area and thus increase the volume of storm runoff from the Project Area. During construction, mitigation measures may include temporary siltation basins to detain runoff and minimize sediment transport to off-site areas. Review and enforcement of best management practices will be through the County's grading permit and the Department of Health's National Pollution Discharge Elimination System (NPDES) permit.

After development, the drainage system will be designed to ensure no increase in runoff toward adjacent properties. On-site measures will be employed to detain any increase in runoff due to development. Mitigation measures that may be employed on a long-term basis include storm drain drywells and landscaping/grading to provide filtering and detention of runoff, if required. In addition, the Project Area may be landscaped to help minimize runoff and provide pervious surfaces. All discharges related to the project construction or operation activities will comply with the State's Water Quality Standards. Appropriate mitigation measures will be included in the LRDP EIS to ensure that development of the Project Area does not contribute towards the impaired status of Waiākea Stream during and after construction.

PROPOSED DISPOSITION OF STATE LAND TO UH FOR THE EXPANSION OF UH-HILO

Draft Environmental Assessment and Anticipated Finding of No Significant Impact

Figure 9. Flood Insurance Rate Map

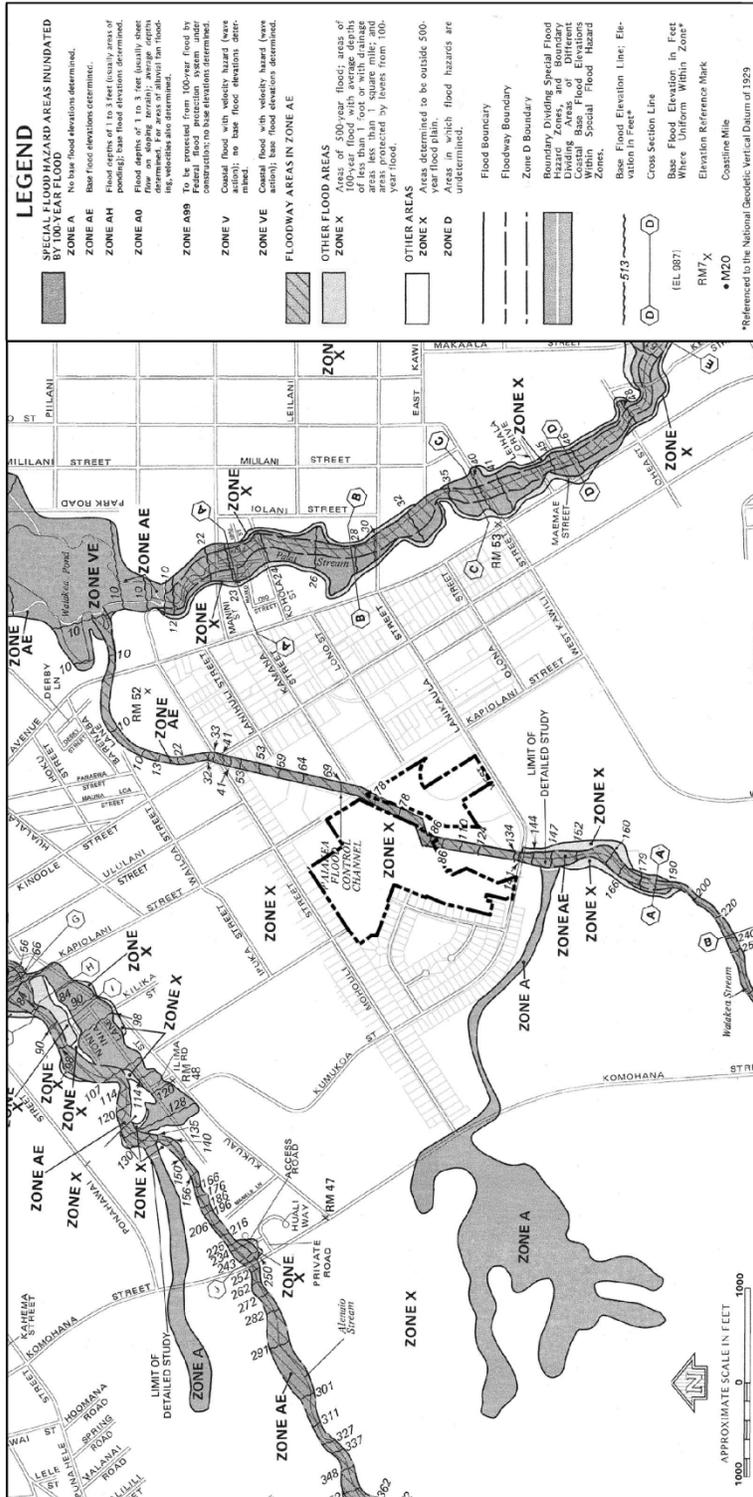


FIGURE 10
Flood Insurance Rate Map
UHH Land Disposition
University of Hawaii at Hilo

PROPOSED DISPOSITION OF STATE LAND TO UH FOR THE EXPANSION OF UH-HILO

Draft Environmental Assessment and Anticipated Finding of No Significant Impact

4.5 NATURAL HAZARDS & HAZARDOUS MATERIALS

4.5.1 Existing Conditions

Hurricanes, tsunamis, earthquakes, and lava flows represent the major natural hazards on the island of Hawai'i. The Project Area is elevated above and located more than 1.5 miles from the shoreline. As such, it would not be vulnerable to tsunamis.

According to the Flood Insurance Rate Map (FIRM), most of the Project Area is designated "Outside Floodplain/Area of Minimal Flooding" (Figure 10). Thus, the Area does not appear vulnerable to flooding or wave action hazards.

According to the Pacific Disaster Center, the Project Area is located outside of the tsunami evacuation zone. Tsunami evacuation zones are derived from tsunami inundation maps, but are more conservative than the inundation maps in that they encompass a greater area that are potentially at risk that should be evacuated and refer to readily identifiable physical landmarks such as roads where possible. The evacuation zones apply to distant tsunamis, assuming worst case wave action from any probable source. The Project Area is not affected since it is situated outside the tsunami evacuation zone.

The U.S. Geologic Survey report identifies the degree of volcanic hazard of this area to be 3 out of a scale of 9. The lower the number, the greater the degree of hazard. It should be noted that the entire city of Hilo has been designated Zone 3. In 1881, a historic lava flow from Mauna Loa flowed into Hilo within one mile of Hilo Bay.

A Phase 1 Environmental Site Assessment (ESA) was conducted for the Kapi'olani Street Extension (Myounghee Noh and Associates 2012). Although the study was specific to the proposed corridor for that street, the background research encompassed two of the Project Area parcels (2-4-001:024 and 2-4-056:014). The Army will be conducting an ESA of the third Project Area parcel (2-4-056:014) prior to the transfer of that parcel to the State. Based on a review of federal and State databases for hazardous substances or petroleum product releases, the Phase 1 ESA found no evidence that these lands have been previously used or developed other than for farming prior to 1940 and light grazing prior to 1986. These uses indicate little potential for historical use or storage of regulated or hazardous chemicals onsite. There were no indications of illegal dumping.

4.5.2 Potential Impacts and Mitigation Measures

There are no hazardous conditions that affect the suitability of the Project Area for university uses. Depending on the ultimate use of the Project Area (as determined through the LRDP process), the potential impact of hurricanes and earthquakes will be mitigated by compliance with the County Building Code in the design and construction of the proposed buildings.

4.6 FLORA

4.6.1 Existing Conditions

A walk-through field study of the Project Area's botanical resources was conducted by Robert Hobdy in November 2012 (attached as Appendix B). The vegetation on the undeveloped portion of the Site is dominated by non-native trees, shrubs, vines, grasses and ferns that have grown into a dense, multi-layered tropical jungle. A total of 136 plant species were recorded during four site visits. The one species that was truly abundant throughout most of the area was strawberry guava (*Psidium cattleianum*), a small shade tolerant tree that proliferates in the understory of larger trees and creates a nearly impenetrable

PROPOSED DISPOSITION OF STATE LAND TO UH FOR THE EXPANSION OF UH-HILO

Draft Environmental Assessment and Anticipated Finding of No Significant Impact

barrier. Also common were the gunpowder tree (*Trema orientalis*), the melochia tree (*Melochia umbellata*) and the maile hohonu vine (*Paederia foetida*) that drapes over trees and shrubs.

Six plant species were native: the endemic neneleau (*Rhus sandwicensis*) which is found only in Hawai'i, and five indigenous species: hala tree (*Pandanus tectorius*), koali awahia (*Ipomoea indica*), (*Cyperus polystachyos*) no common name and two ferns, (*Crepidomanes minutum*) no common name, and pakahakaha (*Lepisorus thunbergianus*) all of which are native to Hawai'i as well as to other Pacific islands. Six species were plants which the Polynesians brought here during the course of their migrations: kukui (*Aleurites moluccana*), niu (*Cocos nucifera*), kī (*Cordyline fruticosa*), 'ape (*Alocasia macrorrhiza*), hau (*Talipariti tileaceum*) and 'ihi 'ai (*Oxalis corniculata*). The remaining 124 plants were non-native species.

Based on the study, none of the plants inventoried were listed as threatened or endangered species; nor were any proposed as candidates for such status. All of the 6 native species found are widespread in Hawai'i and common.

4.6.2 Potential Impacts and Mitigation Measures

Because the Project Area contains no threatened or endangered plant species or their habitats, development of the Project Area is not expected to have a significant impact on botanical resources. Native plants will be used for landscaping wherever possible, and where feasible, existing vegetation will be maintained and incorporated into the landscape design.

4.7 FAUNA

4.7.1 Existing Conditions

A walk-through fauna survey was conducted by Robert Hobdy in November 2012 in conjunction with the botanical survey (see Appendix B). All parts of the Project Area including all habitat types were covered. Field observations were made with the aid of binoculars and by listening to vocalizations. Notes were made on species, abundance, activities and location as well as observations of trails, tracks, scat and signs of feeding. In addition, an evening visit was made to the area to record crepuscular activities and vocalizations and to see if there was any evidence of occurrence of the Hawaiian hoary bat (*Lasiurus cinereus semotus*) in the area.

The fauna of this property are largely made up of non-native species that have been either purposeful or accidental introductions to Hawai'i. Just three species were found to be native, the endangered 'ōpe'ape'a or Hawaiian bat and two indigenous dragonflies, the globe skimmer and the green darner.

Birds:

Birdlife was moderate both in species diversity and in total numbers seen. Ten species of non-native birds were observed during four site visits to the Project Area. Two bird species were common: common myna (*Acridotheres tristis*) and zebra dove (*Geopelia striata*). Less common were spotted dove (*Streptopelia chinensis*), northern cardinal (*Cardinalis cardinalis*) and Japanese white-eye (*Zosterops japonicus*). A few other non-native birds would be occasional users of this site.

The habitat is unsuitable for Hawai'i's native forest birds which presently occupy native forest uplands beyond the elevational range of mosquitoes and the avian diseases they carry and transmit. This dense jungle also does not provide habitat for the other native Endangered birds like the ae'o or Hawaiian stilt

PROPOSED DISPOSITION OF STATE LAND TO UH FOR THE EXPANSION OF UH-HILO

Draft Environmental Assessment and Anticipated Finding of No Significant Impact

(*Himantopus mexicanus knudseni*), the alae ke'oke'o or Hawaiian coot (*Fulica alai*) and the nēnē or Hawaiian goose (*Branta sandvicensis*). None of these native birds were seen.

Mammals:

Two mammal species' were recorded during four site visits in the Project Area. These included the feral pig (*Sus scrofa*) and the Hawaiian hoary bat.

Extensive rooting and wallows by feral pigs were observed in different parts of the Project Area indicating the presence of a significant population of these animals. Feral pigs are common throughout much of the Big Island.

An evening survey was conducted at two locations in the Project Area in order to ascertain the presence of the endemic and Endangered 'ōpe'ape'a or Hawaiian hoary bat. A bat detecting device (Batbox IIID) was employed, set to the frequency of 27,000 Hertz which these bats are known to use for echo location. As soon as this device was turned on at each location, multiple bats were detected emitting their echolocation calls as they flew about in search of flying insects. This level of activity indicated a substantial population of these bats at the time of the survey.

Other non-native mammals would be expected to be present in this habitat. These include mice (*Mus domesticus*), rats (*Rattus* spp.), mongoose (*Herpestes auropunctatus*) and cats (*Felis catus*). Mice and rats feed on seeds, fruits and herbaceous vegetation, while the mongoose and cats would prey on these rodents and birds.

Insects:

There were moderate amounts of insect life on this property mostly observed in the undeveloped portion of the Project Area. Eight insect species were found during four site visits. Two of these species were of common occurrence, the Asian tiger mosquito (*Aedes albopictus*) and the small pomace flies (*Drosophila melanogaster*). Two dragonfly species are indigenous in the islands as well as in tropics elsewhere, the globe skimmer (*Pantala flavescens*) and the green darner (*Anax junius*).

No Endangered insects were observed during the survey. None of the host plants of Blackburn's sphinx moth (*Manduca blackburni*) were found on the property and none of the moths or their larvae were seen. None of the three Endangered Big Island fruit flies, *Drosophila heteroneura*, *D. mulli* or *D. ochrobasis* were seen. These three Endangered species are known from good native forests at much higher elevations in other parts of the Big Island. No Hawaiian damselflies were seen during the survey. Two Big Island species, *megalagrion nesiotes* and *M. Xanthomelas*, are Endangered. This property lacks the aquatic habitat suitable for these damselflies.

Amphibians, Reptiles and Mollusks:

Just one non-native amphibian was found during the survey, the Puerto Rican coqui frog (*Eleutherodactylus coqui*). This frog was found to be abundant across the entire property, and indeed has become abundant across the entire wet windward side of the Big Island. It is considered to be a pest because of its extremely loud nocturnal calls.

No reptiles or mollusks were seen during the survey.

PROPOSED DISPOSITION OF STATE LAND TO UH FOR THE EXPANSION OF UH-HILO

Draft Environmental Assessment and Anticipated Finding of No Significant Impact

4.7.2 Potential Impacts and Mitigation Measures

The native dragonflies, globe skimmer and the green darner, as previously discussed are common in Hawai'i and are also in the tropics elsewhere. No mitigation measures are necessary for the native dragonflies.

The 'ōpe'ape'a, however, is endemic to the Hawaiian Islands and is an Endangered species as well, carrying with it federal protections. It occurs on at least five of the major Hawaiian Islands and has its largest population on Hawai'i Island. These bats are highly mobile and are known to move up and down slopes, from about 10,000 feet in the subalpine zone down to sea level. Movements are likely driven by food source availability. They can show up almost anywhere in a wide range of habitats.

The U.S. Fish and Wildlife Service has jurisdiction over these bats under powers outlined in the Endangered Species Act (1973). They should be consulted before any construction and development occurs on the Project Area. They will determine what actions should be taken that will ensure the welfare of the 'ōpe'ape'a. A possible mitigation measure would be to restrict clearing of woody vegetation taller than 15' during the bat pupping season (June 1 through September 15).

4.8 CULTURAL, ARCHAEOLOGICAL AND HISTORIC RESOURCES

4.8.1 Existing Conditions

4.8.1.1 Cultural Assessment

Scientific Consultant Services Inc. (SCS) prepared a cultural impact assessment for the undeveloped parcels of the Project Area (TMK (3) 2-4-001:024 and 2-4-056:014) to identify traditional customary practices within the Project Area and in the vicinity of the area. The Army Reserve site (TMK (3) 2-4-056:016) is developed and has been used for military uses; however, additional consultation for this parcel is being conducted and will be reported in the Final EA. The cultural impact assessment was conducted in accordance with the OEQC Guidelines for Assessing Cultural Impacts and includes archival research of UHH and the surrounding area. Findings of the cultural impact assessment and other relevant information are summarized below. Appendix D contains the complete cultural impact assessment.

Historical accounts and archaeological/cultural studies pertaining to the ahupua'a of Waiākea (Ellis 1963; Bingham 1969; Handy and Handy 1972; Bird 1974; McEldowney 1979; Kelly et al. 1981; and Maly 1996) provide a wealth of information on traditional settlement patterns, land-use, and subsistence horticulture of the area. These are synthesized below as they allude to the types of sites that may be encountered in the project area.

Historical accounts of residence patterns, land-use, and subsistence horticulture are believed to be indicative of traditional practices developed long before contact with Europeans (McEldowney 1979). Early accounts describe several distinct environmental regions in Waiākea. From the coast inland five or six miles, scattered subsistence agriculture was evident, followed by a region of tall fern and bracken, flanked at higher elevations by a forest region between 10 and 20 miles wide, beyond which was an expanse of grass and lava (Ellis 1969:403). The American Missionary C.S. Stewart wrote, "the first four miles of the country is open and uneven, and beautifully sprinkled with clumps, groves, and single trees of the bread-fruit, pandanus, and candle tree (Stewart 1970:361–363). The majority of Waiākea's estimated 2,000 inhabitants (in 1825) lived within this coastal region (Ellis 1969:253). Taro, plantains, bananas, coconuts, sweet potatoes, and breadfruit were grown individually or in small garden plots. Fish, pig, dog, and birds were also raised and captured for consumption.

PROPOSED DISPOSITION OF STATE LAND TO UH FOR THE EXPANSION OF UH-HILO

Draft Environmental Assessment and Anticipated Finding of No Significant Impact

The present study area is located along the upper reaches of the open coastal region and the lower reaches of the tall fern and bracken zone. It is located in McEldowney's "upland agricultural zone" (see Previous Archaeology section) consisting of "scattered huts" amidst "garden "plots" created through "shifting agriculture" (McEldowney 1979:18–19). Wood, such as ohia and koa for house construction, canoe building, and fires was obtained from this upland agricultural zone, and from the dense forests above (Ellis 1963:236). Hala for thatching was also known to be plentiful along the lava flows of eastern Waiākea (Ellis 1917, cited in Kelly et al. 1981:20). Of particular interest is a description of bird snaring and mention of banana growing in the area of the present study (Maly 1996:6–8)...

Between 1845 and 1865, traditional land-use and residential patterns underwent a change. In particular, the regular use of Hilo Bay by foreign vessels, the whaling industry, the establishment of missions in the Hilo area, the introduction of the sandalwood trade, the legalization of private land ownership, the introduction of cattle ranching, and the introduction of sugar cane cultivation all brought about changes in settlement patterns and long-established land-use patterns (Kelly et al. 1981). Hilo became the center of population and settlements in outlying regions declined or disappeared. While food was still grown for consumption, greater areas of land were continually given over to the specialized cultivation and processing of commercial foodstuffs for export. Sugar cane plantations and industrial facilities were established in areas that were once upland agricultural areas and coastal settlements, respectively.

SCS, Inc. conducted an archaeological inventory survey of the project site in 2013. Nineteen new sites comprising 67 features were recorded during the course of the current archaeological inventory survey (refer to section 4.8.1.3 of this EA below). SCS determined that the vast majority of sites within the study area are associated with historic era sugarcane cultivation, ranching, or the Hilo Dairy facilities. None of the sites were interpreted as pre-Contact.

SCS, Inc. sought comments from Kai Markell, the Director of Native Rights, Land and Culture, Office of Hawaiian Affairs on O'ahu; Kauanoë Hoomanawanui, SHPD Burial Sites Specialist; Rick Gmerkin, Ala Kahakai National Historic Trail, NPS Archaeologist; Mililani Trask; Carol Fukunada; and Iva Goldman. According to SCS, Inc. none of the organizations or individuals that responded was aware of ongoing or past cultural resources or practices associated with lands of the Project Area. Those individuals who had knowledge of the Project Area lands responded that they were not aware of any cultural resources or ongoing cultural practices or beliefs associated with those lands.

4.8.1.2 Archaeological and Historical Assessment

An archaeological inventory survey (AIS) study of the subject parcels was performed by Scientific Consultant Services Inc. (SCS) from November 2012 to March 2013 (see Appendix C). During the reconnaissance survey, SCS crewmembers were paced 10 to 15 meters apart and traversed the Project Area. Interval spacing was reduced to as much as five meters apart in areas of thick ground cover (stands of bamboo, guava and *uluhe* fern). All features were surveyed and plotted on a GIS map.

Nineteen new sites comprised of 67 features were recorded. The majority of all sites within the study area were associated with historic sugar cane cultivation and dairy farming. None of the sites were interpreted as pre-Contact in nature. This is consistent with SCS research and analysis of previous archaeological studies, geological studies, historical research, interviews and County Planning Department records – which can be predicted to consist of sugar cane cultivation and processing sites. As SCS notes in their report:

PROPOSED DISPOSITION OF STATE LAND TO UH FOR THE EXPANSION OF UH-HILO

Draft Environmental Assessment and Anticipated Finding of No Significant Impact

“...Archaeological investigations and historical documentation have shown that the predominant site type in this area is associated with Waiakea Mill Company plantation fields. Pre-Contact sites are infrequently documented and were likely dismantled or obscured by cane field clearing (Maly 1996)...

Nineteen new sites comprising 67 features were recorded during the course of the current archaeological inventory survey...The vast majority of sites within the study area are associated with historic era sugarcane cultivation, ranching, or the Hilo Dairy facilities. None of the sites were interpreted as pre-Contact.”

No further work was recommended by SCS at all of the sites documented in the AIS. Significant data contained in these sites have been collected in the form of measurements, photographs, descriptions, figures, oral interviews, and historic research. According to SCS, the appropriate research has been conducted at all Project Area sites, and further study will not contribute any new information.

SCS surveyed the former Army Reserve site (TMK 2-4-056:016) and found: “The ground surface is mown grass lawn and pavement parking lots. No archaeological features or historic properties exist within the proposed project area.” SCS determined the following for the existing structures: “The structures are modern, are not historic properties, and are not eligible for listing on the National Register of Historic Places or the Hawai‘i Register of Historic Places.” (see Letter Report dated September 21, 2012 in Appendix C).

4.8.2 Potential Impacts and Mitigative Measures

4.8.2.1 Cultural Impact Assessment

Based on SCS’ results of a pedestrian survey of the Project Area, the results of previous archaeological studies at the school campus, as well as organizational response, individual cultural informant responses, and archival research, it is reasonable to conclude that, pursuant to Act 50, the exercise of Native Hawaiian rights, or any ethnic group, related to gathering, access or other customary activities will not be affected by development activities on this parcel. No cultural activities were identified within the Project Area, and the proposed undertaking will not produce adverse effects to any Native Hawaiian cultural practices. Therefore, the proposed lease of the Project Area to the University will not pose any impacts on cultural resources.

4.8.2.2 Archaeological and Historical Impact Assessment

During the course of preparing the AIS, 19 new sites comprised of 67 features were recorded. None of the sites were interpreted as pre-Contact in nature. No further work was recommended by SCS at all of the sites documented in the AIS. No use is currently proposed for the Project Area, thus the proposed lease of the Project Area to the University will not pose any impacts on the archaeological resources of the Project Area. Should iwi kūpuna or Native Hawaiian cultural or traditional deposits be found during the construction of the building, work will cease, and the appropriate agencies will be contacted pursuant to applicable law.

4.9 ROADS AND TRAFFIC

4.9.1 Existing Conditions

The Project Area abuts five streets: Popolo Street from the north (stub out), Noe and Kalili Streets from the west (stub outs), Kumukoa Street along the southwest and West Lanikaula Street along the South. The Project Area also abuts the planned extension of Kapi‘olani Street (see Figure 4).

PROPOSED DISPOSITION OF STATE LAND TO UH FOR THE EXPANSION OF UH-HILO

Draft Environmental Assessment and Anticipated Finding of No Significant Impact

4.9.2 Potential Impacts and Mitigation Measures

The availability of multiple access points to the Project Area is highly suitable for the proposed university use. Depending on the ultimate use of the Project Area (as determined through the LRDP process), measures proposed to mitigate traffic impacts resulting from development of the project may include:

Mitigation of Short-Term Construction Impacts. The contractor shall conform to the safety precautions and requirements of the Rules and Regulations Governing the Use of Traffic Control Devices at Work Sites on or Adjacent to Public Streets and Highways, adopted by the Highway Safety Coordinator, and the U.S. Federal Highway Administration's Manual on Uniform Traffic Control Devices for Streets and Highways, Part VI, Traffic Controls for Highway Construction and Maintenance Operations. Other conditions to be imposed on the contractor to minimize traffic disruptions include:

- (1) Access to and from driveways and public streets shall be provided during most times, but especially during peak hour traffic.
- (2) During non-working hours, any trenches shall be covered with steel plates and all lanes shall be open to traffic.
- (3) As required by the County of Hawai'i, special duty police officers shall be hired to direct the flow of traffic.
- (4) All walkways and intersections shall be maintained in passable condition for pedestrian traffic.

Limited Access to Kapi'olani Street. Since Kapi'olani Street will be a major collector, the LRDP will plan the proposed uses to minimize access points to Kapi'olani Street, in accordance with the County Department of Public Works comments, and thereby preserve the through-traffic function of a major collector.

The LRDP EIS will include a traffic assessment to address the cumulative impacts of the overall UHH campus development.

4.10 AIR QUALITY

4.10.1 Existing Conditions

The State Department of Health (DOH) maintains a limited network of air monitoring stations around the State to gather data on certain regulated pollutants. Currently, no routine ambient air monitoring is conducted by DOH in the Hilo area. Historical monitoring during the 1970's and 1980's indicated very low pollutant levels in Hilo and there is little reason to believe this has changed significantly.

While air quality in the Hilo area is very good for the most part, periodic degradation occurs naturally due to the active volcano, Kilauea, located almost directly south of Hilo. This degradation occurs under southerly or kona wind conditions when plumes from the volcanic vents are carried toward Hilo, which is intermittent, and not continuous.

4.10.2 Potential Impacts and Mitigation Measures

Depending on the ultimate use of the Project Area (as determined through the LRDP process), use of the Project Area may generate more vehicle trips to and from the Project Area on a daily basis. These trips will essentially be split between the morning and afternoon work hours. The impact of possibly higher vehicle trips needs to be

PROPOSED DISPOSITION OF STATE LAND TO UH FOR THE EXPANSION OF UH-HILO

Draft Environmental Assessment and Anticipated Finding of No Significant Impact

assessed against usual tradewind patterns, the projected volume of vehicles generated by the ultimate use of the Project Area, and the fact that newer cars are both more fuel efficient and have better emission controls.

Construction activity will be the principal source of short-term air quality impact. Construction vehicle activity will increase automotive pollutant concentrations along the existing roadways as well as on the Project Area. Site preparation, earth moving, and building and road construction will create particulate emissions. Movement of construction vehicles on unpaved surfaces will also generate particulate emissions.

No exceedance of state or federal carbon monoxide standards is anticipated from motorized vehicles is anticipated. Concentrations will increase with or without the project due to increased traffic volumes, reduced average speed, and queuing at signalized intersections.

Although the potential for fugitive dust seems low due to the wet climate and low wind speeds, adequate dust control will be employed, particularly at dry periods during construction. Dust control will be accomplished by frequent watering of unpaved construction roads within the Project Area and areas of exposed soil surfaces. As soon as it is feasible, landscaping of completed areas will also be employed. Dust control measures will comply with applicable provisions of HAR section 11-60.1-33 and the County grading ordinance.

4.11 NOISE

4.11.1 Existing Conditions

The Project Area is surrounded by residential and other uses. The northern portion is surrounded on the west by the University Heights Residential Subdivision, the north by the Mohouli Heights House Lots, the east by the planned (but yet-to-be-built) Kapi'olani Street, and the south by Wailoa River. The southern portion is bordered on the west by the Church of the Holy Cross, the north by Wailoa River, the east by the planned (but yet-to-be-built) Kapi'olani Street and YMCA, and the south by West Lanikaula Street and the main UHH campus across West Lanikaula Street. Sources of ambient noise include residential noises, wind through vegetation and vehicular noise.

4.11.2 Potential Impacts and Mitigation Measures

The Project Area would not be affected by any exceptional noise generators nor constrained by any adjacent land uses that are exceptionally sensitive to noise. The LRDP will propose compatible uses or buffers to ensure that adjacent residential uses are not impacted by the noise generated by Project Area uses. Construction noise impacts would be mitigated through appropriate construction contract specifications that comply with Department of Health noise regulations.

4.12 VISUAL RESOURCES

4.12.1 Existing Conditions

Only the portion of the Project Area identified as TMK 2-4-056: 016 is developed with buildings and parking (formerly utilized by the Army Reserve), the remaining portions of the Project Area are undeveloped and heavily vegetated.

The Hawai'i County General Plan identifies natural beauty sites. For the South Hilo District, the listed sites are dominated by vantage points to Mauna Kea, Mauna Loa, and Hilo Bay. None of the listed sites are within the Project Area.

PROPOSED DISPOSITION OF STATE LAND TO UH FOR THE EXPANSION OF UH-HILO

Draft Environmental Assessment and Anticipated Finding of No Significant Impact

4.12.2 Potential Impacts and Mitigation Measures

University-related uses of the Project Area would not impact any significant scenic resource, as identified by the General Plan.

4.13 SOCIAL AND EMPLOYMENT CHARACTERISTICS

4.13.1 Existing Conditions

Only the portion of the Project Area identified as TMK 2-4-056: 016 is developed with buildings and parking (formerly utilized by the Army Reserve and presently leased to the UHH), the remaining portions of the Project Area are undeveloped. Presently, no one is residing in the portions of the Project Area identified as TMK 2-4-056: 014 and TMK 2-4-001: 024.

4.13.2 Potential Impacts and Mitigation Measures

No one is residing in the Project Area and no use is currently proposed for the undeveloped portion of the Project Area, thus the proposed lease of the Project Area to the University will not result in any relocations of either residents or employees.

4.14 ECONOMIC FACTORS/GOVERNMENT REVENUES

4.14.1 Existing Conditions

Presently, no revenues in the form of income taxes are being generated to the State of Hawai'i. The State, as landowner, does not pay property taxes.

4.14.2 Potential Impacts and Mitigation Measures

Since no immediate use is proposed for the Project Area, the proposed lease of the Project Area to the University will not pose any impacts on either any revenues to the State that might be generated by the Project Area or any services that might be required to be provided to the Project Area from the State and/or County.

The proposed action is not expected to significantly affect surrounding land values and real estate tax collections since while the specific use is unknown, it will likely be educationally-related as are the existing facilities of the UHH Main Campus. It will however, contribute positively towards the area's development as a premier educational center and be part of the university's role as a economic driver.

4.15 INFRASTRUCTURE

4.15.1 Water System

4.15.1.1 Existing Conditions

DWS has water main connection points that could service future development in the corridor, and thus there is no requirement for water mains under the proposed Kapi'olani Extension to serve the Project Area (Geometrician Associates & SSFM International, Inc., October 2012).

PROPOSED DISPOSITION OF STATE LAND TO UH FOR THE EXPANSION OF UH-HILO
Draft Environmental Assessment and Anticipated Finding of No Significant Impact

4.15.1.2 Potential Impacts and Mitigation Measures

The County water system has adequate capacity to accommodate university-related uses within the Project Area. The extent of improvements to connect to the system would be determined based on specific uses assessed in the LRDP EIS.

4.15.2 Wastewater System

4.15.2.1 Existing Conditions

The University's wastewater system is tied into two lines, one is a 12-inch line along Kawili Street and the other a 10-inch line along Lanikaula Street. The challenges related to topography and a crossing of the Waiakea Flood Control Channel make gravity flow of wastewater an issue that will require additional investigation during the engineering phase of the LRDP.

4.15.2.2 Potential Impacts and Mitigation Measures

The extent of improvements to connect to the system would be determined based on specific uses assessed in the LRDP EIS.

4.15.4 Solid Waste

4.15.4.1 Existing Conditions

The County of Hawai'i Department of Environmental Management, Solid Waste Division is responsible for administering the island's solid waste management system. This division operates the County's South Hilo Landfill and Pu'uanaulu Landfill (West Hawai'i). The UHH contracts a private company to haul its solid waste to the South Hilo Landfill.

4.15.4.2 Potential Impacts and Mitigation Measures

The UHH intends to develop a sustainability plan for its campus. This plan would include initiatives to increase recycling, reduce waste, and create a composting facility. If available, details on the scope and status of this plan will be included in the LRDP.

4.15.5 Electrical /Telephone

4.15.5.1 Existing Conditions

The Hawai'i Electric Light Company, Inc. (HELCO), a privately-owned utility company regulated by the State Public Utilities Commission, provides electrical power to the island of Hawai'i. The HELCO network of power plants serving Hilo includes the Kanoiehua Power Plant, Puna Power Plant, Wailuku Hydro Power Plant, Hilo Coast Power Plant, and Shipman Power Plant. Currently, electrical and telephone poles are available to serve the Project Area from Mohouli and/or Lanikaula Streets.

4.15.5.2 Potential Impacts and Mitigation Measures

Electrical and telephone services are currently sized, adequate, and available to supply the Project Area.

4.16 PUBLIC SERVICES

4.16.1 Police Protection Services

4.16.1.1 Existing Conditions

The Project Area is located in South Hilo, Patrol District 1. The district extends from Hakalau in the north, to the mid-point of Kanoelehua Avenue between Hilo and Kea‘au in the south, to the Saddle Road in the west. The district includes the main police station, located at 349 Kapi‘olani Street, approximately five minutes travel time from the Project Area. More than half of the district’s patrol officers are assigned to the City of Hilo.

4.16.1.2 Potential Impacts and Mitigation Measures

No use is currently proposed for the Project Area, thus the proposed lease of the Project Area to the University will not pose any additional demand on the Police Department at this time. The proximity of the police station to the Project Area is advantageous to university-related uses in terms of response time.

4.16.2 Fire Protection Services

4.16.2.1 Existing Conditions

The Project Area is served by the Kawaihāni Fire Station located at 411 Kawaihāni Street. Backup service would be provided by the Central Fire Station, located at 466 Kinoole Street. Travel time from each station to the Project Area is three to five minutes. Additional backup would be provided by the Waiākea Rescue Station and the Kaumana Station with its HAZMAT team, which would be used in the unlikely event of a chemical spill.

4.16.2.2 Potential Impacts and Mitigation Measures

While no use is currently proposed for the Project Area, as mostly vacant land there may be an occasional and unavoidable demand for services from the Fire Department should there be a wildfire. The proximity of the various fire stations to the Project Area is advantageous to university-related uses in terms of response time.

4.16.3 Medical Services

4.16.3.1 Existing Conditions

Hilo Medical Center (HMC) is the primary health care facility serving the South Hilo district. HMC is located approximately 2.3 miles from UHH at 1190 Waiānuenuenu Avenue. Ambulance service in Hilo is provided by the Hawai‘i County Fire Department, which can serve the Project Area from the Hilo Central Fire Station in five minutes.

4.16.3.2 Potential Impacts and Mitigation Measures

No use is currently proposed for the Project Area, thus the proposed lease of the Project Area to the University should not pose any additional demand for emergency medical care at this time. The proximity of the various fire stations to the Project Area is advantageous to university-related uses in terms of ambulance response time and accessibility to a hospital.

PROPOSED DISPOSITION OF STATE LAND TO UH FOR THE EXPANSION OF UH-HILO
Draft Environmental Assessment and Anticipated Finding of No Significant Impact

4.16.4 Recreational Facilities

4.16.4.1 Existing Conditions

The entire South Hilo District contains 54 parks totaling 590 acres. The immediate area of the Project Area is served by two neighborhood parks, including University Heights Park and Mohouli Park. Both parks are located within walking distance of the Project Area. The existing campus contains approximately 15 acres of recreational facilities used for basketball, baseball, tennis, volleyball and soccer.

4.16.4.2 Potential Impacts and Mitigation Measures

No use is currently proposed for the Project Area, thus the proposed lease of the Project Area to the University should not pose any additional demand on existing recreational facilities.

4.17 SUMMARY OF MITIGATION MEASURES

The following mitigation measures should be considered in the development of the LRDP for the Project Area:

Potential Impact	Mitigation Measure
<i>Site Planning by LRDP</i>	
Water quality (4.3, 4.4)	Consider low-impact design; landscaped stream buffers
Access to Kapi'olani Street (4.9)	Minimize access points to preserve through-traffic function of Kapi'olani Street
Cumulative traffic impact (4.9)	Prepare traffic assessment report and implement mitigation measures recommended in the report
Noise to surrounding residential area (4.11)	Include appropriate use or buffer adjacent to existing residential areas
Solid Waste (4.15.4)	Develop and implement campus sustainability plan
<i>Construction Mitigation</i>	
Water quality (4.3, 4.4)	Grading and NPDES permits will require best management practices erosion control
Hawaiian hoary bat (4.7)	Restrict clearing of woody vegetation taller than 15' during the bat pupping season (June 1 through September 15) as may be required by USFW, and specified in construction contract documents or project scheduling.
Inadvertent archaeological finds (4.8)	Should iwi kūpuna or Native Hawaiian cultural or traditional deposits be found during construction, cease work and notify the appropriate agencies, as specified in construction contract documents.
Air quality (4.10)	Specify in construction contract documents fugitive dust controls, complying with HAR §11-60.1-33 and Grading Permit
Noise (4.11)	Specify in construction contract documents equipment and time controls, in compliance with DOH noise regulations

PROPOSED DISPOSITION OF STATE LAND TO UH FOR THE EXPANSION OF UH-HILO
Draft Environmental Assessment and Anticipated Finding of No Significant Impact

This page intentionally left blank.

5.0 ALTERNATIVES TO THE PROPOSED ACTION

This section identifies and evaluates the known feasible alternatives to the proposed action that would allow the objectives of the project to be met, while minimizing potential adverse environmental impacts (Title 11, Department of Health, Chapter 200, Environmental Impact Statement Rules, Section 11-200-17(f)).

5.1 NO ACTION ALTERNATIVE

Not acquiring the Project Area may result in the need for higher density development within the UHH campus. To accommodate higher density development, either future campus buildings may have to be taller, resulting in greater visual impacts (and more costly construction), and/or remaining open space areas will have to be developed.

Also implementing the no action alternative may result in UHH needing to acquire non-State lands through purchase. The relative ease in acquiring the Project Area as compared to seeking legislative funding for acquiring other lands in the vicinity is a positive factor for implementing the proposed lease of the Project Area to the University of the Project Area.

5.2 ALTERNATIVE SITES

There are no other comparable unencumbered State lands in proximity to the UHH campus of sufficient size. Private lands in proximity could be acquired resulting in higher costs and extended time; or, offsite unencumbered State lands could be sought resulting in greater operational costs, energy consumption, and inefficiencies. Obviously, lands that are located nearby the main campus would be more convenient but may involve the “permanent” loss of some open space or the displacement of existing users (if the lands involve State lands). Lands that are not owned by the State would require State funds for lease of the Project Area to the University. Other locations either owned by the State or other parties present different development considerations such as steeper slopes and more expensive Project Area preparation costs, but possibly provide better views.

The relative ease in acquiring the Project Area as compared to seeking legislative funding for acquiring other lands in the vicinity is a positive factor for the proposed lease of the Project Area to the University.

PROPOSED DISPOSITION OF STATE LAND TO UH FOR THE EXPANSION OF UH-HILO
Draft Environmental Assessment and Anticipated Finding of No Significant Impact

This page intentionally blank

6.0 DETERMINATION, FINDINGS, AND REASONS FOR SUPPORTING DETERMINATION

To determine whether the proposed action may have a significant impact on the environment, expected consequences, both primary and secondary, and the cumulative as well as short-and long-term effects have been evaluated. Based on the analysis performed and the research evaluated, the proposing agency (University of Hawai‘i) is anticipating a finding of no significant impact (AFONSI).

6.1 SIGNIFICANCE CRITERIA

According to the Department of Health Rules (11-200-12), an applicant or agency must determine whether an action may have a significant impact on the environment, including all phases of the project, its expected consequences both primary and secondary, its cumulative impact with other projects, and its short and long-term effects. In making the determination, the rules establish a Significance Criteria to be used as a basis for identifying whether significant environmental impact will occur. According to the Rules, an action shall be determined to have a significant impact on the environment if it meets any one of the following criteria:

- (1) *Involves an irrevocable commitment to loss or destruction of any natural or cultural resource;*

The anticipated use of the Project Area by the UHH will not irrevocably destroy any cultural or natural resource. Potential impacts to the endangered Hawaiian hoary bat can be mitigated. There are neither other endangered or threatened species nor significant historic sites on the Project Area.

- (2) *Curtails the range of beneficial uses of the environment;*

Since the Project Area is currently undeveloped or already used by UHH, the lease to the UHH will not curtail the range of any existing uses of the land. On the other hand, the lease should enhance the potential beneficial uses generated by the university.

- (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;*

The proposed project is consistent with the Environmental Policies established in Chapter 344, HRS.

- (4) *Substantially affects the economic or social welfare of the community or state;*

The proposed lease will enable the expansion of UHH. The UHH provides substantial economic and social welfare to the Hawai‘i Island community and the State.

- (5) *Substantially affects public health;*

The intended university-related uses enabled by the proposed lease will not cause pollution or otherwise affect the public health of the surrounding community.

- (6) *Involves substantial secondary impacts, such as population changes or effects on public facilities;*

The intended university-related uses enabled by the proposed lease could have cumulative traffic impacts. However, this impact can be mitigated through various improvements or traffic demand management

PROPOSED DISPOSITION OF STATE LAND TO UH FOR THE EXPANSION OF UH-HILO

Draft Environmental Assessment and Anticipated Finding of No Significant Impact

measures, and will be more appropriately addressed in terms of the overall campus impacts in the LRDP EIS.

- (7) *Involves a substantial degradation of environmental quality;*

The intended university-related uses enabled by the proposed lease would be planned, designed, and constructed to not involve a substantial degradation of environmental quality. The LRDP and subsequent environmental reviews developed for the specific uses proposed for the Project Area would be the means to validate and ensure that the environment is not substantially degraded.

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

The lease to UH will commit the Project Area to larger university-related actions. The cumulative impact of the overall long-range development plans for UHH will be more appropriately addressed in the EIS for the UHH Long-Range Development Plan.

- (9) *Substantially affects a rare, threatened or endangered species or its habitat;*

Mitigation measures are set forth to avoid impacts to the Hawaiian hoary bat. There are no other rare, threatened or endangered species within the Project Area.

- (10) *Detrimentially affects air or water quality or ambient noise levels;*

No use is currently proposed for the Project Area, thus the proposed lease of the Project Area to the University should not detrimentally affect 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, freshwater, or coastal waters.*

The eventual site plan for the Project Area would avoid the 100-year flood plain. The Project Area is not located in a tsunami evacuation zone, erosion-prone, steep slope, coastal Special Management Area, or other environmentally sensitive area.

- (12) *Substantially affects scenic vistas and view planes identified in county or state plans or studies;*

The Project Area is not listed as a critical view plane in any of the County's published planning documents, the General Plan, or Hilo Community Development Plan. Therefore, no significant vistas or viewplanes will be affected.

- (13) *Requires substantial energy consumption.*

No use is currently proposed for the Project Area, thus the proposed lease of the Project Area to the University should not require substantial energy consumption. Construction of the proposed improvements will increase energy consumption due to the addition of new educational facilities. However, the increase is not expected to exceed the requirements of other similar facilities. The project will be subject to the provisions of the energy section of the Hawai'i County Building Code. During the design phase, appropriate measures will be considered to reduce energy consumption over and above code requirements.

PROPOSED DISPOSITION OF STATE LAND TO UH FOR THE EXPANSION OF UH-HILO
Draft Environmental Assessment and Anticipated Finding of No Significant Impact

6.2 ANTICIPATED DETERMINATION

On the basis of the above criteria, the discussion of impacts and mitigation measures contained in this document, and the public agency and community comments received in the pre-assessment consultation, the University of Hawai'i, as the proposing agency, is Anticipating a Finding of No Significant Impact (AFONSI).

PROPOSED DISPOSITION OF STATE LAND TO UH FOR THE EXPANSION OF UH-HILO
Draft Environmental Assessment and Anticipated Finding of No Significant Impact

This page intentionally left blank

PROPOSED DISPOSITION OF STATE LAND TO UH FOR THE EXPANSION OF UH-HILO
Draft Environmental Assessment and Anticipated Finding of No Significant Impact

7.0 CONSULTED PARTIES

On October 12, 2012, letters requesting pre-assessment consultation comments on the proposed project were sent to the parties listed below. Comment and response letters have been reproduced and are included in Appendix A.

Federal

- U.S. Army Engineer District
- U.S. Fish and Wildlife Service Pacific Islands Office
- U.S. Geological Survey

State of Hawai'i

- Department of Business, Economic Development and Tourism
- DBEDT Office of Planning
- Department of Defense
- Department of Education
- Department of Health
- Department of Human Services
- Department of Labor and Industrial Relations
- Department of Land and Natural Resources
- DLNR State Historic Preservation Division
- Department of Transportation
- Hawai'i Housing Finance and Development Corporation
- Office of Environmental Quality Control
- Office of Hawaiian Affairs
- UH Environmental Center
- State Senator and Representative

County of Hawai'i

- Hawai'i County Council
- Department of Environmental Management
- Department of Public Works
- Department of Research and Development
- Department of Water Supply
- Fire Department
- Office of Housing and Community Development
- Planning Department
- Police Department
- Department of Parks and Recreation, Elderly Activities

Private

- Hospice of Hilo
- YMCA
- Lutheran Church

PROPOSED DISPOSITION OF STATE LAND TO UH FOR THE EXPANSION OF UH-HILO
Draft Environmental Assessment and Anticipated Finding of No Significant Impact

This page intentionally left blank.

PROPOSED DISPOSITION OF STATE LAND TO UH FOR THE EXPANSION OF UH-HILO
Draft Environmental Assessment and Anticipated Finding of No Significant Impact

8.0 REFERENCES

- AECOS Inc., June 2012. Water quality and biological surveys of Waiākea Stream for the Kapi‘olani Street Extension Project. Prepared for SSFM International, Inc. Included as Appendix 3 in the Final Environmental Assessment for the Kapi‘olani Street Extension (Geometrician Associates & SSFM International, Inc., 2012).
- Borthwick, D., and H.H. Hammatt., *Supplemental Archaeological and Testing of the Proposed of Hawai‘i at Hilo Expansion Area (TNK 2-4-01:19)*. Prepared for Engineering Concepts, Cultural Surveys Hawai‘i, Kaneohe. 1993.
- Department of Health, State of Hawai‘i 2008. 2006 State of Hawai‘i Water Quality Monitoring and Assessment Report: Integrated Report to the U.S. Environmental Protection Agency and the U.S. Congress Pursuant to Sections 303(d) and 305(b), Clean Water Act (P.L. 97-117).
- Engineering Concepts, Inc., *Environmental Assessment for the University of Hawai‘i at Hilo Infrastructure for Research and Technology Lots, Hilo, Hawai‘i, TMK: 2-4-01:7 and 41*, November 1993.
- Engineering Concepts, Inc., *Final Environmental Impact Statement for the University of Hawai‘i at Hilo University Park, Hilo, Hawai‘i, TMK: 2-4-01:7, 12, 19, 41 and 2-4-03: 26*, September 1997.
- Engineering Concepts, Inc., *Preliminary Engineering Report for the Proposed UH Hilo University Park, Hilo, Hawai‘i*, November 1993.
- Geometrician Associates & SSFM International, Inc., October 2012. Final Environmental Assessment and FONSI for the Kapi‘olani Street Extension, South Hilo, Island of Hawai‘i, State of Hawai‘i. Prepared for the County of Hawai‘i Department of Public Works.
- Morrow, J. W., E. J. Morgan, A. N. Furuike, A Characterization of Volcanic Aerosol in Two Populated Areas on the Island of Hawai‘i: First Year Findings of a 3-Year Investigation, @ Paper No. 91-89.2, Air & Waste Management Association Annual Meeting, Vancouver, B. C., June 1991.
- Morrow, J. W. and A. N. Kodama, A Characterization of VOG and LAZE in Three Communities on the Island of Hawai‘i, 1 Oct 90 - 30 Sep 91, Summary Report, @ 1 July 1994.
- Morrow, J.W. A Air Quality Impact Report University of Hawai‘i at Hilo University Park, 10 March 1997, @ in Engineering Concepts, Inc., *Final Environmental Impact Statement for the University of Hawai‘i at Hilo University Park, Hilo, Hawai‘i, TMK: 2-4-01:7, 12, 19, 41 and 2-4-03: 26*, September 1997.
- Myounghee Noh & Associates, July 2012. Phase 1 Environmental Site Assessment Report for the Proposed Kapi‘olani Street Extension. Included as Appendix 8 in the Final Environmental Assessment for the Kapi‘olani Street Extension (Geometrician Associates & SSFM International, Inc., 2012).
- National Weather Service Forecast Office. *Hilo, Hawa‘ii (PHTO)* Available at: http://www.prh.noaa.gov/hnl/climate/phto_clim.php (December 2007).
- PBR HAWAII and Kajioka Okada Yamachi Architects, *University of Hawai‘i at Hilo, Long Range Development Plan*, Prepared for the State of Hawai‘i, University of Hawai‘i at Hilo. Honolulu, Hawai‘i. March 1996.
- PBR HAWAII, *Revised Draft Environmental Assessment for University of Hawai‘i at Hilo, Science Complex and Lanikaula Off-site Parking Lot*, Honolulu, Hawai‘i. February 2007.

PROPOSED DISPOSITION OF STATE LAND TO UH FOR THE EXPANSION OF UH-HILO

Draft Environmental Assessment and Anticipated Finding of No Significant Impact

State of Hawai'i Department of Human Services Hawai'i Housing Authority, *Draft Environmental Assessment for Lanakila Homes*, August 11, 1997.

U.S. Department of Agriculture, Soil Conservation Service, *Soil Survey of Island of Hawai'i, State of Hawai'i*, December 1973.

U.S. Department of Transportation Federal Highway Administration, State of Hawai'i Department of Transportation Highways Division, and County of Hawai'i Department of Public Works, *Environmental Assessment for Mohouli Street Extension, Komohana Street to Kaumana Drive, South Hilo, Hawai'i*, September 1997.

Wilson Okamoto & Associates, Inc. in cooperation with Megumi Kon, Incorporated, *Research & Technology Park Conceptual Master Plan for the University of Hawai'i at Hilo*, May 1986.

O:\JOB13\1345.24 UH-Hilo LRDP Update\Acquisition EA and Parcels for UH Hilo\Draft EA\DEA-08.docx

Appendix **A**

COMMENTS AND RESPONSES

UHH Disposition EA
Pre-Assessment Consultation Distribution List

Agencies/Organizations/Individuals	Comment Received	Summary of Comments
STATE		
Department of Agriculture	-	
Department of Accounting and General Services	11/1/2012	no comments
Department of Business, Economic Development & Tourism	-	
DBEDT - Office of Planning	-	
Department of Defense	-	
Department of Education	-	
Department of Hawaiian Home Lands	-	
Department of Health	10/22/2012	no comments
Department of Human Services	11/5/2012	no comments
Department of Labor and Industrial Relations	10/29/2012	no comments
Department of Land and Natural Resources	11/8/2012	no comments
DLNR - Historic Preservation Division	-	
Department of Transportation	11/9/2012	address cumulative traffic impacts on State highways
Hawaii Housing Finance and Development Corporation	-	
Office of Hawaiian Affairs	-	
UH Environmental Center	11/9/2012	questioned whether action is exempt
FEDERAL		
U.S. Army - Engineer Division	-	
U.S. Geological Survey - Hawaiian Volcano Observatory	11/5/2012	no significant impact
U.S. Fish and Wildlife Service	-	
COUNTY		
Department of Environmental Management	-	
Department of Public Works	11/16/2012	Address drainage, flood zone, grading, access to Kapiolani Street
Department of Research and Development	-	
Department of Water Supply	-	
Fire Department	10/29/2012	no comments
Office of Housing and Community Development	-	
Planning Department	11/9/2012	Confirmed LUPAG as Low Density Urban, zoning as RS-10, and not in SMA; plan approval required for public uses
Police Department	-	
Department of Parks & Recreation, Elderly Activities	-	
ELECTED OFFICIALS		
State Senator	-	
State Representative	-	
County Council Member	-	
CITIZEN GROUPS/INDIVIDUALS, CONSULTED PARTIES		
Hospice of Hilo	-	
YMCA	-	
Lutheran Church	-	

NEIL ABERCROMBIE
GOVERNOR



Dean H. Seki
Comptroller
Marla E. Zielinski
Deputy Comptroller

STATE OF HAWAII
DEPARTMENT OF ACCOUNTING AND GENERAL SERVICES
P.O. BOX 119, HONOLULU, HAWAII 96810-0119

NOV - 1 2012

(P)1251.2

Mr. Roy Takemoto
PBR Hawaii
1001 Bishop Street, ASB Tower, Suite 650
Honolulu, HI 96813-3484

Subject: Pre-Assessment Consultation
State Land Disposition to the University of Hawaii - Hilo
South Hilo District, Island of Hawaii
TMK: (3) 2-4-001:024, 2-4-056:014, 2-4-056:016

This is in response to your letter, dated October 12, 2012 regarding the subject project. The proposed project does not impact any of the Department of Accounting and General Services' projects or existing facilities, and we have no comments to offer at this time. Additional comments may be given in the future as UH Hilo's Long-Range Development Plan is updated.

If you have any questions, please call me at 586-0400, or have your staff call Mr. David DePonte of the Public Works Division at 586-0492.

Sincerely,

DEAN H. SEKI
Comptroller

c: Mr. Jerry Watanabe, DAGS Hawaii District



January 10, 2013

PRINCIPALS

THOMAS S. WITTEN, ASLA
President

R. STAN DUNCAN, ASLA
Executive Vice-President

RUSSELL Y. L. CHUNG, FASLA, LEED[®] AP
Executive Vice-President

VINCENT SHIGEKUNI
Vice-President

GRANT T. MURAKAMI, AICP, LEED[®] AP
Principal

W. FRANK BRANDT, FASLA
Chairman Emeritus

ASSOCIATES

TOM SCHINELL, AICP
Senior Associate

RAYMOND T. HIGA, ASLA
Senior Associate

KEVIN K. NISHIKAWA, ASLA
Associate

KIMI MIKAMI YUEN, LEED[®] AP
Associate

SCOTT ALIKA ABRIGO, LEED[®] AP
Associate

SCOTT MURAKAMI, ASLA, LEED[®] AP
Associate

DACHENG DONG, LEED[®] AP
Associate

HONOLULU OFFICE

1001 Bishop Street, Suite 650
Honolulu, Hawaii 96813-3484
Tel: (808) 521-5631
Fax: (808) 523-1402
E-mail: sysadmin@pbrhawaii.com

KAPOLEI OFFICE

1001 Kamehaha Boulevard
Kapolei Building, Suite 313
Kapolei, Hawaii 96707-2005
Tel: (808) 521-5631
Fax: (808) 535-3163

Mr. Dean Seki, State Comptroller
State of Hawai'i
Department of Accounting and General Services
P.O. Box 119
Honolulu, Hawai'i 96810-0119

**SUBJECT: PRE-ASSESSMENT CONSULTATION FOR STATE LAND
DISPOSITION TO THE UNIVERSITY OF HAWAII LOCATED AT
WAIÁKEA, SOUTH HILO DISTRICT, HAWAII
TMK: (3) 2-4-001: 024, 2-4-056: 014, and 2-4-056: 016**

Dear Mr. Seki:

Thank you for your letter dated November 1, 2012 regarding the subject project. As the planning consultant for the proposing agency, University of Hawai'i (UH), we acknowledge that your agency does not have any comments at this time. We further acknowledge that your agency would like to be consulted when the UH prepares the EIS for the UH at Hilo's Long-Range Development Plan.

We appreciate your participation in the environmental review process. Your letter will be included in the Draft Environmental Assessment (EA). We will send you a copy of the Draft EA when it is available.

Sincerely,

PBR HAWAII

Roy Takemoto
Managing Director, Hilo Office

cc: University of Hawai'i at Hilo

O:\JOB13\1345.24 UH-Hilo LRDP Update\Acquisition EA and Parcels for UH Hilo\Pre-Assessment Consultation\Responses\DAGS.docx

NEIL ABERCROMBIE
GOVERNOR OF HAWAII



STATE OF HAWAII
DEPARTMENT OF HEALTH
P. O. BOX 3378
HONOLULU, HI 96801-3378
October 22, 2012

LORETTA J. FUDDY, A.C.S.W., M.P.H.
DIRECTOR OF HEALTH

In reply, please refer to:
File:
12-193
State Land to UH

PBR HAWAII
Attn: Roy Takemoto
1001 Bishop Street, ASB Tower, Suite 650
Honolulu, Hawaii 96813-3484

Dear Mr. Takemoto:

SUBJECT: Pre-Assessment Consultation for State Land Disposition to the University of Hawai'i Located at Hilo, South Hilo District, Hawai'i
TMK: (3) 2-4-001: 024, 2-4-056: 014, and 2-4-056: 016

The Department of Health (DOH), Environmental Planning Office (EPO), acknowledges receipt of your letter, dated October 12, 2012. Thank you for allowing us to review and comment on the subject document. The document was routed to the various branches of the Environmental Health Administration. We have no comments at this time, but reserve the right to future comments. We strongly recommend that you review all of the Standard Comments on our website: www.hawaii.gov/health/environmental/env-planning/landuse/landuse.html. Any comments specifically applicable to this application should be adhered to.

The United States Environmental Protection Agency (EPA) provides a wealth of information on their website including strategies to help protect our natural environment and build sustainable communities at: <http://water.epa.gov/infrastructure/sustain/>. The DOH encourages State and county planning departments, developers, planners, engineers and other interested parties to apply these strategies and environment principles whenever they plan or review new developments or redevelopments projects. We also ask you to share this information with others to increase community awareness on healthy, sustainable community design. If there are any questions about these comments please contact me.

Sincerely,

Laura Leialoha Phillips McIntyre, AICP
Environmental Planning Office Manager
Environmental Health Administration
Department of Health
919 Ala Moana Blvd., Ste. 312
Honolulu, Hawaii 96814
Phone: 586-4337
laura.mcintyre@doh.hawaii.gov



January 10, 2013

PRINCIPALS

THOMAS S. WITTEN, ASLA
President

R. STAN DUNCAN, ASLA
Executive Vice-President

RUSSELL Y. L. CHUNG, FASLA, LEED^{AP}
Executive Vice-President

VINCENT SHIGEKUNI
Vice-President

GRANT T. MURAKAMI, AICP, LEED^{AP}
Principal

W. FRANK BRANDT, FASLA
Chairman Emeritus

Ms. Laura Leialoha Phillips McIntyre, AICP
Environmental Planning Office Manager
Environmental Health Administration
State of Hawai'i
Department of Health
P.O. Box 3378
Honolulu, Hawai'i 96801-3378

SUBJECT: PRE-ASSESSMENT CONSULTATION FOR STATE LAND DISPOSITION TO THE UNIVERSITY OF HAWAII LOCATED AT WAI'AKEA, SOUTH HILO DISTRICT, HAWAII
TMK: (3) 2-4-001: 024, 2-4-056: 014, and 2-4-056: 016

Dear Ms. McIntyre:

Thank you for your letter dated October 22, 2012 regarding the subject project. As the planning consultant for the proposing agency, University of Hawai'i (UH), we acknowledge that your agency does not have any comments at this time. We reviewed the Standard Comments on your agency's website, as well as the EPA website you suggested.

We appreciate your participation in the environmental review process. Your letter will be included in the Draft Environmental Assessment (EA). We will send you a copy of the Draft EA when it is available.

Sincerely,

PBR HAWAII

Roy Takemoto
Managing Director, Hilo Office

cc: University of Hawai'i at Hilo

HONOLULU OFFICE
1001 Bishop Street, Suite 650
Honolulu, Hawaii 96813-3484
Tel: (808) 521-5631
Fax: (808) 523-1402
E-mail: sysadmin@pbrhawaii.com

KAPOLEI OFFICE
1001 Kamehaha Boulevard
Kapolei Building, Suite 313
Kapolei, Hawaii 96707-2005
Tel: (808) 521-5631
Fax: (808) 535-3163

O:\JOB13\1345.24 UH-Hilo LRDP Update\Acquisition EA and Parcels for UH Hilo\Pre-Assessment Consultation\Responses\DOH.docx

NEIL ABERCROMBIE
GOVERNOR



STATE OF HAWAII
DEPARTMENT OF HUMAN SERVICES
Benefit, Employment & Support Services Division
820 Mililani Street, Suite 606
Honolulu, Hawaii 96813

November 5, 2012

PATRICIA McMANAMAN
DIRECTOR
BARBARA A. YAMASHITA
DEPUTY DIRECTOR

Refer to 12:0648

Mr. Roy Takemoto
Managing Director, Hilo Office
PBR Hawaii & Associates, Inc.
1001 Bishop Street, ASB Tower, Suite 650
Honolulu, Hawaii 96813-3484

Dear Mr. Takemoto:

SUBJECT: Pre-Assessment Consultation for State Land Disposition To The University Of Hawai'i located at Hilo, South Hilo District, Hawai'i Tax Map Key: (3) 2-4-001: 024, 2-4-056: 014, and 2-4-056: 016

The Department of Human Services (DHS) received your request to comment on the proposed lease or transfer of the above identified parcels of land from the State to the University of Hawaii.

Your letter and attachment have been reviewed by the Director, Patricia McManaman, and forwarded to us for a response. DHS has no comments at this time to the proposed plans for lease or transfer of the land parcels as identified in your correspondence. However, as there are three DHS licensed child care facilities in the immediate area adjacent to the project zone, we would request the opportunity to review and provide comment on any proposed plans for the extension of Kapiolani Street and development by the University of Hawaii on the Subject Parcels.

If you have any questions or need further information, please contact Ms. Marja Leivo, Child Care Program Specialist, at (808) 586-7112.

Sincerely,

Scott Nakasone
Assistant Division Administrator

c: Patricia McManaman, Director

AN EQUAL OPPORTUNITY AGENCY



January 10, 2013

PRINCIPALS

THOMAS S. WITTEN, ASLA
President

R. STAN DUNCAN, ASLA
Executive Vice-President

RUSSELL Y. L. CHUNG, FASLA, LEED^{AP}
Executive Vice-President

VINCENT SHIGEKUNI
Vice-President

GRANT T. MURAKAMI, AICP, LEED^{AP}
Principal

W. FRANK BRANDT, FASLA
Chairman Emeritus

ASSOCIATES

TOM SCHINELL, AICP
Senior Associate

RAYMOND T. HIGA, ASLA
Senior Associate

KEVIN K. NISHIKAWA, ASLA
Associate

KIMI MIKAMI YUEN, LEED^{AP}
Associate

SCOTT ALIKA ABRIGO, LEED^{AP}
Associate

SCOTT MURAKAMI, ASLA, LEED^{AP}
Associate

DACHENG DONG, LEED^{AP}
Associate

HONOLULU OFFICE
1001 Bishop Street, Suite 650
Honolulu, Hawaii 96813-3484
Tel: (808) 521-5631
Fax: (808) 523-1402
E-mail: sysadmin@pbrhawaii.com

KAPOLEI OFFICE
1001 Kamehaha Boulevard
Kapolei Building, Suite 313
Kapolei, Hawaii 96707-2005
Tel: (808) 521-5631
Fax: (808) 535-3163

Mr. Scott Nakasone, Assistant Division Administrator
State of Hawai'i
Department of Human Services
820 Mililani Street, Suite 606
Honolulu, Hawai'i 96813

SUBJECT: PRE-ASSESSMENT CONSULTATION FOR STATE LAND DISPOSITION TO THE UNIVERSITY OF HAWAII LOCATED AT WALAKEA, SOUTH HILO DISTRICT, HAWAII
TMK: (3) 2-4-001: 024, 2-4-056: 014, and 2-4-056: 016

Dear Mr. Nakasone:

Thank you for your letter dated November 1, 2012 regarding the subject project. As the planning consultant for the proposing agency, University of Hawai'i (UH), we acknowledge that your agency does not have any comments at this time. We further acknowledge that there are three DHS licensed child care facilities in the immediate area and will consult with your department when the UH prepares the EIS for the UH at Hilo's Long-Range Development Plan.

We appreciate your participation in the environmental review process. Your letter will be included in the Draft Environmental Assessment (EA). We will send you a copy of the Draft EA when it is available.

Sincerely,

PBR HAWAII

Roy Takemoto
Managing Director, Hilo Office

cc: University of Hawai'i at Hilo

O:\JOB13\1345.24 UH-Hilo LRD Update\Acquisition EA and Parcels for UH Hilo\Pre-Assessment Consultation\Responses\DHS.docx

NEIL ABERCROMBIE
GOVERNOR



STATE OF HAWAII
DEPARTMENT OF LABOR AND INDUSTRIAL RELATIONS
830 PUNCHBOWL STREET, ROOM 321
HONOLULU, HAWAII 96813
www.hawaii.gov/labor
Phone: (808) 586-8844/Fax: (808) 586-9099

October 29, 2012

PBR Hawaii
Attn: Roy Takemoto
1001 Bishop Street, ASB Tower, Suite 650
Honolulu, HI 96813-3484

Dear Mr. Takemoto:

This is in response to your request for comments dated October 12, 2012 on the proposed lease of State land to the University of Hawaii located at Hilo, South Hilo District on the island of Hawaii.

The Department of Labor and Industrial Relations has no comments, and we foresee no impact on our existing or proposed programs. Should you have any questions, please call me at (808) 586-8844.

Sincerely,

DWIGHT TAKAMINE
Director

DWIGHT TAKAMINE
DIRECTOR

AUDREY HIDANO
DEPUTY DIRECTOR



January 10, 2013

PRINCIPALS

THOMAS S. WITTEN, ASLA
President

R. STAN DUNCAN, ASLA
Executive Vice-President

RUSSELL Y. L. CHUNG, FASLA, LEED^{AP}
Executive Vice-President

VINCENT SHIGEKUNI
Vice-President

GRANT T. MURAKAMI, AICP, LEED^{AP}
Principal

W. FRANK BRANDT, FASLA
Chairman Emeritus

ASSOCIATES

TOM SCHINELL, AICP
Senior Associate

RAYMOND T. HIGA, ASLA
Senior Associate

KEVIN K. NISHIKAWA, ASLA
Associate

KIMI MIKAMI YUEN, LEED^{AP}
Associate

SCOTT ALIKA ABRIGO, LEED^{AP}
Associate

SCOTT MURAKAMI, ASLA, LEED^{AP}
Associate

DACHENG DONG, LEED^{AP}
Associate

Mr. Dwight Takamine, Director
State of Hawai'i
Department of Labor and Industrial Relations
830 Punchbowl Street, Room 321
Honolulu, Hawai'i 96813

**SUBJECT: PRE-ASSESSMENT CONSULTATION FOR STATE LAND
DISPOSITION TO THE UNIVERSITY OF HAWAII LOCATED AT
WAIÁKEA, SOUTH HILO DISTRICT, HAWAII
TMK: (3) 2-4-001: 024, 2-4-056: 014, and 2-4-056: 016**

Dear Mr. Takamine:

Thank you for your letter dated October 29, 2012 regarding the subject project. As the planning consultant for the proposing agency, University of Hawai'i (UH), we acknowledge that your agency does not foresee any impacts on your department's existing or proposed programs resulting from the proposed lease.

We appreciate your participation in the environmental review process. Your letter will be included in the Draft Environmental Assessment (EA). We will send you a copy of the Draft EA when it is available.

Sincerely,

PBR HAWAII

Roy Takemoto
Managing Director, Hilo Office

cc: University of Hawai'i at Hilo

HONOLULU OFFICE
1001 Bishop Street, Suite 650
Honolulu, Hawai'i 96813-3484
Tel: (808) 521-5631
Fax: (808) 523-1402
E-mail: sysadmin@pbrhawaii.com

KAPOLEI OFFICE
1001 Karmokila Boulevard
Kapolei Building, Suite 313
Kapolei, Hawai'i 96707-2005
Tel: (808) 521-5631
Fax: (808) 535-3163

O:\JOB13\1345.24 UH-Hilo LRDP Update\Acquisition EA and Parcels for UH Hilo\Pre-Assessment Consultation\Responses\DLIR.docx

NEIL ABERCROMBIE
GOVERNOR OF HAWAII



STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

WILLIAM J. ATLA, JR.
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

NEIL ABERCROMBIE
GOVERNOR OF HAWAII



STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

12 OCT 18 AM 9:16 ENGINEERING
RECEIVED
LAND DIVISION
2012 OCT 24 P 2:32
DEPT. OF LAND & NATURAL RESOURCES
STATE OF HAWAII

October 17, 2012

MEMORANDUM

PBR Hawaii & Associates, Inc.
Attn: Roy Takemoto
1001 Bishop Street, Suite 650
Honolulu, HI 96813-3484

via email: rtakemoto@pbrhawaii.com

Dear Mr. Takemoto:

SUBJECT: Pre-Assessment Consultation for State Land Disposition to the University of Hawaii, PBR Hawaii & Associates, Inc. for the University of Hawaii, Applicant, Hilo, South Hilo, Hawaii; TMK: (3) 2-4-001: 024, 2-4-056:014 & 016

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) the Engineering Division, (2) the Hawaii District Land Office, and (3) the Division of State Parks on the subject matter. Should you have any questions, please feel free to call Kevin Moore at 587-0426. Thank you.

Sincerely,

Russell Y. Tsuji
Land Administrator

Enclosure(s)

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 - Hawaii District
- Historic Preservation

FROM:

Russell Y. Tsuji, Land Administrator

SUBJECT:

Pre-Assessment Consultation for State Land Disposition to the University of Hawaii

LOCATION:

Hilo, South Hilo, Hawaii; TMK: (3) 2-4-001: 024, 2-4-056:014 & 016

APPLICANT:

PBR Hawaii & Associates, Inc. for the University of Hawaii

Transmitted for your review and comment on the above referenced document. We would appreciate your comments on this document. Please submit any comments by November 7, 2012.

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 Kevin Moore at 587-0426. Thank you.

Attachments

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

Signed:

Print name: **Cory S. Chang, Chief Engineer**

Date: 10/23/12

cc: Central Files

DEPARTMENT OF LAND AND NATURAL RESOURCES
ENGINEERING DIVISION

LD/Kevin Moore
Ref.: State Land Lease UHHilo
Hawaii:584

COMMENTS

- () We confirm that the project site, according to the Flood Insurance Rate Map (FIRM), is located in Flood Zone ____.
- () Please take note that the project site, according to the Flood Insurance Rate Map (FIRM), is located in Flood Zone ____.
- () Please note that the correct Flood Zone Designation for the project site according to the Flood Insurance Rate Map (FIRM) is ____.
- () Please note that the project 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 or Ms. Ardis Shaw-Kim at (808) 768-8296 of the City and County of Honolulu, Department of Planning and Permitting.
- () Mr. Frank DeMarco at (808) 961-8042 of the County of Hawaii, Department of Public Works.
- () Mr. Francis Cerizo at (808) 270-7771 of the County of Maui, Department of Planning.
- () Ms. Wynne Ushigome at (808) 241-4890 of the County of Kauai, Department of Public Works.
- () The applicant should include water demands and infrastructure required to meet project needs. Please note that projects within State lands requiring water service from the Honolulu Board of Water Supply system will be required to pay a resource development charge, in addition to Water Facilities Charges for transmission and daily storage.
- () The applicant 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: _____

(X) **Other: We do not have any objections to the proposed State land disposition to the University of Hawaii located at Hilo, South Hilo District, Hawaii, identified as Tax Map Keys: (3) 2-4-001:024 and 2-4-056:014 & 016.**

Should you have any questions, please call Ms. Suzie S. Agraan of the Planning Branch at 587-0258.

Signed: Carty S. Chang
CARTY S. CHANG, CHIEF ENGINEER
Date: 10/23/12

NEIL ABERCROMBIE
GOVERNOR OF HAWAII



STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

October 17, 2012

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 - Hawaii District
 Historic Preservation

FROM: Russell Y. Tsuji, Land Administrator

SUBJECT: Pre-Assessment Consultation for State Land Disposition to the University of Hawaii

LOCATION: Hilo, South Hilo, Hawaii; TMK: (3) 2-4-001: 024, 2-4-056:014 & 016

APPLICANT: PBR Hawaii & Associates, Inc. for the University of Hawaii

Transmitted for your review and comment on the above referenced document. We would appreciate your comments on this document. Please submit any comments by November 7, 2012.

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 Kevin Moore at 587-0426. Thank you.

Attachments

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

Signed: Gordon Hest
Print name: Gordon Hest
Date: 11/5/12

cc: Central Files

2012 OCT 19 P 1:22

RECEIVED
LAND DIVISION
HILLO, HAWAII

RECEIVED
LAND DIVISION
2012 NOV - 7 A 10:45
DEPT. OF LAND & NATURAL RESOURCES
STATE OF HAWAII

55393



NEIL ABERCROMBIE
GOVERNOR OF HAWAII



RECEIVED
STATE OF HAWAII
WILLIAM J. AILA, JR.
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

72 OCT 18 10:47

DEPT OF LAND & NATURAL RESOURCES
STATE OF HAWAII

October 17, 2012

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 – Hawaii District
 - Historic Preservation

RECEIVED
LAND DIVISION
2012 OCT 26 3:00
DEPT OF LAND & NATURAL RESOURCES
STATE OF HAWAII

FROM: Russell Y. Tsuji, Land Administrator

SUBJECT: Pre-Assessment Consultation for State Land Disposition to the University of Hawaii

LOCATION: Hilo, South Hilo, Hawaii; TMK: (3) 2-4-001: 024, 2-4-056:014 & 016

APPLICANT: PBR Hawaii & Associates, Inc. for the University of Hawaii

Transmitted for your review and comment on the above referenced document. We would appreciate your comments on this document. Please submit any comments by November 7, 2012.

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 Kevin Moore at 587-0426. Thank you.

Attachments

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

Signed:

Print name: Daniel S. Quinn
Date: 10/24/12

cc: Central Files

January 10, 2013

PRINCIPALS

- THOMAS S. WITTEN, ASLA
President
- R. STAN DUNCAN, ASLA
Executive Vice-President
- RUSSELL Y. L. CHUNG, FASLA, LEED^{AP}
Executive Vice-President
- VINCENT SHIGEKUNI
Vice-President
- GRANT T. MURAKAMI, AICP, LEED^{AP}
Principal
- W. FRANK BRANDT, FASLA
Chairman Emeritus

Mr. Russell Tsuji, Land Administrator
State of Hawai'i
Department of Land and Natural Resources
P.O. Box 621
Honolulu, Hawai'i 96809

SUBJECT: PRE-ASSESSMENT CONSULTATION FOR STATE LAND DISPOSITION TO THE UNIVERSITY OF HAWAII LOCATED AT WALA'KEA, SOUTH HILO DISTRICT, HAWAII
TMK: (3) 2-4-001: 024, 2-4-056: 014, and 2-4-056: 016

Dear Mr. Tsuji:

Thank you for your letter dated November 8, 2012 regarding the subject project. As the planning consultant for the proposing agency, University of Hawai'i (UH), we acknowledge that neither your division, the Engineering Division, the Hawaii District Land Office, nor the Division of State Parks had any comments at this time. For your information, the UH Environmental Center questioned whether a lease was exempt from HRS Chapter 343. We followed up by email with Kevin Moore of your staff who confirmed that your division's current policy is that a lease that proposes to change the property's use was not an exempt action and required compliance with HRS Chapter 343. Although an upcoming EIS for the UH-Hilo Long-Range Development Plan could satisfy that requirement, the UH preferred to consummate the lease as soon as possible and therefore has decided to proceed with this Environmental Assessment (EA).

We appreciate your participation in the environmental review process. Your letter will be included in the Draft EA. We will send you a copy of the Draft EA when it is available.

Sincerely,

PBR HAWAII

Roy Takemoto
Managing Director, Hilo Office

cc: University of Hawai'i at Hilo

ASSOCIATES

- TOM SCHINELL, AICP
Senior Associate
- RAYMOND T. HIGA, ASLA
Senior Associate
- KEVIN K. NISHIKAWA, ASLA
Associate
- KIMI MIKAMI YUEN, LEED^{AP}
Associate
- SCOTT ALIKA ABRIGO, LEED^{AP}
Associate
- SCOTT MURAKAMI, ASLA, LEED^{AP}
Associate
- DACHENG DONG, LEED^{AP}
Associate

HONOLULU OFFICE
1801 Bishop Street, Suite 650
Honolulu, Hawaii 96813-3484
Tel: (808) 521-5631
Fax: (808) 523-1402
E-mail: sysadming@pbrhawaii.com

KAPOLEI OFFICE
1001 Kamehaha Boulevard
Kapolei Building, Suite 313
Kapolei, Hawaii 96707-2005
Tel: (808) 521-5631
Fax: (808) 535-3163

O:\JOB13\1345.24 UH-Hilo LRDP Update\Acquisition EA and Parcels for UH Hilo\Pre-Assessment Consultation\Responses\DLNR.docx

NEIL ABERCROMBIE
GOVERNOR



STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
869 PUNCHBOWL STREET
HONOLULU, HAWAII 96813-5097

November 9, 2012

Mr. Roy Takemoto
Managing Director - Hilo
PBR Hawaii
1001 Bishop Street
American Savings Bank Tower, Suite 650
Honolulu, Hawaii 96813-3484

Dear Mr. Takemoto:

Subject: University of Hawaii at Hilo (UHH)
Pre-Assessment Consultation for State Land Disposition
TMK: (3) 2-4-001:024, 2-4-056:014 and 016

Thank you for requesting the State Department of Transportation's (DOT) review of the subject project.

DOT understands the UHH proposes to lease 46,332 acres of land from the Department of Land and Natural Resources (DLNR). The subject land will be included in the UHH's Long-Range Development Plan, currently being updated, to determine their best use for university-related purposes. The subject parcels are located between West Lanikaula Street and Mohouli Street.

The Draft Environmental Assessment should discuss and evaluate the project's contribution to the cumulative traffic impacts on State highways facilities in the area.

DOT appreciates the opportunity to provide comments. If there are any questions, including the need to meet with DOT staff, please contact Mr. Garrett Smith of the DOT Statewide Transportation Planning Office at telephone number (808) 831-7976.

Very truly yours,


GLENN M. OKIMOTO, Ph.D.
Director of Transportation

GLENN M. OKIMOTO
DIRECTOR

Deputy Directors
JADE T. BUTAY
FORD N. FUCHIGAMI
RANDY GRUNE
JADINE URASAKI

IN REPLY REFER TO:

STP 8.1030



January 10, 2013

PRINCIPALS

THOMAS S. WITTEN, ASLA
President

R. STAN DUNCAN, ASLA
Executive Vice-President

RUSSELL Y. L. CHUNG, FASLA, LEED^{AP}
Executive Vice-President

VINCENT SHIGEKUNI
Vice-President

GRANT T. MURAKAMI, AICP, LEED^{AP}
Principal

W. FRANK BRANDT, FASLA
Chairman Emeritus

ASSOCIATES

TOM SCHINELL, AICP
Senior Associate

RAYMOND T. HIGA, ASLA
Senior Associate

KEVIN K. NISHIKAWA, ASLA
Associate

KIMI MIKAMI YUEN, LEED^{AP}
Associate

SCOTT ALIKA ABRIGO, LEED^{AP}
Associate

SCOTT MURAKAMI, ASLA, LEED^{AP}
Associate

DACHENG DONG, LEED^{AP}
Associate

HONOLULU OFFICE
1001 Bishop Street, Suite 650
Honolulu, Hawaii 96813-3484
Tel: (808) 521-5631
Fax: (808) 523-1402
E-mail: sysadming@pbrhawaii.com

KAPOLEI OFFICE
1001 Kamehaha Boulevard
Kapolei Building, Suite 313
Kapolei, Hawaii 96707-2005
Tel: (808) 521-5631
Fax: (808) 535-3163

Mr. Glenn Okimoto, Ph.D., Director
State of Hawai'i
Department of Transportation
869 Punchbowl Street
Honolulu, Hawai'i 96813-5097

**SUBJECT: PRE-ASSESSMENT CONSULTATION FOR STATE LAND
DISPOSITION TO THE UNIVERSITY OF HAWAII LOCATED AT
WAIÁKEA, SOUTH HILO DISTRICT, HAWAII
TMK: (3) 2-4-001: 024, 2-4-056: 014, and 2-4-056: 016**

Dear Mr. Okimoto:

Thank you for your letter dated November 9, 2012 regarding the subject project. As the planning consultant for the proposing agency, University of Hawai'i (UH), we acknowledge your comment that the Draft EA should evaluate the project's contribution to the cumulative traffic impacts on State highway facilities in the area. Since the subject project site is not immediately adjacent to the nearest State highway, which is Puainako Street, and the specific uses of the subject site will be determined by UH Hilo's Long-Range Development Plan (LRDP), we will note in this Environmental Assessment (EA) that the Environmental Impact Statement (EIS) for the LRDP will more appropriately address the cumulative traffic impact of the overall campus development.

We appreciate your participation in the environmental review process. Your letter will be included in the Draft EA. We will send you a copy of the Draft EA when it is available.

Sincerely,

PBR HAWAII

Roy Takemoto
Managing Director, Hilo Office

cc: University of Hawai'i at Hilo

O:\JOB13\1345.24 UH-Hilo LRDP Update\Acquisition EA and Parcels for UH Hilo\Pre-Assessment Consultation\Responses\DOT.docx



UNIVERSITY
of HAWAII
MĀNOA

Water Resources Research Center
Environmental Center

November 09, 2012
EA: 2012-10-12-01

Mr. Roy Takemoto
PBR Hawaii
1001 Bishop Street, ASB Tower, Suite 650
Honolulu, HI 96813-3484
rtakemoto@pbrhawaii.com

Dear Mr. Takemoto,

Pre-Assessment Consultation
State Land Disposition to the University of Hawaii, Hilo, Hawaii

Thank you for contacting us about this lease of state land in Hilo to the University of Hawaii (UH). We anticipate that the lease will not have an impact on existing and proposed projects, plans, policies, and programs of the Environmental Center/Water Resources Research Center that should be considered when preparing the Draft Environmental Assessment (DEA). However, please note that this land is located near Waiākea Stream, which is listed by the State of Hawaii Department of Health as an impaired water body, pursuant to the federal Clean Water Act. Therefore, it may be useful for the DEA to identify the owners of the nearby stream channel and riparian areas; characterize the contributing areas and runoff/drainage for the lands leased to UH; and address any changes to stream pollutant loading, habitat, and biota that could occur as a result of UH activities on the leased parcels and related secondary/cumulative effects.

As previously discussed, we are curious why UH is preparing a DEA for this lease at the present time, given that UH-Hilo will include the subject parcels in its forthcoming Long-Range Development Plan (LRDP) update. An LRDP update is normally the subject of its own Chapter 343, HRS review that would seem to meet the Board of Land and Natural Resources (BLNR) requirement that UH "shall be responsible for compliance with Chapter 343. . ." for its use of the leased lands. Staff submittal and meeting minutes, Item D-4, BLNR meeting for May 12, 2006.

This pre-assessment consultation is a service activity of the Environmental Center to help determine and maintain the optimum quality of the environment. It does not represent the official views of the University of Hawaii. The objectives of our review process are to enhance environmental consciousness, encourage cooperation and coordination, and facilitate public participation. Please send us a paper copy of the Draft EA when it becomes available.

Sincerely,

David Penn, Assistant Specialist

copy: Sara Bolduc

2500 Dole Street, Krauss Annex 19 Honolulu, Hawai'i 96822
Telephone: (808) 956-7361 Fax: (808) 956-3980
An Equal Opportunity/Affirmative Action Institution



January 10, 2013

PRINCIPALS

THOMAS S. WITTEN, ASLA
President

R. STAN DUNCAN, ASLA
Executive Vice-President

RUSSELL Y. L. CHUNG, FASLA, LEED^{AP}
Executive Vice-President

VINCENT SHIGEKUNI
Vice-President

GRANT T. MURAKAMI, AICP, LEED^{AP}
Principal

W. FRANK BRANDT, FASLA
Chairman Emeritus

ASSOCIATES

TOM SCHINELL, AICP
Senior Associate

RAYMOND T. HIGA, ASLA
Senior Associate

KEVIN K. NISHIKAWA, ASLA
Associate

KIMI MIKAMI YUEN, LEED^{AP}
Associate

SCOTT ALIKA ABRIGO, LEED^{AP}
Associate

SCOTT MURAKAMI, ASLA, LEED^{AP}
Associate

DACHENG DONG, LEED^{AP}
Associate

HONOLULU OFFICE
1001 Bishop Street, Suite 650
Honolulu, Hawaii 96813-3484
Tel: (808) 521-5631
Fax: (808) 523-1402
E-mail: sysadmin@pbrhawaii.com

KAPOLEI OFFICE
1001 Kamehaha Boulevard
Kapolei Building, Suite 313
Kapolei, Hawaii 96707-2005
Tel: (808) 521-5631
Fax: (808) 535-3163

Mr. David Penn
University of Hawai'i
Environmental Center
2500 Dole Street, Krauss Annex 19
Honolulu, Hawai'i 96822

**SUBJECT: PRE-ASSESSMENT CONSULTATION FOR STATE LAND
DISPOSITION TO THE UNIVERSITY OF HAWAII LOCATED AT
WAIĀKEA, SOUTH HILO DISTRICT, HAWAII
TMK: (3) 2-4-001: 024, 2-4-056: 014, and 2-4-056: 016**

Dear Mr. Penn:

Thank you for your letter dated November 9, 2012 regarding the subject project. As the planning consultant for the proposing agency, University of Hawai'i (UH), we acknowledge your comment that the Department of Health has listed Waiākea Stream as an impaired water body pursuant to the federal Clean Water Act. The Draft Environmental Assessment (EA) will identify this stream as a sensitive resource that the ongoing UH-Hilo Long-Range Development Plan (LRDP) will need to address with appropriate mitigation measures as the LRDP develops the specific uses for the subject property.

Based on your comment, the proposing agency questioned the Department of Land and Natural Resource's (DLNR's) requirement to comply with HRS Chapter 343 for a lease transaction. DLNR confirmed it is their current policy to require an EA or Environmental Impact Statement (EIS) when a lease proposes to change the use of a property. Although an upcoming EIS for the UH-Hilo Long-Range Development Plan could satisfy that requirement, the UH preferred to consummate the lease as soon as possible and therefore has decided to proceed with this EA.

We appreciate your participation in the environmental review process. Your letter will be included in the Draft EA. We will send you a copy of the Draft EA when it is available.

Sincerely,

PBR HAWAII

Roy Takemoto
Managing Director, Hilo Office

cc: University of Hawai'i at Hilo

O:\JOB13\1345.24 UH-Hilo LRDP Update\Acquisition EA and Parcels for UH Hilo\Pre-Assessment Consultation\Responses\EnvCtr.docx



United States Department of the Interior

U.S. GEOLOGICAL SURVEY
Pacific Islands Water Science Center
677 Ala Moana Blvd., Suite 415
Honolulu, Hawaii 96813
Phone: (808) 587-2400/Fax: (808) 587-2401

November 5, 2012

PBR Hawaii & Associates, Inc.
Attn: Mr. Roy Takemoto
1001 Bishop Street, ASB Tower, Suite 650
Honolulu, Hawaii 96813-3484

Dear Mr. Takemoto:

Subject: Pre-Assessment Consultation for State Land Disposition to the University of Hawaii
Located at Hilo (UHH), South Hilo District, Hawaii, TMK: (3) 2-4-001:024, 2-4-056:014, and 2-4-056:016

Thank you for forwarding the subject Pre-Assessment Consultation letter dated October 12, 2012, for review and comment by the staff of the U.S. Geological Survey Pacific Islands Water Science Center. We have determined that the proposed lease of lands from the State to the UHH will have no significant impact on any of our existing or proposed projects.

We appreciate the opportunity to participate in the review process.

Sincerely,

Stephen S. Anthony
Center Director



January 10, 2013

PRINCIPALS

THOMAS S. WITTEN, ASLA
President

R. STAN DUNCAN, ASLA
Executive Vice-President

RUSSELL Y. L. CHUNG, FASLA, LEED^{AP}
Executive Vice-President

VINCENT SHIGEKUNI
Vice-President

GRANT T. MURAKAMI, AICP, LEED^{AP}
Principal

W. FRANK BRANDT, FASLA
Chairman Emeritus

ASSOCIATES

TOM SCHINELL, AICP
Senior Associate

RAYMOND T. HIGA, ASLA
Senior Associate

KEVIN K. NISHIKAWA, ASLA
Associate

KIMI MIKAMI YUEN, LEED^{AP}
Associate

SCOTT ALIKA ABRIGO, LEED^{AP}
Associate

SCOTT MURAKAMI, ASLA, LEED^{AP}
Associate

DACHENG DONG, LEED^{AP}
Associate

Mr. Stephen Anthony, Center Director
U.S. Department of the Interior
U.S. Geological Survey, Pacific Islands Water Science Center
677 Ala Moana Blvd, Suite 415
Honolulu, Hawai'i 96813

**SUBJECT: PRE-ASSESSMENT CONSULTATION FOR STATE LAND
DISPOSITION TO THE UNIVERSITY OF HAWAII LOCATED AT
WAIÁKEA, SOUTH HILO DISTRICT, HAWAII
TMK: (3) 2-4-001: 024, 2-4-056: 014, and 2-4-056: 016**

Dear Mr. Anthony:

Thank you for your letter dated November 5, 2012 regarding the subject project. As the planning consultant for the proposing agency, University of Hawai'i (UH), we acknowledge that your agency has determined that the proposed lease will have no significant impact on any of your existing or proposed projects.

We appreciate your participation in the environmental review process. Your letter will be included in the Draft Environmental Assessment (EA). We will send you a copy of the Draft EA when it is available in case you have comments on the information presented in the EA.

Sincerely,

PBR HAWAII

Roy Takemoto
Managing Director, Hilo Office

cc: University of Hawai'i at Hilo

HONOLULU OFFICE
1001 Bishop Street, Suite 650
Honolulu, Hawai'i 96813-3484
Tel: (808) 521-5631
Fax: (808) 523-1402
E-mail: sysadmin@pbrhawaii.com

KAPOLEI OFFICE
1001 Karmokila Boulevard
Kapolei Building, Suite 313
Kapolei, Hawai'i 96707-2005
Tel: (808) 521-5631
Fax: (808) 535-3163

O:\JOB13\1345.24 UH-Hilo LRDP Update\Acquisition EA and Parcels for UH Hilo\Pre-Assessment Consultation\Responses\USGS.docx

William P. Kenoi
Mayor

William T. Takaba
Managing Director



County of Hawai'i
DEPARTMENT OF PUBLIC WORKS
Aupuni Center
101 Pauahi Street, Suite 7 • Hilo, Hawaii 96720-4224
(808) 961-8321 • Fax (808) 961-8630

Warren H. W. Lee
Director

Brandon A. K. Gonzalez
Deputy Director

November 16, 2012

Mr. Roy Takemoto, Managing Director
PBR Hawaii & Associates, Inc.
1719 Haleloke Street
Hilo, HI 96720-1553

SUBJECT: PRE-ASSESSMENT CONSULTATION
For State Land Disposition to the University of Hawaii
Location: South Hilo, Hawaii
Tax Map Keys: (3) 2-4-01: 024, 2-4-56: 014, and 2-4-56: 016

We have reviewed the subject proposed lease as described in your letter dated October 12, 2012 and offer the following comments for your consideration.

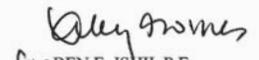
All development-generated runoff shall be disposed of on site and not directed toward any adjacent properties. A drainage plan may be required by the Plan Approval process (Planning Department) in accordance with Section 25-2-72(3) of the Hawaii County Code.

The subject parcels are in an area designated as Zone X on the Flood Insurance Rate Map by the Federal Emergency Management Agency. Zone X is an area determined to be outside the 500-year floodplain.

Any earthwork activity, including grading and grubbing, shall conform to Chapter 10, Erosion and Sedimentation Control, of the Hawaii County Code.

Kapiolani Street (future extension) fronting the subject parcels is classified as a major collector. Therefore, we recommend marginal access onto Kapiolani Street along with no on-street parking. Due to existing terrain, slope easements outside the Kapiolani Street right-of-way may be required. All driveway connections to Kapiolani Street shall conform to Chapter 22, County Streets, of the Hawaii County Code.

Questions may be referred to Mr. Kelly Gomes, P.E. of the Engineering Division at (808) 961-8327.


for BEN E. ISHII, P.E.
Engineering Division Chief

KG

County of Hawai'i is an Equal Opportunity Provider and Employer

12-05533



January 10, 2013

PRINCIPALS

THOMAS S. WITTEN, ASLA
President

R. STAN DUNCAN, ASLA
Executive Vice-President

RUSSELL Y. L. CHUNG, FASLA, LEED^{AP}
Executive Vice-President

VINCENT SHIGEKUNI
Vice-President

GRANT T. MURAKAMI, AICP, LEED^{AP}
Principal

W. FRANK BRANDT, FASLA
Chairman Emeritus

ASSOCIATES

TOM SCHINELL, AICP
Senior Associate

RAYMOND T. HIGA, ASLA
Senior Associate

KEVIN K. NISHIKAWA, ASLA
Associate

KIMI MIKAMI YUEN, LEED^{AP}
Associate

SCOTT ALIKA ABRIGO, LEED^{AP}
Associate

SCOTT MURAKAMI, ASLA, LEED^{AP}
Associate

DACHENG DONG, LEED^{AP}
Associate

HONOLULU OFFICE

1801 Bishop Street, Suite 650
Honolulu, Hawaii 96813-3484
Tel: (808) 521-5631
Fax: (808) 523-1402
E-mail: sysadmin@pbrhawaii.com

KAPOLEI OFFICE

1001 Kamehaha Boulevard
Kapolei Building, Suite 313
Kapolei, Hawaii 96707-2005
Tel: (808) 521-5631
Fax: (808) 535-3163

Mr. Ben Ishii, Engineering Division Chief
County of Hawai'i
Department of Public Works
101 Pauahi Street, Suite 7
Hilo, Hawai'i 96720

**SUBJECT: PRE-ASSESSMENT CONSULTATION FOR STATE LAND
DISPOSITION TO THE UNIVERSITY OF HAWAII LOCATED AT
WAI'AKEA, SOUTH HILO DISTRICT, HAWAII
TMK: (3) 2-4-001: 024, 2-4-056: 014, and 2-4-056: 016**

Dear Mr. Ishii:

Thank you for your letter dated November 16, 2012 regarding the subject project. As the planning consultant for the proposing agency, University of Hawai'i (UH), we will address your comments regarding drainage, earthwork activity, and access to Kapiolani Street in the Draft Environmental Assessment (EA). Thank you for confirming that the subject project site is outside the 500-year floodplain.

We appreciate your participation in the environmental review process. Your letter will be included in the Draft EA. We will send you a copy of the Draft EA when it is available.

Sincerely,

PBR HAWAII



Roy Takemoto
Managing Director, Hilo Office

cc: University of Hawai'i at Hilo

O:\JOB13\1345.24 UH-Hilo LRDP Update\Acquisition EA and Parcels for UH Hilo\Pre-Assessment Consultation\Responses\DPW.docx

William P. Kenoi
Mayor



County of Hawai'i
HAWAII FIRE DEPARTMENT
25 Aupuni Street • Room 2501 • Hilo, Hawai'i 96720
(808) 932-2900 • Fax (808) 932-2928

Darren J. Rosario
Fire Chief
Renwick J. Victorino
Deputy Fire Chief

October 29, 2012

Mr. Roy Takemoto
PBR Hawaii & Associates, Inc.
1719 Haleloke Street
Hilo, Hawai'i 96720

Dear Mr. Takemoto,

**SUBJECT: PRE-ASSESSMENT CONSULTATION FOR STATE LAND
DISPOSITION TO THE UNIVERSITY OF HAWAII LOCATED AT
HILO, SOUTH HILO DISTRICT
TMK: (3) 2-4-001:024, 2-4-056:014 AND 2-4-056:016**

The Hawai'i Fire Department does not have any comments to offer at this time regarding the above-referenced pre-assessment consultation for Environmental Assessment.

Thank you for the opportunity to comment.

Sincerely,

DARREN J. ROSARIO
Fire Chief

RP:lc



Hawai'i County is an Equal Opportunity Provider and Employer.



January 10, 2013

PRINCIPALS

THOMAS S. WITTEN, ASLA
President

R. STAN DUNCAN, ASLA
Executive Vice-President

RUSSELL Y. L. CHUNG, FASLA, LEED[®] AP
Executive Vice-President

VINCENT SHIGEKUNI
Vice-President

GRANT T. MURAKAMI, AICP, LEED[®] AP
Principal

W. FRANK BRANDT, FASLA
Chairman Emeritus

ASSOCIATES

TOM SCHINELL, AICP
Senior Associate

RAYMOND T. HIGA, ASLA
Senior Associate

KEVIN K. NISHIKAWA, ASLA
Associate

KIMI MIKAMI YUEN, LEED[®] AP
Associate

SCOTT ALIKA ABRIGO, LEED[®] AP
Associate

SCOTT MURAKAMI, ASLA, LEED[®] AP
Associate

DACHENG DONG, LEED[®] AP
Associate

Mr. Darren Rosario, Fire Chief
County of Hawai'i
Fire Department
25 Aupuni Street, Room 2501
Hilo, Hawai'i 96720

**SUBJECT: PRE-ASSESSMENT CONSULTATION FOR STATE LAND
DISPOSITION TO THE UNIVERSITY OF HAWAII LOCATED AT
WAIÁKEA, SOUTH HILO DISTRICT, HAWAII
TMK: (3) 2-4-001: 024, 2-4-056: 014, and 2-4-056: 016**

Dear Mr. Rosario:

Thank you for your letter dated October 29, 2012 regarding the subject project. As the planning consultant for the proposing agency, University of Hawai'i (UH), we acknowledge that your agency has no comments at this time.

We appreciate your participation in the environmental review process. Your letter will be included in the Draft Environmental Assessment (EA). We will send you a copy of the Draft EA when it is available in case you have comments based on the information in the EA.

Sincerely,

PBR HAWAII

Roy Takemoto
Managing Director, Hilo Office

cc: University of Hawai'i at Hilo

O:\JOB13\1345.24 UH-Hilo LRDP Update\Acquisition EA and Parcels for UH Hilo\Pre-Assessment Consultation\Responses\Fire.docx

HONOLULU OFFICE

1001 Bishop Street, Suite 650
Honolulu, Hawai'i 96813-3484
Tel: (808) 521-5631
Fax: (808) 523-1402
E-mail: sysadmin@pbrhawaii.com

KAPOLEI OFFICE

1001 Karmokila Boulevard
Kapolei Building, Suite 313
Kapolei, Hawai'i 96707-2005
Tel: (808) 521-5631
Fax: (808) 535-3163

William P. Kenoi
Mayor



County of Hawai'i
PLANNING DEPARTMENT

West Hawai'i Office
74-5044 Ane Keohokalole Hwy
Kailua-Kona, Hawai'i 96740
Phone (808) 323-4770
Fax (808) 327-3563

BJ Leithead Todd
Director

Margaret K. Masunaga
Deputy

East Hawai'i Office
101 Pauahi Street, Suite 3
Hilo, Hawai'i 96720
Phone (808) 961-8288
Fax (808) 961-8742

November 9, 2012

Mr. Roy Takemoto
PBR Hawai'i & Associates, Inc.
1001 Bishop Street, ASB Tower, Suite 650
Honolulu, HI 96813-3484

Dear Mr. Takemoto:

SUBJECT: Pre-Consultation for Draft Environmental Assessment
Project: State Land Disposition to the University of Hawai'i at Hilo
TMK: (3) 2-4:001:024, (3) 2-4-056:014, and (3) 2-4-056:016; South Hilo, HI

Thank you for your letter dated October 12, 2012, requesting comments from this office regarding the preparation of a Draft Environmental Assessment (DEA) for the subject project.

The University of Hawai'i (UH) is proposing to lease State lands (2-4:001:024, 2-4-056:014) for inclusion into their Long-Range Development Plan, presently being updated to determine their best use for university related purposes. In addition, the federal government presently owns parcel 2-4-056:016 and has an agreement to transfer ownership of this parcel to the State. The State would then lease or transfer the parcel to the UH.

The subject properties consist of 46.332 acres and is zoned Single-Family Residential (RS-10) by the County. The properties are situated within the State Land Use Urban District. In addition, the Hawai'i County General Plan Land Use Pattern Allocation Guide (LUPAG) Map designates the parcels as Low Density Urban. The subject parcels are not located within the Special Management Area (SMA).

Please note that Section 25-2-71(c)(2) of the Hawai'i County Code (Zoning) states that Plan approval shall be required for all public uses, structures and buildings and community buildings, as permitted under section 25-4-11. Therefore, Plan approval will be required for any proposed structures on the subject parcels.

Mr. Roy Takemoto
PBR Hawai'i & Associates, Inc.
November 9, 2012
Page 2

We have no further comments to offer, at this time. However, please provide our department with a copy of the Draft Environmental Assessment for our review and comment.

If you have any questions, or if you need further assistance, please feel free to contact Bethany Morrison of this office at (808) 961-8138.

Sincerely,

BJ LEITHEAD TODD
Planning Director

BJM:cs
P:\wpwin60\Bethany\EA-EIS Review\preconsult\draftca State Land Disposition UHH.doc



January 10, 2013

PRINCIPALS

THOMAS S. WITTEN, ASLA
President

R. STAN DUNCAN, ASLA
Executive Vice-President

RUSSELL Y. L. CHUNG, FASLA, LEED[®] AP
Executive Vice-President

VINCENT SHIGEKUNI
Vice-President

GRANT T. MURAKAMI, AICP, LEED[®] AP
Principal

W. FRANK BRANDT, FASLA
Chairman Emeritus

ASSOCIATES

TOM SCHNELL, AICP
Senior Associate

RAYMOND T. HIGA, ASLA
Senior Associate

KEYIN K. NISHIKAWA, ASLA
Associate

KIMI MIKAMI YUEN, LEED[®] AP
Associate

SCOTT ALIKA ABRIGO, LEED[®] AP
Associate

SCOTT MURAKAMI, ASLA, LEED[®] AP
Associate

DACHENG DONG, LEED[®] AP
Associate

Ms. BJ Leithead Todd, Director
County of Hawai'i
Planning Department
101 Pauahi Street, Suite 3
Hilo, Hawai'i 96720

**SUBJECT: PRE-ASSESSMENT CONSULTATION FOR STATE LAND
DISPOSITION TO THE UNIVERSITY OF HAWAII LOCATED AT
WAIÁKEA, SOUTH HILO DISTRICT, HAWAII
TMK: (3) 2-4-001: 024, 2-4-056: 014, and 2-4-056: 016**

Dear Ms. Leithead Todd:

Thank you for your letter dated November 9, 2012 regarding the subject project. As the planning consultant for the proposing agency, University of Hawai'i (UH), thank you for confirming that the subject project site is in the State Land Use Urban District, designated Low Density Urban by the General Plan Land Use Pattern Allocation Guide (LUPAG) Map, zoned Single-Family Residential (RS-10), is not in the Special Management Area, and will require Plan Approval for proposed public structures.

We appreciate your participation in the environmental review process. Your letter will be included in the Draft Environmental Assessment (EA). We will send you a copy of the Draft EA when it is available.

Sincerely,

PBR HAWAII

A handwritten signature in black ink, appearing to read "Roy Takemoto", written over the printed name.

Roy Takemoto
Managing Director, Hilo Office

cc: University of Hawai'i at Hilo

HONOLULU OFFICE
1001 Bishop Street, Suite 650
Honolulu, Hawai'i 96813-3484
Tel: (808) 521-5631
Fax: (808) 523-1402
E-mail: sysadmin@pbrhawaii.com

O:\JOB13\1345.24 UH-Hilo LRDP Update\Acquisition EA and Parcels for UH Hilo\Pre-Assessment Consultation\Responses\Ping.docx

KAPOLEI OFFICE
1001 Karmokila Boulevard
Kapolei Building, Suite 313
Kapolei, Hawai'i 96707-2005
Tel: (808) 521-5631
Fax: (808) 535-3163

Appendix **B**

FLORA AND FAUNA SURVEY

FLORA AND FAUNA SURVEY AND ASSESSMENT
FOR THE
UNIVERSITY OF HAWAII HILO
LONG RANGE DEVELOPMENT PLAN
WAIAKEA, SOUTH HILO, HAWAII

by

ROBERT W. HOBDY
ENVIRONMENTAL CONSULTANT
Kokomo, Maui
November 2012

Prepared for:
PBR HAWAII

FLORA AND FAUNA SURVEY AND ASSESSMENT
UNIVERSITY OF HAWAII HILO LONG RANGE DEVELOPMENT PLAN
WAIAKEA, SOUTH HILO, HAWAII

INTRODUCTION

The University of Hawaii-Hilo Long Range Development Plan Project lies on 46.3 acres in Hilo Town along Waiakea Stream (see Figure 1). The property lies between West Lanikaula Street and Mohouli Street. Most of the property (42.6 acres) is undeveloped forest land while 3.7 acres has existing structures. This biological resources study was initiated in fulfillment of environmental requirements of the planning process.

SITE DESCRIPTION

This project area has three parts to it. The 3.7 acre portion fronting Lanikaula Street has older structures on it with lawns and modest landscaping. The two larger undeveloped portions which are bisected by Waiakea Stream channel, are a very dense, lowland tropical rain forest. Elevations range between 70 feet and 160 feet above sea level. The substrate is rough 'a'ā lava with pockets of organic soil in low spots. Rainfall averages about 150 inches per year (Armstrong, 1983).

BIOLOGICAL HISTORY

The relatively recent 'a'ā lava flows in the upper and eastern parts of Hilo were originally colonized by young, vigorous 'ōhi'a (*Metrosideros polymorpha*) forests and such other pioneer species as kupukupu fern (*Nephrolepis exaltata*) and 'ie'ie (*Freycinetia arborea*). This native species composition began to change during the 1900s as Hilo became a center for flower culture. Many exotic plant species were introduced by nurseries, landscape professionals and plant lovers because everything grew so well in Hilo. Many of these introductions began to naturalize and move out into the wild. Today, the Hilo area is inundated with hundreds of species of these introductions that have proliferated and have replaced the original native species, forming dense and nearly impenetrable jungles. This is what was encountered in most of the project area.

SURVEY OBJECTIVES

This report summarizes the findings of a flora and fauna survey of the University of Hawaii-Hilo Long Range Development Plan project which was conducted on November 2012. The objectives of the survey were to:

1. Document what plant, and animal species occur on the property or may likely occur in the existing habitat.
2. Document the status and abundance of each species.
3. Determine the presence or likely occurrence of any native flora and fauna, particularly any that are Federally listed as Threatened or Endangered. If such occur, identify what features of the habitat may be essential for these species.
4. Determine if the project area contains any special habitats which if lost or altered might result in a significant negative impact on the flora and fauna in this part of the island.

BOTANICAL SURVEY REPORT

SURVEY METHODS

A walk-through botanical survey method was used following routes to ensure that all parts of this large property were covered. Areas most likely to harbor native or rare plants such as the rocky outcrops and gullies were more intensively examined. Notes were made on plant species, distribution and abundance as well as on terrain and substrate.

DESCRIPTION OF THE VEGETATION

The vegetation on the project area is dominated by non-native trees, shrubs, vines, grasses and ferns that have grown into a dense, multi-layered tropical jungle. A total of 136 plant species were recorded during four site visits. The one species that was truly abundant throughout most of the area was strawberry guava (*Psidium cattleianum*), a small shade tolerant tree that proliferates in the understory of larger trees and creates a nearly impenetrable barrier. Also common were the gunpowder tree (*Trema orientalis*), the melochia tree (*Melochia unbellata*) and the maile hohono vine (*Paederia foetida*) that drapes over trees and shrubs.

Six plant species were native: the endemic neneleau (*Rhus sandwicensis*) which is found only in Hawaii, and the five indigenous species: hala tree (*Pandanus tectorius*), koali awahia (*Ipomoea indica*), (*Cyperus polystachyos*) no common name and two ferns, (*Crepidomanes minutum*) no common name, and pākahakaha (*Lepisorus thunbergianus*) all of which are native to Hawaii as well as to other Pacific islands.

Six species were plants which the Polynesians brought here during the course of their migrations: kukui (*Aleurites moluccana*), niu (*Cocos nucifera*), ki (*Cordyline fruticosa*), 'ape (*Alocasia macrorrhiza*), hau (*Talipariti tileaceum*) and 'ihi 'ai (*Oxalis corniculata*).

The remaining 124 plants were non-native species.

DISCUSSION AND RECOMMENDATIONS

The vegetation throughout the project area is dominated by non-native grasses, vines, ferns, shrubs and trees. The area has been heavily altered by historical land uses and continues to be invaded by aggressive weed species. All of the 6 native species found are widespread in Hawaii and common.

No Federally listed Threatened or Endangered plant species (USFWS, 2009) were found on the property, nor were any found that are candidates for such status. No special native habitats were found here either.

Because of the above existing conditions, it is determined that the future expansion of the University facilities on this 46.3 acre parcel will not have a significant negative impact on the botanical resources in this part of Hawaii island. No recommendations regarding the botanical resources are deemed appropriate or necessary.

PLANT SPECIES LIST

Following is a checklist of all those vascular plant species inventoried during the field studies. Plant families are arranged alphabetically within four groups: Conifers, Ferns, Monocots and Dicots. Taxonomy and nomenclature of the ferns follow Palmer (2003), while the Conifers, Monocots and Dicots are in accordance with Wagner et al. (1999) and Staples and Herbst (2005).

For each species, the following information is provided:

1. Scientific name with author citation
2. Common English or Hawaiian name.
3. Bio-geographical status. The following symbols are used:

endemic = native only to the Hawaiian Islands; not naturally occurring anywhere else in the world.

indigenous = native to the Hawaiian Islands and also to one or more other geographic area(s).

Polynesian = all those plants brought to Hawaii during the course of Polynesian migrations.

non-native = all those plants brought to the islands intentionally or accidentally after western contact.

4. Abundance of each species within the project area:

abundant = forming a major part of the vegetation within the project area.

common = widely scattered throughout the area or locally abundant within a portion of it.

uncommon = scattered sparsely throughout the area or occurring in a few small patches.

rare = only a few isolated individuals within the project area.

SCIENTIFIC NAME	COMMON NAME	STATUS	ABUNDANCE
FERNS			
ATHYRIACEAE (Lady Fern Family)			
<i>Diplazium esculentum</i> (Retz.) Sw.	paca	non-native	uncommon
BLECHNACEAE (Chain Fern Family)			
<i>Blechnum appendiculatum</i> Willd.	palm fern	non-native	uncommon
DAVALLIACEAE (Davallia Fern Family)			
<i>Davallia solida</i> (Forst.) Sw.	hare's-foot fern	non-native	uncommon
HYMENOPHYLLACEAE (Filmy Fern Family)			
<i>Crepidomanes minutum</i> (Blume) K. Iwatsuki	-----	indigenous	rare
NEPHROLEPIDACEAE (Sword Fern Family)			
<i>Nephrolepis brownii</i> (Desv.) Hovencamp & Miyamoto	Asian sword fern	non-native	uncommon
POLYPODIACEAE (Polypody Fern Family)			
<i>Lepisorus thunbergianus</i> (Kaulf.) Ching	pākahakaha	indigenous	rare
<i>Phlebodium aureum</i> (L.) J. Sm.	rabbit's foot fern	non-native	uncommon
<i>Phymatosorus grossus</i> (Langsd. & Fisch.) Brownlie	laua'e	non-native	uncommon
PTERIDACEAE (Brake Fern Family)			
<i>Pityrogramma austroamericana</i> Domin	gold fern	non-native	rare
THELYPTERIDACEAE (Marsh Fern Family)			
<i>Christella parasitica</i> (L.) H. Lev.	-----	non-native	rare
CONIFERS			
ARAUCARIACEAE (Araucaria Family)			
<i>Araucaria columnaris</i> (G. Forster) J.D. Hooker	Cook pine	non-native	rare
CUPRESSACEAE (Cypress Family)			
<i>Cupressus</i> sp.	-----	non-native	rare
MONOCOTS			
ARACEAE (Aroid Family)			
<i>Alocasia macrorrhizos</i> (L.) G. Don	'ape	Polynesian	rare
<i>Epipremnum pinnatum</i> (L.) Engl.	taro vine	non-native	uncommon
ARECACEAE (Palm Family)			
<i>Archontophoenix alexandrae</i> (v.Muell.)Wendl.&Drude	king palm	non-native	uncommon
<i>Cocos nucifera</i> L.	niu, coconut	Polynesian	rare
ASPARAGACEAE (Asparagus Family)			
<i>Cordyline fruticosa</i> (L.) A. Chev.	ki, ti	Polynesian	uncommon
COMMELINACEAE (Spiderwort Family)			
<i>Commelina diffusa</i> N.L. Burm.	honohono	non-native	rare
CYPERACEAE (Sedge Family)			
<i>Cyperus haspan</i> L.	-----	non-native	rare
<i>Cyperus polystachyos</i> Rottb.	-----	indigenous	uncommon
<i>Fimbristylis dichotoma</i> (L.) Vahl	-----	non-native	rare
<i>Kyllinga brevifolia</i> Rottb.	kili'o'opu	non-native	rare
ORCHIDACEAE (Orchid Family)			
<i>Spathoglottis plicata</i> Blume	Phillipine ground orchid	non-native	rare

SCIENTIFIC NAME	COMMON NAME	STATUS	ABUNDANCE
PANDANACEAE (Screwpine Family)			
<i>Pandanus tectorius</i> Parkinson ex Z.	hala	indigenous	uncommon
POACEAE (Grass Family)			
<i>Axonopus compressus</i> (Sw.) P. Beauv	broad-leaved carpetgrass	non-native	uncommon
<i>Axonopus fissifolius</i> (Raddi) Kuhl	narrow-leaved carpetgrass	non-native	rare
<i>Bambusa vulgaris</i> J.C. Wendland	common bamboo	non-native	rare
<i>Cenchrus purpureus</i> (Schumach.) Morrone	Napier grass	non-native	rare
<i>Chloris radiata</i> (L.) Sw.	plush grass	non-native	rare
<i>Digitaria ciliaris</i> (Retz.) Koeler	Henry's crab grass	non-native	rare
<i>Digitaria violascens</i> Link	kukae pua'a	non-native	rare
<i>Eragrostis pectinacea</i> (Michx.) Nees	Carolina lovegrass	non-native	rare
<i>Eragrostis unioides</i> (Retz.) Nees	Chinese lovegrass	non-native	rare
<i>Megathyrsus maximus</i> (Jacq.) Simon & Jacobs	Guinea grass	non-native	rare
<i>Melinis minutiflora</i> P. Beauv.	molasses grass	non-native	rare
<i>Melinis repens</i> (Willd.) Zizka	Natal redtop	non-native	rare
<i>Oplismenus hirtellus</i> (L.) P. Beauv.	bamboo grass	non-native	uncommon
<i>Panicum repens</i> L.	torpedo grass	non-native	rare
<i>Paspalum conjugatum</i> Bergius	Hilo grass	non-native	uncommon
<i>Paspalum dilatatum</i> Poir.	Dallis grass	non-native	rare
<i>Paspalum paniculatum</i> L.	arrocillo	non-native	rare
<i>Paspalum scrobiculatum</i> L.	ricegrass	non-native	rare
<i>Paspalum urvillei</i> Steud.	Vasey grass	non-native	rare
<i>Phragmites australis</i> (Cav.) Steud.	reed grass	non-native	rare
<i>Phyllostachys aurea</i> A&C Riviere	dwarf bamboo	non-native	uncommon
<i>Sacciolepis indica</i> (L.) Chase	Glenwood grass	non-native	uncommon
<i>Schizachyrium condensatum</i> (Kunth) Nees	bushy beardgrass	non-native	rare
<i>Setaria palmifolia</i> (J.Kong) Stapf	palm grass	non-native	rare
<i>Setaria parviflora</i> (Poir.) Kerguelen	yellow foxtail	non-native	rare
<i>Sporobolus diander</i> (Retz.) P. Beauv.	Indian dropseed	non-native	rare
<i>Urochloa mutica</i> (Forssk.) T.Q. Nguyen	California grass	non-native	uncommon
ZINGIBERACEAE (Ginger Family)			
<i>Hedychium flavescens</i> N. Carey ex Roscoe	yellow ginger	non-native	rare
DICOTS			
ACANTHACEAE (Acanthus Family)			
<i>Asystasia</i> sp.	-----	non-native	rare
<i>Blechum brownei</i> Juss.	-----	non-native	rare
ANACARDIACEAE (Mango Family)			
<i>Mangifera indica</i> L.	mango	non-native	rare
<i>Rhus sandwicensis</i> A. Gray	neneleau	endemic	rare
APOCYNACEAE (Dogbane Family)			
<i>Allamanda cathartica</i> L.	allamanda	non-native	rare
<i>Alstonia scholaris</i> (L.) R. Br.	Indian devil tree	non-native	uncommon
<i>Plumeria rubra</i> L.	plumeria	non-native	rare

SCIENTIFIC NAME	COMMON NAME	STATUS	ABUNDANCE
ARALIACEAE (Panax Family)			
<i>Schefflera actinophylla</i> (Endl.) Harms	octopus tree	non-native	uncommon
<i>Schefflera arboricola</i> (Hayata) Merrill	arboricola	non-native	rare
ASTERACEAE (Sunflower Family)			
<i>Ageratum conyzoides</i> L.	maile hohono	non-native	uncommon
<i>Bidens pilosa</i> L.	Spanish needle	non-native	rare
<i>Conyza canadensis</i> (L.) Cronq.	horseweed	non-native	uncommon
<i>Crassocephalum crepidioides</i> (Benth.) S. Moore	redflower ragleaf	non-native	rare
<i>Emilia fosbergii</i> Nicolson	red pualele	non-native	rare
<i>Flaveria trinervia</i> (Spreng.) C. Mohr	clustered yellowtops	non-native	rare
<i>Galinsoga parviflora</i> Cav.	-----	non-native	rare
<i>Sphagneticola trilobata</i> (L.) Pruski	wedelia	non-native	uncommon
<i>Tridax procumbens</i> L.	coat buttons	non-native	rare
<i>Youngia japonica</i> (L.) DC.	Oriental hawkweed	non-native	rare
BEGONIACEAE (Begonia Family)			
<i>Begonia semperflorens - cultorum</i>	wax begonia	non-native	uncommon
CAMPANULACEAE (Bellflower Family)			
<i>Hippobroma longiflora</i> (L.) G. Don	star-of-Bethlehem	non-native	rare
CANNABACEAE (Hemp Family)			
<i>Trema orientalis</i> (L.) Blume	gunpowder tree	non-native	common
CARYOPHYLLACEAE (Pink Family)			
<i>Drymaria cordata</i> (L.) Willd.ex Roem.&Schult.	pipili	non-native	rare
CLUSIACEAE (Mangosteen Family)			
<i>Clusia rosea</i> Jacq.	autograph tree	non-native	uncommon
COMBRETACEAE (Indian Almond Family)			
<i>Terminalia myriocarpa</i> Van Heurck&Mull.Arg.	jhalna	non-native	rare
CONVOLVULACEAE (Morning Glory Family)			
<i>Ipomoea alba</i> L.	moon flower	non-native	rare
<i>Ipomoea indica</i> (J. Burm.) Merr.	koali awahia	indigenous	rare
<i>Ipomoea ochracea</i> (Lindl.) G. Don	-----	non-native	rare
<i>Ipomoea triloba</i> L.	little bell	non-native	rare
CUCURBITACEAE (Gourd Family)			
<i>Momordica charantia</i> L.	bitter melon	non-native	rare
EUPHORBIACEAE (Spurge Family)			
<i>Aleurites moluccana</i> (L.) Willd.	kukui	Polynesian	rare
<i>Codiaeum variegatum</i> (L.) Blume	croton	non-native	rare
<i>Euphorbia heterophylla</i> L.	kaliko	non-native	rare
<i>Euphorbia hirta</i> L.	hairy spurge	non-native	rare
<i>Euphorbia hypericifolia</i> L.	graceful spurge	non-native	rare
<i>Euphorbia thymifolia</i> L.	thyme-leaved spurge	non-native	rare
<i>Macaranga mappia</i> (L.) Mull. Arg.	bingabing	non-native	uncommon
FABACEAE (Pea Family)			
<i>Albizia chinensis</i> (Osbeck) Merr.	-----	non-native	uncommon

SCIENTIFIC NAME	COMMON NAME	STATUS	ABUNDANCE
<i>Canavalia cathartica</i> Thouars	maunaloa	non-native	rare
<i>Chamaecrista nictitans</i> (L.) Moench	partridge pea	non-native	rare
<i>Crotalaria lanceolata</i> E. Meyen	rattlepod	non-native	rare
<i>Crotalaria pallida</i>	smooth rattlepod	non-native	rare
<i>Desmodium incanum</i> DC.	Spanish clover	non-native	rare
	three-flowered		
<i>Desmodium triflorum</i> (L.) DC.	beggarweed	non-native	uncommon
<i>Macroptilium lathyroides</i> (L.) Urb.	wild bean	non-native	rare
<i>Mimosa pudica</i> L.	sensitive plant, hilahila	non-native	uncommon
<i>Mucuna</i> sp.	purple-flowered sea bean	non-native	uncommon
<i>Samanea saman</i> (Jacq.) Merr.	monkeypod	non-native	rare
HYPERICACEAE (St. John's wort Family)			
<i>Hypericum mutilum</i> L.	St. John's wort	non-native	rare
LAMIACEAE (Mint Family)			
<i>Hyptis pectinata</i> (L.) Poit.	comb hyptis	non-native	rare
LAURACEAE (Laurel Family)			
<i>Persea americana</i> Mill.	avocado	non-native	rare
LYTHRACEAE (Loosestrife Family)			
<i>Cuphea carthagenensis</i> (Jacq.) Macbr.	tarweed	non-native	rare
MALVACEAE (Mallow Family)			
<i>Melochia unbellata</i> (Houtt.) Stapf	melochia	non-native	common
<i>Talipariti tileaceum</i> (L.) Fryxell	hau	Polynesian	rare
MELASTOMACEAE (Melastoma Family)			
<i>Clidemia hirta</i> (L.) D. Don	Koster's curse	non-native	uncommon
<i>Dissotis rotundifolia</i> (Sm.) Triana	-----	non-native	uncommon
<i>Melastoma candidum</i> D. Don	melastoma	non-native	uncommon
MORACEAE (Mulberry Family)			
<i>Ficus microcarpa</i> L.fil.	Chinese banyan	non-native	uncommon
MYRTACEAE (Myrtle Family)			
<i>Psidium cattleianum</i> Sabine	strawberry guava	non-native	abundant
<i>Psidium guajava</i> L.	common guava	non-native	uncommon
ONAGRACEAE (Evening Primrose Family)			
<i>Ludwigia palustris</i> (L.) Elliot	marsh purslane	non-native	rare
OROBANCHACEAE (Broomrape Family)			
<i>Castilleja arvensis</i> Cham. & Schlectend.	indian paint brush	non-native	rare
OXALIDACEAE (Wood Sorrel Family)			
<i>Oxalis corniculata</i> L.	'ihi, yellow wood sorrel	Polynesian	rare
PASSIFLORACEAE (Passion Flower Family)			
<i>Passiflora edulis</i> Sims	passion fruit	non-native	rare
PLANTAGINACEAE (Plantain Family)			
<i>Buddleja asiatica</i> Lour.	dog tail	non-native	rare
<i>Lindernia crustacea</i> (L.) F.v.Muell.	false pimpernel	non-native	rare
<i>Plantago lanceolata</i> L.	English plantain	non-native	rare

SCIENTIFIC NAME	COMMON NAME	STATUS	ABUNDANCE
<i>Torenia asiatica</i> L.	Ola'a beauty	non-native	rare
POLYGALACEAE (Milkwort Family)			
<i>Polygala paniculata</i> L.	fragrant polygala	non-native	rare
PRIMULACEAE (Primrose Family)			
<i>Ardisia elliptica</i> Thunberg	shoebutton ardisia	non-native	rare
ROSACEAE (Rose Family)			
<i>Rubus rosifolius</i> Sm.	thimbleberry	non-native	uncommon
RUBIACEAE (Coffee Family)			
<i>Coffea arabica</i> L.	coffee	non-native	rare
<i>Oldenlandia callitrichoides</i> (Griesh.) Terrell & Lewis	-----	non-native	rare
<i>Oldenlandia corymbosa</i> L.	-----	non-native	rare
<i>Paederia foetida</i> L.	maile pilau	non-native	common
<i>Spermacoce assurgens</i> Ruiz & Pav.	buttonweed	non-native	rare
<i>Spermacoce exilis</i> (Williams) Adams	-----	non-native	rare
SAPINDACEAE (Soapberry Family)			
<i>Cardiospermum halicacabum</i> L.	heartseed, pōniu	non-native	rare
<i>Filicum decipiens</i> (Wight & Arnott) Thwaites	fern tree	non-native	uncommon
SOLANACEAE (Nightshade Family)			
<i>Cestrum diurnum</i> L.	day cestrum	non-native	rare
URTICACEAE (Nettle Family)			
<i>Cecropia obtusifolia</i> Bertol.	cecropia	non-native	uncommon
<i>Pilea microphylla</i> (L.) Liebm.	artillery plant	non-native	rare
VERBENACEAE (Verbena Family)			
<i>Lantana camara</i> L.	lantana	non-native	rare
<i>Stachytarpheta australis</i> Moldenke	ōwī	non-native	rare

FAUNA SURVEY REPORT

SURVEY METHODS

A walk-through fauna survey method was conducted in conjunction with the botanical survey. All parts of the project area including all habitat types were covered. Field observations were made with the aid of binoculars and by listening to vocalizations. Notes were made on species, abundance, activities and location as well as observations of trails, tracks, scat and signs of feeding. In addition an evening visit was made to the area to record crepuscular activities and vocalizations and to see if there was any evidence of occurrence of the Hawaiian hoary bat (*Lasiurus cinereus semotus*) in the area.

RESULTS

MAMMALS

Two mammals species were recorded during four site visits in the project area. Taxonomy and nomenclature follow Tomich (1986). These included the feral pig (*Sus scrofa*) and the Hawaiian hoary bat.

Extensive rooting and wallows by feral pigs were observed in different parts of the project area indicating the presence of a significant population of these animals. Feral pigs are common throughout much of the Big island.

An evening survey was conducted at two locations in the project area in order to ascertain the presence of the endemic and Endangered 'ōpe'ape'a or Hawaiian hoary bat. A bat detecting device (Batbox IIID) was employed, set to the frequency of 27,000 Hertz which these bats are known to use for echolocation. As soon as this device was turned on at each location, multiple bats were detected emitting their echolocation calls as they flew about in search of flying insects. This level of activity indicated a substantial population of these bats at the time of the survey.

Other non-native mammals would be expected to be present in this habitat. These include mice (*Mus domesticus*), rats (*Rattus* spp.), mongoose (*Herpestes auropunctatus*) and cats (*Felis catus*). Mice and rats feed on seeds, fruits and herbaceous vegetation, while the mongoose and cats would prey on these rodents and birds.

BIRDS

Birdlife was moderate both in species diversity and in total numbers seen. Ten species of non-native birds were observed during four site visits to the project area. Taxonomy and nomenclature follow American Ornithologists' Union (2011). Two bird species were common: common myna (*Acridotheres tristis*) and zebra dove (*Geopelia striata*). Less common were spotted dove (*Streptopelia chinensis*), northern cardinal (*Cardinalis cardinalis*) and Japanese white-eye (*Zosterops japonicus*). Five other species were of rare occurrence (see Animal Species List).

A few other non-native birds would be occasional users of this site, but the habitat is unsuitable for Hawaii's native forest birds which presently occupy native forest uplands beyond the elevational range of mosquitoes and the avian diseases they carry and transmit. This dense jungle also does not provide habitat for the other native Endangered birds like the ae'ō or Hawaiian stilt (*Himantopus mexicanus knudseni*), the alae ke'oke'o or Hawaiian coot (*Fulica alai*) and the nēnē or Hawaiian goose (*Branta sandvicensis*). None of these native birds were seen.

INSECTS

There were moderate amounts of insect life on this property mostly observed in the undeveloped forests and on their margins. Eight insect species were found during four site visits. Taxonomy and nomenclature follow Nishida et al (1992). Two of these species were of common occurrence, the Asian tiger mosquito (*Aedes albopictus*) and the small pomace flies (*Drosophila melanogaster*). Two dragonfly species are indigenous in the islands as well as in tropics elsewhere, the globe skimmer (*Pantala flavescens*) and the green darner (*Anax junius*).

No Endangered insects were observed during the survey. None of the host plants of Blackburn's sphinx moth (*Manduca blackburni*) were found on the property and none of the moths or their larvae were seen. None of the three Endangered Big Island fruit flies, *Drosophila heteroneura*, *D. mulli* or *D. ochrobasis* were seen. These three Endangered species are known from good native forests at much higher elevations in other parts of the Big Island. No Hawaiian damselflies were seen during the survey. Two Big Island species, *megalagrion nesiototes* and *M. Xanthomelas* are Endangered. This property lacks the aquatic habitat suitable for these damselflies.

AMPHIBIANS

Just one non-native amphibian was found during the survey, the Puerto Rican coqui frog (*Eleutherodactylus coqui*). This frog was found to be abundant across the entire property, and indeed has become abundant across the entire wet windward side of the Big Island. It is considered to be a pest because of its extremely loud nocturnal calls.

REPTILES AND MOLLUSKS

No reptiles or mollusks were seen during the survey.

DISCUSSION AND RECOMMENDATIONS

The fauna of this property are largely made up of non-native species that have been either purposeful or accidental introductions to Hawaii. Just three species were found to be native, the Endangered 'ōpe'ape'a or Hawaiian bat and two indigenous dragonflies, the globe skimmer and the green darner.

The globe skimmer and the green darner, as previously discussed are common in Hawaii and are also in the tropics elsewhere. They are of no heightened conservation concern.

The 'ōpe'ape'a, however, is endemic to the Hawaiian Islands and is an Endangered species as well, carrying with it federal protections wherever it goes. It occurs on at least five of the major Hawaiian islands and has its largest population on Hawaii Island. These bats are highly mobile and are known to move up and down slopes, from about 10,000 feet in the subalpine zone down to sea level. Movements are likely driven by food source availability. They can show up almost anywhere in a wide range of habitats.

On this property multiple 'ōpe'ape'a were detected during the evening survey at each of two locations. What the entire population here is, and how it may vary during the year is unknown.

The U.S. Fish and Wildlife Service has jurisdiction over these bats under powers outlined in the Endangered Species Act (1973). They should be consulted before any construction and development occurs on the campus. They will determine what actions should be taken that will ensure the welfare of the 'ōpe'ape'a.

No other fauna concerns are foreseen and no other recommendations are offered regarding the fauna resources on this portion of the University of Hawaii-Hilo Long Range Development Plan Project.

ANIMAL SPECIES LIST

Following is a checklist of the animal species inventoried during the field work. Animal species are arranged in descending abundance within five groups: Mammals, Birds, Insects and Amphibians. For each species the following information is provided:

1. Common name
2. Scientific name
3. Bio-geographical status. The following symbols are used:
 - endemic = native only to Hawaii; not naturally occurring anywhere else in the world.
 - indigenous = native to the Hawaiian Islands and also to one or more other geographic area(s).
 - non-native = all those animals brought to Hawaii intentionally or accidentally after western contact.
 - migratory = spending a portion of the year in Hawaii and a portion elsewhere. In Hawaii the migratory birds are usually in the overwintering/non-breeding phase of their life cycle.
4. Abundance of each species within the project area:
 - abundant = many flocks or individuals seen throughout the area at all times of day.
 - common = a few flocks or well scattered individuals throughout the area.
 - uncommon = only one flock or several individuals seen within the project area.
 - rare = only one or two seen within the project area.

SCIENTIFIC NAME	COMMON NAME	STATUS	ABUNDANCE
MAMMALS			
<i>Lasiurus cinereus semotus</i> Allen	'ōpe'ape'a, Hawaiian hoary bat	endemic	common
<i>Sus scrofa</i> L.	feral pig	non-native	uncommon
BIRDS			
<i>Acridotheres tristis</i> L.	common myna	non-native	common
<i>Geopelia striata</i> L.	zebra dove	non-native	common
<i>Streptopelia chinensis</i> Scopoli	spotted dove	non-native	uncommon
<i>Cardinalis cardinalis</i> L.	northern cardinal	non-native	uncommon
<i>Zosterops japonicus</i> Temminck & Schlegel	Japanese white-eye	non-native	uncommon
<i>Sicalis flaveola</i> L.	saffron finch	non-native	rare
<i>Gallus gallus</i> L.	chicken	non-native	rare
<i>Pluvialis fulva</i> Gmelin	kōlea, Pacific golden-plover	migratory	rare
<i>Carpodacus mexicanus</i> Muller	house finch	non-native	rare
<i>Passer domesticus</i> L.	house sparrow	non-native	rare
AMPHIBIANS			
<i>Eleutherodactylus</i> Coqui Thomas	coqui frog	non-native	abundant

SCIENTIFIC NAME	COMMON NAME	STATUS	ABUNDANCE
INSECTS			
Order DIPTERA - flies			
CULICIDAE (Mosquito Family)			
<i>Culex albopictus</i> Skuse	day mosquito	non-native	common
DROSOPHILIDAE (Fruit Fly Family)			
<i>Drosophila melanogaster</i> Meigen	pomace fly	non-native	abundant
SYRPHIDAE (Hover Fly Family)			
<i>Eumerus aurifrons</i> Wiedemann	bulb fly	non-native	rare
Order HYMENOPTERA - bees & wasps			
APIDAE (Honey Bee Family)			
<i>Apis mellifera</i> L.	honey bee	non-native	rare
Order LEPIDOPTERA - butterflies & moths			
HESPERIIDAE (Skipper Butterfly Family)			
<i>Hylephila phyleus</i> Drury	fiery skipper	non-native	rare
PIERIDAE (White and Sulphur Butterfly Family)			
<i>Pieris rapae</i> L.	cabbage butterfly	non-native	rare
Order ODONATA - dragonflies & damselflies			
AESHNIDAE (Darner Dragonfly Family)			
<i>Anax junius</i> Drury	green darner	indigenous	rare
LIBELLULIDAE (Skimmer Dragonfly Family)			
<i>Pantala flavescens</i> Fabricius	globe skimmer	indigenous	uncommon



Figure 2 Project Area showing a dense forest of gund powder tree and melochia.



Figure 3 Dense wet tropical forest with strawberry guava in understory.

Literature Cited

- American Ornithologists' Union 2011. Check-list of North American Birds. 7th edition. American Ornithologists' Union. Washington D.C.
- Armstrong, R. W. (ed.) 1983. Atlas of Hawaii. (2nd. ed.) University of Hawaii Press.
- Foote, D.E. , E.L. Hill, S. Nakamura, and F. Stephens. 1972. Soil survey of the islands of Kauai, Oahu, Maui, Molokai, and Lanai, State of Hawaii. U.S. Dept. of Agriculture, Soil Conservation Service. Washington, D.C.
- Nishida, G.M. & G.A. Samuelson, J.S. Strazanac & K.S. Kami. 1992. Hawaiian Terrestrial Arthropod Checklist. Hawaiian Biological Survey.
- Staples, G.W. and D.R. Herbst. 2005. A Tropical Garden Flora – Plants Cultivated in the Hawaiian Islands and Other Tropical Places. Bishop Museum Press, Honolulu.
- Tomich, P.Q. 1986. Mammals in Hawaii. Bishop Museum Press, Honolulu.
- United States Congress (1973). Endangered Species Act (7 U.S.C. section 136, 16 U.S.C. section 1531 et seqo.) Washington, D.C.
- U.S. Fish and Wildlife Service. 2011. Endangered and threatened wildlife and Plants. Listings and Occurrences for Hawaii. www.fws.gov/endangered.
- U.S. Fish and Wildlife Service. 2000. Endangered and threatened wildlife and plants: determination of endangered status for Blackburn's sphinx moth from Hawaii. Federal Register 65(21): 4770-4779.
- Wagner, W. L., D.R. Herbst, and S. H. Sohmer. 1999. Manual of the Flowering Plants of Hawai'i. Univ. of Hawai'i Press and Bishop Museum Press. Honolulu.

Appendix **C**

ARCHEOLOGICAL INVENTORY SURVEY

**AN ARCHAEOLOGICAL INVENTORY SURVEY
ON APPROXIMATELY 42.6 ACRES OF LAND FOR THE
UNIVERSITY OF HAWAII-HILO MAUKA ACQUISITION PROJECT
WAIĀKEA AHUPUA`A, SOUTH HILO DISTRICT,
ISLAND OF HAWAII, HAWAII
[TMK: (3) 2-4-001:024 and 2-4-056-016]**

Prepared by:
Glenn Escott, M.A.
July 2013

Prepared for:
PBR Hawaii
1001 Bishop Street
Pacific Tower, Suite 650
Honolulu, Hawaii 96813-3429

TABLE OF CONTENTS

TABLE OF CONTENTS.....	II
LIST OF FIGURES	III
LIST OF TABLES	V
INTRODUCTION	1
PROJECT AREA DESCRIPTION.....	1
SCOPE OF WORK.....	1
METHODS	1
ENVIRONMENTAL SETTING	4
LAVA FLOWS	4
RAINFALL AND DRAINAGE	4
VEGETATION	5
HISTORICAL AND CULTURAL CONTEXTS	5
TRADITIONAL SETTLEMENT PATTERNS, SUBSISTENCE, AND LAND-USE	5
THE <i>MĀHELE</i> OF 1848 AND LAND COMMISSION AWARDS	8
CHANGING RESIDENTIAL AND LAND-USE PATTERNS (1845–1865).....	9
WAIĀKEA MILL COMPANY	9
PREVIOUS ARCHAEOLOGICAL INVESTIGATIONS	12
REGIONAL ARCHAEOLOGICAL STUDIES	17
INVESTIGATIONS SPECIFIC TO STUDY AREA.....	19
EXPECTED ARCHAEOLOGICAL PATTERNS.....	26
RESULTS OF FIELDWORK.....	27
SIGNIFICANCE ASSESSMENTS AND RECOMMENDED TREATMENTS	146
RECOMMENDED TREATMENTS.....	147
REFERENCES CITED.....	148

LIST OF FIGURES

Figure 1: Map of Hawai`i Island Showing Project Location.....	2
Figure 2: Portion of USGS 1995 Hilo Quadrangle Topographical Map, Showing Project Location.....	3
Figure 3: Map of Waiākea Ahupua‘a(Bush <i>et al.</i> 2000).....	6
Figure 4: `Ili Kūpono Lands of Pi`opi`o (Kelly <i>et al.</i> 1981).....	7
Figure 5: Map Showing Portion of Waiākea Homestead Lots and Plantation Fields South and East of the Project Area.	10
Figure 6: Map Showing Waiākea Pasture Land and Waiākea Mill Plantation Cane Lots.	11
Figure 7: Map of Previous Archaeology (Hilo USGS Quad, 1995).	18
Figure 8: Location of CSH, Inc. Archaeological Sites (Borthwick <i>et al.</i> 1993).....	22
Figure 9: Location of Archaeological Sites on Aerial Photograph.....	28
Figure 10: Site 1TS-01 Plan View Map.....	31
Figure 11: Photograph of Site 1TS-01 Feature A, Northwestern Mound Looking East.	32
Figure 12: Site 1TS-01 Feature B Plan View Map.....	33
Figure 13: Photograph of Site 1TS-01 Feature B Looking Southwest.	34
Figure 14: Site 1TS-01 Feature C Plan View Map.....	35
Figure 15: Photograph of Site 1TS-01 Feature C Looking West.....	36
Figure 16: Site 1TS-02 plan view Map.....	38
Figure 17: Photograph of Site 1TS-02 Modified Outcrop Looking Northwest.....	39
Figure 18: Site 1TS-03 Plan View Map.....	40
Figure 19: Photograph of Site 1TS-3 Rock Wall and fence Post Looking West.....	41
Figure 20: Site 2TS-01 Plan View Map.....	43
Figure 21: Photograph of Site 2TS-01 Feature A Looking West.	44
Figure 22: Photograph of Site 2TS-01 Feature B Looking West.....	45
Figure 23: Photograph of Site 2TS-01 Feature C Looking West.....	46
Figure 24: Site 2TS-02 Plan View Map.....	48
Figure 25: Photograph of Site 2TS-02 Looking Northwest.....	49
Figure 26: Site 2TS-03 Feature A Plan View.....	51
Figure 27: Photograph of Site 2TS-03 Feature A Facing Southeast.....	52
Figure 28: Site 2TS-03 Feature B Plan View Map.....	53
Figure 29: Photograph of Site 2TS-03 Feature B Looking Southwest.	54
Figure 30: Site 2TS-02 Plan View Map.....	55
Figure 31: Photograph of Site 2TS-04 Looking Southwest.....	56
Figure 32: Site 29373 Plan View Map (Adapted from Clark et al. 2012:37).....	58
Figure 33: Site 2TS-04 Feature B plan View Map.	59
Figure 34: Photograph of Site 2TS-04 Feature B Looking Southwest.	60
Figure 35: Site 29373 Feature F Plan View Map.	61
Figure 36: Photograph of Site 29373 Feature F Foundation Walls Looking west.	62
Figure 37: Site 29373 Feature H Plan View Map of a Portion of the Cement Pathway.	64
Figure 38: Photograph of Site 29373 Feature H Cement Pathway Looking Southwest.....	65
Figure 39: Site 29373 Feature J Plan view Map.....	67
Figure 40: Photograph of Site 29373 Feature J Top Surface Looking Southwest.....	68
Figure 41: Site 2TS-06 Wall Plan view Map.....	69
Figure 42: Photograph of Site 2TS-06 Wall Looking Southeast.	70

Figure 43: Site 2TS-07 Feature A Plan View.....	72
Figure 44: Photograph of Site 2TS-07 Feature A Looking East.....	73
Figure 45: Site 2TS-07 Feature B Plan View Map.....	74
Figure 46: Photograph of Site 2TS-07 Feature B Looking Northwest.....	75
Figure 47: Site 2TS-07 Feature C Plan View Map.....	77
Figure 48: Photograph of site 2TS-07 feature C Looking North.....	78
Figure 49: site 2TS-07 Feature D Plan View Map.....	79
Figure 50: Photograph of Site 2TS-07 Feature D Looking North.....	80
Figure 51: Site 2TS-07 Feature E Plan View Map.....	81
Figure 52: Photograph of Site 2TS-07 Feature E Looking West.....	82
Figure 53: Site 2TS-07 Feature F Plan View Map.....	83
Figure 54: Photograph of Site 2TS-07 Feature F Looking Southwest.....	84
Figure 55: Site 2TS-08 Plan View Map.....	86
Figure 56: Photograph of Site 2TS-08 Feature A Looking Northeast.....	87
Figure 57: Site 2TS-08 Feature B Plan View Map.....	88
Figure 58: Photograph of Site 2TS-08 Feature B Looking Southeast.....	89
Figure 59: Site 2TS-09 Plan View Map.....	91
Figure 60: Photograph of Site 2TS-09 Feature A Looking Northwest.....	92
Figure 61: Photograph of site 2TS-09 Feature B Looking Southwest.....	93
Figure 62: Site 2TS-10 Plan View Map.....	95
Figure 63: Photograph of Site 2TS-10 Looking Northeast.....	96
Figure 64: Photograph of Site 2TS-11 Feature A Fence Post.....	97
Figure 65: Photograph of Site 2TS-11 Feature B Fence Post.....	98
Figure 66: Site 2TS-12 Plan View of West Half of Site.....	100
Figure 67: Site 2TS-12 Plan View of East Half of Site.....	101
Figure 68: Photograph of Site 2TS-12 Feature A Looking East.....	102
Figure 69: Photograph of Site 2TS-12 Feature B Looking Northwest.....	103
Figure 70: Photograph of Site 2TS-12 Feature C Looking East.....	104
Figure 71: Photograph of Site 2TS-12 Feature D Looking South.....	105
Figure 72: Photograph of Site 2TS-12 Feature E Looking Southeast.....	106
Figure 73: Photograph of Site 2TS-12 Feature F Looking West.....	108
Figure 74: Photograph of Site 2TS-12 Feature G Looking Northwest.....	109
Figure 75: Photograph of Site 2TS-12 Feature H Looking South.....	110
Figure 76: Photograph of Site 2TS-12 Feature I Looking Southwest.....	111
Figure 77: Photograph of Site 2TS-12 Feature J Looking Southwest.....	112
Figure 78: Photograph of Site 2TS-12 Feature K Looking East.....	114
Figure 79: Photograph of Site 2TS-12 Feature L Looking Southwest.....	115
Figure 80: Photograph of Site 2TS-12 Feature M Looking West.....	116
Figure 81: Photograph of Site 2TS-12 Feature N Looking South.....	117
Figure 82: Photograph of Site 2TS-12 Feature O Looking Northwest.....	118
Figure 83: Photograph of Site 2TS-12 Feature P Looking North.....	119
Figure 84: Photograph of Site 2TS-12 Feature Q Looking Northwest.....	121
Figure 85: Site 2TS-13 Plan View, North Half of Site.....	122
Figure 86: Site 2TS-13 Plan View, South Half of Site.....	123
Figure 87: Photograph of Site 2TS-13 Feature A Looking Southeast.....	125
Figure 88: Photograph of Site 2TS-13 Feature B Looking Southwest.....	126

Figure 89: : Photograph of Site 2TS-13 Feature C Looking East.....	127
Figure 90: Photograph of Site 2TS-13 Feature D Looking Southwest.....	128
Figure 91: Photograph of Site 2TS-13 Feature E Looking East.....	130
Figure 92: Site 2TS-14 plan View Map.....	131
Figure 93: Photograph of Site 2TS-14 Feature A Looking Northeast.....	132
Figure 94: Photograph of Site 2TS-14 Feature B Looking East.....	134
Figure 95: Photograph of Site 2TS-14 Feature C Looking South.....	135
Figure 96: Photograph of Site 2TS-14 Feature D Looking Southwest.....	136
Figure 97: Photograph of Site 2TS-14 Feature E Looking Southeast.....	137
Figure 98: Photograph of Site 2TS-14 Feature F Looking Northeast.....	138
Figure 99: Site 2TS-15 Plan View Map.....	140
Figure 100: Photograph of Site 2TS-15 Feature A Looking North.....	141
Figure 101: Photograph of Site 2TS-15 Feature B Looking North.....	142
Figure 102: Site 2TS-16 Plan View Map.....	144
Figure 103: Photograph of Site 2TS-16 Looking Northwest.....	145

LIST OF TABLES

Table 1: Land Commission Awards in Waiākea Ahupua`a.....	8
Table 2: Previous Archaeological Research in Waiākea <i>Ahupua`a</i>	12
Table 3: Inventory of Sites in Project Area.....	27
Table 4: Significance Assessment And recommendations.....	146

INTRODUCTION

PROJECT AREA DESCRIPTION

At the request of PBR Hawai'i, Scientific Consultant Services (SCS), Inc. conducted an Archaeological Inventory Survey of 42.6 acres [TMK: (3) 2-4-001:024 and (3) 2-4-056:014] located in the *ahupua`a* of Waiākea, South Hilo District, Island of Hawai'i (Figures 1 and 2). The project area is located approximately 1.75 kilometers southwest of Hilo Bay and is bounded by Mohouli Street to the northwest, Lanikāula Street to the southeast, and by residential subdivisions to the southwest and northeast. The University of Hawai'i at Hilo (UHH) is considering an option to use the two parcels, currently administered by the State of Hawai'i Department of Land and Natural Resources (DLNR), for a proposed expansion of the university campuses.

SCOPE OF WORK

The Archaeological Inventory Survey was undertaken in accordance with draft Hawai'i Administrative Rules 13§13-284 and 13§13-275, and was performed in compliance with the Rules Governing Standards for Archaeological Inventory Surveys and Reports contained in draft Hawai'i Administrative Rules 13§13-276. The investigation included the following procedures:

- 1.) A 100 percent pedestrian survey of the project area. All sites and features were located, mapped (GIS), described, drawn at appropriate scales, and photographed. Sites were assigned temporary numbers pending State Historic Preservation Division (SHPD) assignment of SIHP site numbers.
- 2.) Limited subsurface testing was conducted at sites, where warranted, to determine depth, quantity, and context of cultural materials and to obtain samples for radiocarbon dating.
- 3.) Historical and archaeological archival research was conducted including a search of historic maps, aerial photos, written records, Land Commission Award documents, and State and County Planning Division documents.
- 4.) State of Hawai'i Planning Department records were studied to determine land-use and activities known to have occurred within the study area.

METHODS

Prior to fieldwork, a search of geological maps, aerial photos, historical maps, historical documents, and archaeological reports was conducted. The project area was found to exist entirely within known Waiākea Sugar Mill Cane Lots and Waiākea Pastureland.

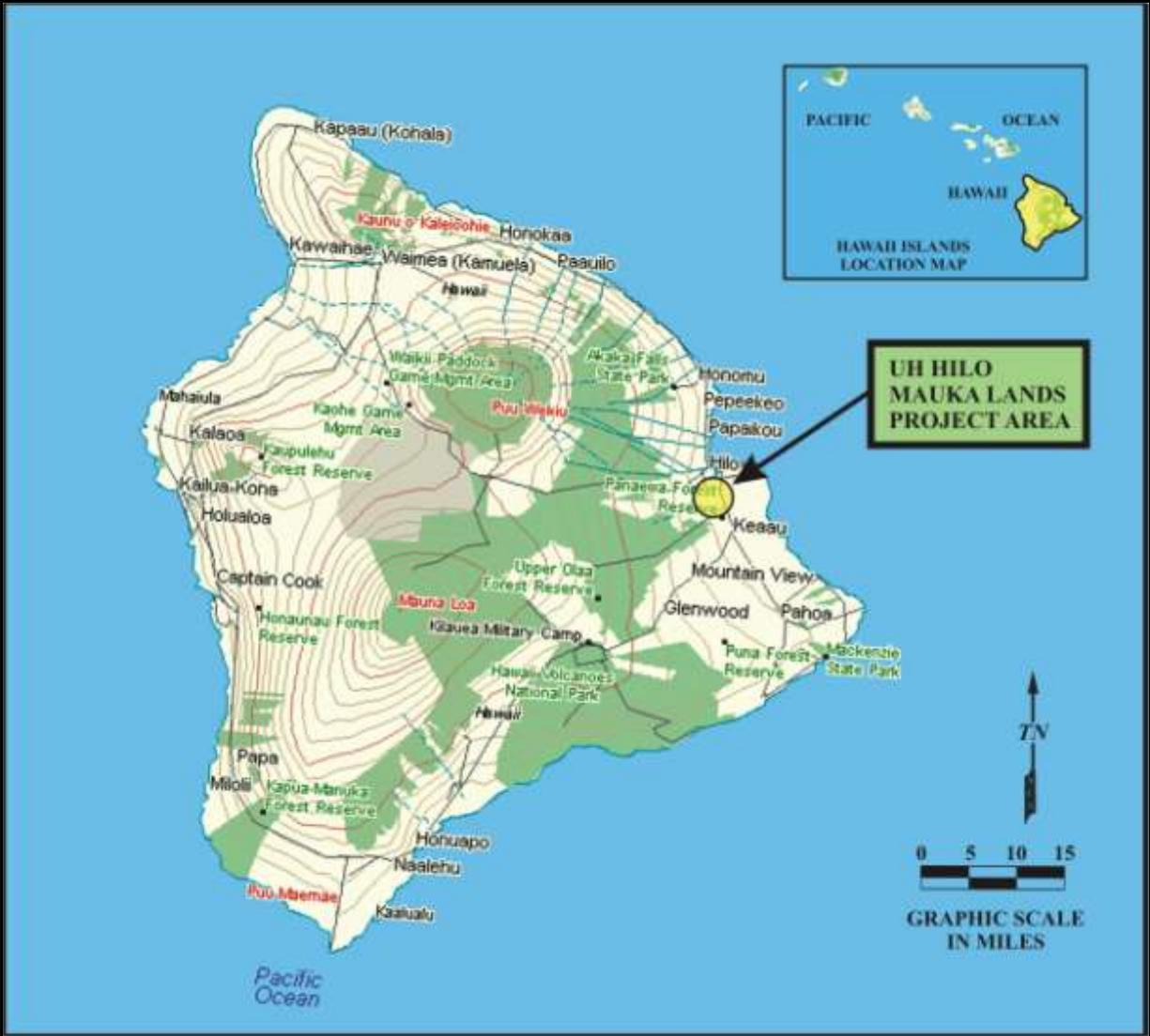


Figure 1: Map of Hawai'i Island Showing Project Location.

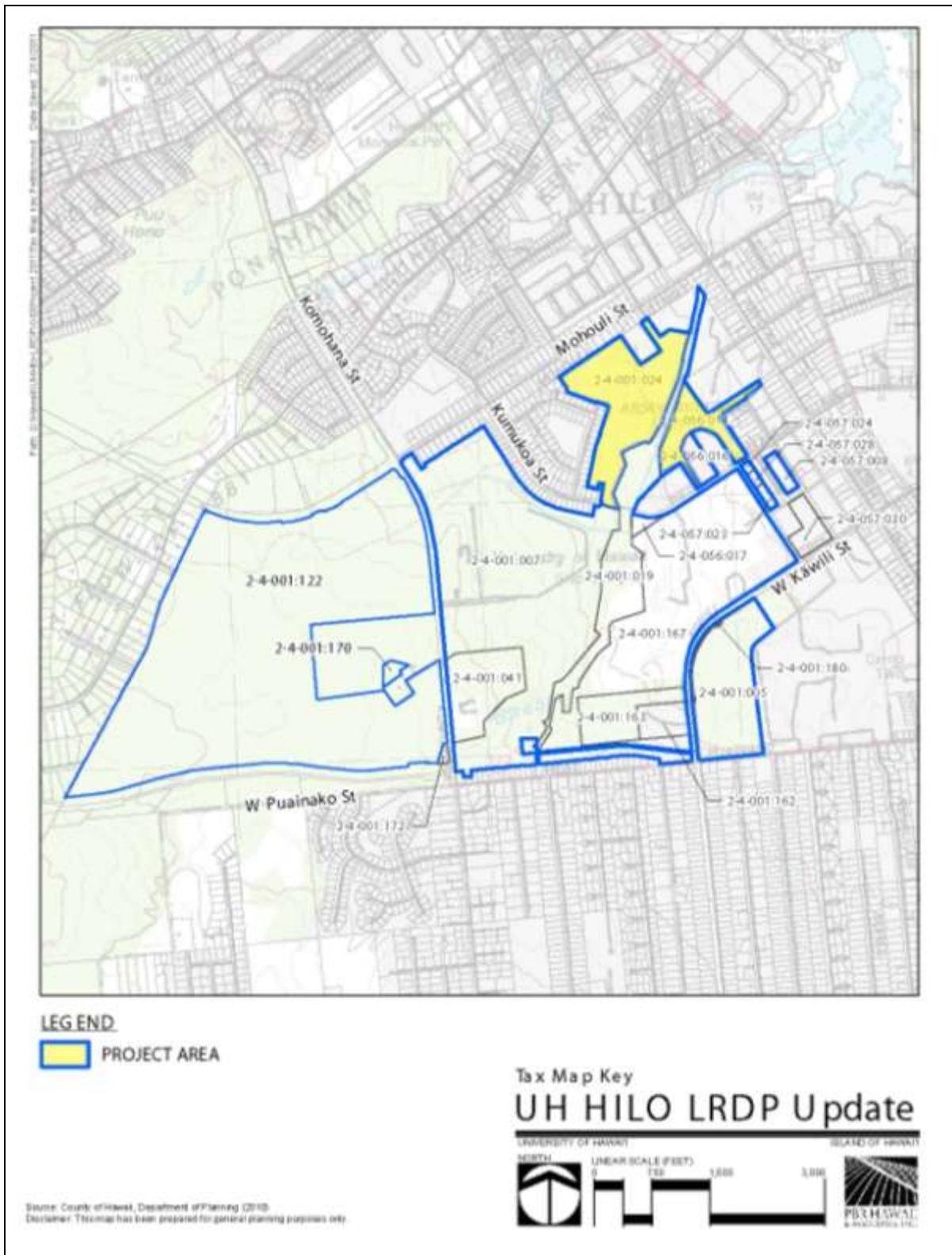


Figure 2: Portion of USGS 1995 Hilo Quadrangle Topographical Map, Showing Project Location.

Fieldwork was carried out from November 2012 to March 2013 under the direction of Glenn Escott, M.A. Fieldwork was completed in two steps; a preliminary reconnaissance was completed and was followed by an Inventory Survey. During the reconnaissance survey, SCS crewmembers were spaced 10 to 15-meters apart and traversed the project area in north-south direction. Ground visibility was limited in many areas by stands of bamboo, guava, and *uluhe* fern (*Dicranopteris linearis*). Interval spacing was reduced to as much as five meters in areas of thick ground cover. All features were surveyed and plotted on a GIS map. Fieldwork and the Inventory Survey report production were completed under the overall direction of Glenn G. Escott, M.A. (Principal Investigator).

Sixteen new sites comprised 65 features and were recorded during this archaeological work. The majority of all sites within the study area were associated with historic sugar cane cultivation and dairy farming. None of the sites were interpreted as pre-Contact in nature.

This report contains background information outlining the environmental and cultural contexts of the project area, a presentation of previous archaeological work within the study area and in the immediate vicinity, and current survey expectations based on that previous work. This report also includes an explanation of the archaeological methods used during the project; detailed descriptions of the archaeological resources encountered; interpretation and evaluation of those resources; and treatment recommendations for all of the documented sites along with a discussion of interim protection for those sites recommended for data recovery.

ENVIRONMENTAL SETTING

LAVA FLOWS

The UH Hilo Mauka Lands project area consists of two undeveloped parcels [TMK: (3) 2-4-001:024 and (3) 2-4-056:014] situated on gently sloping to level land at 80 m (300 feet) to 115 m (380 feet) above means sea level (amsl). The project area substrate is a single Mauna Loa lava flow dated to roughly 1,500 years before present (ybp) (Wolfe and Morris 1996). Soils in the project area belong to the Pana'ewa very rocky silty clay loam (Sato 1973). Sugar cane was cultivated in the area of the current project.

RAINFALL AND DRAINAGE

Rainfall in the project area is high, ranging between 330 and 440 centimeters (150 and 200 inches) per year (Kelly *et al.* 1981). Natural drainage in the area runs from southwest to northeast and from west to east (see Figure 3). There is a concrete spillway located between the two project area parcels that channels rain runoff south toward Hilo Bay..

VEGETATION

Plant communities in the wettest areas of the project are dominated by *waivi* (*Psidium cattleianum*) and common guava (*Psidium guajava*), *uluhe* (*Metrosideros/Dicranopteris*) fern, and bamboo. Some individuals of *ohi`a* (*Metrosideros polymorpha*), *uluhe* (*Dicranopteris linearis*) were also identified on the project area. Vegetation within the vast majority of the project is extremely dense.

HISTORICAL AND CULTURAL CONTEXTS

Hilo was, by most estimates, one of the first settlements on the Island of Hawai`i and was settled between A.D. 300 and 600. The rich marine resources of Hilo Bay and the gently sloping forests of Mauna Loa and Mauna Kea provided abundant resources. Fresh water was available from the Wailoa and Wailuku rivers and smaller streams such as Waiākea, Waiolama, Pukihae, and `Alenaio.

The UH rrent project area lands are located on and near the former `ili (subdivision of an *ahupua`a*) lands of Pū`āinakō, Kāwili, and Mohouli, in the *ahupua`a* of Waiākea, Hilo Hanakāhi `Okana, in the *moku-o-loko* (district) of Hilo (Maly 1996:4–5) (Figure 4). Waiākea Stream flows along the southern edge of the present study area. The *ahupua`a* of Waiākea is large, consists of roughly 95,000 acres, and was regarded as a region of abundant natural resources and numerous fishponds. Waiākea was also an early important political center, notably under chief Kulukulu`a (Kelly *et al.* 1981:3). Kamehameha lived and often returned to his `ili *kūpono* (independent land division where all tributes were paid to the chief of the `ili and not the *ahupua`a*) lands of Pi`opi`o in the *ahupua`a* of Waiākea (Figure 5). The `ili *kūpono* lands and its royal fishpond were passed on to his son Liholiho after his death.

TRADITIONAL SETTLEMENT PATTERNS, SUBSISTENCE, AND LAND-USE

Historical accounts and archaeological/cultural studies pertaining to the *ahupua`a* of Waiākea (Ellis 1963; Bingham 1969; Handy and Handy 1972; Bird 1974; McEldowney 1979; Kelly *et al.* 1981; and Maly 1996) provide a wealth of information on traditional settlement patterns, land-use, and subsistence horticulture of the area. These are synthesized below as they allude to the types of sites that may be encountered in the project area.

Historical accounts of residence patterns, land-use, and subsistence horticulture are believed to be indicative of traditional practices developed long before contact with Europeans (McEldowney 1979). Early accounts describe several distinct environmental regions in

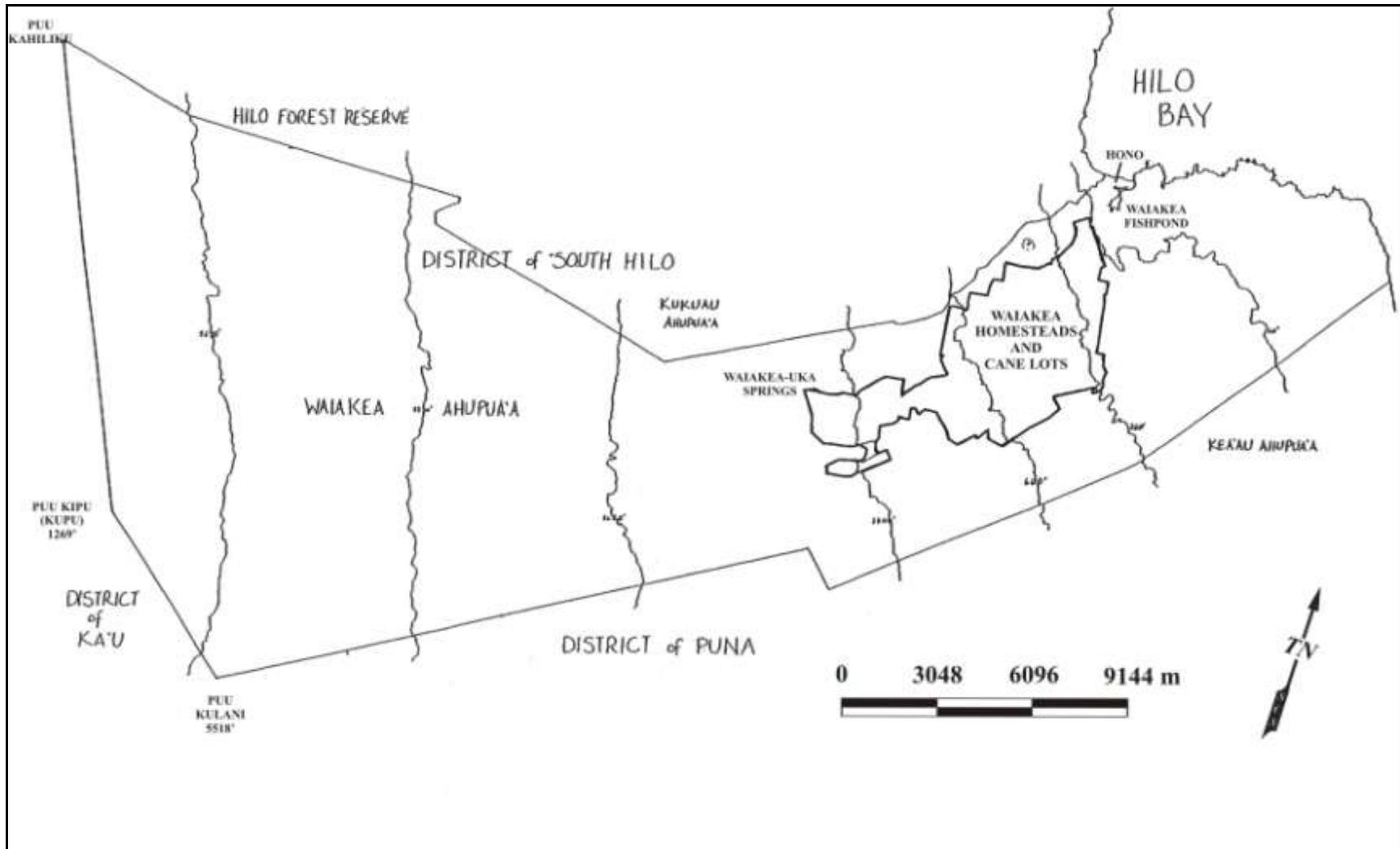


Figure 3: Map of Waiākea Ahupua‘a(Bush *et al.* 2000).

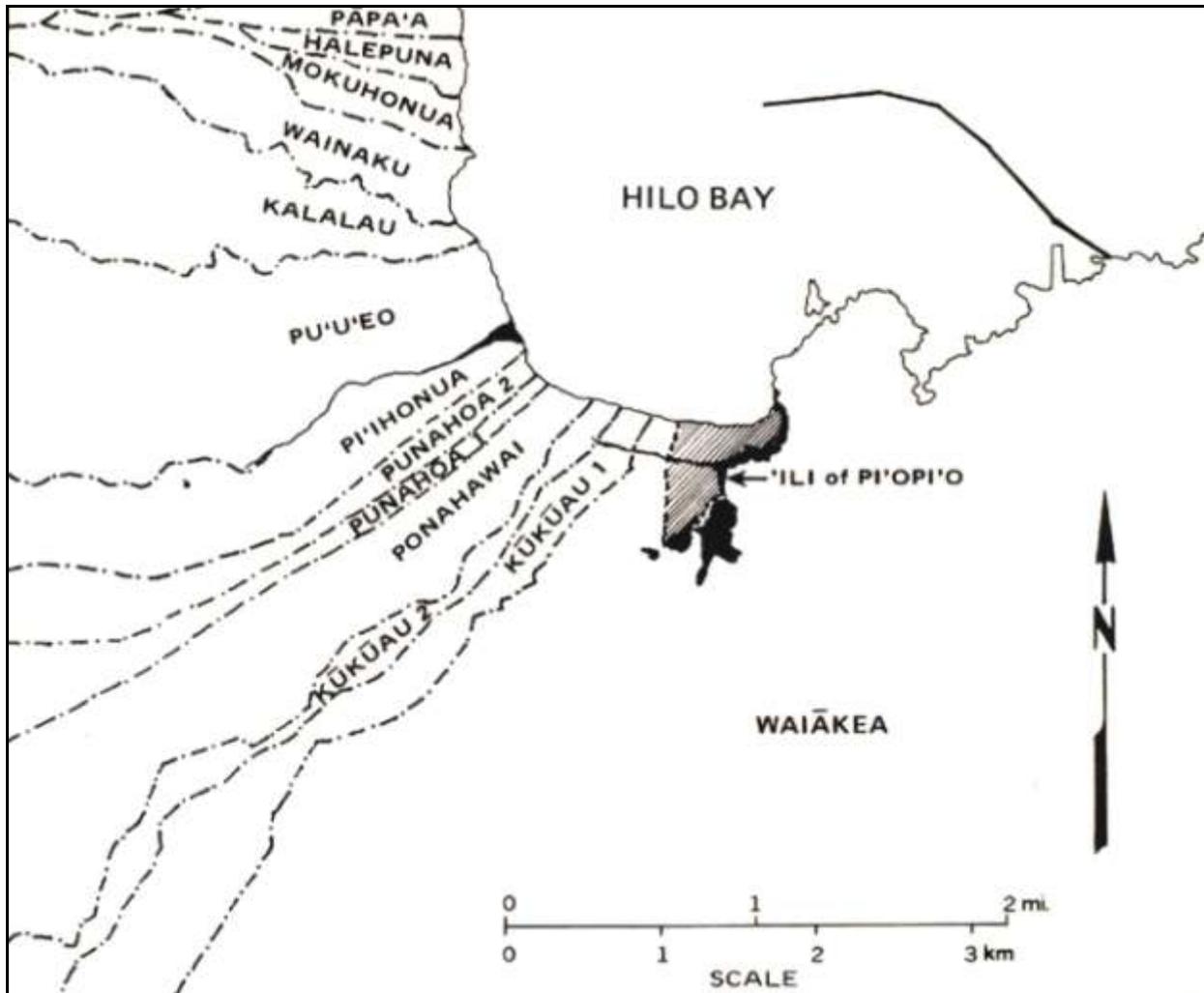


Figure 4: 'Ili Kūpono Lands of Pi`opi`o (Kelly *et al.* 1981).

Waiākea. From the coast inland five or six miles, scattered subsistence agriculture was evident, followed by a region of tall fern and bracken, flanked at higher elevations by a forest region between 10 and 20 miles wide, beyond which was an expanse of grass and lava (Ellis 1969:403). The American Missionary C.S. Stewart wrote, “the first four miles of the country is open and uneven, and beautifully sprinkled with clumps, groves, and single trees of the breadfruit, pandanus, and candle tree (Stewart 1970:361–363). The majority of Waiākea’s estimated 2,000 inhabitants (in 1825) lived within this coastal region (Ellis 1969:253). Taro, plantains, bananas, coconuts, sweet potatoes, and breadfruit were grown individually or in small garden plots. Fish, pig, dog, and birds were also raised and captured for consumption.

The present study area is located along the upper reaches of the open coastal region and the lower reaches of the tall fern and bracken zone. It is located in McEldowney’s “upland

agricultural zone” (see Previous Archaeology section) consisting of “scattered huts” amidst “garden “plots” created through “shifting agriculture” (McEldowney 1979:18–19). Wood, such as *ohi`a* and *koa* for house construction, canoe building, and fires was obtained from this upland agricultural zone, and from the dense forests above (Ellis 1963:236). *Hala* for thatching was also known to be plentiful along the lava flows of eastern Waiākea (Ellis 1917, cited in Kelly *et al.* 1981:20). Of particular interest is a description of bird snaring and mention of banana growing in the area of the present study (Maly 1996:6–8).

THE MĀHELE OF 1848 AND LAND COMMISSION AWARDS

The *ahupua`a* of Waiākea became Crown Lands during the *Māhele* of 1848 and in the following years, twenty-five Land Claims were awarded within the *ahupua`a* of Waiākea (Table 1). The awards were small in area, 24 of which went to native claimants. No Land Commission awards were made within the project area, and all but two were located near the coast. A five-acre parcel was awarded to Keaniho (LCA 2402) approximately one kilometer east of the present study area. The parcel contained a house and three cultivation fields. Keaniho`s parcel bordered *kalo* fields to the west according to testimony given in support of the claim (Maly 1996:22).

Table 1: Land Commission Awards in Waiākea Ahupua`a.

Grantee	LCA	Acreage
Barenaba	2327	12.25
Halai, L.K.	1279	0.60
Hale	40004	4.25
Kahue	2663	3.75
Kaiana, J.B.	2281	10.25
Kaihenui	11050-B	5.19
Kalolo	1333	2.25
Kalua	8854	3.40
Kaluhikaua	1738	2.98
Kamamalu, V.	7713	<i>`Ili`aina</i>
Kamanuhaka	8803	1.02
Kapu	1-F	1.60
Kealiko	11174	1.00
Keaniho	2402	5.00
Keawe	5018	0.24
	10505	—
Kuaio	4344	1.22
Leoi	9982	0.80
Lolo	4738-B	1.27
Mahoe	1-E	4.46
Moealoha	4737	1.03
Nakai	4785	1.05
Napeahi	2603	1.30
Wahine	4737-B	1.01

Wahinealua	11173	2.50
Wahinenohoihilo	10004	1.69

CHANGING RESIDENTIAL AND LAND-USE PATTERNS (1845–1865)

Between 1845 and 1865, traditional land-use and residential patterns underwent a change. In particular, the regular use of Hilo Bay by foreign vessels, the whaling industry, the establishment of missions in the Hilo area, the introduction of the sandalwood trade, the legalization of private land ownership, the introduction of cattle ranching, and the introduction of sugar cane cultivation all brought about changes in settlement patterns and long-established land-use patterns (Kelly *et al.* 1981). Hilo became the center of population and settlements in outlying regions declined or disappeared. While food was still grown for consumption, greater areas of land were continually given over to the specialized cultivation and processing of commercial foodstuffs for export. Sugar cane plantations and industrial facilities were established in areas that were once upland agricultural areas and coastal settlements, respectively.

WAIĀKEA MILL COMPANY

On July 15, 1861, S. Kipi leased the Crown Land of Waiākea from Kamehameha IV to be used as pastureland for an annual amount of \$600 (Kelly *et al.* 1981:89). In 1874, Rufus A. Lyman was granted a 25-year property lease (General Lease 124-A) within Waiākea, encompassing the government pastureland west of the present study area (Maly 1996:26). The lease granted him all privileges of land use including the cutting of firewood and the use of fishponds. The newly established Waiākea Mill Company, founded by Alexander Young and Theo H. Davies, acquired Rufus A. Lyman’s General Lease 124-A in 1879 (with an extension of terms until June 1, 1918 [Maly 1996:27]). By the early 1900s, Waiākea plantation was cultivating sugar cane on over 6,000 acres of government land in Hilo (Kelly *et al.* 1981:89,120).

In 1911, the Waiākea Mill Company applied for a title to several portions of its leased land, but was rejected by the Board of Public Lands. Rather than renew the lease with the Waiākea Mill Company, the government of Hawai`i implemented a plan to sell homestead lots and lease sugar cane lots to the public (Figure 5 and Figure 6). By 1919, 2003 acres of land was returned for house lots and 5,300 acres was returned for cane field lease (Maly 1996:27–28). Sugar cane grown on these lots was, by terms of contract, to be processed by the Waiākea Mill Company for a share of the profits.

The current project area is located Cane Lots 2, 3, 4, and a portion of the Government Land west of the cane lots.

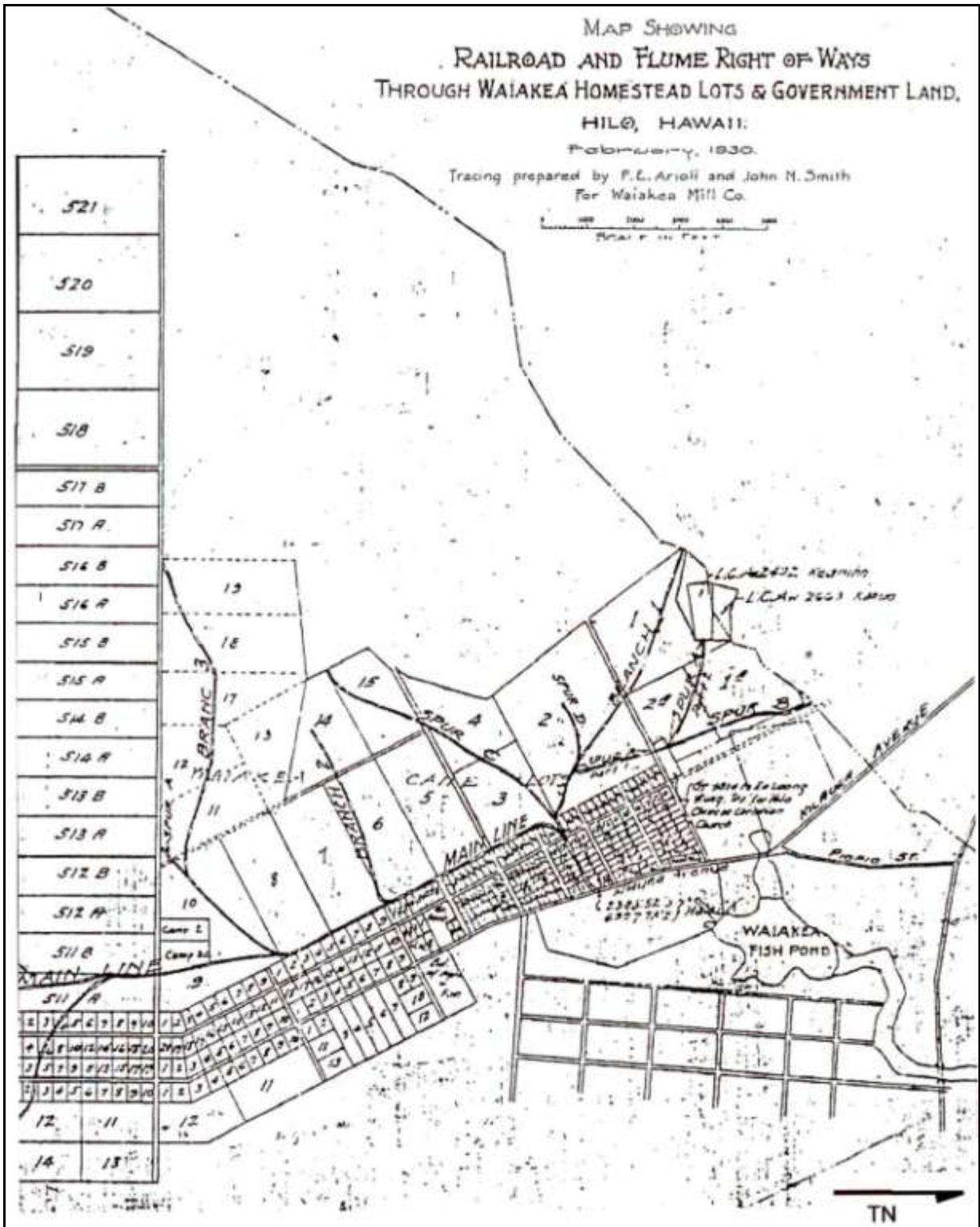


Figure 5: Map Showing Portion of Waiākea Homestead Lots and Plantation Fields South and East of the Project Area.

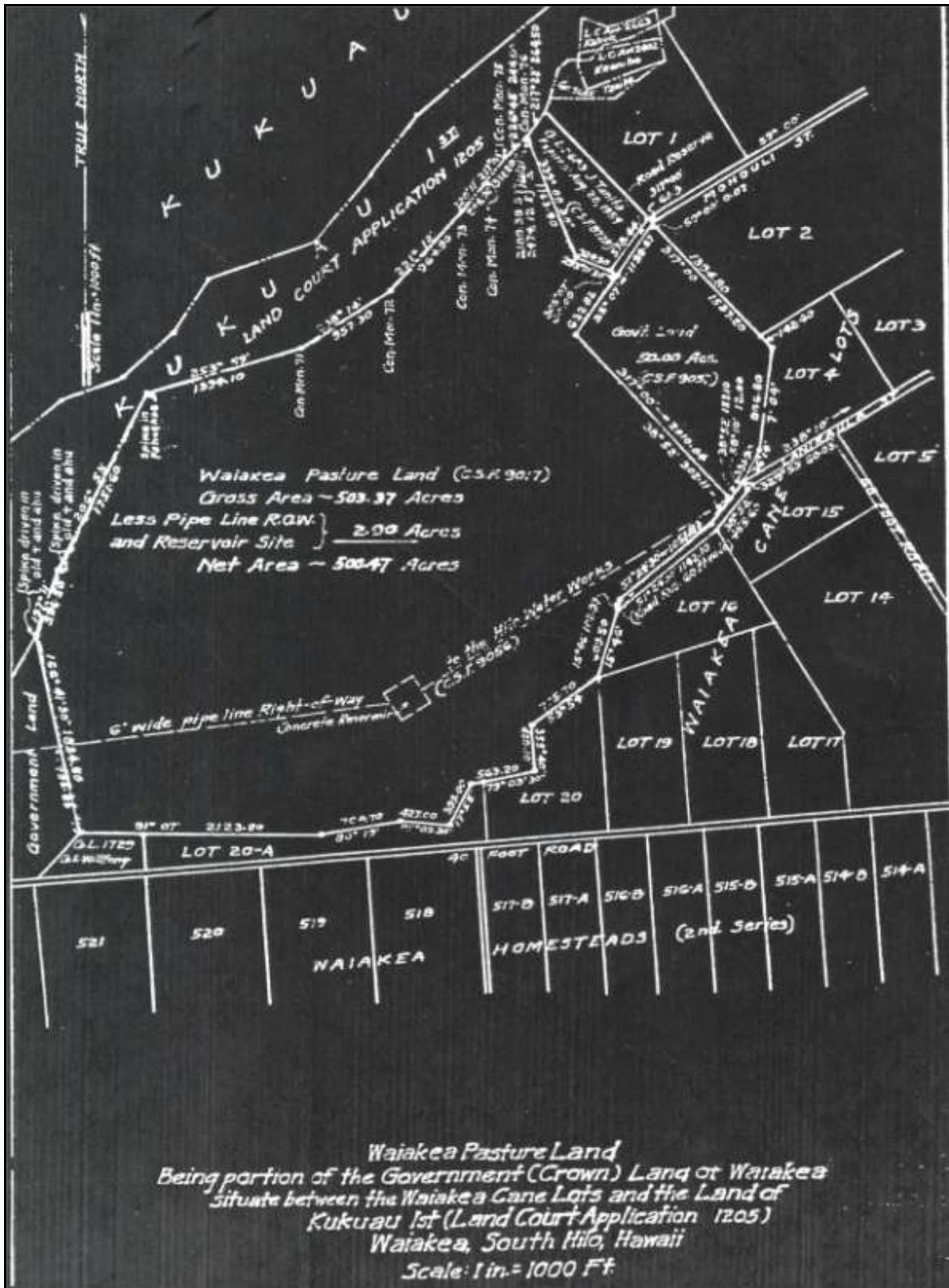


Figure 6: Map Showing Waiākea Pasture Land and Waiākea Mill Plantation Cane Lots.

Lot 2 and the government parcel known as the “Waiākea Pasture Land” west of Lot 2 were leased to Kazuo Miyasaki in 1939 (see Figure 7). Mr. Miyasaki built the Hilo Dairy pasture facilities on the 59.5 acres at Lot 2 (General Lease 2618) and used the Government Pasture Land (General Lease 2751), containing approximately 500 acres, to pasture his cattle. The Government Pasture Land lease passed to John Matson in 1942. During World War II, the parcel covered under General Lease 2751 and known as “Waiākea Pasture Land” was used for training by the U.S. Army Corps (Maly 1996:34). By 1946, the Army was clearing the property of barbed wire, unexploded ordinance, three Quonset buildings, and two latrines.

Lot 2 continued to be used as part of the Hilo Dairy up until the early 1950s. By 1955, the dairy facilities and a pickle factory present on the property were overgrown and were likely no longer in use. General Lease 2618 was terminated in 1956. Lot 2 continued to be used as cattle pastureland until 1966 under General Lease 3568 George Holowaty, and after December 1958, to Walter Perreira. During the time Lot 2 was part of the Hilo Dairy and while it was used for pasture land, access roads, fences, and structures were added to the property. In addition, the upper portion of the lot was bulldozed.

PREVIOUS ARCHAEOLOGICAL INVESTIGATIONS

Numerous archaeological investigations have been carried out in the Hilo area and within the *ahupua‘a* of Waiākea over the last 95 years. Many of the research projects are located adjacent to or in the immediate vicinity of the current study area. Table 2 below summarizes major findings and Figure 7 shows the location of archaeological investigations near the current project area.

Table 2: Previous Archaeological Research in Waiākea *Ahupua‘a*.

Reference	Location	Description & Results
Thrum 1907	Waiākea <i>Ahupua‘a heiau</i> sites	List of <i>heiau</i> in Waiākea — none located near present project area.
Thrum 1908	Waiākea <i>Ahupua‘a</i>	List and description of <i>heiau</i> in Waiākea — none located near present project area.
Hudson 1932	East Hawaii Island	Detailed description of various sites in the Hilo area.

Reference	Location	Description & Results
McEldowney 1979	Hilo Bay area	Zonal Characteristics— Land –use study
Kelly, Nakamura, and Barrère 1981	Hilo Bay area	History of Hilo Bay
Jensen 1991	AIS in Ponahawai <i>Ahupua‘a</i> TMK: (3) 2-3-044:09	Site 14946, an early historic house and sugar cane site. Site 14947, the Hilo Boarding School and Old Mission Ditch
Smith 1991	Waiākea <i>Ahupua‘a</i> , South Hilo, Hawaii Island TMK: 3-2-4-01:7	List and description of sites on the 4000+BP and 1500- 750BP lava flows. Inventory survey recommended.
Stokes and Dye 1991	Hawaii Island	List and description of heiau of Hawaii Island
Smith 1992	Waiākea Cane Lots, Waiākea <i>Ahupua‘a</i> , South Hilo, Hawaii Island TMK: 3-2-4-56:1	Numerous cane field features including walls, clearing mounds, a large rectangular enclosure, and c-shaped enclosures.
Moniz 1992	Waiākea <i>Ahupua‘a</i> , Hilo Hawaii	A listing of 1979-1992 inventory survey results within Waiākea <i>Ahupua‘a</i> that document walls, mounds, platforms, and faced terraces.
Hunt 1992	Lands of Waiākea, Kukuau 1 & 2, and Ponahawai <i>ahupua‘a</i> , South Hilo District, Hawaii (Puainako Street Extension Project)	Interim inventory survey report listing 31 cane field features including walls, clearing mounds, platforms, and faced terraces.
Spear 1993	Pi‘ihonua <i>Ahupua‘a</i> , South Hilo TMK: 2-3-32:4	Inventory survey report of a 5-acre parcel that documents an historic oven and a trash dump. No further work recommended.
Borthwick, Collins, Folk, and Hammatt 1993	Waiākea <i>Ahupua‘a</i> TMK: 2-4-01:7 and 41	Inventory survey of 163 acres of UH property along and east of Komohana Street. Documents four historic sites associated

Reference	Location	Description & Results
		with sugar cane agriculture. No further work recommended.
Hunt and McDermott 1994	Lands of Waiākea, Kukuau 1 & 2, and Ponahawai <i>ahupua</i> 'a, South Hilo District, Hawaii (Puainako Street Extension Project)	Inventory survey final report (completion of Hunt 1992) documenting 13 historical sites associated with sugar cane agriculture.
Maly, Walker, and Rosendahl 1994	Lands of Waiākea, South Hilo TMK: 2-4-57:01	Inventory survey of 4.5 acres in the Waiākea Cane Lots documenting four sites associated with historical sugar cane agriculture. Forty-seven features were recorded including walls, clearing mounds, and terraces. One radiocarbon date and recovered artifacts suggest prehistoric land-use in the project area. Data recovery recommended.
Spear 1995	Lands of Waiākea, South Hilo TMK: 2-4-57:01	Data recovery report of Maly <i>et al.</i> (1994) parcel documenting historic sugar cane agricultural features and a few temporary habitations. No further archaeological work recommended.
Maly 1996	Waiākea Cane Lots (12, 13, 17, 18, 19, 20 & 20-A, District of South Hilo, Island of Hawaii	Oral interviews and archival research pertaining to Waiākea Cane Lots. Provides background of pre-Contact land-uses in the area and description of sugar cane agricultural features, their construction, and uses.
Robins and Spear 1996	Lands of Waiākea, Kukuau 1 & 2, and Ponahawai, South Hilo District, Island of Hawaii (Puainako Street	Inventory survey of proposed realignment of Puainako Street Extension Corridor documenting 30

Reference	Location	Description & Results
	Realignment/Extension Project)	new features at 3 sites (Hunt and McDermott 1994), and one new site containing 16 features. Sites and features are associated with historic sugar cane agriculture.
Eblé, Denham, and Pantaleo 1997	Lands of Waiākea, Kukuau 1 & 2, and Ponahawai <i>ahupua</i> 'a, South Hilo District, Hawaii (Puainako Street Extension Project)	Supplemental testing of features (six sites) documented in Hunt and McDermott (1994). Features associated with historic sugar cane agriculture. Recommended preservation of several sites within the project area.
Spear 1998	Lands of Waiākea, Kukua 1 & 2, and Ponahawai, South Hilo District, Island of Hawaii (Puainako Street Realignment/Extension Project)	Reconnaissance-level survey of proposed realignment of Puainako Street Extension Corridor documenting 27 new features associated with historical sugar cane agriculture.
McGerty and Spear 1999	Lands of Waiākea, Kukua 1 & 2, and Ponahawai, South Hilo District, Island of Hawaii (Puainako Street Realignment/Extension Project)	Inventory survey of Spear (1998) parcel documenting 17 features: 15 historic sugar cane agriculture features and two features associated with a modern pig farm. All features were added to site 18921. Data Recovery recommended.
Dega and Benson 1999	Lands of Waiākea, Kukua 1 & 2, and Ponahawai, South Hilo District, Island of Hawaii (Puainako Street Realignment/Extension Project)	Reconnaissance-level survey of proposed realignment of Puainako Street Extension Corridor documenting eight sites containing 18 features including 12 clearing mounds, two platforms, two walls, a rock alignment, and an <i>'auwai</i> . All but the <i>'auwai</i> were associated with historic sugar cane

Reference	Location	Description & Results
		cultivation. The 'auwai was described as a pre-Contact feature likely also utilized in historic cane field agriculture.
Dega 2000	Lands of Waiākea, Kukua 1 & 2, and Ponahawai, South Hilo District, Island of Hawaii (Puainako Street Realignment/Extension Project)	Inventory survey of Dega and Benson (1999) parcel documenting eight new features (at Site 18921) associated with sugar cane agriculture.
Dega and Spear 2000	Lands of Waiākea, Kukua 1 & 2, and Ponahawai, South Hilo District, Island of Hawaii (Puainako Street Realignment/Extension Project)	Preservation plan for sites 18914, 18915, 18917 and a boulder path/alignment recorded by Eblé <i>et al.</i> (1997).
Bush, McDermott, and Hammatt 2000	Lands of Waiākea, South Hilo TMK: 2-4-01: 122, South Hilo, Hawai'i Island (USDA Pacific Basin Agricultural Center Project)	Inventory survey of 20 acres along western edge of Komohana Street, and adjacent to east-central portion of current project area. Documents one skylight (site 22080) containing a single human femur. Preservation recommended.
McDermott and Hammatt 2001	Lands of Waiākea, South Hilo TMK: 2-4-01: 122, South Hilo, Hawai'i Island (USDA Pacific Basin Agricultural Center Project)	Inventory survey of 10 acres adjacent (west) to Bush <i>et al.</i> (2000) documenting two historic sites (one feature each), including a modified outcrop and a stone causeway. No further work recommended.
Haun 2002	Archaeological Field Inspection of eight acres in	Historic sugar cane agricultural features and

Reference	Location	Description & Results
	Ponahawai <i>Ahupua'a</i> TMK: (3) 2-3-037:001	house site.
Escott 2004	AIS of 258 Acres, Waiākea <i>Ahupua'a</i> [TMK: 3-2-4-01:122].	Sixteen sites associated with sugar cane agriculture, ranching, and WWII training
Calma & Wolforth 2007	AIS of 5.22 Acres Waiākea <i>Ahupua'a</i> [TMK: 3-2-4-01:1007 por.]	Six sugar cane rock clearing mounds identified. No further work recommended.
Escott 2009	AA of 5.0 acres Waiākea <i>Ahupua'a</i> [TMK: (3)-2-4-01:176]	No archaeological sites present.
Escott 2011	AIS of 4.4 Acres Waiākea <i>Ahupua'a</i> [TMK: (3)-2-4-001:007]	A rock wall and rock clearing mound associated with sugarcane agriculture
Clark <i>et al.</i> 2012	AIS of 9.4 Acres Waiākea <i>Ahupua'a</i> [Kapi'olani St. Extension]	Four Historic era sites including two drainage ditches, a rock mound, and the Hilo Dairy structure foundations

The above listed archaeological and historical investigations are instrumental to understanding broad patterns of land-use in the Hilo area (see McEldowney 1977, Kelly *et al.* 1981, Maly 1996), general trends in the distribution of formal archaeological features in the Hilo area (see Thrum 1907 and 1908, Hudson 1930, Smith 1991, Moniz 1992, Spear 1993), and to formulating archaeological expectations at the present project area (see Jensen 1991, Borthwick *et al.* 1993, Hunt and McDermott 1994, Spear 1995, Robins and Spear 1996, McGerty and Spear 1999, Dega 2000, Bush *et al.* 2000, McDermott and Hammatt 2001, Haun 2002, and Escott 2004).

REGIONAL ARCHAEOLOGICAL STUDIES

McEldowney (1979)

McEldowney (1979) provides an overview of changing land-use patterns in the Hilo area based on early historic accounts. She proposes that Hawaiians utilized land in accordance to five elevation zones (1979:14). Land-use zones are classified as (I) coastal, (II) upland agricultural, (III) lower forest, (IV) rainforest, and (V) sub alpine, or montane. The inhabitants of Waiākea *Ahupua'a* had access to resources in all five of McEldowney's zones.

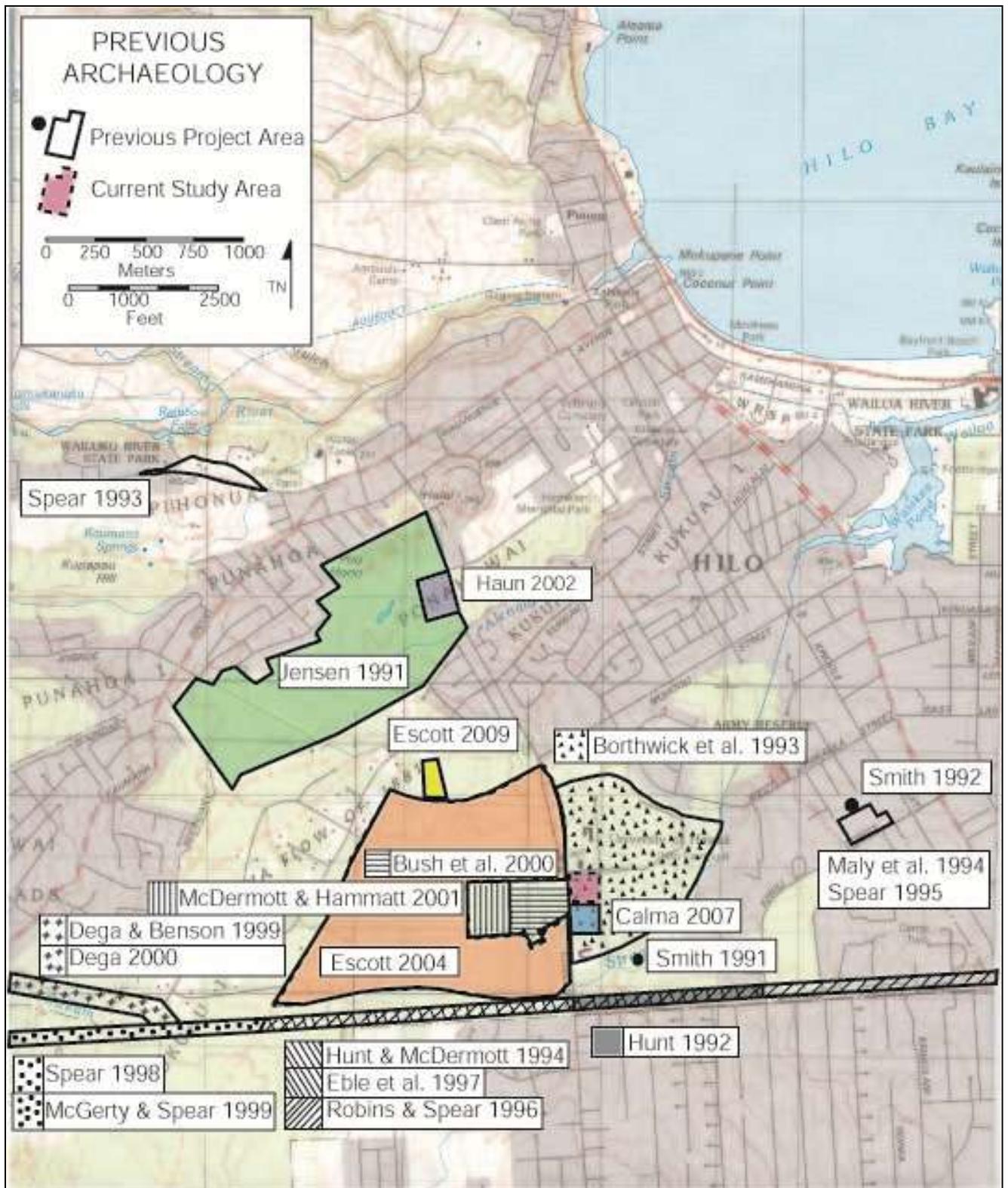


Figure 7: Map of Previous Archaeology (Hilo USGS Quad, 1995).

The present project is situated in the upland agricultural zone (50 to 1,500 feet) described as unwooded grasslands and extensive dryland cultivation plots. McEldowney suggests this region was likely deforested prior to European contact through shifting agricultural practices such as swiddening. Site types consist of scattered houses adjacent to garden and arboreal plots on older *pāhoehoe* and 'a'ā flows with well-developed soils. Modified lava tubes and tubes used for cultural practices are also common in the upland agricultural zone.

Smith (1991)

Smith (1991) also comments on site distribution in the *ahupua'a* of Waiākea based on Mauna Loa lava flows, including a portion of the 1880-1881 *pāhoehoe* flow, a *pāhoehoe* flow dating to 750-1,500 ybp, and a *pāhoehoe* flow dating to 5,000-10,000 ybp. He notes that the majority of sites are located on the older lava flow, which has deeper, more developed soils.

Kelly et al. (1991)

Kelly et al. (1991) also contributes to an historical understanding of changing land-use patterns following European involvement in the economy of Hawaii. In particular, the regular use of Hilo Bay by foreign vessels, the whaling industry, the establishment of missions in the Hilo area, the introduction of the sandalwood trade, the legalization of private land ownership, the introduction of cattle ranching, and the introduction of sugar cane cultivation all brought about changes in settlement patterns and long-established land-use patterns. Hilo became a population center and settlements in outlying regions declined. While food was still grown for consumption, greater areas of land were continually given over to the specialized cultivation and processing of commercial foodstuffs for export. Sugar cane plantations and industrial facilities were established in areas that were once upland agricultural areas and coastal settlements.

Thrum (1907 and 1908), Hudson (1932), and Stokes and Dye (1991)

Thrum (1907 and 1908), Hudson (1932), and Stokes and Dye (1991) represent early archaeological efforts to document site distribution pertinent to the greater Hilo area. Hudson notes there were already no archaeological sites remaining in the city of Hilo by the early 1930s (Hudson 1932:236). All three authors note the dismantling of well-known heiau in the Hilo area (Thrum 1908:240, Hudson 1932:236, Stokes and Dye 1991:152).

INVESTIGATIONS SPECIFIC TO STUDY AREA

Several recent archaeological and historical investigations completed in the immediate vicinity of the present project area have direct bearing on the types and distribution of expected sites and features. The majority of these reports document historic-era sites on well-developed ash and organic soils overlaying a Mauna Loa *pāhoehoe* flow dating to 5,000-10,000 ybp (see

Figure 4). Sites are primarily the remains of sugar cane field clearing and in-field collection and processing architecture. Two recent reports (Bush *et al.* 2000, McDermott and Hammatt 2001) provide insight into predicting the types of sites located on the nearby *pāhoehoe* flow dating to 750-1,500 ybp south of the project area. Two studies document historic-era sugar cane agricultural sites on deep soils north of the present project area (Jensen 1991 and Haun 2002).

Jensen 1991

PHRI conducted an archaeological inventory survey north of the present project area and identified only two sites. Only one of the two sites, SIHP 14947, the Hilo Boarding School and Old Mission Ditch, was recommended for further documentation and preservation. The second site, SIHP 14946, is an historic-era house site associated with sugarcane agriculture.

Haun 2002

Haun conducted a field inspection north of the present project and identified 15 sites with 25 component features. There were 19 rock mounds, a road, a low wall, a retaining wall, a terrace, and two platforms. The features all appear to be historic and related to sugar cane agriculture.

Hunt and McDermott (1994)

The initial archaeological investigations south and southeast of the present project area was an Archaeological Inventory Survey of the Pu‘ainako Street Extension within Waiākea, Kūkūau 1 and 2, and Ponahawai *ahupua‘a* conducted by Hunt and McDermott (1994) in 1992 and 1993. The study entailed historical background research, pedestrian survey, and limited subsurface testing.

The inventory survey report documents 13 sites (SIHP Sites 50-10-35-18911 to -18923) comprised of 88 individual features. All features were interpreted as dating from A.D. 1880 to 1950, and were interpreted as features associated with the cultivation and processing of sugar cane. Five test-units were excavated within several features and it was concluded that the lack of prehistoric artifacts and traditional subsurface features within them supported the interpretation that the features were historic in origin (Hunt and McDermott 1994:104). The inventory survey report recommended that data recovery be carried out at site complexes as additional excavation work "could potentially yield isolated traces of prehistoric use of the area, presumably for dryland agriculture" (Hunt and McDermott 1994:109-113). The report also recommended extensive archival research, a task later undertaken by Maly (1996).

Borthwick, Collins, Folk, and Hammatt (1993)

Cultural Surveys Hawaii conducted an archaeological on a 163-acre UH Hilo parcel adjacent to and southeast of the present study area. The report documents four historic sugar cane cultivation sites (SIHP Sites 18667 through 18670) comprised of seven features (one feature contains 25 clearing mounds), including walls, clearing mounds, enclosures, and a remnant sugar cane field (Figure 8). Test-units contained no cultural material confirming their association with more recent sugar cane cultivation. No further work was recommended.

Maly (1996)

Kepa Maly's report combines the results of McEldowney (1979) with traditional Hawaiian history, early European accounts, previous archaeological work, and oral histories to document cultural and agricultural practices in Hilo and the *ahupua'a* of Waiākea. The report focuses on Hawaiian settlement and population expansion in the region of the present study area. Of particular interest is the description of bird snaring and mention of banana growing in the area of the present study (Maly 1996:6-8). Maly also documents the effect of sugar cane cultivation (Waiākea Mill Company operations from the 1870s to 1940s) on pre-Contact archaeological remains within the present project area. While some components of early Hawaiian sites might be incorporated in more modern archaeological features, the clearing of fields and the construction of collection and processing facilities have dismantled or obscured older archaeological sites (Kenneth Bell in Maly 1996:57). Informants who remembered the Waiākea sugar cane plantation fields stated that features such as stone mounds, ramped platforms, terraces, walls, enclosures, and berms (railway berms) were built in order to facilitate sugar cane cultivation and ranching.

Robins and Spear (1996)

Following Maly's (1996) work, SCS (Robins and Spear 1996) conducted an inventory survey on a narrow parcel of land south of the present study area. The project area covered four proposed road alignments for the Pu'ainako Street Extension project and reflected both an elongation and a lateral expansion of the original road alignment study (Hunt and McDermott 1994) from a 120 to 300-foot wide corridor.

The Robins and Spear survey documented the 30 architectural features associated with sites previously reported by Hunt and McDermott (SIHP Sites 18912, 18914, and 18919) as well as 16 additional features that were combined, with features taken by SHPD from SIHP Site 18919, to form a new site (SIHP Site 20681). Robins and Spear (1996:49-52) concluded that all 46 features, representing four sites, were associated with historic sugar cane activities based on

the fact that all of the sites are located within or adjacent to known sugar cane fields, all features are representative of formal sugar cane field features, site structure is comparable to other known plantation sites and is atypical of traditional Hawaiian structures, and the documented sites contain historic-era artifacts that are specific to sugar plantation or ranching activities.

No traditional Hawaiian components of modern features or pre-Contact artifacts were discovered during the inventory survey work. Robins and Spear (1996:53-56) recommended data recovery for eight sites within the corridor and concurred with SHPD in the preservation of several other sites.

Eblé, Denham, and Pantaleo (1997)

At the request of the Ho' oikaika Hawaiian Club (HHC), Garcia and Associates (Ganda) conducted supplemental archaeological excavations (reported in Eblé *et al.* 1997) at sites previously identified by Hunt and McDermott (1994). The purpose of the additional work was "to aid in the interpretation of site function and chronology, and to ensure that all cultural remains in the area have been sufficiently identified" (Eblé *et al.* 1997:1). The Hunt and McDermott survey had excavated only five units within 88 features and the sponsoring Ho' oikaika group deemed additional excavations necessary to support or refute the report's site age and function determinations. The supplemental archaeological work performed by Ganda was not considered an official stage in the State of Hawai'i historic preservation process but was deemed a supplemental aid to the previous study.

Seven test-units (typically 1.0 m by 1.0 m) were excavated within six sites previously mapped and recorded by Hunt and McDermott (1994). The sites included SIHP Site 18916, 18911, 18912, 18914, 18915, and 18917. The excavation units yielded historic artifacts such as metal and midden. Three samples of wood charcoal were submitted for radiocarbon testing and were dated to pre-Contact (traditional) and early historic times. The samples were considered problematic since they did not precisely date the architectural structures themselves but were taken from the soil matrix below features and were not associated with any subsurface features such as *'imu* or discrete hearths, for example. The report further concluded that all "intact evidence of pre-Contact occupation and/or activity in the project area has been disturbed or destroyed as a result of post-Contact period activity" (Eblé *et al.* 1997:53). The archaeological features examined as part of this supplemental project were interpreted as associated with sugar cane cultivation and processing, and reinforced the interpretations offered by Hunt and

McDermott (1994), Maly (1996), and Robins and Spear (1996). The supplemental testing report recommended preservation for several sites (discussed below) (Eblé *et al.* 1997:56).

Spear (1998)

The following year an archaeological reconnaissance-level investigation was carried out by SCS along the western (*mauka*) portion of the Pu‘ainako Street Extension, located to the south of the present study area. While reconnaissance surveys are not recognized by the SHPD as a stage in the historic preservation process, reconnaissance surveys provide a rapid means of assessing the cultural resources within a given project area. A formal report of a reconnaissance survey is not generally submitted to SHPD because the results are usually incorporated into an inventory survey reports. Twenty-seven features were recorded during the reconnaissance survey and were associated with SIHP Site 18921 previously recorded by Hunt and McDermott (1994). Spear (1998) recommended that an inventory survey be conducted.

McGerty and Spear (1999)

The inventory survey work (McGerty and Spear 1999) generated as a result of the previous reconnaissance survey (Spear 1998) was listed as an addendum to the inventory survey report completed by Robins and Spear (1996). McGerty and Spear (1999) re-identified the features documented by Spear (1998) and recorded a total of 17 features. The number of features was reduced from 27 to 17 because several of the features documented during the reconnaissance survey were combined into more discrete feature designations or were assessed as not being archaeological features. All 17 features were assigned to SIHP Site 18921 and 15 of them were interpreted as features associated with historic sugar cane activities cultivation and processing. The inventory survey report notes that SIHP Site 18921 is located on former Waiākea Sugar Company cane fields (Conde and Best 1973:120, as cited in McGerty and Spear 1999:23).

Based on information provided in an interview, two features (Feature 1 and Feature 11) were interpreted as remnants of a modern pasture or piggery Robins and Spear 1996:42, McGerty and Spear 1999:5). The inventory survey report (McGerty and Spear 1999:25) concurred with Hunt and McDermott (1994:112) that the site was significant under Criterion D and recommended a data recovery investigation.

Dega and Benson (1999)

In August 1999, SCS conducted a reconnaissance-level survey (Dega and Benson 1999) southwest of the UH Hilo Mauka lands project. The survey was performed within a short, expanded section of the highway (western end) occurring just to the south, and partially overlapping the reconnaissance survey area documented in Spear (1998), and the inventory

survey work reported in McGerty and Spear (1999). The project area was approximately 1.0 mile long (east-west) and 300 feet wide (north-south) and was situated from 0.40 km to 2.5 km south of Kaumana Drive at the study corridor's western and eastern termini.

Eight archaeological sites were identified within the western border of the project area. Eighteen features were documented including 12 rock mounds, two platforms, two walls, one alignment, and one stone-lined *'auwai*, or water channel. Seventeen features were interpreted as related to historic sugar cane cultivation and processing, a similar interpretation to that presented previously (Hunt and McDermott 1994, Robins and Spear 1996, McGerty and Spear 1999).

One feature, a rock-lined *'auwai* or water channel, was interpreted as traditional (pre-Contact). The *'auwai* is situated parallel to and between several rock mounds associated with sugar cane cultivation but is suggestive of a traditional water channel because its width (0.80 m) is much smaller than channels typically used for sugar cane field irrigation. Secondly, the gravity-fed system was lined with small cobbles and not metal, as is commonly used in the construction of sugar cane water channels. Thirdly, the channel itself was not deep (average 0.10 m below rock surface) and had not been maintained for some time. Finally, the channel emptied onto a small alluvial plain that would have been well suited to small-scale irrigated taro cultivation. The Dega and Benson (1999) reconnaissance survey report recommended inventory survey work be carried out, including test-excavations within and near the *'auwai* feature.

Dega (2000)

SCS conducted an inventory survey to complete the reconnaissance-level survey reported by Dega and Benson (1999) at SIHP Site 18921. Eight features were documented, two previously recorded by Spear (1998) or during the Dega and Benson (1999) reconnaissance survey. Features included walls, clearing mounds, rock alignments, a platform, and a stone-lined *'auwai*. Four stratigraphic trenches were mechanically excavated in and around the *'auwai* feature. Trenches were typical 1.80 meters wide and totaled 17 meters in length. The *'auwai* was reinterpreted as an historical sugar cane field irrigation ditch due to a lack of stones lining its bottom as is common in traditional Hawaiian *'auwai*. No evidence was found to substantiate the presence of a *lo'i* associated with the irrigation ditch.

Bush, McDermott, and Hammatt (2000)

Cultural Surveys Hawaii carried out an inventory survey of a 20-acre parcel for the proposed USDA Pacific Basin Research Center. The project is located on a parcel along the western-central edge of the UH Hilo Mauka Lands project area on a Mauna Loa *pāhoehoe* lava

flow dated to between 750 and 1,500 ybp. A single human femur was located in an overhang within a collapsed lava blister or lava tube. The site (SIHP Site 22080) was designated a burial and recommended for preservation.

McDermott and Hammatt (2001)

Cultural Surveys Hawaii carried out an additional inventory survey of a 10-acre parcel (adjacent to and west of the 2000 study area) for the proposed USDA Pacific Basin Research Center. The project was also located along the western-central edge of the UH Hilo Mauka Lands project area on a Mauna Loa *pāhoehoe* lava flow dated to between 750 and 1,500 ybp. Two post-Contact sites comprised of two features were documented. SIHP Site 22734 consisted of a modified outcrop and SIHP Site 22735 consisted of a stacked stone causeway. No further work was recommended at both sites.

Escott 2004

Sixteen new sites (80 features) and three previously recorded sites were recorded during inventory survey work conducted on lands just south of the present project area. Eleven of the sites on the project area were associated with Historic-era sugarcane agriculture, three were associated with WWII military training activities, one was associated with Historic-era ranching, and four were associated with Historic-era dirt roads. None of the sites were recommended for preservation, two of the military sites were recommended for data recovery, and the seventeen remaining sites required no further work.

Calma and Wolforth 2007

SCS, Inc. conducted an archaeological inventory survey on 5.22 acres of UH-Hilo for the College of Pharmacy (see Figure 9). The project area is immediately south of the current project area, and is within the Borthwick *et al.* 1993 project area.. A single site consisting of six rock clearing mounds associated with sugarcane agriculture were identified within the project area (Figure 10). No further work was recommended for the rock mounds.

EXPECTED ARCHAEOLOGICAL PATTERNS

Based on previous archaeological studies, geological studies, historical research, interviews, and County Planning Department records, site distribution and type can be predicted to consist of sugar cane cultivation and processing sites. Archaeological investigations and historical documentation have shown that the predominant site type in this area is associated with Waiākea Mill Company plantation fields. Pre-Contact sites are infrequently documented and were likely dismantled or obscured by cane field clearing (Maly 1996).

RESULTS OF FIELDWORK

Nineteen new sites comprising 68 features were recorded during the course of the current archaeological inventory survey (Table 3 and Figure 10). The vast majority of sites within the study area are associated with historic era sugarcane cultivation, ranching, or the Hilo Dairy facilities. None of the sites were interpreted as pre-Contact.

Table 3: Inventory of Sites in Project Area.

Site	Features	LxWxH (meters)	Type	Function	Age
1TS-01	3	40.0 x 30.0 x 0.6*	Modified Outcrops	Agricultural	Historic
1TS-02	1	14.0 x 8.0 x 0.5*	Modified Outcrop	Agricultural	Historic
1TS-03	1	16.0 x 3.0 x 0.3*	Linear Rock Wall	Agricultural	Historic
2TS-01	3	40.0 x 40.0 x 0.9	Rock Mounds	Agricultural	Historic
2TS-02	1	15.0 x 15.0 x 0.4*	Modified Outcrop	Agricultural	Historic
2TS-03	2	12.5 x 8.0 x 1.0*	Rock Mound and Large Berm	Agricultural	Historic
2TS-04	2	15.0 x 9.0 x 0.7*	Rock Mounds	Agricultural	Historic
2TS-05	9	50.0 x 30.0 x 1.1*	Concrete Complex (Dairy)	Dairy	Historic
2TS-06	1	350.0 x 1.0 x 2.0*	Rock Wall	Boundary	Historic
2TS-07	7	25.0 x 25.0 x 0.8*	Mounds and Modified Outcrops	Agricultural	Historic
2TS-08	2	13.0 x 10.0 x 1.1*	Rock Mounds and Modified Outcrops	Agricultural	Historic
2TS-09	2	10.0 x 10.0 x 0.6*	Rock Piles	Agricultural	Historic
2TS-10	1	4.5 x 3.0 x 0.8	Modified Outcrop	Agricultural	Historic
2TS-11	2	Undetermined*	Fence Posts	Boundary	Historic
2TS-12	17	80.0 x 34.0 x 1.5*	Modified Outcrops, Terrace, Rock Walls and Mounds	Agricultural	Historic
2TS-13	5	27.0 x 18.5 x 1.5*	Platform and Modified Outcrops	Agricultural	Historic
2TS-14	5	40.0 x 40.0 x 1.1	Linear Walls, Modified Outcrop, Paving and Water Retaining Feature	Agricultural	Historic
2TS-15	2	15.0 x 8.0 x 1.3	Platform and Modified Outcrop	Undetermined	Historic
2TS-16	1	7.0 x 5.0 x 0.4	Pit Feature w/Partial Fill	Agricultural	Historic

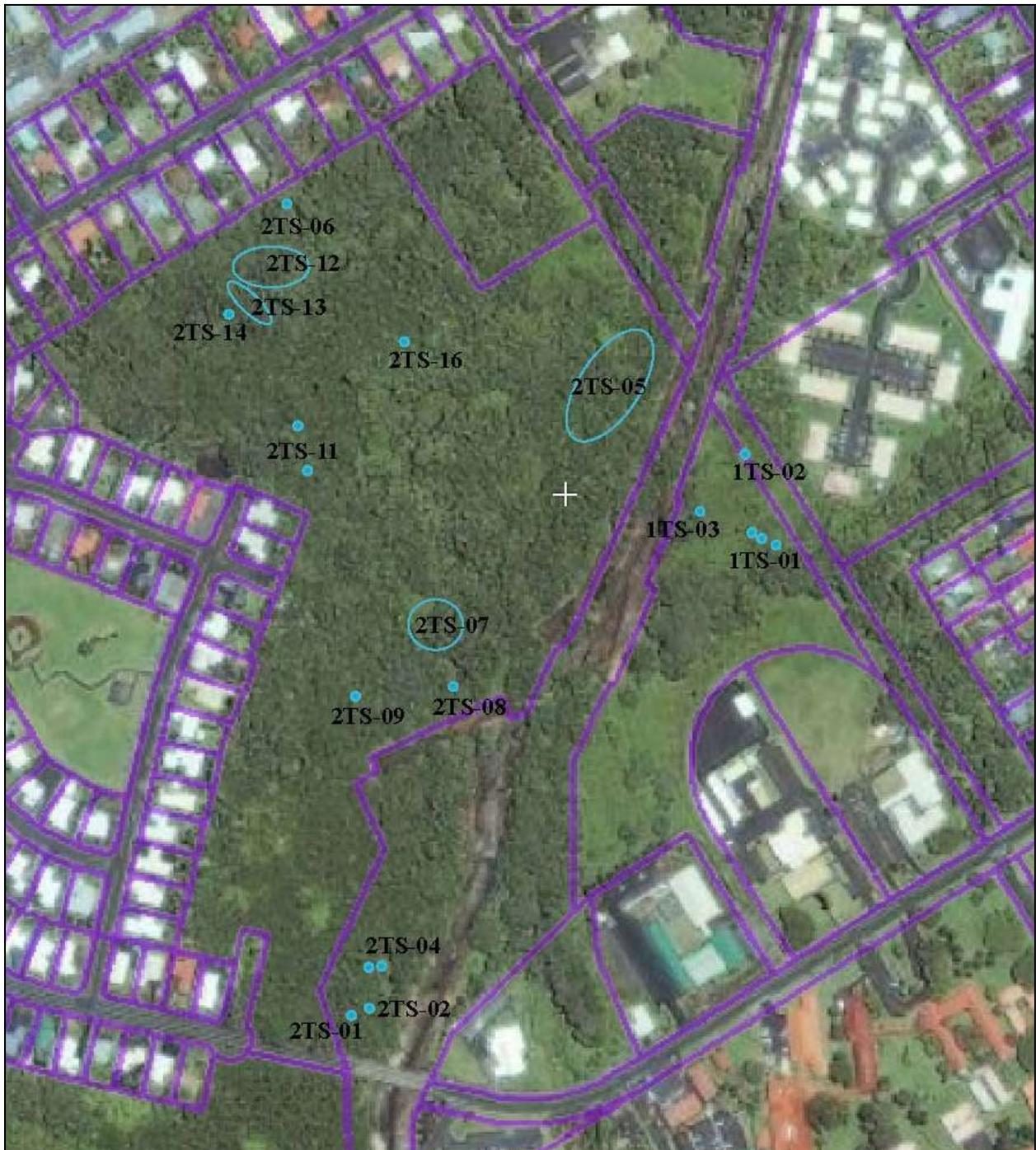


Figure 9: Location of Archaeological Sites on Aerial Photograph.

The project area consists of two parcels:

- Project Area I is used to designate the southeastern portion of study area located entirely within TMK: (3) 2-4-056:014. The natural environment of Project Area I is dominated by thick stands of bamboo and guava, as well as a small seasonal stream located in the southeastern portion of the parcel. Sites located within this portion of the study area are concentrated along the seasonal stream.
- Project Area II is used to designate the remainder of the study area located entirely within TMK: (3) 2-4-001:024. The natural environment of Project Area II is dominated by thick stands of guava and groves of Alexander Palm trees (*Archontophoenix alexandrae*). Sites are concentrated along the northwest and southeast portions of Project Area II.

All of the sites identified on the two project area parcels are historic era sugarcane, ranching, and dairy facility features (see Table 3). The vast majority of features (n=24) were modified outcrops created by piling and stacking cobbles and small boulders onto exposed bedrock outcrops. The remaining features are rock clearing mounds (n=16), concrete foundations and structural remains (n=9), rock walls (n=4), fence posts (n=2), rock piles (n=3), platforms (n=2), a paving (n=1), a water diversion feature (n=1), a partially filled pit (n=1), a terrace (n=1), and a large rock berm (n=1). All of the sites are situated on level to slightly undulating pāhoehoe or thin soil terrain covered with leaf litter and other decomposing organic material. Descriptions of all archaeological sites located in the project area are recorded below.

SITE 1TS-01

Modified Outcrops and Rock Mound

FUNCTION:

Agricultural

AGE:

Historic

DIMENSIONS:

Length:40.0 m NW/SE; Width, 30.0 m; Height, 0.7 m Max.

CONDITION:

Fair

INTEGRITY:

Impacted by Vegetation

SURFACE ARTIFACTS:

None

EXCAVATION:

None

DESCRIPTION:

Site 1TS-01 consists of three modified outcrops (Features A, B, and C) recorded along the east perimeter of Project Area I (see Figure X and Figure X). The features are located within a bamboo thicket along the northeast edge of a seasonal stream. They are situated on flat terrain that appears to have been bulldozed. All three of the features were

constructed by piling rock onto exposed bedrock. The features are constructed of medium to large angular and subangular pāhoehoe cobbles and small boulders. All of the features located within this site are loosely constructed and lack core-fill. The features are associated with sugarcane agriculture.

Feature A is a modified outcrop located within a dense bamboo thicket at the southeast end of the site. The modified outcrop is 7.5 m long (NW/SE) by 3.5 m wide and is 0.7 m in maximum height (Figure XX). Feature A consists of two rock mound features on a bare bedrock outcrop. Both mounds are constructed of loosely piled angular and subangular cobbles and small boulders. No stacking or facing is evident in the feature construction. The northwest mound is roughly circular in shape (Figure X), and the southeast mound is rectangular (Figure X). Feature A has been slightly altered by weathering and is in fair condition.

Feature B consists of a modified outcrop located approximately six meters northwest of Feature A. Feature B measures 4.2 m long (NE/SW) by 3.5 m wide and is 0.39 m in maximum height (Figure X and Figure X). Feature B is constructed of angular and subangular cobbles and small boulders loosely piled onto an area of exposed bedrock. No stacking or facing is evident in the feature construction. Feature B has been slightly altered by weathering and is in fair condition.

Feature C consists of a roughly oval modified outcrop located 6.0 meters northwest of Feature B. Feature C measures 5.4 m long (NW/SE) by 3.5 m wide and is 0.6 m in maximum height (Figure X and Figure X). Feature C is constructed of angular and subangular cobbles and small boulders loosely piled onto an area of exposed bedrock. No stacking or facing is evident in the feature construction. Feature C has been slightly altered by weathering and is in fair condition.

The modified outcrops at Site 1TS-01 are most likely the result of agricultural activities involving clearing farm land of loose rocks. These sites are most likely associated with the sugarcane agriculture of the late 1800s and early 1900s. The features have been slightly impacted by weathering and possibly by pigs, and are in fair condition. No further work is recommended at the site.



Figure 11: Photograph of Site 1TS-01 Feature A, Northwestern Mound Looking East.



Figure 13: Photograph of Site 1TS-01 Feature B Looking Southwest.

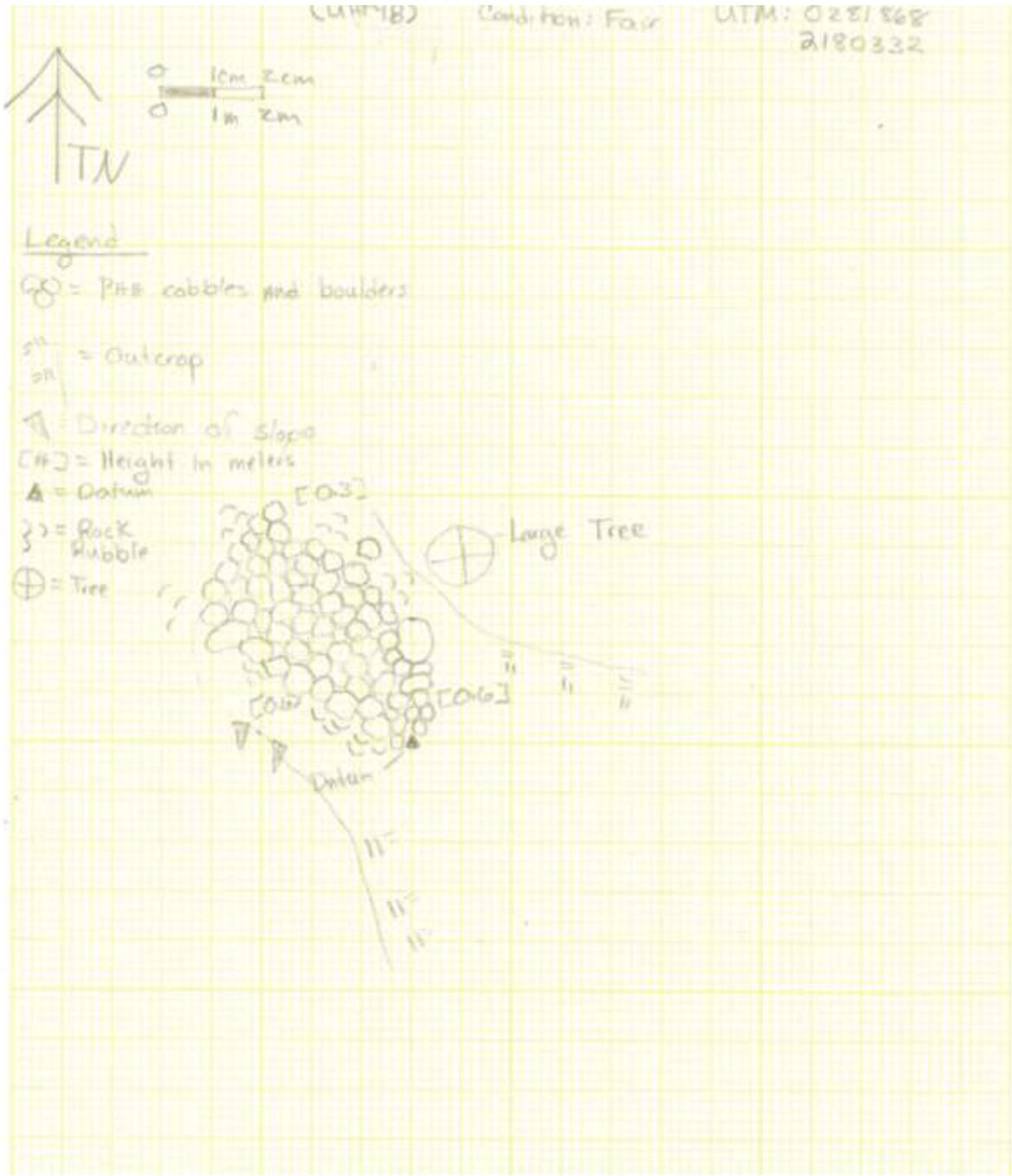


Figure 14: Site 1TS-01 Feature C Plan View Map.



Figure 15: Photograph of Site 1TS-01 Feature C Looking West.

SITE 1TS-02**Modified Outcrop**

FUNCTION: Agricultural
AGE: Historic
DIMENSIONS: Length: 14.0 m N/S; Width, 8.0 m; Height, 0.5 m Max.
CONDITION: Fair
INTEGRITY: Altered by Weathering and Vegetation Overgrowth
SURFACE ARTIFACTS: None
EXCAVATION: None
DESCRIPTION: Site 1TS-02 consists of a modified outcrop located in the northern tip of Project Area I (See Figure X and X). Site 1TS-02 is 7.0 m long (N/W) by 3.2 m wide and is 0.5 m in maximum height (Figure X). The modified outcrop is constructed of small to medium angular pāhoehoe cobbles and small boulders loosely piled on an exposed bedrock outcrop. No stacking or facing is evident in the feature construction. Site 1TS-02 is most likely the result of agricultural field clearing activities associated with sugarcane agriculture. The site has been slightly impacted by weathering and is in fair condition. No further work is recommended at the site.

SITE 1TS-03**Rock Wall**

FUNCTION: Agricultural Boundary
AGE: Historic
DIMENSIONS: Length: 16.0 m NW/SE; Width, 3.0 m; 0.3 m Max.
CONDITION: Fair
INTEGRITY: Vegetation and Erosion
SURFACE ARTIFACTS: None
EXCAVATION: None
DESCRIPTION: Site 1TS-03 consists of a low, linear rock wall located along the northwest perimeter of Project Area I. The wall is 16.0 m long (NW/SE) by 0.9 m wide and is 0.3 m tall (see Figure X and X). The rock wall is constructed of two courses of angular and subangular pāhoehoe small boulders placed side by side on the ground surface. The boulders are stacked one to two courses high. Milled 4 by 4 inch milled fence posts are located along the alignment. The feature appears to be the base, or beginning of a wall constructed to delineate a boundary. It might delineate the boundary between Waieka Cane Lots 3 and 4. These were lease lots created between 1919 and 1920. The wall has been slightly impacted by vegetation and is in fair condition. No further work is recommended at this site.

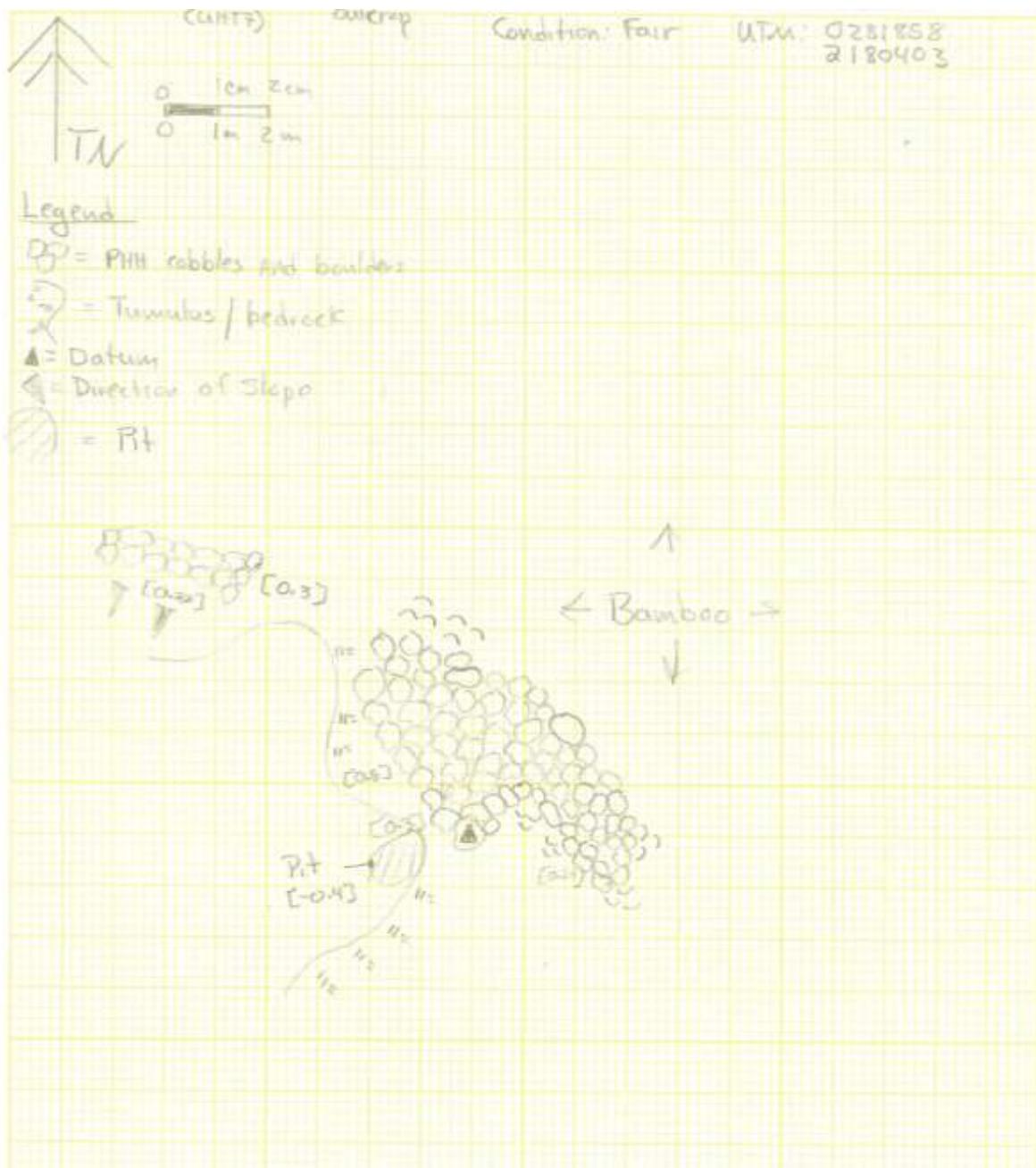


Figure 16: Site 1TS-02 plan view Map.



Figure 17: Photograph of Site 1TS-02 Modified Outcrop Looking Northwest.

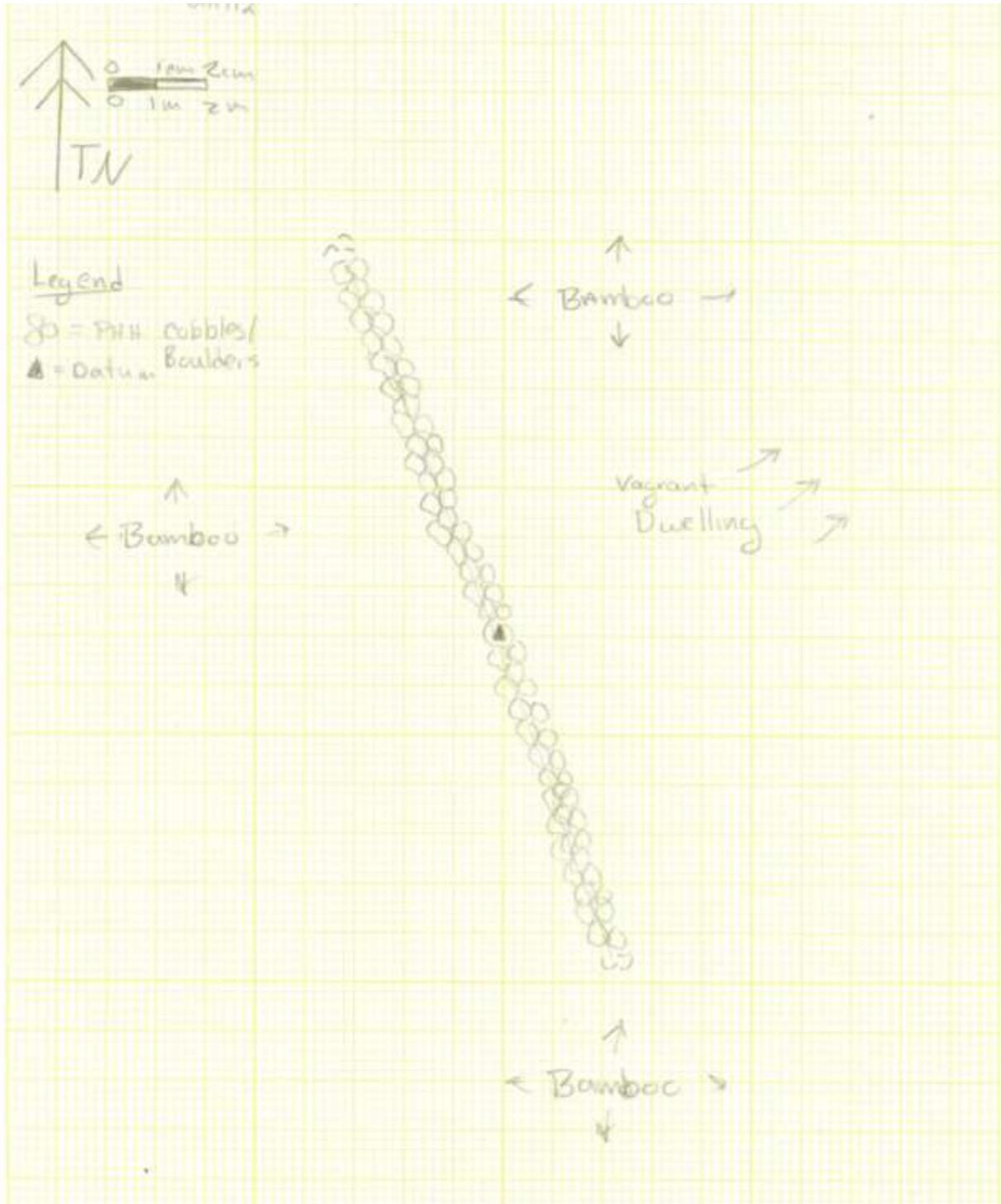


Figure 18: Site 1TS-03 Plan View Map.



Figure 19: Photograph of Site 1TS-3 Rock Wall and fence Post Looking West.

SITE 2TS-01**Rock Mounds**

FUNCTION:	Agricultural
AGE:	Historic
DIMENSIONS:	Length: 40.0 m NW/SE; Width,40.0 m; Height, 1.1 m Max.
CONDITION:	Fair
INTEGRITY:	Altered by Weathering and Vegetation Overgrowth
SURFACE ARTIFACTS:	None
EXCAVATION:	None
DESCRIPTION:	Site 2TS-01 consists of two rock mounds (Features A and B) and one modified outcrop (Feature C) located along the southern boundary of Project Area II (see Figure X and X). The three features are located on undulating pāhoehoe terrain. They are constructed of loosely piled and stacked angular and subangular pāhoehoe cobbles and small boulders.

Feature A is of an irregularly shaped rock mound located in the southwest corner of the site. The rock mound is 10.2 m long (NE/SW) by 5.3 m wide and is 1.0 m in maximum height (Figure X and X). Feature A is constructed of angular and subangular cobbles and small boulders loosely piled on the ground surface. There are two smaller portions (2.5 m long by 1.2m wide by 0.39 m high) of Feature A located along its northwest side. No stacking or facing is evident in the feature construction. Feature A has been slightly altered by weathering and is in fair condition. No further work is recommended at Feature A.

Feature B consists of a roughly circular rock mound located 6.0 meters northeast of Feature A. The rock mound is 6.2 m long (NW/SE) by 4.8 m wide and is 0.4 m tall (Figure X). Feature B is low-lying and is constructed of pāhoehoe cobbles and small boulders loosely piled on the ground surface. No stacking or facing is evident in the feature construction. Feature B has been slightly altered by weathering and is in fair condition. No further work is recommended at Feature B.

Feature C consists of a roughly circular shaped modified outcrop located 3.0 meters southeast of Feature B. The feature is 3.5 m long (N/S) by 3.4 m wide and is 1.1 m in maximum height (Figure X). The modified outcrop is constructed of angular and subangular cobbles and small boulders loosely piled and stacked on an exposed bedrock outcrop. Feature C has been slightly altered by weathering and is in fair condition. No further work is recommended at Feature C.

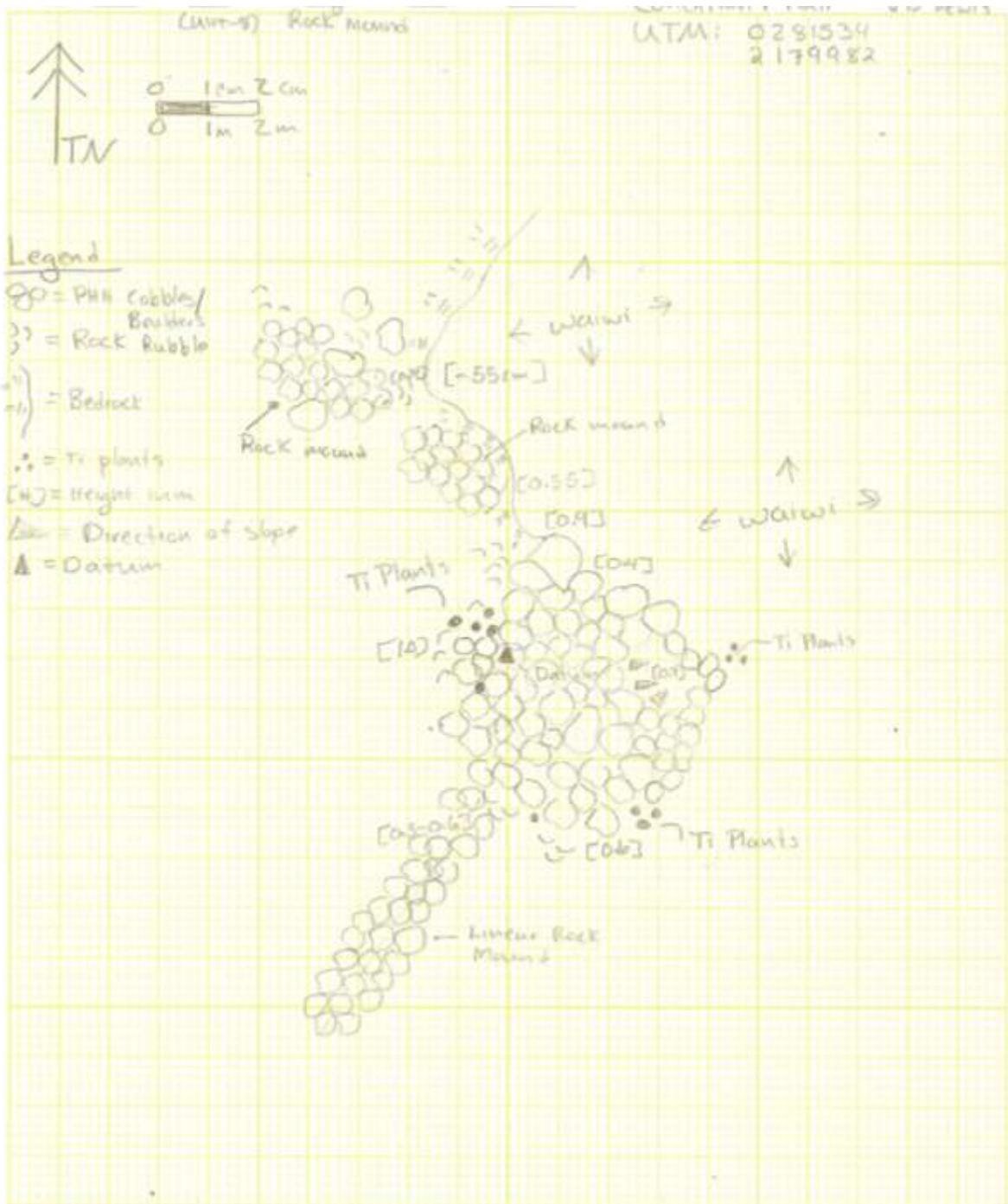


Figure 20: Site 2TS-01 Plan View Map.



Figure 21: Photograph of Site 2TS-01 Feature A Looking West.



Figure 22: Photograph of Site 2TS-01 Feature B Looking West.



Figure 23: Photograph of Site 2TS-01 Feature C Looking West.

The rock mounds and modified outcrop at Site 2TS-01 are most likely the result of agricultural activities associated with sugarcane cultivation. The features have been slightly impacted by natural weathering and are in fair condition. No further work is recommended at the site.

SITE 2TS-02

Rock Mound

FUNCTION: Agricultural
AGE: Historic
DIMENSIONS: Length: 15.0 m NE/SW; Width, 15.0 m; Height, 0.4 m Max.
CONDITION: Poor
INTEGRITY: Altered by Vegetation overgrowth and Erosion
SURFACE ARTIFACTS: None
EXCAVATION: None
DESCRIPTION: Site 2TS-02 consists of a large rock mound located in the southern portion of Project Area II. The rock mound is 9.0 m long (SW/NE) by 3.0 m wide and is 0.4 m in maximum height (see Figure X and X). Site 2TS-02 is situated along the north edge of a northwest/southeast running pāhoehoe outcrop and is constructed of loosely piled pāhoehoe cobbles and small boulders. No stacking or facing is evident in the feature construction. Site 2TS-02 is most likely the result of field clearing activities associated with sugarcane agriculture. This site has been impacted by vegetation and weathering, and is in poor condition. No further work is recommended at the site.

SITE 2TS-03

Rock Mounds

FUNCTION: Agricultural
AGE: Historic
DIMENSIONS: Length: 12.5 m N/S; Width, 8.0 m; Height, 1.0m Max.
CONDITION: Fair
INTEGRITY: Altered by Vegetation overgrowth.
SURFACE ARTIFACTS: None
EXCAVATION: None
DESCRIPTION: Site 2TS-03 consists of two rock mounds (Feature A and Feature B) located along the southern perimeter of Project Area II (see Figure X and X). The site is a guava thicket on undulating terrain. Both Feature A and Feature B are constructed of medium to large pāhoehoe cobbles and small boulders piled and stacked along the edges of bedrock outcrops.

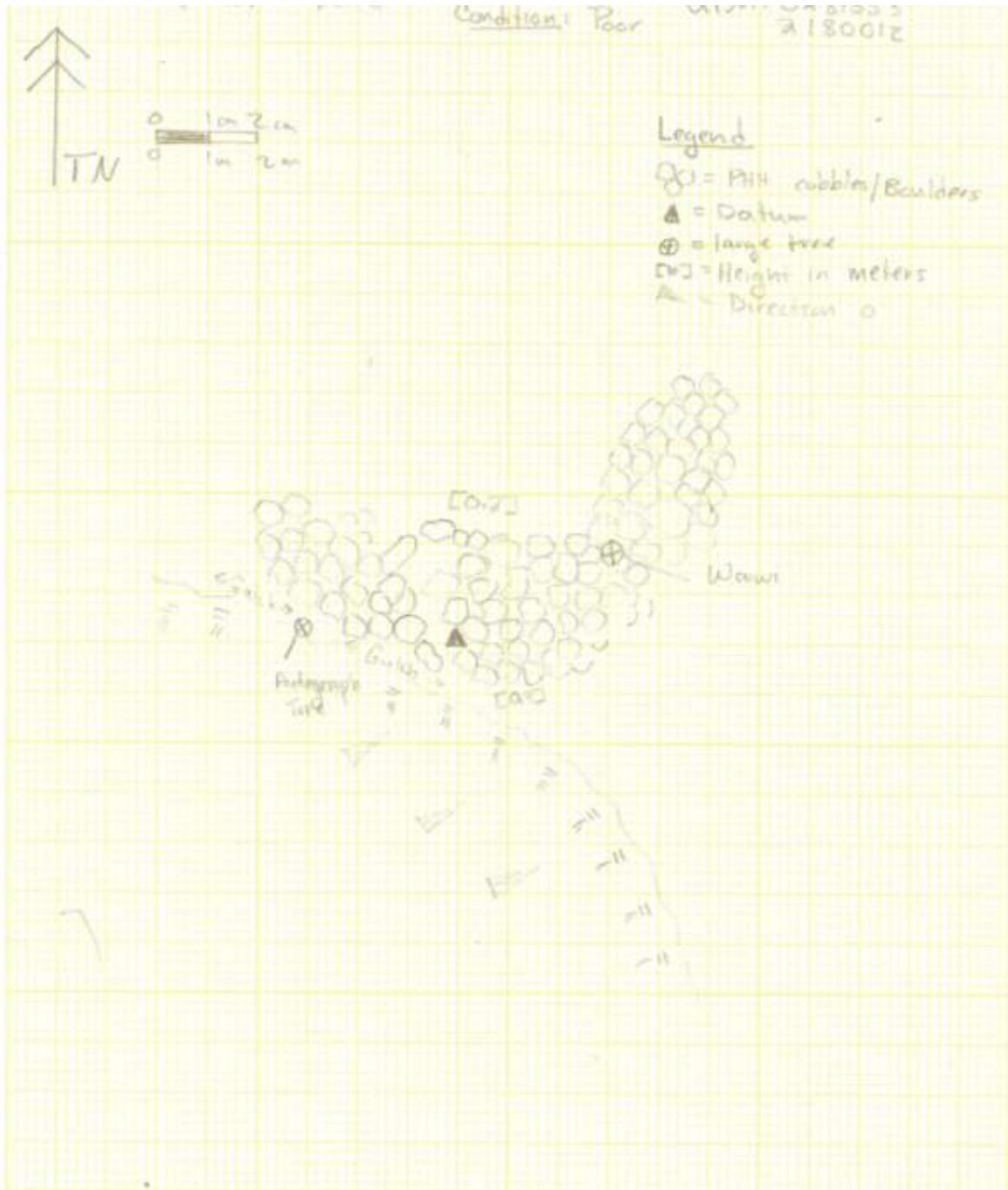


Figure 24: Site 2TS-02 Plan View Map.



Figure 25: Photograph of Site 2TS-02 Looking Northwest.

The Feature A rock mound is 11.2 m long (N/S) by 5.2 m wide and is 1.0 m in maximum height (Figure X). It is constructed of angular and subangular pāhoehoe cobbles and small boulders loosely piled on the ground surface. No stacking or facing is evident in the feature construction. Feature A has been altered by weathering and is in fair condition. No further work is recommended at Feature A.

Feature B is a rock mound located 10.0 meters southeast of Feature A. Feature B is 7.0 m long (E/W) by 1.5 m wide and 0.8 m in maximum height (Figure X). The rock mound is constructed of loosely stacked and piled pāhoehoe cobbles and small boulders. The feature is stacked 1-3 courses high. Feature B has been altered by weathering and is in fair condition. No further work is recommended at Feature B.

Features A and B at Site 2TS-03 are most likely the result of field clearing activities associated with sugarcane agriculture. The features have been slightly impacted by weathering and vegetation overgrowth and are in fair condition. No further work is recommended at the site.

SITE 2TS-04

Rock Mounds

FUNCTION:

Agricultural

AGE:

Historic

DIMENSIONS:

Length: 15.0 m NW/SE; Width, 9.0 m; Height, 0.7 m Max.

CONDITION:

Good

INTEGRITY:

Altered by Erosion and Vegetation Overgrowth

SURFACE ARTIFACTS:

None

EXCAVATION:

None

DESCRIPTION:

Site 2TS-04 consists of two rock mounds (Features A and B) located in the southern portion of Project Area II (see Figure X and X). The rock mounds are circular in shape, are oriented in a northwest/southeast direction, and are constructed of pāhoehoe basalt cobbles and small boulders piled several courses high.

Feature A is a rock mound located on the east side of the site. The rock mound measures 5.0 m long (E/W) by 3.5 m wide and is 0.5 m in maximum height (Figure X). Feature A is roughly circular in shape and is constructed of angular and subangular pāhoehoe cobbles and small boulders piled 1-3 courses high on the ground surface. No stacking or facing is evident in the feature construction. The rock mound slopes slightly to the southwest and southeast. Feature A has been slightly altered by weathering and is in fair condition.



Figure 27: Photograph of Site 2TS-03 Feature A Facing Southeast.

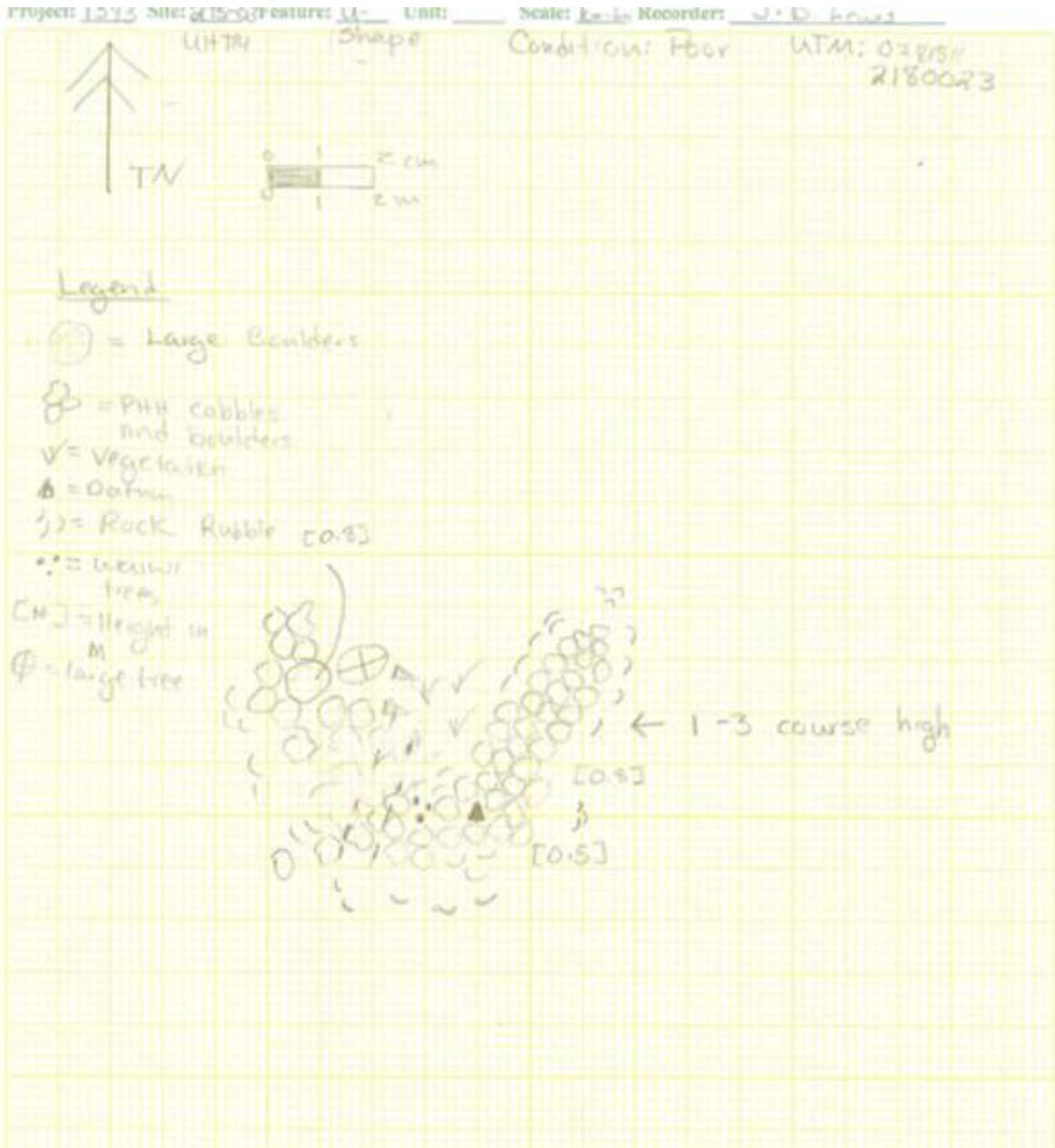


Figure 28: Site 2TS-03 Feature B Plan View Map.



Figure 29: Photograph of Site 2TS-03 Feature B Looking Southwest.

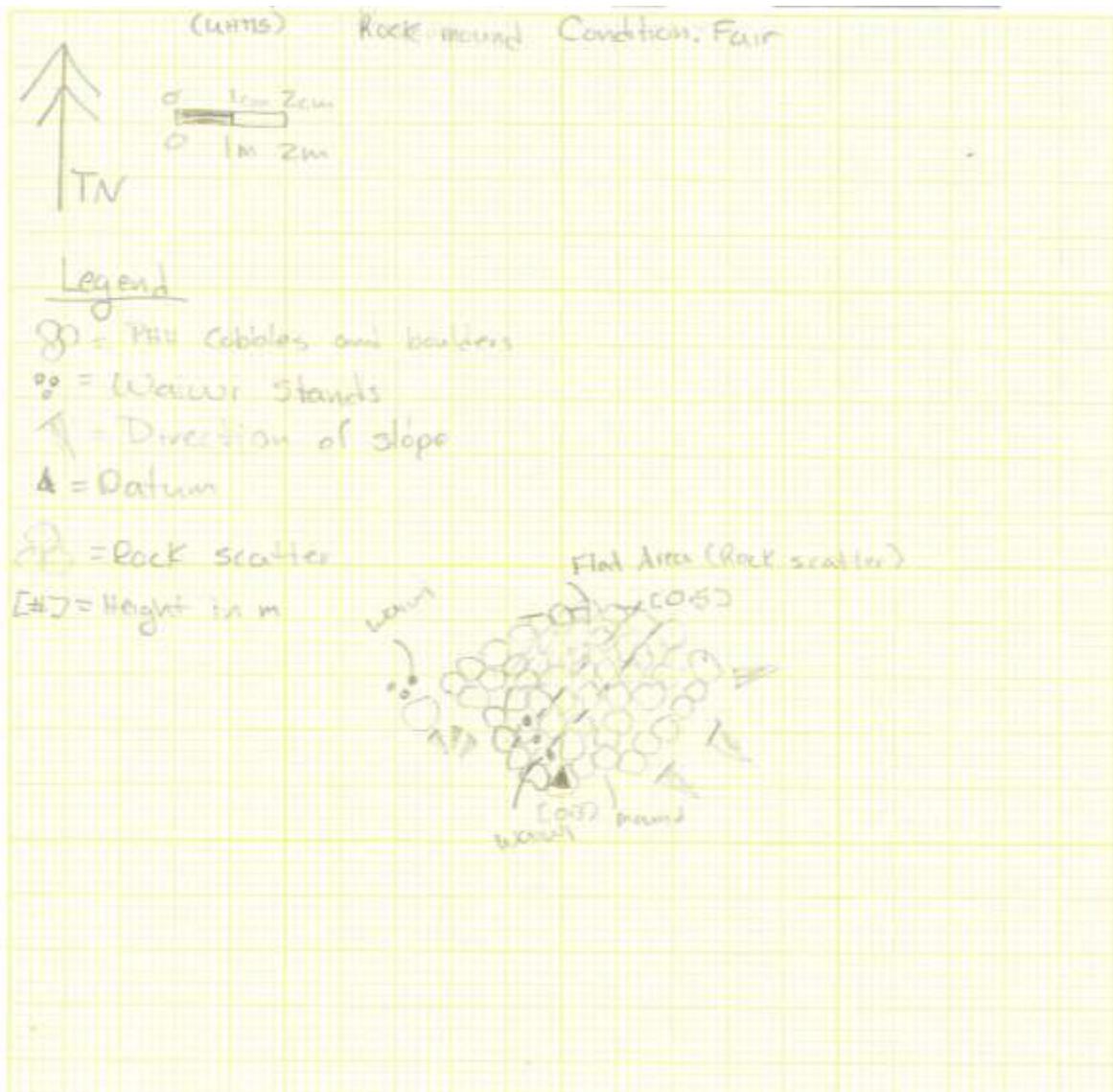


Figure 30: Site 2TS-02 Plan View Map.



Figure 31: Photograph of Site 2TS-04 Looking Southwest.

Feature B is a rock mound located 7.0 meters southwest of Feature B. The rock mound measures 5.0 m long (N/S) by 4.5 m wide and is 0.7 m in maximum height (Figure X). Feature B is roughly rectangular in shape and is constructed of angular and subangular pāhoehoe cobbles and small boulders piled on the ground surface. No stacking or facing is evident in the feature construction. Feature B has been slightly altered by weathering and is in fair condition.

The rock mounds at Site 2TS-03 are most likely the result of agricultural field clearing activities associated with sugarcane agriculture. The features have been slightly impacted by weathering and vegetation but are in fair condition. No further work is recommended at the site.

SITE 29373

Hilo Dairy Facility

FUNCTION:

Dairy

AGE:

Historic

DIMENSIONS:

Length: 150.0 m N/S; Width, 70.0 m; Height, 1.1 m Max.

CONDITION:

Good

INTEGRITY:

Altered by Weathering and Vegetation

SURFACE ARTIFACTS:

Yes: milk bottles, steering mechanisms, midden

EXCAVATION:

None

DESCRIPTION:

Site 29373 is the remains of the Hilo Dairy facilities located along the eastern perimeter of Project Area II (see Figure X and X). Features A, B, C, D, and E of Site 29373 were previously recorded during an archaeological inventory survey (AIS) by Rechtman Consulting, LLC (Clark *et al.* 2012). The five previously recorded features were relocated during the current study. They are a concrete foundation for a bathroom (Feature A), a cobble and concrete loading ramp (Feature B), a small concrete foundation (Feature C), a concrete foundation with corrugated metal roofing (Feature D), and a bottle dump (Feature E). no further work was recommended at the five features at Site 29373 (Clark et al. 2012:47).

Five new features were recorded southwest of those recorded in the Recthman Consulting, LLC AIS report. The five newly recorded features include the foundation of a multi-room building (Feature F), the foundation of the former barn (Feature G), a small concrete slab (Feature H), a concrete retaining wall (Feature I), and a pile of waterworn rock (Feature J).

Feature F is the foundation of a multi-room building (Figure X). The foundation 10.0 meters long (N/S) by 7.5 meters wide. The foundation walls are a maximum of 1.1 meters high. Fragments of corrugated metal roofing litter the interior floor space of the foundation.

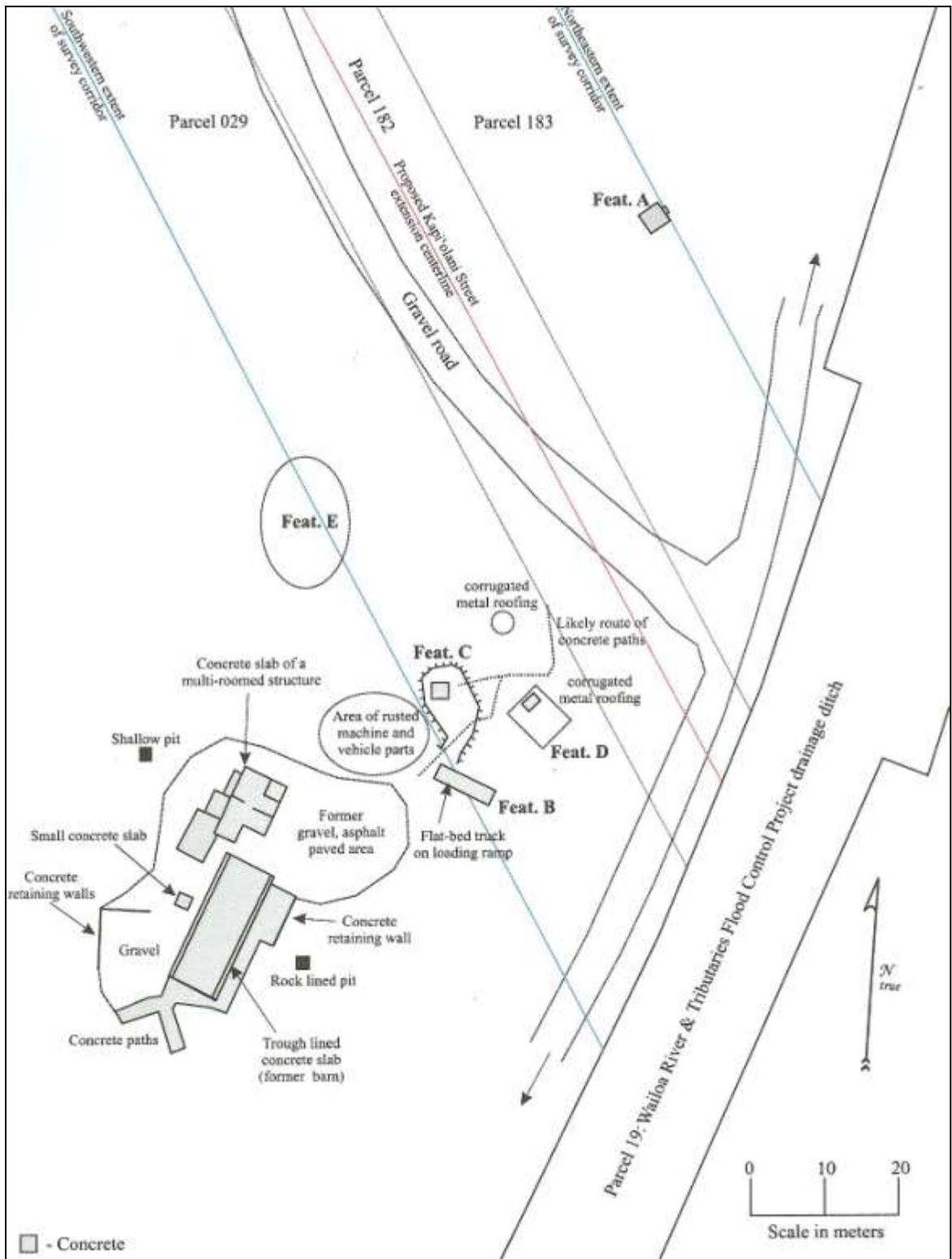


Figure 32: Site 29373 Plan View Map (Adapted from Clark et al. 2012:37).

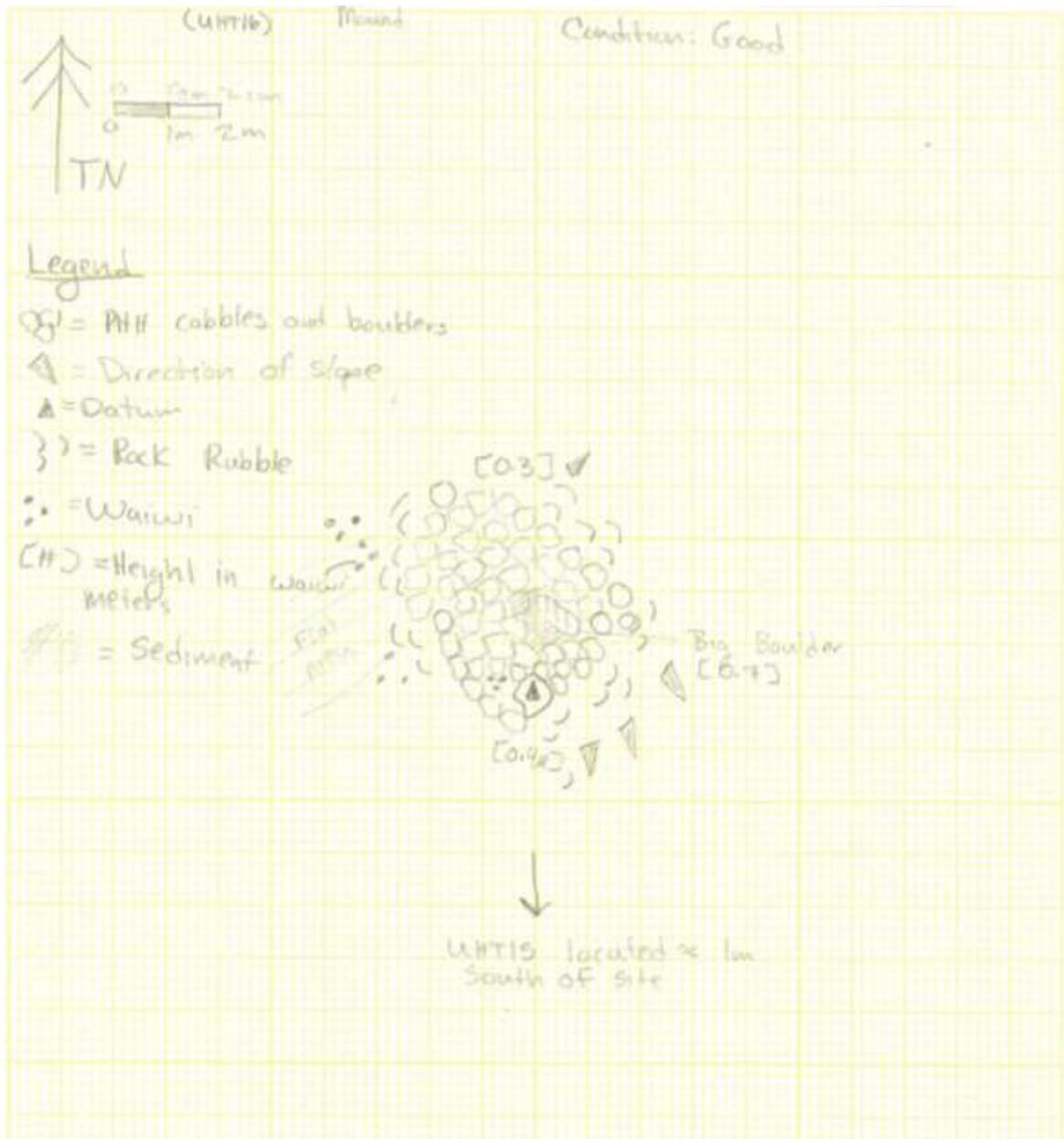


Figure 33: Site 2TS-04 Feature B plan View Map.



Figure 34: Photograph of Site 2TS-04 Feature B Looking Southwest.

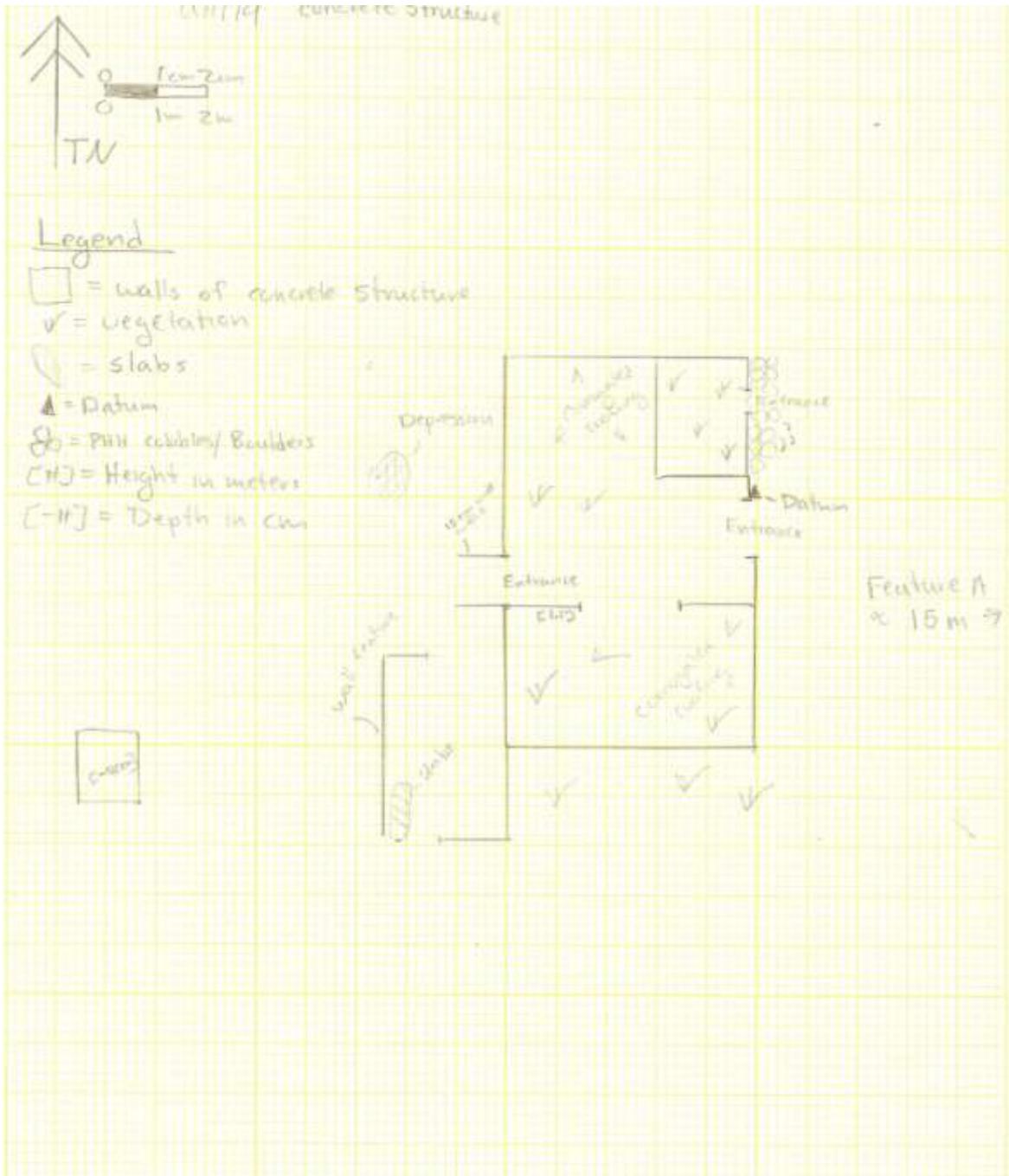


Figure 35: Site 29373 Feature F Plan View Map.



Figure 36: Photograph of Site 29373 Feature F Foundation Walls Looking west.

The Feature F foundation is rectangular in shape and contains three rooms as well as three entrances. Two entrances are located along the east edge of the building while a single entrance is located along the west perimeter of the building. A flat “lanai” area is located along the west exterior of the building while a small, squared shaped concrete structure (1.3 m x 1.5 m x 0.4 m tall) is located south of the main structure. A shallow pit is located directly west of the west perimeter wall and is situated beneath large trees. The pit is roughly 1. meters long by 1.4 meters wide and is less than one meter deep at the center. The foundation at Feature F has been impacted by weathering and is in poor condition.

Feature G is a concrete slab located 6 meters south of Feature F. The slab is 2.5 m long (N/S) by 2.0 m wide and is 0.4 m tall. Feature G is roughly rectangular in shape and is littered with rusted corrugated roofing. The ground surface surrounding Feature G is littered with fragments of corrugated metal, pipe, and other modern metal debris. Feature G has been altered by weathering and is in poor condition.

Feature H is located roughly three meters south of Feature F. The feature is the foundation for the milking barn and the concrete paths associated with the barn. The overall feature is approximately 28.0 meters long (NE/SW) by 13.0 meters wide. the walls are roughly 0.4 meters in maximum height. The main features of the foundation are the two parallel troughs (Figure X) located on the east and west sides of the foundation, and the cement pathway along the east and south sides of the barn foundation.

The two parallel concrete troughs measure roughly 15.0 m long (NE/SW) and are 0.75 m wide(Figure X). The trough walls are 0.4 m in height. The troughs were used to feed the cattle while they were being milked. A concrete wall is located 6.5 m east of the troughs and measures 4.5 m long (N/S) by 2.0 m wide and is 1.1 m tall. The wall encloses the eastern limit of a concrete slab between the barn and the wall. There is a rusted vehicle cab located on the concrete slab. Milk bottles, fragments of metal, and large metal barrows are also located on the slab. there is a shallow rock-lined pit 4.0 meters southeast of the walled slab. The pit is roughly 2.0 meters by 2.0 meters and is approximately 1.0 meter deep.

The concrete pathway leads southwest away from the south edge of the barn. The pathway is forked and each fork is roughly 3.0 meters long by 1.75 meters wide. Portions of the road edge are lined with cobbles (Figure X). the top surface of the concrete pathway is smooth (Figure X). Feature H has been altered by weathering and is in poor condition.

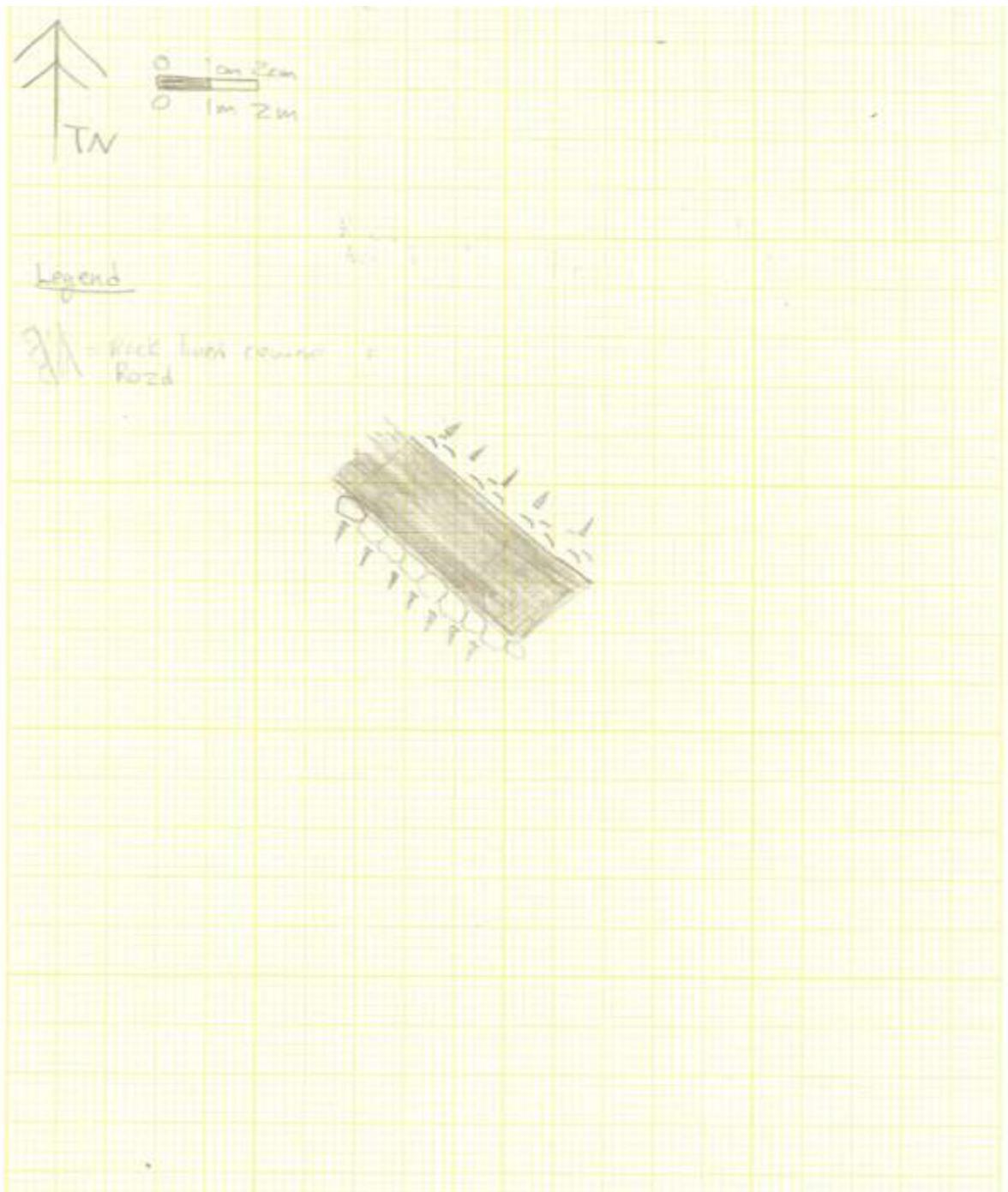


Figure 37: Site 29373 Feature H Plan View Map of a Portion of the Cement Pathway.



Figure 38: Photograph of Site 29373 Feature H Cement Pathway Looking Southwest.

Feature I is a concrete retaining wall that surrounds the newly recorded features at Site 29373 (see Figure X). The wall is irregularly shaped, is roughly 0.2 to 0.4 meters wide, and is about 0.4 to 0.9 meters in height. The wall retains the level bulldozed pad that the Hilo dairy structures were built on. Feature I has been altered by weathering and is in poor condition.

Feature J consists of an area of waterworn rock located just southwest of the concrete pathway at Feature H. Feature J measures 6.9 m long (N/S) by 7.4 m wide and has a flat top surface (Figure X). The feature is concentration of small water-worn rocks strewn across a level bulldozed area. A chunk of concrete containing small water-worn pebbles is located along the east edge of the rocks, suggesting that this feature might be the remnants of a concrete/pebble mixing or staging area. Modern era trash was also observed on the ground surface near the Feature J. Feature J has been slightly altered by weathering and is in fair condition.

The structural features and artifacts present at Site 29373 are the remains of the Hilo Dairy facilities operated between 1938 and 1955. The features have been slightly impacted by weathering, vegetation overgrowth and erosion and are in poor to fair condition. No further work is recommended at the site.

SITE 2TS-06	Rock Wall
FUNCTION:	Boundary
AGE:	Historic
DIMENSIONS:	Length: 350.0 m N/S; Width, 1.0 m; Height, 2.0 m Max.
CONDITION:	Good
INTEGRITY:	Altered by Weathering, Vegetation and Erosion.
SURFAE ARTIFACTS:	Milk Bottles
EXCAVATION:	None
DESCRIPTION:	Site 2TS-06 consists of a 350.0 m long (NW/SE) by 1.0 m wide and 2.0 m tall rock wall that is situated northwest/southeast and bisects Project Area II (see Figure X and X). The wall is constructed of angular and subangular large cobbles and small boulders stacked and tightly fitted together (Figure XX). The wall is neatly dry-stacked 4-10 courses high with sections of the wall being core-filled. The exterior wall facing is constructed of pāhoehoe boulders ranging from 15.0 to 65.0 cm in length with their flattest side facing outward (Figure XX). Sections of the wall are collapsed while other sections are heavily impacted by large banyan trees and guava. The majority of sites in Project Area II are located along the northwest section of the wall.

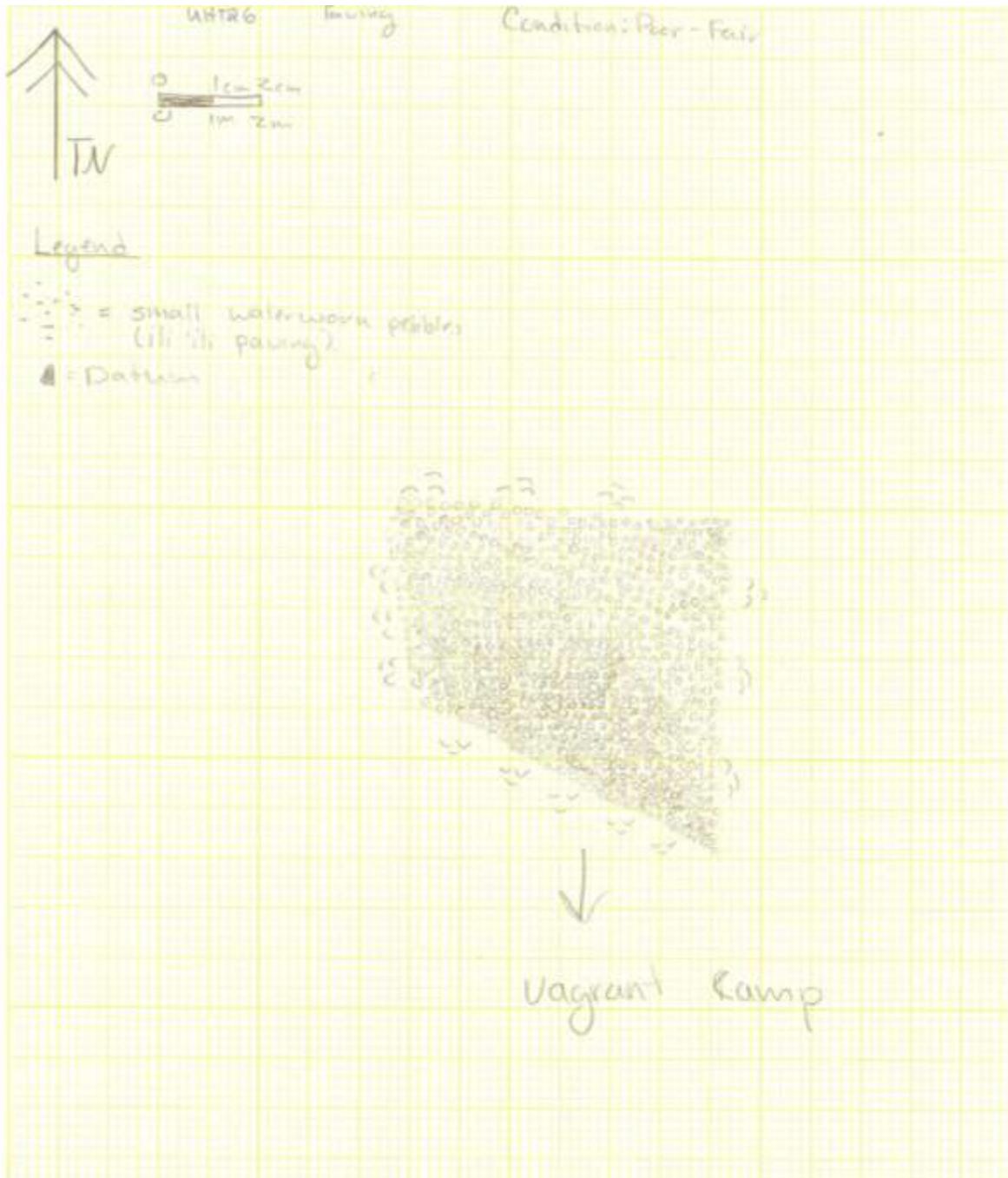


Figure 39: Site 29373 Feature J Plan view Map.



Figure 40: Photograph of Site 29373 Feature J Top Surface Looking Southwest.

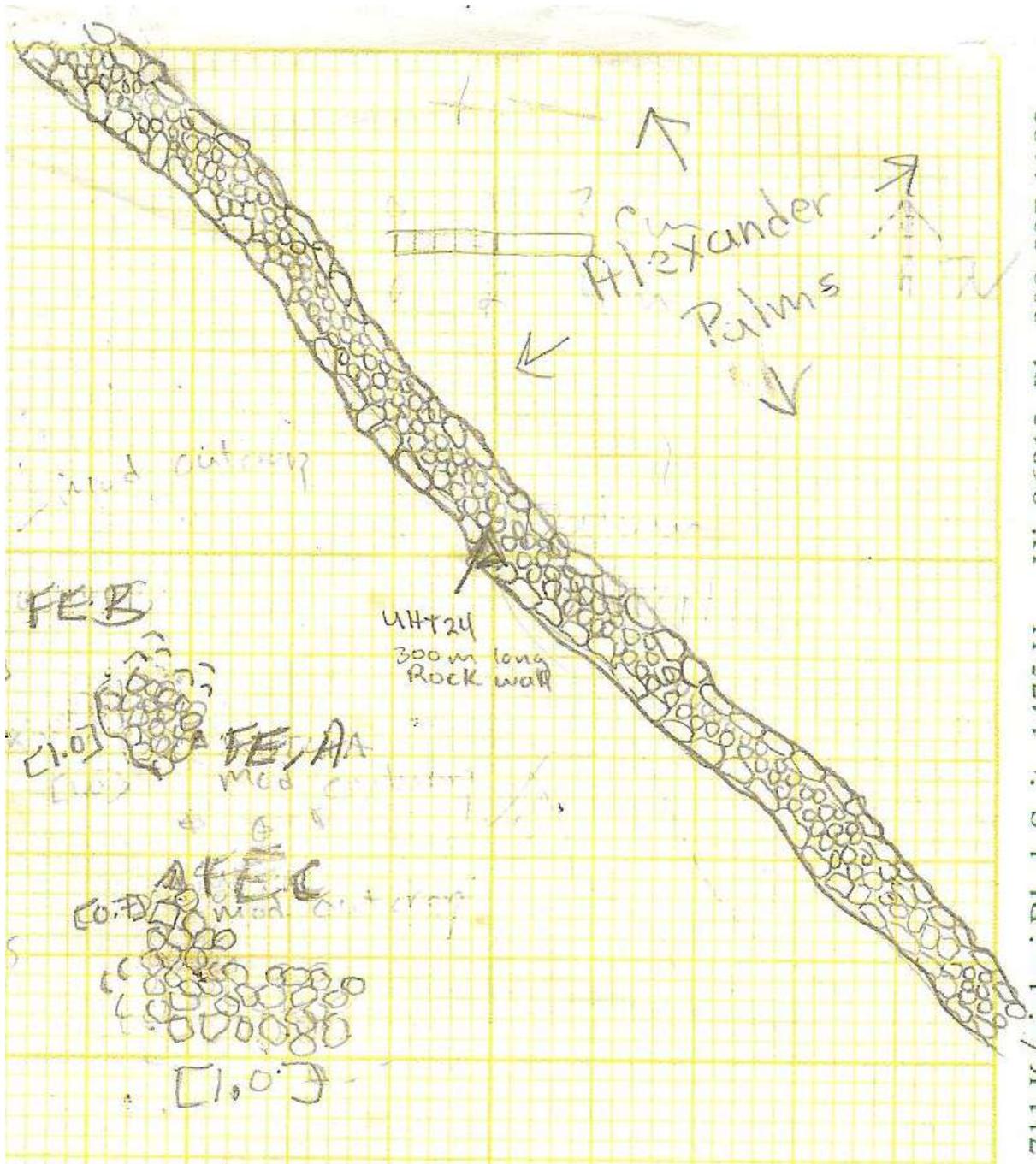


Figure 41: Site 2TS-06 Wall Plan view Map.



Figure 42: Photograph of Site 2TS-06 Wall Looking Southeast.

Site 2TS-06 is an Historic era boundary wall most likely associated with sugarcane and ranching activities. It is possible that the wall marked the western edge of the Hilo Dairy pasturelands. It is roughly near the western boundary of the Waiākea Cane Lot 3 leased by the Hilo Dairy. The wall has been impacted by weathering and is in fair condition. No further work is recommended at the site.

SITE 2TS-07

Rock Mounds and Modified Outcrops

FUNCTION: Agricultural
AGE: Historic
DIMENSIONS: Length: 30.0 m N/S; Width, 25.0 m; Height, 0.8 m Max.
CONDITION: Fair to Good
INTEGRITY: Altered by Erosion and Vegetation
SURFACE ARTIFACTS: None
EXCAVATION: None
DESCRIPTION: Site 2TS-07 consists of a modified outcrop (Features A) and four rock mounds (Feature B through F) located in the central portion of Project Area II (see Figure X and X). The features are constructed of piled and stacked rock. All of the features are similar in appearance to sugarcane era rock clearing mounds documented in nearby archaeological studies. There are a large number of Alexandria palm trees growing at the site.

Feature A is a modified outcrop located along the east side of Site 2TS-07. Feature A is 5.0 m long (NW/SE) by 2.0 m and is 0.8 m in maximum height (Figure X and X). The modified outcrop is constructed of angular and subangular cobbles and small boulders. Feature A is linear in shape and is neatly stacked and faced along its northwest perimeter. The south edge of the modified outcrop is characterized by stretches of pāhoehoe rock rubble. Feature A has been slightly impacted by weathering and is in good condition.

Feature B consists of a 2.0 m long (N/S) by 1.6 m wide and 0.8 m tall circular rock mound located 5.0 meters southwest of Feature A (Figure X). The rock mound is constructed of angular and subangular cobbles and small boulders. The north and northwest perimeters of Feature B are stacked three courses high and are well faced. A large tree is growing out of the west edge of the feature. Feature B has been slightly altered by weathering and is in good condition.

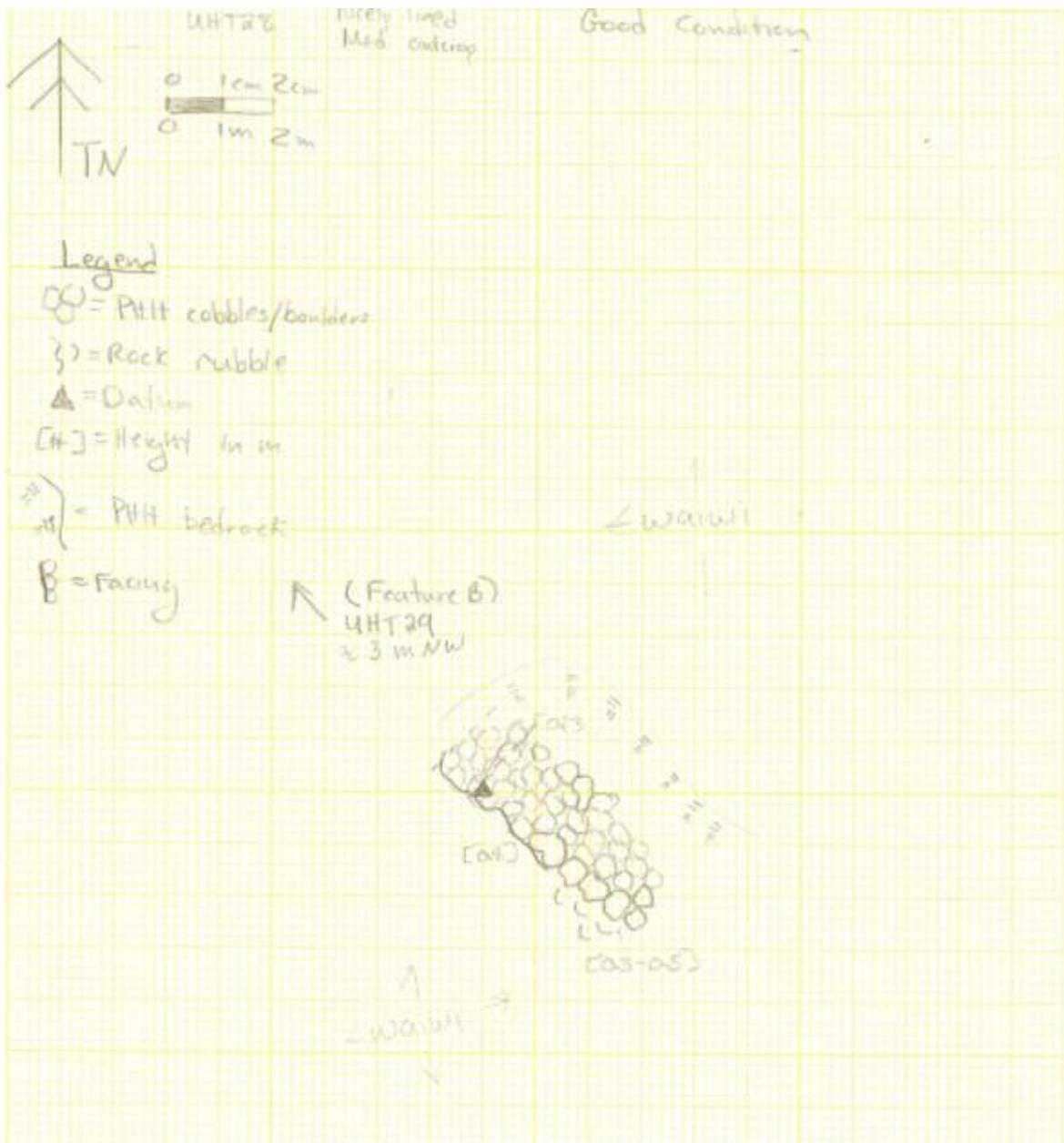


Figure 43: Site 2TS-07 Feature A Plan View.



Figure 44: Photograph of Site 2TS-07 Feature A Looking East.

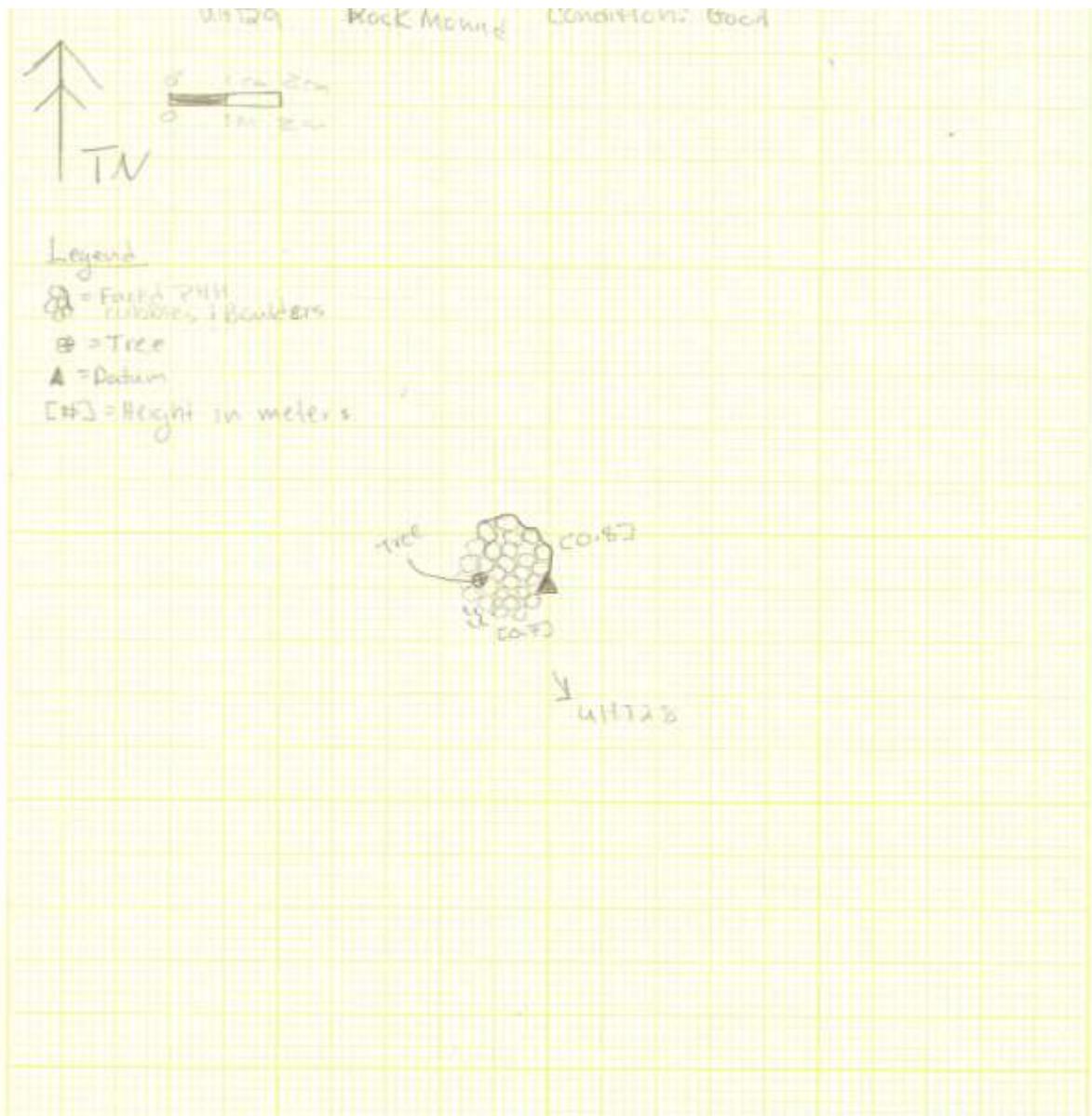


Figure 45: Site 2TS-07 Feature B Plan View Map.



Figure 46: Photograph of Site 2TS-07 Feature B Looking Northwest.

Feature C consists of a cluster of two rock mounds located 9.5 meters northwest of Feature A. The cluster is 6.2 meters long (NE/SW) by 4.3 meters wide. The northeastern rock mound is slightly irregular in shape and measures 3.2 m long (N/S) by 2.5 m wide by 0.46 m in maximum height. The second rock mound is located 1.0 meter southwest of the first rock mound and is 4.0 m long (SW/NE) by 2.5 m wide by 0.8 m in maximum height (Figure X). The rock mounds are constructed on a large flat bedrock outcrop. There is no facing or stacking evident in the feature construction. A large Alexander palm is situated between the two mounds. Feature C has been slightly altered by weathering and is in fair condition.

Feature D consists of a roughly circular rock mound located 16.0 meters southwest of Feature C. The rock mound measures 2.3 m long (N/S) by 2.3 m wide and is 0.7 m in maximum height. Feature D is constructed of angular and subangular cobbles and small boulders stacked five courses high. The mound is partially faced along its north, south and east edges (Figure X). Feature D has been slightly altered by weathering and is in fair condition.

Feature E consists of a large linear rock mound located 15.0 meters southwest of Feature D. The rock mound is 9.0 m long (NW/SE) by 3.0 m wide and is 1.0 m tall (Figure X). Feature E is constructed of angular and subangular cobbles and small boulders stacked four to five courses high. The mound is partially faced along its south and southeast edges (Figure X). Feature E is partially collapsed along the north and northwest edges. Feature E has been slightly altered by weathering and is in fair condition.

Feature F consists of an irregularly shaped rock mound located 15.0 meters south of Feature E. The rock mound is 9.2 m long (SW/NE) by 5.7 m wide and is 1.0 m tall (Figure X). Feature F is constructed of angular and subangular cobbles and small boulders stacked four courses high. The mound is partially faced along its east edge (Figure X). Feature F is partially collapsed along the north and northwest edges. Feature F has been slightly altered by weathering and is in fair condition.

The rock mounds and modified outcrop at Site 2TS-07 are most likely the result of agricultural field clearing activities associated with sugarcane agriculture. The features are similar in size and construction technique to those documented at nearby archaeological studies. The features at Site 2TS-07 have been slightly impacted by weathering, vegetation overgrowth and erosion and are in fair condition. No further work is recommended at the site.

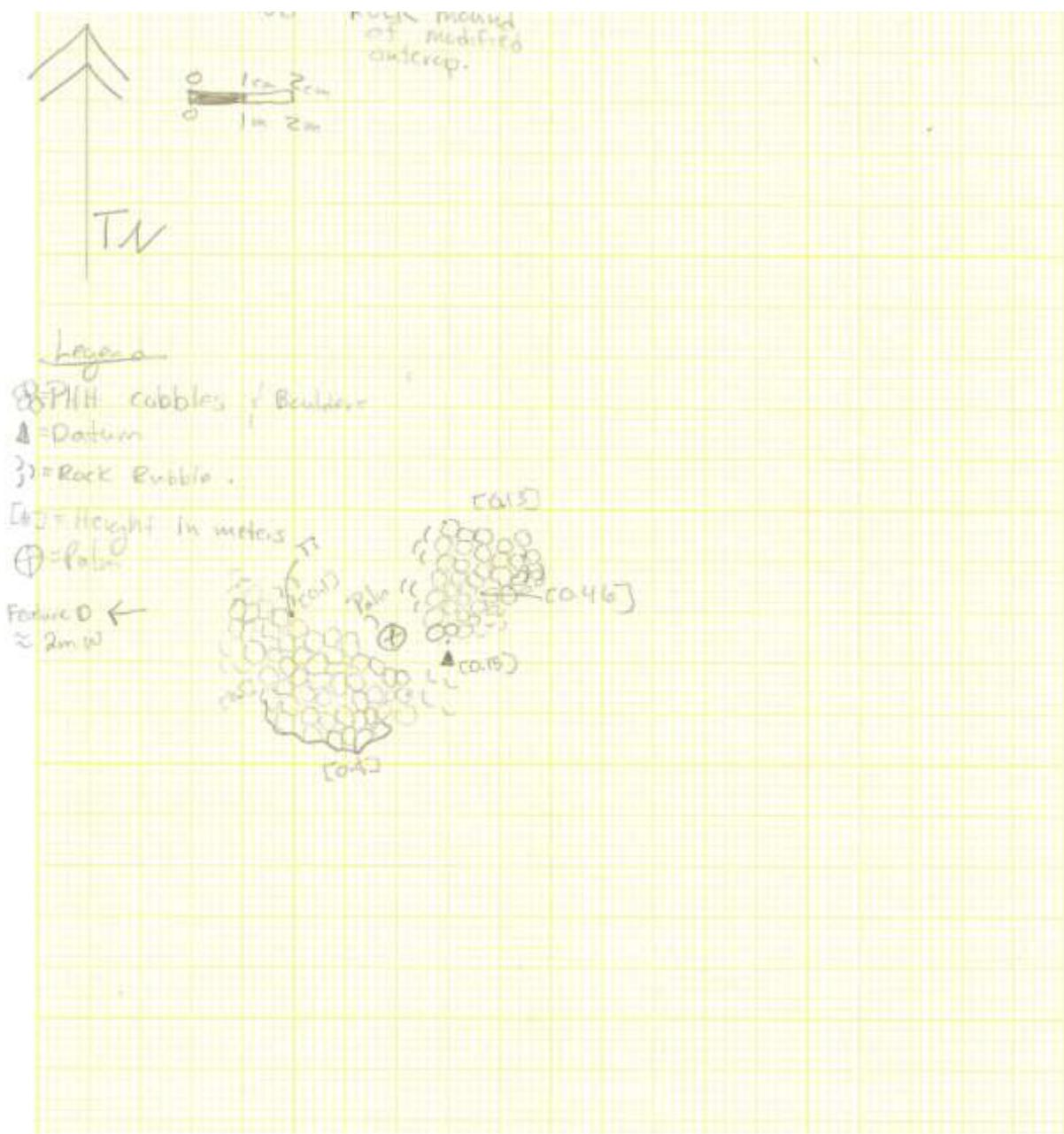


Figure 47: Site 2TS-07 Feature C Plan View Map.



Figure 48: Photograph of site 2TS-07 feature C Looking North.

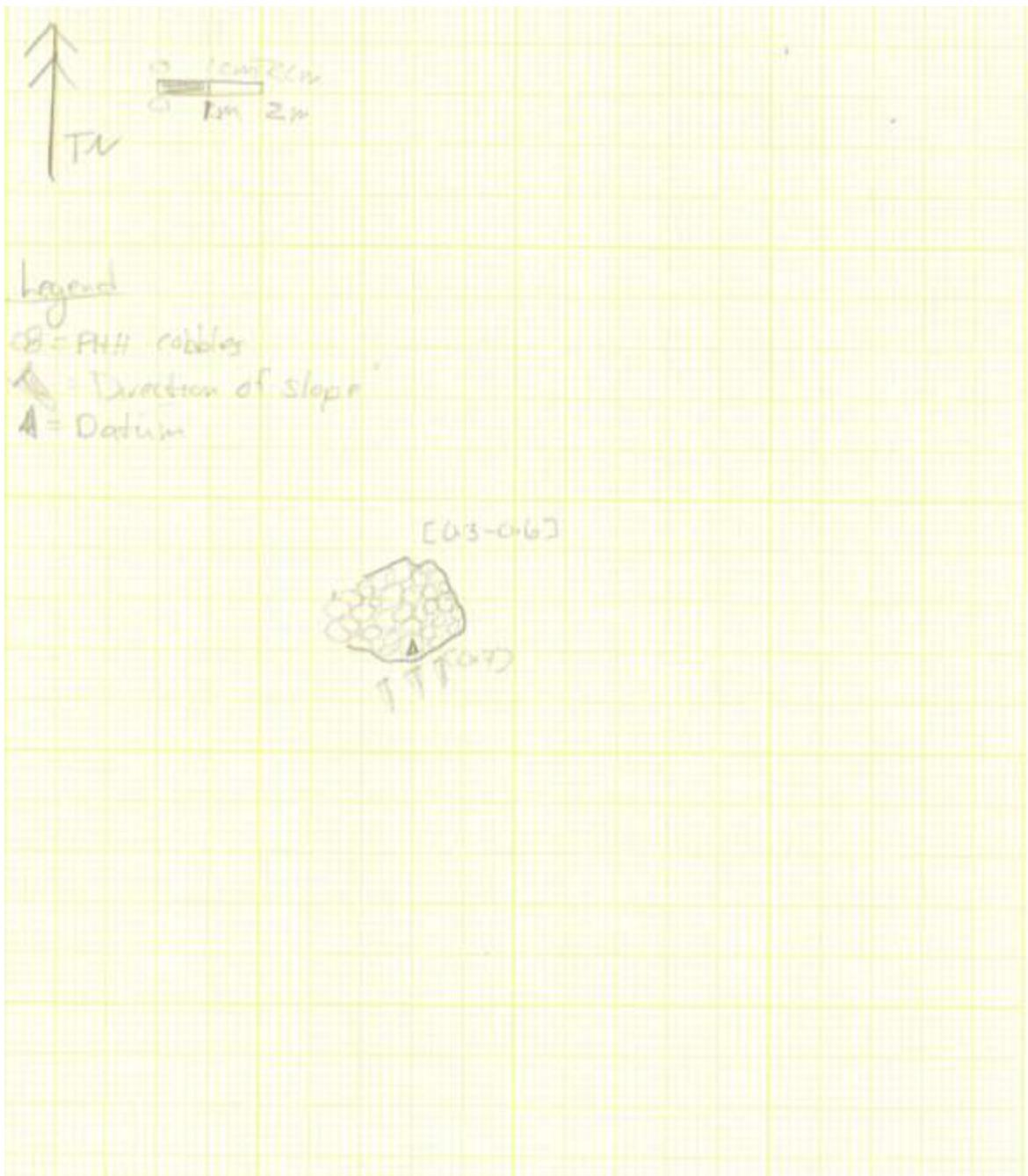


Figure 49: site 2TS-07 Feature D Plan View Map.



Figure 50: Photograph of Site 2TS-07 Feature D Looking North.

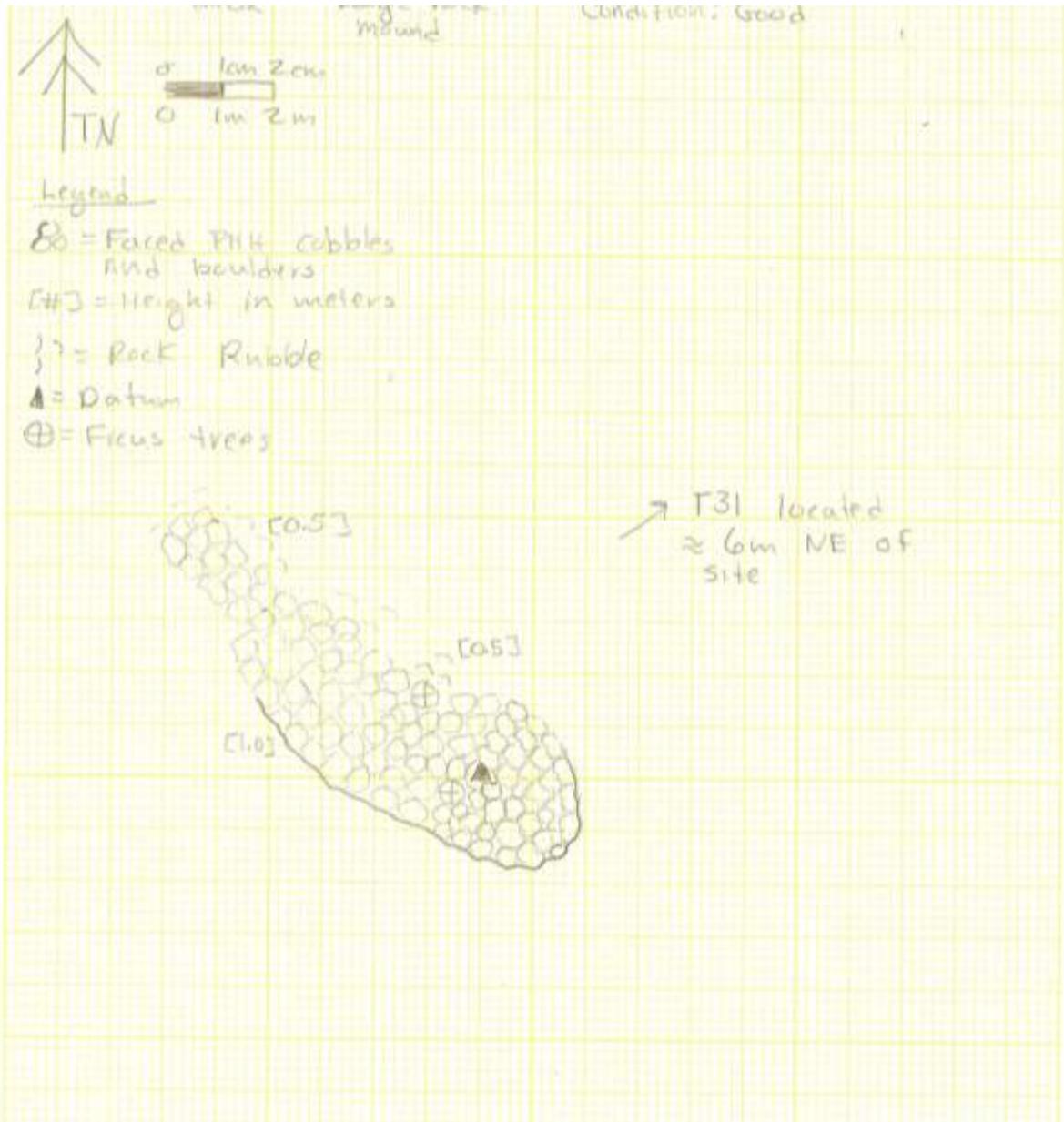


Figure 51: Site 2TS-07 Feature E Plan View Map.



Figure 52: Photograph of Site 2TS-07 Feature E Looking West.



Figure 53: Site 2TS-07 Feature F Plan View Map.



Figure 54: Photograph of Site 2TS-07 Feature F Looking Southwest.

SITE 2TS-08**Rock Mound and Modified Outcrop**

FUNCTION:	Agricultural
AGE:	Historic
DIMENSIONS:	Length: 13.0 m N/S; Width, 10.0 m; Height, 1.1 m Max.
CONDITION:	Good
INTEGRITY:	Altered by Weathering, Vegetation and Erosion.
SURFACE ARTIFACTS:	None
EXCAVATION:	None
DESCRIPTION:	Site 2TS-08 consists of a rock mound (Feature A) and a modified outcrop (Feature B) located just south of Site 2TS-07 and within the central portion of Project Area II (see Figure X and X). The two features are irregularly shaped and are constructed of pāhoehoe cobbles and boulders . The features are located on slightly undulating pāhoehoe and thin soil with thick stands of guava.

Feature A consists of an oval rock mound located corner of the site. The rock mound measures 4.0 m long (SE/NW) by 1.7 m wide and is 1.1 m tall. It is constructed of angular and subangular cobbles and small boulders stacked five to seven courses high (Figure X and X). The southwest perimeter of the rock mound is faced. Feature a has been slightly altered by weathering and is in good condition.

Feature B consists of an oblong modified outcrop located 10.0 meters southwest of Feature A. The modified outcrop measures 7.5 m long (E/W) by 2.5 m wide and is 1.0 m in maximum height (Figure X and X). Feature B is constructed of piled angular and subangular cobbles and small boulders. The feature is roughly stacked three courses high and is roughly faced along its south and southwest edges. Feature B has been slightly altered by weathering and is in good condition.

The rock mound and modified outcrop located at Site 2TS-08 are most likely the result of agricultural field clearing activities associated with sugarcane agricultre. The features have been slightly impacted by weathering, vegetation overgrowth and erosion and are in good condition. No further work is recommended at the site.

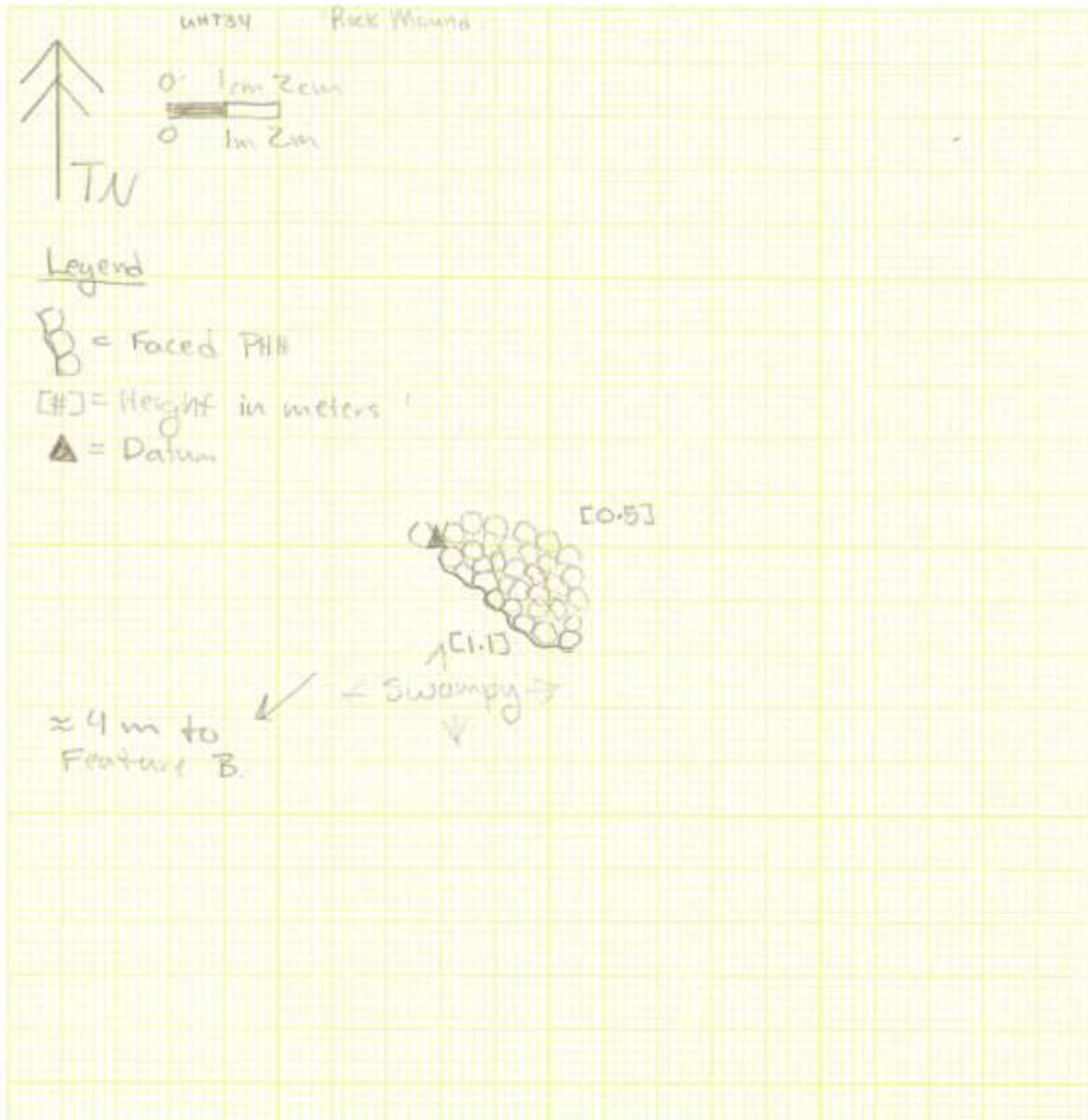


Figure 55: Site 2TS-08 Plan View Map.



Figure 56: Photograph of Site 2TS-08 Feature A Looking Northeast.

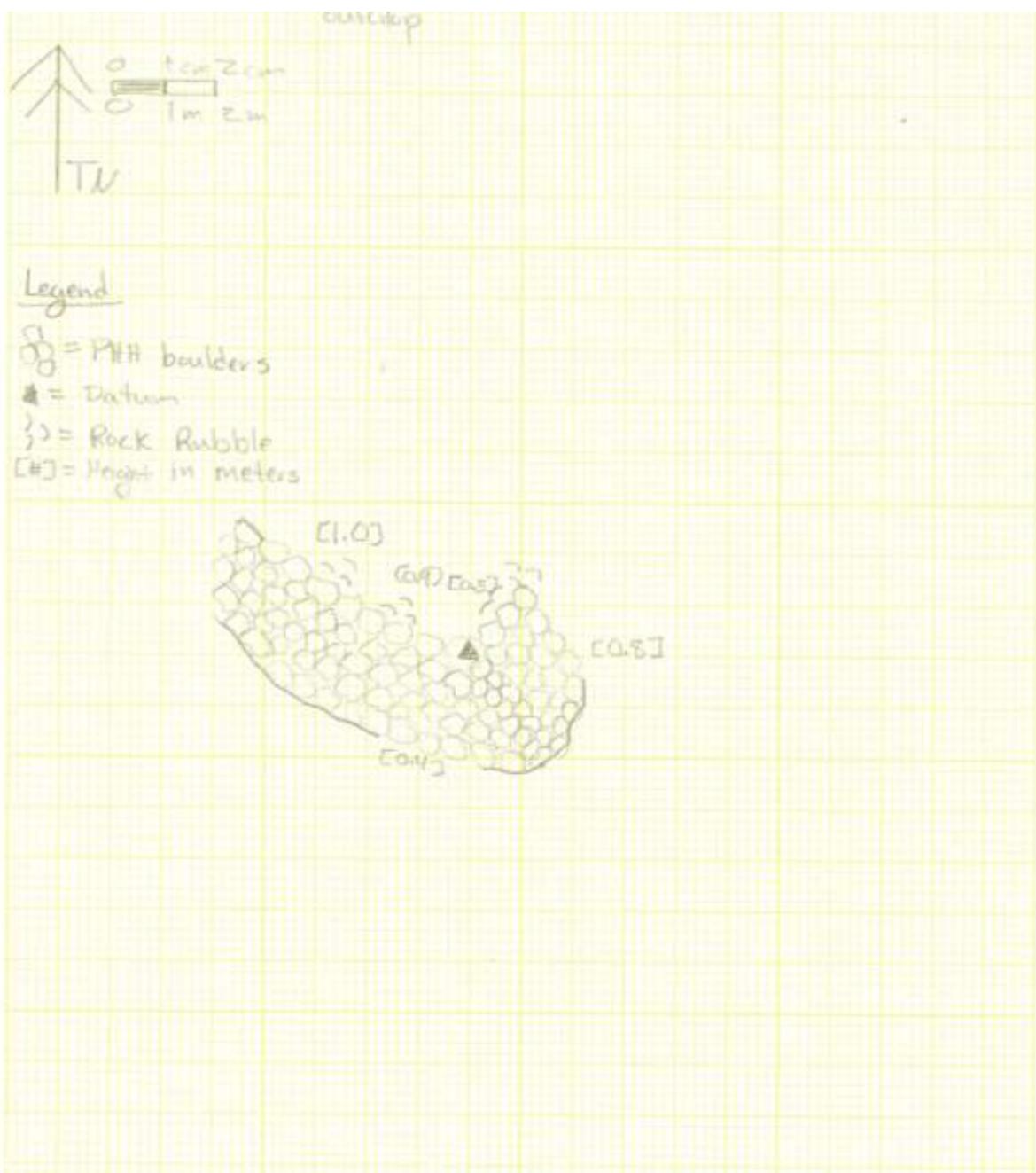


Figure 57: Site 2TS-08 Feature B Plan View Map.



Figure 58: Photograph of Site 2TS-08 Feature B Looking Southeast.

SITE 2TS-09**Rock Piles**

FUNCTION:	Agricultural
AGE:	Historic
DIMENSIONS:	Length: 10.0 m NW/SE; Width, 10.0 m; Height 0.6 m Max.
CONDITION:	Fair
INTEGRITY:	Altered by Erosion and Vegetation
SURFACE ARTIFACTS:	None
EXCAVATION:	None
DESCRIPTION:	Site 2TS-09 consists of two roughly circular rock mounds (Feature A and Feature B) located west of Site 2TS-08 and within the central portion of Project Area II (see Feature X). The rock mounds are constructed of angular and subangular pāhoehoe cobbles and small boulders loosely piled between two exposed bedrock outcrops (Figure XX).

Feature A consists of a rock mound located in the north portion of the site. Feature A is 2.4 m long (SW/NE) by 1.5 m wide and is 0.6 m in maximum height. The rock mound is on the southeast edge of a pāhoehoe outcrop. It is constructed of loosely piled cobbles and small boulders. There is no stacking or facing in the feature construction. Feature A has been slightly altered by weathering and is in fair condition.

Feature B is a roughly circular rock mound located 3.0 meters southeast of Feature A. Feature B is 2.4 m long (N/S) by 2.0 m wide and is 0.3 m in maximum height. Feature B is constructed of loosely piled angular and subangular pāhoehoe cobbles and small boulders. There is no stacking or facing in the feature construction. Feature B has been slightly altered by weathering and is in fair condition.

The rock mounds located at Site 2TS-09 are most likely the result of agricultural field clearing activities associated with sugarcane agriculture. The features have been slightly impacted by weathering, vegetation overgrowth and erosion and are in fair condition. No further work is recommended at the site.

SITE 2TS-10**Modified Outcrop**

FUNCTION:	Agricultural
AGE:	Historic
DIMENSIONS:	Length: 4.3 m E/W; Width, 2.9 m; Height, 0.8 m Max.
CONDITION:	Fair
INTEGRITY:	Altered by Erosion and Vegetation Overgrowth

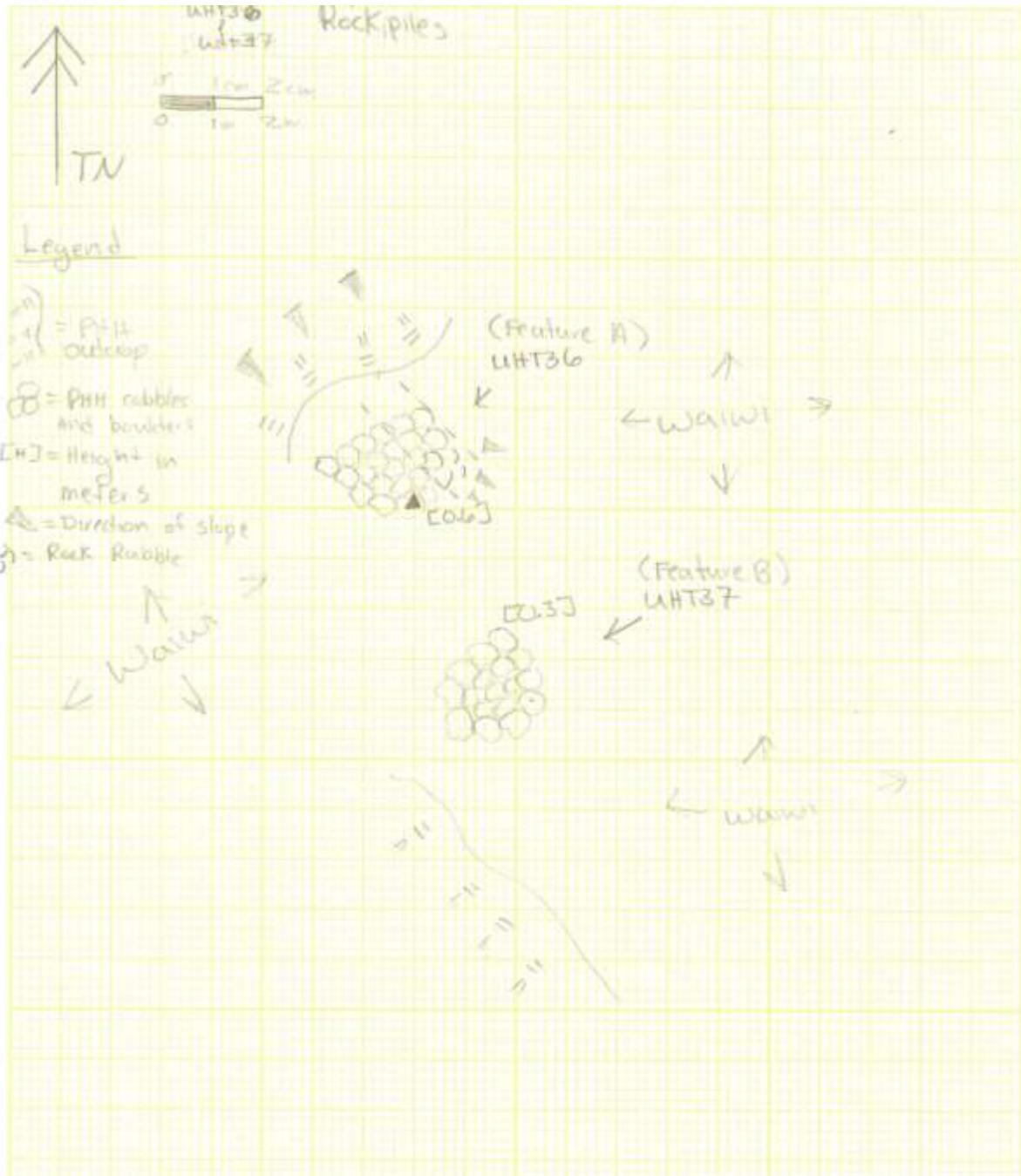


Figure 59: Site 2TS-09 Plan View Map.



Figure 60: Photograph of Site 2TS-09 Feature A Looking Northwest.



Figure 61: Photograph of site 2TS-09 Feature B Looking Southwest.

SURFACE ARTIFACTS: None
EXCAVATION: None
DESCRIPTION: Site 2TS-10 consists of an oval modified outcrop located within the northwestern portion of Project Area II (see Figure X). The modified outcrop is built on the eastern edge of a pāhoehoe outcrop surrounded by a guava thicket. The feature is constructed of piled angular and subangular cobbles and small boulders and slopes to the east. There is no facing or stacking evident in the feature construction. The modified outcrop located at Site 2TS-10 is most likely the result of agricultural field clearing activities associated with sugarcane agriculture. The feature has been slightly impacted by weathering, vegetation overgrowth and erosion and is in fair condition. No further work is recommended at the site.

SITE 2TS-11

Metal Fence Posts

FUNCTION: Boundary
AGE: Historic
DIMENSIONS: Length: m N/S; 0.1 m Width, m; Height, 1.4 m Max.
CONDITION: Poor
INTEGRITY: Altered by Weathering
SURFACE ARTIFACTS: None
EXCAVATION: None
DESCRIPTION: Site 2TS-11 consists of two metal fence posts (Feature A and Feature B) located within the northwest portion of Project Area II (see Figure X). Feature B is 33.0 meters northeast of Feature A. The fence posts are T-posts that are roughly 10 cm wide by 1.4 m in height. Rusted round wire dangles from holes at the top of each post. The posts are rusted and have been hammered into the pāhoehoe bedrock. Fragments of round wire are strewn between the fence posts. The fence posts most likely mark a boundary along the western portion of the Waiākea Cane Lots. The posts have been impacted by weathering and are in poor condition. No further work is recommended at the site.

SITE 2TS-12

Modified Outcrop/Rock Mound Complex

FUNCTION: Agricultural
AGE: Historic
DIMENSIONS: Length: 80.0 m NE/SW; Width, 34.0 m; Height 1.5 m Max.
CONDITION: Good
INTEGRITY: Altered by Weathering, Ungulate Activity and Vegetation
SURFACE ARTIFACTS: Aluminum pots and machine bottles.
EXCAVATION: None

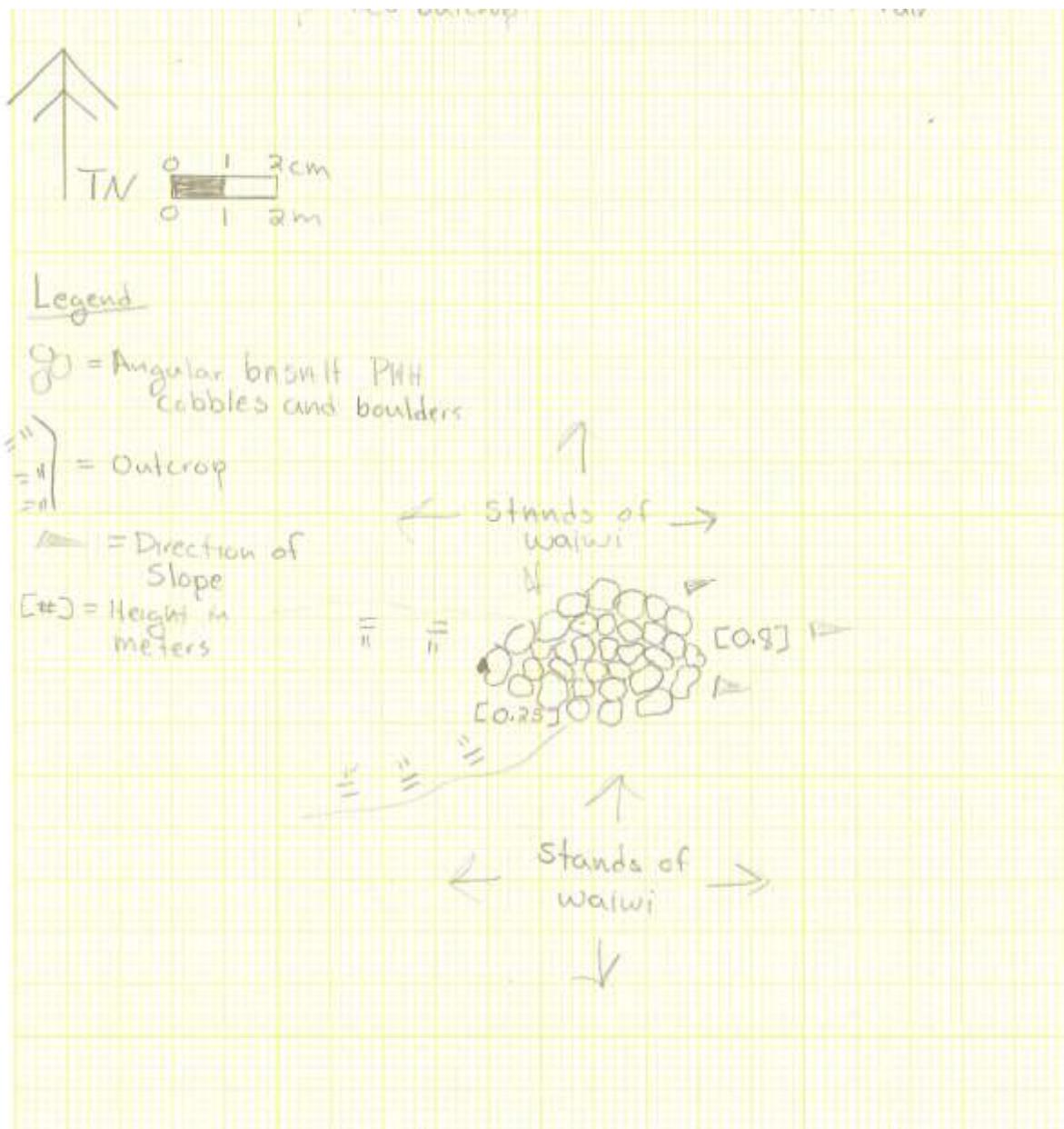


Figure 62: Site 2TS-10 Plan View Map.



Figure 63: Photograph of Site 2TS-10 Looking Northeast.



Figure 64: Photograph of Site 2TS-11 Feature A Fence Post.



Figure 65: Photograph of Site 2TS-11 Feature B Fence Post

DESCRIPTION: Site 2TS-12 is a large agricultural site comprising thirteen modified outcrops, three rock mounds, and one rock wall (Features A through Q) located in the northern tip of Project Area II (see Figure X). The features are situated amidst undulating pāhoehoe terrain and are built on the slopes of large bedrock outcrops.

Feature A is of circular modified outcrop located in the northeast corner of Site 2TS-12. The feature measures 2.2 m long (N/S) by 2.2 m wide and is 1.0 m tall. Feature A is constructed of angular and subangular cobbles and small boulders piled and stacked three to four courses high. The western edge of the feature is faced. Feature A has been slightly altered by weathering and is in fair condition.

Feature B consists of a modified outcrop located 3.0 meters northwest of Feature A. The feature is 9.4 m long (E/W) by 2.2 m wide and is 1.2 m in maximum height. There is a small, slightly detached rock mound at the southwest end of Feature B. The rock mound is 1.5 m long (N/S) by 1.0 m wide and 0.8 m in height. The eastern portion of the Feature B consists of a large rock mound that abuts a large outcrop. Feature B is constructed of small to medium pāhoehoe basalt cobbles and small boulders piled and stacked two to three courses high on the ground surface. Feature B is well faced along its south perimeter. Feature B has been slightly altered by weathering and is in good condition.

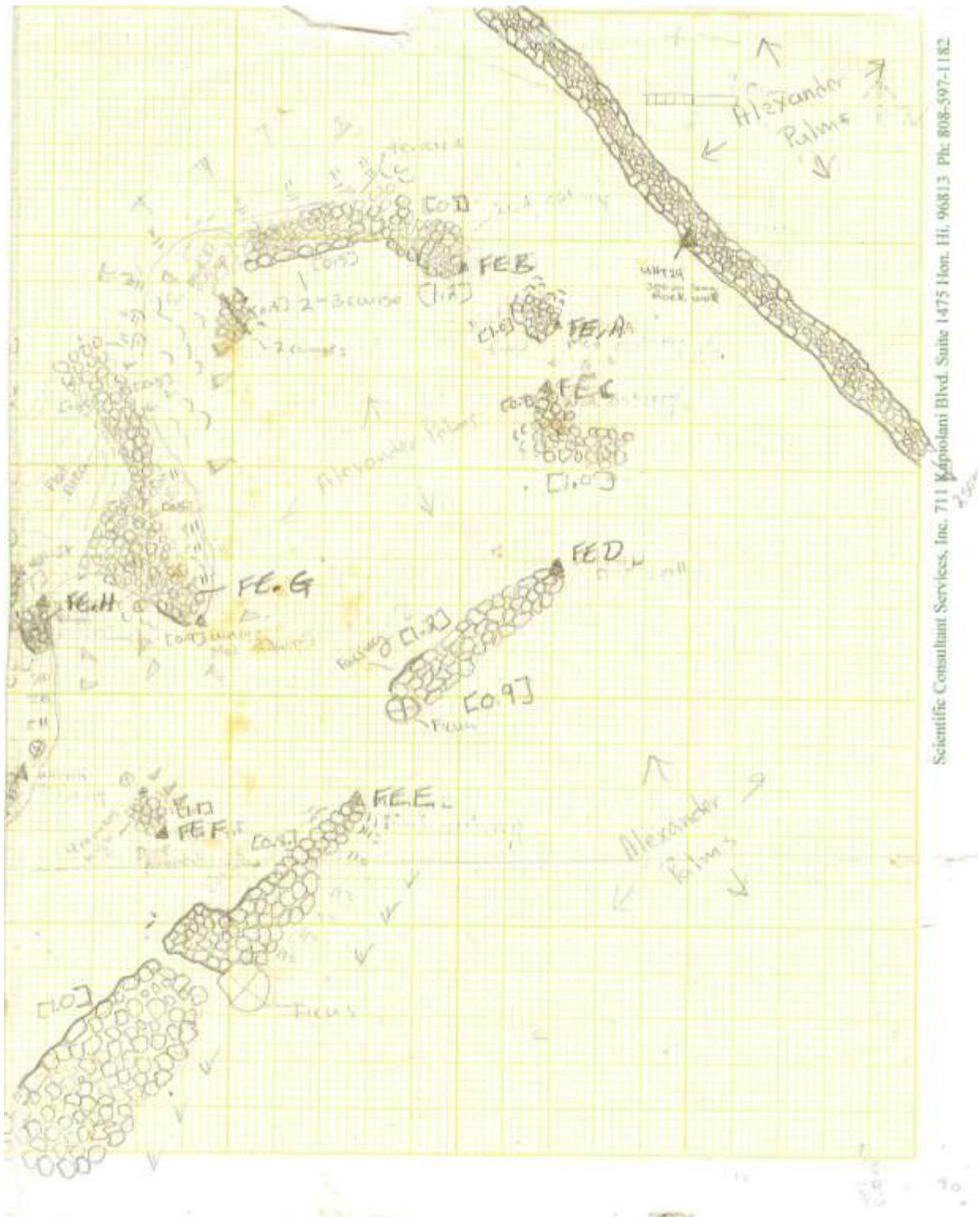
Feature C consists of an L-shape modified outcrop located 2.0 meters south of Feature A. Feature C is 4.4 m long (NW/SE) by 4.0 m wide and is 1.0 m tall (Figure X). Feature C is constructed of pāhoehoe cobbles and small boulders piled against the southwest perimeter of a pāhoehoe outcrop. No stacking or facing is evident in the feature construction. Feature C has been slightly altered by weathering and is in good condition.

Feature D consists of a linear rock wall located 4.0 meters south of Feature C. The wall is 10.0 m long (NE/SW) by 2.0 m wide and is 1.2 m in height (Figure X). The rock wall is oriented northeast to southwest and is constructed of pāhoehoe cobbles and small boulders. The northwest perimeter of the wall is faced and is four to six courses high. Feature D has been slightly altered by weathering and is in good condition.

Feature E consists of a linear modified outcrop located 4.0 meters southwest of Feature D. Feature E is 20.0 m long (NE/SW) by 4.6 m wide and is 1.5 m tall (Figure X). Feature E has two segments: one to the northeast and one to the southwest. The northeast section is L-shaped and is faced along its south and northwest edges.



Figure 66: Site 2TS-12 Plan View of West Half of Site.



Scientific Consultant Services, Inc. 711 Kapiolani Blvd. Suite 1475 Hon. HI. 96813 Ph: 808-597-1182

Figure 67: Site 2TS-12 Plan View of East Half of Site.



Figure 68: Photograph of Site 2TS-12 Feature A Looking East.



Figure 69: Photograph of Site 2TS-12 Feature B Looking Northwest.



Figure 70: Photograph of Site 2TS-12 Feature C Looking East.

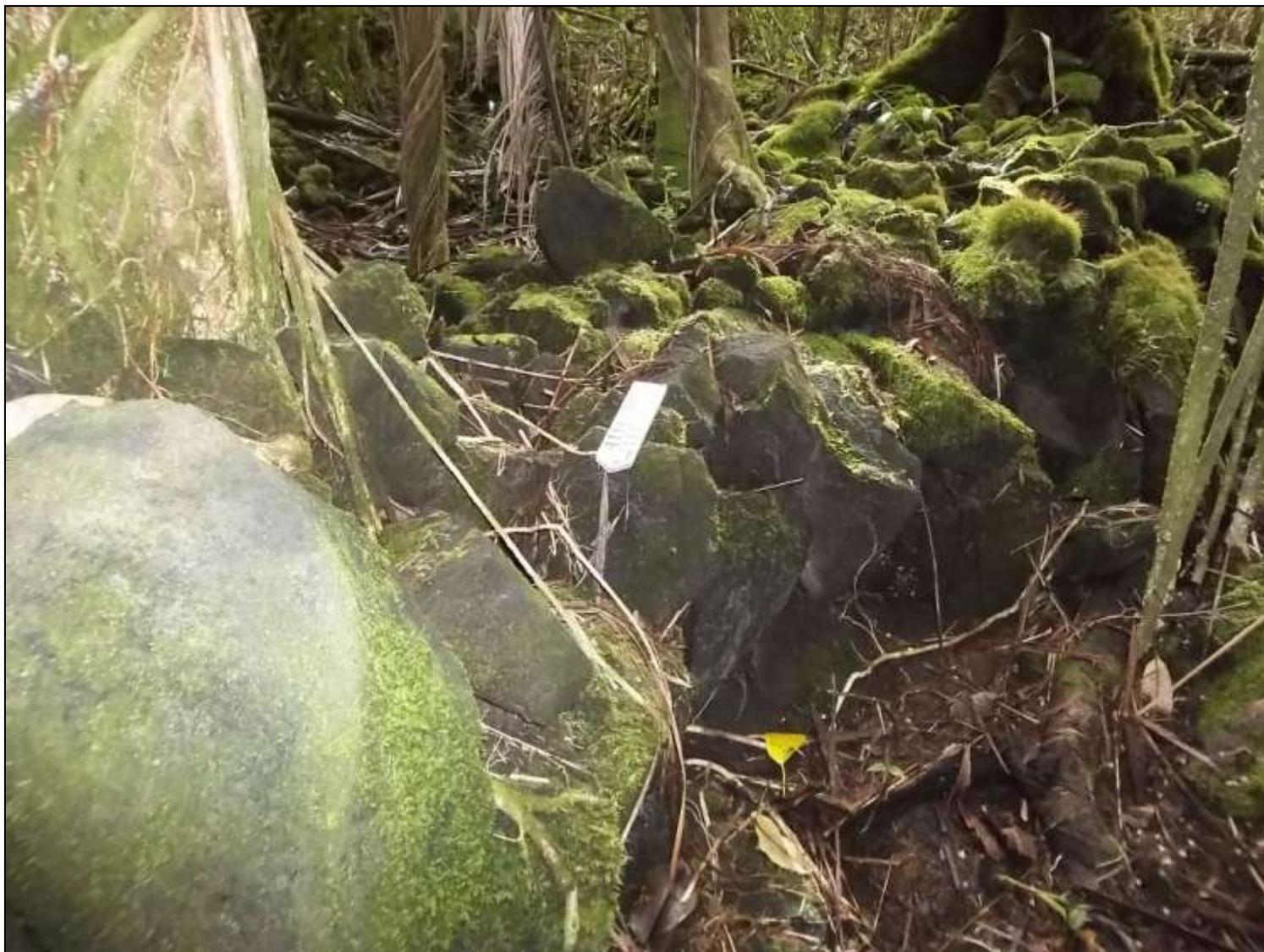


Figure 71: Photograph of Site 2TS-12 Feature D Looking South.



Figure 72: Photograph of Site 2TS-12 Feature E Looking Southeast.

The faced portion of the wall is neatly stacked four courses high and abuts the west edge of a pāhoehoe outcrop. The southwestern section of Feature E is linear in shape with facing and four course high stacking present along its western edge. Both segments of Feature E lack core—are constructed of pāhoehoe cobbles and small boulders. Feature E has been slightly altered by weathering and is in fair condition.

Feature F consists of a circular rock mound located between Feature E and Feature K. The rock mound is 2.1 m long (NW/SE) by 1.4 m wide and is 1.1 m tall (Figure X). The rock mound is constructed of angular and subangular cobbles and small boulders piled and stacked four courses high on the ground surface. There is no facing evident in the feature construction. Feature F has been slightly altered by weathering, is partially collapsed, and is in fair condition.

Feature G consists of an irregularly shaped modified outcrop located 2.0 meters northeast of Feature H. Feature G measures 13.2 m long (SW/NE) by 5.0 m wide and is 0.9 m tall (Figure X). The feature is built on a pāhoehoe outcrop and runs along the north, west and south edges of the outcrop. Feature G is constructed of angular pāhoehoe cobbles and small boulders piled and stacked on the ground surface. The southern tip of Feature G is stacked and roughly faced. Feature G has been slightly altered by weathering, is partially collapsed, and is in fair condition.

Feature H consists of an oblong modified outcrop located 1.0 meter southeast of Feature I. The feature is 2.1 m long (N/S) by 1.2 m wide and is 0.7 m tall (Figure X). The feature is situated along the edge of a north/south oriented pāhoehoe outcrop. Feature H is constructed of pāhoehoe cobbles and small boulders piled on the ground surface. No stacking or facing is evident in the feature construction. Feature H has been slightly altered by weathering and is in fair condition.

Feature I consists of an oval modified outcrop located 1.0 meter west of Feature H. Feature I is 5.0 m long (NE/SW) by 2.2 m wide and is 0.9 in height (Figure X). The modified outcrop is constructed of angular and subangular cobbles and small boulders piled two to four courses high on the ground surface. No stacking or facing is evident in the feature construction. Feature I has been slightly altered by weathering and is in fair condition.

Feature J consists of a circular rock pile located 0.7 m south of Feature I. It is 1.1 m long (N/S) by 1.0 m wide and is 0.5 m tall (Figure X). Feature J is constructed of loosely piled angular and subangular pāhoehoe cobbles and small boulders. No stacking or facing is evident in the feature construction. Feature J has been slightly altered by weathering and is in fair condition.



Figure 73: Photograph of Site 2TS-12 Feature F Looking West.



Figure 74: Photograph of Site 2TS-12 Feature G Looking Northwest.



Figure 75: Photograph of Site 2TS-12 Feature H Looking South.



Figure 76: Photograph of Site 2TS-12 Feature I Looking Southwest.



Figure 77: Photograph of Site 2TS-12 Feature J Looking Southwest.

Feature K consists of a linear modified outcrop located 4.0 meters south of Feature H. Feature K is 4.9 m long (NE/SW) by 2.0 m wide and is 0.8 m in height (Figure X). Feature K is situated along the eastern edge of a pāhoehoe outcrop and is constructed of angular and subangular pāhoehoe cobbles and small boulders piled on the ground surface. No stacking or facing is evident in the feature construction. Feature K has been altered by weathering and is in fair condition..

Feature L consists of a circular rock mound located 4.0 meters southwest of Feature K. The rock mound is 3.0 m long (N/S) by 2.0 m wide and is 1.0 m in maximum height (Figure X). The feature is constructed of angular and subangular cobbles and small boulders stacked four to six courses high on the ground surface. Feature L has been altered by weathering, is partially collapsed, and is in fair condition.

Feature M consists of a linear modified outcrop located 4.0 meters northwest of Feature I. Feature M is 7.0 m long (NE/SW) by 1.3 m wide and is 0.9 m in maximum height (Figure X). The north section of Feature M is constructed of angular and subangular cobbles and small boulders loosely piled into a mound, while the south section of the feature is neatly stacked two to three courses high. Both sides of the southern end of the feature are roughly faced. Feature M has been altered by weathering, is partially collapsed, and is in fair condition.

Feature N consists of a modified outcrop located 2.0 meters southwest of Feature M. Feature N is 5.4 m long (NE/SW) by 3.0 m wide and is 1.2 m tall (Figure X). Feature N is irregular in shape and constructed by piling angular pāhoehoe cobbles and small boulders on the southwest edge of a pāhoehoe outcrop. There is no stacking or facing evident in the feature construction. Feature N has been slightly altered by weathering and is in fair condition.

Feature O consists of a linear modified outcrop located 3.0 meters north of Feature N. feature O is 5.0 m long (NE/SW) by 1.0 m wide and is 1.4 m in maximum height (Figure X). The feature is constructed of piled angular and subangular pāhoehoe cobbles and small boulders piled onto a pāhoehoe outcrop. There is no stacking or facing evident in the feature construction. Feature N has been slightly altered by weathering and is in fair condition.

Feature P consists of an irregularly-shaped modified outcrop located 4.0 meters west of Feature O. Feature P is 5.0 m long (NW/SE) by 4.0 m wide and is 0.7 m in maximum height (Figure X).



Figure 78: Photograph of Site 2TS-12 Feature K Looking East.



Figure 79: Photograph of Site 2TS-12 Feature L Looking Southwest.



Figure 80: Photograph of Site 2TS-12 Feature M Looking West.



Figure 81: Photograph of Site 2TS-12 Feature N Looking South.



Figure 82: Photograph of Site 2TS-12 Feature O Looking Northwest.



Figure 83: Photograph of Site 2TS-12 Feature P Looking North.

The modified outcrop is constructed of piled and stacked angular and subangular cobbles and small boulders. The central portion of Feature P is one course high (1.0 long running E/W). The west and east edges consist of large modified outcrop mounds with facing along the west edge of the west modified outcrop mound. Feature P is located on what appears to be flat, bulldozed terrain that is currently heavily vegetated. Feature P Has been slightly altered by weathering and is in fair condition.

Feature Q consists of a linear modified outcrop located 5.0 meters southwest of Feature P. The feature is 32.0 m long (E/W) by 4.0 m wide and is 1.5 m in maximum height (Figure X). Feature Q is constructed of angular, medium to large pāhoehoe cobbles and small boulders piled and stacked along an east/west running outcrop. Thick stands of vegetation grow atop this feature.

The modified outcrops and rock mounds located at Site 2TS-12, are most likely the result of agricultural field clearing activities associated with sugarcane agriculture. The features are similar in size, construction, and overall orientation to other sugarcane features documented in nearby archaeological studies. The features have been impacted by weathering, vegetation overgrowth and erosion and are in fair to good condition. No further work is recommended at the site.

SITE 2TS-13

Platform and Modified Outcrops

FUNCTION:	Agricultural
AGE:	Historic
DIMENSIONS:	Length: 27.0 m N/S; Width, 18.5.0 m; Height, 1.5 m Max.
CONDITION:	Good
INTEGRITY:	Altered by Weathering, Vegetation and Erosion.
SURFACE ARTIFACTS:	None
EXCAVATION:	None
DESCRIPTION:	Site 2TS-13 consists of two modified outcrops and three rock mounds (Features A through E), located approximately 50.0 meters southwest of the north /northeast boundary of Project Area II (see Figure X and X). The features are constructed of angular and subangular pāhoehoe cobbles and small boulders piled and neatly stacked to create faced features standing four courses high. The site is situated on relatively flat terrain that might be the result of bulldozing activities. Site 2TS-13 is thickly vegetated with guava, banyans, Alexander palms and <i>hala</i> .



Figure 84: Photograph of Site 2TS-12 Feature Q Looking Northwest.

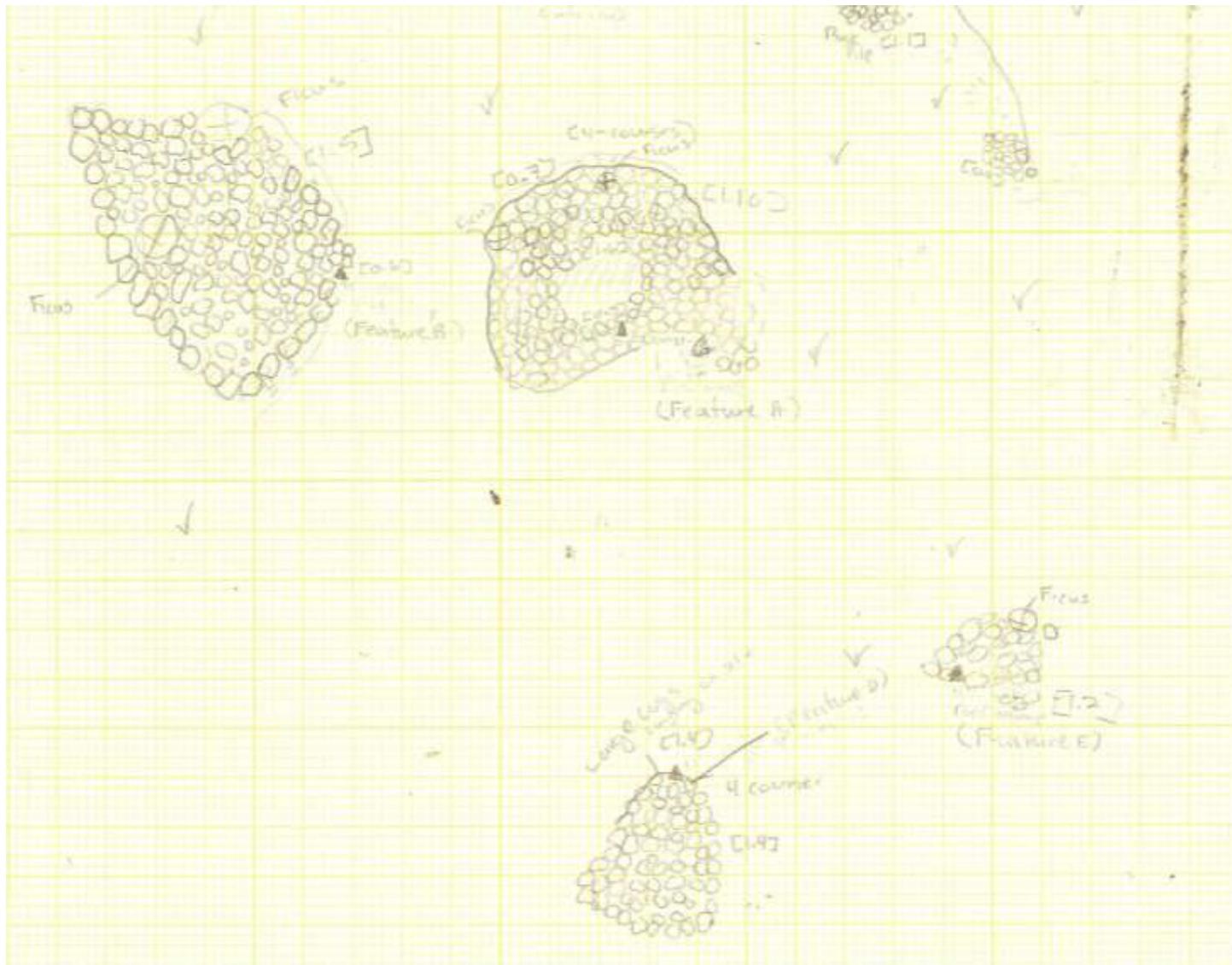


Figure 86: Site 2TS-13 Plan View, South Half of Site.

Feature A consists of a square rock mound centrally located within Site2TS-13. The rock mound measures 4.7 m long (E/W) by 4.1 m wide and is 1.1 m in maximum height (Figure X and X). Feature a is constructed of angular and subangular pāhoehoe cobbles and small boulders stacked four to six courses high. Feature A is mostly faced along its north, east and west perimeter walls. The top surface of the rock mound is relatively flat but contains a 2.0 m, east-west running depression situated at its center. Rock rubble is present along the southeast corner of feature. This feature is impacted by vegetation consisting of two large banyans growing along its northern edges. Feature a has been altered by weathering and vegetation and is in fair condition.

Feature B consists of a modified outcrop located 3.2 meters west of Feature A. Feature B is 6.7 m long (NW/SE) by 4.5 m wide and is 1.5 m tall (Figure X). the modified outcrop is oblong in shape, lacks facing and is constructed of medium to large angular pāhoehoe cobbles and boulders piled on the ground surface. Two large ficus trees are growing on both the west and north edges of this feature. No stacking or facing is evident in the feature construction. Feature B has been slightly altered by weathering and is in fair condition.

Feature C consists of a modified outcrop located 5.0 meters north of Feature A. Feature C is 8.5 m long (E/W) by 2.1 m wide and is 0.6 m tall (Figure X). The feature is roughly L-shaped and runs east to west. The modified outcrop is situated along the north and southeast edges of a pāhoehoe outcrop. The west edge of the feature utilizes small cobbles (5-15 cm in diameter) giving this portion of Feature C a paved look. The north perimeter runs east to west and consists of a one to three course high wall. Two small rock mounds built atop the pāhoehoe outcrop are located just southeast of the main portion of the northwest-southeast running L-shape. The rock mounds are approximately 1.5 m long by 1.0 m wide with heights ranging between 0.4 m and 1.1m. Feature C has been slightly altered by weathering and is in fair condition.

Feature D consists of a roughly oval rock mound located 5.5 m southwest of Feature E. Feature D is 3.4 m long (N/S) by 2.5 m wide and is 1.4 m tall (Figure X). The rock mound is constructed of cobbles and small boulders piled and stacked up to four courses high. The rock mound is faced on its north and northwest edges. Feature D has been slightly altered by weathering and is in fair condition.



Figure 87: Photograph of Site 2TS-13 Feature A Looking Southeast.



Figure 88: Photograph of Site 2TS-13 Feature B Looking Southwest.



Figure 89: : Photograph of Site 2TS-13 Feature C Looking East.



Figure 90: Photograph of Site 2TS-13 Feature D Looking Southwest.

Feature E consists of a circular rock mound located 7.0 meters southeast of Feature A. Feature E is 2.4 m long (NE/SW) by 1.8 m wide and is 1.2 m tall (Figure X). Feature E is constructed of loosely piled cobbles and small boulders. there is no stacking or facing evident on the feature construction. There is a large ficus growing in the north end of the rock mound. Feature E has been slightly altered by weathering and vegetation and is in fair condition.

The features located at Site 2TS-13 are most likely the result of agricultural field clearing activities associated with sugarcane agriculture. The features have been slightly impacted by weathering, vegetation overgrowth and erosion and are in fair to good condition. No further work is recommended at the site.

SITE 2TS-14	Agricultural Complex
FUNCTION:	Agricultural
AGE:	Historic
DIMENSIONS:	Length: 40.0 m NE/SW; Width,40.0 m; Height, 1.6 m Max.
CONDITION:	Good
INTEGRITY:	Altered by Weathering, Vegetation and Ungulate Activity
SURFACE ARTIFACTS:	Aluminum pots and glass machine bottles
EXCAVATION:	None
DESCRIPTION:	Site 2TS-14 consists of a collection of agricultural features located along the northwest edge of Project Area II. Features present at this site consist of a linear rock wall (Feature A), a modified outcrop (Feature B), a paved area (Feature C) a rock mound (Feature D) and a water diversion feature (Feature E). Site is located approximately 20 meters southwest of Site 2TS-13 (see Figure X and X). All features utilize pāhoehoe cobbles and boulders ranging from 10 to 70 cm in diameter. Construction material is angular and irregular in shape. Eighty-five percent of site features are faced and stacked several courses high. Artifacts observed at this site consist of aluminum pots and several machine made glass bottles. Site lines up with Sites 2TS-13 and 2TS-12, which are located northeast and east of this site. Site is impacted by gravity, vegetation overgrowth and ungulate activity.

Feature A consists of a linear, east-west running rock wall located 8.0 meters south of Feature C and is 8.2 m long (E/W) by 2.1 m wide and is 0.7 m tall (see Figure X and X). Feature lacks facing and resembles a highly linear, 2-4 course high rock mound. A large lauhala tree grows from the eastern tip of this feature.



Figure 91: Photograph of Site 2TS-13 Feature E Looking East.

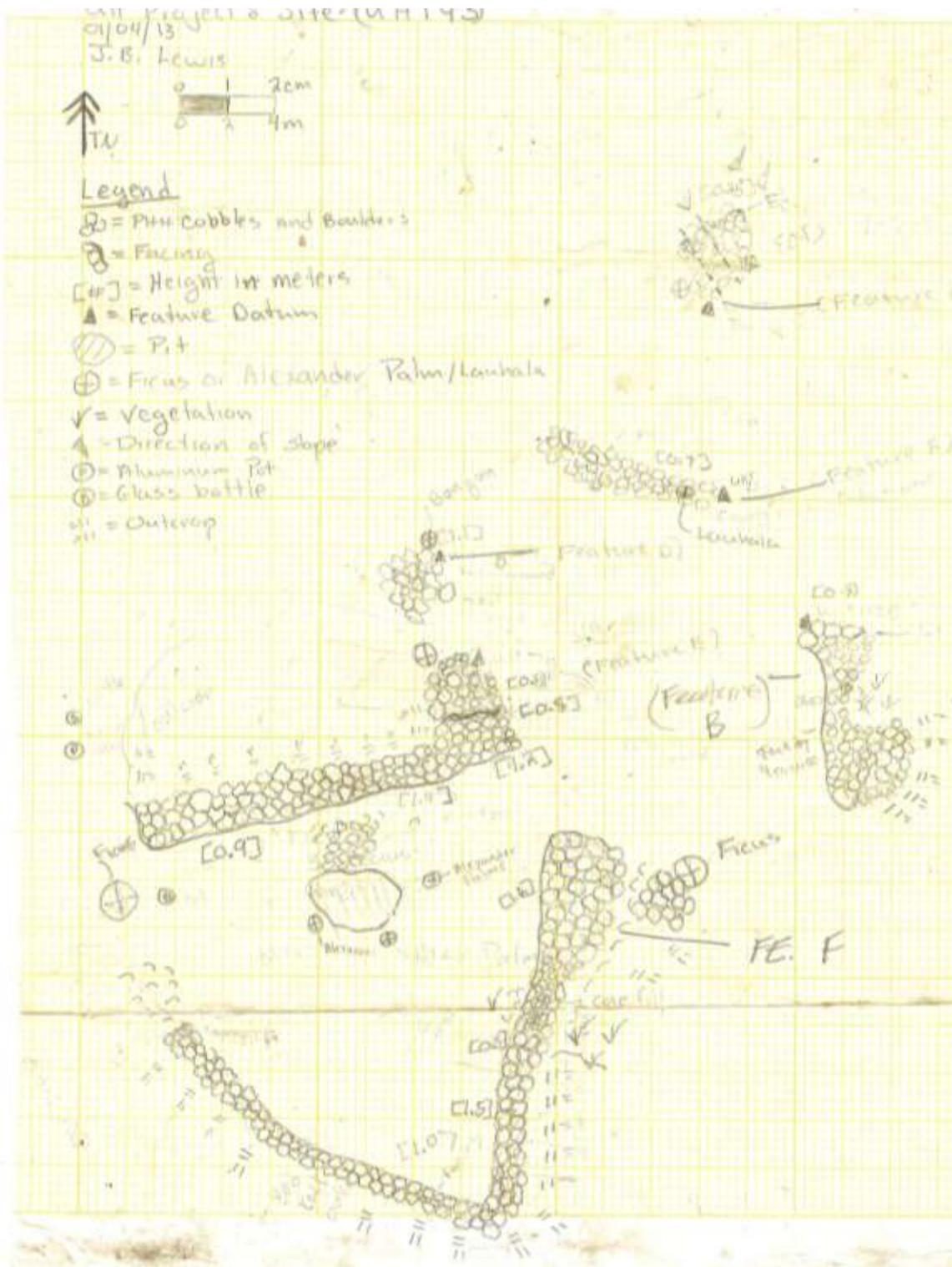


Figure 92: Site 2TS-14 plan View Map.



Figure 93: Photograph of Site 2TS-14 Feature A Looking Northeast.

Feature B consists of a modified outcrop located 6.0 meters southeast of Feature A and is 8.0 m long (N/S) by 2.3 m wide and is 0.7 m tall (Figure X). Feature B runs north to south and is faced along its western edge. Feature is irregularly shaped, utilizes dry-stack technology and stands 3-5 courses high. A large ficus tree grows from the south end of the feature.

Feature C consists of a pavement located 6.0 meters north of Feature A and measures 4.3 m long (N/S) by 3.1 m wide and is 0.2 tall (Figure X). Pavement is constructed of 10 to 20 cm in diameter pāhoehoe cobbles strewn across a soil covered outcrop. Pavement is not flat or placed in an interlocking manner. Feature is oblong in shape and runs north to south. Feature C is stacked one course high along its northern tip and is in poor condition.

Feature D consists of oblong rock mound located 2.0 meters north of Feature E and is 3.1 m long (N/S) by 2.9 wide and is 1.1 m tall (Figure X). Rock mound is located on flat, mucky terrain and lacks facing or stacking. Boulders used to construct this rock mound consist of large (50 cm in diameter) boulders piled atop each other. A large banyan grows out of north end of Feature D.

Feature E consists of a large retaining water feature located 1.0 m south of Feature D. Feature E is irregularly shaped and consists of three perimeter wall with the following measurements:

- North perimeter wall: 18.0 m long (NE/SW) by 2.0 m wide and is 1.2 m tall.
- East perimeter wall: 16.2 m long (N/S) by 2.0-3.0 m wide and is 1.5 m tall.
- South perimeter wall: 14.3 m long (NW/SW) by 2.5 m wide and is 1.0 m tall.

The perimeter walls are dry-stacked 3-5 courses high. A large pit is located 3.0 meters southeast of the north perimeter wall and measures 3.0 m (E/W) by 3.2 m wide and is 0.8 m deep. Pit lacks rocky substrate and is soil and mud filled. Three aluminum pots and a glass bottle are located west of the north perimeter wall.

The features located at Site 2TS-14 most likely resulted from agricultural activities associated with the Waiākea sugar industry. The features have been impacted by weathering, vegetation overgrowth and erosion and are in poor to good condition. No further work is recommended at the site.



Figure 94: Photograph of Site 2TS-14 Feature B Looking East.



Figure 95: Photograph of Site 2TS-14 Feature C Looking South.



Figure 96: Photograph of Site 2TS-14 Feature D Looking Southwest.



Figure 97: Photograph of Site 2TS-14 Feature E Looking Southeast.



Figure 98: Photograph of Site 2TS-14 Feature F Looking Northeast.

SITE 2TS-15**Platform and Modified Outcrop**

FUNCTION:	Agricultural
AGE:	Historic
DIMENSIONS:	Length: 15.0 m N/S; Width, 8.0 m; Height, 1.3 m Max.
CONDITION:	Good
INTEGRITY:	Altered by Weathering, Vegetation and Ungulate Activity
SURFACE ARTIFACTS:	None
EXCAVATION:	None
DESCRIPTION:	Site 2TS-15 consists of a roughly rectangular, core-filled platform (Feature A) and a linear modified outcrop (Feature B), located 15.0 meters south of north boundary of Project Area II (see Figure X and X). Features are core-filled with small to medium angular and sub-angular pebbles and boulders as well as being nicely stacked and faced. Features are situated on bulldozed flat terrain and are vegetated with banyan trees and false maile. Features are most likely the result of agricultural activities associated with the Waiākea sugar industry. Feature function has yet been determined due to the disparate construction style between this feature as the rest of the features and sites located within Project Area II.

Feature A consists of a core-filled rock platform located 15.0 meters south of the northern perimeter of Project Area II and is 4.5 m long (N/S) by 4.0 m wide and is 1.3 m tall (Figure X). This core-filled feature utilizes small angular and sub-angular pebbles and cobbles within its interior while the exterior is dry-stacked 5 courses high with medium to large pāhoehoe cobbles and boulders.

Feature B consists of linear modified outcrop located 4.0 meters west of Feature A and is 5.6 m long (NE/SW) by 2.4 m wide and is 0.8 tall (Figure X). Feature B is neatly faced along south and east perimeters and is stacked 4 courses high. Interior of feature is core filled with 5-15 cm in diameter angular and sub-angular pebbles and boulders. Exterior facing is constructed of dry-stacked pāhoehoe boulders measuring 20-50 cm in diameter.

The features located at Site 2TS-15 most likely resulted from agricultural activities associated with the Waiākea sugar industry. The features have been impacted by weathering, vegetation overgrowth and erosion and are in good condition. No further work is recommended at the site.



Figure 100: Photograph of Site 2TS-15 Feature A Looking North.



Figure 101: Photograph of Site 2TS-15 Feature B Looking North.

SITE 2TS-16**Pit with Partial Fill**

FUNCTION: Agricultural
AGE: Historic
DIMENSIONS: Length: 7.0 m E/W; Width, 5.0 m; Height, 0.4 m Max.
CONDITION: Fair
INTEGRITY: Altered by Weathering, Vegetation and Ungulate Activity
SURFACE ARTIFACTS: None
EXCAVATION: None
DESCRIPTION: Site 2TS-16 consists of a roughly circular rock pit with partial fill located 7.0 meters southeast of 2TS-06, and is centrally located within Project Area II (see Figure X and X). Feature measures 7.0 m long (E/W) by 5.0 wide and is 0.4 tall (Figure X) with a 2.5 x 1.8 m x 0.5 m in depth pit located within its northern perimeter. Site has large tree lying across it and slopes slightly to the southeast. Faced edges as well as core-fill are not apparent within this site.

Site 2TS-16 most likely resulted from agricultural activities associated with the Waiākea sugar industry. The features have been impacted by weathering, vegetation overgrowth and erosion and are in good condition. No further work is recommended at the site.

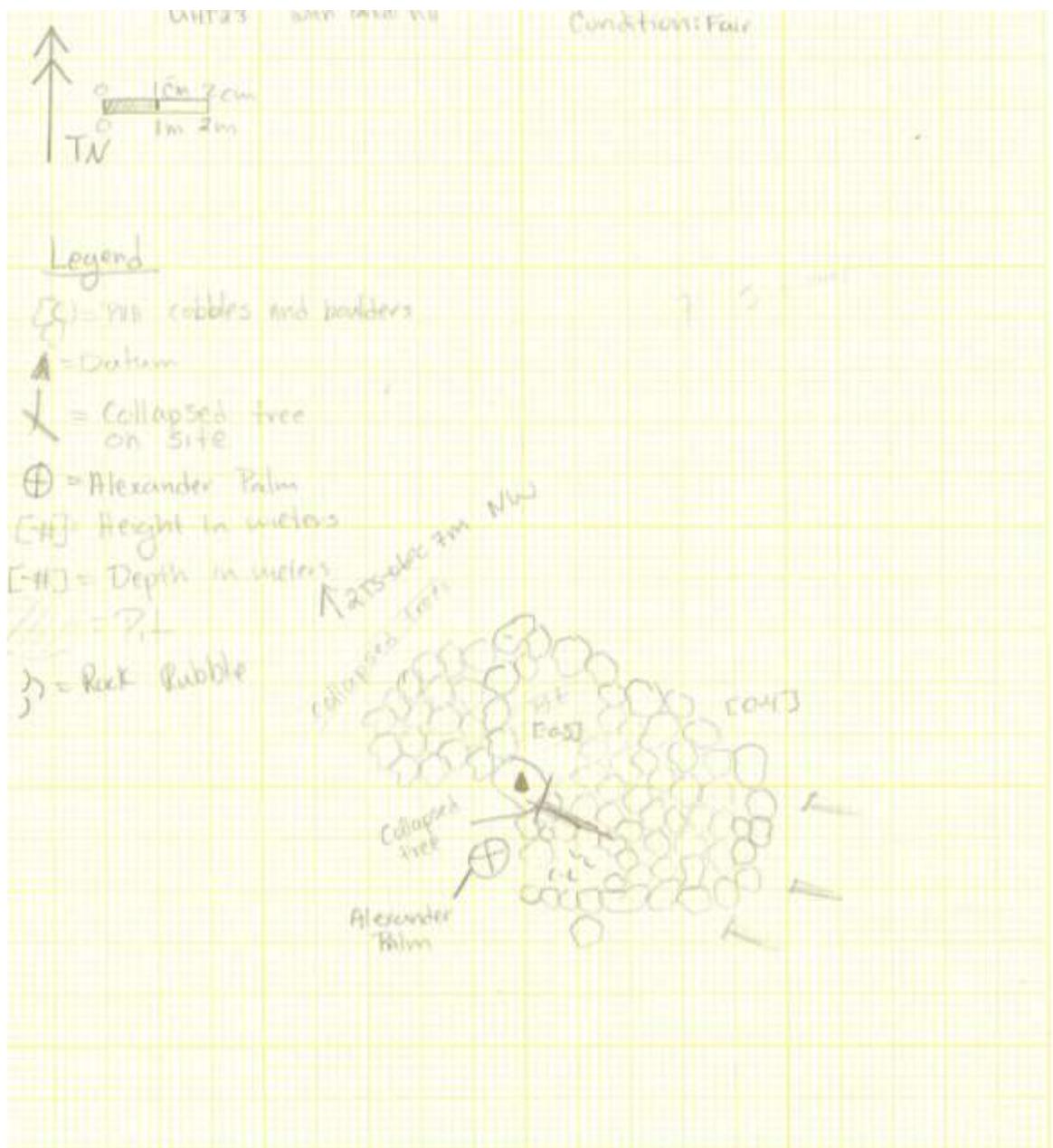


Figure 102: Site 2TS-16 Plan View Map.



Figure 103: Photograph of Site 2TS-16 Looking Northwest.

SIGNIFICANCE ASSESSMENTS AND RECOMMENDED TREATMENTS

Numerous archaeological investigations have occurred in the immediate vicinity (Pu`ainako Street Expansion Project) and in the east central portion of the present project area (U.S.D.A Pacific Basin Research Center). Appendix A summarizes site assessments and recommendation for 18 sites recorded during these investigations.

Sites identified during this project were assessed in accordance with Rules Governing Procedures for Historic Preservation Review for Governmental Projects Covered Under Sections 6E-7 and 6E-8 contained in draft Hawai`i Administrative Rules 13§13-275 (Table 4). To be assessed as significant a site must possess integrity of location, design, setting, materials, workmanship, feeling, and association and must be characterized by one or more of the following five criteria:

- (A) It must be associated with events that have made an important contribution to the broad patterns of history.
- (B) It must be associated with the lives of persons important in the past.
- (C) It must embody distinctive characteristics of a type, period, or method of construction, or represent the work of a master, or possess high artistic value.
- (D) It must yield or may be likely to yield, information important in prehistory or history.
- (E) It must 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.

Table 4: Significance Assessment And recommendations..

Site	Site Description	Significance Criteria	Recommended Mitigation
1TS-01	Modified Outcrops	D	No Further Work
1TS-02	Modified Outcrop	D	No Further Work
1TS-03	Linear Rock Wall	D	No Further Work
2TS-01	Rock Mounds	D	No Further Work
2TS-02	Modified Outcrop	D	No Further Work

Site	Site Description	Significance Criteria	Recommended Mitigation
2TS-03	Rock Mound and Large Berm	D	No Further Work
2TS-04	Rock Mounds	D	No Further Work
2TS-05	Concrete Complex (Dairy)	D	No Further Work
2TS-06	Rock Wall	D	No Further Work
2TS-07	Mounds and Modified Outcrops	D	No Further Work
2TS-08	Rock Mounds and Modified Outcrops	D	No Further Work
2TS-09	Rock Piles	D	No Further Work
2TS-10	Modified Outcrop	D	No Further Work
2TS-11	Fence Posts	D	No Further Work
2TS12	Modified Outcrops, Terrace, Rock Walls and Mounds	D	No Further Work
2TS-13	Platform and Modified Outcrops	D	No Further Work
2TS-14	Linear Walls, Modified Outcrop, Paving and Water Retaining Feature	D	No Further Work
2TS-15	Platform and Modified Outcrop	D	No Further Work
2TS-16	Pit Feature w/Partial Fill	D	No Further Work

RECOMMENDED TREATMENTS

No further work is recommended at all of the sites documented in this AIS report. Significant data contained in these sites have been collected in the form of measurements, photographs, descriptions, figures, oral interview, and historical research. The appropriate research has been conducted at all project area sites, and further study will not contribute any new information. The project area archaeological sites are associated with historic agriculture and pasture activities. Test excavations at numerous historic agricultural sites in the immediate vicinity have underscored the low excavation potential of these types of features (Borthwick, *et al.* 1993; Hunt and McDermott 1994; Robins and Spear 1996; Eblé, *et al.* 1997; Dega 2000; and McDermott and Hammatt 2001). No prehistoric components were found within tested historic agricultural features. The historic sugar cane fields are well documented on historical maps and in historical documents. Soil depths at these sites are very shallow, features are built on bedrock outcrops, and the dismantling of features during past testing has contributed no new archaeological data to improve our understanding of them.

REFERENCES CITED

- Bingham, M.
1969 *A Residence of Twenty-one Years in the Sandwich Islands*. Hartford.
- Bird, I.
1974 *Six months in the Sandwich Islands*. Charles E. Tuttle Co., Rutland.
- Borthwick, D., J. Collins, W.H. Folk, and H.H. Hammatt
1993 *Archaeological Survey and Testing of Lands Proposed for Research and Technology Lots at the University of Hawaii at Hilo (TMK:2-4-01:7 and41)*. On file at State Historic Preservation Division, Kapolei, Hawaii.
- Borthwick, D., and H.H. Hammatt
1993 *Supplemental Archaeological Survey and Testing of the Proposed of Hawaii at Hi/o Expansion Area (TMK:2-4-01:19)*. On file at State Historic Preservation Division, Kapolei, Hawai`i.
- Bush, A.R., M. McDermott, and H.H. Hammatt
2000 *Archaeological Inventory Survey of an Approximately 20-Acre Parcel Proposed for the USDA Pacific Basin Agricultural Research Center Located near the intersection of Komohana and Puainako Streets, South Hilo, Hawai`i Island (TMK 2-4-01: por122), Prepared for SSFM International Inc.* On file at State Historic Preservation Division, Kapolei, Hawai`i.
- Dega, M.F., and LB. Benson
1999 *Letter Report concerning Archaeological Reconnaissance Survey of the Puainako Street Realignment/Extension Project Expanded Corridor, Waiākea, Kukuau 1 and 2 and Ponahawai, South Hilo District, Island of Hawai`i*. Scientific Consultant Services Inc., Honolulu, Hawai`i.
- Dega, M.
2000 *Addendum To: Archaeological Inventory Survey of the Pu`ainako Street Realignment/Extension Project, Expanded Corridor, Waiākea, Kukuau 1 and 2, South Hilo District, Hilo, Island of Hawai`i*. On file at State Historic Preservation Division, Kapolei, Hawaii.
- Dega, M., and R.L. Spear
2001 *A Preservation Plan for the Pu`ainako Street Extension and Widening Project: Sites 50-10-35-18914, 18915, 18917, and a Boulder/Path Alignment within Kūkūau 1 and 2 and Waiākea, South Hilo District, Island of Hawai`i*. On file at State Historic Preservation Division, Kapolei, Hawaii.

- Eblé, F.J., T. Denham, and J. Pantaleo
 1997 Draft Report of Supplemental Archaeological Testing Conducted Along the Proposed Alternate Alignments of Pu`ainako Street (TMK:2-4-01), Hi/o, *Hawaii*. On file at State Historic Preservation Division, Kapolei, Hawai`i.
- Ellis, W.
 1963 *Journal of William Ellis*. Honolulu Advertiser Publishing Co., Ltd, Honolulu.
- Gerrish, G.
 2000 Vegetation Report for the Puainako Street Extension and Widening Project, Prepared for Okahara & Associates, Engineering Consultants, Hilo.
- Handy, E.S.C., and E.G. Handy
 1972 Native Planters in Old Hawaii. *B.P. Bishop Museum Bulletin 233*. Bishop Museum Press, Honolulu.
- Hudson, A.E.
 1932 *Archaeology of East Hawaii*, Ms. In Department of Anthropology, Bishop Museum, Honolulu.
- Hunt, T.L.
 1992 Interim Report: Archaeological Inventory Survey Puainako Street Extension Project: Lands of Waiākea, Kukuau 1 and 2, and Ponahawai, South Hilo District, *Island of Hawai`i*, Prepared for Okahara & Associates, Engineering Consultants, Ms. on file at State Historic Preservation Division, Kapolei, Hawai`i.
- Hunt, T., and M. McDermott
 1994 Archaeological Inventory Survey, Puainako Street Extension Project: Lands of Waiākea, Kukuau 1 and 2, and Ponahawai, South Hi/o District, Island of Hawai`i, Prepared for Okahara and Associates, Engineering Consultants, Ms. on file at State Historic Preservation Division, Kapolei, Hawai`i.
- Kelly, M., B. Nakamura, and Dorothy Barrèr
 1981 A Chronological History, Land and Water Use in the Hilo Bay Area, Island of Hawai`i, Bishop Museum, Honolulu.
- Maly, K.A.
 1996 *Historical Documentary Research and Oral History Interviews: Waiākea Cane Lots (12, 13, 17, 18, 19, 20, and 20-A)*. Kumu Pono Associates, Hilo, Hawai`i. On file at State Historic Preservation Division, Kapolei, Hawai`i.
- Maly, K.A., A. Walker, and P. Rosendahl
 1994 *Archaeological Inventory Survey, Waiākea Cane Lots Portion of Parcel 6*. Paul H. Rosendahl, Ph.D., Inc., Hilo, HI. On file at State Historic Preservation Division, Kapolei, Hawai`i.

McEldowney, H.

1979 *Archaeological and Historical Literature Search and Research Design: Lava Flow Control Study, Hilo, Hawaii*, Department of Anthropology, Bishop Museum. Prepared for the U.S. Army Engineer District, Pacific Ocean.

McDermott, M., and H.H Hammatt

2001 *Addendum to: Archaeological Inventory Survey of an Approximately 20-Acre Parcel Proposed for the USDA Pacific Basin Agricultural Research Center Located near the intersection of Komohana and Puainako Streets, South Hilo, Hawai`i Island (TMK 2-4-01: por122)*, Prepared for SSFM International Inc. On file at State Historic Preservation Division, Kapolei, Hawaii.

McGerty, L, and R.L Spear

1999 *Addendum to: An Inventory Survey of the Pu`ainako o Street Realignment/Extension Project Expanded Corridor, Waiākea, Kukuau 1 and 2 and Ponahawai, South Hilo District, Island of Hawai`i*. Scientific Consultant Services Inc., Honolulu, Hawai`i.

Moniz, J.J,

1992 *Summary of Prior Archaeological Work” Historical and Archaeological Synthesis of Land Use and Settlement Patterns Waiākea Ahupua`a, Hilo Hawaii, UH Anthropology 645: Historic Preservation, Fall 1992, Honolulu.*

Robins, J.J., and RL. Spear

1996 *An Inventory Survey of the Puainako Street Realignment/Extension Project Expanded Corridor, Waiākea, Kukuau 1 and 2 and Ponahawai, South Hilo District, Island of Hawai`i*. Scientific Consultant Services Inc., Honolulu, Hawai`i.

Sato, H., W. Ikeda, R Paeth, R Smythe, and M. Takehiro Jr.

1973 *Soil Survey of Island of Hawaii, State of Hawaii*. United States Department of Agriculture Soil Conservation Service. Washington D.C.

Smith, M.

1991 *Site Inspection of the University of Hawaii – Hilo Perimeter Alignment, Research and Technology Park Phase I, Waiākea, South Hilo, Hawaii Island (TMK: 3-2-4-01:7), November 8, 1991*, State Historic Preservation Division, Department of Land and Natural Resources, Honolulu.

1992 *Field Inspection for State Land Disposition of the Proposed Department of Water Supply Office Site in Hilo, Waiākea Cane Lots, Waiākea, South Hilo, Hawaii Island (TMK: 3-2-4-56:1)*, January 3, 1992, State Historic Preservation Division, Department of Land and Natural Resources, Honolulu.

Spear, R.L.

1993 *An Inventory Survey of the H.C.E.O.C. (Option II) Parcel, Piihonua Ahupua`a, South Hilo District, Hilo, Island of Hawai`i [TMK: 2-4-57-10]*. Prepared for Roy Takamoto, Ms. on file at the State Historic Preservation Division, Kapolei Hawaii.

1995 *Data Recovery Excavations for Sites 50-10-35-19431, 19432, 19433, and 19434, Land of Waiākea, South Hilo District, Island of Hawai`i (TMK:2-4- 57:01)*. Scientific Consultant Services Inc., Honolulu, Hawai`i.

1998 *Letter Report concerning Archaeological Reconnaissance Survey of the Puainako Street Realignment/Extension Project Expanded Corridor, Waiākea, Kukuau 1 and 2 and Ponahawai, South Hilo District, Island of Hawai`i*. Scientific Consultant Services Inc., Honolulu, Hawai`i.

Sokes, J.F.G., and T. Dye

1991 *Heiau of the Island of Hawai`i; A Historic Survey of Native Hawaiian Temple Sites*. Bishop Museum, Honolulu.

Thrum, T.G.

1907 *Heiau and heiau sites throughout the Hawaiian Islands. Hawaii Almanac and Annual*

1908 *Hawaii Almanac and Annual 1909*, Honolulu: [n.p].

Wolfe, E.W., and J. Morris

1996 *Geological Map of the Island of Hawai`i*. U.S.G.S. Miscellaneous Investigations Series. Department of the Interior, Washington, D.C.

Appendix **D**

CULTURAL IMPACT ASSESSMENT

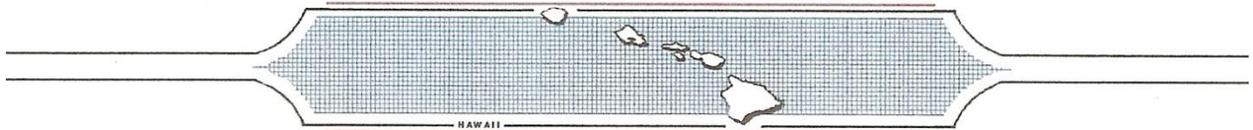
**A CULTURAL IMPACT ASSESSMENT OF LANDS FOR THE
42.6 ACRE UNIVERSITY OF HAWAI'I-HILO MAUKA
ACQUISITION PROJECT, WAIĀKEA AHUPUA'A,
SOUTH HILO DISTRICT, ISLAND OF HAWAI'I
[TMK: (3) 2-4-001:024 and 2-4-056-014]**

Prepared By:
Glenn G. Escott, M.A.

DRAFT Report
October 2013

Prepared For:
PBR Hawai'i
1001 Bishop St, Suite 650
Honolulu, HI 96813

SCIENTIFIC CONSULTANT SERVICES Inc.



1347 Kapi'olani Boulevard, Suite 408 Honolulu, HI 96814

Hawai'i Island Office: PO Box 155 Kea'au, HI 96749

TABLE OF CONTENTS

TABLE OF CONTENTS.....	I
LIST OF FIGURES	II
LIST OF TABLES.....	II
INTRODUCTION	1
METHODOLOGY	4
ARCHIVAL RESEARCH.....	6
INTERVIEW METHODOLOGY	6
PROJECT AREA AND VICINITY	7
RAINFALL AND DRAINAGE	7
VEGETATION.....	7
HISTORICAL AND CULTURAL CONTEXTS.....	8
TRADITIONAL SETTLEMENT PATTERNS, SUBSISTENCE, AND LAND-USE	8
THE <i>MĀHELE</i> OF 1848 AND LAND COMMISSION AWARDS	11
CHANGING RESIDENTIAL AND LAND-USE PATTERNS (1845–1865).....	12
WAIĀKEA MILL COMPANY.....	12
PREVIOUS ARCHAEOLOGICAL INVESTIGATIONS.....	15
REGIONAL ARCHAEOLOGICAL STUDIES.....	21
INVESTIGATIONS SPECIFIC TO STUDY AREA.....	22
CULTURAL INFORMANT INTERVIEWS.....	30
SUMMARY.....	31
CIA INQUIRY RESPONSE.....	31
CULTURAL ASSESSMEMNT.....	32
REFERENCES CITED.....	33

LIST OF FIGURES

Figure 1: Hawai‘i Island Map Showing Project Area Location.	1
Figure 2: Portion of USGS 1995 Hilo Quadrangle Topographical Map, Showing Project Location (2005).....	2
Figure 3: Map of Waiākea Ahupua‘a(Bush <i>et al.</i> 2000).....	9
Figure 4: ‘Ili Kūpono Lands of Pi‘opi‘o (Kelly <i>et al.</i> 1981).....	10
Figure 5: Map Showing Waiākea Pasture Land, Cane Lots, and Homestead Lots.	13
Figure 6: Map Showing Portion of Waiākea Cane Lots and Waiākea Pasture Land.	14
Figure 7: Previous Archaeological Studies Located on USGS Map (Hilo USGS Quad, 1995). 20	
Figure 8: Location of CSH, Inc. Archaeological Sites (Borthwick <i>et al.</i> 1993).....	24

LIST OF TABLES

Table 1: Land Commission Awards in Waiākea Ahupua‘a.....	11
Table 2: Previous Archaeological Research in Waiākea Ahupua‘a.	15
Table 3: Inventory of Sites in Project Area.	29
Table 4: Individuals Responding to CIA.	30

INTRODUCTION

At the request of PBR Hawai‘i, Scientific Consultant Services, Inc. (SCS) conducted a Cultural Impact Assessment of 42.6 acres [TMK: (3) 2-4-001:024 and (3) 2-4-056:014] located in the *ahupua‘a* of Waiākea, South Hilo District, Island of Hawai‘i (Figures 1 and 2). The project area is located approximately 1.75 kilometers southwest of Hilo Bay and is bounded by Mohouli Street to the northwest, Lanikāula Street to the southeast, and by residential subdivisions to the southwest and northeast. The University of Hawai‘i at Hilo (UHH) is considering an option to use the two parcels, currently administered by the State of Hawai‘i Department of Land and Natural Resources (DLNR), for a proposed expansion of the university campuses.

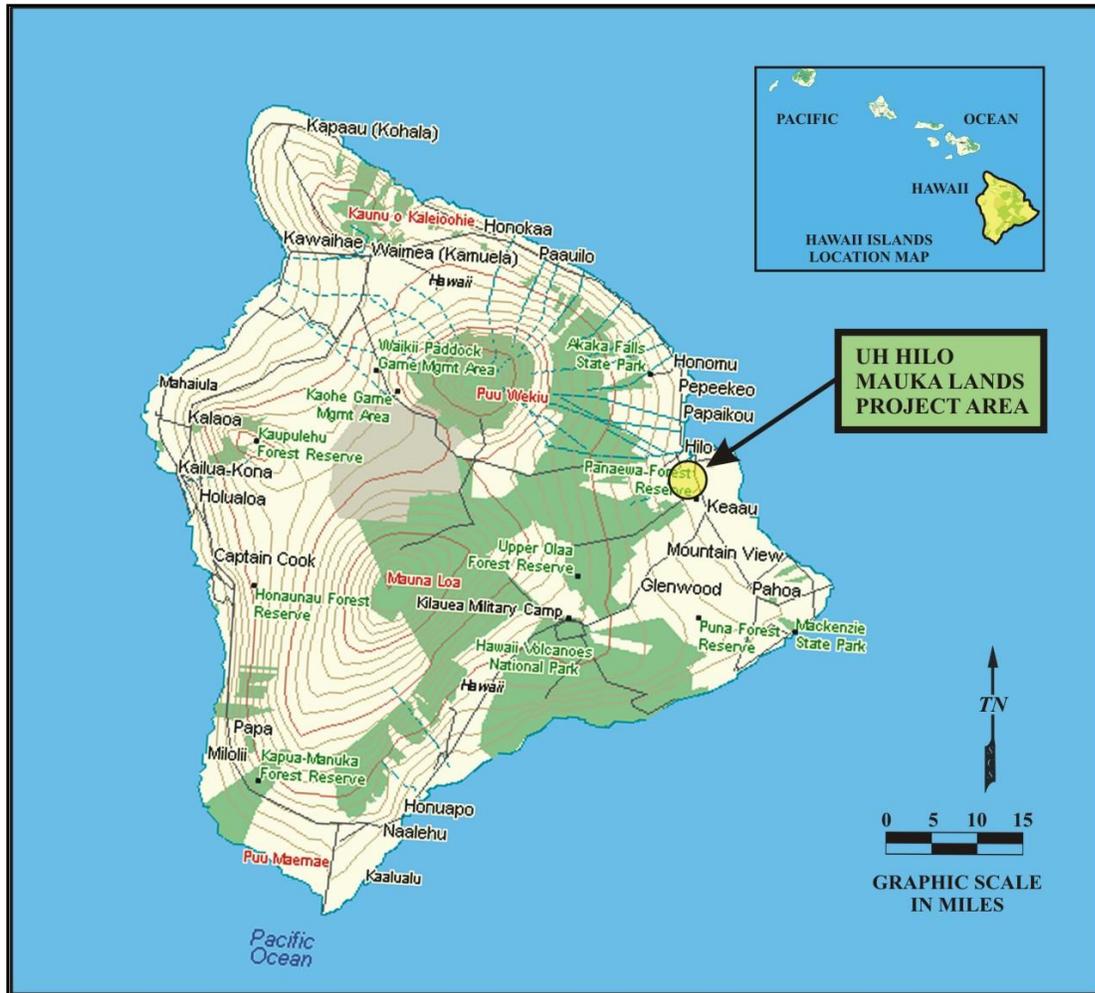
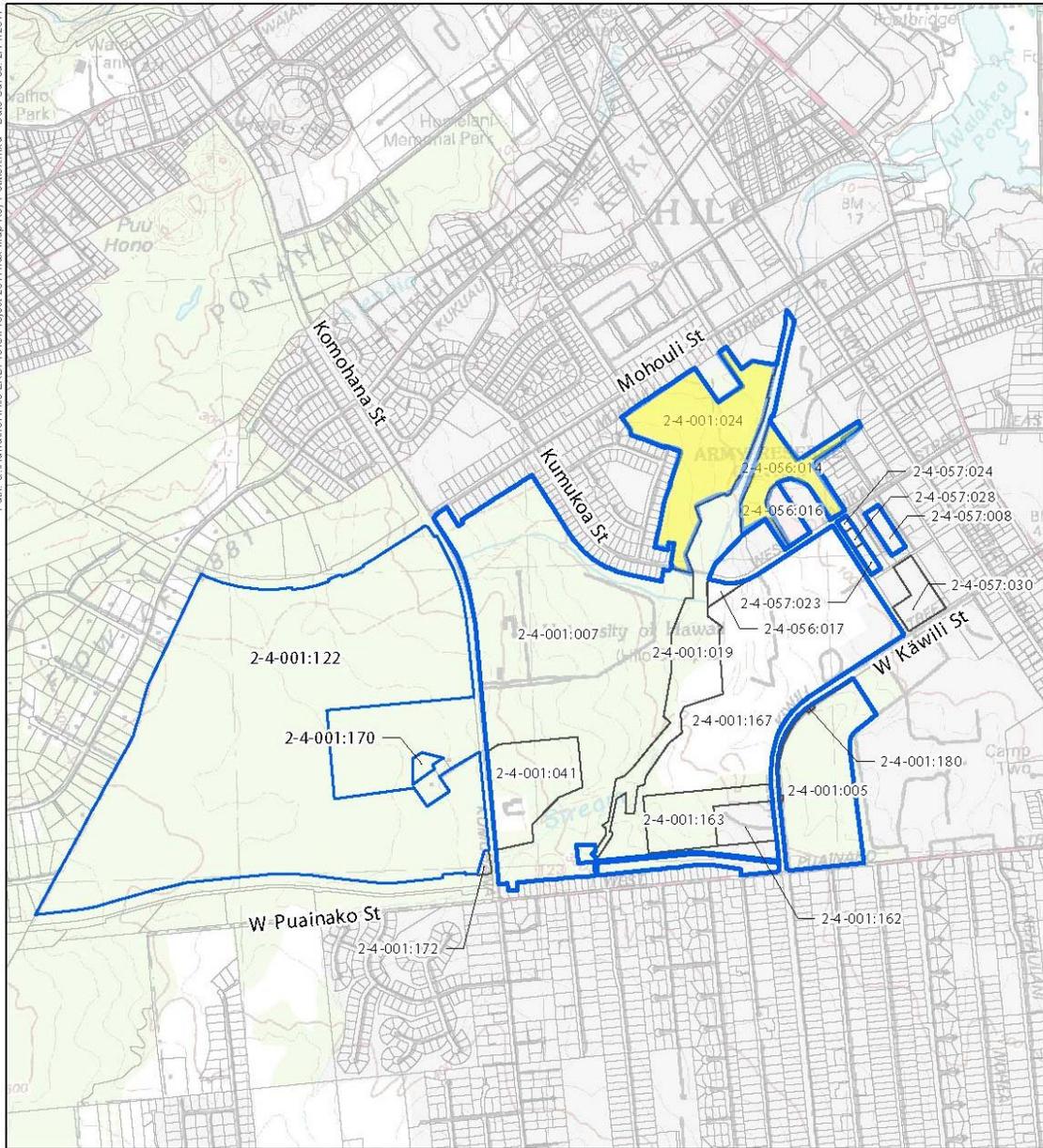


Figure 1: Hawai‘i Island Map Showing Project Area Location.

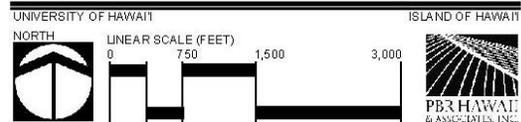
Path: O:\Hawaii\UH\GIS\Project\2011\Tax Map Key_Peritonn.mxd Date Saved: 2/14/2011



LEGEND

 PROJECT AREA

Tax Map Key
UH HILO LRDP Update



Source: County of Hawaii, Department of Planning (2010)
Disclaimer: This map has been prepared for general planning purposes only.

Figure 2: Portion of USGS 1995 Hilo Quadrangle Topographical Map, Showing Project Location (2005).

The Constitution of the State of Hawai‘i clearly states the duty of the State and its agencies is to preserve, protect, and prevent interference with the traditional and customary rights of native Hawaiians. Article XII, Section 7 requires the State to “protect all rights, customarily and traditionally exercised for subsistence, cultural and religious purposes and possessed by *ahupua‘a* tenants who are descendants of native Hawaiians who inhabited the Hawaiian Islands prior to 1778” (2000). In spite of the establishment of the foreign concept of private ownership and western-style government, Kamehameha III (Kauikeaouli) preserved the people's traditional right to subsistence. As a result in 1850, the Hawaiian Government confirmed the traditional access rights to native Hawaiian *ahupua‘a* tenants to gather specific natural resources for customary uses from undeveloped private property and waterways under the Hawai‘i Revised Statutes (HRS) 7-1. In 1992, the State of Hawai‘i Supreme Court, reaffirmed HRS 7-1 and expanded it to include, “native Hawaiian rights...may extend beyond the *ahupua‘a* in which a native Hawaiian resides where such rights have been customarily and traditionally exercised in this manner” (Pele Defense Fund v. Paty, 73 Haw.578, 1992).

Act 50, enacted by the Legislature of the State of Hawaii (2000) with House Bill 2895, relating to Environmental Impact Statements, proposes that:

...there is a need to clarify that the preparation of environmental assessments or environmental impact statements should identify and address effects on Hawai‘i’s culture, and traditional and customary rights... [H.B. NO. 2895].

Act 50 requires state agencies and other developers to assess the effects of proposed land use or shoreline developments on the “cultural practices of the community and State” as part of the HRS Chapter 343 environmental review process (2001).

Its purpose has broadened, “to promote and protect cultural beliefs, practices and resources of native Hawaiians [and] other ethnic groups, and it also amends the definition of ‘significant effect’ to be re-defined as “the sum of effects on the quality of the environment including actions that are...contrary to the State’s environmental policies...or adversely affect the economic welfare, social welfare, or cultural practices of the community and State” (H.B. 2895, Act 50, 2000).

Thus, Act 50 requires an assessment of cultural practices to be included in the Environmental Assessments and the Environmental Impact Statements, and to be taken into consideration during the planning process. The concept of geographical expansion is recognized

by using, as an example, “the broad geographical area, e.g. district or *ahupua‘a*” (OEQC 1997). It was decided that the process should identify ‘anthropological’ cultural practices, rather than ‘social’ cultural practices. For example, *limu* (edible seaweed) gathering would be considered an anthropological cultural practice, while a modern-day marathon would be considered a social cultural practice.

According to the Guidelines for Assessing Cultural Impacts established by the Hawaii State Office of Environmental Quality Control (OEQC 1997): The types of cultural practices and beliefs subject to assessment may include subsistence, commercial, residential, agricultural, access-related, recreational, and religious and spiritual customs. The types of cultural resources subject to assessment may include traditional cultural properties or other types of historic sites, both manmade and natural, which support such cultural beliefs.

This Cultural Impact Assessment involves evaluating the probability of impacts on identified cultural resources, including values, rights, beliefs, objects, records, properties, and stories occurring within the project area and its vicinity (H.B. 2895, Act 50, 2000).

METHODOLOGY

This Cultural Impact Assessment was prepared in accordance with the methodology and content protocol provided in the Guidelines for Assessing Cultural Impacts (OEQC 1997). In outlining the “Cultural Impact Assessment Methodology”, the OEQC states: ...information may be obtained through scoping, community meetings, ethnographic interviews and oral histories... (1997).

The report contains archival and documentary research, as well as communication with organizations having knowledge of the project area, its cultural resources, and its practices and beliefs. This Cultural Impact Assessment was prepared in accordance with the methodology and content protocol provided in the Guidelines for Assessing Cultural Impacts (OEQC 1997). The assessment concerning cultural impacts should address, but not be limited to, the following matters:

- (1) a discussion of the methods applied and results of consultation with individuals and organizations identified by the preparer as being familiar with cultural practices and features associated with the project area, including any constraints or limitations which might have affected the quality of the information obtained;
- (2) a description of methods adopted by the preparer to identify, locate, and select the persons interviewed, including a discussion of the level of effort undertaken;
- (3) ethnographic and oral history interview procedures, including the circumstances under which the interviews were conducted, and any constraints or limitations which might have affected the quality of the information obtained;
- (4) biographical information concerning the individuals and organizations consulted, their particular expertise, and their historical and genealogical relationship to the project area, as well as information concerning the persons submitting information or interviewed, their particular knowledge and cultural expertise, if any, and their historical and genealogical relationship to the project area;
- (5) a discussion concerning historical and cultural source materials consulted, the institutions and repositories searched, and the level of effort undertaken, as well as the particular perspective of the authors, if appropriate, any opposing views, and any other relevant constraints, limitations or biases;
- (6) a discussion concerning the cultural resources, practices and beliefs identified, and for the resources and practices, their location within the broad geographical area in which the proposed action is located, as well as their direct or indirect significance or connection to the project site;
- (7) a discussion concerning the nature of the cultural practices and beliefs, and the significance of the cultural resources within the project area, affected directly or indirectly by the proposed project;
- (8) an explanation of confidential information that has been withheld from public disclosure in the assessment;
- (9) a discussion concerning any conflicting information in regard to identified cultural resources, practices and beliefs;
- (10) an analysis of the potential effect of any proposed physical alteration on cultural resources, practices or beliefs; the potential of the proposed action to isolate cultural resources, practices or beliefs from their setting; and the potential of the proposed action to introduce elements which may alter the setting in which cultural practices take place, and;
- (11) the inclusion of bibliography of references, and attached records of interviews, which were allowed to be disclosed.

Based on the inclusion of the above information, assessments of the potential effects on cultural resources in the project area and recommendations for mitigation of these effects can be proposed.

ARCHIVAL RESEARCH

Archival research focused on a historical documentary study involving both published and unpublished sources. These included legendary accounts of native and early foreign writers; early historical journals and narratives; historic maps and land records such as Land Commission Awards, Royal Patent Grants, and Boundary Commission records; historic accounts, and previous archaeological project reports.

INTERVIEW METHODOLOGY

Interviews are conducted in accordance with Federal and State laws and guidelines. Individuals and/or groups who have knowledge of traditional practices and beliefs associated with a project area or who know of historical properties within a project area are sought for consultation. Individuals who have particular knowledge of traditions passed down from preceding generations and a personal familiarity with the project area are invited to share their relevant information. Often people are recommended for their expertise, and indeed, organizations, such as Hawaiian Civic Clubs, the Island Branch of Office of Hawaiian Affairs, historical societies, Island Trail clubs, and Planning Commissions are depended upon for their recommendations of suitable informants. These groups are invited to contribute their input, and suggest further avenues of inquiry, as well as specific individuals to interview.

If knowledgeable individuals are identified, personal interviews are sometimes taped and then transcribed. These draft transcripts are returned to each of the participants for their review and comments. After corrections are made, each individual signs a release form, making the information available for this study. When telephone interviews occur, a summary of the information is often sent for correction and approval, or dictated by the informant and then incorporated into the document. Key topics discussed with the interviewees vary from project to project, but usually include: personal association to the *ahupua'a*, land use in the project's vicinity; knowledge of traditional trails, gathering areas, water sources, religious sites; place names and their meanings; stories that were handed down concerning special places or events in the vicinity of the project area; evidence of previous activities identified while in the project vicinity.

In this case, letters briefly outlining the development plans along with maps of the project

area were sent to individuals and organizations whose jurisdiction includes knowledge of the area with an invitation for consultation. Consultation was sought from Kai Markell, the Director of Native Rights, Land and Culture, Office of Hawaiian Affairs on O‘ahu; Kauanoe Hoomanawanui, SHPD Burial Sites Specialist; and Rick Gmerkin, Ala Kahakai National Historic Trail, NPS Archaeologist. If cultural resources are identified based on the information received from these organizations and/or additional informants, an assessment of the potential effects on the identified cultural resources in the project area and recommendations for mitigation of these effects can be proposed. Public Notices were placed in the Office of Hawaiian Affairs (OHA) Ka Wai Ola Newspaper, the Honolulu Star Advertiser, and the West Hawai‘i Today.

PROJECT AREA AND VICINITY

The UH Hilo Mauka Lands project area consists of two undeveloped parcels [TMK: (3) 2-4-001:024 and (3) 2-4-056:014] situated on gently sloping to level land at 80 m (300 feet) to 115 m (380 feet) above mean sea level (amsl). The project area substrate is a single Mauna Loa lava flow dated to roughly 1,500 years before present (ybp) (Wolfe and Morris 1996). Soils in the project area belong to the Pana‘ewa very rocky silty clay loam (Sato 1973). Sugar cane was cultivated in the area of the current project.

RAINFALL AND DRAINAGE

Rainfall in the project area is high, ranging between 330 and 440 centimeters (150 and 200 inches) per year (Kelly *et al.* 1981). Natural drainage in the area runs from southwest to northeast and from west to east. There is a concrete spillway located between the two project area parcels that channels rain runoff northeast toward Hilo Bay.

VEGETATION

Plant communities in the wettest areas of the project are dominated by *waivi* (*Psidium cattleianum*) and common guava (*Psidium guajava*), *uluhe* (*Metrosideros/Dicranopteris*) fern, bamboo (*Bambusa* sp.), banyans (*Ficus* sp.), and Alexander palm (*Archontophoenix alexandrae*). Vegetation within the vast majority of the project is dense.

HISTORICAL AND CULTURAL CONTEXTS

Hilo was, by most estimates, one of the first settlements on the Island of Hawai‘i and was settled between A.D. 300 and 600. The rich marine resources of Hilo Bay and the gently sloping forests of Mauna Loa and Mauna Kea provided abundant resources. Fresh water was available from the Wailoa and Wailuku rivers and smaller streams such as Waiākea, Waiolama, Pukihāe, and ‘Alenaio.

The project area lands are located on and near the former *‘ili* (subdivision of an *ahupua‘a*) lands of Pū‘āinakō, Kāwili, and Mohouli, in the *ahupua‘a* of Waiākea, Hilo Hanakāhi ‘Okana, in the *moku-o-loko* (district) of Hilo (Maly 1996:4–5) (Figure 3). Waiākea Stream flows along the southern edge of the present study area. The *ahupua‘a* of Waiākea is large, consists of roughly 95,000 acres, and was regarded as a region of abundant natural resources and numerous fishponds. Waiākea was also an early important political center, notably under chief Kulukulu‘a (Kelly *et al.* 1981:3). Kamehameha lived and often returned to his *‘ili kūpono* (independent land division where all tributes were paid to the chief of the *‘ili* and not the *ahupua‘a*) lands of Pi‘opi‘o in the *ahupua‘a* of Waiākea (Figure 4). The *‘ili kūpono* lands and its royal fishpond were passed on to his son Liholiho after his death.

TRADITIONAL SETTLEMENT PATTERNS, SUBSISTENCE, AND LAND-USE

Historical accounts and archaeological/cultural studies pertaining to the *ahupua‘a* of Waiākea (Ellis 1963; Bingham 1969; Handy and Handy 1972; Bird 1974; McEldowney 1979; Kelly *et al.* 1981; and Maly 1996) provide a wealth of information on traditional settlement patterns, land-use, and subsistence horticulture of the area. These are synthesized below as they allude to the types of sites that may be encountered in the project area.

Historical accounts of residence patterns, land-use, and subsistence horticulture are believed to be indicative of traditional practices developed long before contact with Europeans (McEldowney 1979). Early accounts describe several distinct environmental regions in Waiākea. From the coast inland five or six miles, scattered subsistence agriculture was evident, followed by a region of tall fern and bracken, flanked at higher elevations by a forest region between 10 and 20 miles wide, beyond which was an expanse of grass and lava (Ellis 1969:403).

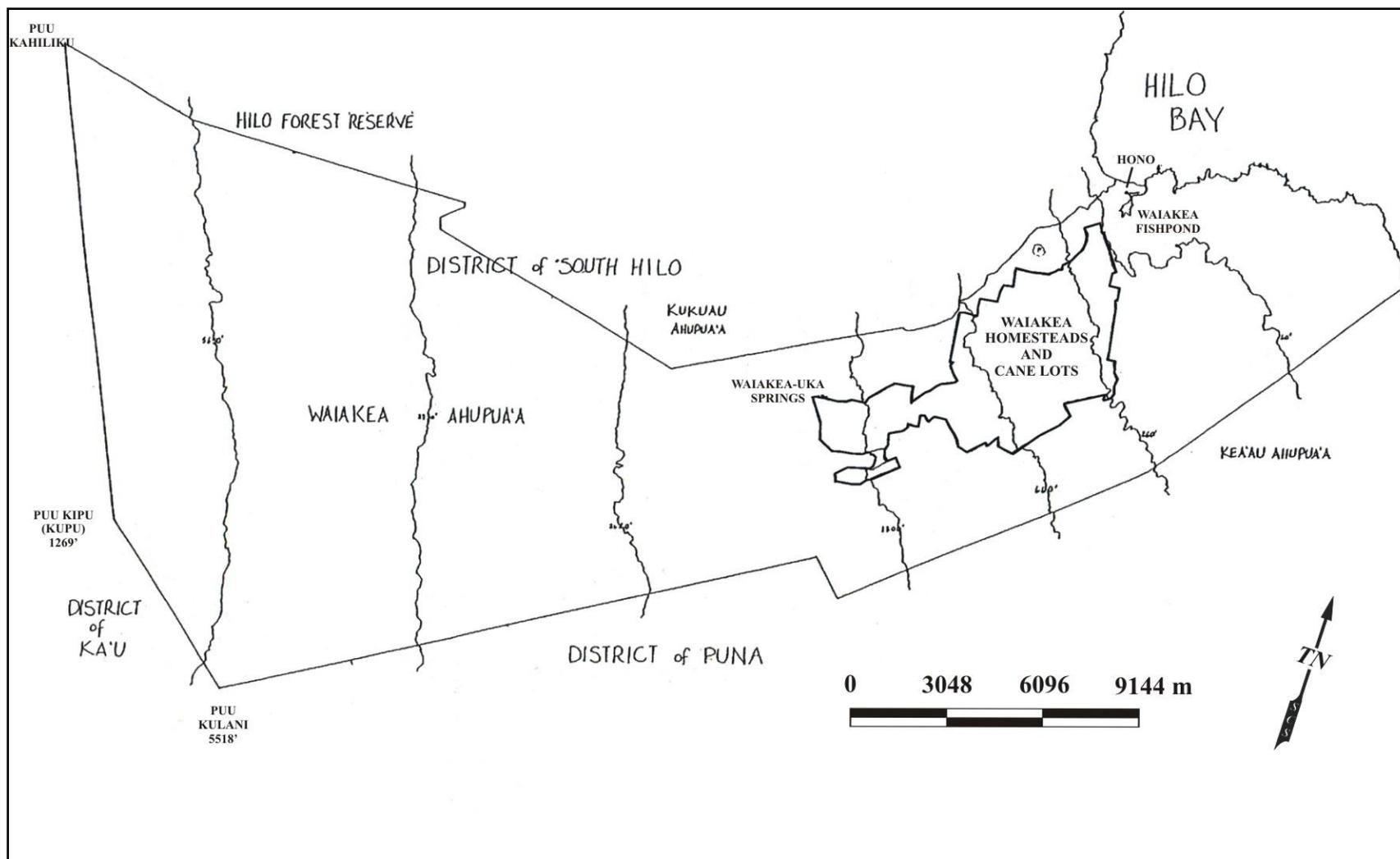


Figure 3: Map of Waiākea Ahupua‘a(Bush *et al.* 2000).

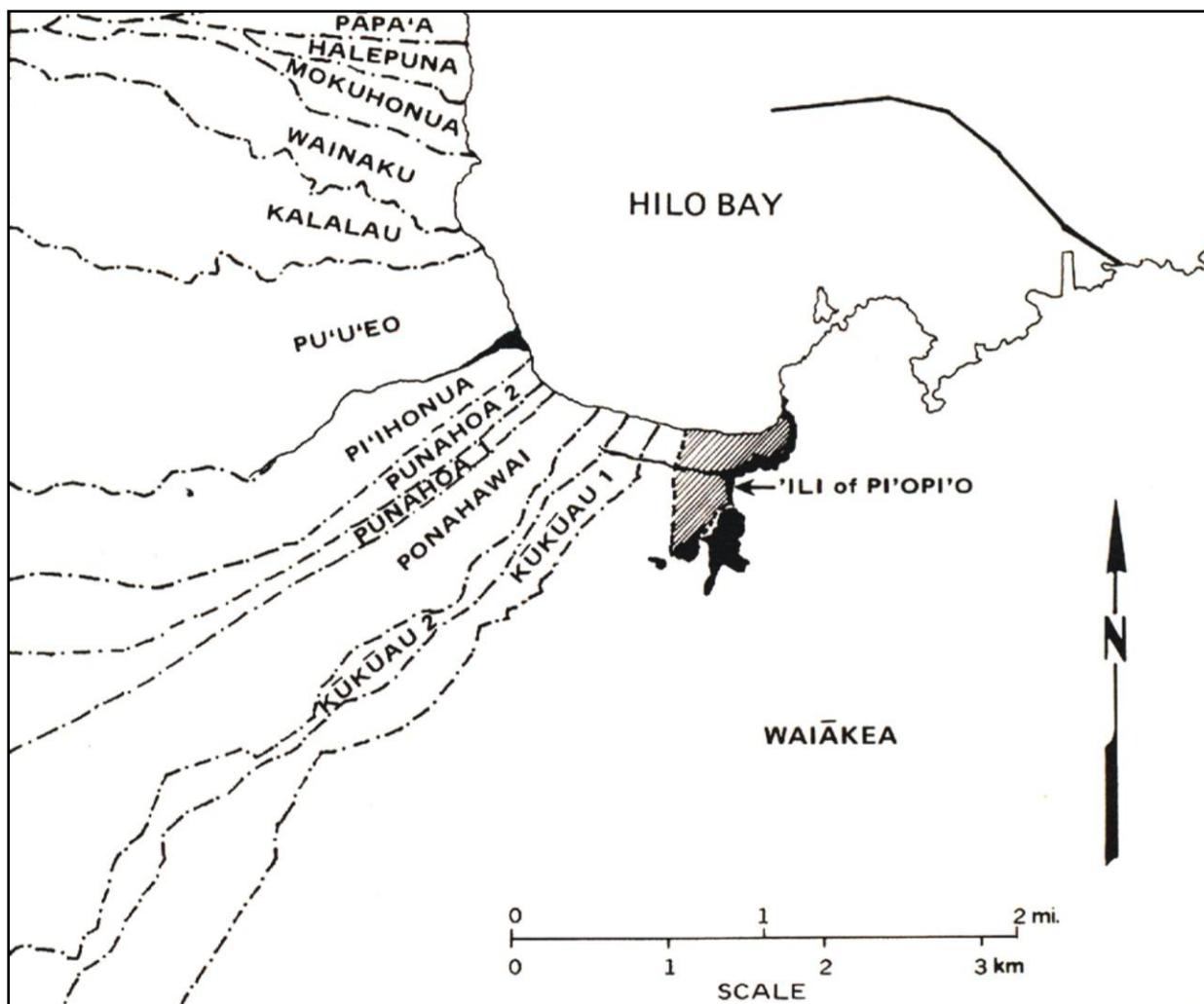


Figure 4: *'Ili Kūpono Lands of Pi'opi'o* (Kelly *et al.* 1981).

The American Missionary C.S. Stewart wrote, “the first four miles of the country is open and uneven, and beautifully sprinkled with clumps, groves, and single trees of the bread-fruit, pandanus, and candle tree” (Stewart 1970:361–363). The majority of Waiākea's estimated 2,000 inhabitants (in 1825) lived within this coastal region (Ellis 1969:253). Taro, plantains, bananas, coconuts, sweet potatoes, and breadfruit were grown individually or in small garden plots. Fish, pig, dog, and birds were also raised and captured for consumption.

The present study area is located along the upper reaches of the open coastal region and the lower reaches of the tall fern and bracken zone. It is located in McEldowney's “upland agricultural zone” (see Previous Archaeology section) consisting of “scattered huts” amidst “garden plots” created through “shifting agriculture” (McEldowney 1979:18–19).

Wood, such as *ohi‘a* and *koa* for house construction, canoe building, and fires was obtained from this upland agricultural zone, and from the dense forests above (Ellis 1963:236). *Hala* for thatching was also known to be plentiful along the lava flows of eastern Waiākea (Ellis 1917, cited in Kelly *et al.* 1981:20). Of particular interest is a description of bird snaring and mention of banana growing in the area of the present study (Maly 1996:6–8).

THE *MĀHELE* OF 1848 AND LAND COMMISSION AWARDS

The *ahupua‘a* of Waiākea became Crown Lands during the *Māhele* of 1848 and in the following years, twenty-five Land Claims were awarded within the *ahupua‘a* of Waiākea (Table 1). The awards were small in area, 24 of which went to native claimants. No Land Commission awards were made within the project area, and all but two were located near the coast. One award to Kahue (LCA 2663) and one to Keaniho (LCA 2402) were in neighboring Ponahawai Ahupua‘a approximately one mile west of the present study area (Maly 1996:22).

Table 1: Land Commission Awards in Waiākea Ahupua‘a.

Grantee	LCA	Acreage
Barenaba	2327	12.25
Halai, L.K.	1279	0.60
Hale	40004	4.25
Kahue	2663	3.75
Kaiana, J.B.	2281	10.25
Kaihenui	11050-B	5.19
Kalolo	1333	2.25
Kalua	8854	3.40
Kaluhikaua	1738	2.98
Kamamalu, V.	7713	<i>‘Ili ‘aina</i>
Kamanuhaka	8803	1.02
Kapu	1-F	1.60
Kealiko	11174	1.00
Keaniho	2402	5.00
Keawe	5018	0.24
	10505	—
Kuaio	4344	1.22
Leoi	9982	0.80
Lolo	4738-B	1.27
Mahoe	1-E	4.46
Moealoha	4737	1.03
Nakai	4785	1.05
Napeahi	2603	1.30
Wahine	4737-B	1.01
Wahinealua	11173	2.50
Wahinenohoihilo	10004	1.69

CHANGING RESIDENTIAL AND LAND-USE PATTERNS (1845–1865)

Between 1845 and 1865, traditional land-use and residential patterns underwent a change. In particular, the regular use of Hilo Bay by foreign vessels, the whaling industry, the establishment of missions in the Hilo area, the introduction of the sandalwood trade, the legalization of private land ownership, the introduction of cattle ranching, and the introduction of sugar cane cultivation all brought about changes in settlement patterns and long-established land-use patterns (Kelly *et al.* 1981). Hilo became the center of population and settlements in outlying regions declined or disappeared. While food was still grown for consumption, greater areas of land were continually given over to the specialized cultivation and processing of commercial foodstuffs for export. Sugar cane plantations and industrial facilities were established in areas that were once upland agricultural areas and coastal settlements, respectively.

WAIĀKEA MILL COMPANY

On July 15, 1861, S. Kipi leased the Crown Land of Waiākea from Kamehameha IV to be used as pastureland for an annual amount of \$600 (Kelly *et al.* 1981:89). In 1874, Rufus A. Lyman was granted a 25-year property lease (General Lease 124-A) within Waiākea, encompassing the government pastureland (Figure 5) west of the present study area (Maly 1996:26). The lease granted him all privileges of land use including the cutting of firewood and the use of fishponds. The newly established Waiākea Mill Company, founded by Alexander Young and Theo H. Davies, acquired Rufus A. Lyman's General Lease 124-A in 1879 (with an extension of terms until June 1, 1918 [Maly 1996:27]). By the early 1900s, Waiākea plantation was cultivating sugarcane on over 6,000 acres of government land in Hilo (Kelly *et al.* 1981:89,120).

In 1911, the Waiākea Mill Company applied for a title to several portions of its leased land, but was rejected by the Board of Public Lands. Rather than renew the lease with the Waiākea Mill Company, the government decided to sell some of the land as homestead lots and to lease a portion of the land to small cultivators as cane lots (see Figure 5). By 1919, 2003 acres of land were purchased as house lots and 5,300 acres was leased to private growers for cane production (Maly 1996:27–28). Sugarcane grown on these lots was, by terms of contract, to be processed by the Waiākea Mill Company for a share of the profits. The current project area is located within portions of the former Waiākea Cane Lots 2, 3, 4, and a portion of the Waiākea Pasture Land west of the cane lots (Figure 6).

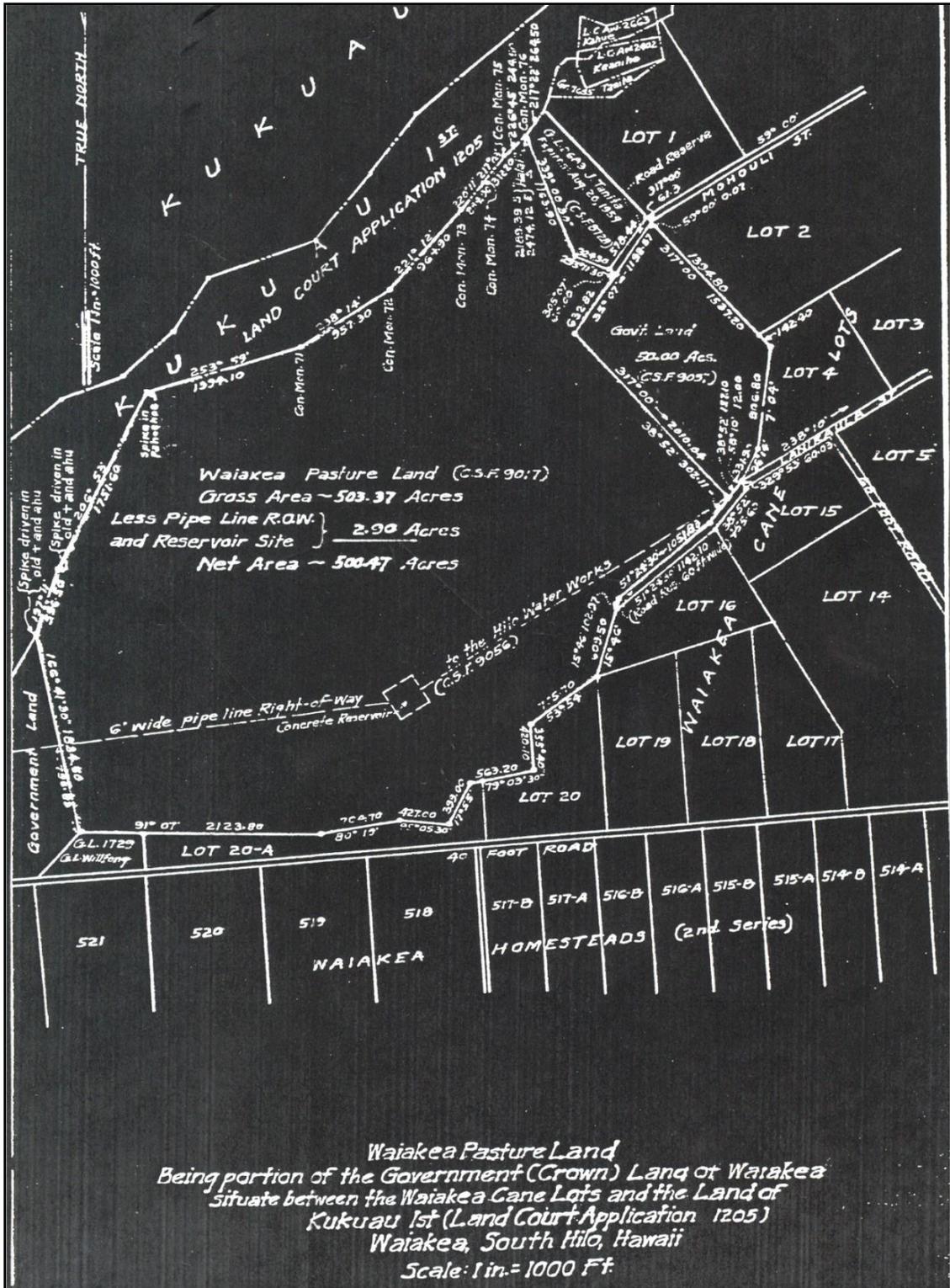


Figure 5: Map Showing Waiākea Pasture Land, Cane Lots, and Homestead Lots.

Lot 2 and the government parcel known as the “Waiākea Pasture Land” west of Lot 2 were leased to Kazuo Miyasaki in 1939 (see Figure 6). Mr. Miyasaki built the Hilo Dairy pasture facilities on the 59.5 acres at Lot 2 (General Lease 2618) and used the Government Pasture Land (General Lease 2751), containing approximately 500 acres, to pasture his cattle. The Government Pasture Land lease passed to John Matson in 1942. During World War II, the parcel covered under General Lease 2751 and known as “Waiākea Pasture Land” was used for training by the U.S. Army Corps (Maly 1996:34). By 1946, the Army was clearing the property of barbed wire, unexploded ordinance, three Quonset buildings, and two latrines.

Lot 2 continued to be used as part of the Hilo Dairy up until the early 1950s. By 1955, the dairy facilities and a pickle factory present on the property were overgrown and were likely no longer in use. General Lease 2618 was terminated in 1956. Lot 2 continued to be used as cattle pastureland until 1966 under General Lease 3568 to George Holowaty, and after December 1958, to Walter Perreira. During the time Lot 2 was part of the Hilo Dairy and while it was used for pasture land, access roads, fences, and structures were added to the property. In addition, the upper portion of the lot was bulldozed.

PREVIOUS ARCHAEOLOGICAL INVESTIGATIONS

Numerous archaeological investigations have been carried out in the Hilo area and within the *ahupua‘a* of Waiākea over the last 95 years. Many of the research projects are located adjacent to or in the immediate vicinity of the current study area. Table 2 below summarizes major findings and Figure 7 shows the location of archaeological investigations near the current project area.

Table 2: Previous Archaeological Research in Waiākea Ahupua‘a.

Reference	Location	Description & Results
Thrum 1907	Waiākea <i>Ahupua‘a heiau</i> sites	List of <i>heiau</i> in Waiākea —none located near present project area.
Thrum 1908	Waiākea <i>Ahupua‘a</i>	List and description of <i>heiau</i> in Waiākea —none located near present project area.
Hudson 1932	East Hawai‘i Island	Detailed description of various sites in the Hilo area.
McEldowney 1979	Hilo Bay area	Zonal Characteristics—Land – use study
Kelly, Nakamura, and Barrère 1981	Hilo Bay area	History of Hilo Bay

Reference	Location	Description & Results
Jensen 1991	AIS in Ponahawai <i>Ahupua'a</i> TMK: (3) 2-3-044:09	Site 14946, an early historic house and sugar cane site. Site 14947, the Hilo Boarding School and Old Mission Ditch
Smith 1991	Waiākea <i>Ahupua'a</i> , South Hilo, Hawai'i Island TMK: 3-2-4-01:7	List and description of sites on the 4000+BP and 1500-750BP lava flows. Inventory survey recommended.
Stokes and Dye 1991	Hawaii Island	List and description of <i>heiau</i> of Hawaii Island
Smith 1992	Waiākea Cane Lots, Waiākea <i>Ahupua'a</i> , South Hilo, Hawai'i Island TMK: 3-2-4-56:1	Numerous cane field features including walls, clearing mounds, a large rectangular enclosure, and c-shaped enclosures.
Moniz 1992	Waiākea <i>Ahupua'a</i> , Hilo Hawai'i	A listing of 1979-1992 inventory survey results within Waiākea <i>Ahupua'a</i> that document walls, mounds, platforms, and faced terraces.
Hunt 1992	Lands of Waiākea, Kukuau 1 & 2, and Ponahawai <i>ahupua'a</i> , South Hilo District, Hawai'i (Puainako Street Extension Project)	Interim inventory survey report listing 31 cane field features including walls, clearing mounds, platforms, and faced terraces.
Spear 1993	Pi'ihonua <i>Ahupua'a</i> , South Hilo TMK: 2-3-32:4	Inventory survey report of a 5-acre parcel that documents an historic oven and a trash dump. No further work recommended.
Borthwick, Collins, Folk, and Hammatt 1993	Waiākea <i>Ahupua'a</i> TMK: 2-4-01:7 and 41	Inventory survey of 163 acres of UH property along and east of Komohana Street. Documents four historic sites associated with sugar cane agriculture. No further work recommended.
Hunt and McDermott 1994	Lands of Waiākea, Kukuau 1 & 2, and Ponahawai <i>ahupua'a</i> , South Hilo District, Hawai'i (Puainako Street Extension Project)	Inventory survey final report (completion of Hunt 1992) documenting 13 historical sites associated with sugar cane agriculture.

Reference	Location	Description & Results
Maly, Walker, and Rosendahl 1994	Lands of Waiākea, South Hilo TMK: 2-4-57:01	Inventory survey of 4.5 acres in the Waiākea Cane Lots documenting four sites associated with historical sugar cane agriculture. Forty-seven features were recorded including walls, clearing mounds, and terraces. One radiocarbon date and recovered artifacts suggest prehistoric land-use in the project area. Data recovery recommended.
Spear 1995	Lands of Waiākea, South Hilo TMK: 2-4-57:01	Data recovery report of Maly <i>et al.</i> (1994) parcel documenting historic sugar cane agricultural features and a few temporary habitations. No further archaeological work recommended.
Maly 1996	Waiākea Cane Lots (12, 13, 17, 18, 19, 20 & 20-A, District of South Hilo, Island of Hawai‘i	Oral interviews and archival research pertaining to Waiākea Cane Lots. Provides background of pre-Contact land-uses in the area and description of sugar cane agricultural features, their construction, and uses.
Robins and Spear 1996	Lands of Waiākea, Kukua 1 & 2, and Ponahawai, South Hilo District, Island of Hawai‘i (Puainako Street Realignment/Extension Project)	Inventory survey of proposed realignment of Puainako Street Extension Corridor documenting 30 new features at 3 sites (Hunt and McDermott 1994), and one new site containing 16 features. Sites and features are associated with historic sugar cane agriculture.
Eblé, Denham, and Pantaleo 1997	Lands of Waiākea, Kukuau 1 & 2, and Ponahawai Ahupua‘a, South Hilo District, Hawai‘i (Puainako Street Extension Project)	Supplemental testing of features (six sites) documented in Hunt and McDermott (1994). Features associated with historic sugar cane agriculture. Recommended preservation of several sites within the project area.
Spear 1998	Lands of Waiākea, Kukua 1 & 2, and Ponahawai, South Hilo	Reconnaissance-level survey of proposed realignment of

Reference	Location	Description & Results
	District, Island of Hawai'i (Puainako Street Realignment/Extension Project)	Puainako Street Extension Corridor documenting 27 new features associated with historical sugar cane agriculture.
McGerty and Spear 1999	Lands of Waiākea, Kukua 1 & 2, and Ponahawai, South Hilo District, Island of Hawai'i (Puainako Street Realignment/Extension Project)	Inventory survey of Spear (1998) parcel documenting 17 features: 15 historic sugar cane agriculture features and two features associated with a modern pig farm. All features were added to site 18921. Data Recovery recommended.
Dega and Benson 1999	Lands of Waiākea, Kukua 1 & 2, and Ponahawai, South Hilo District, Island of Hawai'i (Puainako Street Realignment/Extension Project)	Reconnaissance-level survey of proposed realignment of Puainako Street Extension Corridor documenting eight sites containing 18 features including 12 clearing mounds, two platforms, two walls, a rock alignment, and an <i>'auwai</i> . All but the <i>'auwai</i> were associated with historic sugar cane cultivation. The <i>'auwai</i> was described as a pre-Contact feature likely also utilized in historic cane field agriculture.
Dega 2000	Lands of Waiākea, Kukua 1 & 2, and Ponahawai, South Hilo District, Island of Hawai'i (Puainako Street Realignment/Extension Project)	Inventory survey of Dega and Benson (1999) parcel documenting eight new features (at Site 18921) associated with sugar cane agriculture.
Dega and Spear 2000	Lands of Waiākea, Kukua 1 & 2, and Ponahawai, South Hilo District, Island of Hawai'i (Puainako Street Realignment/Extension Project)	Preservation plan for sites 18914, 18915, 18917 and a boulder path/alignment recorded by Eblé <i>et al.</i> (1997).
Bush, McDermott, and Hammatt 2000	Lands of Waiākea, South Hilo TMK: 2-4-01: 122, South Hilo, Hawai'i Island (USDA Pacific Basin Agricultural Center)	Inventory survey of 20 acres along western edge of Komohana Street, and adjacent to east-central portion of current project

Reference	Location	Description & Results
	Project)	area. Documents one skylight (site 22080) containing a single human femur. Preservation recommended.
McDermott and Hammatt 2001	Lands of Waiākea, South Hilo TMK: 2-4-01: 122, South Hilo, Hawai‘i Island (USDA Pacific Basin Agricultural Center Project)	Inventory survey of 10 acres adjacent (west) to Bush <i>et al.</i> (2000) documenting two historic sites (one feature each), including a modified outcrop and a stone causeway. No further work recommended.
Haun 2002	Archaeological Field Inspection of eight acres in Ponahawai Ahupua‘a TMK: (3) 2-3-037:001	Historic sugar cane agricultural features and house site.
Escott 2004	AIS of 258 Acres, Waiākea Ahupua‘a [TMK: 3-2-4-01:122].	Sixteen sites associated with sugar cane agriculture, ranching, and WWII training.
Calma & Wolforth 2007	AIS of 5.22 Acres Waiākea Ahupua‘a [TMK: 3-2-4-01:1007 por.]	Six sugar cane rock clearing mounds identified. No further work recommended.
Escott 2009	AA of 5.0 acres Waiākea Ahupua‘a [TMK: (3)-2-4-01:176]	No archaeological sites present.
Escott 2011	AIS of 4.4 Acres Waiākea Ahupua‘a [TMK: (3)-2-4-001:007]	A rock wall and rock clearing mound associated with sugarcane agriculture.
Clark <i>et al.</i> 2012	AIS of 9.4 Acres Waiākea Ahupua‘a [Kapi‘olani St. Extension]	Four Historic era sites including two drainage ditches, a rock mound, and the Hilo Dairy structure foundations.
Escott 2013 (Draft)	AIS of 42.6 Acres of Current CIA Project Area	Eighteen sugarcane agriculture and Hilo Dairy sites recorded.

The above listed archaeological and historical investigations are instrumental to understanding broad patterns of land-use in the Hilo area (see McEldowney 1977, Kelly *et al.* 1981, Maly 1996), general trends in the distribution of formal archaeological features in the Hilo area (see Thrum 1907 and 1908, Hudson 1930, Smith 1991, Moniz 1992, Spear 1993), and to formulating archaeological expectations at the present project area (see Jensen 1991, Borthwick *et al.* 1993, Hunt and McDermott 1994, Spear 1995, Robins and Spear 1996, McGerty and Spear 1999, Dega 2000, Bush *et al.* 2000, McDermott and Hammatt 2001, Haun 2002, and Escott 2004).

REGIONAL ARCHAEOLOGICAL STUDIES

McEldowney (1979)

McEldowney (1979) provides an overview of changing land-use patterns in the Hilo area based on early historic accounts. She proposes that Hawaiians utilized land in accordance to five elevation zones (1979:14). Land-use zones are classified as (I) coastal, (II) upland agricultural, (III) lower forest, (IV) rainforest, and (V) sub alpine, or montane. The inhabitants of Waiākea *Ahupua'a* had access to resources in all five of McEldowney's zones.

The present project is situated in the upland agricultural zone (50 to 1,500 feet) described as unwooded grasslands and extensive dryland cultivation plots. McEldowney suggests this region was likely deforested prior to European contact through shifting agricultural practices such as swiddening. Site types consist of scattered houses adjacent to garden and arboreal plots on older *pāhoehoe* and 'a'ā flows with well-developed soils. Modified lava tubes and tubes used for cultural practices are also common in the upland agricultural zone.

Smith (1991)

Smith (1991) also comments on site distribution in the *ahupua'a* of Waiākea based on Mauna Loa lava flows, including a portion of the 1880-1881 *pāhoehoe* flow, a *pāhoehoe* flow dating to 750-1,500 ybp, and a *pāhoehoe* flow dating to 5,000-10,000 ybp. He notes that the majority of sites are located on the older lava flow, which has deeper, more developed soils.

Kelly *et al.* (1981)

Kelly *et al.* (1981) also contributes to an historical understanding of changing land-use patterns following European involvement in the economy of Hawai'i. In particular, the regular use of Hilo Bay by foreign vessels, the whaling industry, the establishment of missions in the Hilo area, the introduction of the sandalwood trade, the legalization of private land ownership, the introduction of cattle ranching, and the introduction of sugar cane cultivation all brought about changes in settlement patterns and long-established land-use patterns. Hilo became a population center and settlements in outlying regions declined. While food was still grown for consumption, greater areas of land were continually given over to the specialized cultivation and processing of commercial foodstuffs for export. Sugar cane plantations and industrial facilities were established in areas that were once upland agricultural areas and coastal settlements.

Thrum (1907 and 1908), Hudson (1932), and Stokes and Dye (1991)

Thrum (1907 and 1908), Hudson (1932), and Stokes and Dye (1991) represent early archaeological efforts to document site distribution pertinent to the greater Hilo area. Hudson

notes there were already no archaeological sites remaining in the city of Hilo by the early 1930s (Hudson 1932:236). All three authors note the dismantling of well-known *heiau* in the Hilo area (Thrum 1908:240, Hudson 1932:236, Stokes and Dye 1991:152).

INVESTIGATIONS SPECIFIC TO STUDY AREA

Several recent archaeological and historical investigations completed in the immediate vicinity of the present project area have direct bearing on the types and distribution of expected sites and features. The majority of these reports document historic-era sites on well-developed ash and organic soils overlaying a Mauna Loa *pāhoehoe* flow dating to 5,000-10,000 ybp. Sites are primarily the remains of sugar cane field clearing and in-field collection and processing architecture. Two recent reports (Bush *et al.* 2000, McDermott and Hammatt 2001) provide insight into predicting the types of sites located on the nearby *pāhoehoe* flow dating to 750-1,500 ybp south of the project area. Two studies document historic-era sugar cane agricultural sites on deep soils north of the present project area (Jensen 1991 and Haun 2002).

Jensen 1991

PHRI conducted an archaeological inventory survey north of the present project area and identified only two sites. Only one of the two sites, SIHP 14947, the Hilo Boarding School and Old Mission Ditch, was recommended for further documentation and preservation. The second site, SIHP 14946, is an historic-era house site associated with sugarcane agriculture.

Haun 2002

Haun conducted a field inspection north of the present project and identified 15 sites with 25 component features. There were 19 rock mounds, a road, a low wall, a retaining wall, a terrace, and two platforms. The features all appear to be historic and related to sugar cane agriculture.

Hunt and McDermott (1994)

The initial archaeological investigations south and southeast of the present project area was an Archaeological Inventory Survey of the Pu‘ainako Street Extension within Waiākea, Kūkūau 1 and 2, and Ponahawai *ahupua‘a* conducted by Hunt and McDermott (1994) in 1992 and 1993. The study entailed historical background research, pedestrian survey, and limited subsurface testing.

The inventory survey report documents 13 sites (SIHP Sites 50-10-35-18911 to -18923) comprised of 88 individual features. All features were interpreted as dating from A.D. 1880 to

1950, and were interpreted as features associated with the cultivation and processing of sugar cane. Five test-units were excavated within several features and it was concluded that the lack of prehistoric artifacts and traditional subsurface features within them supported the interpretation that the features were historic in origin (Hunt and McDermott 1994:104). The inventory survey report recommended that data recovery be carried out at site complexes as additional excavation work "could potentially yield isolated traces of prehistoric use of the area, presumably for dryland agriculture" (Hunt and McDermott 1994:109-113). The report also recommended extensive archival research, a task later undertaken by Maly (1996).

Borthwick, Collins, Folk, and Hammatt (1993)

Cultural Surveys Hawaii conducted an archaeological survey on a 163-acre UH Hilo parcel adjacent to and southeast of the present study area. The report documents four historic sugar cane cultivation sites (SIHP Sites 18667 through 18670) comprised of seven features (one feature contains 25 clearing mounds), including walls, clearing mounds, enclosures, and a remnant sugar cane field (Figure 8). Test-units contained no cultural material confirming their association with more recent sugar cane cultivation. No further work was recommended.

Maly (1996)

Kepa Maly's report combines the results of McEldowney (1979) with traditional Hawaiian history, early European accounts, previous archaeological work, and oral histories to document cultural and agricultural practices in Hilo and the *ahupua'a* of Waiākea. The report focuses on Hawaiian settlement and population expansion in the region of the present study area. Of particular interest is the description of bird snaring and mention of banana growing in the area of the present study (Maly 1996:6-8). Maly also documents the effect of sugar cane cultivation (Waiākea Mill Company operations from the 1870s to 1940s) on pre-Contact archaeological remains within the present project area. While some components of early Hawaiian sites might be incorporated in more modern archaeological features, the clearing of fields and the construction of collection and processing facilities have dismantled or obscured older archaeological sites (Kenneth Bell in Maly 1996:57). Informants who remembered the Waiākea sugar cane plantation fields stated that features such as stone mounds, ramped platforms, terraces, walls, enclosures, and berms (railway berms) were built in order to facilitate sugar cane cultivation and ranching.

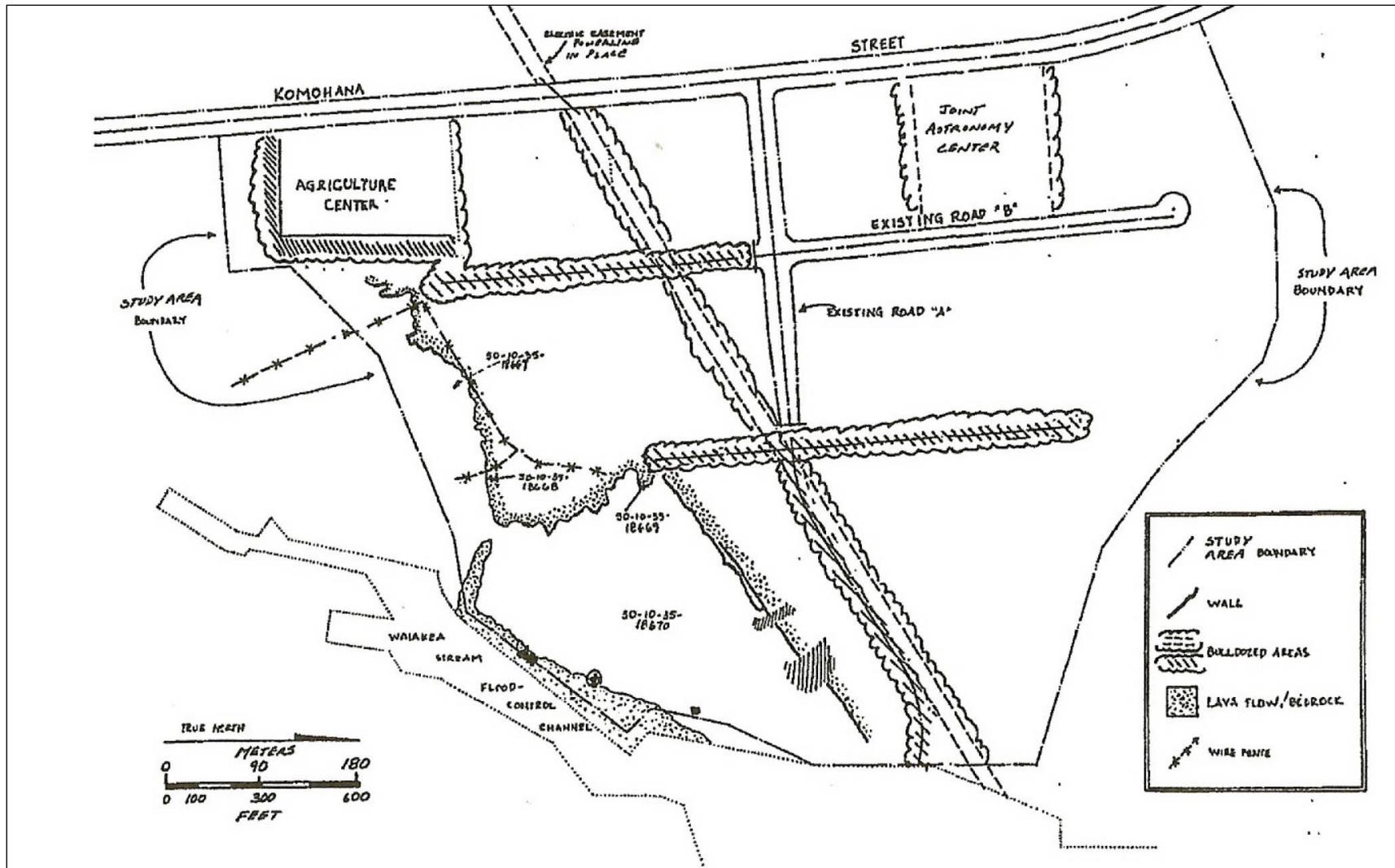


Figure 8: Location of CSH, Inc. Archaeological Sites (Borthwick *et al.* 1993).

Robins and Spear (1996)

Following Maly's (1996) work, SCS (Robins and Spear 1996) conducted an inventory survey on a narrow parcel of land south of the present study area. The project area covered four proposed road alignments for the Pu'ainako Street Extension project and reflected both an elongation and a lateral expansion of the original road alignment study (Hunt and McDermott 1994) from a 120 to 300-foot wide corridor.

The Robins and Spear survey documented the 30 architectural features associated with sites previously reported by Hunt and McDermott (SIHP Sites 18912, 18914, and 18919) as well as 16 additional features that were combined, with features taken by SHPD from SIHP Site 18919, to form a new site (SIHP Site 20681). Robins and Spear (1996:49-52) concluded that all 46 features, representing four sites, were associated with historic sugar cane activities based on the fact that all of the sites are located within or adjacent to known sugar cane fields, all features are representative of formal sugar cane field features, site structure is comparable to other known plantation sites and is atypical of traditional Hawaiian structures, and the documented sites contain historic-era artifacts that are specific to sugar plantation or ranching activities.

No traditional Hawaiian components of modern features or pre-Contact artifacts were discovered during the inventory survey work. Robins and Spear (1996:53-56) recommended data recovery for eight sites within the corridor and concurred with SHPD in the preservation of several other sites.

Eblé, Denham, and Pantaleo (1997)

At the request of the Ho' oikaika Hawaiian Club (HHC), Garcia and Associates (Ganda) conducted supplemental archaeological excavations (reported in Eblé *et al.* 1997) at sites previously identified by Hunt and McDermott (1994). The purpose of the additional work was "to aid in the interpretation of site function and chronology, and to ensure that all cultural remains in the area have been sufficiently identified" (Eblé *et al.* 1997:1). The Hunt and McDermott survey had excavated only five units within 88 features and the sponsoring Ho' oikaika group deemed additional excavations necessary to support or refute the report's site age and function determinations. The supplemental archaeological work performed by Ganda was not considered an official stage in the State of Hawai'i historic preservation process but was deemed a supplemental aid to the previous study.

Seven test-units (typically 1.0 m by 1.0 m) were excavated within six sites previously mapped and recorded by Hunt and McDermott (1994). The sites included SIHP Site 18916, 18911, 18912, 18914, 18915, and 18917. The excavation units yielded historic artifacts such as metal and midden. Three samples of wood charcoal were submitted for radiocarbon testing and were dated to pre-Contact (traditional) and early historic times. The samples were considered problematic since they did not precisely date the architectural structures themselves but were taken from the soil matrix below features and were not associated with any subsurface features such as *'imu* or discrete hearths, for example. The report further concluded that all "intact evidence of pre-Contact occupation and/or activity in the project area has been disturbed or destroyed as a result of post-Contact period activity" (Eblé *et al.* 1997:53). The archaeological features examined as part of this supplemental project were interpreted as associated with sugar cane cultivation and processing, and reinforced the interpretations offered by Hunt and McDermott (1994), Maly (1996), and Robins and Spear (1996). The supplemental testing report recommended preservation for several sites (discussed below) (Eblé *et al.* 1997:56).

Spear (1998)

The following year an archaeological reconnaissance-level investigation was carried out by SCS along the western (*mauka*) portion of the Pu'ainako Street Extension, located to the south of the present study area. While reconnaissance surveys are not recognized by the SHPD as a stage in the historic preservation process, reconnaissance surveys provide a rapid means of assessing the cultural resources within a given project area. A formal report of a reconnaissance survey is not generally submitted to SHPD because the results are usually incorporated into an inventory survey reports. Twenty-seven features were recorded during the reconnaissance survey and were associated with SIHP Site 18921 previously recorded by Hunt and McDermott (1994). Spear (1998) recommended that an inventory survey be conducted.

McGerty and Spear (1999)

The inventory survey work (McGerty and Spear 1999) generated as a result of the previous reconnaissance survey (Spear 1998) was listed as an addendum to the inventory survey report completed by Robins and Spear (1996). McGerty and Spear (1999) re-identified the features documented by Spear (1998) and recorded a total of 17 features. The number of features was reduced from 27 to 17 because several of the features documented during the reconnaissance survey were combined into more discrete feature designations or were assessed as not being archaeological features. All 17 features were assigned to SIHP Site 18921 and 15 of them were interpreted as features associated with historic sugar cane activities cultivation and processing.

The inventory survey report notes that SIHP Site 18921 is located on former Waiākea Sugar Company cane fields (Conde and Best 1973:120, as cited in McGerty and Spear 1999:23).

Based on information provided in an interview, two features (Feature 1 and Feature 11) were interpreted as remnants of a modern pasture or piggery (Robins and Spear 1996:42, McGerty and Spear 1999:5). The inventory survey report (McGerty and Spear 1999:25) concurred with Hunt and McDermott (1994:112) that the site was significant under Criterion D and recommended a data recovery investigation.

Dega and Benson (1999)

In August 1999, SCS conducted a reconnaissance-level survey (Dega and Benson 1999) southwest of the UH Hilo Mauka lands project. The survey was performed within a short, expanded section of the highway (western end) occurring just to the south, and partially overlapping the reconnaissance survey area documented in Spear (1998), and the inventory survey work reported in McGerty and Spear (1999). The project area was approximately 1.0 mile long (east-west) and 300 feet wide (north-south) and was situated from 0.40 km to 2.5 km south of Kaumana Drive at the study corridor's western and eastern termini.

Eight archaeological sites were identified within the western border of the project area. Eighteen features were documented including 12 rock mounds, two platforms, two walls, one alignment, and one stone-lined '*auwai*, or water channel. Seventeen features were interpreted as related to historic sugar cane cultivation and processing, a similar interpretation to that presented previously (Hunt and McDermott 1994, Robins and Spear 1996, McGerty and Spear 1999).

One feature, a rock-lined '*auwai* or water channel, was interpreted as traditional (pre-Contact). The '*auwai* is situated parallel to and between several rock mounds associated with sugar cane cultivation but is suggestive of a traditional water channel because its width (0.80 m) is much smaller than channels typically used for sugar cane field irrigation. Secondly, the gravity-fed system was lined with small cobbles and not metal, as is commonly used in the construction of sugar cane water channels. Thirdly, the channel itself was not deep (average 0.10 m below rock surface) and had not been maintained for some time. Finally, the channel emptied onto a small alluvial plain that would have been well suited to small-scale irrigated taro cultivation. The Dega and Benson (1999) reconnaissance survey report recommended inventory survey work be carried out, including test-excavations within and near the '*auwai* feature.

Dega (2000)

SCS conducted an inventory survey to complete the reconnaissance-level survey reported by Dega and Benson (1999) at SIHP Site 18921. Eight features were documented, two previously recorded by Spear (1998) or during the Dega and Benson (1999) reconnaissance survey. Features included walls, clearing mounds, rock alignments, a platform, and a stone-lined 'auwai. Four stratigraphic trenches were mechanically excavated in and around the 'auwai feature. Trenches were typical 1.80 meters wide and totaled 17 meters in length. The 'auwai was reinterpreted as an historical sugar cane field irrigation ditch due to a lack of stones lining its bottom as is common in traditional Hawaiian 'auwai. No evidence was found to substantiate the presence of a *lo 'i* associated with the irrigation ditch.

Bush, McDermott, and Hammatt (2000)

Cultural Surveys Hawaii carried out an inventory survey of a 20-acre parcel for the proposed USDA Pacific Basin Research Center. The project is located on a parcel along the western-central edge of the UH Hilo Mauka Lands project area on a Mauna Loa *pāhoehoe* lava flow dated to between 750 and 1,500 ybp. A single human femur was located in an overhang within a collapsed lava blister or lava tube. The site (SIHP Site 22080) was designated a burial and recommended for preservation.

McDermott and Hammatt (2001)

Cultural Surveys Hawaii carried out an additional inventory survey of a 10-acre parcel (adjacent to and west of the 2000 study area) for the proposed USDA Pacific Basin Research Center. The project was also located along the western-central edge of the UH Hilo Mauka Lands project area on a Mauna Loa *pāhoehoe* lava flow dated to between 750 and 1,500 ybp. Two post-Contact sites comprised of two features were documented. SIHP Site 22734 consisted of a modified outcrop and SIHP Site 22735 consisted of a stacked stone causeway. No further work was recommended at both sites.

Escott (2004)

Sixteen new sites (80 features) and three previously recorded sites were recorded during inventory survey work conducted on lands just south of the present project area. Eleven of the sites on the project area were associated with Historic-era sugarcane agriculture, three were associated with WWII military training activities, one was associated with Historic-era ranching, and four were associated with Historic-era dirt roads. None of the sites were recommended for preservation, two of the military sites were recommended for data recovery, and the seventeen remaining sites required no further work.

Calma and Wolforth (2007)

SCS, Inc. conducted an archaeological inventory survey on 5.22 acres of UH-Hilo for the College of Pharmacy (see Figure 8). The project area is immediately south of the current project area, and is within the Borthwick *et al.* 1993 project area.. A single site consisting of six rock clearing mounds associated with sugarcane agriculture were identified within the project area. No further work was recommended for the rock mounds.

Escott (2009)

SCS, Inc. conducted an archaeological assessment of a five-acre parcel of land along Mohouli Extension. No archaeological sites or features were located on the current project area parcel. The entire 5-acre parcel is completely covered by pahoehoe lava from the 1880 to 1881 flow. The recent flow lava also prevented modern sugar cane or other agricultural pursuits. No cultural resources, modern structures, or modern disturbance were identified on the study parcel.

Escott (2013, Draft)

SCS, Inc. conducted an archaeological inventory survey on 42.6 acres of Land next to UH-Hilo for proposed UH expansion. Eighteen new sites and a previously recorded site (Site 29373) comprising 68 features were recorded during the course of the archaeological inventory survey (Table 3). The vast majority of sites within the study area are associated with historic era sugarcane cultivation, ranching, or the Hilo Dairy facilities. None of the sites were interpreted as pre-Contact.

Table 3: Inventory of Sites in Project Area.

Site #*	Features	LxWxH (meters)	Type	Function	Age
29965	3	40.0 x 30.0 x 0.6	Modified Outcrops	Agricultural	Historic
29966	1	14.0 x 8.0 x 0.5	Modified Outcrop	Agricultural	Historic
29967	1	16.0 x 3.0 x 0.3	Linear Rock Wall	Agricultural	Historic
29968	3	40.0 x 40.0 x 0.9	Rock Mounds	Agricultural	Historic
29969	1	15.0 x 15.0 x 0.4	Modified Outcrop	Agricultural	Historic
29970	2	12.5 x 8.0 x 1.0	Rock Mounds	Agricultural	Historic
29971	2	15.0 x 9.0 x 0.7	Rock Mounds	Agricultural	Historic
29373	10	50.0 x 30.0 x 1.1	Concrete Complex (Dairy)	Dairy	Historic
29972	1	350.0 x 1.0 x 2.0	Rock Wall	Boundary	Historic
29973	7	25.0 x 25.0 x 0.8	Mounds and Modified Outcrops	Agricultural	Historic

Site #*	Features	LxWxH (meters)	Type	Function	Age
29974	2	13.0 x 10.0 x 1.1	Rock Mounds and Modified Outcrops	Agricultural	Historic
29975	2	10.0 x 10.0 x 0.6	Rock Mounds	Agricultural	Historic
29976	1	4.5 x 3.0 x 0.8	Modified Outcrop	Agricultural	Historic
29977	2	33.0 m Apart	Fence Posts	Boundary	Historic
29978	17	80.0 x 34.0 x 1.5	Modified Outcrops, Rock Mounds, and a Wall	Agricultural	Historic
29979	5	27.0 x 18.5 x 1.5	Rock Mounds and Modified Outcrops	Agricultural	Historic
29980	5	40.0 x 40.0 x 1.1	A Wall, Modified Outcrops and Rock Mounds	Agricultural	Historic
29981	2	15.0 x 8.0 x 1.3	Rock Mound and Modified Outcrop	Agricultural	Historic
29982	1	7.0 x 5.0 x 0.4	Rock Mound	Agricultural	Historic

CULTURAL INFORMANT INTERVIEWS

SCS, Inc contacted seven individuals who either work for the Office of Hawaiian Affairs, are the SHPD Burial Sites Specialist (HIBC), are familiar with the project area lands through cultural, professional, or historical work, or are long-time residents of the area (Table 4). None of the individuals were aware of past or ongoing cultural activities conducted on the subject parcels.

Table 4: Individuals Responding to CIA.

Name	Affiliation	Responded	Has Knowledge	Cultural Practices
Kai Markell	Office of Hawaiian Affairs	No	-	-
Robert K. Lindsey, Jr.	Office of Hawaiian Affairs	Yes	Yes	No
Kauanoë Hoomanawanui	SHPD Burial Sites Program	Yes	Yes	No
Rick Gmerkin	Ala Kahakai NHT, NPS	Yes	Yes	No
Carol Funada	Long-time Neighborhood Resident	Yes	Yes	No
Iva Goldman	Long-time Neighborhood Resident	Yes	Yes	No
Helen Wong Smith	Former UH Hawaiian Collections	Yes	Yes	No

SUMMARY

The “level of effort undertaken” to identify potential effect by a project to cultural resources, places or beliefs (OEQC 1997) has not been officially defined and is left up to the investigator. A good faith effort can mean contacting agencies by letter, interviewing people who may be affected by the project or who know its history, research identifying sensitive areas and previous land use, holding meetings in which the public is invited to testify, notifying the community through the media, and other appropriate strategies based on the type of project being proposed and its impact potential.

In the case of the present parcel, letters of inquiry were sent to organizations whose expertise would include the project area. Consultation was sought from Kai Markell, the Director of Native Rights, Land and Culture, Office of Hawaiian Affairs on O‘ahu; Robert K. Lindsey, Jr., Trustee, Office of Hawaiian Affairs on ‘Oahu; Kauanoe Hoomanawanui, SHPD Burial Sites Specialist; and Rick Gmerkin, Ala Kahakai National Historic Trail, NPS Archaeologist. Inquiries were also made to members of the community who are familiar with the project area lands through cultural, professional, or historical work, or are long-time residents of the area.

Public notices were published in the Office of Hawaiian Affairs Ka Wai Ola Newspaper, and were published in the Honolulu Star Advertiser and the Tribune Herald.

Historical and cultural source materials were extensively used and can be found listed in the References Cited portion of the report. Such scholars as I‘i, Kamakau, Chinen, Kame‘eleihiwa, Fornander, Kuykendall, Kelly, Handy and Handy, Puku‘i and Elbert, Thrum, and Cordy have contributed, and continue to contribute to our knowledge and understanding of Hawai‘i, past and present. The works of these and other authors were consulted and incorporated in the report where appropriate. Land use document research was supplied by the Waihona ‘Aina 2007 Data Base.

CIA INQUIRY RESPONSE

As suggested in the “Guidelines for Accessing Cultural Impacts” (OEQC 1997), CIAs incorporating personal interviews should include ethnographic and oral history interview procedures, circumstances attending the interviews, as well as the results of this consultation. It is also permissible to include organizations with individuals familiar with cultural practices

and features associated with the project area.

As stated above, consultation was sought from Kai Markell, the Director of Native Rights, Land and Culture, Office of Hawaiian Affairs on O‘ahu; Robert K. Lindsey, Jr., Trustee, Office of Hawaiian Affairs on ‘Oahu ; Kauanoë Hoomanawanui, SHPD Burial Sites Specialist; Rick Gmerkin, Ala Kahakai National Historic Trail, NPS Archaeologist; Helen Wong Smith; Carol Fukunada; and Iva Goldman. None of the organizations or individuals that responded were aware of ongoing or past cultural resources or practices associated with lands of the project area. Those individuals who had knowledge of the project area lands responded that they were not aware of any cultural resources or ongoing cultural practices or beliefs associated with those lands.

Analysis of the potential effect of the project on cultural resources, practices or beliefs, its potential to isolate cultural resources, practices or beliefs from their setting, and the potential of the project to introduce elements which may alter the setting in which cultural practices take place is a requirement of the OEQC (No. 10, 1997). To our knowledge, the project area has not been used for traditional cultural purposes within recent times. Based on historical research and the responses from the above listed contacts, it is reasonable to conclude that Hawaiian rights related to gathering, access or other customary activities within the project area will not be affected and there will be no direct adverse effect upon cultural practices or beliefs. There will be no visual impact of the project from surrounding vantage points, e.g. the highway, mountains, and coast.

CULTURAL ASSESSMENT

Based on the results of a pedestrian survey of the project area, the results of previous archaeological studies at the school campus, as well as organizational response, individual cultural informant responses, and archival research, it is reasonable to conclude that, pursuant to Act 50, the exercise of native Hawaiian rights, or any ethnic group, related to gathering, access or other customary activities will not be affected by development activities on this parcel. No cultural activities were identified within the project area, and the proposed undertaking will not produce adverse effects to any native Hawaiian cultural practices.

REFERENCES CITED

- Bingham, M.
1969 *A Residence of Twenty-one Years in the Sandwich Islands*. Hartford.
- Bird, I.
1974 *Six months in the Sandwich Islands*. Charles E. Tuttle Co., Rutland.
- Borthwick, D., J. Collins, W.H. Folk, and H.H. Hammatt
1993 *Archaeological Survey and Testing of Lands Proposed for Research and Technology Lots at the University of Hawaii at Hilo (TMK:2-4-01:7 and41)*. On file at State Historic Preservation Division, Kapolei, Hawai'i.
- Borthwick, D., and H.H. Hammatt
1993 *Supplemental Archaeological Survey and Testing of the Proposed of Hawaii at Hilo Expansion Area (TMK:2-4-01:19)*. On file at State Historic Preservation Division, Kapolei, Hawai'i.
- Bush, A.R., M. McDermott, and H.H. Hammatt
2000 *Archaeological Inventory Survey of an Approximately 20-Acre Parcel Proposed for the USDA Pacific Basin Agricultural Research Center Located near the intersection of Komohana and Puainako Streets, South Hilo, Hawai'i Island (TMK 2-4-01: por122), Prepared for SSFM International Inc.* On file at State Historic Preservation Division, Kapolei, Hawai'i.
- Chinen, J.J.
1961 *Original Land Titles in Hawaii*. Family History Library Book, Honolulu.
- Dega, M.F., and LB. Benson
1999 *Letter Report concerning Archaeological Reconnaissance Survey of the Puainako Street Realignment/Extension Project Expanded Corridor, Waiākea, Kukuau 1 and 2 and Ponahawai, South Hilo District, Island of Hawai'i*. Scientific Consultant Services Inc., Honolulu, Hawai'i.
- Dega, M.
2000 *Addendum To: Archaeological Inventory Survey of the Pu'ainako Street Realignment/Extension Project, Expanded Corridor, Waiākea, Kukuau 1 and 2, South Hilo District, Hilo, Island of Hawai'i*. On file at State Historic Preservation Division, Kapolei, Hawaii.

- Dega, M., and R.L. Spear
 2001 *A Preservation Plan for the Pu‘ainako Street Extension and Widening Project: Sites 50-10-35-18914, 18915, 18917, and a Boulder/Path Alignment within Kūkūau 1 and 2 and Waiākea, South Hilo District, Island of Hawai‘i.* On file at State Historic Preservation Division, Kapolei, Hawai‘i.
- Eblé, F.J., T. Denham, and J. Pantaleo
 1997 *Draft Report of Supplemental Archaeological Testing Conducted Along the Proposed Alternate Alignments of Pu‘ainako Street (TMK:2-4-01), Hilo, Hawa‘ii.* On file at State Historic Preservation Division, Kapolei, Hawai‘i.
- Ellis, W.
 1963 *Journal of William Ellis.* Honolulu Advertiser Publishing Co., Ltd, Honolulu.
- Escott, G
 2004 *An Archaeological Inventory Survey on Approximately 288 Acres of Land for the University of Hawai‘i-Hilo Mauka Lands Development.* Prepared for PBR Hawai‘i. SCS Report 361-4, Honolulu.
- 2009 *Archaeological Assessment of the Five-Acre Hilo Fire Department Administration Site In Waiākea Ahupua‘a, South Hilo District, Hawai‘i Island, Hawai‘i [TMK: (3) 2-4-01:176].* SCS Report 961. SHPD Library, Kapolei.
- 2013 *Draft Archaeological Inventory Survey on Approximately 42.6 Acres of Land for the University of Hawai‘i-Hilo Mauka Acquisition Project, Waiākea Ahupua‘a, South Hilo District, Hawai‘i Island, Hawai‘i [TMK: (3) 2-4-001:024 and 2-4-056:016].* Report prepared for PBR Hawai‘i. Scientific Consultant Services, Inc., Honolulu.
- Gerrish, G.
 2000 *Vegetation Report for the Puainako Street Extension and Widening Project.* P prepared for Okahara & Associates, Engineering Consultants, Hilo.
- Handy, E.S.C., and E.G. Handy
 1972 *Native Planters in Old Hawai‘i. B.P. Bishop Museum Bulletin 233.* Bishop Museum Press, Honolulu.
- Hudson, A.E.
 1932 *Archaeology of East Hawaii,* Ms. In Department of Anthropology, Bishop Museum, Honolulu.
- Hunt, T.L.
 1992 *Interim Report: Archaeological Inventory Survey Puainako Street Extension Project: Lands of Waiākea, Kukuau 1 and 2, and Ponahawai, South Hilo District, Island of Hawai‘i.* Prepared for Okahara & Associates, Engineering Consultants, Ms. on file at State Historic Preservation Division, Kapolei, Hawai‘i.

- Hunt, T., and M. McDermott
 1994 *Archaeological Inventory Survey, Puainako Street Extension Project: Lands of Waiākea, Kukuau 1 and 2, and Ponahawai, South Hilo District, Island of Hawai‘i*. Prepared for Okahara and Associates, Engineering Consultants, Ms. on file at State Historic Preservation Division, Kapolei, Hawai‘i.
- Kalakaua, D.
 1990 *The Legends and Myths of Hawai‘i*. Mutual Publishing. Honolulu.
- Kamakau, S.
 1961 *Ruling Chiefs of Hawai‘i*. The Kamehameha School Press. Honolulu.
 1992 *Ruling Chiefs of Hawai‘i*. The Kamehameha School Press. Honolulu.
- Kame‘eleihiwa, L.
 1992 *Native Land and Foreign Desires: Pehea Lā E Pono Ai?* Bishop Museum Press. Honolulu.
- Kelly, M., B. Nakamura, and Dorothy Barrèr
 1981 *A Chronological History, Land and Water Use in the Hilo Bay Area, Island of Hawai‘i*. Bishop Museum, Honolulu.
- Kuykendall, R.S.
 1966 *The Hawaiian Kingdom*. Vol. 1. University of Hawai‘i Press. Honolulu.
- Malo, D.
 1951 *Hawaiian Antiquities*. Bishop Museum Press. Honolulu.
- Maly, K.A.
 1996 *Historical Documentary Research and Oral History Interviews: Waiākea Cane Lots (12, 13, 17, 18, 19,20, and 20-A)*. Kumu Pono Associates, Hilo, Hawai‘i. On file at State Historic Preservation Division, Kapolei, Hawai‘i.
- Maly, K.A., A. Walker, and P. Rosendahl
 1994 *Archaeological Inventory Survey, Waiākea Cane Lots Portion of Parcel 6*. Paul H. Rosendahl, Ph.D., Inc., Hilo, HI. On file at State Historic Preservation Division, Kapolei, Hawai‘i.
- McEldowney, H.
 1979 *Archaeological and Historical Literature Search and Research Design: Lava Flow Control Study, Hilo, Hawaii*, Department of Anthropology, Bishop Museum. Prepared for the U.S. Army Engineer District, Pacific Ocean.

- McDermott, M., and H.H Hammatt
 2001 *Addendum to: Archaeological Inventory Survey of an Approximately 20-Acre Parcel Proposed for the USDA Pacific Basin Agricultural Research Center Located near the intersection of Komohana and Puainako Streets, South Hilo, Hawai‘i Island (TMK 2-4-01: por122)*, Prepared for SSFM International Inc. On file at State Historic Preservation Division, Kapolei, Hawai‘i.
- McGerty, L, and R.L Spear
 1999 *Addendum to: An Inventory Survey of the Pu‘ainako o Street Realignment/Extension Project Expanded Corridor, Waiākea, Kukuau 1 and 2 and Ponahawai, South Hilo District, Island of Hawai‘i*. Scientific Consultant Services Inc., Honolulu, Hawai‘i.
- Moffat, R.M. and G. L. Fitzpatrick
 1995 *Surveying the Māhele*. An Editions Limited Book. Hong Kong.
- Moniz, J.J,
 1992 *Summary of Prior Archaeological Work, Historical and Archaeological Synthesis of Land Use and Settlement Patterns Waiākea Ahupua‘a, Hilo Hawai‘i*, UH Anthropology 645: Historic Preservation, Fall 1992, Honolulu.
- OEQC
 2010 Office of Environmental Quality Control *OEQC Bulletin*. Honolulu.
- Robins, J.J., and RL. Spear
 1996 *An Inventory Survey of the Puainako Street Realignment/Extension Project Expanded Corridor, Waiākea, Kukuau 1 and 2 and Ponahawai, South Hilo District, Island of Hawai‘i*. Scientific Consultant Services Inc., Honolulu, Hawai‘i.
- Sato, H., W. Ikeda, R Paeth, R Smythe, and M. Takehiro Jr.
 1973 *Soil Survey of Island of Hawaii, State of Hawaii*. United States Department of Agriculture Soil Conservation Service. Washington D.C..
- Smith, M.
 1991 *Site Inspection of the University of Hawaii – Hilo Perimeter Alignment, Research and Technology Park Phase I, Waiākea, South Hilo, Hawai‘i Island (TMK: 3-2-4-01:7), November 8, 1991*. State Historic Preservation Division, Department of Land and Natural Resources, Honolulu.
- 1992 *Field Inspection for State Land Disposition of the Proposed Department of Water Supply Office Site in Hilo, Waiākea Cane Lots, Waiākea, South Hilo, Hawai‘i Island (TMK: 3-2-4-56:1)*, January 3, 1992, State Historic Preservation Division, Department of Land and Natural Resources, Honolulu.

Spear, R.L.

1993 *An Inventory Survey of the H.C.E.O.C. (Option II) Parcel, Pi'ihonua Ahupua'a, South Hilo District, Hilo, Island of Hawai'i [TMK: 2-4-57-10]*. Prepared for Roy Takamoto, Ms. on file at the State Historic Preservation Division, Kapolei Hawai'i.

1995 *Data Recovery Excavations for Sites 50-10-35-19431, 19432, 19433, and 19434, Land of Waiākea, South Hilo District, Island of Hawai'i (TMK:2-4- 57:01)*. Scientific Consultant Services Inc., Honolulu, Hawai'i.

1998 *Letter Report concerning Archaeological Reconnaissance Survey of the Puainako Street Realignment/Extension Project Expanded Corridor, Waiākea, Kukuau 1 and 2 and Ponahawai, South Hilo District, Island of Hawai'i*. Scientific Consultant Services Inc., Honolulu, Hawai'i.

Sokes, J.F.G., and T. Dye

1991 *Heiau of the Island of Hawai'i; A Historic Survey of Native Hawaiian Temple Sites*. Bishop Museum, Honolulu.

Thrum, T.G.

1907 *Heiau and heiau sites throughout the Hawaiian Islands. Hawaii Almanac and Annual 1908*, Honolulu: [n.p].

1908 *Hawaii Almanac and Annual 1909*, Honolulu: [n.p].

Waihona 'Aina

2012 Māhele online database. www.com.

Wolfe, E.W., and J. Morris

1996 *Geological Map of the Island of Hawai'i*. U.S.G.S. Miscellaneous Investigations Series. Department of the Interior, Washington, D.C..