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STATE OF HAWAII
OFFICE OF ENVIRONMENTAL QUALITY CONTROL
OFFICE OF CONSERVATION AND COASTAL LANDS
POST OFFICE BOX 621
HONOLULU, HAWAII 96809

REF: OCCL: AJR

CDUA: OA-3732

DEC 23 2014
DEC 10 2014

Acceptance Date: December 8, 2014

180 Day Expiration Date: June 6, 2015

SUSPENSE DATE: 21 Days from stamped date

MEMORANDUM

To: Jessica E. Wooley, Director
Office of Environmental Quality Control

FROM: Samuel J. Lemmo, Administrator
Office of Conservation and Coastal Lands

SUBJECT: **DRAFT ENVIRONMENTAL ASSESSMENT (DEA) FOR CONSERVATION DISTRICT USE APPLICATION (CDUA) OA-3732** for the Horn Single Family Residence (SFR) Project located in the Ko'olaupoko District, Island of Oahu, *TMK: (1) 4-2-004:001*

The Department of Land and Natural Resources has reviewed the Draft Environmental Assessment (DEA) for the proposed project and anticipates a Finding of No Significant Impact (FONSI) determination. Please publish notice of availability for this project in the **December 23, 2014** issue of the Environmental Notice. We have enclosed the applicants OEQC Bulletin publication form, a digital copy of the DEA and publication form, and a hardcopy of the DEA.

Should you wish to provide comments regarding this project please respond by the suspense date noted above. If no response is received by the suspense date, we will assume there are no comments. Please contact Alex J. Roy, M.Sc. of our Office of Conservation and Coastal Lands staff at (808) 587-0316 should you have any questions.

Enclosures: One (1) CD with a copy of OEQC publication form, OA-3732 DEA
OCCL Acceptance letter (hard copy)
OEQC Bulletin Publication Form (hard copy)
DEA (Hard Copy)

APPLICANT ACTIONS
SECTION 343-5(C), HRS
PUBLICATION FORM (JANURARY 2013 REVISION)

Project Name: Draft Environmental Assessment for the Proposed Horn Single Family Residence (SFR) project

Island: Oahu

District: Ko'olauloa

TMK: (1) 4-2-004:001

Permits: State of Hawaii, Conservation District Use Permit, City and County of Honolulu, Grading Permit

Approving Agency: Office of Conservation and Coastal Lands, Department of Land and Natural Resources, Kalanimoku Building, 1151 Punchbowl Street, Room 131, Honolulu, Hawaii 96813; Contact: Samuel J. Lemmo, Administrator; Telephone: (808) 587-0377

Applicant: Dawn R. Horn, 129 South Kalaheo Dr., Kailua, HI 96734; Telephone: (805) 225-7873

Consultant: Group 70 International, Inc., 925 Bethel St., 5th Floor, Honolulu, HI 96813; Telephone: (808) 523-5866

Status (check one only):

- X DEA-AFNSI Submit the approving 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 approving 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 approving 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 approving agency notice of determination on agency letterhead, an OEQC publication form, and an electronic word processing summary (you may send the summary to oeqchawaii@doh.hawaii.gov. NO environmental assessment is required and a 30-day consultation period upon publication in the periodic bulletin.
- DEIS The applicant simultaneously transmits to both the OEQC and the approving agency, 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 oeqc@doh.hawaii.gov); a 45-day comment period ensues upon publication in the periodic bulletin.
- FEIS The applicant simultaneously transmits to both the OEQC and the approving agency, 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 oeqc@doh.hawaii.gov); no comment period ensues upon publication in the periodic bulletin.
- Section 11-200-23 Determination The approving agency simultaneous transmits its determination of acceptance or nonacceptance (pursuant to Section 11-200-23, HAR) of the FEIS to both OEQC and the applicant. No comment period ensues upon publication in the periodic bulletin.

___ Statutory hammer
Acceptance

The approving agency simultaneously transmits its notice to both the applicant and the OEQC that it failed to timely make a determination on the acceptance or nonacceptance of the applicant's FEIS under Section 343-5(c), HRS, and that the applicant's FEIS is deemed accepted as a matter of law.

___ Section 11-200-27
Determination

The approving agency simultaneously transmits its notice to both the applicant 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:

The applicants propose to construct a two-story Single Family Residence (SFR) on an approximately 37 acre parcel located in Kailua, in the Ko'olaupoko District on the Island of Oahu. The proposed project will consist of constructing a 3,800 square-foot SFR with a garage, lanai, small pool and access driveway. The SFR will include: 3 bedrooms; 3 bathrooms, and living areas, along with a water meter to be installed at the property entrance on Kanapu'u Drive; a two-inch diameter pipe will convey water to the home. Wastewater flows generated at the home site will be transmitted to the existing City and County 8-inch main through a 6-inch gravity sewer lateral along the driveway connection at Kanapu'u Drive. Some minor agriculture (<1.0 acre) for personal use and landscaping, including the removal of invasive species is also being proposed.

1711 KANAPU'U DRIVE Residence and Stewardship

TMK (1) 4-2-004:001
Kailua, O'ahu, Hawai'i

Draft Environmental Assessment

Applicant:

MDHE LLC - Horn
129 South Kalaheo Avenue
Kailua, HI 96813

Prepared by:



GROUP 70
INTERNATIONAL

Group 70 International, Inc.

Architecture • Planning & Environmental Services • Interior Design • Civil Engineering
Honolulu, Hawai'i

November 2014

1711 KANAPU'U DRIVE Residence and Stewardship

TMK (1) 4-2-004:001
Kailua, O'ahu, Hawai'i

Draft Environmental Assessment

This environmental document is prepared in accordance with the requirements of Chapter 343, HRS and Hawai'i Administrative Rules, Title 11, Department of Health.

Applicant:

MDHE LLC - Horn
129 South Kalaheo Avenue
Kailua, HI 96813

Prepared by:



GROUP 70
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November 2014

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Section 1.0

Introduction

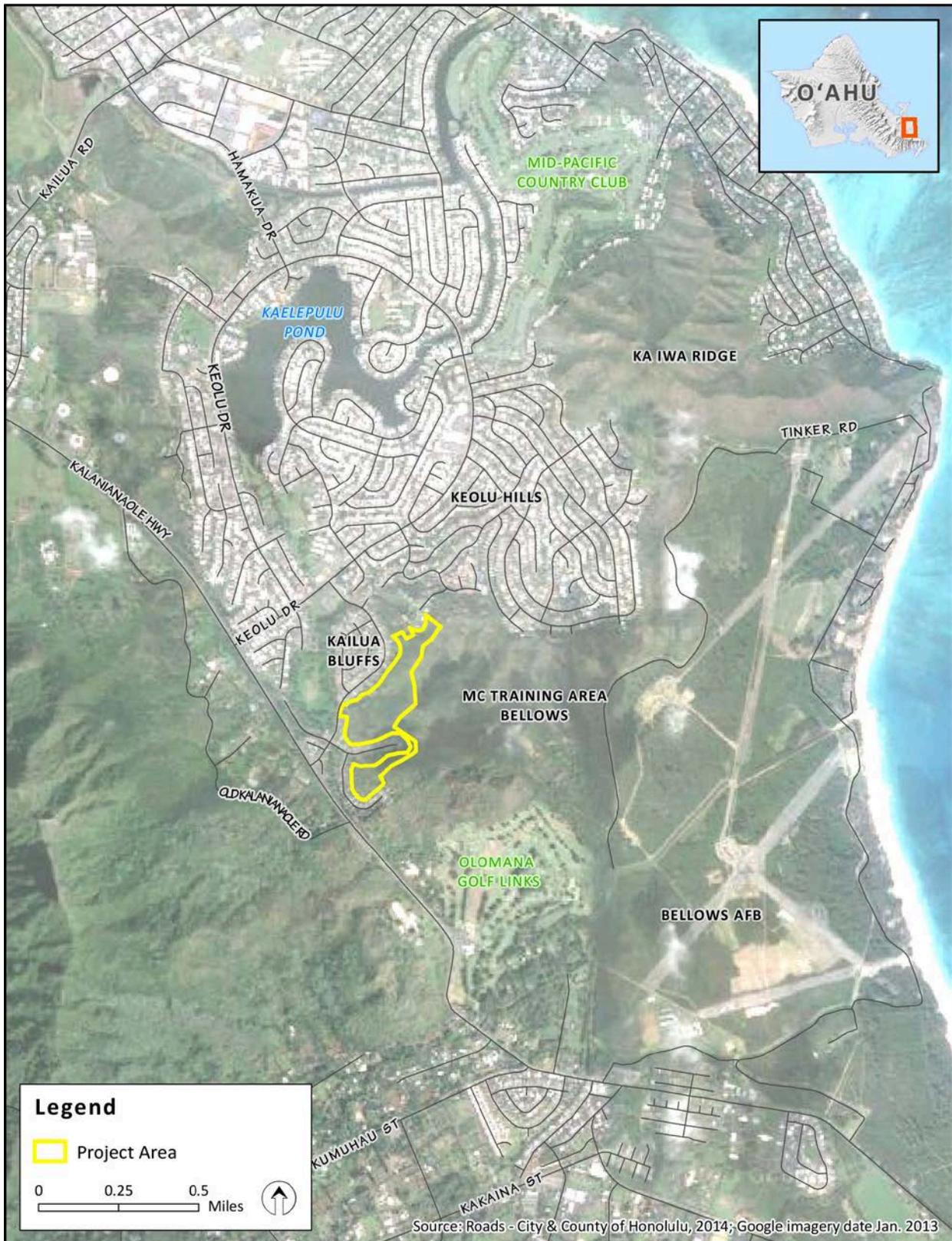
1.0 INTRODUCTION

This Environmental Assessment (EA) was prepared in accordance with Hawai‘i Revised Statutes (HRS) Chapter 343, and HRS Chapter 183C, Conservation District, and Hawai‘i Administrative Rules (HAR) Title 13 Chapter 5, Conservation District Rules.

1.1 INFORMATION SUMMARY

Type of Document:	Draft Environmental Assessment (EA)
Name of Proposed Action:	Residence and Stewardship 1711 Kanapu‘u Drive, Kailua, O‘ahu, Hawai‘i
Applicant:	MDHE, LLC 129 South Kalaheo Ave. Kailua, HI 96734 Contact: Dawn R. Horn; Phone: 808 225-7873
Applicant’s Agent:	Group 70 International, Inc. 925 Bethel Street, 5 th Floor Honolulu, HI 96813 Contact: Jeff Overton, AICP; Principal Planner Phone: 808 523-5866
Approving Agency:	Office of Conservation and Coastal Lands Department of Land and Natural Resources 1151 Punchbowl St., Room 131, Honolulu, HI 96813
EA Trigger:	HRS 343-5(2) Use within State Conservation District
Project Location:	1711 Kanapu‘u Drive, Kailua, O‘ahu, HI (<i>Figure 1-1</i>)
Tax Map Key:	(1) 4-2-004:001 (<i>Figure 1-2</i>)
Land Area:	36.89 acres
Landowner:	MDHE LLC
State Land Use District:	Urban & Conservation District (General Subzone) (<i>Figure 1-3</i>)
City/County Zoning:	P-1 Restricted Preservation, P-2 General Preservation (<i>Figure 1-3</i>)
City & County	Ko‘olaupoko Sustainable Communities Plan
Development Plan:	Open Space Preservation, Low Density Residential
Special Design District:	None
Special Management Area:	Not in SMA
Flood Zone:	Zone X
Anticipated Determination:	Finding of No Significant Impact (FONSI)

1711 KANAPU'U DRIVE
RESIDENCE AND STEWARDSHIP
Draft Environmental Assessment



Project Location
1711 Kanapu'u Drive, Kailua

Figure 1-1

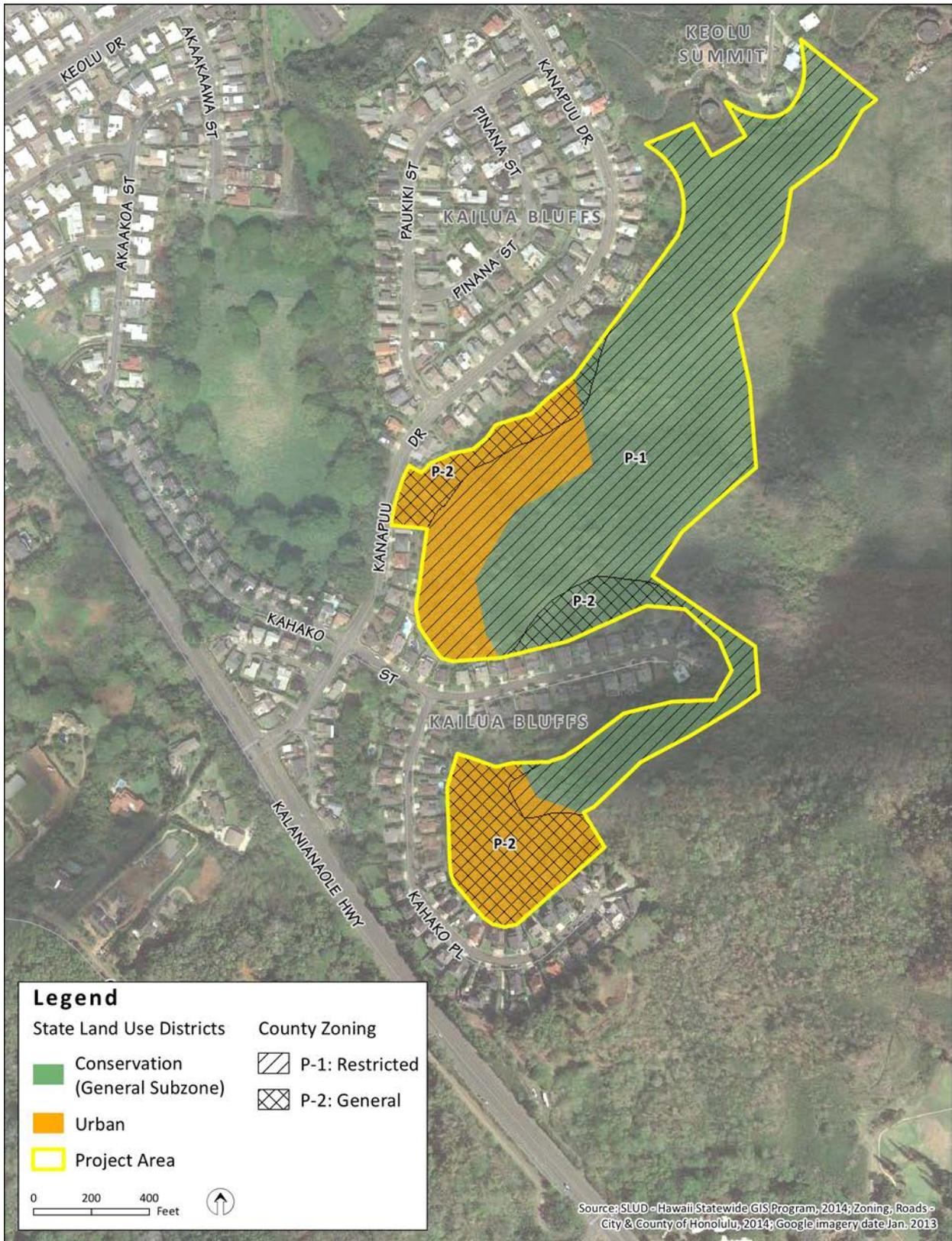
1711 KANAPU'U DRIVE
RESIDENCE AND STEWARDSHIP
Draft Environmental Assessment



Parcel Boundary: Tax Map Key
1711 Kanapu'u Drive, Kailua

Figure 1-2

**1711 KANAPU'U DRIVE
RESIDENCE AND STEWARDSHIP
Draft Environmental Assessment**



**State Land Use Districts and County Zoning
1711 Kanapu'u Drive, Kailua**

Figure 1-3

1.2 SITE LOCATION AND CHARACTERISTICS

The parcel lies within the traditional moku of Ko'olaupoko and the ahupua'a of Kailua. The 36.89-acre parcel is represented as TMK: (1) 4-2-004:001 (*Figure 1-2*). The project site is owned by MDHE, LLC, a Veteran-owned, Limited Liability Company formed for the care and management of the property. Classified by the State Land Use Commission primarily as Conservation District (general subzone), two areas within the parcel are in the Urban District (*Figure 1-3*). The City and County of Honolulu's Land Use Ordinance zoning for the majority of the parcel is P-1, Restricted Preservation, with the two Urban District areas zoned P-2, General Preservation (*Figure 1-3*).

The parcel is accessed from the residential subdivisions of Kailua Bluffs and lies south of the Keolu Summit ridge-top development. Approximately 81 lots zoned R-5 Residential District border the parcel's west and southern boundaries as part of Kailua Bluffs, characterized by single family, detached residences. The Keolu Summit development contains 6 homes located between the 240- and 280-foot elevation level, adjacent to the parcel's northern boundary (*Figure 1-3*). The parcel was previously part of a cattle ranch and remnants of barbed-wire fencing can be found. A rudimentary jeep road rises from the vicinity of Kanapu'u Drive to the ridge line, and ties to a ridge line trail. East of the parcel below the ridge line is land used as Marine Corps Training Area Bellows.

Development History

The two Urban District areas within the parcel are a remnant of site development. In 1980 and 1987, the State of Hawai'i Land Use Commission approved two petitions by developer Lone Star Hawai'i, Inc. Reclassification of 34.1 acres from Conservation District to Urban District was granted for Increment I in 1981. Proposed in four phases, a total of 250 units were proposed in Increment I as a mix of single family residences, and attached residences in cluster development (LUC 1981). Increment II was proposed at another 159 units on an additional 37.8 acres of land reclassified from Conservation District to Urban District. In 1987, the developer provided evidence of substantial progress on on-site and off-site improvements under Increment I, and the Land Use Commission reclassified the additional 37.8 acres. The total lots to be available for residences were reduced to approximately 104 units. Lot 88 – now defined as 1711 Kanapuu Drive – incorporates areas of the Urban district not developed by Lone Star Hawai'i, Inc. As with the other lots, the parcel was sold for development in accordance with the Covenants, Conditions, and Restrictions established for the subdivision.

Encroachments

Plantings of ornamental trees by neighbors encroach on the property in several areas within the Urban district. The landowner has removed items dumped on the property and initiated removal of dying trees and potential fire hazards. Humane trapping and relocation of feral pigs has been conducted by the Pig Hunters Association of O'ahu in cooperation with the land owner. These initial land management efforts were authorized by the State Department of Land and Natural Resources (DLNR) Office of Coastal and Conservation Lands (OCCL). A built encroachment – a concrete block wall and drainage swale – installed by a Keolu Summit landowner crossing into the parcel's northern boundary was resolved with an after-the-fact approval for a drainage swale (File No. CDUP OA-3721).

**1711 KANAPU'U DRIVE
RESIDENCE AND STEWARDSHIP**

Draft Environmental Assessment

1.3 OVERVIEW OF PLANNED USE

The project consists of a single family residence and stewardship of the parcel. The house site will be supported by an access driveway and tie-in to City and County utilities (electrical, water, and sewer) at 1711 Kanapu'u Drive. With a vision of low-impact and sustainable systems, the home will include a rooftop photovoltaic (PV) system with battery storage backup, subsistence agricultural plantings near the home. Stewardship consists of caring for the land, over time re-introducing suitable native plants in select areas to enhance vegetation diversity.

1.4 PURPOSE OF THE ENVIRONMENTAL ASSESSMENT

This Environmental Assessment (EA) was prepared in accordance with Hawai'i Revised Statutes (HRS) 343, specifically §343-5(2) for use of land classified as State Conservation District. The content of this EA is guided by Hawai'i Administrative Rules (HAR) 11-200 Environmental Impact Statement Rules. The Office of Conservation and Coastal Lands of DLNR is the Approving Agency for the EA.

Following acceptance of the Draft EA and accompanying Conservation District Use Application by OCCL, the Draft EA will be submitted to the Office of Environmental Quality Control for publication in *The Environmental Notice*. After the 30-day review period, public comments received will be considered and addressed to the extent feasible within the scope and evaluation of the proposed action. A Final EA will be prepared incorporating comments and highlighting any changes to the EA between versions.

It is anticipated that OCCL will issue a Finding of No Significant Impact (FONSI) upon acceptance of the Final EA.

1.5 PERMITS AND APPROVALS REQUIRED

The Board of Land and Natural Resources considers issuance of a Conservation District Use Permit (CDUP) following acceptance of the Final EA. The CDUP is required per HRS Chapter 183C, Conservation District and promulgated in HAR Title 15 Chapter 13-5, Conservation District Rules. City and County of Honolulu permits related to construction are also needed.

Land uses identified as allowable in Conservation District subzones are specified in HAR Chapter 13-5. The project components described in this Draft Environmental Assessment (DEA) are allowable in the General subzone; Table 1-1 summarizes Conservation District regulations and required reviews and permits. Appendix A contains acknowledgment from the Office of Conservation and Coastal Lands that the uses proposed for 1711 Kanapu'u Drive, as described in pre-consultation, are allowable with general conditions.

**1711 KANAPU’U DRIVE
RESIDENCE AND STEWARDSHIP
Draft Environmental Assessment**

**Table 1-1: Compliance with HAR Chapter 13-5
Identified Land Uses and Required Permits**

Proposed use	Regulatory Reference HAR Chapter 13-5 (Unless otherwise noted)	Review or Permit Required †	General Conditions
Single Family Residence and Accessory Use	13-5 Section 24 <i>Identified Land Use in Resource Subzone* (R-7)</i> Single Family Residence	D-1: Board of Land and Natural Resources Permit (Conservation District Use Permit with EA)	In compliance with HAR 13-5 Exhibit 4: Single Family Residential Standards
Access driveway	City and County of Honolulu Uniform Fire Code 2006	Review by Honolulu Fire Department	16’ width With 20’ clearance
Removal of invasive plants and diseased or dead trees Native plant introduction	13-5 Section 22 <i>Identified Land Use in the Protective Subzone* (P-4, 11, 13)</i> Remove Invasive Species (>1 ac) Tree Removal Land and Resource Mgmt. (> 1 ac)	B-1: Site Plan approval A-2: No permit required B-2: Site Plan approval	Issuance of CDUP OCCL requires documentation of the need to remove trees
Subsistence Agriculture	13-5 Section 23 <i>Identified Land Use in the Limited Subzone* (L-1)</i> Agriculture (< 1 ac)	C-1: Departmental permit	Issuance of CDUP
† Required permits are identified by alpha-numeric code summarized in HAR §13-5-22 * Allowable land uses in Protective, Limited and Resource Subzones also apply to the General Subzone			

Additional County and State permits will be needed to implement the proposed action:

- District Boundary Determination (State of Hawai’i Land Use Commission)
- Building Permit (Buildings, Electrical, Plumbing), and Sidewalk/Driveway Work (Department of Planning and Permitting - DPP)
- Grading, Grubbing, Trenching and Stockpiling Permits (DPP)
- Sewer Connection Permits (DPP)
- National Pollutant Discharge Elimination System for construction activities (State of Hawai’i Department of Health, Clean Water Branch)

1.6 AGENCIES, ORGANIZATIONS AND INDIVIDUALS CONTACTED DURING THE PRE-CONSULTATION PROCESS

The landowner initiated contact with occupants of all neighboring parcels. In June of 2013, upon completion of the parcel purchase, letters were mailed to neighbors with the landowner’s telephone and email contact information, and to notify them of planned management activities. A website was established: www.1711kanapuu.com to provide information in plans for the property, and interested parties are able to register themselves for electronic updates. Neighbors will again be notified of the issuance of the Draft EA and submittal of the CDUA and thus provided an opportunity to comment. A presentation on the project will be made to the Kailua Neighborhood Board.

A list of agencies and parties contacted during the EA pre-consultation period is provided in *Section 7.0* of this document.

Section 2.0

Description of the
Proposed Action

2.0 DESCRIPTION OF THE PROPOSED ACTION

2.1 PURPOSE OF THE PROPOSED ACTION

The purpose of the action is to construct a single family home for personal use by the landowner, as allowed under state regulations for Conservation District lands. MDHE, LLC owner, Dawn Horn, is a long-time resident of the Kailua area. She and her family plan to build a single family residence and driveway accessed from Kanapu'u Drive. Additional uses include subsistence agriculture and stewardship activities including planting of native species to enhance vegetation diversity (*Figure 2-1*). Ultimately, the family anticipates actively managing approximately 15% (roughly 6 acres) of the parcel. The site is adjacent to a developed residential community and use will be consistent with the surrounding area.

2.2 DESCRIPTION OF THE PROPOSED ACTION

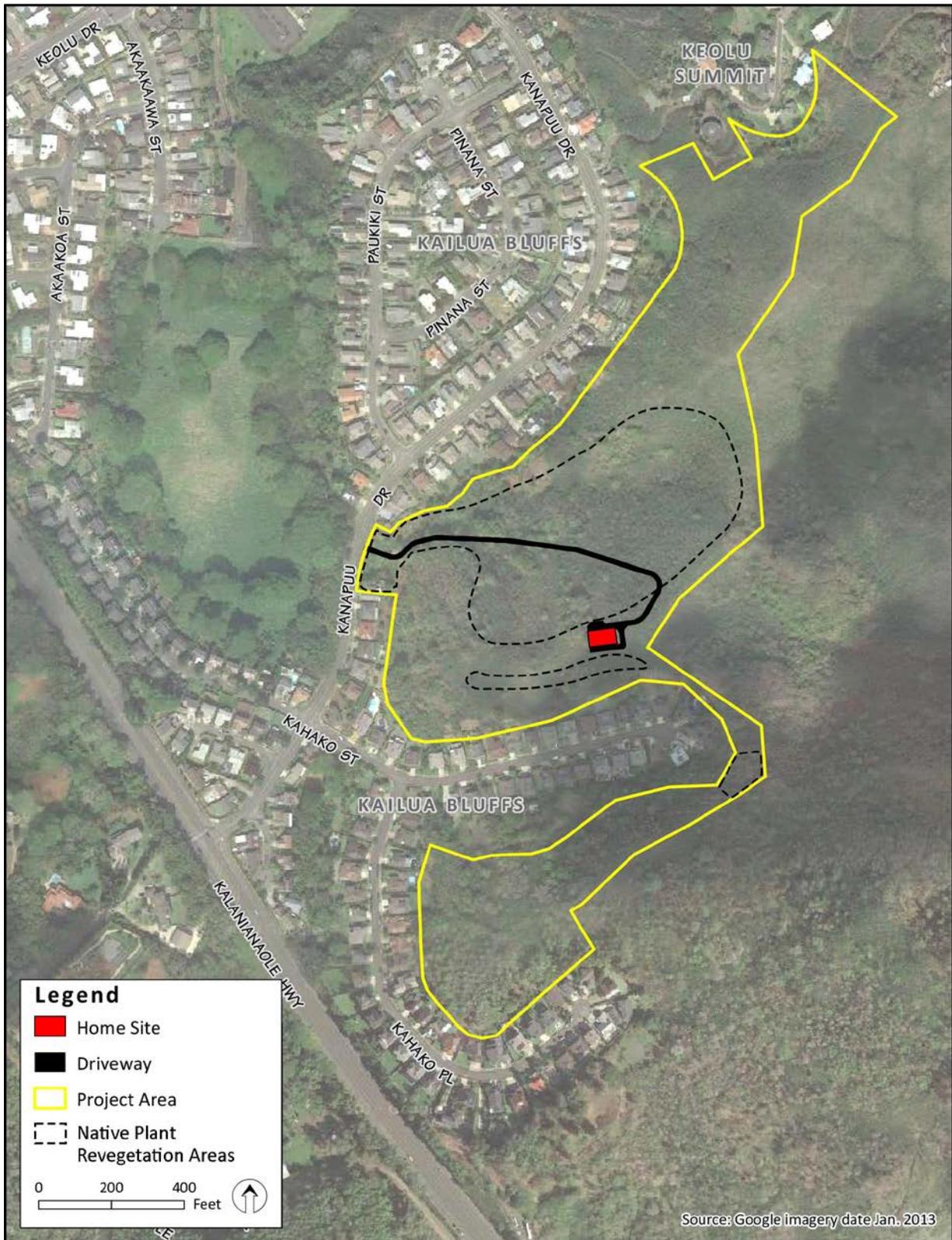
No more than 5,000 square feet of the parcel's 36.89 acre parcel will be used for a single family residence with adjacent yard and landscaping. The home design consists of a single structure tucked among existing trees into a spur ridge below the ridge crest, and will be accessed from 1711 Kanapu'u Drive. To be built in conformance with all applicable building and grading codes, the family's electrical needs will ultimately be provided by rooftop PV panels with battery storage backup. Initially the site will be connected to the Hawaiian Electric Company grid for power during construction. Potable water and sewer will provided through existing City and County services along Kanapu'u Drive. The driveway was reviewed by the Plans Review division of the Honolulu Fire Department to ensure it is in compliance with Honolulu City Fire Code emergency access standards. The improvements will be contained within an area of roughly 1.6 acres, or less than 5% of the parcel. Agricultural plots in the vicinity of the home site will be established to provide fresh produce for the family (*Figure 2-1*).

Additional land use will continue land stewardship that was initiated upon taking ownership. Removing diseased trees and planting native species will enhance vegetation diversity. The property's central gulch will be the focal point for native plant introduction (*Figure 2-1*). Removal of aggressive invasive plants and feral pigs, and addressing erosion through planting native species, will be conducted where needed throughout the property.

2.3 CONSERVATION DISTRICT USE REQUIREMENTS

The structure will be in compliance with the residential standards of the Conservation District as promulgated in Hawai'i Administrative Rules (HAR) Title 13 Chapter 5. The standards limit the home site to a single family dwelling (with one kitchen) and a maximum developable area of 5,000 square feet.

1711 KANAPU'U DRIVE
RESIDENCE AND STEWARDSHIP
Draft Environmental Assessment



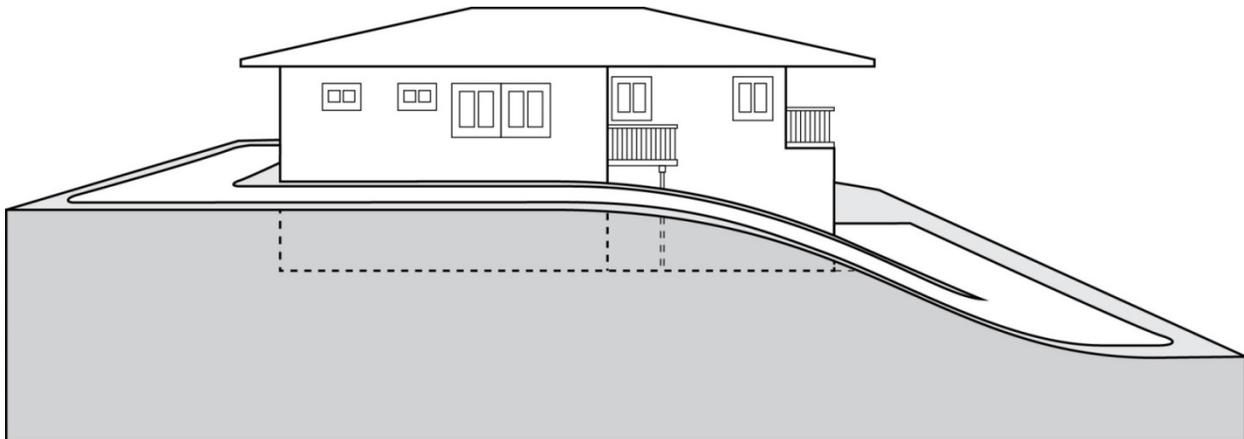
Overview of Planned Use
1711 Kanapu'u Drive, Kailua

Figure 2-1

Single Family Home

The home will be a two-story structure with the majority of living space on the upper level and vehicular access to a garage on the lower level (*Figure 2-2*). The home's lower level will rise from a concrete slab constructed at 244-foot mean sea level. Architecturally, it will evoke an open Plantation-style home incorporating a covered lanai. The maximum developable area encompasses all floor areas under roof (including first and second story areas), pool, decks, garage, and other above ground structures. As per the HAR standards, the structure's paint and roof color will be compatible with the surroundings, and landscaping will be used to screen the structures. The wastewater and water collection systems will be permitted by the Department of Planning and Permitting, and grading of the property will be kept to a minimum with consideration of slope. The structures will conform to all applicable building and grading codes.

The access driveway follows an old jeep trail in the lower contoured portion, and will be excavated with embankments where needed for stabilization. Use of permeable surfacing materials such as Grasscrete® or gravel paving will be finalized in the City and County construction permit phase in consultation with the Honolulu Fire Department Plans Review division.



Home Elevation View

Figure 2-2

2.4 UTILITIES AND INFRASTRUCTURE

2.4.1 WATER SUPPLY

The City and County of Honolulu Board of Water Supply responded to an inquiry from the landowner prior to finalization of purchase, confirming the existing water system is adequate to accommodate the proposed development. A water meter will be installed at the property entrance on Kanapu'u Drive; a two-inch diameter pipe will convey water to the home. Fire suppression infrastructure will also be installed to include appropriately sized water supply lines and fire hydrants at correct spacing.

2.4.2 WASTEWATER

Wastewater flows generated at the home site will be transmitted to the existing City and County 8-inch main through a 6-inch gravity sewer lateral along the driveway connection at 1711 Kanapu'u Drive.

2.4.3 STORM DRAINAGE

The onsite drainage system will be in compliance with City and County of Honolulu standards. Runoff from the home's roof will be channeled through downspouts that discharge to grade. Overland flow will be collected by the existing culvert located at the bottom of the hill near the driveway along Kanapu'u Drive. Storm water quality Best Management Practices will be installed as required by the City. The estimated drainage runoff for the project area (home site and driveway) drainage basin is approximately 94.84 cubic feet per second, based on a 10-year recurrence interval (1-hour duration rainfall).

2.4.4 UTILITIES

Electrical power and communication infrastructure will be routed to the home site through an underground conduit.

2.4.5 ACCESS, ROADWAYS AND PARKING

The proposed driveway access is contoured along the hillside, gaining 150 feet in elevation to the home site along its 1,220 foot length. The proposed driveway apron along Kanapu'u Drive will be 24-feet wide, narrowing to 16-foot width with a 2-foot shoulder clearance on each side. Selection of acceptable permeable surfacing materials will be finalized in the City and County construction permit phase in consultation with the Honolulu Fire Department Plans Review division.

The estimated earthwork requirement for the home site and access driveway combined is approximately 5,000 cubic yards of excavation and 8,000 cubic yards of fill, resulting in net fill of approximately 3,000 cubic yards.

Section 3.0

The Environmental Setting,
Potential Impacts and
Mitigation Measures

3.0 THE ENVIRONMENTAL SETTING, POTENTIAL IMPACTS AND MITIGATION MEASURES

This section describes the existing environmental setting and identifies possible impacts of the proposed project. Strategies to mitigate those potential impacts are also identified.

3.1 TOPOGRAPHY

Existing Conditions

The project site consists of approximately 37 acres extending westward from a low ridge line dividing the Keolu Hills region of Kailua from the Marine Corps Training Area Bellows in Waimanalo. Extending north from Kalaniana‘ole Highway, the parcel’s western boundary rises behind the Kailua Bluffs subdivision. The site is undeveloped land, overgrown with non-native koa haole shrubs, tall grass, and other weedy plants. A graded jeep trail passes through the site; there are no existing structures. The property elevation ranges from 120 to 360 feet mean sea level (*Figure 3-1*).

Anticipated Impacts and Mitigation Measures

Most of the property will remain unaffected by the proposed action, with the avoidance of steep slope areas. Excavation and grading will be required to provide an access driveway and level area for the residential home. The home’s lower level will rise from a concrete slab constructed at 244-foot elevation; the second level will lie at approximately 254-foot elevation, requiring approximately four feet of a portion of the spur ridge to be graded. It is anticipated that portions of the access driveway will be excavated and embanked along the sides, where necessary for stabilization. Retaining walls, where practicable, are proposed to be located along the driveway access to minimize disturbed areas and visual impacts to the hillside.

The estimated earthwork requirement is approximately 5,000 cubic yards of excavation and 8,000 cubic yards of fill, having a net fill of approximately 3,000 cubic yards.

Best Management Practices will be implemented pursuant to the required Grading Permit to mitigate any potential impacts of soil erosion and fugitive dust during any grading or excavation.

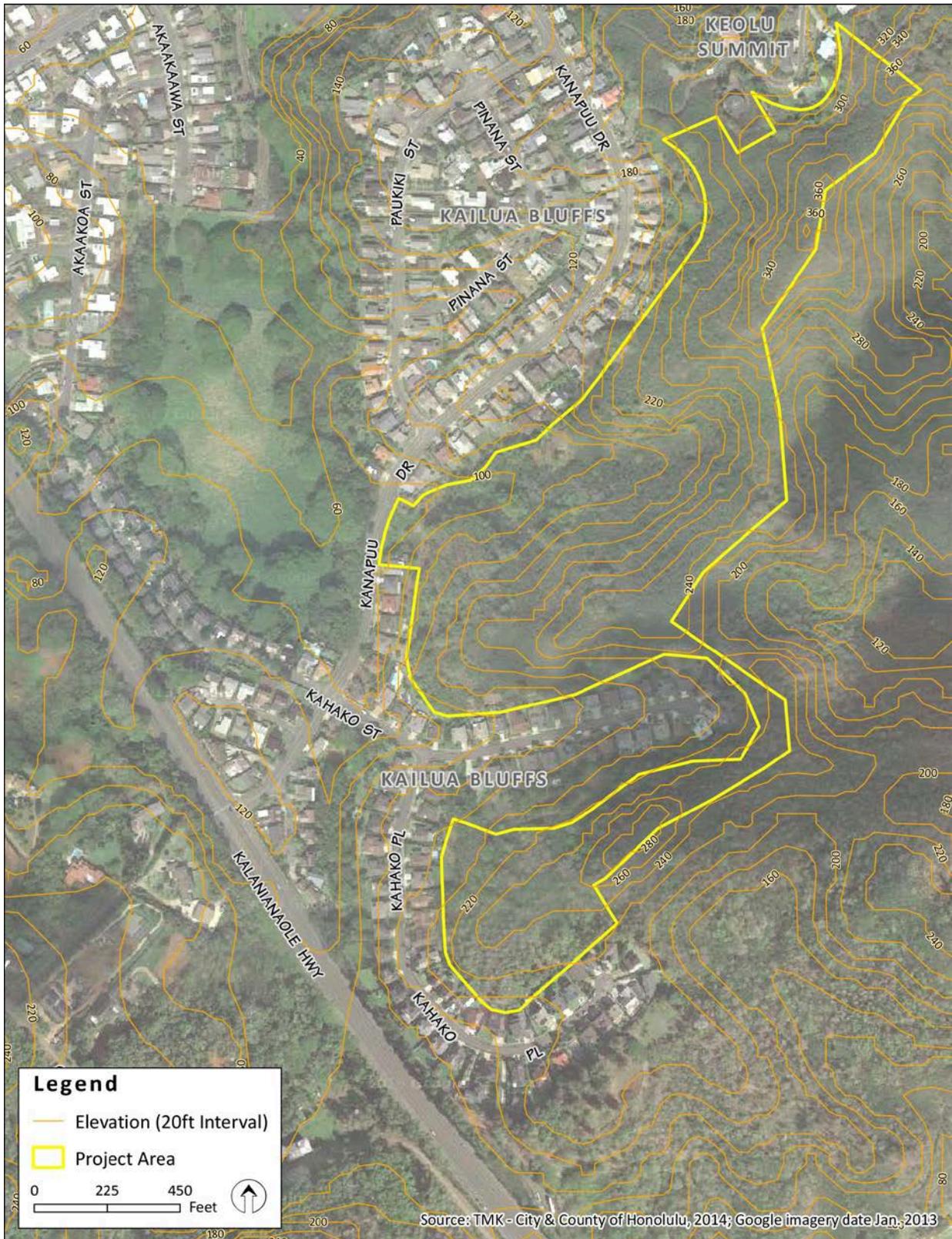
3.2 GEOLOGY AND SOILS

Existing Conditions

The geology of Windward O‘ahu is dominated by the Ko‘olau Range, the eroded remnants of a volcanic dome. The Ko‘olau Range runs northwest to southeast, which transitions to a fringing coastal plain. Precipitous fluted cliffs (pali) extend for 20 miles on the windward side of the Ko‘olau Range.

The soils on the property consist mainly of Pāpa‘a Series - 35 to 70 percent slopes (PYF). An area of ‘Alaeloa Series (AeE) – 15 to 35 percent slopes occurs on one edge of the property (*Figure 3-2*).

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Topography

1711 Kanapu'u Drive, Kailua

Figure 3-1

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- **Pāpa‘a clay (PYF).** This soil of the Pāpa‘a Series has very steep slopes. In a representative profile, the surface layer is very dark brown clay about 12 inches thick. The next layers extend to a depth of approximately 24 inches, and consist of reddish-brown and dark reddish-gray clay with a prismatic structure. Below this is clay to silty clay loam that has a variegated color pattern of grays, brown and yellows. Soft, weathered rock is at a depth of about 40 inches. The clays in this soil are very sticky and plastic, and they crack widely when dry. The soil is slightly acid throughout the profile. Permeability is slow, runoff is rapid, and the erosion hazard is severe. These soil typically support pasture, and are dominated by guava, Java plum, koa haole, Christmas berry, lantana, and sourgrass. (USDA 1972.)
- **‘Alaeloa silty clay (AeE).** This soil of the ‘Alaeloa Series occurs on smooth side slopes and toe slopes in the uplands. In a representative profile the surface layer is dark reddish-brown silty clay about 10 inches thick. The subsoil which is about 48 inches thick is dark-red and red silty clay that has sub angular blocky structure. The substratum is soft, weathered basic igneous rock. The soil is medium acid in the surface layer and strongly acid in the subsoil. Permeability is moderately rapid, runoff is medium and the erosion hazard is moderate. This soil is used for pineapple, pasture, truck crops, orchards, wildlife habitat, and home sites. Small areas are used for sugarcane.

The Land Study Bureau classifies most of the project site as Class E soils which have the lowest agricultural productivity rating. The project site was not included in the 1977 Agricultural Lands of Importance classification.

Anticipated Impacts and Mitigation Measures

Most of the property will remain unaffected by the proposed action, with the avoidance of steep slope areas. Soil will be disturbed within the limits of the proposed access drive and home site construction. Erosion control practices will comply with County, State, and Federal regulations. Best Management Practices will be implemented as required in the Grading Permit to mitigate potential impacts of soil erosion and fugitive dust during grading or excavation. The State Department of Health (DOH) National Pollutant Discharge Elimination System (NPDES) permit will be obtained for the project from the State prior to construction.

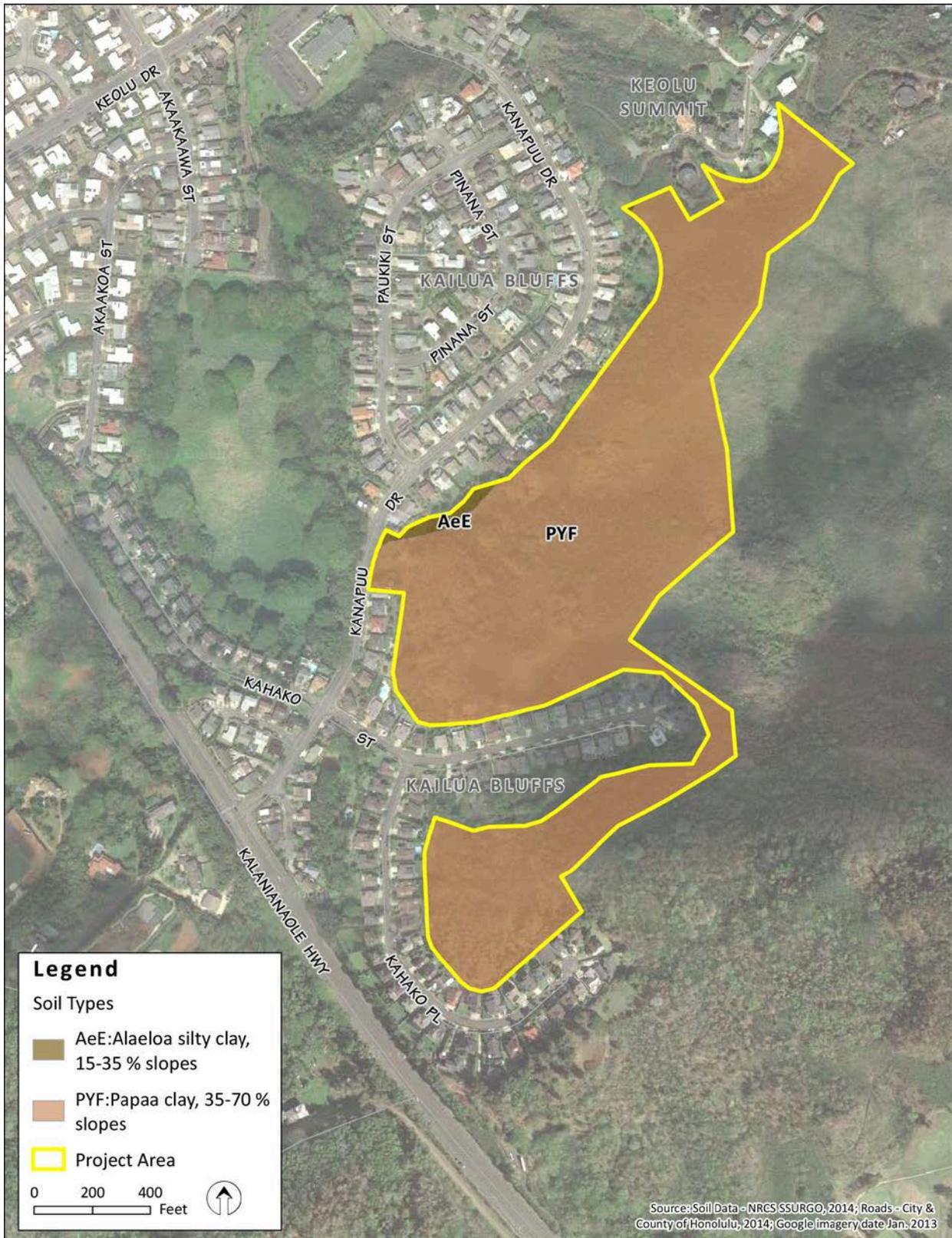
Long-term soil conditions at this property are anticipated to be improved through native plant introduction and increased plant diversity.

3.3 CLIMATE

Existing Conditions

The climate at the project site is typical of that which characterizes most of the State of Hawai‘i. It is relatively mild with constant temperatures throughout the year, moderate humidity, persistent northeasterly trade winds, and infrequent severe rainstorms. Visibility surrounding the existing sites is typically clear except when vog (derived from the words “volcanic” and “smog”) is present. Vog is a result of erupting volcanoes on the island of Hawai‘i. During prolonged periods of southerly Kona winds, the vog can affect islands across the entire State.

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Soils

1711 Kanapu'u Drive, Kailua

Figure 3-2

The Kailua District typically has a warm and dry climate. Normal monthly high temperatures in the area range from 80 degrees in January to 89 degrees in August for an average of 84 degrees. Normal month low temperatures range from 65 degrees in February and a high of 74 degrees in August for a monthly average of 70 degrees. Precipitation ranges from 0.44 inches in August to a high of 3.8 inches in December. The annual average rainfall in Kailua is 70 inches per year (Environmental Communications, Inc. 2012). Three rain gauges located outside the periphery of the property show average annual rainfall ranging from 31.4 inches (north, in Lanikai), 41.9 inches (south, off Kalaniana'ole Highway in Waimānalo), to 44.8 inches (west, closer to the windward slope of Mt. Olomanā) (Giambelluca et al. 2013).

Anticipated Impacts and Mitigation Measures

The project will have no effect on climate conditions, and therefore, no mitigation measures are recommended.

3.4 NATURAL HAZARDS

Existing Conditions

3.4.1 FLOODING

The project site is located within flood Zone X, which indicates that the area is determined to be outside the 500-year floodplain. No base flood elevation or depths have been determined for Zone X areas (*Figure 3-3*). The project area is located well away from streams and coastal areas; further, the natural resources survey identified no aquatic habitats present on the existing site (AECOS 2014).

3.4.2 TSUNAMI

While tsunami inundation of low lying coastal areas is a natural phenomenon in Hawai'i, it is infrequent. The islands are exposed to the major tsunami wave generating areas of the Pacific Ocean. The project site's lowest elevation ranges from 120 to 360 feet mean sea level, and is outside of the City and County tsunami inundation zone (FEMA 2013).

3.4.3 SEISMIC ACTIVITY

The entire City and County of Honolulu lies in a seismic zone designated as Zone 2A. Under the Uniform Building Code seismic provisions, a Zone 2A area could experience seismic activity between .075 and .10 of the earth's gravitational acceleration ("g-force"). In comparison, the County of Hawai'i, with its ongoing volcanic activity, is designated as Zone 4. Zone 4 is the highest seismic zonation representing that the island of Hawai'i could experience severe seismic activity between .30 and .40 g-forces.

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Flood Zone Designation
1711 Kanapu'u Drive, Kailua

Figure 3-3

3.4.4 HURRICANES AND TROPICAL STORMS

Hurricanes and tropical storms are giant whirlwinds in which air moves around a center of low pressure, reaching maximum velocity in a circular band. Tropical storms are categorized as an organized system of strong thunderstorms with defined circulation and maximum sustained winds of 39 to 73 miles per hour. Hurricanes are intense tropical weather systems with well-defined circulation and maximum sustained winds of 74 miles per hour or greater. These intense storms are often accompanied by heavy rainfall and flash flooding.

In the Northern Hemisphere, a hurricane's circulation includes low pressure and counter-clockwise inflow at the surface, and high pressure and clockwise outflow at upper levels. The overall diameter of the hurricane circulation is typically between 300 and 600 miles. A hurricane or tropical storm may create hazardous conditions from high winds, torrential rainfall, coastal and inland flooding and erosion, high surf, and storm surge, which may damage or destroy property and/or threaten lives. The general season for these storms in Hawai'i is between the months of June to December.

Hurricanes are considered to be relatively rare events in the Hawaiian Islands. Records show that strong wind storms have struck all major Hawaiian Islands. The first officially recognized hurricane in Hawaiian waters was Hurricane Hiki in August 1950. Since that time, five hurricanes have caused serious damage in Hawaii: Nina (1957), Dot (1959), Iwa (1982), Estelle (1986), and Iniki (1992).

Anticipated Impacts and Mitigation Measures

Zone X includes areas of minimal hazard from the principal source of flood in the area and the National Flood Insurance Program does not have any regulations for development within this district. No mitigation measures are required.

Because the project area is located away from the coastal area and the stream courses, the project area is not subject to stream flooding or coastal inundation. To prevent ponding or localized flooding resulting from storm run-off, drainage infrastructure in affected areas of the project will be provided to meet applicable design and construction standards. All construction will necessarily conform to relevant building codes to mitigate the risk of wind and seismic damage.

3.5 FLORA AND FAUNA

A botanical survey for the project site was conducted for the project by AECOS, Inc. in November 2013. The findings of the assessment are summarized in the following, and the report is included as Appendix B.

3.5.1 FLORA

Existing Conditions

The parcel is dominated by introduced plant species, including naturalized species and various ornamentals planted by neighboring land owners along the western side. As part of a natural resource survey conducted on the parcel, plant species were identified and abundance calculated with emphasis on the ridgeline, gulch bottoms, and areas adjacent to the developed subdivision lots. During the survey, conducted over three separate days in November 2013, the

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parcel’s floristic composition was identified as that typical for lowland O’ahu: native species accounted for only 3% of the plants encountered (8% if including Polynesian introductions), but constituted far less than 3% of the parcel’s biomass.

In all, 86 taxa of vascular plants were recorded during the three-day botanical survey. None are of special interest or concern from a conservation perspective. Thirty-three of the taxa (comprising 38% of those recorded) were identified as ornamental plantings encroaching upon the parcel’s western boundary, assumed to have been made by neighboring landowners. Three native species (all shrubs) exist on the parcel and are indigenous - those that arrived and survived prior to human contact in Hawai’i, and are also found outside of the Hawaiian Islands. Five species are considered “canoe” plants – those brought by early Polynesians. The dominant biomass of the parcel is fairly uniform: Guinea grass and koa haole scrub, with a mixture of other shrubs and herbs. Patches of introduced tree species (ironwood and Formosan koa) occur on the section of ridgeline, with forested slopes above developed house lots bordering the parcel.

The complete plant species list is in Appendix B; only those plants found across the overall parcel are included in Table 3-1.

Table 3-1: Non-native plants		
Scientific Name	Common Name	Status
<i>Abutilon grandifolium</i>	hairy abutilon	Naturalized
<i>Acacia confuse</i>	Formosa koa	Naturalized
<i>Acacia farnesiana</i>	<i>klu</i>	Naturalized
<i>Asparagus densiflorus</i>	asparagus “fern”	Naturalized
<i>Asparagus plumosus</i>	climbing asparagus “fern”	Naturalized
<i>Asystasia gangetica</i>	Chinese violet	Naturalized
<i>Bambusa multiplex</i>	hedge bamboo	Ornamental
<i>Barleria repens</i>	pink ruellia	Ornamental
<i>Bidens alba</i>	beggartick	Naturalized
<i>Bidens cyanapiifolia</i>	---	Naturalized
<i>Blechnum appendiculatum</i>	---	Naturalized
<i>Canavalia cathartica</i> *	Maunaloa vine	Naturalized
<i>Carmonaretusa</i>	Fukien tea	Naturalized
<i>Casuarina equisetifolia</i>	ironwood	Naturalized
<i>Chamaecrista nictitans</i>	Partridge pea	Naturalized
<i>Chrysophyllum oliviforme</i>	satinleaf	Naturalized
<i>Citharexylum caudatum</i>	fiddlewood	Naturalized
<i>Clusia rosea</i>	autograph tree	Naturalized
<i>Coccinia grandis</i>	scarlet-fruited gourd	Naturalized
<i>Desmodium incanum</i>	Spanish clover	Naturalized
<i>Digitaria insularis</i>	sourgrass	Naturalized
<i>Hyptis pectinata</i>	comb hyptis	Naturalized
<i>Jasminum fluminense</i>	Brazilian jasmine	Naturalized
<i>Lantana camara</i>	<i>lākana</i> , lantana	Naturalized

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Table 3-1: Non-native plants		
<i>Leucaena leucocephala</i>	<i>koa haole</i>	Naturalized
<i>Lygodium japonicum</i>	Japanese climbing fern	Naturalized
<i>Mimosa pudica</i>	sensitive plant	Naturalized
<i>Momordica charantia</i>	wild bitter melon	Naturalized
<i>Murraya paniculata</i>	mock orange	Naturalized
<i>Neonotonia wightii</i> *	glycine vine	Naturalized
<i>Ochna thomasiana</i>	Mickey Mouse plant	Naturalized
<i>Opuntia ficus-indica</i>	<i>pānini</i>	Naturalized
<i>Passiflora edulis</i>	passion fruit vine	Naturalized
<i>Passiflora suberosa</i>	<i>huehue haole</i>	Naturalized
<i>Pithecellobium dulce</i>	‘opiuma	Naturalized
<i>Plantago major</i>	common plantain	Naturalized
<i>Portulaca oleracea</i>	pigweed	Naturalized
<i>Rivina humilis</i>	coral berry	Naturalized
<i>Santalum album</i> *	white sandalwood	Naturalized
<i>Schinus terebinthifolius</i>	Christmas berry	Naturalized
<i>Senna surattensis</i>	scrambled egg plant, <i>kolomana</i>	Naturalized
<i>Sideroxylon persimile</i> *	bumelia	Naturalized
<i>Solanum seafortianum</i>	---	Naturalized
<i>Spathodea campanulata</i>	African tulip tree	Naturalized
<i>Stapelia gigantean</i>	giant toad plant	Naturalized
<i>Swietenia mahagoni</i>	Cuban mahogany	Naturalized
<i>Syzygium cuminii</i>	Java plum	Naturalized
<i>Urochloa maxima</i>	Guinea grass	Naturalized
<i>Urochloa mutica</i>	California grass	Naturalized
Native and early Polynesian Introduced plants		
Scientific Name	Common Name	Status
<i>Cocos nucifera</i>	<i>niu</i> , coconut	Polynesian
<i>Dodonaea viscosa</i>	‘a‘ali‘i	Indigenous
<i>Osteomeles anthyllidifolia</i>	‘ulei	Indigenous
<i>Waltheria indica</i>	‘uhaloa	Indigenous

Anticipated Impacts and Mitigation Measures

Most of the property will remain unaffected by the proposed action, with the existing habitat areas remaining largely intact. The project includes planting native vegetation in select areas of the parcel, to restore and increase native plant diversity. Over time, non-native plants will be replaced with native species. Best Management Practices for soil management will be employed at planting sites to improve soil structure, reduce erosion, and optimal water use. Over the long-term, soil conditions are expected to improve where non-native species are replaced by native species. No rare or endangered plants exist on the parcel. Further, the parcel does not include any wetlands, floodplains, or other sensitive ecosystems. Aside from exotic plant removal, no additional mitigation measures specific to flora resources are proposed.

3.5.2 FAUNA

3.5.2.1 Avifauna

All of the birds detected during the survey represent avian species that have been introduced to the Hawaiian Islands. Three species [Red-vented Bulbul (*Pycnonotus cafer*), Java Sparrow (*Padda oryzivora*), and House Finch (*Haemorhous mexicanus*)] accounted for slightly more than 59% of the total number of individual birds recorded. Red-vented Bulbuls were the most frequently recorded species, accounting for 23% of the individual birds observed at five avian point count stations. The zoologist conducting the avian survey searched the remainder of the property for species and habitats not detected during the point counts at the five established stations. A total of 142 individual birds of 14 species, representing 11 separate families, were recorded during station counts (Appendix B).

Table 3-2: Non-native Birds	
Scientific Name	Common Name
<i>Acridotheres tristis</i>	Common Myna
<i>Cardinalis cardinalis</i>	Northern Cardinal
<i>Copsychus malabaricus</i>	White-rumped Shama
<i>Estrilda astrild</i>	Common Waxbill
<i>Garrulax canorus</i>	Chinese Hwamei
<i>Geopelia striata</i>	Zebra Dove
<i>Haemorhous mexicanus</i>	House Finch
<i>Leiothrix lutea</i>	Red-billed Leiothrix
<i>Padda oryzivora</i>	Java Sparrow
<i>Passer domesticus</i>	House Sparrow
<i>Pycnonotus cafer</i>	Red-vented Bulbul
<i>Sicalis flaveola</i>	Saffron Finch
<i>Streptopelia chinensis</i>	Spotted Dove
<i>Zosterops japonicus</i>	Japanese White-eye

Although no seabirds were detected during the course of this survey, low numbers of several seabird species potentially overfly the site on occasion. There are no known nesting colonies of any of the O‘ahu resident seabird species on, or within close proximity of the subject property (AECOS 2014).

3.5.2.2 Mammals

Consistent with the location of the site and the highly disturbed habitats present, only non-native mammals were detected during the natural resource management survey. Several dogs (*Canis familiaris*) were heard barking from houses below the site. Scat, tracks, and sign of feral pig (*Sus scrofa*) were encountered at a number of locations within the site, but mostly in the area of the proposed house site and the trail connecting the site with the main (east) ridgeline trail. Although no rodents were detected during the course of the survey, it is likely that the four established Muridae found on O'ahu - roof rat (*Rattus r. rattus*), brown rat (*Rattus norvegicus*), European house mouse (*Mus musculus domesticus*), and possibly black rat (*Rattus exulans hawaiiensis*) - use various resources in the area on a seasonal basis. All of these introduced rodents are deleterious to native ecosystems and the native faunal species dependent on them.

No Hawaiian hoary bats were detected during the course of this survey. A possibility exists that bats may occasionally use resources within the lower, more densely treed parts of the site.

No species proposed for listing or listed under the federal endangered species act of 1973, as amended or the State of Hawai'i's (H.R.S. 195D) were recorded during the course of the natural resources survey (AECOS 2014).

Anticipated Impacts and Mitigation Measures

The current habitats on the property are neither unique nor important for any Federal or State listed avian or mammalian species currently known from the Island of O'ahu. Existing habitat areas will be enhanced in the central portion of the property through selective removal of non-native species and planting of native species. Access for human trapping of feral pigs by the Pig Hunters Association of O'ahu will be allowed as needed to minimize feral pig damage to soils. The project will not result in modification of any federally designated Critical Habitat, as there is none present on the subject property.

The primary cause of mortality in resident seabirds is thought to be predation by alien mammalian species at the nesting colonies (AECOS 2014). As there are no known nesting colonies of any O'ahu resident seabirds near the property, the project will have no effect. The second-most cause of mortality in locally nesting seabird species in Hawai'i is collision with man-made structures. Night-flying seabirds, especially fledglings on their way to sea in the summer and fall, can become disoriented by exterior lighting. When disoriented, seabirds may collide with man-made structures and, if not killed outright, can be easy prey for feral mammals (AECOS 2014).

To avoid adverse impacts on night-flying sea birds, lights associated with construction activities will be shielded, and if large flood/work lights are used, they will be placed on poles high enough to allow the lights to be pointed directly at the ground. Exterior house lighting will be shielded to reduce the potential for interactions between nocturnally flying seabirds and man-made structures.

Though the presence of the Hawaiian Hoary Bay has not been confirmed on the site and are uncommon on O'ahu, the endangered species status mandates protection. Removal or pruning of trees taller than 15 feet will be avoided during the pupping season June through mid-September.

3.6 AIR QUALITY

Existing Conditions

As required by the Clean Air Act (last amended in 1990), the U.S. EPA established the National Ambient Air Quality Standards (NAAQS) to protect public health and welfare and prevent the significant deterioration of air quality. These standards cover seven major air pollutants: carbon monoxide (CO), nitrogen oxides (NOX), ozone (O₃), particulate matter smaller than 10 microns (PM₁₀), particulate matter smaller than 2.5 microns (PM_{2.5}), sulfur oxides (SOX), and lead. The State DOH, Clean Air Branch (CAB) has also established State Ambient Air Quality Standards (SAAQS) for six of these air pollutants to regulate air quality statewide. The SAAQS for carbon monoxide and nitrogen dioxide are more stringent than NAAQS (DOH 2010). Hawai'i also has a stringent standard for hydrogen sulfide, which is a common odorous pollutant associated with wastewater treatment facilities.

The DOH, CAB regularly samples ambient air quality at monitoring stations throughout the State and annually publishes this information. In general, air quality in the State of Hawai'i continues to be one of the best in the nation, and criteria pollutant levels remain well below NAAQS and SAAQS. Air quality monitoring data compiled by the DOH indicates that the established air quality standards for all monitored parameters are consistently met throughout the State and on the island of O'ahu.

Air quality at the project site is positively influenced by trade winds that regularly blow from a northeasterly direction moving generated air pollutants across the island and out to the open ocean. Problems with poor air quality and elevated pollutant levels generally occur when trade winds diminish or give way to southerly and southwesterly winds (known as Kona wind conditions). Kona winds often bring vog from the island of Hawai'i's active volcanoes, providing the greatest potential for air pollutant buildup.

Anticipated Impacts and Mitigation Measures

Construction

There will be two types of short-term air quality impacts that will result from the proposed construction project at the site: 1) fugitive dust generation dust from vehicle movement and soil excavation and 2) on-site/off-site emissions from moving construction equipment and commuting construction workers. State of Hawai'i Air Pollution Control regulations prohibit visible emissions of fugitive dust from construction activities at the property line. Most of the property will remain unaffected by the proposed action, with the existing vegetated areas remaining largely intact. In the limited work areas, a dust control program will be implemented to control dust from construction activities. Fugitive dust emission will be controlled through the mitigation measures such as watering active work areas, using wind screens, keeping adjacent paved roads clean, covering open-bodied trucks and limiting the area to be disturbed at any given time.

Operations

The project involves a residential home which will not affect existing air quality. No mitigation is required.

3.7 NOISE

Existing Conditions

Title 11, Chapter 46, of the HAR 11-46 defines maximum permissible sound levels which are intended to protect, control, and abate noise pollution from stationary sources and construction, industrial, and agricultural equipment. Maximum permissible sound levels for the property are shown below, relevant to the residential district for excessive noise sources during the day (7am to 10 pm) and night (10pm to 7am) at the property line where the activity occurs.

- Class A - Residential, conservation, preservation, public space, open space, or similar type zones – 55 decibel (dB) (day) and 45 dB (night)

Contributors to the existing background ambient noise levels within the project area is attributed to motor vehicle traffic along the neighboring streets and background ambient noise such as wind moving through vegetation, and birds.

Anticipated Impacts and Mitigation Measures

The project will not result in significant increases in ambient noise levels. While noise may be generated during the construction period, the project is not expected to impact the distant neighbors. Construction activities will be monitored by the State to comply with the provisions of the regulation for community noise control. The dominant noise sources during construction will be earth moving equipment. Noise levels associated with construction equipment typically range from 80 to 95 dB at 50 feet from the source. While significant impacts to neighboring areas are not anticipated, mitigation measures will be implemented to minimize construction noise impacts. These measures include limiting work to daytime hours and reducing truck/equipment idling when not in use.

Once the residential home is developed, ongoing noise impacts are not anticipated to occur. In addition, impacts to other noise sensitive areas are not expected, particularly since the project site is located well away from schools, hospitals, and nursing homes.

3.8 UTILITIES AND INFRASTRUCTURE

Group 70 International, Inc. prepared a Preliminary Engineering Review for the proposed project site in November, 2014 (Appendix C).

3.8.1 WATER SYSTEM

Existing Conditions

Public water supplies are currently not used at the project site.

Probable Impacts and Mitigation Measures

The proposed project will utilize public water supplies from 1711 Kanapu'u Drive. Prior to property purchase, the current landowner inquired as to the availability of water suitable for a residential use on the property. The Honolulu City and County's Board of Water Supply

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confirmed the existing water system is adequate and noted a final decision on availability of water would be confirmed with submittal of a building permit application. The location of the water meter will be on Kanapu'u Drive, and applicable water system facility charges for resource development, transmission and daily storage will be assessed.

Based on the Board of Water Supply's "Water System Standards, 2002," the project will require an average daily demand of about 500 gallons per day. The flow rate will require a proposed 5/8-inch water meter, which has a maximum capacity of 20 gallons per day, with on-site pipes anticipated to be 2-inches. The water system will be sized according to the Uniform Plumbing Code, 1997.

The Board of Water recommended investigation of non-potable water for irrigation of agricultural component of the project. The landowner may pursue a non-potable well source in the future, and will obtain necessary permits from the Commission on Water Resources and the Office of Conservation and Coastal Lands.

3.8.2 WASTEWATER

Existing Conditions

There is an existing 8-inch sewer main along Kanapu'u Drive. The main is owned, operated, and maintained by the City and County of Honolulu. No wastewater treatment and/or disposal facilities exist on the project site. No wastewater is currently being generated from the site since the area consists of vacant land.

Probable Impacts and Mitigation Measures

Based on the City's Wastewater System Standards, the dwelling will generate an average daily flow of about 320 gallons per day of wastewater. The proposed project will be serviced by a new 6-inch gravity lateral which will connect to the City and County of Honolulu's existing 8-inch main along 1711 Kanapu'u Drive street frontage. Prior to property purchase, the current landowner inquired as to the availability of sewer connection suitable for a single-lot development on the property. The sewer connection application was approved, confirming a sewer capacity reservation for two years from approval date. The approval requires completed construction plans and payment of applicable wastewater system facility charges.

3.8.3 STORM DRAINAGE

Existing Conditions

The drainage pattern of the property north of Kahako Street generally flows towards Kanapu'u Drive. There are two ditches on the property that collect runoff, which direct runoff towards an existing 54-inch culvert to a storm water detention basin across Kanapu'u Drive. The inlet has a capacity of 128.8 cubic feet per second. The two ditches have easements in favor of the property owners; the intake structure has an easement in favor of the City and County.

The property area bounded by Kahako Place and Kahako Street collects runoff through a ditch running along the properties on Kahako Place. This ditch directs flow to a 12-foot diameter culvert that discharges to a storm water detention basin. This ditch has an easement in favor of

the property owners. These ditches are not well maintained; photographs show the ditches filled with debris, which may prevent runoff flow to the discharge points.

A drainage report and detailed hydrologic and hydraulic analysis will be prepared and submitted to the State for approval along with construction plans.

Probable Impacts and Mitigation Measures

Most of the property will remain unaffected by the proposed action, with the existing drainage areas remaining largely intact. To comply with City drainage standards, the proposed onsite drainage system will remain, as overland flow with runoff from the dwelling unit being collected from roof downspouts which could potentially flow through a trenched irrigation system in the proposed crops and native plant agricultural area, then sheet flow towards the existing intake structure. This would increase time of concentration for storm water quality purposes. The drainage runoff in the project area's drainage basin for proposed conditions is approximately 94.84 cfs, based on a 10-year recurrence interval, 1-hour duration rainfall. The proposed flow condition is an increase of 1.14 cfs from the existing condition flow of 93.7 cfs. The proposed flow conditions still do not exceed the culvert's inlet capacity of 128.8 cfs.

On-site storm drainage system will be designed in accordance with City and County of Honolulu Department of Planning and Permitting's Rules Relating to Storm Drainage Standards. Additionally, any applicable Uniform Plumbing Code Standards will be incorporated in the design. No significant storm drainage impacts are anticipated.

3.9 HAZARDOUS WASTE

Existing Conditions

Hazardous waste is defined as having a chemical composition or containing other properties that make it capable of causing illness, death, or some other harm to humans and other life forms when mismanaged or released into the environment (EPA 2005).

No hazardous waste materials have been identified on the property.

Anticipated Impacts and Mitigation Measures

The project will not involve the use of hazardous materials. Therefore, adverse impacts relating to the hazardous waste are not anticipated as a result of the proposed project. Construction of the project will not involve hazardous waste since there are no existing structures located on the project site that will need to be removed. Some hazardous materials will be used in the course of construction such as fuels and lubricants. Best Management Practices will be employed to prevent and address any inadvertent leakage from construction vehicles.

3.10 ELECTRICAL AND COMMUNICATIONS

Existing Conditions

Currently there is no transmission of electrical power or communication infrastructure to the site, as it is undeveloped.

Anticipated Impacts and Mitigation Measures

The proposed project includes rooftop photovoltaic panels with battery backup to provide a portion of the energy to the single family residence. The power produced will be provided to the HECO grid through electric lines on Kanapu‘u Drive. Telecommunications for the site will be extended from underground conduits on Kanapu‘u Drive (Appendix C).

3.11 TRAFFIC AND ROADWAYS

Existing Conditions

The project site is located near Kanapu‘u Drive and Kahako Street. Access to the site will be from Kanapu‘u Drive, an existing two lane City and County road. A mid-day site inspection of these roads observed infrequent vehicle use of this portion of Kanapu‘u Drive.

Existing dirt roads suitable for foot traffic and the small 4-wheel drive electric utility vehicle used for maintenance of the site provide circulation within the project parcel.

Existing Bus Service

Bus service is provided approximately 0.2 miles from the project site entrance at 1711 Kanapu‘u Drive by routes along nearby Kalaniana‘ole Highway, including Routes 57, 77 and Express 85 and 89.

Anticipated Impacts and Mitigation Measures

Significant impacts to existing traffic in the area are not anticipated to occur as a result of the project. The project is a residential home and will generate traffic typical of the use. The proposed project is anticipated to generate less than five trips during the AM and PM peak hours of traffic and will not impact the traffic operations on the roadways near the project site.

Existing bus service for the project site will not be affected by the project. The project will not generate any significant increases or decreases in the existing ridership.

While impacts to existing traffic and bus services are not anticipated to occur as a result of the project, if deemed appropriate, the Contractor will notify the City and County of Honolulu, Department of Transportation Services, Public Transit Division and Oahu Transit Services, Inc. (bus operations and para-transit operations) of the scope of work, location, proposed closure of any street, traffic lane, sidewalk, or bus stop and duration of project’s at least two weeks prior to construction.

3.11.1 PARKING

Existing Conditions

Current parking for the parcel is along the curb near the 1711 Kanapu‘u Drive property entrance. The site is made up of vacant preservation land which is overgrown with tall brush and shrub vegetation.

Probable Impacts and Mitigation Measures

The project will require parking on the site. A designated parking area will be created to support the residential use at the home site. No mitigation measures are proposed.

3.12 SOCIO-ECONOMIC CHARACTERISTICS

Existing Conditions

The project site is located in the Kailua region of Windward O‘ahu, specifically, the subdivision known as Kailua Bluffs. Kailua is primarily a residential community, with a centralized commercial district along Kailua Road. It has a compact, easy-to-shop business district surrounded by mostly single family homes. In 2010, the population of the Kailua community was 38,635 persons (US Census Bureau).

Anticipated Impacts and Mitigation Measures

Development of the project is not expected to result in negative impacts to socioeconomic conditions. The project will involve the development of a residential home and will not significantly affect the existing population or general socio-economic character of the area.

The project will create short-term employment opportunities for the site work and general construction of the project. The overall labor required to support the project is not large enough to change the area’s occupational character.

No specific socio-economic mitigation actions are recommended.

3.13 PUBLIC FACILITIES AND SERVICES

This section discusses the project’s probable impact on public facilities and services of the project site and surrounding areas.

3.13.1 EDUCATIONAL FACILITIES

Existing Conditions

Educational facilities located near the project site include:

- Keolu Elementary School is located at 1416 Keolu Drive, approximately 0.5 miles away from the project site and is the closest public school educational facility.
- Kailua Intermediate School is located at 145 Kainalu Drive, approximately 2.8 miles away from the project site.
- Kailua High School is located at 451 Ulumanu Drive, approximately 2.3 miles away from the project site.

Anticipated Impacts and Mitigation Measures

The project is not expected to affect existing educational facilities near the project site. No mitigation is proposed.

3.13.2 RECREATIONAL FACILITIES

Existing Conditions

There are no existing recreational areas within the site. The closest park is Keolu Hills Neighborhood Park. There are also many other parks and beaches that are located within the Kailua Community, including Kailua Beach Park, Kailua District Park and Ka'elepulu Mini Park.

The property is only accessed by the current property owner, via a recently cleared road. There are no public access trails on the property. An abandoned private dirt road/jeep trail was identified in the archaeological survey. This corridor/trail is not known to be of historic or cultural importance, and therefore is not accessible to the public.

Anticipated Impacts and Mitigation Measures

The proposed project will not affect existing recreational facilities, therefore, no mitigation is recommended.

3.13.3 POLICE

Existing Conditions

The project site in Kailua is served by Honolulu Police Department (HPD) District 4 which covers the area between Waimanalo to Kahuku. The Kailua HPD station is located at 219 Ku'uilei Road, approximately 3.6 miles from the project site.

Anticipated Impacts and Mitigation Measures

This project should not impact police department's operations or ability to provide adequate protection services to the surrounding community. District 4 police protection should be adequate for to serve the proposed project. No adverse impacts or mitigation is proposed.

3.13.4 FIRE

Existing Conditions

Primary fire protection of the project area is served by the Olomana Fire Station (Station 39), which is located approximately 1.7 miles away from the project site. The second closest facility is the Kailua Fire Station (Station 18) which is about 3.7 miles away from the project site.

Anticipated Impacts and Mitigation Measures

Access to the property has been designed to be in compliance with the fire and building code requirements. The driveway access will be 16 feet wide, with an additional 2 feet of clearance at each shoulder. Additionally, in compliance with the fire department requirements, there will be a fire truck turnaround at the end of the driveway access and a sprinkler system installed at the site. The project is not expected to impact the Fire Department's operations or ability to provide fire protection services to the project areas and surrounding areas.

3.13.5 EMERGENCY MEDICAL SERVICES

Existing Conditions

Castle Medical Center is the nearest emergency hospital to the project site. Located approximately 2.2 miles from the project site, the average EMS response is three to five minutes.

Anticipated Impacts and Mitigation Measures

The proposed project will not impact the handling of EMS or medical emergencies. The Castle Medical Center will continue to function in its present location and will be accessible to the project site in Kailua. No mitigation is proposed.

3.13.6 SOLID WASTE MANAGEMENT

Existing Conditions

The existing project site is vacant; therefore, no solid waste is being generated and no form of solid waste disposal taking place on the site.

Anticipated Impacts and Mitigation Measures

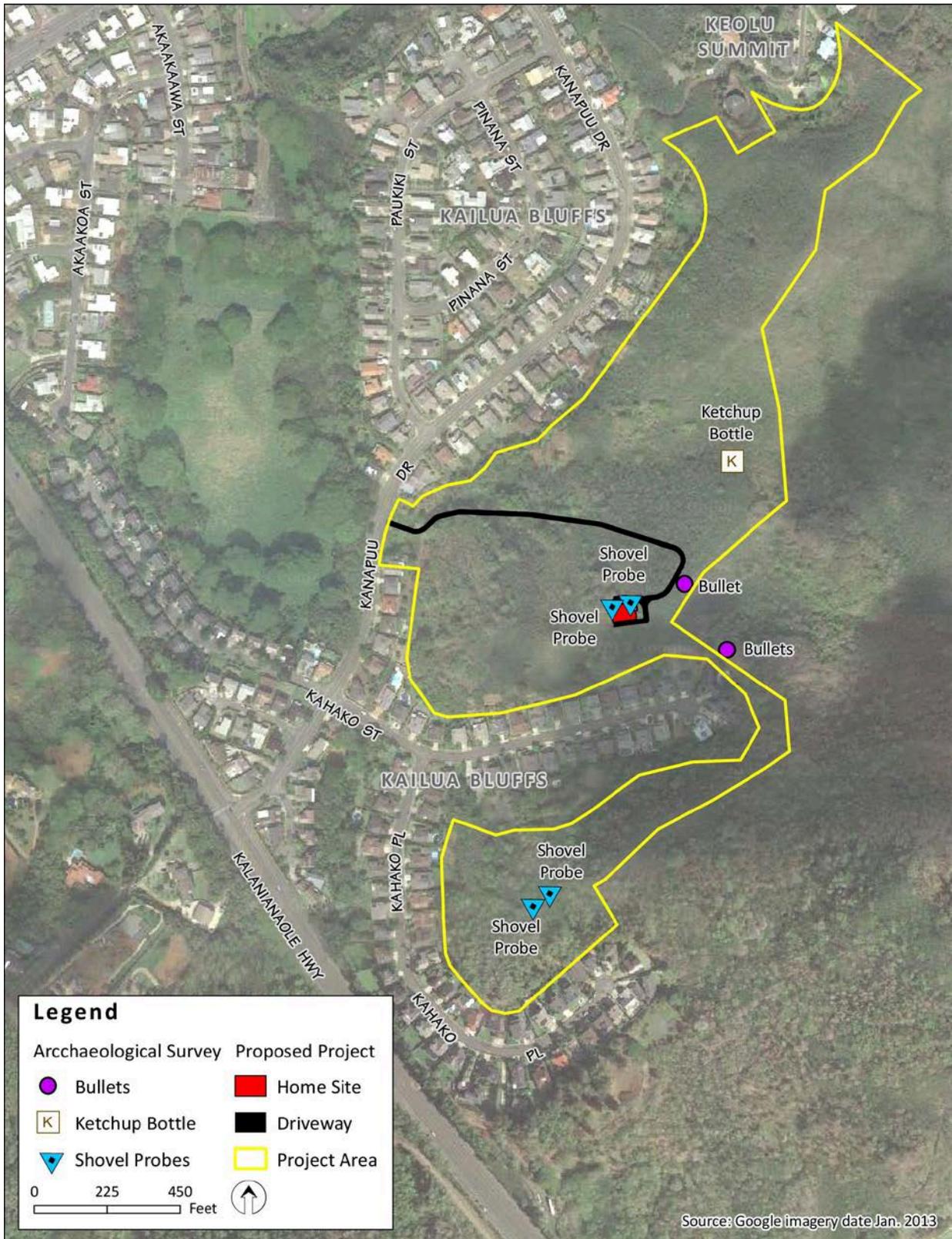
The project will result in the generation of general solid waste; initial solid waste will be related to construction, and ongoing solid waste will be household-related. Waste management services are to be provided by the City and County of Honolulu, Residential Refuse Collection Service. Construction wastes are expected to be minimal since the site will require no demolition of existing structures. General City recycling practices will also be maintained by the landowner.

3.14 ARCHAEOLOGICAL AND HISTORICAL RESOURCES

Existing Conditions

In September 2013, an Archaeological Inventory Survey was performed for the project site by Scientific Consultant Services, Inc. (SCS). The survey resulted in no archaeological findings on the ground surface or within the subsurface of the roughly 5.5 acre area surveyed. Therefore, the resultant report is an Archaeological Assessment (AA), in accordance with the HAR §13-275-5(b)(5) statement " Results of the survey shall be reported either through an archaeological assessment, if no sites were found, or an archaeological survey report which meets the minimum standards set forth in Chapter 13-276." The AA is included as Appendix D. The archaeological investigation included archival research, pedestrian surveys, and shovel probes in project areas where ground disturbance is planned to take place (*Figure 3-4*). State Historic Preservation Division reviewed the Draft AA and commented that development beyond the 5.5 acre survey area requires further historic preservation actions.

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Archaeological Survey
1711 Kanapu'u Drive, Kailua

Figure 3-4

Anticipated Impacts and Mitigation Measures

Most of the property will remain unaffected by the proposed action, with most existing areas remaining unaffected. While no historic properties were identified during the archeological survey of the site, there is a remote possibility of discovering cultural deposits and/or human burials in either a primary or secondary context. The majority of prior archaeological studies in the project vicinity have resulted in no identified archaeological sites; however, in a 2005 AIS 1,500 meters northwest of the project area, two historic sites including a lithic scatter and a water-flow control structure were identified. In the event that historic or traditional cultural properties (i.e. cultural layers, etc.) are encountered during construction, work in the project area will cease until SHPD is notified, and appropriate protocols are carried out.

3.15 CULTURAL RESOURCES

Existing Conditions

A Cultural Impact Assessment (CIA) was completed for the project by SCS. The study was prepared in March 2014 and is included as Appendix E. The following section provides a description of the CIA and findings for the project area.

The project requires compliance with Act 50 Session Laws of Hawai'i 2000 and the State of Hawai'i environmental review process under Chapter 343, Hawai'i Revised Statutes (HRS), which requires consideration of a proposed project's effect on traditional cultural practices. Through document research and cultural consultation efforts, the report provided information that was applicable to the assessment of the project and its potential impacts to cultural practices. Hawaiian organizations, agencies, and community members have been contacted for both CIA studies in order to identify potentially knowledgeable individuals with cultural expertise and/or knowledge of the project areas and their vicinities.

The noteworthy findings from this study include portions of two Land Commission Awards documented in the project area (LCA 44:2 awarded to Kala'au, signed by Kamehameha III, and LCA 4452-12, awarded to Queen Kalama) and cultural impact assessment inquiry responses from members of the Kailua community. Although the majority of contacted organizations and individuals did not respond to the cultural impact assessment inquiry of the property, three of the responses from members of the Kailua community noted that there is a possibility for historic cultural sites to be located on or near the property.

Anticipated Impacts and Mitigation Measures

The information presented in the CIA report for the project site reveals no notable cultural activities took place at the specific project areas (Appendix E). There was no additional information from the other contacted organizations, newspapers, and archival research. Therefore, 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 the activities of the proposed home. Adverse effects are not anticipated since no cultural activities were identified to occur at the specific project area.

3.16 VISUAL RESOURCES

Existing Conditions

The project site is located in Kailua, Windward O'ahu. *Figure 3-5* provides an aerial perspective of the general area. The project site is directly surrounded by trees and overgrown brush and scrub vegetation. Beyond this area are residential homes to the west, northwest and south (*Figure 3-5A through 3-5D*). To the north and east lie open preservation lands (*Figure 3-5E and 3-5F*). Beyond these open preservation lands looking east, are makai views of lush greenery and mountainous landscapes (*Figure 3-5G*).

Scenic features are one of the key elements of the Ko'olaupoko Sustainable Communities Plan. The plan prioritizes the preservation of views of ridgelines of coastal headlands and mountains from the vantage points of the ocean, major roads, parks, and other public places (*Figure 3-6*).

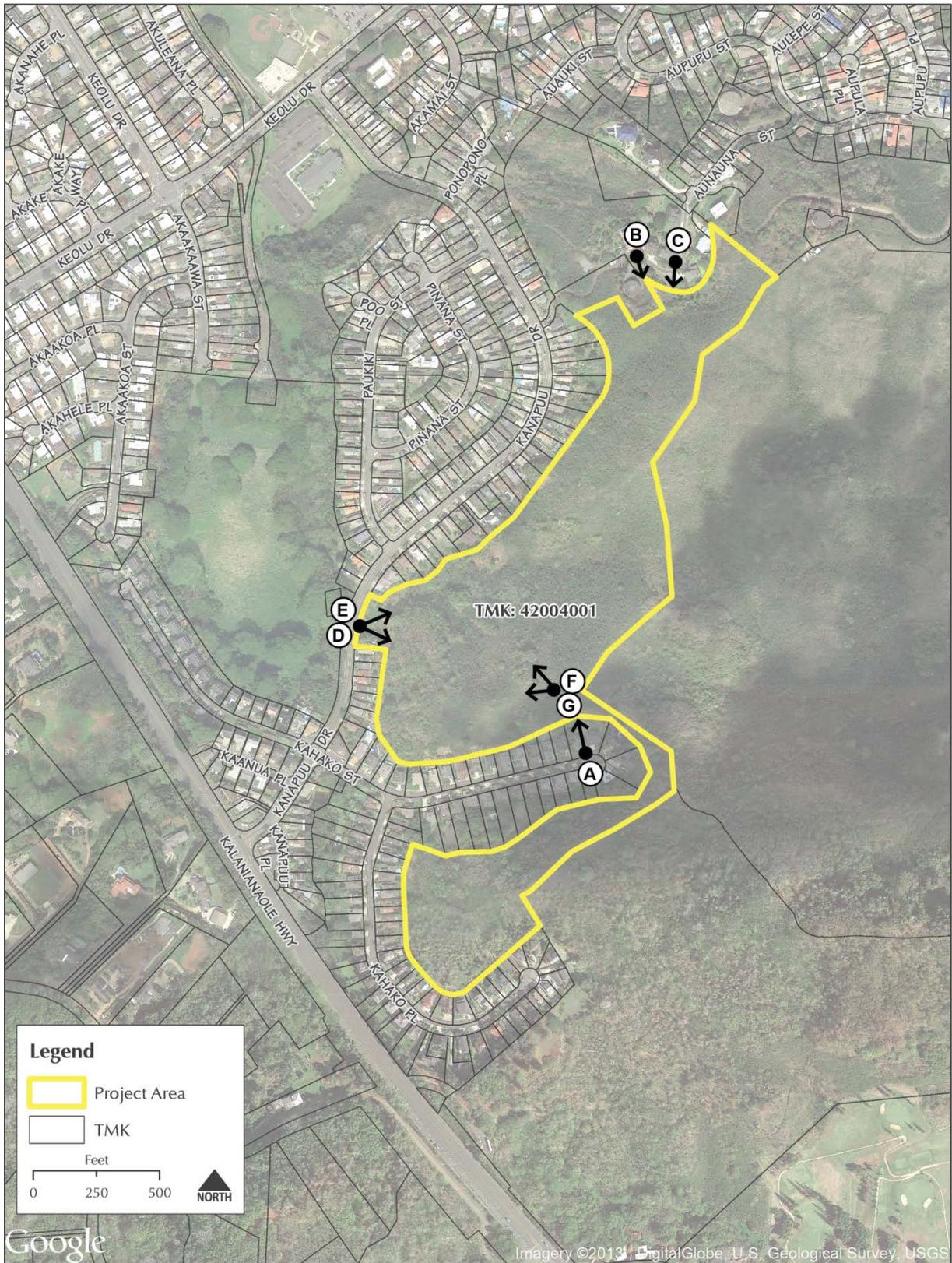
Anticipated Impacts and Mitigation Measures

Most of the property will remain unaffected by the proposed action. The project will be developed on vacant land under regulations allowing a single family residence. The project will be visible from a small portion of Kanapu'u Drive, with some of the home's roofline anticipated to be visible from distant points in Kailua. However, it will not be visible from Kahako Street. The driveway access from Kanapu'u Drive will be gated and fenced. From vantage points both mauka and makai of the site, the property will generally appear as a continuation of vacant preservation lands in the area. The use of this land for a home site will not detract from the visual resources of the area and will meet State and City development standards. The residence will blend with the surrounding land, to preserve the natural beauty of Kailua and Windward O'ahu. No significant impacts to scenic vistas or existing open preservation landscapes are anticipated.

Potential Cumulative and Secondary Impacts

Cumulative effects are impacts, which result from the incremental effects of an activity when added to other past, present, and reasonably foreseeable future actions, regardless of what agency or person undertakes such other actions. The project will not result in cumulative or secondary impacts. The proposed project involves the development of a residence within the 37 acre parcel. Development of the site will be for personal use by a homeowner and will result in very minor environmental and social impacts. The home will fit with the adjacent residential uses of the general area. Construction activity during the proposed project will generate direct employment, as well as indirect and induced employment in construction-related industries.

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Site Photo Key
1711 Kanapu'u Drive, Kailua

Figure 3-5

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View from Kahako Street Looking North Towards the Property

Figure 3-5A



View from Keolu Summit Water Tank Looking South Towards the Property

Figure 3-5B

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(Source: Google Maps, 2013)

View from Keolu Summit Looking South Towards to the Property

Figure 3-5C



(Source: Google Maps, 2013)

View from Kanapu'u Drive Looking East Towards to the Property

Figure 3-5D

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(Source: Google Maps, 2013)

View from Kanapu'u Drive Looking Northeast Towards the Property

Figure 3-5E



View from the Property Looking West

Figure 3-5F

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View from the Property Looking Northwest

Figure 3-5G

Section 4.0

Alternatives to the
Proposed Action

4.0 ALTERNATIVES TO THE PROPOSED ACTION

Three alternative scenarios can be considered for this property, including No Action, Active Recreation, and Subdivision for Residential Use.

No Action Alternative

The No-Action Alternative would allow the property to continue in the form it has been in for the past few decades. In 2013, the new owner found the property to contain extensive illegal dumping material, clogged natural drainage courses, and substantial areas of erosion and habitat degradation due to invasive plants. Uncontrolled access allows a range of illegal activities occurring on this parcel, causing disruptions to the neighboring residential areas. More than a dozen neighboring properties had encroached onto the Conservation District land with unauthorized uses. Continuation of these conditions does not support the Conservation District objectives, and degrades the land and vegetation cover. The No Action alternative would result in greater impacts due to continued soil erosion, invasive vegetation growth, illegal dumping and activities including encroachments. In comparison to the proposed action, the potential impacts of this alternative are significantly greater.

Active Recreational Use Plan Alternative

One option for the future use of this property could be conversion to an active recreational use site as envisioned by the subdivision's 1980 developer, Lone Star Hawai'i, Inc. Hiking trails connected to others throughout the Ko'olaupoko area, and a picnic area, were part of the proposed uses included in the redistricting from Conservation to Urban (LUC 1981). Open access for hiking, mountain bike riding, camping and outdoor events could be allowed through a Conservation District permitting process to enable broad community use. Points of access could be established at the property boundaries and from the terminus of adjoining public roadways. People visiting the property could park along the wide, public streets and enter the property from all sides. Such a use would not include support facilities, as public access would not generate revenues. Facilities could be supported with offsetting access fees. Through internet advertising and social media, recreational use could become extremely popular given the views, natural setting, and proximity to urban areas and a primary island highway. Zip line rides or ATV rides could be considered with additional permitting. The associated impacts with these uses that would need to be addressed include traffic, parking, noise, habitat impacts, and the need for solid waste and wastewater management. In comparison to the proposed action, the potential impacts of this alternative would be significantly greater.

Subdivision for Residential Use Plan Alternative

The property has two areas (6.4 and 4.7 acres) of State Urban District land which could be utilized for a small residential subdivision or condominium development. Residential use would require County approvals for a Sustainable Communities Plan amendment and Zone Change from Preservation to Residential. The 11 acres converted to R-10 Residential zoning, with set-asides for steep areas and drainage routes, could support 30 to 40 new units. This small residential project would be extremely popular due to its natural setting and exceptional views. New infrastructure expansion would be required to provide roadways, water supply, and

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wastewater service. The new development would increase the area's population and introduced associated community impacts of traffic from an estimated 60 - 80 additional vehicles, associated noise, visual impacts, drainage/runoff, erosion, and vegetation/habitat loss. In comparison to the proposed action, the potential impacts of this alternative would be significantly greater.

Section 5.0

Applicable Land Use
Plans and Policies

5.0 APPLICABLE LAND USE PLANS AND POLICIES

In this chapter, the project's consistency with applicable land use policies set forth in the Hawai'i State Plan, State Land Use Law, State Coastal Zone Management (CZM) Program, State 2050 Sustainable Plan, City and County of Honolulu General Plan, Ko'olaupoko SCP, Land Use Ordinance (LUO), and SMA are discussed.

5.1 HAWAI'I STATE PLAN

The Hawai'i State Plan establishes a statewide planning system that provides goals, objectives, and policies that detail priority directions and concerns of the State of Hawai'i; relevant elements related to the project follow.

State goals under the Hawai'i State Planning Act (Chapter 226, HRS) include:

- A strong, viable economy, characterized by stability, diversity, and growth, that enables the fulfillment of the needs and expectations of Hawai'i present and future generations.
- A desired physical environment, characterized by beauty, cleanliness, quiet, stable natural systems, and uniqueness, that enhances the mental and physical well-being of the people.
- Physical, social, and economic well-being, for individuals and families in Hawai'i, that nourishes a sense of community responsibility, of caring, and of participation in community life (Chapter 226-4, HRS).

Specific objectives and policies of the State Plan that pertain to the project are as follows:

Section 226-11 Objectives and policies for the physical environment--land-based, shoreline, and marine resources.

- (a) Planning for the State's physical environment with regard to landbased, shoreline, and marine resources shall be directed towards achievement of the following objectives:
 - (1) Prudent use of Hawaii's land-based, shoreline, and marine resources.
 - (b) To achieve the land-based, shoreline, and marine resources objectives, it shall be the policy of this State to:
 - (3) Take into account the physical attributes of areas when planning and designing activities and facilities.
 - (4) Manage natural resources and environs to encourage their beneficial and multiple use without generating costly or irreparable environmental damage.
 - (6) Encourage the protection of rare or endangered plant and animal species and habitats native to Hawai'i.

Section 226-13 Objectives and policies for the physical environment--land, air, and water quality.

- (a) Planning for the State's physical environment with regard to land, air, and water quality shall be directed towards achievement of the following objectives:
 - (1) Maintenance and pursuit of improved quality in Hawai'i's land, air, and water resources.
- (b) To achieve the land, air, and water quality objectives, it shall be the policy of this State to:
 - (2) Promote the proper management of Hawai'i's land and water resources.
 - (4) Encourage actions to maintain or improve aural and air quality levels to enhance the health and well-being of Hawai'i's people.

Discussion:

The project design brings a land steward to the parcel with interest in managing Hawai'i's land resources. The project team has consulted with relevant State agencies and resource experts to discuss requirements, regulations, and best practices related to the project. Mitigation measures will be carried out to address potential impacts to the physical environment – land, air, and water – that occur from the project.

5.1.1 STATE FUNCTIONAL PLAN: CONSERVATION LANDS

In addition to the State Plan, Functional Plans were approved by the Governor to guide implementation of State and County actions in key areas primarily within programs administered or funded by agencies of the state. The Functional Plans identify priority issues and contain objectives, policies, and implementing actions to address priority issues, and include: Agriculture; Conservation Lands; Education; Employment; Energy; Health; Higher Education; Historic Preservation; Housing; Human Services; Recreation; Tourism; and Transportation.

The Conservation Lands Functional Plan was revised in 1991. The Conservation Lands Functional Plan addresses three issues: inventories of resources and background information and basic research; management; and education and public information.

Discussion:

The project will use a portion of privately-owned vacant preservation lands for the construction of a single family residence, driveway, rooftop PV system and small agricultural cultivation area. The majority of the project parcel will remain open preservation land. The landowner is interested in cultivation of native plants and envisions removing select non-native plant species and replanting with native species. These efforts would bring stewardship to a parcel that, to date, has been unmanaged. The project will take into account the physical attributes of the area and has been designed to provide environmentally-sound practices that will not result in irreparable environmental damage. A botanical survey of the project area has shown that the parcel is dominated by non-native vegetation, and no rare or endangered plant species, animals, or habitats exist on the site.

Section 226-18 Objectives and policies for facility systems--energy.

(c) To further achieve the energy objectives, it shall be the policy of this State to:

- (8) Support research and development as well as promote the use of renewable energy sources;

Discussion:

The project will include development of a small rooftop PV solar installation with battery backup. Electricity generated will be delivered to HECO to offset energy use in the home.

5.2 HAWAI'I STATE LAND USE DISTRICT BOUNDARIES

Under the Chapter 205, HRS, all lands of the State are to be classified in one of four categories: urban, rural, agricultural, and conservation lands. The State Land Use Commission (LUC), an agency of the State DBEDT, is responsible for each district's standards and for determining the boundaries of each district (Chapter 205-2(a), HRS). The LUC is also responsible for administering all requests for district reclassifications and/or amendments to district boundaries, pursuant to Chapter 205-4, HRS, and the HAR, Title 15, Chapter 15 as amended. Under this Chapter, all lands in Hawai'i are classified into four land use districts: (1) Conservation, (2) Agricultural; (3) Urban, and (4) Rural.

Conservation lands are comprised of lands in existing forest and water reserve zones and include areas necessary for protecting watersheds and water sources, scenic and historic areas, parks, wilderness, open space, recreational areas, habitat for endemic plants, fish and wildlife, and all submerged lands seaward of the shoreline. The Conservation District also includes lands subject to flooding and soil erosion. Conservation Districts are administrated by the State BLNR and uses are governed by rules promulgated by the State DLNR.

The Urban District generally includes lands characterized by "city-like" concentrations of people, structures and services. This District also includes vacant areas for future development. Jurisdiction of this district lies primarily with the respective counties. Generally, lot sizes and uses permitted in the district area are established by the respective County through ordinances or rules.

Discussion:

As classified by the State of Hawai'i LUC, the project site contains both State Urban and Conservation District (*Figure 1-3*). The Urban zone extends from a subdivision of single family homes built in the 1990s that encircle the property's west boundary. The Conservation District's General Subzone (the remainder of the parcel's State zoning) is applied to open space where specific conservation uses may not be defined, and encompasses lands with topography or other environmental factors not adaptable to wider urban, rural or agricultural uses. These lands are suitable for farming and a variety of agricultural uses including facilities accessory to those uses where compatible with the natural physical environment. The proposed use of this property is consistent with permitted uses for the Preservation and Urban Districts, with the approval of a CDUA permit from DLNR, OCCL.

5.3 TITLE 13 CHAPTER 5, HAWAI'I ADMINISTRATIVE RULES

Title 13, Chapter 5 in the Hawaii Administrative Rules regulates the land use in the Conservation District for the purpose of conserving, protecting, and preserving the important natural and cultural resources of Hawaii. Subzones within the Conservation District are classified as follows:

- Protective – To protect valuable natural and cultural resources in designated areas such as restricted watersheds, marine, plant, and wildlife sanctuaries, significant historic, archaeological, geological, and volcanological features and sites; and other designated unique areas.
- Limited – To limit uses where natural conditions suggest constraints on human activities.
- Resource – To ensure, with proper management, the sustainable use of the natural resources of those areas.
- General – To designate open space where specific conservation uses may not be defined, but where urban use would be premature.
- Special – To provide for sustainable use of areas possessing unique developmental qualities that complement the natural resources of the area.

Discussion:

The proposed project falls within the subzones of Limited, Resource, General, and Special, which include the land uses that will take place on the property such as Agriculture, Landscaping, and Single Family Residence. The home will be in compliance with all of the standards for Single Family Residences as specified in Exhibit 4 of Chapter 5. The developed area of the property will fall within the maximum developable area standard of 3,500 square feet. The home will also utilize appropriate screening during grading activities; earth-tone colors to be compatible with the surrounding area; and proper grading and contouring of the property. Department of Health permits for wastewater will be obtained.

5.4 HAWAI'I COASTAL ZONE MANAGEMENT PROGRAM

The CZM Act of 1972 (16 United States Code (USC), Section 1451), as amended through Public Law 104-150, created the coastal management program and the National Estuarine Research Reserve system. The coastal states are authorized to develop and implement a State coastal zone management program. The Hawai'i CZM Program received Federal approval in the late 1970's. The objectives of the CZM Program, as defined in Section 205A-2, HRS, are to protect valuable and vulnerable coastal resources such as coastal ecosystems, special scenic and cultural values and recreational opportunities. The objectives of the program are also to reduce coastal hazards and to improve the review process for activities proposed within the coastal zone. Each County is responsible for designating a Special Management Area (SMA) that extends inland from the shoreline. Development within the SMA is subject to County approval to ensure the proposal is consistent with the policies and objectives of the Hawai'i CZM Program.

Discussion:

The project area is not within the SMA as delineated by the City and County of Honolulu and as such does not required an additional review under State CZM and County SMA rules.

5.5 HAWAI‘I 2050 SUSTAINABILITY PLAN

The Hawai‘i 2050 Sustainability Plan is a long-term strategy with goals and objectives that respect culture, character, beauty, and history of the state’s island communities; balance among economic, community, and environmental priorities; and an effort to meet the needs of the present without compromising the ability of future generations to meet their own needs.

The 2050 Plan delineates five goals toward a sustainable Hawai‘i accompanied by strategic actions for implementation and indicators to measure success or failure. The goals and strategic actions that are pertinent to the project are as follows.

Goal One: Living sustainably is part of our daily practice in Hawai‘i.

Strategic Actions: Develop a sustainability ethic.

Discussion:

The project support Hawai‘i’s movement towards living sustainably. Energy costs in Hawai‘i are the highest in the United States, and the principal source of electricity is oil-fired plants that consume more than 400 million gallons of petroleum-based fuels annually. The project will include rooftop PV solar generation with battery backup. The electricity generated will be used to power the residential dwelling. Additionally, the landowner will create agricultural plots for food cultivation to provide fresh produce for personal use.

5.6 CITY AND COUNTY OF HONOLULU GENERAL PLAN

Adopted by resolution in 1977, the 1992 revised edition of the General Plan for the City and County of Honolulu sets forth the long-range objectives for the general welfare and prosperity of the people of O‘ahu and broad policies to attain those objectives. The General Plan provides objectives and policies intended to guide and coordinate City land use planning and regulation, and budgeting for operations and capital improvements. The project is consistent with the applicable objectives and policies of the General Plan, as described below.

Natural Environment

Objective A: To protect and preserve the natural environment.

- *Policy 1: Protect Oahu’s natural environment, especially the shoreline, valleys, and ridges, from incompatible development.*
- *Policy 4: Require development projects to give due consideration to natural features such as slope, flood and erosion hazards, water- recharge areas, distinctive land forms, and existing vegetation.*
- *Policy 7: Protect the natural environment from damaging levels of air, water, and noise pollution.*
- *Policy 8: Protect plants, birds, and other animals that are unique to the State of Hawai‘i and the Island of O‘ahu.*

5.6.1 KO'OLAUPOKO SUSTAINABLE COMMUNITIES PLAN

The Island of O'ahu is divided into eight regional plan areas; six areas (including Ko'olaupoko) are addressed in "sustainable communities plans" (SCP) in keeping with modest development patterns and rural characteristics; the areas are termed "development plans" in keeping with the City's policy of directing most of the island's population growth to these regions. Each plan implements the objectives and policies of the General Plan and serves as a guide for public policy, investment, and decision-making within each respective region. Together with the General Plan, they guide population and land use growth over a 20- to 25-year time span.

The project site is located within the region encompassed by the Ko'olaupoko SCP. The Ko'olaupoko SCP was last revised in August 2000, under the projection that the region will experience essentially no growth during the 20-year planning horizon of the SCP. The Plan's vision for Ko'olaupoko focuses on the long-term protection of community resources and its residential character, and the adoption of public improvement programs and development regulations that reflect a stable population. Key elements of the vision applicable to this project include: adopt the ahupua'a concept as a basis for land use and natural resources management; preserve and promote open space throughout the region; preserve and promote agricultural uses; and maintain the predominantly low-rise, low-density, single family character of the urban fringe and rural communities.

Discussion:

The project site is designated on the Ko'olaupoko SCP Urban Land Use Map as Open Space Preservation and Low Density Residential (*Figure 1-3*). The proposed project is in keeping with the projected development pattern of the SCP as it provides one home and is not considered as "significant residential growth" in the area. The single family dwelling will be sited in an area ringed with an existing residential neighborhood. It will be considered a rural form of residential development which consists of single family homes in "country" settings on relatively large lots, e.g., lots of one acre or more. The project will also protect community resources by bringing a steward to the land with an interest in managing and maintaining sections of the parcel's preservation land.

5.7 CITY AND COUNTY OF HONOLULU LAND USE ORDINANCE GUIDELINES

The purpose of the LUO is to regulate land use in a manner that will encourage orderly development in accordance with adopted land use policies, including the County General Plan and development plans. The LUO is also intended to provide reasonable development and design standards. These standards are applicable to the location, height, bulk and size of structures, yard areas, off-street parking facilities, and open spaces, and the use of structures and land for agriculture, industry, business, residences or other purposes (Revised Ordinance for the City and County of Honolulu (ROH), Chapter 21).

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RESIDENCE AND STEWARDSHIP**

Draft Environmental Assessment

Discussion:

The site is designated as P-1 Restricted Preservation District and P-2 General Preservation District by the County LUO (*Figure 1-3*). The purpose of the preservation districts is to preserve and manage major open space and recreation lands and lands of scenic and other natural resource value. It is intended that all lands within a state-designated Conservation District be zoned P-1 Restricted Preservation district. It is also the intent that lands designated Urban by the State, but well-suited to the functions of providing visual relief and contrast to the City's built environment or serving as outdoor space for the public's use and enjoyment be zoned P-2 General Preservation district. Areas unsuitable for other uses because of topographical considerations related to public health, safety and welfare concerns shall also be placed in this district. Pursuant to Section 21-3.40-1 of the LUO, the use and development standards of this zoning district shall be governed by the appropriate State agencies. The project will obtain a CDUA permit approval from the BLNR.

5.7.1 SPECIAL MANAGEMENT AREA

The project area is not located within the SMA, which was established to preserve, protect, and where possible, to restore the natural resources of the coastal zone of Hawai'i. Special controls on developments within the SMA area are necessary to avoid permanent loss of valuable resources and foreclosure of management options. The review guidelines of Section 25-3.2 of the ROH are used by DPP and the City Council for the review of developments proposed in the SMA. These guidelines are derived from Section 205A-26 HRS.

Discussion:

The entire project area is not within the SMA as delineated by the County and, as such, does not require additional review under State CZM and County SMA rules.

Section 6.0

Findings Supporting
Anticipated Determination

6.0 FINDINGS SUPPORTING ANTICIPATED DETERMINATION

6.1 ANTICIPATED DETERMINATION

After reviewing the significance criteria outlined in Chapter 343, Hawai'i Revised Statutes (HRS), and Section 11-200-12, State Administrative Rules, Contents of Environmental Assessment, the proposed action has been determined to not result in significant adverse effects on the natural or human environment. A Finding of No Significant Impact (FONSI) is anticipated.

6.2 REASONS SUPPORTING THE ANTICIPATED DETERMINATION

The potential impacts of the residential improvements have been fully examined and discussed in this Draft Environmental Assessment. As stated earlier, there are no significant environmental impacts expected to result from the proposed action. This determination is based on the assessments as presented below for criterion (1) to (13).

1. *Involve an irrevocable loss or destruction of any natural or cultural resources.*

The archaeological and cultural landscapes have been documented in studies conducted specifically for the project area. As detailed in *Section 3.12 and 3.13* of this report, the project does not involve any known loss or destruction of existing natural or cultural resources. The only specific area of concern is the unknown potential for the inadvertent discovery of subsurface historical or cultural resources, including the unknown possibility of iwi kūpuna (ancestral remains).

If any cultural, historic, or archaeological resources are unearthed or ancestral remains are inadvertently discovered, the State Department of Land and Natural Resources (DLNR), State Historic Preservation Division (SHPD), the O'ahu Island Burial Council representative and participating interests from lineal descendants and individuals will be notified. The treatment of these resources will be conducted in strict compliance with the applicable historic preservation and burial laws.

No threatened or endangered species would be impacted by the proposed action.

2. *Curtail the range of beneficial uses of the environment.*

The proposed activities will not curtail the range of beneficial uses of the environment. Existing uses conform to existing land use designations. The project would actually increase beneficial uses of the parcels, replacing vacant, untended land with a modest residential use, subsistence agriculture and native landscape restoration.

3. *Conflict 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.*

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The planned uses does not conflict 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. State waters will not be impacted in any way.

4. *Substantially affects the economic or social welfare of the community or State.*

The planned uses would have no adverse social or economic impact to the state. Short-term economic benefits anticipated during construction will include direct, indirect, and induced employment opportunities and multiplier effects but not at a level that would generate significant economic expansion. The limited scale construction will have some positive economic impact.

5. *Substantially affects public health.*

The planned uses are consistent with existing land uses and are not expected to affect public health, except in beneficial ways mentioned in item (4) above. However, there will be temporary short-term impacts to air quality emanating from possible dust emissions and temporary degradation of the acoustic environment in the immediate vicinity resulting from construction equipment. Construction-related impacts of noise, dust, and emissions will be mitigated by compliance with the State Department of Health Administrative Rules.

6. *Involves substantial secondary impacts, such as population changes or effects on public facilities.*

The approval will not have substantial secondary impacts, such as population changes or effects on public facilities.

7. *Involves a substantial degradation of environmental quality.*

The planned uses will have no significant adverse environmental impacts nor will it degrade environmental quality. It will not degrade water quality, nor impact marine flora and fauna. The proposed single family residence is visually consistent with the existing community, and is designed to blend into the natural setting.

8. *Is individually limited but cumulatively has considerable effect upon the environment or involves a commitment for larger actions.*

The planned uses would not involve cumulative impacts and is not a precursor for other future actions.

9. *Substantially affects a rare, threatened or endangered species, or its habitat.*

The project area does not contain identified rare, threatened or endangered species or habitat. No impact is anticipated.

10. *Detrimentially affects air or water quality or ambient noise levels.*

General temporary impacts associated with construction have been identified in this EA. Mitigation measures which are outlined in this EA will be applied during the on-going construction activity. No debris, petroleum products, or other construction-related substances

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or materials will be allowed to flow, fall, leach or otherwise enter the coastal waters. Best Management Practices will be adhered to during construction to minimize environmental pollution and damage. There will be some additional noise above ambient during construction resulting from equipment operation (trucks, back hoe, concrete operations). No detrimental long-term impacts to air, water, or acoustic quality are anticipated with the residential action.

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

The planned residence is not in the shoreline area or an erosion prone, geologically hazardous area. Drainage and erosion controls are planned.

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

The planned residence and access driveway will only be visible from limited locations in the vicinity. The residence will not exceed 25 feet in height will have a no effect on public views or scenic view planes. Enhanced natural trees and new landscaping will block public views from the surrounding community.

13. *Require substantial energy consumption.*

The single family residence will be tied in to the island's electrical grid. A residential roof-top photovoltaic system is planned to provide the majority of the household's power needs. Additionally, energy-efficient systems for lighting and water heating will help to reduce consumption.

6.3 SUMMARY

Based on the above findings, the residential action does not have significant socio-economic or environmental impacts. The Environmental Assessment recommends mitigation measures to alleviate impacts when such impacts are identified. The action is consistent with the Hawai'i State Land Use District Boundaries; the Hawai'i Coastal Zone Management Plan, the City's General Plan and Development Plan; the City's Zoning Ordinance, and Special Management Area regulations.

Section 7.0

Agencies and
Parties Consulted

7.0 AGENCIES AND PARTIES CONSULTED

Table 7-1 lists the agencies, organizations, and individuals who were contacted during the planning process. Copies of the comment letters and responses are included in this section.

DISTRIBUTION	EA Pre-Consultation	EA Pre-Consultation Comments Received	Receiving Draft EA	Comments Received	Receiving Final EA/FONSI
A. Federal Agencies or Affiliates					
U.S. Army Corps of Engineers, Honolulu District			X		
U.S. Dept. of the Interior, Fish and Wildlife Service			X		
B. State Agencies					
DBEDT, Office of Planning			X		
Department of Health (DOH)	X		X		
Department of Land and Natural Resources (DLNR)			X		
DLNR, State Historic Preservation Division	X		X (HC)		
DLNR, Office of Conservation and Coastal Land (OCCL)	X		X		
Land Use Commission	X				
Office of Environmental Quality Control			X		
Office of Hawaiian Affairs (OHA)			X		
UH Environmental Center			X		
C. City and County of Honolulu					
Board of Water Supply	X		X		
Department of Planning and Permitting (DPP)	X		X		
Honolulu Police Department			X		
Honolulu Fire Department	X		X		

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DISTRIBUTION	EA Pre-Consultation	EA Pre-Consultation Comments Received	Receiving Draft EA	Comments Received	Receiving Final EA/FONSI
Kailua Neighborhood Board # 31	X		X		
D. Elected Officials					
State House Rep. Cynthia Thielen (District 50)	X		X		
State House Rep. Chris Lee (District 51)	X		X		
State Senator Jill Tokuda (District 24)	X		X		
State Senator Laura Thielen (District 25)	X		X		
Councilmember Ikaika Anderson (Council District 3)	X		X		
E. Libraries					
Hawai'i State Library			X		
Kailua Public Library			X		
F. Organizations, Individuals					
Neighbors – adjacent	X				
Kailua Bluffs Neighborhood Watch	X		X		
National Tropical Botanical Garden	X				
O'ahu Invasive Species Council	X				
The Outdoor Circle	X				
University of Hawaii College of Tropical Agriculture and Human Resources	X				
Windward Farmers Conservation District	X				

Section 8.0

List of References

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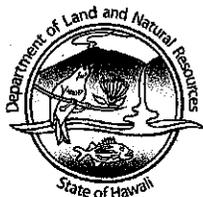
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Appendix A

Pre-consultation
Letter from OCCL

NEIL ABERCROMBIE
GOVERNOR OF HAWAII



STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES

OFFICE OF CONSERVATION AND COASTAL LANDS
POST OFFICE BOX 621
HONOLULU, HAWAII 96809

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

JESSE K. SOUKI
FIRST DEPUTY

WILLIAM M. TAM
DEPUTY DIRECTOR - WATER

AQUATIC RESOURCES
BOATING AND OCEAN RECREATION
BUREAU OF CONVEYANCES
COMMISSION ON WATER RESOURCE MANAGEMENT
CONSERVATION AND COASTAL LANDS
CONSERVATION AND RESOURCES ENFORCEMENT
ENGINEERING
FORESTRY AND WILDLIFE
HISTORIC PRESERVATION
KAHOOLAWE ISLAND RESERVE COMMISSION
LAND
STATE PARKS

REF: OCCL: AJR

Jeffrey Overton
c/o Group 70 International, Inc.
925 Bethel St., 5th Floor
Honolulu, HI 96823

RECEIVED

COR: OA-14-196

MAY 21 2014

MAY 22 2014

GROUP 70 INTL

RE: PRE-CONSULTATION FOR A PROPOSED SINGLE FAMILY RESIDENCE, ACCESSORY STRUCTURES AND LAND MANAGEMENT PROJECT
Kailua, Honolulu District, Island of Oahu
TMK: (1) 4-2-004:001

Dear Mr. Overton,

The Office of Conservation and Coastal Lands (OCCL) is in receipt of your letter dated *May 9, 2014* which outlines a proposal to construct a Single Family Residence (SFR) and other accessory structures on the subject parcel located within the State Land Use Conservation District General Subzone.

According to the letter submitted you are the agent for the applicant (Dawn Horn) who is proposing to conduct a number of land uses on the subject parcel. The proposed project includes the construction of a SFR and restoration of native vegetation on the remainder of the parcel. The house site would be supported by an access driveway from Kanapu'u Drive with utilities being provided by the City and County of Honolulu. The proposed project design will utilize low-impact and sustainable systems, including a photovoltaic (PV) system and subsistence agriculture for personal use. Specific land uses being proposed by the landowner include:

- Construction of a SFR and associated landscaping and land development;
- Construction of an access driveway in conformance with Honolulu Fire Department access requirements;
- Installation of photovoltaic panels for power generation using solar energy;
- Removal of invasive species;
- Construction of a Fire Break;
- Removal of dead, diseased or invasive vegetation, plants and trees;
- Restoration of native plants; and
- Erosion control (*upland retaining walls*)

Tree Removal

Your proposal to conduct tree removal of dead and hazardous trees is an identified land use in the Conservation District Resource Subzone pursuant to Hawaii Administrative Rules (HAR)

§13-5-22, P-11 **TREE REMOVAL (A-2)** *Removal of trees that pose a hazard to public safety; provided, however, that the landowner shall be required to provide documentation for the need to remove the trees.*

The Office of Conservation and Coastal Lands (OCCL) has no objections to your request to conduct tree removal on the subject parcel. Pursuant to Hawaii Administrative Rules (HAR) §13-5, these actions are uses for which no permit is required. The OCCL requests that the correspondent adhere to the following general conditions:

1. That in issuing this letter, the Department and Board has relied on the information and data that the correspondent has provided in connection with the letter. If, subsequent to this letter, such information and data prove to be false, incomplete or inaccurate, this letter may be modified, suspended or revoked;
2. The correspondent shall implement typical Best Management Practices (BMP) while conducting any land use in the conservation district;
3. The proposed project is minor in scope and may be considered an exempt action pursuant to Hawaii Revised Statutes (HRS), §343, as amended, and Hawaii Administrative Rules (HAR), §11-200-5, Environmental Impact Statement Rules and §11-200-8, Exempt Classes of Action; and
4. If the scope of the project changes or the cumulative natural resource impacts is perceived to be moderate or major, the department may require additional authorizations or approvals for the proposed land use.

Single Family Residence and Accessory Uses (i.e., Erosion Control, Landscaping)

Your proposal to construct a Single Family Residence is an identified land use in the Conservation District General Subzone pursuant to HAR §13-5-24, R-7 **SINGLE FAMILY RESIDENCE (D-1)**, *A single family residence that conforms to design standards as outlined in this chapter.* In order to apply for this use the landowner will be required to submit a Conservation District Use Application (CDUA) and all associated documents for review. Please note that the final decision to approve or deny this use rests with the Board of Land and Natural Resources (BLNR).

Fire Break

Pursuant to HAR §13-5-41.1 *Fire buffer zone*. Proposed fire buffer zones shall include the requirements listed in Exhibit 5, entitled *Fire Buffer Zone Standards: August 12, 2011*.

Photovoltaic System

Currently the landowner is also proposing a conceptual plan that would generate revenue from surplus photovoltaic electricity as a way to fund native plant restoration activities and site development.

Pursuant to HAR §13-5-22, P-12 **POWER GENERATION FROM RENEWABLE RESOURCES (D-1)** *Hydroelectric, wind generation, ocean thermal, energy conversion, wave, solar, geothermal, biomass, and other renewable power generation facilities from natural resources; includes generation, conversion, and transmission facilities and access roads. Renewable energy projects shall minimize impacts to natural, cultural, and recreational*

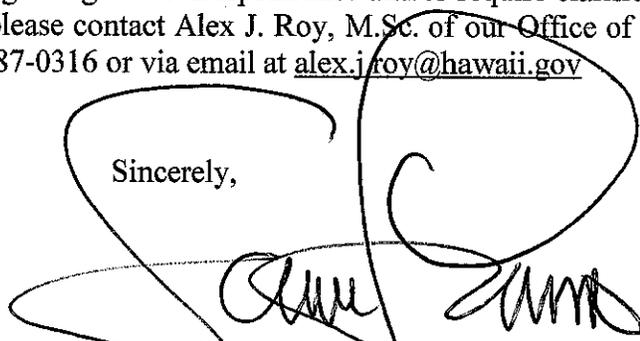
resources, and shall be expedited in the application review and decision making process. A management plan (HAR §13-5, Exhibit 3), approved simultaneously with the permit, is also required. The final decision to approve or deny this land use rests with the BLNR.

Additionally, the proposal to conduct commercial activities in the conservation district (i.e., sale of surplus photovoltaic electricity) **will require a formal public hearing** pursuant to HAR §13-5-40(a)(1).

Please be aware that there is a pending enforcement action on the subject parcel that must be resolved prior to applying for the proposed land uses, pursuant to HAR §13-5-6(c). Once the enforcement action has been resolved you may submit the CDUA and all associated documents for review by this office.

If you have any questions regarding this correspondence and/or require clarification of our rules or the comments received, please contact Alex J. Roy, M.Sc. of our Office of Conservation and Coastal Lands staff at 808-587-0316 or via email at alex.j.roy@hawaii.gov

Sincerely,



Samuel J. Lemmo, Administrator
Office of Conservation and Coastal Lands

CC: *Chairperson*
ODLO
CCH - DPP
DOFAW

Appendix B

Natural Resources Survey

Natural resources survey for the parcel at 1711 Kanapuu Drive (TMK: 4-2-004:001) in Kailua, O'ahu

February 4, 2014

AECOS No. 1361

Eric Guinther and Reginald David¹

AECOS, Inc.

45-939 Kamehameha Hwy, Suite 104

Kāne'ohe, Hawai'i 96744

Phone: (808) 234-7770 Fax: (808) 234-7775 Email: guinther@aecos.com

Introduction

This report² presents results from biological resource surveys undertaken on a 36.893-ac parcel in Kailua, windward O'ahu (Fig. 1) and owned by MDHE, LLC. The primary purpose of the surveys is to determine if any sensitive biological resources occur on the property that must be considered in developing plans for a single residential dwelling and appurtenances (including a driveway and solar PV array).

The subject property at 1711 Kanapuu Drive (TMK: 4-2-004:001) has an irregular shape, fitting between the developed parcels of Kailua Bluffs (neighborhood), house lots along Kanapuu Drive, Kahako Street, and Kahako Place, and the ridgeline that separates Kailua from Waimanalo. This ridge is a continuous feature from the eastern flank of Olomanu to Keolu Hills *mauka* of Lanikai. The subject parcel rises steeply to the ridge line, which lies mostly at elevations between 280 ft and 360 ft above sea level (ASL). The east face of this ridge is part of Bellows Air Force Station. The subject property includes only one small valley of any consequence, but includes three lateral ridges in addition to the main ridge forming the east side. There are no streams or wetlands on the property. The small valley is a gulch, the bottom of which is

¹ Rana Biological Consulting, Inc., Kailua-Kona, Hawai'i.

² This report has been prepared for Group70, and will become part of the administrative record for environmental entitlements.

lacking definable bed and banks that would typify a dry (intermittent or ephemeral) stream.

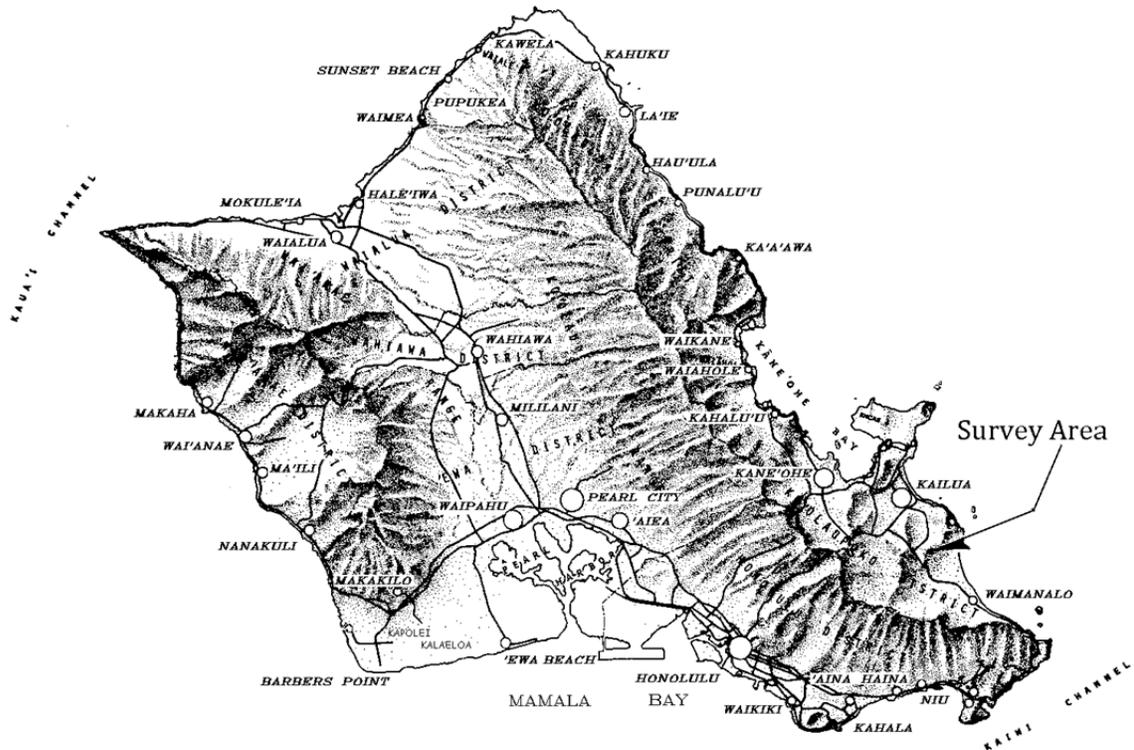


Figure 1. Location of 1711 Kanapuu Drive parcel on the Island of O'ahu.

Methods

Botanical Survey

Botanical surveys were conducted by Eric Guinther on November 6, 7, and 21, 2013. The surveys entailed traversing much of the property on foot with emphasis on the ridgeline, gulch bottoms, and parts close to adjacent, developed lots. Most plant species were identified as they were encountered and qualitative abundance determined as the survey progressed. A handheld GNSS unit (Trimble GeoXH) was used to record progress of the survey (survey track) as well as feature locations. In some areas, owing to uncertainty of the exact property boundary, all weeds and plantings made by neighbors on the subject property were not necessarily included in the listing.

Plants not immediately identified in the field were photographed and/or a piece “collected” for identification in the laboratory. Plant names follow *Manual of the Flowering Plants of Hawai'i* (1999) for native and naturalized flowering plants, *A Tropical Garden Flora* (2005) for crop and ornamental plants, and *Hawaii's Ferns and Fern Allies* (2003) for ferns and fern allies. More recent name changes for naturalized plants follow Imada (2012).

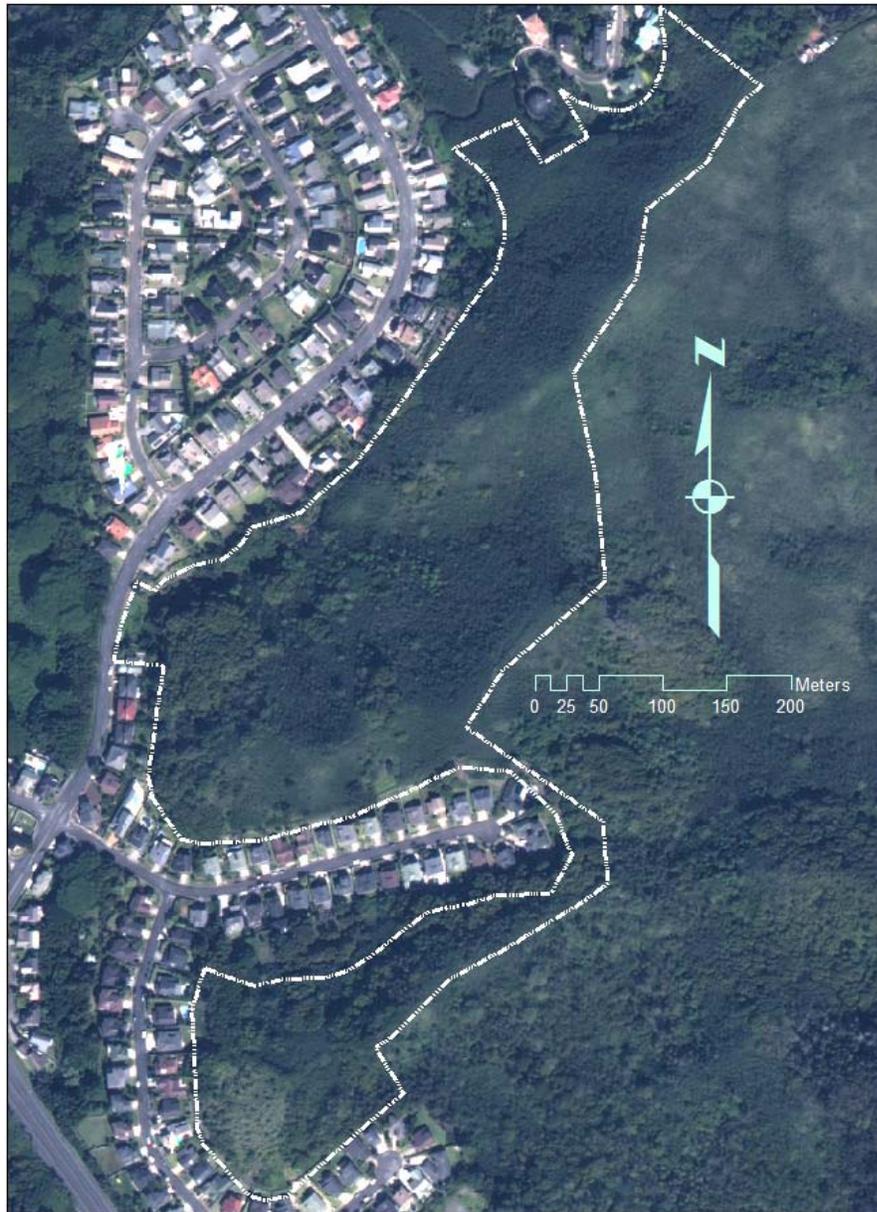


Figure 2. Satellite image of parcel at 1711 Kanapuu Drive outlined in white.

Vertebrates Survey

Avian Survey

Five avian point count stations were sited approximately 200 m (650 ft) apart along the length of the property on November 7, 2013. A single, eight-minute avian point count was made at each count station. Field observations were made with the aid of Leica 8 X 42 binoculars and by listening for vocalizations. The point counts were conducted between 8:20 am and 10:15 am, the daily peak of bird activity.

When not conducting point counts, the zoologist searched the remainder of the property for species and habitats not detected during the point counts. Weather conditions were good with unlimited visibility and winds of between one and four kilometers per hour.

Mammalian Survey

With the exception of the endangered Hawaiian hoary bat (*Lasiurus cinereus semotus*), or 'ōpe'ape'a as it is known locally, all terrestrial mammals currently found on the Island of O'ahu are alien species, and most are ubiquitous. The survey of mammals was limited to visual and auditory detection, coupled with visual observation of scat, tracks, and other animal sign. A running tally was kept of all terrestrial vertebrate mammalian species detected within the project area.

Results

Vegetation

The vegetation across much of the parcel is fairly uniform: Guinea grass (*Urochloa maxima*) and *koa haole* (*Leucaena leucocephala*) form a scrub growth that covers most of the land (Fig. 3). *Koa haole* plants becoming notably larger downslope and into the valley part. Many of the larger *koa haole* trees on the slopes have grown nearly parallel to the ground, possibly toppled (but continuing to grow) by a strong wind event in the distant past. A mixture of other shrubs and herbs (see Flora section) occur in the *koa haole*/Guinea grass association. And, there are patches of trees, such as ironwood (*Casuarina equisetifolia*) and Formosan koa (*Acacia confusa*) on parts of the ridges. Forested slopes occur along the western ends of the lateral ridges and the

northwest face of the southern lateral ridge, above developedouselots bordering the parcel.



Figure 3. View of subject parcel looking north from the southernmost ridge. Property includes lateral ridge behind houses and extends to beyond the peak in the center of the picture. Scrub growth with scattered trees dominates the property.

Flora

Although the majority of the property is dominated by a few species of trees, shrubs, and grasses, the flora listing (Table 1) is much “enhanced” by plantings made by adjacent land owners. In a number of locations, adjacent property owners have encroached on the subject property, planting a variety of landscape species and clearing the natural vegetation in some areas.

In all, 86 taxa of vascular plants were recorded during the botanical survey. Table 1 is divided into two parts: Table 1a lists those vascular plant species that are not native to the Hawaiian Islands. Table 1b lists those species native to the

Table 1. Flora for the property at TMK: 4-2-004:001, Kailua, O'ahu.

Table 1a. Non-native (ornamentals and naturalized) plants

Family Species	Common name	Status	Abundance	Notes
<i>FERNS AND FERN ALLIES</i>				
BLECHNACEAE				
<i>Blechnum appendiculatum</i> Willd.	---	Nat	U	
SCHIZAEACEAE				
<i>Lygodium japonicum</i> (Thunb.) Sw.	Japanese climbing fern	Nat	R	
<i>FLOWERING PLANTS</i>				
<i>DICOTYLEDONS</i>				
ACANTHACEAE				
<i>Asystasia gangetica</i> (L.) T. Anderson	Chinese violet	Nat	A	
<i>Barleria repens</i> C. Nees	pink ruellia	Orn	U	
ANACARDIACEAE				
<i>Schinus terebinthifolius</i> Raddi	Christmas berry	Nat	O	
APOCYNACEAE				
<i>Plumeria rubra</i> L.	plumeria	Orn	R	<1>
ASCLEPIADACEAE				
<i>Stapelia gigantea</i> N.E. Brown	giant toad plant	Nat	U	
ASTERACEAE (COMPOSITAE)				
<i>Bidens alba</i> (L.) DC.	beggartick	Nat	R	
<i>Bidens cyanapiifolia</i> Kunth	---	Nat	U1	
<i>Sphagneticola trilobata</i> (L.) Pruski	wedelia	Nat	R3	<1>
BIGNONIACEAE				
<i>Spathodea campanulata</i> P. Beauv.	African tulip tree	Nat	R	
BORAGINACEAE				
<i>Carmona retusa</i> (Vahl) Masamune	Fukien tea	Nat	A	
CACTACEAE				
<i>Cereus</i> sp.	---	Orn	R	<1>
<i>Opuntia cochenillifera</i> (L.) P. Mill.	cochineal cactus	Nat	R	<1>
<i>Opuntia ficus-indica</i> (L.) Mill.	<i>pānini</i>	Nat	R	
CASUARINACEAE				
<i>Casuarina equisetifolia</i> L.	ironwood	Nat	R1	
CARICACEAE				
<i>Carica papaya</i> L.	papaya	Nat	R	<1>
CLUSIACEAE				
<i>Clusia rosea</i> Jacq.	autograph tree	Nat	R	
COMBRETACEAE				
<i>Terminalia catappa</i> L.	tropical almond	Nat	R	<1>

Table 1a (continued).

Family Species	Common name	Status	Abundance	Notes
CUCURBITACEAE				
<i>Coccinia grandis</i> (L.) Voigt	scarlet-fruited gourd	Nat	R	
<i>Momordica charantia</i> L.	wild bitter melon	Nat	R	
EUPHORBIACEAE				
<i>Codiaeum variegatum</i> (L.) Blume	croton	Orn	R	<1>
<i>Euphorbia hirta</i> L.	garden spurge	Nat	U3	<1>
<i>Euphorbia lactea</i> Haworth	milk-stripped euphorbia	Orn	R	<1>
<i>Phyllanthus debilis</i> Klein ex Willd.	niuri	Nat	U3	<1>
FABACEAE				
<i>Acacia confuse</i> Merr.	Formosa <i>koa</i>	Nat	C	
<i>Acacia farnesiana</i> (L.) Willd.	<i>klu</i>	Nat	U	
<i>Albizia saman</i> F. Muell.	monkeypod	Nat	R	<1>
<i>Canavalia cathartica</i> Thours	<i>maunaloa</i> vine	Nat	U	<2>
<i>Chamaecrista nictitans</i> (L.) Moench	partridge pea	Nat	U1	
<i>Desmodium incanum</i> DC.	Spanish clover	Nat	U	
<i>Leucaena leucocephala</i> (Lam.) deWit	<i>koa haole</i>	Nat	AA	
<i>Mimosa pudica</i> L.	sensitive plant	Nat	R	
<i>Neonotonia wightii</i> (Wight & Arnott) Lackey	glycine vine	Nat	U3	<2>
<i>Pithecellobium dulce</i> (Roxb.) Benth.	' <i>opiuma</i>	Nat	R	
<i>Senna surattensis</i> (N.L. Burm.) H. Irwin & Barneby	scrambled egg plant, <i>kolomana</i>	Nat	U	
LAMIACEAE				
<i>Hyptis pectinata</i> (L.) Poit.	comb hyptis	Nat	O3	
MALVACEAE				
<i>Abutilon grandifolium</i> (Willd.) Sweet	hairy abutilon	Nat	U	
MELIACEAE				
<i>Swietenia mahagoni</i> (L.) N. Jacq.	Cuban mahagoni	Nat	R	
MORACEAE				
<i>Ficus carica</i> L.	common fig	Orn	R	<1>
MORINGACEAE				
<i>Moringa oleifera</i> Lam.	horseradish tree	Orn	R	<1>
MYRTACEAE				
<i>Psidium guajava</i> L.	common guava	Nat	U	<1>
<i>Syzygium cuminii</i> (L.) Skeels	Java plum	Nat	O	
OCHNACEAE				
<i>Ochna thomasiana</i> Engler & Gilg	Mickey Mouse plant	Nat	U	
OLEACEAE				
<i>Jasminum fluminense</i> Vell.	Brazilian jasmine	Nat	C	
PASSIFLORACEAE				
<i>Passiflora edulis</i> Sims	passion fruit vine	Nat	R	
<i>Passiflora suberosa</i> L.	<i>huehue haole</i>	Nat	O	

Table 1a (continued).

Family Species	Common name	Status	Abundance	Notes
PHYTOLACCACEAE				
<i>Rivina humilis</i> L.	coral berry	Nat	C	
PLANTAGINACEAE				
<i>Plantago major</i> L.	common plantain	Nat	R2	
PORTULACACEAE				
<i>Portulaca oleracea</i> L.	pigweed	Nat	R	
PROTEACEAE				
<i>Macadamia cf. integrifolia</i> Maiden & Betche	mac nut	Orn	R	<1> <2>
RUTACEAE				
<i>Murraya paniculata</i> (L.) W. Jack	mock orange	Nat	O	
SANTALACEAE				
<i>Santalum album</i> L.	white sandalwood	Nat	R	<2>
SAPINDACEAE				
<i>Filicium decipiens</i> (Wight & Arnott) Thwaites ex J.D. Hook.	fern tree	Nat	R	<1>
SAPOTACEAE				
<i>Chrysophyllum oliviforme</i> L.	satinleaf	Nat	O	
<i>Sideroxylon persimile</i> (W. Hemsley) T. D. Penn.	bumelia	Nat	C	<2>
SOLANACEAE				
<i>Solanum seaforthianum</i> Andr.	---	Nat	R	
VERBINACEAE				
<i>Citharexylum caudatum</i> L.	fiddlewood	Nat	R	
<i>Lantana camara</i> L.	<i>lākana</i> , lantana	Nat	O	
MONOCOTYLEDONS				
AGAVACEAE				
<i>Agave sisalana</i> Perrine	sisal, <i>malina</i>	Nat	R	<1>
<i>Agave</i> sp.	---	Orn	R	<1>
<i>Cordyline fruticosa</i> (L.) A. Chev.	<i>ti</i> horticultural variety	Orn	R	<1>
<i>Dracaena marginata</i> Lam. 'Tricolor'	money tree cultivar	Orn	R	<1>
<i>Dracaena sanderiana</i> M.T. Masters	sanderiana	Orn	R	<1>
ALOEACEAE				
<i>Aloë vera</i> (L.) N.L. Burm.	aloe	Nat	R	<1>
ARECACEAE				
<i>Veitchia merrillii</i> (Beccari) H. E. Moore	Manila palm	Orn	R	<1>
LILIACEAE				
<i>Asparagus densiflorus</i> (Kunth) Jessop	asparagus "fern"	Nat	U	
<i>Asparagus plumosus</i> J.G. Baker	climbing asparagus "fern"	Nat	U3	
POACEAE (GRAMINEAE)				
<i>Arundo donax</i> L.	giant reed	Nat	R	<1>
<i>Bambusa multiplex</i> (Lour.) J.A. & J.H. Schultes	hedge bamboo	Orn	R	<2>

Table 1a (continued).

Family Species	Common name	Status	Abundance	Notes
POACEAE (continued)				
<i>Chloris barbata</i> (L.) Sw.	swollen fingergrass	Nat	U3	<1>
<i>Digitaria insularis</i> (L.) Mez ex Ekman	sourgrass	Nat	C3	
<i>Diplachne fusca uninervia</i> (J. Presl.) P.M. Peterson & N. Snow	sprangletop	Nat	R2	<1>
<i>Echinochloa crus-galli</i> (L.) P. Beauv.	barnyard grass	Nat	R1	<1>
<i>Oatea acuminata</i> (Munro) C.E. Smith	weeping bamboo	Orn	R	<1>
<i>Urochloa maxima</i> (Jacq.) R.D. Webster	Guinea grass	Nat	AA	
<i>Urochloa mutica</i> (Forssk.) Nguyen	California grass	Nat	U3	

Table 1b. Native (and early Polynesian introduced) Plants

Family Species	Common name	Status	Abundance	Notes
<i>FLOWERING PLANTS</i>				
DICOTYLEDONS				
BORAGINACEAE				
<i>Cordia subcordata</i> Lam.	<i>kou</i>	Pol	R	<1>
SAPINDACEAE				
<i>Dodonaea viscosa</i> N. Jacq.	<i>'a'ali'i</i>	Ind	R	
MALVACEAE				
<i>Waltheria indica</i> L.	<i>'uhaloa</i>	Ind	O	
OXALIDACEAE				
<i>Oxalis corniculata</i> L.	yellow wood sorrel, <i>'ihi'ai</i>	Pol	U	<1>
ROSACEAE				
<i>Osteomeles anthyllidifolia</i> (Sm.) Lindl.	<i>'ulei</i>	Ind	U1	
MONOCOTYLEDONS				
AGAVACEAE				
<i>Cordyline fruticosa</i> (L.) A. Chev.	<i>ki, ti</i>	Pol	R	<1>
ARECACEAE				
<i>Cocos nucifera</i> L.	<i>niu, coconut</i>	Pol	R	
MUSACEAE				
<i>Musa</i> sp. hybrid	<i>mai'a, banana</i>	Pol	R1	<1>

Legend to Table 1

Status = distributional status

- End** = endemic; native to Hawai'i and found naturally nowhere else.
Ind = indigenous; native to Hawai'i, but not unique to the Hawaiian Islands.
Nat = naturalized, exotic, plant introduced to the Hawaiian Islands since the arrival of Cook Expedition in 1778, and well-established outside of cultivation.
Orn = ornamental; cultivated or landscape plants not known to have naturalized in the wild in Hawai'i.
Pol = an early Polynesian introduction (so-called "canoe plant").

Table 1 (continued).

Abundance = occurrence ratings for plants on property in November 2013.

R - Rare -	only one or two plants seen.
U - Uncommon -	several to a dozen plants observed.
O - Occasional -	found regularly, but not abundant anywhere.
C - Common -	considered an important part of the vegetation and observed numerous times.
A - Abundant -	found in large numbers; may be locally dominant.
AA - Abundant -	very abundant and dominant; defining vegetation type.
Numbers (as in R3) offset occurrence ratings (1 – several plants; 2 – many plants; 3 – abundant in a limited area) in cases where distribution across the survey area may be limited, but individuals seen are more than indicated by the occurrence rating alone.	

Notes:

- <1> Generally associated with gardening/landscaping areas encroaching into the subject property.
 <2> Plant lacking flowers or fruit; identification uncertain.

Hawaiian Islands, and species that are considered early Polynesian introductions or “canoe plants”. Plant species in Table 1a characterize the flora, but are of no special interest or concern from a conservation perspective. Species in Table 1b are 9% of the total and represent the small native component of the flora at this location. Note <1> shows that 33 (or 38%) of the plant species identified are plantings made as a part of the landscaping of neighboring parcels (Fig. 4). Half of the native and early Polynesian species (Table 1b) are included in these landscape plants.

Avian Survey

A total of 142 individual birds of 14 species, representing 11 separate families, were recorded during station counts (Table 2). All of the species detected are alien to the Hawaiian Islands (that is, no native birds were observed). Three species: Red-vented Bulbul (*Pycnonotus cafer*), Java Sparrow (*Padda oryzivora*), and House Finch (*Haemorhous mexicanus*), accounted for slightly more than 59% of the total number of individual birds recorded. Red-vented Bublubs were the most frequently recorded species, accounting for 23% of the individual birds recorded during the course of this survey (Table 2).

Mammalian Survey

Two terrestrial mammalian species were detected during the course of this survey. Several dogs (*Canis familiaris*) were heard barking from houses below the site. Scat, tracks, and sign of feral pig (*Sus scrofa*) were encountered at a number of locations within the site, but mostly in the area of the proposed house site and the trail connecting the site with the main (east) ridgeline trail.



Figure 4. View along the western property line showing encroachment of landscaping from neighborhood on left.

Discussion

Botanical Resources

The status column in Table 1 indicates native vs. non-native species (natives and early Polynesian introductions are separated out into Table 1b). Only native plants (indigenous or endemic species) would have any potential conservation value in this location. In all, Table 1b lists 8 species (9%), but only three of these are truly natives, the other 5 are early Polynesian introductions. None of the species listed in Table 1b are rare, and most are relatively common across O'ahu. A floristic composition of 3% natives (8% if Polynesian introductions included) is typical for lowland O'ahu. Considering number of plants, the natives account for far less than 3% of the vegetation biomass. The vast majority of the plants now growing on the property are introduced, naturalized species and, along the western side, various ornamentals.

Table 2. Avian species detected during point counts on the property at TMK: 4-2-004:001 in Kailua, November 2013.

Common Name	Scientific Name	ST	RA
COLUMBIFORMES			
COLUMBIDAE – Pigeons & Doves			
Spotted Dove	<i>Streptopelia chinensis</i>	A	0.60
Zebra Dove	<i>Geopelia striata</i>	A	1.00
PASSERIFORMES			
PYCNONOTIDAE – Bulbuls			
Red-vented Bulbul	<i>Pycnonotus cafer</i>	A	6.40
ZOSTEROPIDAE – White-eyes			
Japanese White-eye	<i>Zosterops japonicus</i>	A	3.20
TIMALIIDAE - Babblers			
Chinese Hwamei	<i>Garrulax canorus</i>	A	0.40
Red-billed Leiothrix	<i>Leiothrix lutea</i>	A	0.40
TURDIDAE - Thrushes			
White-rumped Shama	<i>Copsychus malabaricus</i>	A	0.60
STURNIDAE – Starlings			
Common Myna	<i>Acridotheres tristis</i>	A	1.00
EMBERIZIDAE – Emberizids			
Saffron Finch	<i>Sicalis flaveola</i>	A	0.80
CARDINALIDAE – Cardinals Saltators & Allies			
Northern Cardinal	<i>Cardinalis cardinalis</i>	A	0.80
FRINGILLIDAE – Fringilline and Carduline Finches & Allies			
Carduelinae – Carduline Finches			
House Finch	<i>Haemorhous mexicanus</i>	A	4.20
PASSERIDAE - Old World Sparrows			
House Sparrow	<i>Passer domesticus</i>	A	0.60
ESTRILDIDAE – Estrildid Finches			
Estrildinae – Estrildine Finches			
Common Waxbill	<i>Estrilda astrild</i>	A	2.80
Java Sparrow	<i>Padda oryzivora</i>	A	6.20

Legend to Table 2

ST Status

A Alien – Introduced to the Hawaiian Islands by humans

RA Relative Abundance - Number of birds detected divided by the number of count stations (5)

Avian Resources

The findings of the avian survey are consistent with the location and with the highly disturbed nature of habitats present on the property. During the course

of our survey, 14 avian species were detected, all alien to the Hawaiian Islands. The density and diversity of birds was greatest in the lower elevations around the gardens and the small, central valley, not surprising as this is an area with the most diverse and densest vegetation on the site.

Although no seabirds were detected during the course of this survey, low numbers of several seabird species potentially overfly the site on occasion. The primary cause of mortality in resident seabirds is thought to be predation by alien mammalian species at the nesting colonies (USFWS, 1983; Simons and Hodges, 1998; Ainley et al., 2001). Collision with man-made structures is considered to be the second-most cause of mortality in locally nesting seabird species in Hawai'i. Nocturnally flying seabirds, especially fledglings on their way to sea in the summer and fall, can become disoriented by exterior lighting. When disoriented, seabirds may collide with man-made structures and, if not killed outright, can be easy prey for feral mammals (Hadley, 1961; Telfer, 1979; Sincock, 1981; Reed et al., 1985; Telfer et al., 1987; Cooper and Day, 1998; Podolsky et al., 1998; Ainley et al., 2001; Hue et al., 2001; Day et al., 2003). There are no known nesting colonies of any of the O'ahu resident seabird species on, or within close proximity of the subject property.

There currently are no suitable habitats on the property that could support native avian species. Modifications of the site may provide open grassy areas that could be utilized by indigenous shorebirds. It is unlikely the site will ever support any endemic native birds.

Mammalian Resources

The findings of the mammalian survey are consistent with the location of the site and the highly disturbed habitats present on the property. Although no rodents were detected during the course of our survey, it is likely that the four established alien Muridae found on O'ahu—roof rat (*Rattus r. rattus*), brown rat (*Rattus norvegicus*), European house mouse (*Mus musculus domesticus*), and possibly black rat (*Rattus exulans hawaiiensis*)—use various resources in the general project area on a seasonal basis. All of these introduced rodents are deleterious to native ecosystems and the native faunal species dependent on them.

No Hawaiian hoary bats were detected during the course of this survey. A small possibility exists that bats may occasionally use resources within the lower, more densely treed parts of the site.

Protected Species, Jurisdictional Waters, and Critical Habitats

No species proposed for listing or listed under the federal endangered species act of 1973, as amended or the State of Hawai'i's (H.R.S. 195D) were recorded during the course of this survey (DLNR, 1998; USFWS; 2005a, 2005b, 2013).

The property lacks flowing or standing water. The valley bottom is dry and shows minimal evidence of effects from flowing water other than narrow erosion channels incised less than 0.5 m to perhaps 1 m (mostly 1 to 2 ft) in a very few locations.

Much of the property is within the General (G) subzone of the state Conservation District. "General" is the least restrictive of the four levels of conservation subzones; the specific purpose being "to designate open space where specific conservation uses may not be defined, but where urban use would be premature" (DLNR, 1994).

There is no federally delineated Critical Habitat present on or near the property (USFWS, 2012). Any development on the property will not result in an impact to federally designated Critical Habitat. There is no equivalent statute under state law.

Recommendations

To avoid adverse impacts on night-flying sea birds, lights associated with construction activities should be shielded, and if large flood/work lights are used, they should be placed on poles that are high enough to allow the lights to be pointed directly at the ground. Exterior house lighting should be shielded to reduce the potential for interactions between nocturnally flying seabirds and man-made structures.

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Appendix C

Preliminary Engineering Report

PRELIMINARY ENGINEERING REPORT

FOR

1711 Kanapuu Drive

TMK: 4-2-004:001

Kailua, O'ahu, Hawai'i

November 14, 2014

DEVELOPER/OWNER:

MDHE, LLC - Horn

THIS WORK WAS PREPARED
BY ME OR UNDER MY SUPERVISION



SIGNATURE
EXPIRATION DATE: 4-30-16

Prepared by:



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1.0 INTRODUCTION

The purpose of this report is to provide an overview of the preliminary engineering design for the Horn residence in Kailua, Oahu. The Horn residence is being developed by MDHE, LLC (Owner). This report evaluates the existing site conditions and defines requirements for roadway, water, wastewater, and drainage utilities, along with other site improvements.

2.0 PROPOSED PROJECT

2.1 Location

The project site is located in Kailua, on the island of O‘ahu in the State of Hawai‘i. The site lies within the traditional moku of Kailua and the ahupua‘a of Ko‘olaupoko. The site is bounded by the Kaopa Subdivision (Kanapuu Dr, Kahako Pl., and Kahako St.) to the South and the West, a water storage tank and residence in the Keolu Summit development at the end of Aunauna St. to the North, and two State conservation land areas zoned as P-1 to the East. The project area proposed at the site would constitute 4.2% (approximately 1.56 acres) of the site’s 36.89-acre parcel represented as TMK: (1) 4-2-004:001. Refer to Figure 1, Location Map and Figure 2, Project Area Map.

2.2 Project Description

The proposed project is to construct a single family residential dwelling with supporting property elements, including an access driveway constructed to meet emergency access codes, and agricultural plots to provide food for the family’s use.

3.0 EXISTING CONDITIONS

3.1 Roadway

The property has street frontage along Kanapuu Drive. Kanapuu Drive is owned and maintained by the City and County of Honolulu (CCH). It is a two-way, two lane, a.c. paved roadway, 40’ wide from curb to curb.

The site does not have an existing driveway apron. There is no existing vehicular access to the property.

3.2 Water

The City and County of Honolulu Board of Water Supply (BWS) operates two water systems (water mains), for two different pressure zones, along Kanapuu Drive. The existing 8” main is on the Windward 272 system, and the existing 12” main is on the Kailua Heights 390 system.

The BWS has approved connection to either system for the proposed project. The property lies within both pressure zones. Therefore the proposed system to connect to depends on the pressure zone that the dwelling lies in.

3.3 Sewer

There is an existing 8-inch sewer main along Kanapuu Drive which would be used to service the property. However, there is no existing sewer lateral. The main is owned, operated, and maintained by the CCH.

1711 Kanapuu Drive
Preliminary Engineering Report

The CCH has approved a sewer connection application for three single-family dwellings and a photovoltaic farm. The expiration date on this approval is April 5, 2015.

3.4 Drainage

Drainage within the project area's drainage basin is currently overland flow combined with drain ditches that convey runoff to a 54" culvert located under Kanapuu Drive. The culvert is owned and maintained by the City and County of Honolulu (CCH). See Figure 4, Conceptual Site and Utility Plan.

The existing drainage runoff from the site's basin is approximately 93.7 cubic feet per second (cfs). This is based on the CCH's 10-year recurrence interval, 1-hour duration rainfall event. Of the 93.7 cfs, Ditch-1 discharges 20.1 cfs and Ditch-2 discharges 5.2 cfs. The 54" culvert's inlet capacity is 128.8 cfs. See Figure 3, Existing Runoff Map and existing drainage calculations:

According to the Flood Insurance Rate Map (FIRM) 15003C0380G (01/19/2011), the site currently is located in flood zone X which includes areas outside of the 500 year flood plain. Refer to Figure 5, Flood Map.

Existing Drainage Calculations:

Reference:

"Rules Relating to Storm Drainage Standards," January 2000, City & County of Honolulu, DPP.

"Drainage Report for Kaopa Subdivision Unit 4-Phases VI-B and VII", May 1990, EDP Hawaii Inc.

Q=CIA

Existing Conditions for Project's Drainage Basin:

The project's drainage basin consists of the following three sub-basin areas:

1. Ditch-1 (From referenced drainage report)
 - a. Q = 20.1 cubic feet per second (cfs)
 - b. A = 6.2 acres
2. Ditch-2 (From referenced drainage report)
 - a. Q = 5.2 cfs
 - b. A = 1.6 acres
3. Project Area (Calculated below)
 - a. Q = 68.4 cfs
 - b. A = 15.2 acres

Q (total, existing) = Ditch-1+Ditch-2+Project Area = 20.1+5.2+68.4 = 93.7 cfs

The 54" culvert which collects runoff from the project's drainage basin has an inlet capacity of 128.8 cfs. This capacity was taken from the referenced drainage report.

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Preliminary Engineering Report

Project Area Calculations:

Runoff Coefficient, C (From Table 1):

C = 0.6 (Band 2; steep forested and steep grass meadows)

Time of Concentration, T_c (From Plate 5):

Representative flow path length, L = 1,120 feet

Average Slope along path length, s = 9.4%

T_c = 7.5 minutes

Rainfall Intensity, i (From Plate 1; T_m=10 year) = 3.0 inches/hour

Correction Factor, CF (from Plate 4) = 2.5

Corrected Rainfall Intensity, I = CF x i = 3.0 x 2.5 = 7.5

Area of Project Area Basin, A = 15.2 acres

Q (Project Area) = 0.6x7.5x15.2 = 68.4 cubic feet per second (cfs).

4.0 PROPOSED INFRASTRUCTURE IMPROVEMENTS

4.1 Roadway Improvements

Primary vehicular access to the site is anticipated to be through a proposed driveway apron located along Kanapuu Drive. The driveway apron will be 24-feet wide.

The proposed paved driveway access is routed along the hillside, climbing up nearly 150 feet at a length of nearly 1,220 linear feet to the dwelling. The driveway access will follow the City and County of Honolulu's fire department requirements. The driveway access will have a paved width of 16-feet. As required by the fire department, there will be a fire truck turnaround at the end of the driveway access.

4.2 Water System

Based on the BWS's "Water System Standards, 2002," the project will require an average daily demand of about 500 gallons per day (gpd).

Based on the floor plan, which includes 3 bedrooms and 4.5 bathrooms, the meter is anticipated to be no bigger than 1-inch. The water system will be sized according to the Uniform Plumbing Code (UPC), 1997. See water demand calculations below:

WATER DEMAND CALCULATIONS

Per the City and County of Honolulu, Department of Water Supply, *Water System Standards*, dated 2002.

Single-family units = 1 units

Consumption Guidelines:

Single-family Residential = 500 gallons/unit

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Average Daily Demand (ADD) =
Single-family Residential = 500 gallons/unit x 1 units = 500 gallons

Maximum Daily Demand (1.5 x ADD) = 1.5 x 500 gpd = 750 gallons/day (gpd)

Maximum Fire Flow (*Single-family with sprinklers) = 500 gallons/minute (gpm)

*Per the City and County of Honolulu Fire Code, a single family dwelling unit with fire sprinklers installed shall have a fire flow requirement that is half of the required flow stated.

The standard fire flow required for the dwelling, which is anticipated to be fire sprinklered, is 500 gpm for a 1-hour period. This will use a proposed 4-inch detector check (DC) meter for fire flow, with a 6-inch fire water line that will service a privately owned on-site fire hydrant. The fire water line will continue from the hydrant and service the fire sprinklers for the dwelling unit. Refer to water demand calculations above.

The layout of the domestic and fire water lines shall be determined during the design stage of the project. For preliminary design purposes, there are three layout alternatives for the domestic water line and two for the fire water line.

The domestic water layout alternatives include the following:

1. A direct route from the meter near the driveway apron to the dwelling
2. Routed along the access driveway till about STA 4+60, and then turn right up the hill towards the dwelling
3. Routed along the entire access driveway

The fire water layout alternatives include the following:

1. Routed along the access driveway till about STA 4+60, and then turn right up the hill towards the dwelling
2. Routed along the entire access driveway

See Figure 4 - Site and Utility

4.3 Wastewater System

Based on the City's "Wastewater System Standards," the dwelling will generate an average daily flow of about 320 gpd of wastewater. See wastewater demand calculations below:

WASTEWATER DEMAND CALCULATIONS

Per the City and County of Honolulu, Design Standards of the Department of Wastewater Management, Volume 1, dated July, 1993.

Residential homes for the project = 1 home

Wastewater contribution for the home = 80 gallons/day/capita

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Preliminary Engineering Report

Occupancy = 4 capita/home

$$\begin{aligned}\text{Contribution} &= (1 \text{ home}) \times (80 \text{ gallons/day/capita}) \times (4 \text{ capita/home}) \\ &= 320 \text{ gallons/day (gpd)}\end{aligned}$$

The dwelling will be serviced by a new 6-inch sewer lateral which will connect to the existing 8-inch main along Kanapuu Drive.

The layout of the sewer lateral shall be determined during the design stage of the project. For preliminary design purposes, there are three layout alternatives for the sewer lateral.

The sewer lateral layout alternatives include the following:

1. A direct route from the meter near the driveway apron to the dwelling
2. Routed along the access driveway till about STA 4+60, and then turn right up the hill towards the dwelling
3. Routed along the entire access driveway

See Figure 4 Site and Utility Plan.

4.4 Grading

Grading will be required to create a level pad for the dwelling and for the access driveway.

The dwelling's pad elevation for the lower level is anticipated to be at 244-foot mean sea level (msl).

The access driveway is anticipated to have excavation and embankment on both sides. Retaining walls, where practicable, are proposed to be located along the driveway access to minimize disturbed areas and visual impacts to the hillside.

The proposed grading is approximately 5,000 cubic yards (cy) of excavation and 8,000 cy of fill, having a net fill of approximately 3,000 cubic yards (this earthwork quantity does not account for subgrade requirements that is usually recommended by a geotechnical engineer). Refer to Figure 6 Conceptual Grading and Drainage Plan.

4.5 Drainage

Drainage will remain as overland flow throughout the site. Runoff from the dwelling unit will be collected from roof downspouts which will discharge to grade. There will be drainage culverts located along the driveway access to allow overland flow to follow natural drainage patterns.

The drainage runoff in the project area's drainage basin for proposed conditions is approximately 94.84 cfs, based on a 10-year recurrence interval, 1-hour duration rainfall. The proposed flow condition is an increase of 1.14 cfs from the existing condition flow of 93.7 cfs. The proposed flow conditions still do not exceed the culvert's inlet capacity of 128.8 cfs. See proposed drainage calculations below:

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Proposed Conditions for Project's Drainage Basin:

The project's drainage basin consists of the following three sub-basin areas:

1. Ditch-1 (From referenced drainage report)
 - a. $Q = 20.1$ cubic feet per second (cfs)
 - b. $A = 6.2$ acres
2. Ditch-2 (From referenced drainage report)
 - a. $Q = 5.2$ cfs
 - b. $A = 1.6$ acres
3. Project Area (Calculated below)
 - a. $Q = 69.5$ cfs
 - b. $A = 15.2$ acres

$$Q \text{ (total, proposed)} = \text{Ditch-1} + \text{Ditch-2} + \text{Project Area} = 20.1 + 5.2 + 69.5 = 94.84 \text{ cfs}$$

The 54" culvert which collects runoff from the project's drainage basin has an inlet capacity of 128.8 cfs. This capacity was taken from the referenced drainage report.

Project Area Calculations:

Runoff Coefficient, C (From Table 1):

$C = 0.61$ (Weighted C value, see table below)

Basin Area Description	C-Value	Area (ac)	% of Basin Area	Weighted C-Value
Existing	0.6	14.55	95.7	0.57
Proposed Impervious	0.95	0.65	4.3	0.04
Total	--	15.2	--	0.61

Time of Concentration, T_c (From Plate 5):

Representative flow path length, $L = 1,120$ feet

Average Slope along path length, $s = 9.4\%$

$T_c = 7.5$ minutes

Rainfall Intensity, i (From Plate 1; $T_m = 10$ year) = 3.0 inches/hour

Correction Factor, CF (from Plate 4) = 2.5

Corrected Rainfall Intensity, $I = CF \times i = 3.0 \times 2.5 = 7.5$

Area of Project Area Basin, $A = 15.2$ acres

$$Q \text{ (Project Area)} = 0.61 \times 7.5 \times 15.2 = 69.5 \text{ cubic feet per second (cfs)}$$

Drainage culverts are proposed to be located along the driveway access near stations 0+90 and 3+65 to allow overland flow to follow natural drainage patterns. At station 0+90, two side-by-side HDPE corrugated drainage culverts, each with a diameter of 36", will convey its proposed sub-basin's flow of approximately 89.6 cfs. At station 3+65, an HDPE corrugated drainage culvert, with a diameter of 24", will convey its proposed sub-basin's flow of approximately 12.4 cfs. See drainage calculations below:

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Preliminary Engineering Report

Proposed Conditions for Culvert (STA 0+90):

$$Q \text{ (Project Area)} + Q \text{ (Ditch-1)} = 69.5 + 20.1 = 89.6 \text{ cfs}$$

Proposed Conditions for Culvert (STA 3+90) Drainage Basin:

Runoff Coefficient, C (From Table 1):

$$C = 0.6 \text{ (Band 2; steep forested and steep grass meadows)}$$

Time of Concentration, T_c (From Plate 5):

Representative flow path length, L = 420 feet

Average Slope along path length, s = 36 %

T_c = 5 minutes

Rainfall Intensity, i (From Plate 1; T_m=10 year) = 3.0 inches/hour

Correction Factor, CF (from Plate 4) = 2.75

$$\text{Corrected Rainfall Intensity, } I = CF \times i = 3.0 \times 2.75 = 8.25$$

Area of Basin, A = 2.5 acres

$$Q = 0.6 \times 8.25 \times 2.5 = 12.4 \text{ cubic feet per second (cfs)}$$

The project has a disturbed area greater than 1 acre. According to the standards for storm water quality under the City's rules for storm water drainage standards, the project is classified as a Priority A2 project (disturbed area greater than 1 acre but less than 5). The project is required to provide Best Management Practices (BMPs) that will meet the criteria for Priority A2 projects under the standards for storm water quality. The selection and design of the BMPs will occur during the design stage.

5.0 CONCLUSION

The proposed improvements for this project will be designed in accordance with the applicable rules and regulations of the City and County of Honolulu. Future utilities will provide adequate potable and fire water, wastewater conveyance, and storm drainage management for the project. Based on the foregoing study, the existing utility infrastructure has capacity to service the proposed improvements for this project.

1711 Kanapuu Drive
Preliminary Engineering Report

REFERENCES

City and County of Honolulu, *Design Standards* of the Department of Wastewater Management, Volume 1, dated July, 1993.

City and County of Honolulu, Department of Planning and Permitting, *Rules Relating to Storm Drainage Standards*, dated January 2000.

City and County of Honolulu, Department of Water Supply, *Water System Standards*, dated 2002.

City and County of Honolulu, Fire Code of the City and County of Honolulu, Revised Ordinances of Honolulu, Chapter 20.

EDP Hawaii Inc., Drainage Report for Kaopa Subdivision Unit 4-Phases VI-B and VII, dated May, 1990.



Figure 1: Location Map

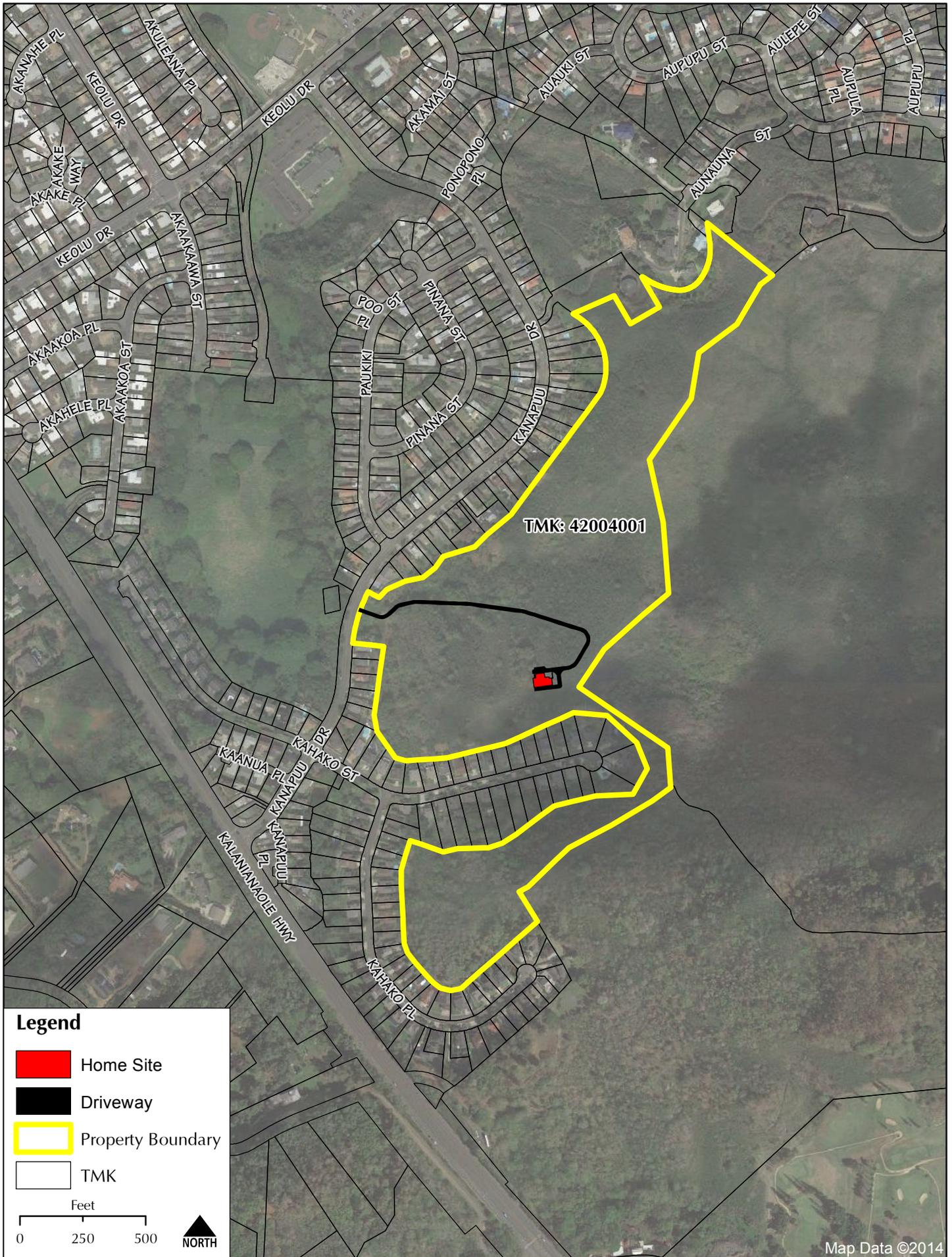


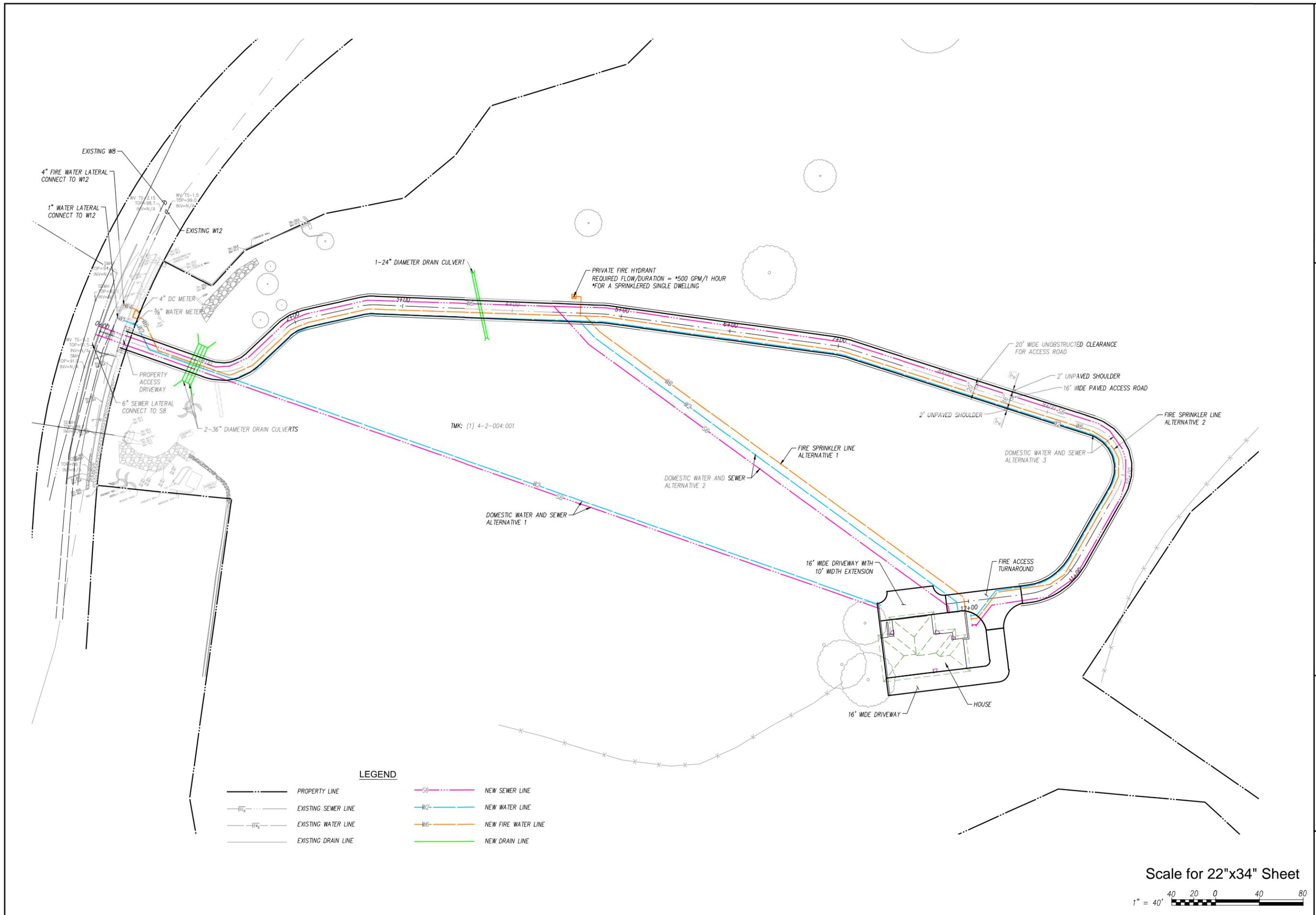
Figure 2: Project Area Map

**CONCEPTUAL
 SITE AND UTILITY PLAN**

CAD DRAWING:	213037-01 SITE AND UTILITY PLAN.DWG
SCALE:	1"=40'
DATE:	2014-07-29
PROJECT #:	.

FIGURE

4



LEGEND

—	PROPERTY LINE	—S6—	NEW SEWER LINE
- - -	EXISTING SEWER LINE	- - -W2-	NEW WATER LINE
- - -	EXISTING WATER LINE	- - -W6-	NEW FIRE WATER LINE
- - -	EXISTING DRAIN LINE	- - -D6-	NEW DRAIN LINE

Scale for 22"x34" Sheet

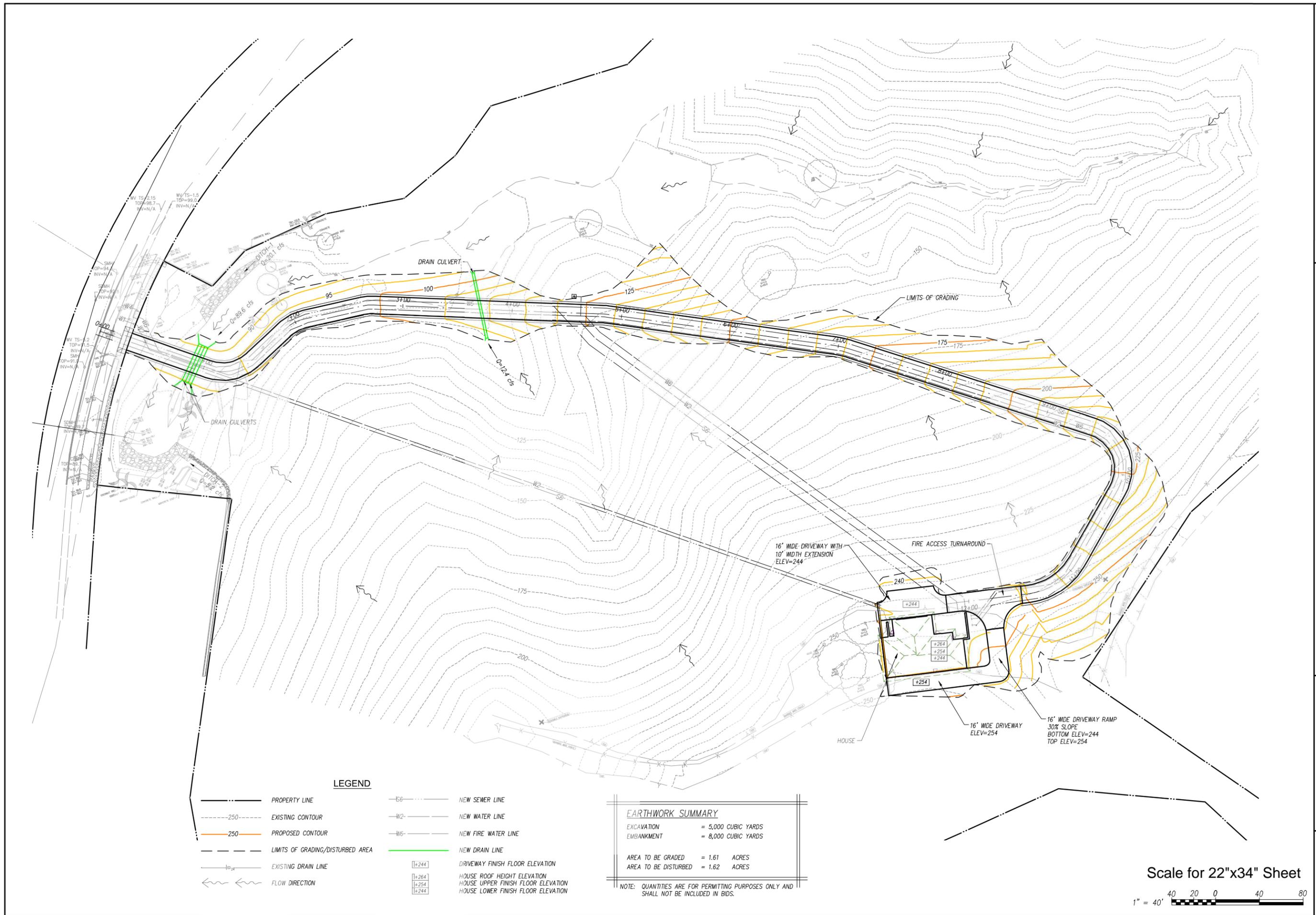


**CONCEPTUAL
 GRADING AND DRAINAGE PLAN**

CAD DRAWING:
 213037-01 GRADING PLAN
 SCALE: 1"=40'
 DATE: 2014-07-29
 PROJECT #:

FIGURE

6



LEGEND

—●—●—	PROPERTY LINE	—S6—	NEW SEWER LINE
---250---	EXISTING CONTOUR	—W2—	NEW WATER LINE
—250—	PROPOSED CONTOUR	—W6—	NEW FIRE WATER LINE
- - - - -	LIMITS OF GRADING/DISTURBED AREA	—	NEW DRAIN LINE
— 0.2 —	EXISTING DRAIN LINE	[+244]	DRIVEWAY FINISH FLOOR ELEVATION
←←←	FLOW DIRECTION	[+264]	HOUSE ROOF HEIGHT ELEVATION
		[+254]	HOUSE UPPER FINISH FLOOR ELEVATION
		[+244]	HOUSE LOWER FINISH FLOOR ELEVATION

EARTHWORK SUMMARY

EXCAVATION	= 5,000 CUBIC YARDS
EMBANKMENT	= 8,000 CUBIC YARDS
AREA TO BE GRADED	= 1.61 ACRES
AREA TO BE DISTURBED	= 1.62 ACRES

NOTE: QUANTITIES ARE FOR PERMITTING PURPOSES ONLY AND SHALL NOT BE INCLUDED IN BIDS.

Scale for 22"x34" Sheet
 1" = 40'

Appendix D

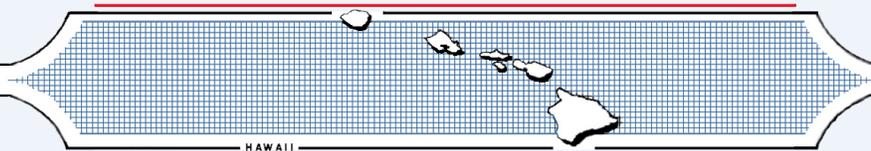
Archaeological Assessment

**AN ARCHAEOLOGICAL ASSESSMENT REPORT
FOR A PROPERTY LOCATED AT 1711 KANAPU`U DRIVE, KAILUA
KAILUA AHUPUA`A, KO`OLAUPOKO DISTRICT
ISLAND OF O`AHU, HAWAII
[TMK: (1) 4-2-004: 001 por.]**

Prepared by:
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Alexander D. Hazlett, Ph.D.**
and
Robert L. Spear, Ph.D.
April 2014
Revised November 2014
Draft

Prepared for:
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ABSTRACT

At the request of Mr. Jeff Overton of Group 70 International, Inc., Scientific Consultant Services (SCS), Inc. conducted an Archaeological Assessment (Archaeological Inventory Survey with negative findings) of approximately 5.5 acres of undeveloped land within a 37-acre parcel in the *ahupua`a* of Kailua, Ko`olaupoko District, Island of O`ahu, Hawai`i [Tax Map Key (1) 4-2-004: 001 por.]. The combination of a pedestrian survey and a total of four manually excavated shovel probes within the project area boundaries did not reveal the presence of historic properties on the ground surface or within subsurface contexts.

Archaeological Inventory Survey-level work was performed in order to identify potential historic properties (non-burial and burial), to assess the significance of any newly identified historic properties, to make a project effect determination, and to propose mitigation measures to address the project effect on historic properties, pursuant to Hawaii Administrative Rules (HAR) § 13-275 and § 13-284 .

While Inventory Survey-level investigations were completed, this report is being written as an Archaeological Assessment, in accordance with HAR §13-275-5(b)(5), which states " Results of the survey shall be reported either through an archaeological assessment, if no sites were found, or an archaeological survey report which meets the minimum standards set forth in chapter 13-276."

The archaeological inventory survey program has been completed with no historic properties identified on the ground surface or within subsurface contexts. Thus, no further archaeological work is recommended for the surveyed areas. However, should any historic properties be encountered during construction activities within the project area, all work in the vicinity of the find must cease and the State Historic Preservation Division shall be notified immediately.

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INTRODUCTION

At the request of Mr. Jeff Overton of Group 70 International, Inc. and MDHE LLC, landowner, Scientific Consultant Services (SCS), Inc. performed an Archaeological Assessment (Archaeological Inventory Survey with negative findings) of approximately 5.5 acres of undeveloped land within a larger 36.89-acre parcel of undeveloped land located at 1711 Kanapu`u Drive, Kailua, Kailua Ahupua`a, Ko`olaupoko District, Island of O`ahu, Hawai`i [Tax Map Key (1) 4-2-004: 001 por.] (Figures 1 and 2).

Fieldwork was conducted from September 20 to 23, 2013 and on October 13, 2014 by SCS archaeologist Guerin Tome, B.A., under the direction of Robert L. Spear, Ph.D., Principal Investigator. Archaeological Inventory Survey-level work was performed in order to identify and document historic properties, to gather sufficient information on these properties, to evaluate the significance of any newly identified historic properties, to determine the project effect on these properties, and to make mitigation recommendations to address possible adverse impacts to identified historic properties, pursuant to Hawaii Administrative Rules (HAR) § 13-284 and HAR § 13-276. During the current survey, no historic properties were identified on the ground surface or within subsurface contexts.

The Archaeological Inventory Survey-level fieldwork was conducted in advance of the construction of a single-family residential dwelling. Access to the site will be from Kanapu`u Drive; a driveway following existing terrain to the extent possible will lead to the structure. Utility infrastructure will include waterlines, sewer lines, storm drain culverts, and electrical and communication lines.

GEOGRAPHIC SETTING

O`ahu, the third largest island of the Hawaiian Island chain, formed as two volcanic masses (the older Wai`anae on the west and the younger Ko`olau Volcanic Series on the east) joined together (Macdonald *et al.* 1983:431). As lava flowing from the Ko`olau Volcano moved to the northwest, the ocean separating the Ko`olau and Wai`anae Volcanoes was filled in, connecting the two volcanic masses and forming the Schofield Plain (Handy and Handy 1972: 434; Macdonald *et al.* 1983:420). Subsequently, active volcanism ceased and rain caught in the upper reaches of the newly formed Ko`olau Range began to sculpt the deep valleys and streams

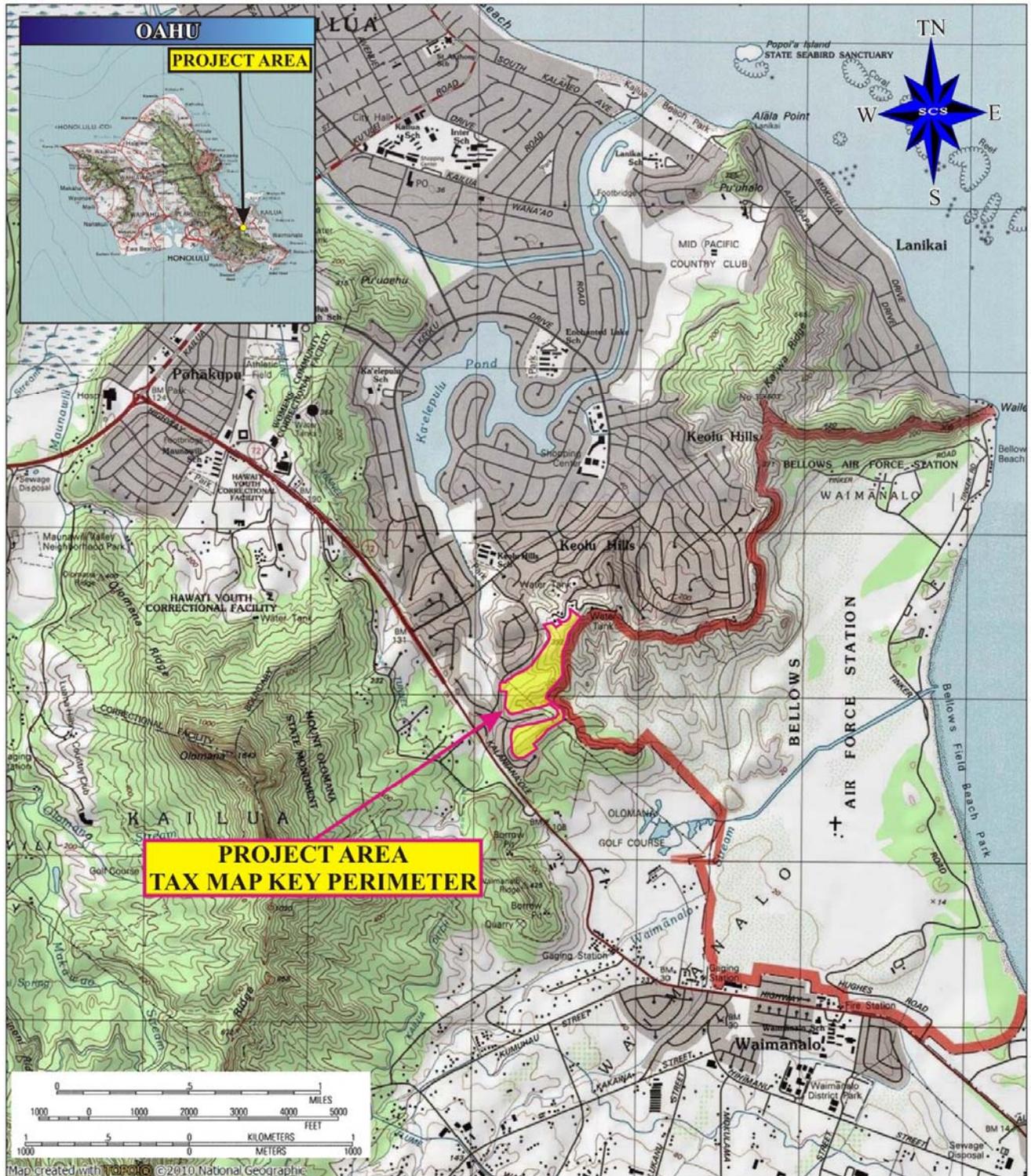


Figure 1: USGS Quadrange (Koko Head 1999) Map Showing Project Area Location.

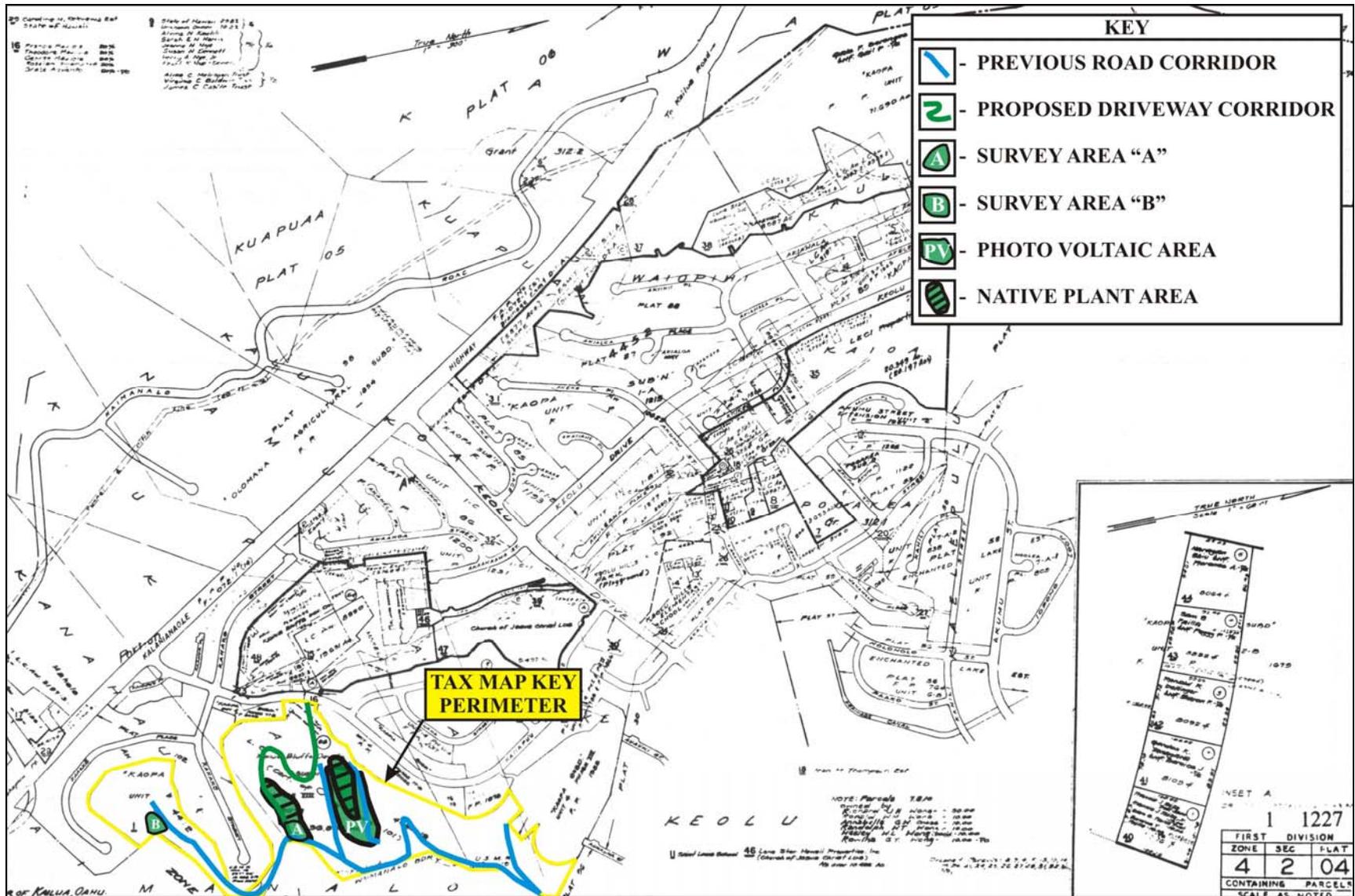


Figure 2: Tax Map Key [TMK: (1) 4-2-004] Showing Project Area Location.

on the windward and leeward faces of the Ko`olau Range (Handy and Handy 1973:435). The project area is situated on the slope of one of these steep-sided valleys on the windward side of O`ahu.

PROJECT AREA

The undeveloped 36.89-acre property is located at 1711 Kanapu`u Drive, Kailua, Kailua Ahupua`a, Ko`olaupoko District, Island of O`ahu, Hawai`i [Tax Map Key (1) 4-2-004: 001 por.]. The 5.5 acre project area is bounded by the Kaopa Subdivision (Kanapu`u Dr, Kahako Pl., and Kahako St.) to the South and the West, a water storage tank and residence in the Keolu Summit development at the end of Aunauna Street to the North, and two State Conservation Land Areas, zoned as P-1, to the East.

PROJECT AREA SOILS

According to Foote *et al.* (1972:26, 110, Map 66), the project area is situated within soils of the Alaeloa Series, specifically, Alaeloa Silty Clay (AeE) and Papaa clay (PYF). Soils of the Alaeloa Series consist of gently sloping to very steep, well-drained, volcanic soils. The Alaeloa silty clay, 15 to 35 percent slopes (AeE), exhibit moderately rapid permeability, medium runoff, and a moderate erosion hazard. This soil type is utilized for agriculture (pineapple), pasture, wildlife habitat, home sites, and water supply. The Papaa series soils are formed in basalt end up as colluvium. The Papaa clay with 35 to 70 percent slopes (PYF), has convex, very steep slopes. This soil is very sticky and very plastic and cracks widely when dry. Runoff is rapid and the erosion hazard is severe for this soil. The PYF soils are primarily used for pasture.

PROJECT AREA VEGETATION

Within the project area`s perimeters were mainly non-native vegetation that included Formosan Koa (*Acacia confusa*), Chinese violet (*Asystasia gangetica*), koa haole (*Leucaena leucocephala*), Kikuyu (*Pennisetum clandestinum*), signal grass (*Brachiaria* sp), and California grass (*Urochloa mutica*).

CLIMATE

The project area is situated within the wet region of O`ahu`s windward side and receives an average of 41 inches a year (Giambelluca *et al.* 2013). As the Ko`olau Range "...catches the warm moist air driven against it by the trade winds...chills the air and produces the ample precipitation that waters the land from mountain to sea..." the higher elevations within the Kailua Ahupua`a are prone to receive more precipitation due to cloud descent and lower temperature climates. The project area is located approximately 1.5

miles inland and between 100 and 250 feet above mean sea level (amsl). At this elevation, temperatures range from the high 50s to the high 80s during the winter months and from the mid-60s to the high 80s or low 90s during the summer (Armstrong 1980: 62).

TRADITIONAL AND HISTORIC SETTING

TRADITIONAL SETTING

Early settlement and agricultural development was probably first established on the windward side of the Hawaiian Islands and may have begun as early as A.D. 900-1000 on O`ahu during what is known as the Colonization Period (Kirch 2011:22). Most likely arriving from east Polynesia, these early inhabitants brought with them tools, fishing gear, and other artifacts, as well as useful plants and animals. Settling in favorable localities offering both fishing and agricultural opportunities and having near access to inland resources was a priority (Kirch 1985). Although receiving the majority of their protein from fish, Handy and Handy (1972: vi) have stated: "...for every fisherman's house along the coasts there were hundreds of homesteads of planters in the valley and on the slopes and plains between the shore and forest."

As the Hawaiian culture developed, land became the property of the king, or *ali`i`ai moku* (the *ali`i* who eats the island/district), which he held in trust for the gods. His title of *ali`i`ai moku* ensured rights and responsibilities to the land, but did not confer absolute ownership. The king kept the parcels he wanted, his higher chiefs received large parcels from him and, in turn they, distributed smaller parcels to lesser chiefs. The *maka`āinana* (commoners) worked the individual plots of land (Kirch and Sahlins 1992 vol.1:25).

In general, several terms, such as *moku*, *ahupua`a*, *ili* or *ili`āina* were devised to describe various land sections. A district (*moku*) contained smaller land divisions (*ahupua`a*), which customarily continued inland from the ocean and upland into the mountains. Extended household groups living within the *ahupua`a* were, therefore, able to harvest from both the land and the sea. As the Polynesian economy was based on agricultural production and marine exploitation, as well as animal husbandry and utilizing forest resources, this situation ideally allowed each *ahupua`a* to be self-sufficient by supplying needed resources from different environmental zones (Lyons 1875:111). The *ili`āina*, or *ili*, were smaller land divisions next in importance to the *ahupua`a* and were administered by the chief who controlled the *ahupua`a* in which the *ili* were located (*ibid*: 33; Lucas 1995:40). The *mo`o`āina* were narrow strips of land within an *ili*. The land holding of a tenant, or *hoa`āina*, residing in an *ahupua`a* was called a *kuleana* (Lucas 1995:61). Oral history notes that the division of O`ahu's lands into districts

(*moku*) and sub-districts was solidified by the *ali`i nui*, Mā`ili-kūkahi during the early part of the 16th century (Kamakau 1991:53-56). O`ahu contained six districts including Wai`anae, `Ewa, Waialua, Ko`olauloa, Ko`olaupoko, and Kona at the time of contact.

The Hawaiian economy was based on agricultural production and marine exploitation, as well as raising livestock and collecting wild plants and birds. Extended household groups settled in various *ahupua`a*. During pre-Contact times, there were primarily two types of agriculture, wetland and dry land, both of which were dependent upon geography and physiography. River valleys provided ideal conditions for wetland *kalo* (*Colocasia esculenta*) agriculture that incorporated pond fields and irrigation canals. Other cultigens, such as *kō* (sugar cane, *Saccharum officinarum*) and *mai`a* (banana, *Musa* sp.), were also grown and, where appropriate, such crops as *`uala* (sweet potato, *Ipomoea batatas*) were produced. This was the typical agricultural pattern seen during traditional times on all the Hawaiian Islands (Kirch 1985). Agricultural development on the windward side of O`ahu was likely to have begun early (A.D. 1100–1300).

Kailua Ahupua`a is the largest valley on the windward coast and the largest *ahupua`a* in the Ko`olaupoko District. Kailua Ahupua`a is situated between the *ahupua`a* of Waimānalo, to the southeast, and Kāne`ohe, to the north and west. Compared with other areas of O`ahu and the Hawaiian Islands, in general, Kailua Ahupua`a has been blessed with an abundant and diverse set of natural resources. Large extensive sandy beaches front the *makai* portion of the *ahupua`a*. The extensive reef environment and nearby offshore islands, including Mōkōlea and the two Mokulua islets, provide additional resource gathering environments. Two extensive inland freshwater areas, Kawainui Marsh and Ka`elepulu Pond, exist inland from the coast. Kawainui Marsh and Ka`elepulu Pond, along with 18 permanent freshwater streams, provided an abundance of ecologically diverse environments. Mount Olomana (1,643 feet) dominates the landscape in the central portion of the *ahupua`a*. Other low ridgelines and gulches exist in the central portion southern half of the *ahupua`a*. The massive cliffs of the Ko`olau uplands of Maunawili provide a natural barrier to Honolulu District as well as an extensive upland mountain environment. These mountains would have been important raw material sources in ancient times, containing diverse and numerous lithics (for making stone tools), medicinal plants, and hardwoods.

Kailua Ahupua`a supported one of the largest pre-Contact populations in O`ahu, and possibly in the Hawaiian Islands, due to its bountiful natural resources, environment, and favorable physiographic setting. Access to abundant fresh water, coastal environments, and the

mountains, as well as large areas amenable to both agriculture and habitation, made Kailua a favorite place for members of the *ali`i* class as well as the *maka`āinana* (commoners). Kailua was known as a favorite place for the *ali`i* to visit and recreate. Handy and Handy (1972:457) relay that “Kailua was the home of the *ali`i* Kuali`i in the early 18th century, and presumably had been the seat of the high chiefs of the Ko`olaupoko from very early times.” Large agricultural systems provided *kalo* (taro) and a variety of other crops such as *mai`a* (banana) and *`uala* (sweet potato). Handy and Handy (1972:457) state that terraced areas were present on the flanks of Ka`elepulu Pond near the base of a ridge located to the east. It is possible that the ridge to which Handy and Handy (1972:457) are referring is Ka`iwa Ridge. Fish were farmed in abundance in the two large natural *loko i`a* (fishponds) Kawainui and Ka`elepulu, along with the numerous fortified fishponds that were constructed along the shoreline and inland areas of Kawainui. The extensive *kai lawai`a* (fishery) of Kailua Bay and the offshore islands provided a patchwork of ocean resource zones that extended a mile offshore from the beaches of Oneawa and Kailua Bay.

The earliest inhabitants of Kailua Ahupua`a more than likely settled from the coast to the mid to upper regions (more inland), a pattern typical of the *ahupua`a* resource acquisition strategies of Hawai`i (Tuggle 1994). The plentiful freshwater sources, use of fishponds, favor of the land by the *ali`i*, aptly places Kailua as an important and well-used area of O`ahu.

WAHI PANA

There are many important legends associated with the environs of Kailua Ahupua`a (Fornander 1969; Beckwith 1970; Sterling and Summers 1978; Drigot and Seto 1982). Legends and oral histories provide the meaning of the specialness of this place, the name Kailua means “two seas” which apparently refer to the two inland water sources, Kawainui Marsh and Ka`elepulu Pond (Pukui *et al.* 1976:69). Few other areas in the Hawaiian Islands have as many landforms named for sacred persons and events as does Kailua (Drigot and Seto 1982).

Many important legends center focus on Kawainui and Ka`elepulu, as well as the peak of Olomana, Mōkapu Peninsula and Alāla Point (*i.e.*, the high point-lookout between Kailua Beach and Lanikai). Themes of voyaging, creation, fertility and genealogical ties to ancestor gods are mentioned repeatedly throughout the legends. One well-known legend involved the creation of the first man (Kanehulihonua) and woman (Keakahuilani) by the gods Kāne, Kū and Lono at Mōkapu. There are many legends involving the famous Ali`i Olopana who is remembered as residing in Kailua. Well remembered and recorded in *oli* and *mo`olelo* are many historic episodes involving Olopana who, with his brother Kahikiula came to O`ahu from Kahiki and

settled in Kailua with his wife Hina. Olopana is credited with the establishment of Pahukini and Holomakani Heiau near Kawainui, and with other *heiau* throughout Ko`olaupoko. Hina and Kahikiula, Olopana's brother, gave birth to Kamapua`a whose capture, escape, and subsequent rebellions against his `anakala (uncle) resulted in Olopana's eventual death and Kamapua`a's subsequent return to Kahiki (Fornander 1969). The development of Kamapua`a into one of Hawai`i's preeminent legendary figures, following his exploits with Olopana and his tumultuous love affair with Pele, were documented by numerous sources in the past. Some epics were written as segments in Hawaiian Language newspaper that lasted over a year. The significance of these legends is paramount and this is evidenced by the continued interest as versions of these events continue to be translated. These legends are primary sources of insight into traditional Hawaiian epistemologies, and their connection to specific places within the Hawaiian landscape is immeasurably valuable.

In *Ho`ona`auao No Kawai Nui*, Drigot and Seto (1982) describe some of the numerous *mele* and *oli* (chants) that were composed describing Kawainui and Ka`elepulu Fishponds. These chants describe the environment and relationships between people and the land. These chants tell of the *mo`o akua* ('lizard god' 'dragon') or the *mo`o* goddesses, Hauwahine and Haumea, who were respected guardians that protected and nourished these Kailua fishponds, which were known for their production of mullet and *awa* (milkfish). These *mo`o* goddesses were said to reside on the ridge between Olomana and Pu`u O Ehu. There are numerous legends describing the *mo`o* goddess Hauwahine of Kawainui. For example, Hauwahine is referred to in the epic *Hiiakaikapoliopole* by Hi`iaka as the guardian of Kawainui. Her ability to take the forms of a *mo`o* and a woman allude to her supernatural powers.

In *Hawaiian Mythology*, Martha Beckwith (1970) discusses Haumea as associated with themes surrounding food supplies for the life of man and marriages and births for the increase of healthy family populations. According to legend, the great fish-attracting tree or stick named Makalei (which brought prosperity to the people who honored and respected the tree; and, to the creator goddess Haumea, who brought the tree from Paliuli, Hilo, Hawai`i Island), stood on the banks of Kawainui. The Makelei tree/stick is associated with a source of a never-ending supply of food. If treated properly, this tree/stick will feed and nourish the Hawaiian people, and allow for healthy, fertile populations. According to Beckwith (1970), in the *Kumulipo* version of this legend, Haumea is referred to as a genealogical link to the ancestor gods. Her role as midwife to Olopana's daughter (Muleiula) and her status as patroness of painless childbirth is connected to the bringing of these gods and certain chiefly lineages to O`ahu (*ibid.*). The Makalei tree or

branch is also symbolic of the ability to produce healthy offspring of strong stock; thus, providing longevity and continuity to the genealogic line (*ibid.*).

Other well-known traditions about the ample productivity of the Kailua region and its ability to nourish the Hawaiian people include the legend of the *lepo`ai`ia* (edible mud). This *lepo`ai`ia*, which was brought to Kawainui by the famous voyager Ali`i Kaulaakalana from Kahiki was served as a substitute for *poi* to Kamehameha’s warriors during a time of *kalo* shortage in Kailua Ahupua`a (Sterling and Summers 1978:231-232). Protocols surrounding the procurement of the mud included a ban on inappropriate speech, which would result in the death of the harvester. Informants provided descriptions of the mud; it was found only in Kawainui, it was thick and jelly-like, like *haupia* pudding in texture but the color of *poi*.

Kailua Ahupua`a also has strong connections to the legends of the well-known *menehune*, the race of “little people” who built monumental structures (*e.g.*, fishponds and *heiau*) at night for the Hawaiians. The *menehune* have been credited with the construction of Ulupō Heiau, one of the largest structures on the Windward side of O`ahu. Ulupō Heiau is located on the Kāne`ohe (north) side of Kailua Road, just *makai* (east) of Castle Junction. It is located near the head of the former Kawainui fishpond (McAllister, in Sterling and Summers 1978:232). According to Kirch (1996:32), “[a]lthough not the largest temple site on O`ahu in terms of area ... Ulupō (“night inspiration”) may be the greatest in terms of the sheer mass and volume of stones used in its construction.” During McAllister’s visit to Ulupō, an elderly Hawaiian man named Mahoe pointed out to him a narrow pathway on the northwest corner called the “*menehune* pathway” that led from the spring. According to Akuni Ahau, an informant, this was the spring in which the sacrificial pigs were washed prior to bringing them up to the temple oven of Ulupō (McAllister in Sterling and Summers 1978:233).

Many famous *ali`i* were known to reside in Kailua and to come to Kailua to visit and recreate. In addition to the aforementioned famous Olopana, Kakuhihewa was said to reside at `Ālele, which refers to central Kailua, a flat plain previously known as Kula o `Ālele (Fornander 1969, Volume 2:274). Fornander (*ibid*) described the Kakuhihewa residence at Kailua as one of three (Kakuhihewa) royal residences (Waikīkī and `Ewa being the other two). Fornander (*ibid*) described the residence, named Pāmoa, as a large house but not as overtly large as past residences of lesser chiefs and estimated that Kakuhihewa lived in the last half of the 16th century. Kamakau’s (1991:69) description of Kakuhihewa’s residence suggests a wide variety of games and other activities took place here:

At `Ālele in Kailua he built his “government house”, *Hale Aupuni*. It was forty *anana* long and fifteen *anana* wide: Pāmoa was its name. All these were done here: storytelling, distribution of lands, recalling traditions of the ancestors, reciting of genealogies, practicing of battle skills, wielding of war clubs, thrusting of spears, observation of omens, study of land features, study of stars, playing *kōnane*, learning the *mele* of ancestors and chiefs, running, learning to leap from cliffs, *maika* rolling, dart throwing, boxing, hand wrestling, sitting wrestling, shoulder wrestling, hand to hand fighting, all kinds of sports that strengthened the body, cultivating and fishing.

Other chiefs known to reside in Kailua include Kūali`i, whose *piko*-cutting ceremony occurred at the *heiau* of `Ālala, and the sacred drums of Opuku and Hāwea were used at the *heiau* to announce the event to people (Fornander and Sterling, in Kelly and Nakamura 1981). Kūali`i is remembered as leading many battles in his quest as *mō`ī* (supreme ruler) of O`ahu. He and his forces battled rival chiefs in O`ahu, as well as voyaging to other battles, collecting additional allied warriors, and aiding in the battles of other chiefs with whom he was aligned on other islands (Fornander 1969, Volume 2: 280-282). Kūali`i was known to reside in both Kailua and Kualoa, but preferred Kailua, where he died at an advanced age. Fornander (Fornander 1969, Volume 2:284) explains the extent to which Kūali`i went to conceal his bones after his death. Before his death he entrusted his dearest *kahu* (‘attendant’ or ‘guardian’) to attend to his funerary arrangements. After his death and the subsequent defleshing of his *iwi* (bones) for concealment, which was done to avoid access and desecration by mortal men, Kūali`i’s trusted *kahu* secretly ground the *iwi* into a fine powder. Afterwards he announced that a great feast must be prepared to honor Kūali`i, and chiefs from far and near were invited to attend. Great preparations were undertaken, and on the arrival of the feast day, the *kahu* secretly mixed the powdered remains into the *poi* that was served at the feast. When asked if he had carried out his chief’s wishes he replied “...he had hidden his masters bones in a hundred living tombs.”

The practice and popularity of maintaining a residence in Kailua by other prominent and famous *ali`i* continued into early Post-Contact times. For example, Kelly and Nakamura (1981) report that Kahekili, a paramount chief of Maui, was said to have resided in Kailua in the 1780s, during which time he battled many O`ahu warrior-chiefs, killed Kahahana, and took his place as high *ali`i* of O`ahu (Kelly and Nakamura 1981). During his period of residence in Kailua, Kamehameha I reportedly worked in the fishponds of both Kawainui and Ka`elepulu, in order to encourage and stimulate fishing and the growing of food to feed his warriors brought from Hawai`i to conquer O`ahu in 1795 (Kamakau, in Kelly and Nakamura 1981). In the 1870s,

Queen Lili`uokalani was said to reside at Maunawili at the Boyd Estate. According to Brennan (2000), “[s]he would come on the water by way of Waimānalo. And then the carriage pulled by horses would bring her into Maunawili. And Maunawili was the place where she chose to rest and recuperate.”

HISTORIC PERIOD

Historic accounts of Kailua directly after contact are limited, and while great changes were occurring in land use practices, little written documentation exists to create a precise timeline. Levi Chamberlain, a missionary who traveled around the islands in 1828 to inspect the conditions of the mission schools, recorded one of the only written accounts. On approaching and passing through Kailua he recorded his interpretations of Kawainui:

Here at Kailua we found a small school under the care of a female not very well qualified for an instructor. Kailua is a large district and the schools of which there are several; have on former examinations, made a very good appearance. At the present time, most of the males are absent procuring house timber for Kaleohano, the proprietor of the district.

Directing our course towards Kaneohe, the next district, we were obliged to pass over a tract of land mostly overflowed with water from the late rains. Here I was obliged to wade, as the distance was too great to admit of my being carried on the shoulders of my attendants, as was generally the case in passing a small stream of water. After emerging from the flat, our path was not improved, for we had now to walk through mud instead of water—we walked some distance along the steep hill, and at length by a winding path ascended to the top of it. We sat down to rest for a few minutes, and I found myself upon the summit of a ridge extending from the mountains in a right line to the sea and dividing the low lands of Kailua from those of Kāne`ohe (Chamberlain Ms.: 664, in Kelly and Nakamura 1981:7).

THE MĀHELE (1848-1851)

In the 1840s, a drastic change in the traditional land tenure resulted in a division of island lands and a system of private ownership based on Western law. While it is a complex issue, many scholars believe that in order to protect Hawaiian sovereignty from foreign powers, Kamehameha III (Kamehameha III) was forced to establish laws changing the traditional Hawaiian economy to that of a market economy (Kuykendall 1938, Vol. I: 145; Daws 1977:111; Kelly 1983:45; Kame`eleihiwa 1992:169-70, 176; Kelly 1998:4). The Māhele of 1848 divided Hawaiian lands between the king, the chiefs, the government, and began the process of private ownership of lands. The subsequently awarded parcels were called Land Commission Awards

(LCAs). Once lands were thus made available and private ownership was instituted, the *maka`āinana* (commoners), if they had been made aware of the procedures, were able to claim the plots on which they had been cultivating and living. These claims did not include any previously cultivated but presently fallow land, *`okipu`u* (forest clearing on O`ahu), stream fisheries, or many other resources necessary for traditional survival (Kelly 1983; Kame`eleihiwa 1992:295; Kirch and Sahlins 1992). If occupation could be established through the testimony of two witnesses, the petitioners were awarded the claimed LCA and issued a Royal Patent after which they could take possession of the property (Chinen 1961:16).

Māhele land records provide a component to understanding land use history during the early to mid 1800s. However, due to the fact that many people who had use rights in the land did not register their claims with the Board of Commissioners, the land commission documents represent only a portion of the population that was living on and cultivating the land (Kelly and Nakamura 1981). Kelly and Nakamura (1981) discussion of land history of Kailua indicates the importance of the *ahupua`a* of Kailua in relation to the individual naming of at least 63 *`ili* (smaller land divisions) within the region. This is compared with to the average of 30 to 40 named *`ili* within larger *ahupua`a* (Lyons, in Kelly and Nakamura 1981). The additional amount of individually-named parcels attests to the importance and value of the lands of Kailua to the Hawaiians before the Māhele. According to the Māhele documents, the *ahupua`a* of Kailua, except for the *`ili* claimed by the king and by other chiefs, was claimed by Kamehameha III to his wife Kalama. In addition to Kalama, forty-one high-ranking chiefs claimed an interest in Kailua Ahupua`a. Kamehameha III kept the *`ili* of Kawailoa (in which the current project area is located) as Crown Lands (Kelly and Nakamura 1981). Kawailoa was an *`ili lele* (essentially a discontinuous piece of land) made up of several parcels located at the coast, along the banks Ka`elepuhu pond and Kawainui, and in the upper reaches of Maunawili Valley.

Land Commission Awards (LCA) for Kailua documented garden areas clustered around all eighteen permanent and perennial streams and in areas of natural springs. Two LCA are located within the project area, located near an unnamed stream, and are identified as LCA 44:2 and LCA 4452:12 on TMK (1) 4-2-004 (Figure 3). According to the Waihona `Aina Database (2014), LCA 44 M.A. (Royal Patent 8262) consisted of one half of the *`ili* of Kaula (204 acres) and includes a portion of the project area (see Figure 2). Land Commission Award 44 was awarded to Kalaau and signed by Kamehameha III at the "Royal Palace on 2 February 1848." The Land Commission Awards are presented in Appendix A.

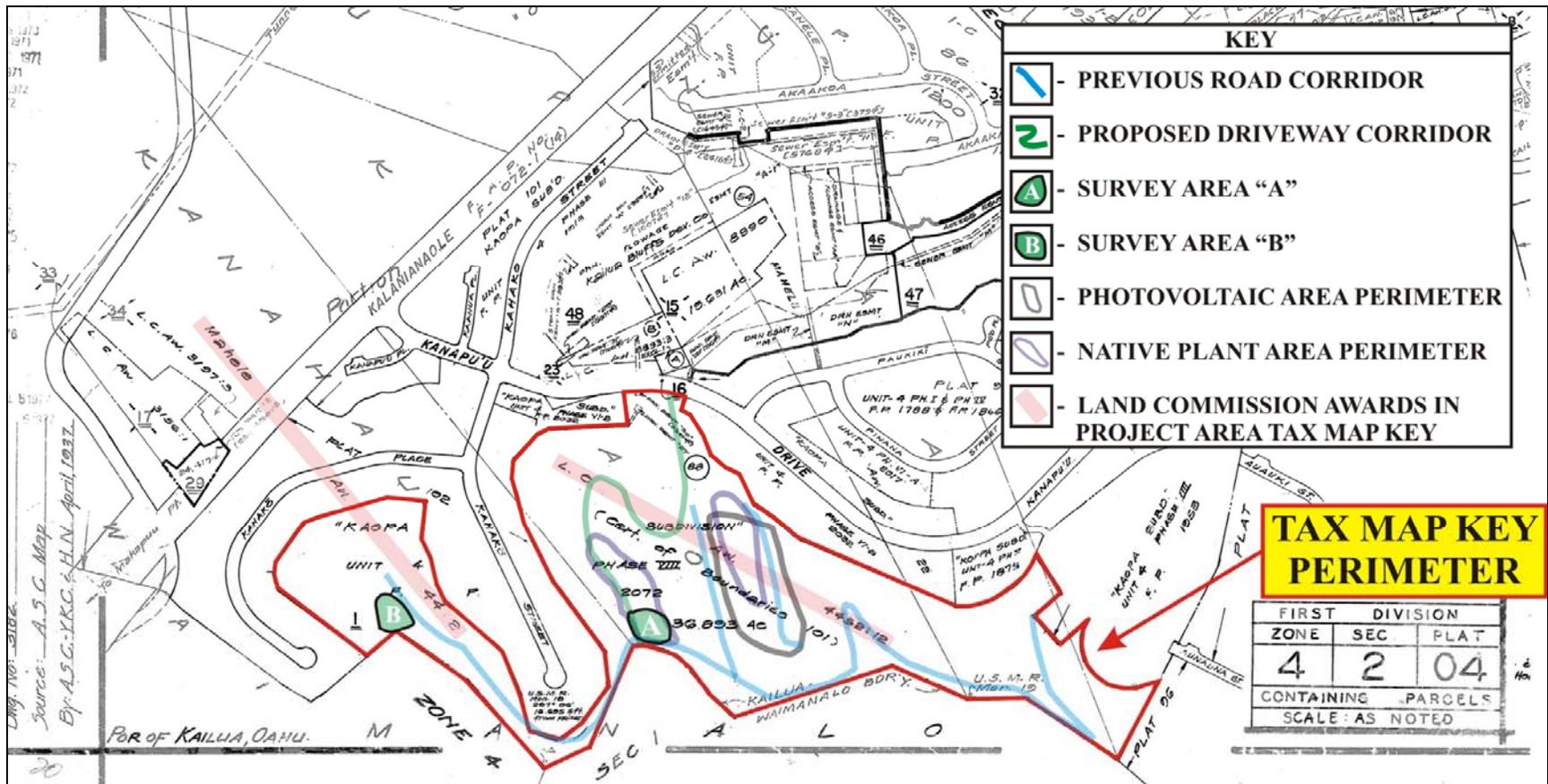


Figure 3: Tax Map Key [TMK: (1) 4-2-04] Depicting LCA 44:2 and LCA 4452:12.

Land Commission Award 4452 included 11,885 acres within the *ahupua`a* of Kailua awarded to Queen Kalama and also included a portion of the project area (see Figure 2). As specified in LCA 4452, these lands were awarded to Queen Kalama as house lots (see Appendix A).

During the 100 or so years following the Māhele, the agricultural patterns of Kailua were drastically altered. Rice production began in earnest after the initial wave of Chinese immigrants reached Hawai`i. Princess Ruth, also, leased lands around Ka`elepulu Pond to Chinese farmers (Susan Lebo, Personal communication). Many of the abandoned *kalo lo`i* in Kailua were converted to rice. Land was rented from farmers not using their lands for rice cultivation, and several mills were constructed (*e.g.*, one was located in the *ili* of Makali`i). Rice farming began as early as 1789 in Hawai`i (Kelly and Nakamura 1981). Until 1900, rice was the most important crop in Kailua. After 1900, truck-farming of taro and introduced, western crops was most prevalent (*ibid.*). In 1876, the Reciprocity Treaty between the Hawaiian Kingdom and the United States was signed. After the signing of this treaty, the sugar industry in Hawai`i was greatly expanded.

Following this treaty, sugarcane production underwent a great expansion and its reliance on water from Kailua was substantial. By 1878, construction of a complex of flumes, ditches, and tunnels was completed in the *mauka* portions of Maunawili to collect water from streams and springs. This system facilitated the delivery of water to Waimānalo's sugarcane fields. By 1900, this system was 4 ½ miles long, and diverted all of Maunawili's stream water to Waimānalo. In the 1920s, improvements to the existing system were added. This included catchment tunnels excavated into the Ko`olau Mountains to increase water flow (Wilcox 1996).

In 1909, the Hawaiian Copra Company decided to level the “sand dunes and smooth[ing] out the former dune areas” (Hall 1997:77-78). They planted 130,000 coconut trees on 200 acres of beach sand, calling the area Coconut Grove. This unfortunate event likely disturbed numerous types of culturally significant sites. Incomplete and disarticulated human burials along with truncated cultural deposits resulted from these actions.

By 1924, a system of pumps, pipelines, tunnels, and ditches was completed that pumped water from Kawainui Marsh into the Kailua reservoir, which was part of the Waimānalo Irrigation System. This was used until the early 1950s (Wilcox 1996:111; map of Kailua Ditch

on 106). Use of the Kawainui water rapidly declined after the liquidation of the Waimānalo Sugar Company in 1947 (*ibid.*).

Ranching began in Kailua Ahupua`a in the early 1900s, and the Kaneohe Ranch began to dominate land holdings in the Kailua and Kāne`ohe areas. Cattle, sheep, and horses were pasturing throughout Kailua's open plains landscape. As a result of this, it is likely that cattle grazing destroyed many abandoned gardens and *lo`i*. Kaneohe Ranch (Castle Trust) was also involved in commercial agriculture growing pineapple and sugarcane on its vast land holdings.

By the 1950s truck farming and ranching began to give way to housing, municipal, and commercial development. The realignment of the Pali Highway in 1959 allowed for the advertisement of Kailua as the ultimate “bedroom” community of Honolulu, just 10 miles and 25 minutes (by car) away. Kailua's expansion has continued until the present time.

PREVIOUS ARCHAEOLOGY

Based on previous archaeological studies and archival research, at the time of Contact (1778), Kailua was a thriving community. The location of Kailua Ahupua`a allowed easy access to the shoreline, and included prime agricultural lands including the Kawainui Marsh, the largest freshwater marsh in Hawai`i. Additionally, resources included an inland pond (Ka`elepulu) and as many as 18 streams fed the terraced taro fields. All of the freshwater made the ground rich and fertile and “provided bountiful agricultural and resource gathering areas” (Mann *et al.* 2002). *Mele* (chants) also suggest there may have been two very productive fishponds in Kailua. Kailua, a populous community favored by *ali`i*, was also the center of a large royal complex in the 15th and 16th centuries that included playgrounds for sports and physical training (Sterling and Summers 1978:231-232).

Since Thrum's study of the island in 1907, numerous studies have been conducted in Kailua during which additional sites have been identified. Site types range from terraces to habitation platforms, to *heiau*, and skeletal remains. Although diverse site types have been found in Kailua, a great number of such sites have been burials. Ancient Hawaiians typically buried their ancestors in sand, land with no potential agricultural value (Kirch 1985). Since Kailua Town was built on former sand dunes and due to the previously documented human skeletal remains in the area, Native Hawaiian burials continue to be inadvertently encountered during construction-related activities associated with ever-increasing development. Thus, the inventory of burials has been increasing. More than 83 archaeological reports describing finds of burials,

temporary and permanent habitation sites, agricultural sites and the like have been filed on this *ahupua`a*, a testament to its importance. However, most of these studies are from the *mauka* regions, as the coastal area had already undergone extensive development.

ARCHAEOLOGICAL STUDIES WITHIN KAILUA AHUPUA`A

Ka`elepulu Fishpond (State Site 50-80-11-377) was initially recorded by McAllister during the 1930 Bishop Museum survey of the island of O`ahu (McAllister 1971:190). According to Pukui *et al.* (1976:69) the literal meaning of Ka`elepulu is the "moist blackness". McAllister describes the inland pond as a having once been a "fresh water pond of much importance" (*ibid*). McAllister (*ibid*) states that Ka`elepulu Fishpond appears on the Alexander map of 1884 as encompassing an area of 190 acres with marshland amounting to 90 acres. There was a sluice gate (*mākāhā*) on the northeastern (*makai*) side of the pond and an outlet which extended to Kailua Bay. Taro patches (*lo`i*) once extended between Ka`elepulu and the stream from Kawai Nui Marsh (*ibid*: 119). According to Mrs. Charles Olona (an informant in Sterling and Summers 1978:240), the pond was kept remarkably clean and it produced the most abundantly healthy and tender fish, including: mullet, *awa*, *āhole*, and *o`opu*. Hammatt and Shideler (1992:7) suggest that these areas, including the extensive marsh lands of Puha and Ka`elepulu Pond, would have made the relatively flat coastal margins just north and south of Wailea Point, logical choices for early Polynesian settlement.

Kawai Nui Marsh (State Site 50-80-11-370) also was initially recorded by McAllister, under the auspices of the 1930 Bishop Museum survey of the island of O`ahu (McAllister 1971:186). McAllister (*ibid*) describes Kawai Nui Marsh as having been at one time a large inland pond which "...belonged to the alii. Any person coming from this area...had royal blood in his veins and could go where he wished, apparently taking precedence over alii from other sections".

In 1977, Stephen Clark conducted a cursory Archaeological Surface Survey of the roadway corridor for the proposed extension of Hamakua Drive between Hahani Street and Akoakoa Street, in Kailua [TMK: (1) 4-2, 5] (Clark 1977). During the survey two sites were newly identified (State Site 50-80-11-4699 and State Site 50-80-11-4700). State Site 50-80-11-4699, a possible agricultural/habitation complex consisting of a large earthen mound, a possible wall, alignments, a human mandible, a paved enclosure, two possible agricultural plots, and two possible *auwai*. State Site 50-80-11-4700 is a T-shaped site which was tentatively interpreted as a *heiau* and additional features including, two partially paved platforms, one paved with coral

and containing an interior alignment; alignments, including a rectangular notched alignment; a rectangular mound with associated alignments; additional alignments with interior features. Artifacts identified during the survey include: a possible sharpening stone; coral; a muller; basalt flakes; four possible post, or image, holes; two sharpening stone fragments; historic bottle glass fragments.

In 1984 Chiniago conducted a cursory Archaeological Survey at the two proposed locations of the Maunawili Pump Station on the corner of Auloa Road and Kalaniana`ole Highway, and Kukanono Pump Station, on the southeast side of the existing Kukanono Sewage Treatment Plant at the end of Manu-Oo Street, and the associated force mains, in Kailua [TMK: (1) 4-2-7, 3, 13, 51] (Barrera 1984). No historic properties were identified during the survey.

The Bishop Museum conducted an Archaeological Reconnaissance Survey of the area proposed for the Windward Park in Kailua [TMK: (1) 4-2-014:002 and 004] (Pantaleo and Cleghorn 1989). During the survey archaeological five sites (State Sites 50-80-11-2034 through -2037 and -3739) were documented. State Site 50-80-11-2034 consists of a terrace and an L-shaped terrace; Site -2035 consists of two rock walls; Site -2036 consists of a rock wall and a mound; Site -2037 consists of a linear mound. Site -3739 is a site complex of five features including: Feature A (terrace), Feature B (alignment), Feature C (a rock mound), Feature D (C-shaped alignment), and Feature E (alignment).

The inadvertent discovery of human skeletal remains at 1414 Aalapapa Street, Lanikai, O`ahu [TMK: (1) 4-3-004:005] was found upon construction at the Cole House site. In accordance with State Historic Preservation Division and in consultation with the O`ahu Island Burial Council, Cultural Surveys Hawai`i, Inc. conducted the removal of three burials under the direction of the State Historic Preservation Department. It was determined that the human skeletal remains were part of State Site 50-80-11-3738 (Bath and Smith 1988), which were more than likely an expanded area of the site; further disinterment of burials was halted (Hammatt and Shideler 1992).

Cultural Surveys Hawai`i, Inc. (CSH) conducted an Archaeological and Historical Assessment and Field Inspection of a 0.8 mile segment of the Auloa Road right-of way in anticipation of the installation of a 16-inch water line, in Kailua [TMK: (1) 4-2] (Hammatt and Chiogioji 1997). No new sites were identified during the Field Inspection. However, CSH made note of two existing historic properties located at Castle Junction (the Kaneohe Ranch office

building, State Site 50-80-10-1360, and a war memorial monument) adjacent to the CSH project area.

Between December 1999 and August 2000 the International Archaeological Research Institute (IARII) conducted Archaeological Monitoring during sewerline installations along Kalāheo Avenue, Kailua [TMK: (1) 4-2-001, 019, 020; 4-4-022 through 032; 4-4-011] (Ormsby *et al.* 2003). No historic properties were identified.

Scientific Consultant Services, Inc. (SCS) conducted Archaeological Monitoring during ground alterations associated with fire hydrant installations at Kailua Elementary School [TMK: (1) 4-3-056:003] (Calis 2003). During the course of the monitoring activities Site 50-80-10-6524, a burial site containing three burials, was newly identified. Burials 1 and 2 were "...identified *in situ*, in a primary burial context" (*ibid*: 12). Both Burials 1 and 2 were in flexed position and determined to be adult females of Polynesian ancestry interred during the pre-Contact Period. Burial 3, extensively disturbed during backhoe trenching, was recovered from the backdirt pile (*ibid*: 12, 15, and 16). The age of Burial 3 was determined to be pre-pubescent. However, as Burial 3 was in fragmented condition, gender and ethnicity could not be determined (*ibid*: 12).

Between April and November 2003 Archaeological Monitoring was conducted by CSH during the Anti-Crime Street Lights Project along both sides of Kailua Road [TMK: (1) 4-3-056; 4-2-038] (Jones and Hammatt 2004). Site 50-80-11-6657, a firepit yielding a date of A.D. 1400 to 1850 was identified. The findings of the archaeological monitoring indicate the ground surface and the subsurface strata, to a lesser extent, have undergone extensive modifications due to the urbanization of the area.

Between April 2003 and April 2005 CSH conducted Archaeological Monitoring of the Kalāheo Avenue Reconstructed Sewer Project [TMK: (1) 4-3-016, 017-020, 024-027, 075, & 080] (Borthwick *et al.* 2006). Two sites were identified (State Site 50-80-11-6770 and 50-80-11-6818) during the monitoring activities. State Site 50-80-11-6770 consists of five sets of human skeletal remains (Features A through E) encountered near the intersection of Wilikoki Place and North Kalāheo Street. State Site 50-80-11-6818 consists of fragmented, previously disturbed, human skeletal remains discovered at the intersection of `Ōma`o Street and North Kalāheo Street.

T. S. Dye and Associates conducted an Archaeological Inventory Survey of an approximately 192, 862 square foot beach lot located at 55 Kailuana Place, Kailua [TMK: (1) 4-

3-022:011] (Putzi and Dye 2004a). During the inventory survey one site (State Site 50-80-11-6642) was newly identified. State Site 50-80-11-6642 "...yielded evidence of traditional Hawaiian habitation and [five intact] early Historic-era human burials..." and included Traditional-type materials (midden deposit and artifacts) and a pig burial (*ibid*: 24–25).

Subsequent to the Archaeological Inventory Survey (Putzi and Dye 2004a), T. S. Dye and Associates conducted Archaeological Data Recovery of Site -6642 [TMK: (1) 4-3-022:011] during the re-internment of the five burials initially identified during the AIS (Putzi and Dye 2004b). Data Recovery yielded "...traditional Hawaiian artifacts, food remains, and the partially exposed remains of a sixth burial" (Putzi and Dye 2004b). Based on the findings of the Data Recovery excavations, State Site 50-80-11-6642 has been interpreted as a "a burial ground; a center of religious ceremony; a habitation area, including food processing and food procurement; a work area for craftsmen, such as woodworkers; animal husbandry; and as a residence for the *ali`i*" (*ibid*: 28). The variety of activities conducted at this site provides a clearer picture of traditional life-ways in the early post-Contact Period as well, as additional data pertaining to traditional Hawaiian mortuary practices.

In September 2006 Pacific Consulting Services, Inc. conducted an Archaeological Assessment (Archaeological Inventory-level Survey work with negative findings); with limited shovel excavation, of the 10.7 acre Kailua area proposed for emergency rock fall and landslide mitigation [TMK: (1) 4-2-003:014 and 017] (Collins and Nees 2007). The project area is located along Kailua Road. No historic properties were identified.

Cultural Surveys Hawaii, Inc. conducted an Archaeological Inventory Survey of a 0.7 acre property located on Hekili Street, in Kailua [TMK: (1) 4-2-038:009 and 010] (Tulchin *et al.* 2007). During the survey one site (State Site 50-80-11-6916) was identified. State Site 50-80-11-6916 consists of a pre-Contact cultural deposit (comprised of midden, basalt tools, lithic debitage, numerous pit features, and two human burials). The findings at Site -6916 suggest "...a pre-Contact indigenous occupation...with an emphasis on lithic reduction work related to the manufacture of stone tools" (*ibid*: 95). The pre-Contact date is supported by radiocarbon analysis which yielded a calibrated 2-Sigma date ranging from 1440 A.D. to 1520 A.D. (Tulchin *et al.* 2007).

ARCHAEOLOGICAL STUDIES IN THE VICINITY OF THE PROJECT AREA

A limited number of archaeological studies have been conducted in the vicinity of the current project area (Figure 44), these studies are described below.

Between April 2003 and October 2005 CSH conducted Archaeological Monitoring of ground altering activities associated with the Reconstructed Sewer Project located in Kailua within select portions of Keolu Drive, Hamakua Drive, and Kainehe Street [TMK: (1) 4-2-1; 77; 81; 82; 87; 89; 90; 93 through 95] (Fong *et al.* 2007). The southernmost end of this project was located approximately 590 m north of the current project area. No historic properties were encountered.

In 2005 Scientific Consultant Services, Inc. conducted an Archaeological Inventory Survey of 25 acres, in Kailua [TMK: (1) 4-2-003:004 por. & 022 por.] (Morawski and Monahan 2005). This project was located approximately 1500 m northwest of the current project area. During the survey two historic sites were identified: a lithic scatter (State Site 50-80-11-6816) and an Historic water-flow control structure (State Site 50-80-11-6817) comprised of two features. No excavation was conducted. Thus, no radiocarbon samples were available.

Scientific Consultant Services, Inc. conducted an Archaeological Assessment of four tax map key parcels totaling 6.255-acres of land, in Enchanted Lakes, Kailua Ahupua`a, Ko`olaupoko District, Island of O`ahu [TMK: (1) 4-2-083: 074, 075, 077, and 079] (Tome and Spear 2012). The combination of a pedestrian survey and a total of fourteen mechanically excavated trenches within the project area boundaries did not reveal the presence of archaeological cultural material or archaeological sites on the ground surface or within subsurface contexts. Modern debris was observed along the northeastern and southeastern perimeters of the project area.

EXPECTED FINDINGS

Documentation of archaeological sites within Kailua Ahupua`a, in conjunction with historical documentation regarding human land use in Kailua Ahupua`a suggested that the project area might contain pre- or post-Contact sites, including surface and/or subsurface house structure remnants (*e.g.*, brick constructed walls and foundations) and agricultural features [*i.e.*, *lo`i* basalt rock walls, terraces, or *auwai* (ditches)]. Pre-Contact or Historic artifacts and remnants of food midden (marine and terrestrial vertebrates and shelled invertebrates) from earlier episodes of land use might also be encountered.

METHODOLOGY

Archival work was conducted at the State Historic Preservation Division (SHPD) library (Kapolei), the SHPD website, and at the Scientific Consultant Services, Inc. library (Honolulu

office). Scientific Consultant Services, Inc., archaeologist Guerin Tome, B.A., conducted the fieldwork from September 20 to 23, 2013 and on October 13, 2014, under the direction of Robert L. Spear, Ph.D., Principal Investigator.

FIELD METHODS

At the request of the Group 70, three survey areas and two linear survey corridors within the 37-acre TMK parcel were selected for pedestrian survey with limited subsurface testing. These consisted of Survey Area A [which included the proposed Primary Home Site and one portion of the Native Plant Area], Survey Area B [the Alternate Home Site], and the Photovoltaic Area [which overlapped and included the other portion of the Native plant area] and two linear survey corridors (a proposed driveway corridor, approximately 450 m long and 3 m wide, and a previously created private road corridor, approximately 650 m long and 3 m wide, that followed the ridgeline along the east side of the property for most of its length). Only these areas, comprising approximately 5.5 acres, were selected for archaeological investigation, as these are the areas proposed for ground altering activities in the near future (see Figures 1 and 2).

The pedestrian survey consisted of transects ranging from 5 to 10 m apart based on steepness of terrain. Thus, in areas with steep terrain, transects were closer together and in areas with gentle terrain, transects were farther apart. The Archaeological Inventory Survey was conducted in order to identify archaeological sites and assess the project area's geographical features where ground disturbance might take place; SCS was not tasked to survey the entire TMK parcel.

Four (4) manually excavated Shovel Probes (SP-1 through SP-4) were strategically placed for sampling within the project area. The shovel probes were excavated to locate archaeological deposits within subsurface contexts. Thus, areas exhibiting relatively level terrain were selected, as these areas are more likely to contain habitation and related activities (*i.e.*, food preparation and tool manufacturing).

The location of each shovel probe was also recorded with a handheld Garmin GPSMap 60CSx. Soil stratigraphy encountered during excavation was documented utilizing metric graph paper and United States Department of Agriculture (USDA) *Munsell Soil Color Charts* (2000). All measurements were recorded in metric with centimeters below surface. No soil samples were collected since no subsurface archaeological cultural materials were identified. Shovel probe excavations were conducted utilizing shovels, trowels, and a whisk broom. All excavations were terminated as the result of the absence of the presence of cultural materials.

On October 13, 2014 SCS Archaeologist Guerin Tome conducted a pedestrian survey of the revised driveway corridor. The pedestrian survey consisted of transects ranging from 5 to 10 m apart based on the steepness of terrain.

LABORATORY METHODS

All field notes, digital photographs, and collected archaeological materials are currently curated at the SCS laboratory in Honolulu. All samples collected during the project have undergone analysis at the SCS laboratory in Honolulu. All data were clearly recorded on standard laboratory forms. Artifact analysis data is presented in Appendix B. All stratigraphic profiles drafted for presentation within this report are presented in the Fieldwork Results section of this document. Plan view sketches showing location and morphology of identified subsurface strata were illustrated.

FIELDWORK RESULTS

The current archaeological investigation of Tax Map Keys (1) 4-2-004:001 included pedestrian survey of the above-described survey areas and limited subsurface excavation. After the proposed driveway corridor was revised the entire revised corridor was also subjected to pedestrian survey. During the initial survey several Historic artifacts were encountered on the ground surface. The Historic artifacts, described in Appendix B, include five brass .30-06 caliber blank rifle cartridges, dating to 1943, and a single isolated artifact, consisting of a Hazel-Atlas glass ketchup bottle manufactured from 1920 to 1964. The brass cartridges recovered during the survey document military training in this area during WWII. No Traditional or Historic cultural sites, features, or material were identified during the pedestrian survey of the revised driveway corridor. No Traditional or Historic cultural materials were encountered in subsurface contexts.

SURVEY AREA A

Survey Area A included the primary proposed house site as well as a larger parcel proposed for the cultivation of crops and native plants (see Figures 1 and 2). The combined survey area measured approximately 0.8 acres and was located partially on a slightly undulating earthen ridge. The south side of the survey area was bordered by an abandoned dirt roadway corridor (this abandoned road was surveyed later, as part of the Proposed Road Corridor linear survey area). Vegetation within Survey Area A consisted of Formosan Koa (*Acacia confusa*), Chinese violet (*Asystasia gangetica*), koa haole (*Leucaena leucocephala*), and California grass (*Urochloa mutica*). Shovel Probes 2 and 3 were located within Survey Area A (Figure 5).

SURVEY AREA B

Survey Area B measured approximately 0.2 acres and was located on a ridge approximately 250 m northeast of Kalaniana'ole Highway, situated on a relatively flat area covered with 3 to 4 foot tall grasses, trees, and shrubs. Vegetation within Survey Area B consisted of Formosan Koa (*Acacia confusa*) and *koa haole* (*Leucaena leucocephala*). Modern white PVC pipe and black plastic irrigation lines were observed on the ground surface within Survey Area B; the presence of the PVC pipe and irrigation lines on the ground surface of Survey Area B suggest possible re-vegetation of the area. The southwest portion of Survey Area B displays exposed basalt bedrock which has been mechanically affected, based on the coloration (whitish-gray fracture facets). Shovel Probes 1 and 4 were located within Survey Area B (see Figure 5).

PHOTOVOLTAIC AREA

The Photovoltaic Area, which included the other parcel proposed for the cultivation of crops and native plants, measured approximately 2.5 acres and was located in a small valley approximately 60 meters north of Survey Area A, oriented along a general east/west axis (see Figures 1 and 2). In the middle of the valley is a gulch that drains from the east to the west, as the result of heavy rains. On the north and south sides of the drainage are moderate to steep slopes, ranging from approximately 45 to 80 degrees. A single isolated artifact consisting of a Hazel-Atlas glass ketchup bottle manufactured between 1920 and 1964 (see Figure 5); (Appendix B), was collected from a smaller gully that drains into the primary gulch. Based on the steepness of this area, subsurface testing was not conducted. Since the original survey, the landowner has decided to not pursue development of a photovoltaic area, but anticipates planting native and indigenous plants in the area.

PREVIOUS ROAD CORRIDOR

An abandoned private dirt road or jeep trail ran along the ridge line that defines the eastern border of the TMK parcel (see Figures 1 and 2). The jeep trail survey corridor measured approximately 650 m long and 3 m wide, it extended northeast from Survey Area B and then zig-zagged north past Survey Area A, following the ridge toward the northern end of the TMK parcel. The jeep trail narrowed to the width of a foot trail at a point due east of the Photovoltaic Area and continues north along the ridgeline. At the northern end of the trail, a jeep-trail spur extended from down slope to the west. A short jeep-trail spur extended west along the south side of Survey Area A, this spur was surveyed as part of the Proposed Driveway. Five brass .30-06 caliber blank rifle cartridges, dating to 1943, were discovered lying on the surface of this abandoned private road (see Figure 5 and Appendix B).

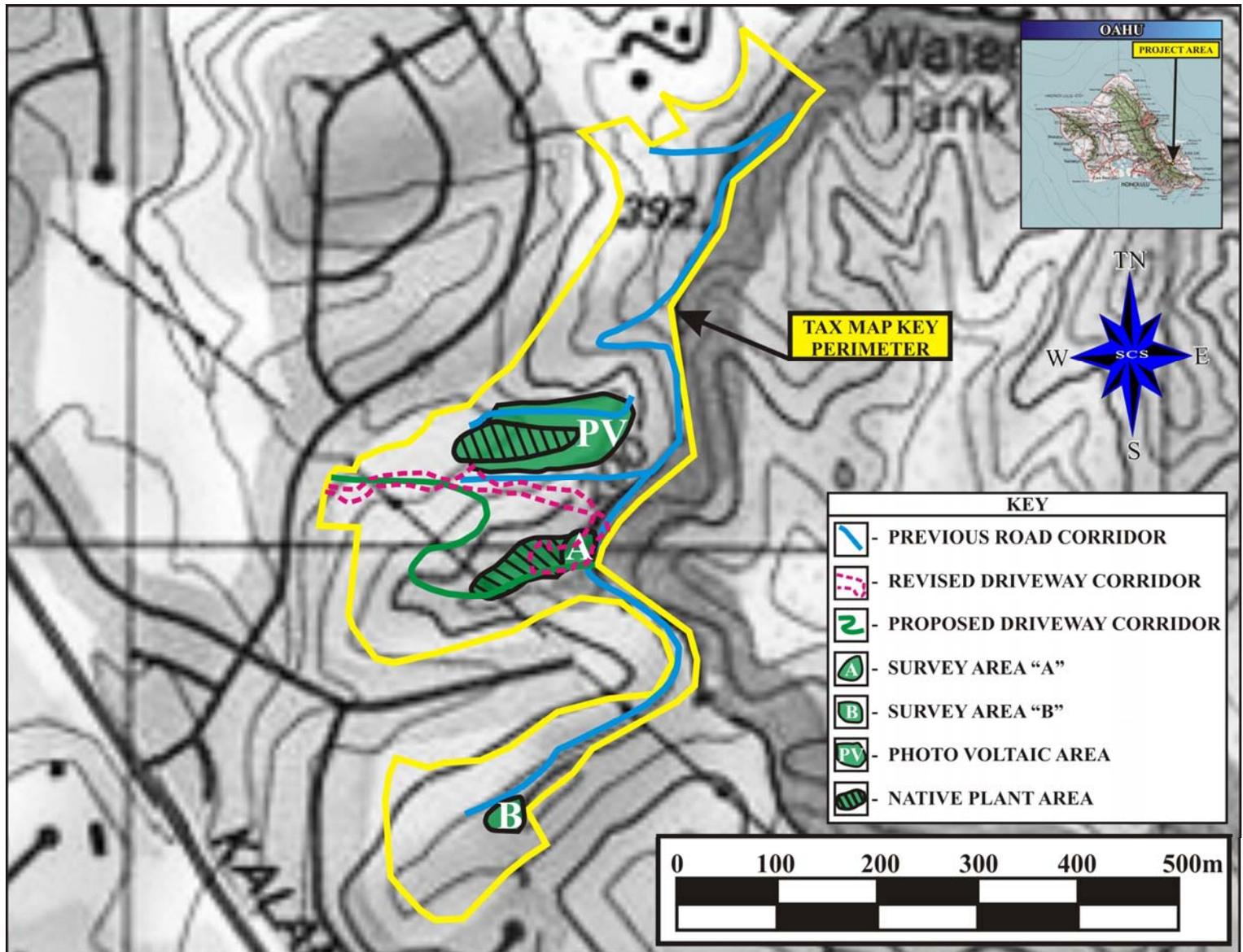


Figure 5: USGS Quadrangle (Koko Head 1999) Map Showing Location of Shovel Probes 1 through 4.

PROPOSED DRIVEWAY CORRIDOR

SCS surveyed an approximately 450 m long and 3 m wide corridor for a proposed driveway that started from the Proposed Primary Home Site in Survey Area A following an abandoned private dirt road or jeep trail westward along the south side of Survey Area A, then turned north and east down the slope and then turning back to the west to connect to Kanapu`u Drive (see Figures 1 and 2). Vegetation within the Proposed Driveway Corridor consisted of Formosan Koa (*Acacia confusa*), Chinese violet (*Asystasia gangetica*), koa haole (*Leucaena leucocephala*), and California grass (*Urochloa mutica*).

SHOVEL PROBES

As previously stated in the Field Methods section of this report, four (4) manually excavated Shovel Probes (SP-1 through SP-4) were excavated to locate subsurface archaeological deposits (see Figure 5). Between two and three strata were exposed during excavations within the project area. All stratigraphic layers within the 4 shovel probes, with the exception of Shovel Probe-4 (SP4), Layer II, were interpreted as naturally occurring strata. Shovel Probe-4, Layer II, was interpreted as modern imported fill that contained crushed coral.

Shovel Probe 1 (SP-1)

Shovel Probe 1 (SP-1) was located on a relatively flat area within Survey Area B (GPS Coordinates North 2362704/East 631299) (see Figure 5). The ground surface of SP-1 displayed clumps of tall (4 ft.) grasses and decomposing vegetation (Figure 6). Shovel Probe 1 measured 0.5 x 0.5 x 0.36 m deep. Three stratigraphic layers were identified within SP-1 (Figures 7 and 8). Excavation was terminated due to the lack of cultural material. No cultural materials were identified within SP-1.

Layer I (0-8cmbs) Dark brown (10YR 3/3, dry) silty loam. Due to the presence of a diffuse lower boundary, Layer I was interpreted as a natural stratum. Sterile.

Layer II (8-30 cmbs) Mottled yellowish red (5YR 4/6, dry) silt, Dark reddish brown (5YR 3/2, dry) silty clay and Strong brown (7.5YR 4/6, dry) silt. Based on the presence of saprolitic basalt rocks and a diffuse lower boundary, Layer II was interpreted as a natural stratum. Sterile.

Layer III (30-36 cmbs) Light yellowish brown (2.5Y 6.4, dry) clayey silt. Based on the presence of saprolitic basalt rocks, Layer III was interpreted as a natural stratum. Sterile.

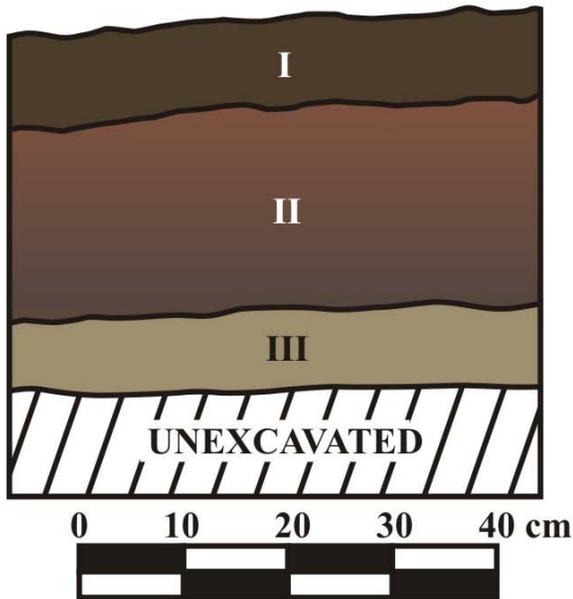


Figure 6: Pre-Excavation Photographic Overview of Shovel Probe 1. View to Northeast.



Figure 7: Photograph of Shovel Probe 1 North Wall Stratigraphic Profile. View to North.

**SP-1 NORTH WALL
STRATIGRAPHIC PROFILE**



KEY

- I** - LAYER I: DARK BROWN (10YR 3/3, DRY) SILTY LOAM WITH GRASS AND SHRUB ROOTS.
- II** - LAYER II: YELLOWISH RED (5YR 4/6, DRY) SILT MOTTLED WITH DARK REDDISH BROWN (5YR 3/2, DRY) SILTY CLAY AND STRONG BROWN (7.5YR 4/6, DRY) SILT.
- III** - LAYER III: LIGHT YELLOWISH BROWN (2.5Y 6/4, DRY) CLAYEY SILT.

Figure 8: Stratigraphic Profile Drawing of Shovel Probe 1. North Wall.

Shovel Probe 2 (SP-2)

Shovel Probe 2 (SP-2) was placed on a relatively level, vertical short, earthen mound situated amongst a series of short earthen mounds which are positioned on a short ridge within Survey Area A (GPS Coordinates North 2362990/East 631390) (see Figure 5). The ground surface of SP-2 displayed grasses and decomposing vegetation (Figure 9). Shovel Probe 2 measured 0.5 x 0.5 x 0.43 m deep. Two stratigraphic layers were identified within SP-2 (Figures 10 and 11). Excavation was terminated due to the lack of cultural material. No cultural materials were identified within SP-2.

Layer I (0-23 cmbs) Very dark grayish brown (10YR 3/2, dry) silty loam. Due to the presence of a diffuse lower boundary, Layer I was interpreted as a natural stratum. Sterile.

Layer II (23-43) Dark reddish brown (5YR 3/4, dry) silty clay. Due to the presence of a diffuse upper boundary, Layer II was interpreted as a natural stratum. Sterile.

Shovel Probe 3 (SP-3)

Shovel Probe 3 (SP-3) was placed on a downward sloping, northeastward trending, surface within Survey Area A (GPS Coordinates North 2362986/East 631373) (Figure 12; see Figure 5). Shovel Probe 3 measured 0.5 x 0.5 x 0.37 m deep. Two stratigraphic layers were identified within SP-3 (Figures 13 and 14). Excavation was terminated due to the lack of cultural material. No cultural materials were identified within SP-3.

Layer I (0-23 cmbs) Very dark grayish brown (10yr 3/2, dry) silty loam. Due to the presence of a diffuse lower boundary, Layer I was interpreted as a natural stratum. Sterile.

Layer II (23-43) Dark reddish brown (5YR 3/4, dry) silty clay. Due to the presence of a diffuse upper boundary, Layer II was interpreted as a natural stratum. Sterile.

Shovel Probe 4 (SP-4)

Shovel Probe 4 (SP-4) was located on a relatively flat area within Survey Area B (GPS Coordinates North 2362716/East 631316) (see Figure 5). The ground surface of SP-4 displayed clumps of tall (4 ft.) grasses and decomposing vegetation (Figure 15). Shovel Probe 4 measured 0.5 x 0.5 x 0.42 m deep. Three stratigraphic layers were identified within SP-4 (Figures 16 and 17). Excavation was terminated due to the lack of cultural material. No cultural materials were identified within SP-4.

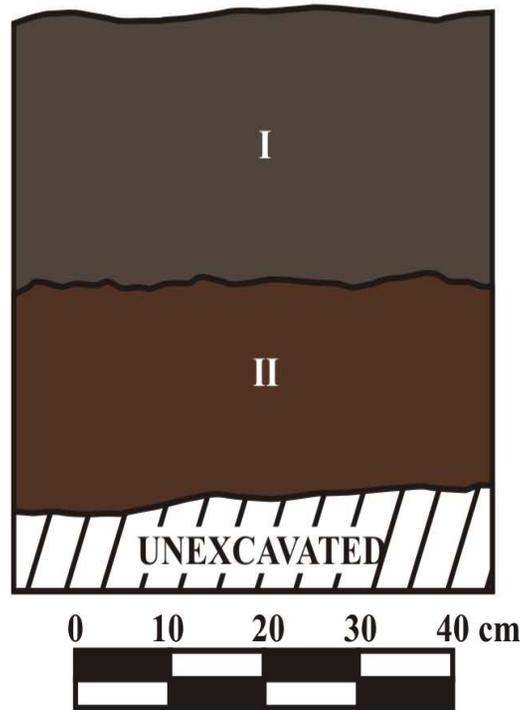


Figure 9: Pre-Excavation Photographic Overview of Shovel Probe 2. View to Northwest.



Figure 10: Photograph of Shovel Probe 2 North Wall Stratigraphic Profile. View to North.

**SP-2 NORTH WALL
STRATIGRAPHIC PROFILE**



KEY

- I** - LAYER I: VERY DARK GRAYISH BROWN (10YR 3/2, DRY) SILTY LOAM WITH GRASS AND SHRUB ROOTS.
- II** - LAYER II: DARK REDDISH BROWN (5YR 3/4, DRY) SILTY CLAY WITH SHRUB ROOTS

Figure 11: Stratigraphic Profile Drawing of Shovel Probe 2. North Wall.

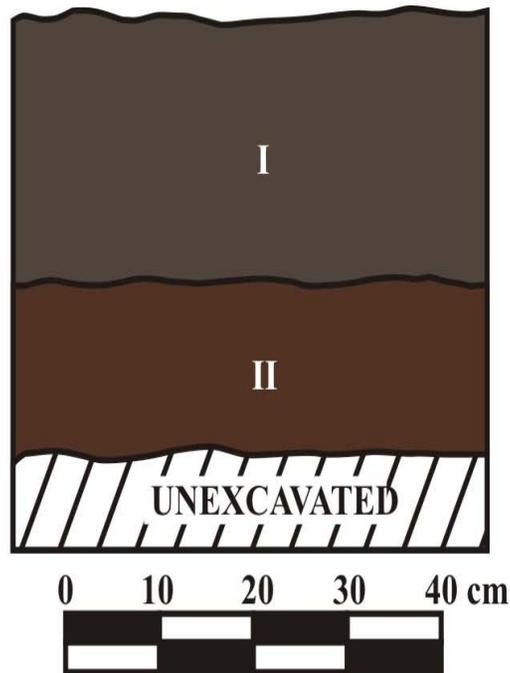


Figure 12: Pre-Excavation Photographic Overview of Shovel Probe. View to North.



Figure 13: Photograph of Shovel Probe 3 East Wall Stratigraphic Profile. View to East.

**SP-3 EAST WALL
STRATIGRAPHIC PROFILE**



KEY

- I** - LAYER I: VERY DARK GRAYISH BROWN (10YR 3/2, DRY) SILTY LOAM WITH GRASS AND SHRUB ROOTS.
- II** - LAYER II: DARK REDDISH BROWN (5YR 3/4, DRY) SILTY CLAY WITH SHRUB ROOTS

Figure 14: Stratigraphic Profile Drawing of Shovel Probe 3. East Wall.

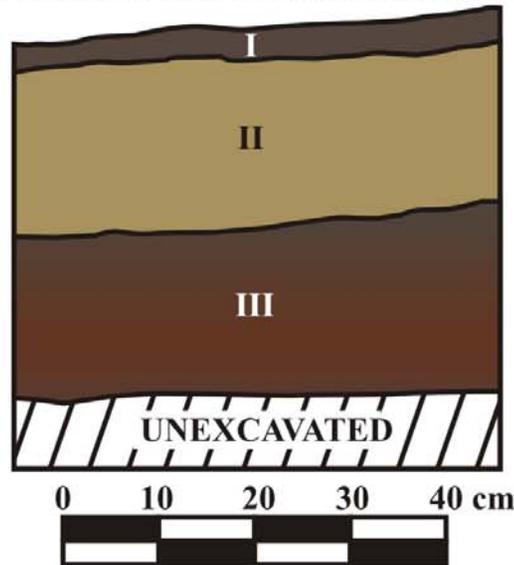


Figure 15: Pre-Excavation Photographic Overview of Shovel Probe. View to Southeast.



Figure 16: Photograph of Shovel Probe 4East Wall Stratigraphic Profile. View to East.

**SP-4 EAST WALL
STRATIGRAPHIC PROFILE**



KEY

- I** - LAYER I: DARK BROWN (7.5YR 3/2, DRY) SILTY LOAM WITH GRASS AND SHRUB ROOTS.
- II** - LAYER II: OLIVE YELLOW (2.5Y 6/6, DRY) CLAYEY SILT WITH GRASS ROOTS
- III** - LAYER III: LIGHT YELLOWISH BROWN (10YR 3/2, DRY) SILTY CLAYEY LOAM MOTTLED WITH DARK RED (2.5YR 3/6, DRY) SILTY CLAY AND MOTTLED WITH VERY DARK GRAY (7.5YR 3/1, DRY) SILTY CLAY

Figure 17: Stratigraphic Profile Drawing of Shovel Probe 4. East Wall.

Layer I (0-3 cmbs) Semi-loosed ark brown (7.5YR 3/2, dry) silty loam. Although Layer I exhibited a solid lower boundary, Layer I is a loamy stratum, which is typically formed of organic materials (*i.e.*, decomposing vegetation). Thus, Layer I was interpreted as a natural stratum. Sterile.

Layer II (3-20 cmbs) Semi-compact olive yellow (2.5Y 6/6, dry) clayey silt. Layer II exhibits a solid lower boundary. Four pieces of crushed coral were recovered from Layer II. The presence of crushed coral and saprolitic rocks suggests that Layer II is a mix of local fill and imported fill. Sterile.

Layer III (20-40 cmbs) Compact very dark grayish brown (20YR 3/2, dry) silty clayey loam with mottles of dark red (2.5 YR 3/6, dry) silty clay and very dark gray (7.5YR 3/1, dry) silty clay. The presence of loam in Layer III suggests a former A-Horizon which may have been covered over by Layer II. Thus, Layer III was interpreted as a natural stratum. Sterile.

PEDESTRIAN SURVEY OF THE REVISED DRIVEWAY CORRIDOR

After the proposed driveway corridor was revised the entire revised corridor was also subjected to pedestrian survey (Figure 18). The revised corridor extended to the north downslope between survey area A and the Photovoltaic Area (see Figure 5). Vegetation within Survey Area A consisted of Formosan Koa (*Acacia confusa*), Chinese violet (*Asystasia gangetica*), koa haole (*Leucaena leucocephala*), and California grass (*Urochloa mutica*) (Figure 19). . No Traditional or Historic cultural sites, features, or material were identified during the pedestrian survey

DISCUSSION AND CONCLUSION

Through the pedestrian surface survey and limited subsurface testing, the archaeological investigation of approximately 5.5 acres of the undeveloped 37-acre project area yielded five Historic Era artifacts on the ground surface, only. The Historic artifacts, described in Appendix B, include five brass .30-06 caliber blank rifle cartridges, dating to 1943, collected from the surface at two locations along an earthen road corridor along a ridgeline, and a single isolated artifact consisting of a Hazel-Atlas glass ketchup bottle manufactured from 1920 to 1964, collected from the surface in the Photovoltaic Area (see Appendix B). Limited subsurface test excavation, conducted in the form of 4 shovel probes, revealed the presence of two to three strata that were primarily interpreted as natural matrices. The exception was SP-4, Layer II, which was interpreted as a local fill matrix.

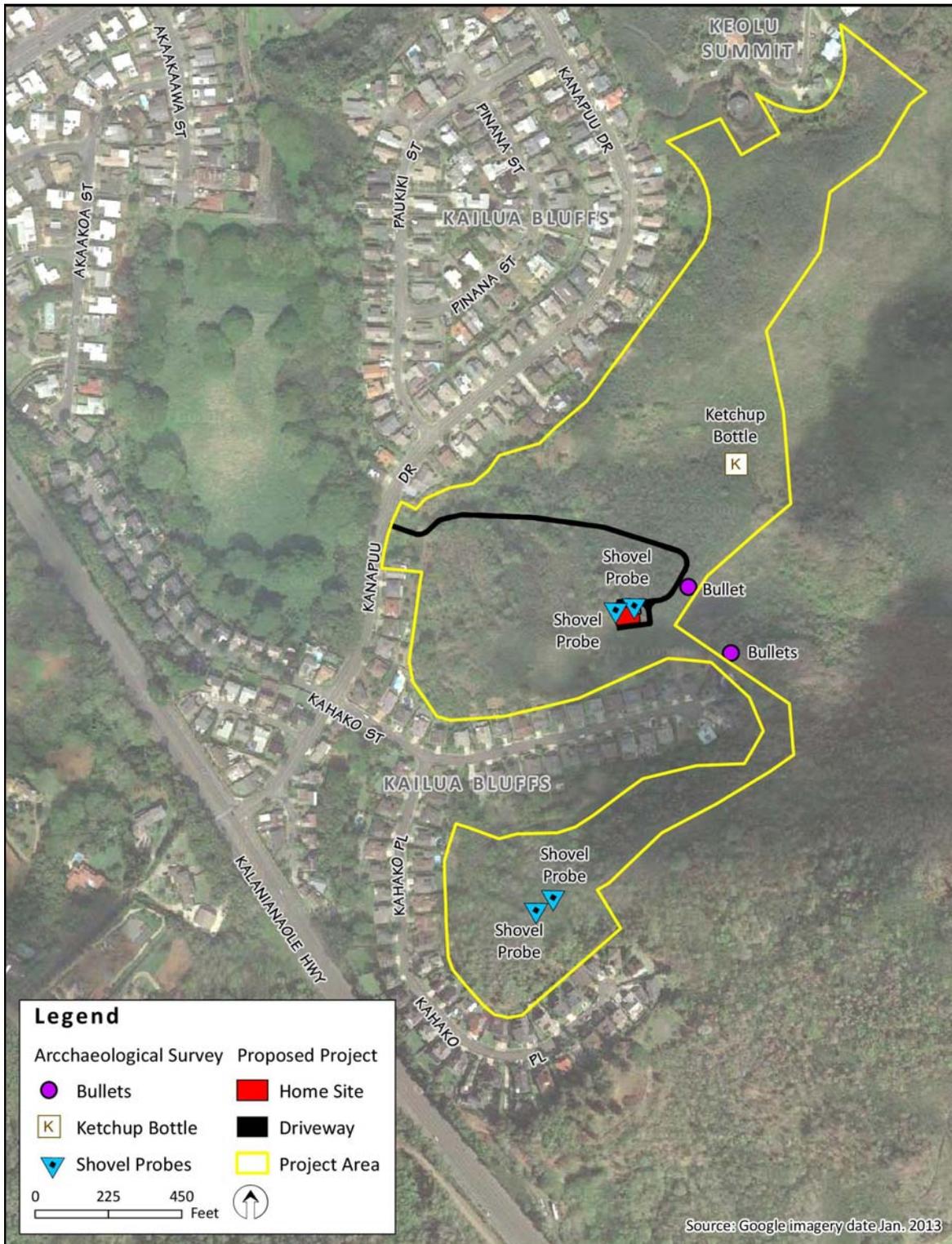


Figure 18: Client-Provided Aerial Photo (Source: Google Earth) Shows the Revised Driveway Corridor.



Figure 19: Photo of Revised Driveway Corridor, View to North.

RECOMMENDATIONS

An Archaeological Inventory Survey, through pedestrian survey and limited subsurface testing, of approximately 5.5 acres within a 37-acre property, located at Tax Map Key (1) 4-2-004:001 (por.), has been conducted and did not yield historic properties on the ground surface, or within subsurface contexts. Thus, the archaeological survey program has been completed and no further archaeological work is recommended for the surveyed areas. However, should any historic properties be encountered during construction activities within the project area, all work in the vicinity of the find must cease and the State Historic Preservation Division shall be notified immediately.

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APPENDIX A: LAND COMMISSION AWARDS

Document Delivery

Mahele Database Documents

Number: 00044MA

Claim Number:	00044MA		
Claimant:	Kalaau		
Other claimant:			
Other name:			
Island:	Oahu		
District:	Koolaupoko		
Ahupuaa:	Kailua		
Ili:	Kaulu		
Apana:	1	Awarded:	1
Loi:	0	FR:	
Plus:		NR:	
Mala Taro:	0	FT:	
Kula:	0	NT:	
House lot:	0	RP:	8262
Kihapai/Pakanu:	0	Number of Royal Patents:	1
Salt lands:	0	Koele/Poalima:	No
Wauke:	0	Loko:	No
Olona:	0	Lokoia:	No
Noni:	0	Fishing Rights:	No
Hala:	0	Sea/Shore/Dunes:	No
Sweet Potatoes:	0	Auwai/Ditch:	No
Irish Potatoes:	0	Other Edifice:	No
Bananas:	0	Spring/Well:	No
Breadfruit:	0	Pigpen:	No
Coconut:	0	Road/Path:	No
Coffee:	0	Burial/Graveyard:	No
Oranges:	0	Wall/Fence:	No
Bitter Melon/Gourd:	0	Stream/Muliwai/River:	No
Sugar Cane:	0	Pali:	No
Tobacco:	0	Disease:	No
Koa/Kou Trees:	0	Claimant Died:	No
Other Plants:	0	Other Trees:	0

Other Mammals: **No**

Miscellaneous:

No. 44 M.A., Kalaau

No. 5749, Kalaau, Honolulu, 3 February 1848
N.R. 127v5

To the Land Commissioners, Respectful Greetings: I hereby state that I have a share of land from the Mo'i and the Minister of the Interior and the Minister of Finance, of the Independent Kingdom. It is 1/2 of Kaulu 'Ili at Kailua, Koolau Poko, Oahu.

Respectfully,
KALAAU

F.T. 456v10

No. 5749, Kalaau, 2 March 1855

½ Kaulu ili for Kailua in Koolaupoko, Oahu.

I, hereby approve this distribution. It is correct and the ½ land portion written above is for Kalaau. I have given consent that it be presented to the land officers who settle claims.

(sign) Kamehameha

Royal Palace, 2 February 1848

True copy from Mahele Book, S. Spencer

[Award 44 M.A.; Royal Land Patent No. 8262; Kaulu Kailua Koolaupoko; 2 ap.; 204 Acs; No 5749 not awarded]

Number: 04452*O

Claim Number:	04452*O		
Claimant:	Kalama, Hazaleleponi		
Other claimant:	Govt		
Other name:			
Island:	Oahu		
District:	Koolalupoko, Kona		
Ahupuaa:	Hakipuu, Kailua, Kaneohe		
Ili:	Beretania, Aienui, Halehala, Waikahalulu, Nuuanu St. (Pamoo)		
Apana:	10	Awarded:	1
Loi:		FR:	
Plus:		NR:	603,605v3
Mala Taro:		FT:	456,548v3
Kula:		NT:	187,358v10,81v16
House lot:	1	RP:	7213,7427,7482,7530,7983,
Kihapai/Pakanu:		Number of Royal Patents:	9
Salt lands:		Koele/Poalima:	No
Wauke:		Loko:	No
Olona:		Lokoia:	No
Noni:		Fishing Rights:	No
Hala:		Sea/Shore/Dunes:	No
Sweet Potatoes:		Auwai/Ditch:	No
Irish Potatoes:		Other Edifice:	No
Bananas:		Spring/Well:	No
Breadfruit:		Pigpen:	No
Coconut:		Road/Path:	No
Coffee:		Burial/Graveyard:	No
Oranges:		Wall/Fence:	No
Bitter Melon/Gourd:		Stream/Muliwai/River:	No
Sugar Cane:		Pali:	No
Tobacco:		Disease:	No
Koa/Kou Trees:		Claimant Died:	No

Other Plants:

Other Trees:

Other Mammals:

No

Miscellaneous:

claims

**No. 4452*O, [Hazaleleponi Kalama], C. Kanaina (for Kalama) Honolulu, Jan. 19, 1848
N.R. 603-605v3**

To the President of the Land Commissioners, William L. Lee, Respectfully: By direction of Queen Hazaleleponi Kalama, I hereby present her claims for house lots which have not previously been given. Therefore I hereby describe her house lots and her right to them.

1. Houselot of Naopala and Kauwila at Kamanuwai in Honolulu. This lot is for H. Kalama. It was originally unused land and her makuakane built the house and made the improvements before sailing with King Liholiho (this was the year 1822). It has been occupied since then, and no one has objected.

2. Lot of Kekai, mauka of Pelekane, in Honolulu. This lot is for H. Kalama. It was formerly unused land until the time of Kaomi, when she and her people made the improvements on it, and since then until the present time no one has objected.

3. Lot of Noi at Kaanaana in Honolulu. This lot was for Timothy Haalilio and it became the King's, who gave it to H. Kalama forever.

4. Lot of Keawehano, beyond Aienui. This lot is mine and Kalama's. It was formerly unused and when we returned here with King Liholiho from Hawaii in the year 1821, we and our people made the improvements on it and from then until this time no one has objected.

5. Lot to Kekukahiko beyond Mokuhinia at Lahaina, Maui, mauka of the Government Road. This lot is for H. Kalama. She and her people made the improvements on it in 1839 and it has been continuously occupied since then with no objections.

6. Lot of Kekai, beyond Mokuhinia at Lahaina, Maui, makai of the Government Road. This lot is for H. Kalama. She and her people made improvements on it in 1839 and it has been continuously occupied since then with no objections.

These are what I have described correctly to you, and on the day you send for me I will be prepared to bring the proper witnesses for the aforesaid claims.

I am, with thanks,

CHARLES KANAINA

P.S. Let it be done soon, after this week. I request that [you] do not defer it for a long time.
Wailuku, Lahaina 6 apana

N.R. 605v3

No. 4452, C. Kanaina, Honolulu, January 19, 1848

To the President of the Land Commissioners, William L. Lee, Respectfully: I hereby state this claim for a house lot of mine in Honolulu. It was an unused place. Before the death of David

Kamehameha, I settled my man there and he and I made the improvements on it and he has continued to dwell on it until this time, with no dissent from any one.

I humbly say to you that I will bring the proper witnesses for this claim. I request that it be done soon after this week. Do not defer it. I am, with thanks,
CHARLES KANAINA

F.T. 456-460v3

No. 4452, H. Kalama, from 278 page, 31 March 1853, Counter the Government

C. Kanaina, sworn says, the ili of Waikehalulu was given to Kalama after the death of Kaomi, when Captain Belcher was here, and at the Division of lands in 1848, this ili was given to her again by the King, excepting only such parts of it as are occupied by the Government or by private parties.

This lele of Waikahalulu is bounded:
On Waikiki side by Kaakaukukui & Auwaiolimu
Makai by the sand point
Ewa side by the inner harbor
Mauka by Beretania Street.

This ili was formerly in the possession of Kaiama, a chief under Kamehameha I, from the time of the Battle of Nuuanu until it was given to Kaomi by His present Majesty.

After Kaomi died it was given to Kalama. The stone or coral on this ili was tabooed by Kinau for the government, but I cannot tell the year. But it was not tabooed so that the konohiki, who held the land, could not cut stone on it. No one else could do so however. I cut stone on it in the lifetime of Kaahumanu. No one was allowed to cut stone on it without Kinau's consent. Does not consider that this land belongs to the Government as a part of the harbor.

M. Kekuanaoa, sworn, says he knows the lele of Waikahalulu. Knows that Kinau tabooed the stone on this ili. When Kuakini was Governor he held this ili. After that it was given to Kaomi by the present King and subsequently to Kalama. Kinau tabooed the stone by her own authority. The Government was not organized at that time. If any of the Chiefs wanted to cut stone they had only to ask her, but if any kanaka cut stone there he had to divide [it] with her. I think the government can taboo the stone but not the substratum under it, for that belongs to the land.

A. Paki, sworn, says when I was acting Governor of Oahu, in 1822 perhaps, my father, Hinau, had charge of Waikahalulu. After we were pau the land was given to Kaiama. In former times, the only taboos on these makai lands, as far as I know, were put on by the several konohikis. By the Organic Acts, the coral reefs were tabooed by the Legislature. But the taboo put on before that for the purpose of preventing the filling up of the Harbor was declared by myself, by order of the Governor of Oahu in 1844. But the soil and all the rights & privileges appertaining to the land belongs to the konohiki nevertheless.

John Young, sworn, says he thinks the mauka part of Waikahalulu belongs to Kalama. By the first laws it was declared that no private individual could take any property or land which the chiefs had set apart for the Government. This was confirmed by the new statutes, which declare the coral reefs on all the islands to be Government property. The rights of piscary, however, still remain with the konohikis. I have understood that cutting the stone on this land was tabooed to prevent the Harbor from being filled up, and since I was made Minister of the Interior none of the chiefs have been permitted to cut stone there without the consent of the Privy Council. The government had some idea of selling a part of it at one time, and had it surveyed by Mr. Metcalf. But by advice of Colonel Smith, in 1849, perhaps, they declined to sell it.

Kanaina never mentioned this claim on behalf of the Queen till recently when the N.P.S. Navigation Company applied for a part of the land. The Government has exercised the rights of ownership on it ever since I came to be Minister of the Interior and the taboo on the stone by A. Paki was done in his capacity as Government Agent. The Government has disposed of a part of the land to the N.P.S. N. Company.

L. Haalelea, sworn, says the stone on this land was tabooed by Kinau, who also forbid the women from gathering limu there &c. After her death these restrictions appeared to be discontinued, and the people indiscriminately went there for limu. I heard of the taboo declared by Paki in 1841 to prevent the harbor from being filled up.

G.P. Judd, sworn, When I came to the Islands, the Harbor and the land in question were in the hands of the Governor of Oahu. In the time of Kuakini (Governor of Oahu) the stone began to be tabooed by the Government & so it has been ever since. I never heard that the Queen claimed this makai lele of Waikahalulu till 1850, when her agent, Kanaina, started this claim. As I understand it, this lele belongs to the Government, as a part of the Harbor, and I do not think the Queen or any one else has a right to it. In former times, all the people were allowed indiscriminately to go and take limu there. I do not know that the people of Waikahalulu alone were privileged to take limu. (This is admitted by Kanaina.)

At the Division of lands in 1848, I understood that the mauka part only of this Ili was given to the Queen.

G.P. Kalama, sworn, says he acted as clerk at the Division of lands, in the Palace in 1848. At the Division of the Queen's lands, the ili of Waikahalulu was given to her, that is to say, the mauka part of it only, and it was distinctly stated by Mr. Young, Mr. Judd & others at the time that she did not take the makai lele now in dispute, which is was understood the Government had previously set apart for its own purposes.

F.T. 548-550v3

No. 4452, H. Kalama, 28 April 1854

Kiheī, sworn says, he knows the part of the Pa Moo claimed by the Queen. It is on the southeast side of the King's part.

It is bounded:

On the Waikiki side by J. Pukou's lot
Makai by the Canton Hotel premises
On the Ewa side by the King's part of the Pa Moo
Mauka by S.C. Damon's lot.

The Queen got this lot from His Majesty in the year 1845, since which time I and the other tenants have lived under her.

Wakea, sworn says, he knows this lot and formerly lived on it under the Queen. Confirms in full the testimony given by last witness. Knows also the lot belonging to the Queen in the possession of Keawehano, in Honolulu.

It is bounded:
On the Waikiki side by the lot called Aie Nui
makai by Marin Street
On Ewa side by John Meek's land
Mauka by King Street.

This lot formerly belonged to Kalaimoku and from him it came to C. Kanaina who gave it to the Queen about the year 1838 and she has held it ever since.

C. Kanaina, sworn says, the Queen got this lot from him about the year 1838. It is an old possession of the family and the Queen's title is undisputed.

Kekai, sworn says, he knows the lot claimed by Kalama in Honolulu, called "Halehala."

It is bounded:
Mauka by land belonging to the King
On Waikiki side by the British Consulate ground
Makai by the King's lot called "Beretane"
On Ewa side by the land called "Kaakopua."

The Queen got this lot from the King about the time of their marriage. It is present[ly] occupied by myself and others under the Queen.

Puliou, sworn says, he knows the house lot claimed by H. Kalama in Kalihi. It is enclosed by a wall.

It is bounded:
On Honolulu side by a fish pond belonging to Liholiho.
Makai by the sea beach
On Ewa side by John Ii
Mauka by the konohiki of Mokauea.

N.T. 187-188v10

No. 4452, Hazaleleponi Kalama

COPY HAZALELEPONI KALAMA'S DIVISION

Kula ahupuaa, Puna, Hawaii
Kapalaalaea ahupuaa, Kona, Hawaii
Kalahuihua ili of Waimea, Kohala, Hawaii
Anaehoomalu ili of Waimea, Kohala, Hawaii
Waipio ahupuaa, Hamakua, Hawaii

Kaohe ili for Wailuku, Maui
Puhiawaawa ili for Wailuku, Maui
Lemukee ili of Wailuku, Maui
Puohala, Wailuku, Maui
Manienie, Wailuku, Maui

Waikahalulu, Honolulu, Kona, Oahu
Kailua ahupuaa, Koolaupoko, Oahu
Kaneohe ahupuaa, Koolaupoko, Oahu.
Hakipuu ahupuaa, Koolaupoko, Oahu.

I have approved this land division, the lands listed above are for Hazaleleponi Kalama, and they may be presented to the land officeres.

(Sign) Kamehameha

Copied by S.P. Kalama (for H. Kalama) Secretary

Royal Palace, 11 February 1848

See page 358

N.T. 358v10

No. 4452, H. Kalama, (from page 187)

COPY

H. Kalama's land distributions.

Kula ahupuaa, Puna, Hawaii
Kapalaalaea ahupuaa, Kona, Hawaii
Kalahuihua ili for Waimea, Kohala, Hawaii
Anaehoomalu ili for Waimea, Kohala, Hawaii
Waipio ahupuaa, Hamakua, Hawaii
Kaohe ili for Wailuku Puali, West Hawaii

Puhiawawa, ili for Wailuku, Puali, West Hawaii [sic, Maui]

Lemukee ili for Wailuku, Puali, West Hawaii [sic, Maui]

Manienie, Ili for Wailuku, Puali, West Hawaii [sic, Maui]

Waikahalulu, ili for Honolulu, Kona, Oahu
Kailua ahupuaa, Koolaupoko, Oahu

Kaneohe ahupuaa, Koolaupoko, Oahu
Hakipuu ahupuaa, Koolaupoko, Oahu.

TRUE COPY

A.G. Thruston, Clerk
Interior Department, 26 April 1854

A decision has been made by the Privy Council on this 29th day of Aug. 1850, that all of those lands are for Hazaleleponi Kalama as fee simple without a half division for the government.

A.G. Thruston, Clerk

N.T. 81v16

No. 4452, H. Kalama, 15 May 1854

Kekai, sworn, says he knows the house lots of Queen Kalama, at Lahaina, Maui.

The first lot is in the ahupuaa of Waiokama and is bounded as follows:

Mauka by konohiki's land
Olowalu by Kaheana's land
Makai by public Road
Kaanapali by loko called "Mokuhinia."

Claimant received this lot from the King about the year 1836, and her retainers have occupied it ever since, without dispute.

The second lot is also in Waiokama and is bounded as follows:

Mauka by public road
Olowalu by konohiki's land
Makai by A. Paki's land
Kaanapali by loko called "Mokuhinia."

Claimant received this lot from the king at the same time as the first lot and has held it ever since.

Keawehano, sworn, says he knows these two lots and confirms in full the testimony of Kekai.

[Award 4452; (Oahu) R.P. 7482; Hakipuu Koolaupoko; 1 ap.; 1165.03 Acs; R.P. 7427; Nuuanu Street (Pamoo)Honolulu Kona; R.P. 7530; Aienui Honolulu Kona; 1 ap.; 28020 sq. ft.; R.P. 7213; Halehala Honolulu Kona; 1 ap.; 3 Acs 20 perches; R.P. 7983; Kailua Koolaupoko, 11885 acres; R.P. 5683 & 7220; R.P. 7984, Kaneohe Koolaupoko, 9500 acres; R.P. 7255 & 7516; Waikalalulu Honolulu Kona; 1 ap.; 1.006 Ac.;(Maui) R.P. 7299 Wailuku; R.P. 7303 Wailuku; R.P.; 7300 Wailuku; 7302 Wailuku; 7301 Wailuku; (Lahaina award no R.P.); (Hawaii) R.P. 7523; Anaehoomalu Waimea S. Kohala; 1 ap.; 866 Acs; R.P. 7529; Waipio Hamakua; R.P. 7522; Kalahuipuaa Waimea S. Kohala; 1 ap.; 359 Acs; R.P. 7483; Puna; Kula & Halekamahina; 3 ap.; 2902 Acs; No R.P.; Kapalaalaea N. Kona; 1 ap; Ahupuaa]



APPENDIX B: CULTURAL MATERIAL ANALYSIS

SCS PROJECT 1458 CULTURAL MATERIAL INVENTORY									
Lab Bag	Project Area Location	GPS Coord. (UTM; NAD83)	Excavation Unit	Layer/ Level	Depth	Collected Item	Measurements	Count	Remarks
1	Ridge Road	E 631444/ N 2363006	-	Surface	-	Brass .30-06 Caliber Blank Rifle Cartridge	Length: 6.3 cm Base diameter: 1.2 cm Mouth diameter (inner): 0.7 cm	1	Expended, dented, neck horizontally crimped near mouth, rimless, bottlenecked, Type 3 base stamped a capital L at the 11 o'clock position, a capital C at the 1 o'clock position, and 43 at the 6 o'clock position. The cartridge manufacturer is Lake City Army Ammunition Plant of Independence, Missouri. The cartridge manufacture date (based on the 43 on the cartridge base): 1943.
2	Photovoltaic Area	E 631489/ N 2363122	-	Surface	-	Glass Ketchup Bottle	Overall height: 21.1 cm Body height: 9.0 cm Mouth diameter (inner): 2.0 cm Base diameter: 5.0 cm	1	See below.
Complete, clear, automatic machine made, single stepped finish, tapered ring collar, steep shoulders, eight vertically paneled body, embossed base. Base embossment: 1st line (horizontal): H-257, 2nd line (horizontal): 0 1, 3rd line (horizontal): a capital H over a capital A . The bottle manufacturer is Hazel-Atlas Glass Company of Wheeling, West Virginia. Bottle manufacture date (based on manufacturer's symbol): 1920–1964.									
3	Ridge Road	E 631484/ N 2362944	-	Surface	-	Brass .30-06 Caliber Blank Rifle Cartridge	Existing length: 5.0 cm Base diameter: 1.2 cm	1	Expended, neck and mouth missing, rimless, bottlenecked, Type 3 base stamped a capital L at the 11 o'clock position, a capital C at the 1 o'clock position, and 43 at the 6 o'clock position. The cartridge manufacturer is Lake City Army Ammunition Plant of Independence, Missouri. The cartridge manufacture date (based on the 43 on the cartridge base): 1943.

SCS PROJECT 1458 CULTURAL MATERIAL INVENTORY									
Lab Bag	Project Area Location	GPS Coord. (UTM; NAD83)	Excavation Unit	Layer/ Level	Depth	Collected Item	Measurements	Count	Remarks
3	Ridge Road	E 631484/ N 2362944	-	Surface	-	Brass .30-06 Caliber Blank Rifle Cartridge	Length: 6.2 cm Base diameter: 1.2 cm	1	Expended, neck horizontally crimped near mouth, rimless, bottlenecked, Type 4 base stamped 4 at the 11 o'clock position, a 3 at the 1 o'clock position, a capital T at the 7 o'clock position, and a capital W at the 5 o'clock position. The cartridge manufacturer is Twin Cities Army Ammunition Plant of Minneapolis, Minnesota. The cartridge manufacture date (based on the 43 on the cartridge base): 1943.
3	Ridge Road	E 631484/ N 2362944	-	Surface	-	Brass .30-06 Caliber Blank Rifle Cartridge	Length: 6.3 cm Base diameter: 1.2 cm Mouth diameter (inner): 0.7 cm	1	Expended, dented, neck horizontally crimped near mouth, rimless, bottlenecked, Type 1 base stamped a capital S and a capital L at the 12 o'clock position and 43 at the 6 o'clock position. The cartridge manufacturer is St. Louis Ordinance Plant of St. Louis, Missouri. The cartridge manufacture date (based on the 43 on the cartridge base): 1943.
3	Ridge Road	E 631484/ N 2362944	-	Surface	-	Brass .30-06 Caliber Blank Rifle Cartridge	Existing length: 4.8 cm Base diameter: 1.2 cm	1	Expended, neck and mouth missing, rimless, bottlenecked, Type 1 base stamped a capital S and a capital L at the 12 o'clock position and 43 at the 6 o'clock position. The cartridge manufacturer is St. Louis Ordinance Plant of St. Louis, Missouri. The cartridge manufacture date (based on the 43 on the cartridge base): 1943.
4	Area B	E 631316/ N 2362716	SP-4	II	-	Coral Reef Detritus	2.6 g	4	Non-cultural

Appendix E

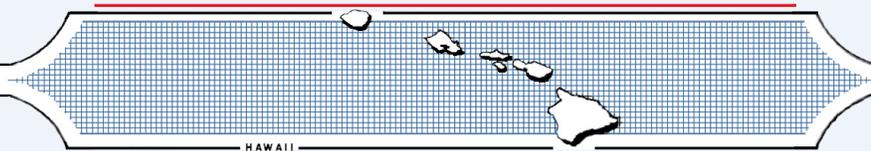
Cultural Impact Assessment

**A CULTURAL IMPACT ASSESSMENT FOR A
PROPERTY LOCATED AT 1711 KANA PU'U DRIVE, KAILUA
KAILUA AHUPUA'A, KO'OLAUPOKO DISTRICT
ISLAND OF O'AHU, HAWAII
[TMK: (1) 4-2-004:001]**

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April 2014

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INTRODUCTION

At the request of Mr. Jeff Overton of Group 70 International, Inc., Scientific Consultant Services, Inc. (SCS), has prepared a Cultural Impact Assessment (CIA) for approximately 4.3 acres of undeveloped land within a 37- acre property project located at 1711 Kanapu`u Drive, Kailua, Kailua Ahupua`a, Ko`olaupoko District, Island of O`ahu, Hawai`i [Tax Map Key (1) 4-2-004: 001] (Figures 1 and 2).

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 (2000) 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.” In spite of the establishment of the foreign concept of private ownership and western-style government, Kamehameha III (Kauikeaouli) preserved the peoples 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 Hawaiian 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 Hawai`i (2000) with House Bill (HB) 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 Hawaii’s culture, and traditional and customary rights... [H.B. NO. 2895].

Articles IX and XII of the state constitution, other state laws, and the courts of the State impose on government agencies a duty to promote and protect cultural beliefs and practices, and resources of Native Hawaiians as well as other ethnic groups. Act 50 also requires state agencies and other developers to assess the effects of proposed land use or shore line developments on the “cultural practices of the community and State” as part of the HRS Chapter 343 (2001) environmental review process.

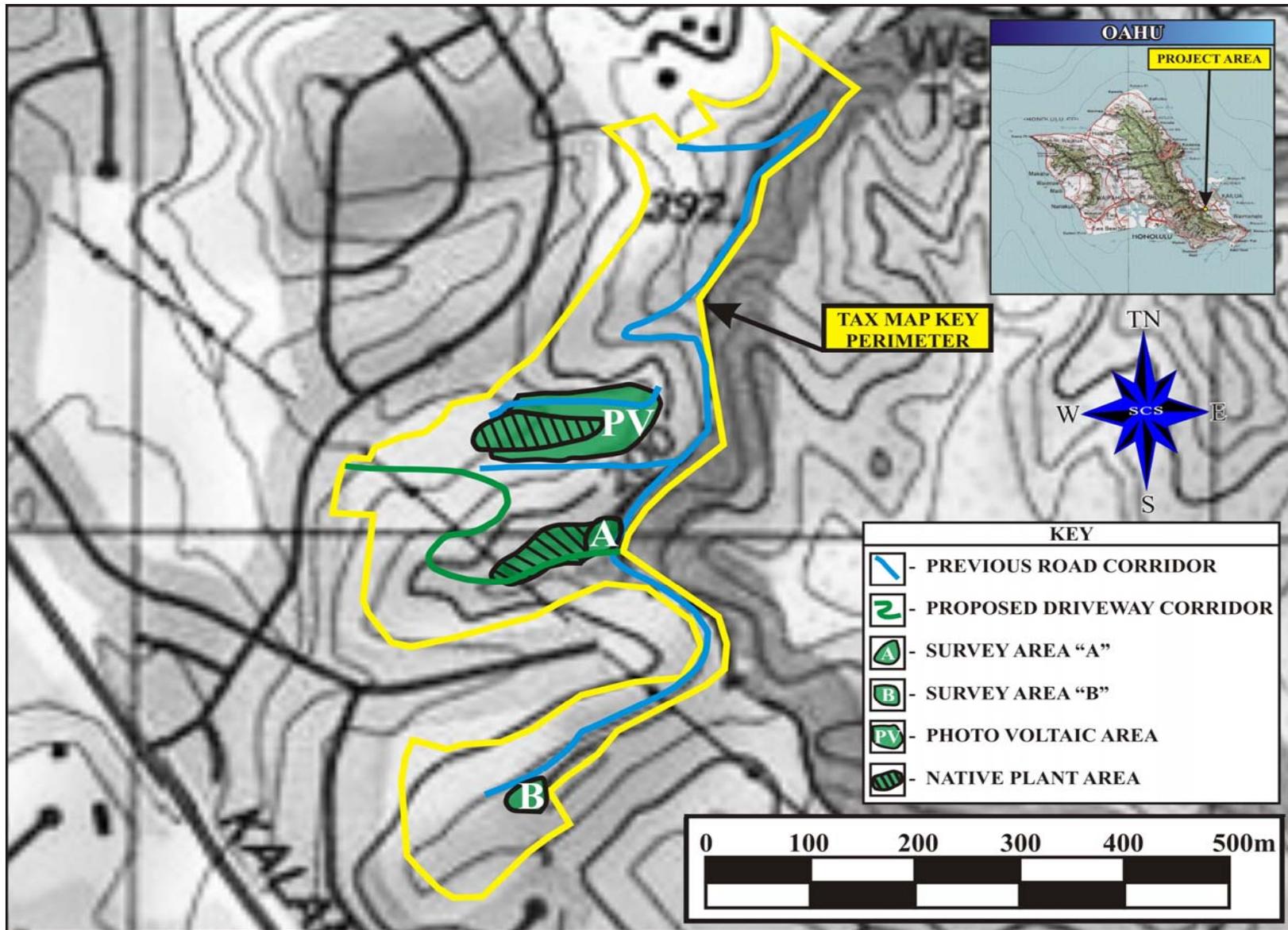


Figure 1: USGS Quadrangle (Koko Head 1999) Map Showing Project Area Location.

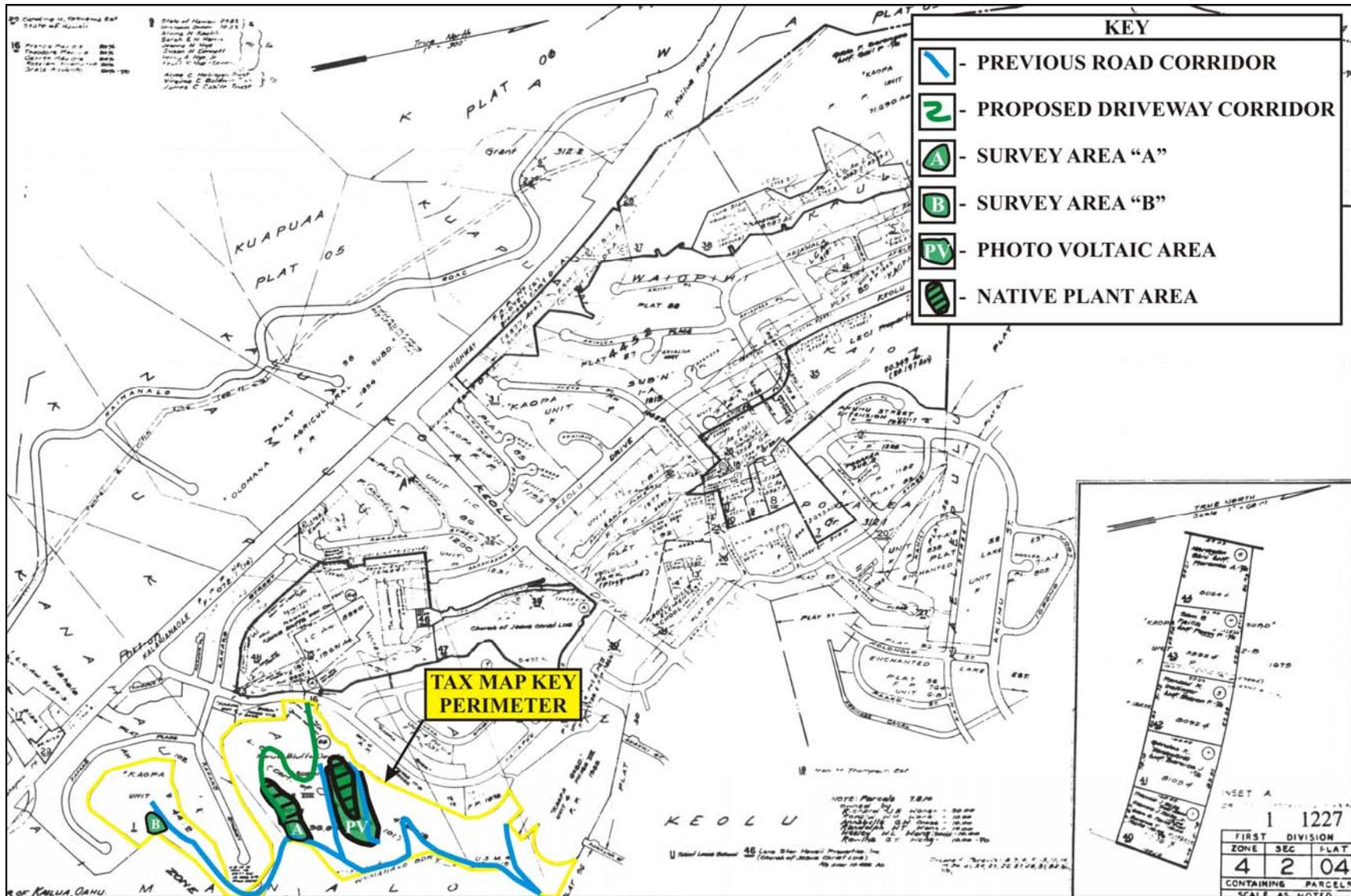


Figure 2: Tax Map Key [TMK: (1) 4-2-004] Showing Project Area Location.

It also re-defined the definition of “significant effect” to include “the sum of effects on the quality of the environment including actions impacting a natural resource, limit the range of beneficial uses of the environment, 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). Cultural resources can include a broad range of often overlapping categories, including places, behaviors, values, beliefs, objects, records, stories, etc. (H.B. 2895, Act 50, 2000).

Thus, Act 50 requires that an assessment of cultural practices and the possible impacts of a proposed action be included in Environmental Assessments and Environmental Impact Statements, and to be taken into consideration during the planning process. As defined by the Hawaii State Office of Environmental Quality Control (OEQC), the concept of geographical expansion is recognized by using, as an example, “the broad geographical area, e.g. district or *ahupua`a*” (OEQC 2012:12). 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.

Therefore, the purpose of a Cultural Impact Assessment is to identify the possibility of on-going cultural activities and resources within a project area, or its vicinity, and then assessing the potential for impacts on these cultural resources. The CIA is not intended to be a document of in depth archival-historical land research, or a record of oral family histories, unless these records contain information about specific cultural resources that might be impacted by a proposed project.

According to the Guidelines for Assessing Cultural Impacts established by the Hawaii State Office of Environmental Quality Control (OEQC 2012:12):

The types of cultural practices and beliefs subject to assessment may include subsistence, commercial, residential, agricultural, access-related, recreational, and religions 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.

The meaning of “traditional” was explained in *National Register Bulletin*:

Traditional” in this context refers to those beliefs, customs, and practices of a living community of people that have been passed down through the generations’, usually orally or through practice. The traditional cultural significance of a historic property then is significance derived from the role the property plays in a community’s historically rooted beliefs, customs, and practices. . . . [Parker and King 1998:1]

METHODOLOGY

This Cultural Impact Assessment was prepared as much as possible in accordance with the suggested methodology and content protocol in the Guidelines for Assessing Cultural Impacts (OEQC 2012:11-13). In outlining the “Cultural Impact Assessment Methodology”, the OEQC (2012:11) states that:

“...information may be obtained through scoping, community meetings, ethnographic interviews and oral histories...”

This 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. An example of the letters of inquiry is presented in Appendix A, copies of the posted legal notice and Affidavit are presented in Appendix B, an example of the follow-up letter of inquiry is presented in Appendix C, and responses to the inquiries are presented in Appendix D. This Cultural Impact Assessment was prepared in accordance with the suggested methodology and content protocol provided in the Guidelines for Assessing Cultural Impacts (OEQC 2012:13), whenever possible. The assessment concerning cultural impacts may include, but not be limited to:

- A. 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.
- B. 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.
- C. 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.

- D. 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.
- E. A discussion concerning historical and cultural source materials consulted, the institutions and repositories searched and the level of effort undertaken. This discussion should include, if appropriate, the particular perspective of the authors, any opposing views, and any other relevant constraints, limitations or biases.
- F. A discussion concerning the cultural resources, practices and beliefs identified, and, for 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.
- G. 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.
- H. An explanation of confidential information that has been withheld from public disclosure in the assessment.
- I. A discussion concerning any conflicting information in regard to identified cultural resources, practices and beliefs.
- J. 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.
- K. A bibliography of references, and attached records of interviews which were allowed to be disclosed.

If on-going cultural activities and/or resources are identified within the project area, assessments of the potential effects on the 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, land records, such as Land Commission

Awards, Royal Patent Grants, and Boundary Commission records; historic accounts, and previous archaeological reports.

INTERVIEW METHODOLOGY

Interviews are conducted in accordance with Federal and State laws, and guidelines, when knowledgeable individuals are able to identify cultural practices in, or in close proximity to, the project area. If they have knowledge of traditional stories, practices and beliefs associated with a project area or if they know of historical properties within the project area, they are sought out for additional consultation and interviews. 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 concerning particular cultural resources. Often people are recommended for their expertise, and indeed, organizations, such as Hawaiian Civic Clubs, the Island Branch of Office of Hawaiian Affairs (OHA), 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. It should be stressed again that this process does not include formal or in-depth ethnographic interviews or oral histories as described in the OEQC's Guidelines for Assessing Cultural Impacts (2012). The assessments are intended to identify potential impacts to on-going cultural practices, or resources, within a project area or in its close vicinity.

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 interview available for this study. When telephone interviews occur, a summary of the information is usually sent for correction and approval, or dictated by the informant and then incorporated into the document. If no cultural resource information is forthcoming and no knowledgeable informants are suggested for further inquiry, interviews are not conducted.

ENVIRONMENTAL SETTING

PROJECT AREA DESCRIPTION AND ENVIRONMENTAL SETTING

The property is located at 1711 Kanapu`u Drive, Kailua, Kailua Ahupua`a, Ko`olaupoko District, Island of O`ahu, Hawai`i [Tax Map Key (1) 4-2-004: 001]. Bellows Air Force Base forms the eastern property boundary, Koa Haole forest and residential housing form the northern property boundary, the Kaopa Subdivision forms western and southern boundaries, and the Koa Haole forest also bounds the property on the south.

The project area is located approximately between 100 and 200 feet above mean sea level (amsl). At this elevation, temperatures range from the high 50s to the high 80s during the winter months and from the mid-60s to the high 80s or low 90s during the summer (Armstrong 1980: 62).

PROJECT AREA SOILS

According to Foote *et al.* (1972:26, 110, Map 66), the project area is situated within the matrices described as Alaeloa Silty Clay (AeE) and Papaa clay (PYF). The Alaeloa soil series consists of well-drained soils which are gently sloping to very steep, developed in material weathered from igneous rock. The Alaeloa silty clay, 15 to 35 percent slopes (AeE), exhibit moderately rapid permeability, medium runoff and moderate erosion hazard. This soil type is utilized for agriculture (pineapple), pasture, wildlife habitat, homesites, and water supply. The Papaa series soils are formed in basalt end up as colluvium. The Papaa clay with 35 to 70 percent slopes (PYF), has convex, very steep slopes. This soil is very sticky and very plastic and cracks widely when dry. Runoff is rapid and the erosion hazard is severe for this soil. This soil is primarily used for pasture.

PROJECT AREA VEGETATION

Within the project area's perimeters were mainly non-native vegetation that included Formosan Koa (*Acacia confusa*), Chinese violet (*Asystasia gangetica*), Koa Haole (*Leucaena leucocephala*), Kikuyu (*Pennisetum clandestinum*), (*Brachiara* sp) and California grass (*Urochloa mutica*).

CLIMATE

The project area is situated within the wet region of O`ahu's windward (eastern) side. According to Price (1983:62), the project area usually receives about ten inches a year during December and January. Higher elevations within the Kailua Ahupua`a are prone to receive more precipitation due to cloud descent and lower temperature climates.

TRADITIONAL AND HISTORIC SETTING

TRADITIONAL SETTING

Recent re-evaluation of radiocarbon dates suggests O`ahu Island was first settled between A.D. 850 and 1100 by Polynesians sailing most likely from central East Polynesia (Kirch 2011:24). Archaeological settlement pattern data indicates that the initial colonization and occupation of the Hawaiian Islands first occurred on the windward shoreline areas of the main islands, with populations eventually settling into drier leeward areas at later periods (Kirch 1985). Coastal

settlement was still dominant, but populations began exploiting and living in the upland (*kula*) zones. Greater population expansion to inland areas began about the A.D. Twelfth Century, but continued through the 16th Century.

As the Hawaiian culture developed, land became the property of the king, or *ali`i `ai moku* (the *ali`i* who eats the island/district), which he held in trust for the gods. His title of *ali`i `ai moku* ensured rights and responsibilities to the land, but did not confer absolute ownership. The king kept the parcels he wanted, his higher chiefs received large parcels from him and, in turn they, distributed smaller parcels to lesser chiefs. The *maka`āinana* (commoners) worked the individual plots of land (Kirch and Sahlins 1992 vol.1:25).

In general, several terms, such as *moku*, *ahupua`a*, *`ili* or *`ili`āina* were devised to describe various land sections. A district (*moku*) contained smaller land divisions (*ahupua`a*), which customarily continued inland from the ocean and upland into the mountains. Extended household groups living within the *ahupua`a* were, therefore, able to harvest from both the land and the sea. As the Polynesian economy was based on agricultural production and marine exploitation, as well as animal husbandry and utilizing forest resources, this situation ideally allowed each *ahupua`a* to be self-sufficient by supplying needed resources from different environmental zones (Lyons 1875:111). The *`ili`āina*, or *`ili*, were smaller land divisions next in importance to the *ahupua`a* and were administered by the chief who controlled the *ahupua`a* in which the *ili* were located (*ibid*:33; Lucas 1995:40). The *mo`o`āina* were narrow strips of land within an *`ili*. The land holding of a tenant, or *hoa`āina*, residing in an *ahupua`a* was called a *kuleana* (Lucas 1995:61). Oral history notes that the division of O`ahu's lands into districts (*moku*) and sub-districts was solidified by the *ali`i nui*, Mā`ili-kūkahi during the early part of the 16th century (Kamakau 1991:53-56). O`ahu contained six districts including Wai`anae, `Ewa, Waialua, Ko`olauloa, Ko`olaupoko, and Kona at the time of contact.

The Hawaiian economy was based on agricultural production and marine exploitation, as well as raising livestock and collecting wild plants and birds. Extended household groups settled in various *ahupua`a*. During pre-Contact times, there were primarily two types of agriculture, wetland and dry land, both of which were dependent upon geography and physiography. River valleys provided ideal conditions for wetland *kalo* (*Colocasia esculenta*) agriculture that incorporated pond fields and irrigation canals. Other cultigens, such as *kō* (sugar cane, *Saccharum officinarum*) and *mai`a* (banana, *Musa* sp.), were also grown and, where appropriate, such crops as *`uala* (sweet potato, *Ipomoea batatas*) were produced. This was the

typical agricultural pattern seen during traditional times on all the Hawaiian Islands (Kirch 1985). Agricultural development on the windward side of O`ahu was likely to have begun early (A.D. 1100–1300) during what is known as the Expansion Period (*ibid*).

Kailua Ahupua`a is the largest valley on the windward coast and the largest *ahupua`a* in the Ko`olaupoko District. Kailua Ahupua`a is situated between the *ahupua`a* of Waimānalo, to the southeast, and Kāne`ohe, to the north and west. Compared with other areas of O`ahu and the Hawaiian Islands, in general, Kailua Ahupua`a has been blessed with an abundant and diverse set of natural resources. Large extensive sandy beaches front the *makai* portion of the *ahupua`a*. The extensive reef environment and nearby offshore islands, including Mōkōlea and the two Mokulua islets, provide additional resource gathering environments. Two extensive inland freshwater areas, Kawainui Marsh and Ka`elepulu Pond, exist inland from the coast. Kawainui Marsh and Ka`elepulu Pond, along with 18 permanent freshwater streams, provided an abundance of ecologically diverse environments. Mount Olomana (1,643 feet) dominates the landscape in the central portion of the *ahupua`a*. Other low ridgelines and gulches exist in the central portion southern half of the *ahupua`a*. The massive cliffs of the Ko`olau uplands of Maunawili provide a natural barrier to Honolulu District as well as an extensive upland mountain environment. These mountains would have been important raw material sources in ancient times, containing diverse and numerous lithics (for making stone tools), medicinal plants, and hardwoods.

Kailua Ahupua`a supported one of the largest pre-Contact populations in O`ahu, and possibly in the Hawaiian Islands, due to its bountiful natural resources, environment, and favorable physiographic setting. Access to abundant fresh water, coastal environments, and the mountains, as well as large areas amenable to both agriculture and habitation, made Kailua a favorite place for members of the *ali`i* class as well as the *maka`āinana* (commoners). Kailua was known as a favorite place for the *ali`i* to visit and recreate. Handy and Handy (1972:457) relay that “Kailua was the home of the *ali`i* Kuali`i in the early 18th century, and presumably had been the seat of the high chiefs of the Ko`olaupoko from very early times.” Large agricultural systems provided *kalo* (taro) and a variety of other crops such as *mai`a* (banana) and *`uala* (sweet potato). Handy and Handy (1972:457) state that terraced areas were present on the flanks of Ka`elepulu Pond near the base of a ridge located to the east. It is possible that the ridge to which Handy and Handy (1972:457) are referring is Ka`iwa Ridge. Fish were farmed in abundance in the two large natural *loko i`a* (fishponds) Kawainui and Ka`elepulu, along with the numerous fortified fishponds that were constructed along the shoreline and inland areas of Kawainui. The extensive *kai lawai`a* (fishery) of Kailua Bay and the offshore islands provided a

patchwork of ocean resource zones that extended a mile offshore from the beaches of Oneawa and Kailua Bay.

The earliest inhabitants of Kailua Ahupua`a more than likely settled from the coast to the mid to upper regions (more inland), a pattern typical of the *ahupua`a* resource acquisition strategies of Hawai`i (Tuggle 1994). The plentiful freshwater sources, use of fishponds, favor of the land by the *ali`i*, and the nearby tool resource site aptly places Kailua as an important and well-used area of O`ahu.

WAHI PANA

There are many important legends associated with the environs of Kailua Ahupua`a (Fornander 1969; Beckwith 1970; Sterling and Summers 1978; Drigot and Seto 1982). Legends and oral histories provide the meaning of the specialness of this place, the name Kailua means “two seas” which apparently refer to the two inland water sources, Kawainui Marsh and Ka`elepulu Pond (Pukui *et al.* 1976:69). Few other areas in the Hawaiian Islands have as many landforms named for sacred persons and events as does Kailua (Drigot and Seto 1982).

Of special interest is the significance of the channel that connected Kawainui Marsh and Ka`elepulu Pond in Hawaiian legendary accounts. A sacred connection of great *mana* was considered between the two bodies of water, Kawainui Marsh (male) and Ka`elepulu Pond (female), where legend has it that the two were mated at Kawailoa (O`Leary and Hammatt 2004).

Many important legends center focus on Kawainui and Ka`elepulu, as well as the peak of Olomana, Mōkapu Peninsula and Alāla Point (*i.e.*, the high point-lookout between Kailua Beach and Lanikai). Themes of voyaging, creation, fertility and genealogical ties to ancestor gods are mentioned repeatedly throughout the legends. One well-known legend involved the creation of the first man (Kanehulihonua) and woman (Keakahuilani) by the gods Kāne, Kū and Lono at Mōkapu. There are many legends involving the famous Ali`i Olopana who is remembered as residing in Kailua. Well remembered and recorded in *oli* and *mo`olelo* are many historic episodes involving Olopana who, with his brother Kahikiula came to O`ahu from Kahiki and settled in Kailua with his wife Hina. Olopana is credited with the establishment of Pahukini and Holomakani Heiau near Kawainui, and with other *heiau* throughout Ko`olaupoko. Hina and Kahikuila, Olopana's brother, gave birth to Kamapua`a whose capture, escape, and subsequent rebellions against his `anakala (uncle) resulted in Olopana's eventual death and Kamapua`a's subsequent return to Kahiki (Fornander 1969). The development of Kamapua`a into one of

Hawai`i's preeminent legendary figures, following his exploits with Olopana and his tumultuous love affair with Pele, were documented by numerous sources in the past. Some epics were written as segments in Hawaiian Language newspaper that lasted over a year. The significance of these legends is paramount and this is evidenced by the continued interest as versions of these events continue to be translated. These legends are primary sources of insight into traditional Hawaiian epistemologies, and their connection to specific places within the Hawaiian landscape are immeasurably valuable.

In *Ho`ona`auao No Kawai Nui*, Drigot and Seto (1982) describe some of the numerous *mele* and *oli* (chants) that were composed describing the fishponds Kawainui and Ka`elepulu. These chants describe the environment and relationships between people and the land. These chants tell of the *mo`o akua* ('lizard god' 'dragon') or the *mo`o* goddesses Hauwahine and Haumea, who were respected guardians of the land; these goddesses protected and nourished the Kailua fishponds, which were known for their production of mullet and *awa* (milkfish). These *mo`o* goddesses were said to reside on the ridge between Olomana and Pu`u O Ehu. There are numerous legends describing the *mo`o* goddesses of Kawainui Hauwahine. For example, Hauwahine is referred to in the epic *Hiiakaikapoliopole* by Hi`iaka as the guardian of Kawainui. Her ability to take the forms of a *mo`o* and a woman allude to her supernatural powers.

On the banks of Kawainui stood the great fish-attracting tree or stick named Makalei, which brought prosperity to the people who honored and respected the tree; and, to the creator goddess Haumea, who brought the tree from Paliuli, Hilo, Hawai`i Island. In *Hawaiian Mythology*, Martha Beckwith (1970) discusses Haumea as associated with themes surrounding food supplies for the life of man and marriages and births for the increase of healthy family populations. The Makelei tree/stick is associated with a source of a never-ending supply of food. If treated properly, this tree/stick will feed and nourish the Hawaiian people, and allow for healthy, fertile populations. According to Beckwith (1970), in the Kumulipo version of this legend, Haumea is referred to as a genealogical link to the ancestor gods. Her role as midwife to Olopana's daughter (Muleiula) and her status as patroness of painless childbirth is connected to the bringing of these gods and certain chiefly lineages to O`ahu (*ibid.*). The Makalei tree or branch is also symbolic of the ability to produce healthy offspring of strong stock; thus, providing longevity and continuity to the genealogic line (*ibid.*).

Other well-known traditions about the ample productivity of the Kailua region and its ability to nourish the Hawaiian people include the legend of the *lepo`ai`ia* (edible mud). This *lepo`ai`ia*, which was brought to Kawainui by the famous voyager Ali`i Kaulaakalana from

Kahiki was served as a substitute for *poi* to Kamehameha's warriors during a time of *kalo* shortage in Kailua Ahupua`a (Sterling and Summers 1978:231-232). Protocols surrounding the procurement of the mud included inappropriate speech, which would result in the death of the harvester. Informants provided descriptions of the mud; it was found only in Kawainui, it was thick and jelly-like, like *haupia* pudding in texture but the color of *poi*.

Kailua Ahupua`a also has strong connections to the legends of the well-known *menehune*, the race of "little people" who built monumental structures (e.g., fishponds and *heiau*) at night for the Hawaiians.¹ The *menehune* have been credited with the construction of Ulupō Heiau, one of the largest structures on the Windward side of O`ahu. Ulupō Heiau is located on the Kāne`ohe (north) side of Kailua Road, just *makai* (east) of Castle Junction. It is located near the head of the former Kawainui fishpond (McAllister, in Sterling and Summers 1978:232). According to Kirch (1996:32), "[a]lthough not the largest temple site on O`ahu in terms of area ... Ulupō ("night inspiration") may be the greatest in terms of the sheer mass and volume of stones used in its construction." During McAllister's visit to Ulupō, an elderly Hawaiian man named Mahoe pointed out to him a narrow pathway on the northwest corner called the "*menehune* pathway" that led from the spring. According to Akuni Ahau, an informant, this was the spring in which the sacrificial pigs were washed prior to bringing them up to the temple oven of Ulupō (McAllister in Sterling and Summers 1978:233).

Many famous *ali`i* were known to reside in Kailua and to come to Kailua to visit and recreate. In addition to the aforementioned famous Olopana, Kakuhihewa was said to reside at `Ālele, which refers to central Kailua, a flat plain previously known as Kula o `Ālele (Fornander 1969, Volume 2:274). Fornander (*ibid*) described the Kākuhihewa residence at Kailua as one of three (Kakuhihewa) royal residences (Waikīkī and `Ewa being the other two). Fornander (*ibid*) described the residence, named Pāmoa, as a large house but not as overtly large as past residences of lesser chiefs and estimated that Kakuhihewa lived in the last half of the 16th century. Kamakau's (1991:69) description of Kakuhihewa's residence suggests a wide variety of games and other activities took place here:

At `Ālele in Kailua he built his "government house", *Hale Aupuni*. It was forty *anana* long and fifteen *anana* wide: Pāmoa was its name. All these were done here: storytelling, distribution of lands, recalling traditions of the ancestors, reciting of genealogies,

¹ There are interesting alternative interpretations of the *menehune* legends; including the idea that the term was initially mistranslated (or incompletely understood), and that the word-concept is actually closer to "commoner" or *maka`āinana* than it is to mythical entities.

practicing of battle skills, wielding of war clubs, thrusting of spears, observation of omens, study of land features, study of stars, playing *kōnane*, learning the *mele* of ancestors and chiefs, running, learning to leap from cliffs, *maika* rolling, dart throwing, boxing, hand wrestling, sitting wrestling, shoulder wrestling, hand to hand fighting, all kinds of sports that strengthened the body, cultivating and fishing.

Other chiefs known to reside in Kailua include Kūali`i, whose *piko*-cutting ceremony occurred at the *heiau* of `Ālala, and the sacred drums of Opuku and Hāwea were used at the *heiau* to announce the event to people (Fornander and Sterling, in Kelly and Nakamura 1981). Kūali`i is remembered as leading many battles in his quest as *mō`ī* (supreme ruler) of O`ahu. He and his forces battled rival chiefs in O`ahu, as well as voyaging to other battles, collecting additional allied warriors, and aiding in the battles of other chiefs with whom he was aligned on other islands (Fornander 1969, Volume 2: 280-282). Kūali`i was known to reside in both Kailua and Kualoa, but preferred Kailua, where he died at an advanced age. Fornander (Fornander 1969, Volume 2: 284) explains the extent to which Kūali`i went to conceal his bones after his death. Before his death he entrusted his dearest *kahu* (‘attendant’ or ‘guardian’) to attend to his funerary arrangements. After his death and the subsequent defleshing and preparation of his *iwi* (bones) for concealment, which was done to avoid access and desecration by mortal men, Kūali`i’s trusted *kahu* secretly ground the *iwi* into a fine powder. Afterwards he announced that a great feast must be prepared to honor Kūali`i, and chiefs from far and near were invited to attend. Great preparations were undertaken, and on the arrival of the feast day, the *kahu* secretly mixed the powdered remains into the *poi* that was served at the feast. When asked if he had carried out his chief’s wishes he replied “...he had hidden his masters bones in a hundred living tombs.”

The practice and popularity of maintaining a residence in Kailua by other prominent and famous *ali`i* continued into early Post-Contact times. For example, Kelly and Nakamura (1981) report that Kahekili, a paramount chief of Maui, was said to have resided in Kailua in the 1780s, during which time he battled many O`ahu warrior-chiefs, killed Kahahana, and took his place as high *ali`i* of O`ahu (Kelly and Nakamura 1981). During his period of residence in Kailua, Kamehameha I reportedly worked in the fishponds of both Kawainui and Ka`elepulu, in order to encourage and stimulate fishing and the growing of food to feed his warriors brought from Hawai`i to conquer O`ahu in 1795 (Kamakau, in Kelly and Nakamura 1981). In the 1870s, Queen Lili`uokalani was said to reside at Maunawili at the Boyd Estate. According to Brennan (2000), “[s]he would come on the water by way of Waimānalo. And then the carriage pulled by

horses would bring her into Maunawili. And Maunawili was the place where she chose to rest and recuperate.”

HISTORIC PERIOD

Historic accounts of Kailua directly after contact are limited, and while great changes were occurring in land use practices, little written documentation exists to create a precise timeline. Levi Chamberlain, a missionary who traveled around the islands in 1828 to inspect the conditions of the mission schools, recorded one of the only written accounts. On approaching and passing through Kailua he recorded his interpretations of Kawainui:

Here at Kailua we found a small school under the care of a female not very well qualified for an instructor. Kailua is a large district and the schools of which there are several; have on former examinations, made a very good appearance. At the present time, most of the males are absent procuring house timber for Kaleohano, the proprietor of the district.

Directing our course towards Kaneohe, the next district, we were obliged to pass over a tract of land mostly overflowed with water from the late rains. Here I was obliged to wade, as the distance was too great to admit of my being carried on the shoulders of my attendants, as was generally the case in passing a small stream of water. After emerging from the flat, our path was not improved, for we had now to walk through mud instead of water—we walked some distance along the steep hill, and at length by a winding path ascended to the top of it. We sat down to rest for a few minutes, and I found myself upon the summit of a ridge extending from the mountains in a right line to the sea and dividing the low lands of Kailua from those of Kāne`ohe (Chamberlain Ms.: 664, in Kelly and Nakamura 1981:7).

THE MĀHELE (1848-1851)

In the 1840s, a drastic change in the traditional land tenure resulted in a division of island lands and a system of private ownership based on Western law. While it is a complex issue, many scholars believe that in order to protect Hawaiian sovereignty from foreign powers, Kamehameha III (Kamehameha III) was forced to establish laws changing the traditional Hawaiian economy to that of a market economy (Kuykendall 1938, Vol. I:145; Daws 1977:111; Kelly 1983:45; Kame`eleihiwa 1992:169-70, 176; Kelly 1998:4). The Māhele of 1848 divided Hawaiian lands between the king, the chiefs, the government, and began the process of private ownership of lands. The subsequently awarded parcels were called Land Commission Awards (LCAs). Once lands were thus made available and private ownership was instituted, the *maka`āinana* (commoners), if they had been made aware of the procedures, were able to claim the plots on which they had been cultivating and living. These claims did not include any

previously cultivated but presently fallow land, *ʻokipu`u* (forest clearing on O`ahu), stream fisheries, or many other resources necessary for traditional survival (Kelly 1983; Kame`eleihiwa 1992:295; Kirch and Sahlins 1992). If occupation could be established through the testimony of two witnesses, the petitioners were awarded the claimed LCA and issued a Royal Patent after which they could take possession of the property (Chinen 1961:16).

Māhele land records provide a component to understanding land use history during the early to mid 1800s. However, due to the fact that many people who had use rights in the land did not register their claims with the Board of Commissioners, the land commission documents represent only a portion of the population that was living on and cultivating the land (Kelly and Nakamura 1981). These authors discussion of land history of Kailua indicates the importance of the *ahupua`a* of Kailua in relation to the individual naming of at least 63 *ʻili* (smaller land divisions) within the region. This is compared with to the average of 30 to 40 named *ʻili* within larger *ahupua`a* (Lyons, in Kelly and Nakamura 1981). The additional amount of individually-named parcels attests to the importance and value of the lands of Kailua to the Hawaiians before the Māhele. According to the Māhele documents, the *ahupua`a* of Kailua, except for the *ʻili* claimed by the king and by other chiefs, was claimed by Kamehameha III to his wife Kalama. In addition to Kalama, forty-one high-ranking chiefs claimed an interest in Kailua Ahupua`a. Kamehameha III kept the *ʻili* of Kawailoa (in which the current project area is located) as Crown Lands (Kelly and Nakamura 1981). Kawailoa was an *ʻili lele* (essentially a discontinuous piece of land) made up of several parcels located at the coast, along the banks Ka`elepuhu Pond and Kawainui, and in the upper reaches of Maunawili Valley.

Land Commission Awards (LCA) for Kailua documented garden areas clustered around all eighteen permanent and perennial streams and in areas of natural springs. Two LCA are located within the project area, located near an unnamed stream, and are identified as LCA 44:2 and LCA 4452:12 on TMK (1) 4-2-004 (Appendix E). According to the Waihona `Aina Database (2014), LCA 44 M.A. (Royal Patent 8262) consisted of on half of the *ʻili* of Kaula (204 acres) and includes a portion of the project area (See Figure 2). Land Court Award 44 was awarded to Kalaau and signed by Kamehameha III at the "Royal Palace on 2 February 1848" (see Appendix E).

Land Court Award 4452 included 11,885 acres within the *ahupua`a* of Kailua awarded to Queen Kalama and also included a portion of the project area (see Figure 2). As specified in LCA 4452, these lands were awarded to Queen Kalama as house lots (see Appendix E).

During the 100 or so years following the Māhele, the agricultural patterns of Kailua were drastically altered. Rice production began in earnest after the initial wave of Chinese immigrants reached Hawai`i. Many of the abandoned *kalo lo`i* in Kailua were converted to rice. Land was rented from farmers not using their lands for rice cultivation, and several mills were constructed (e.g., one was located in the `ili of Makali`i). Rice farming began as early as 1789 in Hawai`i (Kelly and Nakamura 1981). Until 1900, rice was the most important crop in Kailua. After 1900, truck-farming of taro and introduced, western crops was most prevalent (*ibid.*). In 1876, the Reciprocity Treaty between the Hawaiian Kingdom and the United States was signed. After the signing of this treaty, the sugar industry in Hawai`i was greatly expanded.

Following this treaty, sugarcane production underwent a great expansion and its reliance on water from Kailua was substantial. By 1878, construction of a complex of flumes, ditches, and tunnels was completed in the *mauka* portions of Maunawili to collect water from streams and springs. This system facilitated the delivery of water to Waimānalo's sugarcane fields. By 1900, this system was 4 ½ miles long, and diverted all of Maunawili's stream water to Waimānalo. In the 1920s, improvements to the existing system were added. This included catchment tunnels excavated into the Ko`olau Mountains to increase water flow (Wilcox 1996).

In 1909, the Hawaiian Copra Company decided to level the “sand dunes and smooth[ing] out the former dune areas” (Hall 1997:77-78). They planted 130,000 coconut trees on 200 acres of beach sand, calling the area Coconut Grove. This unfortunate event likely disturbed numerous types of culturally significant sites. Incomplete and disarticulated human burials along with truncated cultural deposits resulted from these actions.

By 1924, a system of pumps, pipelines, tunnels, and ditches was completed that pumped water from Kawainui Marsh into the Kailua reservoir, which was part of the Waimānalo Irrigation System. This was used until the early 1950s (Wilcox 1996:111; map of Kailua Ditch on 106). Use of the Kawainui water rapidly declined after the liquidation of the Waimānalo Sugar Company in 1947 (*ibid.*).

Ranching began in Kailua Ahupua`a in the early 1900s, and the Kaneohe Ranch began to dominate land holdings in the Kailua and Kāne`ohe areas. Cattle, sheep, and horses were pasturing throughout Kailua's open plains landscape. As a result of this, it is likely that cattle grazing destroyed many abandoned gardens and *lo`i*. Kaneohe Ranch (Castle Trust) was also involved in commercial agriculture growing pineapple and sugarcane on its vast land holdings.

By the 1950s truck farming and ranching began to give way to housing, municipal, and commercial development. The realignment of the Pali Highway in 1959 allowed for the advertisement of Kailua as the ultimate “bedroom” community of Honolulu, just 10 miles and 25 minutes (by car) away. Kailua’s expansion has continued until the present time.

PREVIOUS ARCHAEOLOGY

Based on previous archaeological studies and archival research, at the time of Contact (1778), Kailua was a thriving community during the pre-Contact Period. Kailua Ahupua`a was close to the shoreline, and included prime agricultural lands including the Kawainui Marsh, the largest freshwater marsh in Hawai`i. Additionally, resources included an inland pond (Ka`elepulu) and as many as 18 streams fed the terraced taro fields. All of the freshwater made the ground rich and fertile and “provided bountiful agricultural and resource gathering areas” (Mann et al. 2002). Mele (chants) also suggest there may have been two very productive fishponds in Kailua. Additionally, geological studies have confirmed that the caldera of the Ko`olau Volcano (in the shadow of which Kailua lies) was a basalt quarry, ideal for stone tool production. Kailua, a populous community favored by ali`i, was also the center of a large royal complex in the 15th and 16th centuries that included playgrounds for sports and physical training (Sterling and Summers 1978:231-232).

Since Thrum’s study of the island in 1907, numerous studies have been conducted in Kailua during which additional sites have been identified. Site types range from terraces to habitation platforms, to *heiau*, and skeletal remains. Although diverse site types have been found in Kailua, a great number of such sites have been burials. Ancient Hawaiians typically buried their ancestors in sand, land with no potential agricultural value (Kirch 1985). Since Kailua Town was built on former sand dunes and due to the previously documented human skeletal remains in the area, Native Hawaiian burials continue to be inadvertently encountered during construction-related activities associated with ever-increasing development. Thus, the inventory of burials has been increasing. More than 83 archaeological reports describing finds of burials, temporary and permanent habitation sites, agricultural sites and the like have been filed on this *ahupua`a*, a testament to its importance. However, most of these studies are from the *mauka* regions, as the coastal area had already undergone extensive development.

ARCHAEOLOGICAL STUDIES WITHIN KAILUA AHUPUA`A

Ka`elepulu Fishpond (State Site 50-80-11-377) was initially recorded by McAllister during the 1930 Bishop Museum survey of the island of O`ahu (McAllister 1971:190).

According to Pukui *et al.* (1976:69) the literal meaning of Ka`elepulu is the "moist blackness". McAllister describes the inland pond as a having once been a "fresh water pond of much importance" (*ibid*). McAllister (*ibid*) states that Ka`elepulu Fishpond appears on the Alexander map of 1884 as encompassing an area of 190 acres with marshland amounting to 90 acres. There was a sluice gate (*mākāhā*) on the northeastern (*makai*) side of the pond and an outlet which extended to Kailua Bay. Taro patches (*lo`i*) once extended between Ka`elepulu and the stream from Kawai Nui Marsh (*ibid*:119). According to Mrs. Charles Olona (an informant in Sterling and Summers 1978:240) an informant, the pond was kept remarkably clean and it produced the most abundantly healthy and tender fish, including: mullet, *awa*, *āhole*, and *o`opu*. Hammatt and Shideler (1992:7) suggest that these areas, including the extensive marsh lands of Puha and Ka`elepulu Pond, would have made the relatively flat coastal margins just north and south of Wailea Point, logical choices for early Polynesian settlement.

Kawai Nui Marsh (State Site 50-80-11-370) also was initially recorded by McAllister, under the auspices of the 1930 Bishop Museum survey of the island of O`ahu (McAllister 1971:186). McAllister (*ibid*) describes Kawai Nui Marsh as having been at one time a large inland pond which...

...belonged to the alii. Any person coming from this area...had royal blood in his veins and could go where he wished, apparently taking precedence over alii from other sections.

In 1977, Stephen Clark conducted a cursory Archaeological Surface Survey of the roadway corridor for the proposed extension of Hamakua Drive between Hahani Street and Akoakoa Street, in Kailua [TMK: (1) 4-2, 5] (Clark 1977). During the survey two sites were newly identified (State Site 50-80-11-4699 and State Site 50-80-11-4700). State Site 50-80-11-4699, a possible agricultural/habitation complex consisting of a large earthen mound, a possible wall, alignments, a human mandible, a paved enclosure, two possible agricultural plots, and two possible *auwai*. State Site 50-80-11-4700 is a T-shaped site which was tentatively interpreted as a *heiau* and additional features including, two partially paved platforms, one paved with coral and containing an interior alignment; alignments, including a rectangular notched alignment; a rectangular mound with associated alignments; additional alignments with interior features. Artifacts identified during the survey include: a possible sharpening stone; coral; a muller; basalt flakes; four possible post, or image, holes; two sharpening stone fragments; historic bottle glass fragments.

In 1984 Chiniago conducted a cursory Archaeological Survey at the two proposed locations of the Maunawili Pump Station on the corner of Auloa Road and Kalaniana`ole Highway, and Kukanon Pump Station, on the southeast side of the existing Kukanono Sewage Treatment Plant at the end of Manu-Oo Street, and the associated force mains, in Kailua [TMK: (1) 4-2-7, 3, 13, 51] (Barrera 1984). No historic properties were identified during the survey.

The Bishop Museum conducted an Archaeological Reconnaissance Survey of the area proposed for the Windward Park in Kailua [TMK: (1) 4-2-014:002 and 004] (Pantaleo and Cleghorn 1989). During the survey archaeological five sites (State Sites 50-80-11-2034 through -2037 and -3739) were documented. State Site 50-80-11-2034 consists of a terrace and an L-shaped terrace; Site -2035 consists of two rock walls; Site -2036 consists of a rock wall and a mound; Site -2037 consists of a linear mound. Site -3739 is a site complex of five features including: Feature A (terrace), Feature B (alignment), Feature C (a rock mound), Feature D (C-shaped alignment), and Feature E (alignment).

The inadvertent discovery of human skeletal remains at 1414 Aalapapa Street, Lanikai, O`ahu [TMK: (1) 4-3-004:005] was found upon construction at the Cole House site. In accordance with State Historic Preservation Division and in consultation with the O`ahu Island Burial Council, Cultural Surveys Hawai`i, Inc. conducted the removal of three burials under the direction of the State Historic Preservation Department. It was determined that the remains were part of State Site 50-80-11-3738 (Bath and Smith 1988), which were more than likely an expanded area of the site; further disinterment of burials was halted (Hammatt and Shideler 1992).

Cultural Surveys Hawai`i, Inc. (CSH) conducted an Archaeological and Historical Assessment and Field Inspection of a 0.8 mile segment of the Auloa Road right-of way in anticipation of the installation of a 16-inch water line, in Kailua [TMK: (1) 4-2] (Hammatt and Chiogioji 1997). No new sites were identified during the Field Inspection. However, CSH made note of two existing historic properties located at Castle Junction (the Kaneohe Ranch office building, State Site 50-80-10-1360, and a war memorial monument) adjacent to the CSH project area.

Between December 1999 and August 2000 the International Archaeological Research Institute (IARII) conducted Archaeological Monitoring during sewerline installations along Kalaheo Avenue, Kailua [TMK: (1) 4-2-001, 019, 020; 4-4-022 through 032; 4-4-011] (Ormsby *et al.* 2003). No historic properties were identified.

Scientific Consultant Services, Inc. (SCS) conducted Archaeological Monitoring during ground alterations associated with fire hydrant installations at Kailua Elementary School [TMK: (1) 4-3-056:003] (Calis 2003). During the course of the monitoring activities Site 50-80-10-6524, a burial site containing three burials, was newly identified. Burials 1 and 2 were "...identified *in situ*, in a primary burial context" (*ibid*: 12). Both Burials 1 and 2 were in flexed position and determined to be adult females of Polynesian ancestry interred during the pre-Contact Period. Burial 3, extensively disturbed during backhoe trenching, was recovered from the backdirt pile (*ibid*: 12, 15, and 16). The age of Burial 3 was determined to be pre-pubescent. However, as Burial 3 was in fragmented condition, gender and ethnicity could not be determined (*ibid*: 12).

Between April and November 2003 Archaeological Monitoring was conducted by CSH during the Anti-Crime Street Lights Project along both sides of Kailua Road [TMK: (1) 4-3-056; 4-2-038] (Jones and Hammatt 2004). Site 50-80-11-6657, a firepit yielding a date of A.D. 1400 to 1850 was identified. The findings of the archaeological monitoring indicate the ground surface and the subsurface strata, to a lesser extent, have undergone extensive modifications due to the urbanization of the area.

Between April 2003 and April 2005 CSH conducted Archaeological Monitoring of the Kalāheo Avenue Reconstructed Sewer Project [TMK: (1) 4-3-016, 017-020, 024-027, 075, & 080] (Borthwick *et al.* 2006). Two sites were identified (State Site 50-80-11-6770 and 50-80-11-6818) during the monitoring activities. State Site 50-80-11-6770 consists of five sets of human skeletal remains (Features A through E) encountered near the intersection of Wilikoki Place and North Kalāheo Street. State Site 50-80-11-6818 consists of fragmented, previously disturbed, human skeletal remains discovered at the intersection of `Ōma`o Street and North Kalāheo Street.

T. S. Dye and Associates conducted an Archaeological Inventory Survey of an approximately 192, 862 square foot beach lot located at 55 Kailuana Place, Kailua [TMK: (1) 4-3-022:011] (Putzi and Dye 2004a). During the inventory survey one site (State Site 50-80-11-6642) was newly identified. State Site 50-80-11-6642 "...yielded evidence of traditional Hawaiian habitation and [five intact} early Historic-era human burials..." and included Traditional-type materials (midden deposit and artifacts) and a pig burial (*ibid*: 24–25).

Subsequent to the Archaeological Inventory Survey (Putzi and Dye 2004a), T. S. Dye and Associates conducted Archaeological Data Recovery of Site -6642 [TMK: (1) 4-3-022:011]

during the re-internment of the five burials initially identified during the AIS (Putzi and Dye 2004b). Data Recovery yielded "...traditional Hawaiian artifacts, food remains, and the partially exposed remains of a sixth burial" (Putzi and Dye 2004b). Based on the findings of the Data Recovery excavations, State Site 50-80-11-6642 has been interpreted as a "a burial ground; a center of religious ceremony; a habitation area, including food processing and food procurement; a work area for craftsmen, such as woodworkers; animal husbandry; and as a residence for the *ali`i*" (*ibid*: 28). The variety of activities conducted at this site provides a clearer picture of traditional life-ways in the early post-Contact Period as well, as additional data pertaining to traditional Hawaiian mortuary practices.

In September 2006 Pacific Consulting Services, Inc. conducted an Archaeological Assessment (Archaeological Inventory-level Survey work with negative findings); with limited shovel excavation, of the 10.7 acre Kailua area proposed for emergency rock fall and landslide mitigation [TMK: (1) 4-2-003:014 and 017] (Collins and Nees 2007). The project area is located along Kailua Road. No historic properties were identified.

Cultural Surveys Hawaii, Inc. conducted an Archaeological Inventory Survey of a 0.7 acre property located on Hekili Street, in Kailua [TMK: (1) 4-2-038:009 and 010] (Tulchin *et al.* 2007). During the survey one site (State Site 50-80-11-6916) was identified. State Site 50-80-11-6916 consists of a pre-Contact cultural deposit (comprised of midden, basalt tools, lithic debitage, numerous pit features, and two human burials). The findings at Site -6916 suggest "...a pre-Contact indigenous occupation...with an emphasis on lithic reduction work related to the manufacture of stone tools" (*ibid*:95). The pre-Contact date is supported by radiocarbon analysis which yielded a calibrated 2-Sigma date, with 95.4 percent accuracy, ranging from 1440 A.D. to 1520 A.D. (Tulchin *et al.* 2007).

ARCHAEOLOGICAL STUDIES IN THE VICINITY OF THE PROJECT AREA

Only a handful of studies have been conducted in the vicinity of the current project area (Figure 3), these studies are described below.

Between April 2003 and October 2005 CSH conducted Archaeological Monitoring of ground altering activities associated with the Reconstructed Sewer Project located in Kailua within select portions of Keolu Drive, Hamakua Drive, and Kainehe Street [TMK: (1) 4-2-1; 77; 81; 82; 87; 89; 90; 93 through 95] (Fong *et al.* 2007). The southernmost end of this project was located approximately 590 m north of the current project area. No historic properties were encountered.

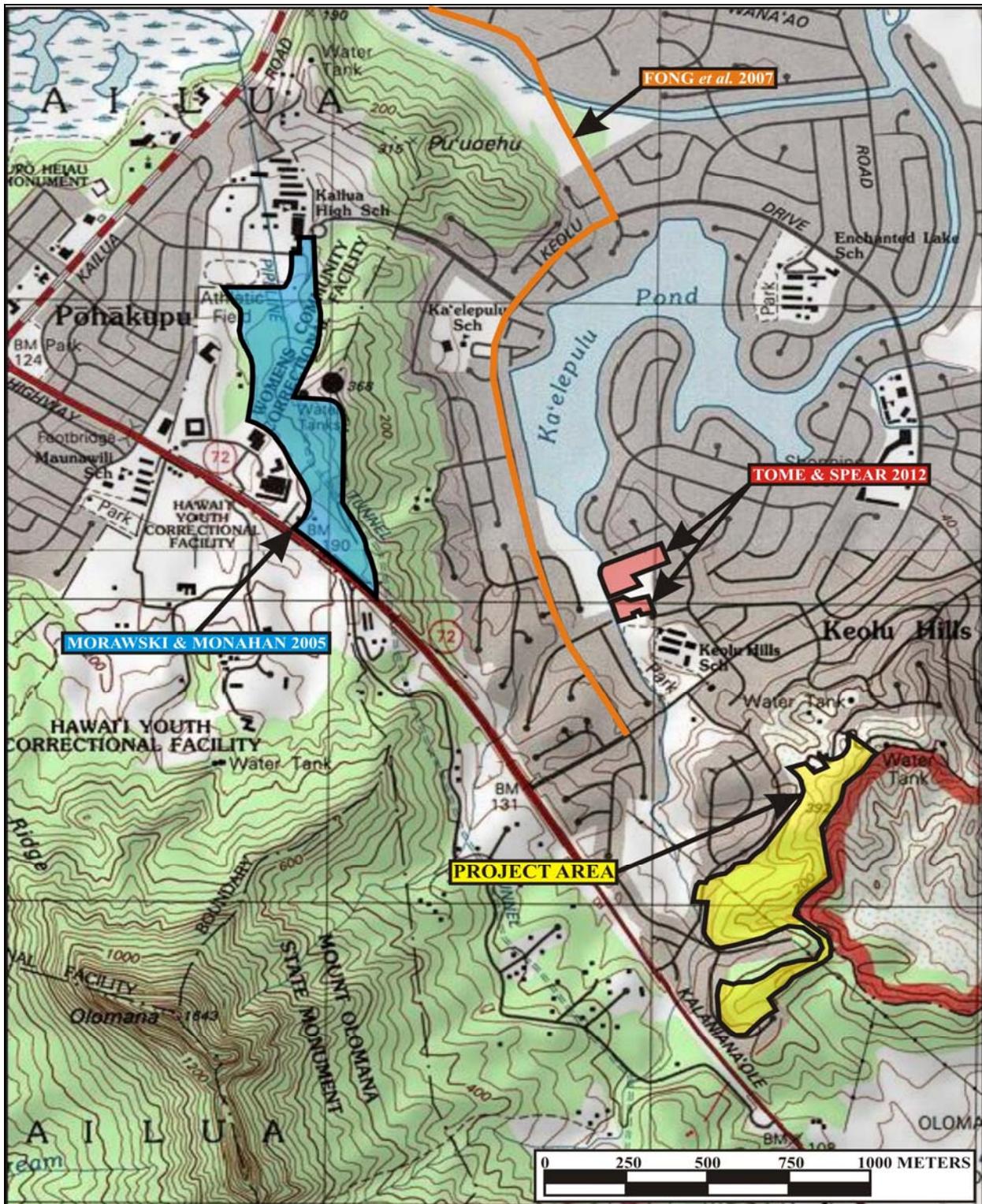


Figure 3: USGS Quadrangle (Koko Head 1999) Map Showing Previous Archaeological Studies in the Vicinity of the Project Area.

In 2005 Scientific Consultant Services, Inc. conducted an Archaeological Inventory Survey of 25 acres, in Kailua [TMK: (1) 4-2-003:004 por. & 022 por.] (Morawski and Monahan 2005). This project was located approximately 1500 m northwest of the current project area. During the survey two historic sites were identified: a lithic scatter (State Site 50-80-11-6816) and an Historic water-flow control structure (State Site 50-80-11-6817) comprised of two features. No excavation was conducted. Thus, no radiocarbon samples were available.

Scientific Consultant Services, Inc. conducted an Archaeological Assessment of four tax map key parcels totaling 6.255-acres of land, in Enchanted Lakes, Kailua Ahupua`a, Ko`olaupoko District, Island of O`ahu [TMK: (1) 4-2-083: 074, 075, 077, and 079] (Tome and Spear 2012). The combination of a pedestrian survey and a total of fourteen mechanically excavated trenches within the project area boundaries did not reveal the presence of archaeological cultural material or archaeological sites on the ground surface or within subsurface contexts. Modern debris was observed along the northeastern and southeastern perimeters of the project area.

In 2013, Scientific Consultant Services, Inc. conducted an Archaeological Assessment, including limited subsurface testing, on approximately 4.3 acres of undeveloped land within the 37-acre current project area, located in the *ahupua`a* of Kailua, Ko`olaupoko District, Island of O`ahu, Hawai`i [Tax Map Key (1) 4-2-004: 001] (Dagher *et al.* 2013, in prep.). The combination of a pedestrian survey and a total of four manually excavated test pits within the project area boundaries did not reveal the presence of archaeological cultural material or archaeological sites on the ground surface or within subsurface contexts.

CONSULTATION

Consultation was sought from Ms. Hinalaimoana K.K. Wong-Kalu, Chair, O`ahu Island Burial Council; Kailua Hawaiian Civic Club; Ms. Nanette Napoleon, community member; Lanikai Canoe Club; Dr. Kamana`opono M. Crabbe, Chief Executive Officer, Office of Hawaiian Affairs; Mr. Aaron Mahi, O`ahu Island Burial Council, Ko`olaupoko District Representative; Mr. Kawika Farm, State Historic Preservation Division, Burial Sites Specialist; Ko`olaupoko Hawaiian Civic Club; Mr. Ricky Bermudez, Kahu and Traditional Cultural Practitioner; Brian Isaacson, community member; Skip Byron; community member; John Leong, community member; Teresa Parsons, community member; and Mr. William Ho`ohuli, community member.

In addition, a Cultural Impact Assessment Notice was published on August 18, 21, and 22, 2013, in *The Honolulu Star-Advertiser*, and in the September 2013 issue of the OHA newspaper, *Ka Wai Ola* (Lisa E. Asato, personal; communication) (see Appendix B). These notices requested information of cultural resources or activities in the area of the proposed project, stated the Tax Map Key (TMK) number, and where to respond with pertinent information. Based on the responses, an assessment of the potential effects on cultural resources in the project area and recommendations for mitigation of these effects can be proposed.

CULTURAL IMPACT ASSESSMENT INQUIRY RESPONSES

Analysis of the potential effect of the project on cultural resources, practices or beliefs, the potential to isolate cultural resources, maintain practices or beliefs in their original setting, and the potential of the project to introduce elements that may alter the setting in which cultural practices take place is a requirement of the OEQC (2012:13). As stated earlier, this includes the cultural resources of the different groups comprising the multi-ethnic community of Hawai`i.

As stated elsewhere in this document, consultation was sought from the following individuals and organizations: Ms. Hinaleimoana K.K. Wong-Kalu, Chair, O`ahu Island Burial Council; Kailua Hawaiian Civic Club; Ms. Nanette Napoleon, community member; Lanikai Canoe Club; Dr. Kamana`opono M. Crabbe, Chief Executive Officer, Office of Hawaiian Affairs; Mr. Aaron Mahi, O`ahu Island Burial Council, Ko`olaupoko District Representative; Mr. Kawika Farm, State Historic Preservation Division, Burial Sites Specialist; Ko`olaupoko Hawaiian Civic Club; Mr. Ricky Bermudez, Kahu and Traditional Cultural Practitioner; Brian Isaacson, community member; Skip Byron; community member; John Leong, community member; Teresa Parsons, community member; and Mr. William Ho`ohuli, community member.

Responses were received from several community members including Brian Isaacson, Skip Byron, Teresa Parsons, and Leimomi Kekina, of the Lanikai Canoe Club. All responses were received electronically via a-mail and are presented below.

Brian Isaacson

Brian Isaacson stated that "...it appears that the recently purchased property owned by Dawn Horn is within the Conservation District Boundaries and that the ridge and associated topography may have historic sites on it. The Kaiwa Ridge has a significant drainage area, and there are a number of known sites in the general area, so even though I have no personal knowledge of possible sites on the property, information in the plan seems to indicate that they

may be there. I'm not sure that the plans that Ms. Horn has for developing the property are in accordance with the KSC plan or are consistent with preserving historic sites."

Skip Byron

Skip Byron stated that, "The SCP reference indicates the Kaiwa Ridge is a prominent land feature and within the conservation district boundary. I believe the SCP also suggests the Kaiwa Ridge contains clusters of historic sites in an area on or near the Horn property."

"Currently, I see trails being cut on the property in what appears to me to be arbitrary without regard for possible historic sites, disturbing the conservation land and scaring the scenic plain of this prominent land feature. I have heard the land owner report at public meetings that she intends to clear old roads across the land as well. I'm concerned the current and planned work on the property appears to be ongoing prior to, and without consideration, of a Cultural Impact Study."

Teresa Parsons, Lanikai Canoe Club

Teresa Parsons "...studied the maps and am having some difficulty determining the location of the proposed project(s). On the USGS Quad map, the project is indicated to be in the area contained between Kahako Street and Kahako Place, whereas the TMK map indicates the project as being located in the larger portion of this parcel of land. Can you clarify where Ms. Horn is proposing this project and how large the footprint will be?"

"The larger portion of the parcel is on the highest ground topographically and faces the ocean. There is evidence of cultural practices (possibly a he`iau?) on the higher elevation. Honestly, I am no longer in sufficient physical condition to climb in that region, but I can attest to seeing evidence in past years' hikes in the area."

"The smaller portion of the parcel is incredibly rocky and unstable, so I typically avoid it since there are cracks in the ground rock the size to allow a foot and leg to be swallowed or trapped."

Leimomi Kekini

Leimomi Kekini suggested contacting Cultural Surveys Hawai`i; Halau Mohala Ilima, of Kailua; the Kailua Hawaiian Civic Club; and Dr. Chuck Burrows.

SUMMARY

The “level of effort undertaken” to identify potential effect by a project to cultural resources, places or beliefs (OEQC 2012) 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. Sending inquiring letters to organizations concerning development of a piece of property that has already been totally impacted by previous activity and is located in an already developed industrial area may be a “good faith effort”. However, when many factors need to be considered, such as in coastal or mountain development, a good faith effort might mean an entirely different level of research activity.

In the case of the current undertaking, letters of inquiry were sent to individuals and organizations that may have knowledge or information pertaining to the collection of cultural resources and/or practices currently, or previously conducted in close proximity to the 37- acre property within the Kailua Ahupua`a, Ko`olaupoko District, Island of O`ahu, Hawai`i [Tax Map Key (1) 4-2-004: 001].

Historical and cultural source materials were extensively used and can be found listed in the References Cited portion of the report. Such scholars as Samuel Kamakau, Martha Beckwith, Jon J. Chinen, Lilikalā Kame`eleihiwa, R. S. Kuykendall, Marion Kelly, E. S. C. Handy and E.G. Handy, Elspeth P. Sterling, and Mary Kawena Puku`i and Samuel H. Elbert 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 Database (2014).

CULTURAL ASSESSMENT AND RECOMMENDATIONS

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 also a suggested guideline of the OEQC (2012). Based on historical research, and no additional suggestion for contacts, 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 (2012). As indicated by the lack of responses received from the community, the project area has not been, and is not currently, used for traditional cultural purposes.

Based on the above research and the comments received from the community, it is reasonable to conclude that, pursuant to Act 50, the exercise of native Hawaiian rights, or any ethnic group, related to traditional cultural practices including, gathering, access, cultivation, the use of traditional plants, *oli* (chanting) and *ha`a* (dancing), making traditional-type tools (i.e., *poi* pounders, *poi* boxes, etc.), and access to the ocean will be not impacted by the proposed Horn property project, located on approximately 4.3 acres of undeveloped land within a 37-acre property of land in Kailua Ahupua`a, Ko`olaupoko District, Island of O`ahu, Hawai`i [Tax Map Key (1) 4-2-004: 001].

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APPENDIX A: EXAMPLE LETTER OF INQUIRY

Dear :

In compliance with the State of Hawai'i Revised Statute (HRS) Chapter 343 Environmental Impact Statements Law, and in accordance with the State of Hawai'i Department of Health's Office of Environmental Quality Control (OEQC) Guidelines for Assessing Cultural Impacts as adopted by the Environmental Council, State of Hawai'i on November 19, 1997, Scientific Consultant Services, Inc. (SCS) is in the process of preparing a Cultural Impact Assessment (CIA) pertaining to the proposed construction of a single-family dwelling and farm located in Kailua Ahupua'a, Ko'olaupoko District, O'ahu, Hawai'i [TMK: (1) 4-2-004:001.] (Figures 1 and 2).

According to the *Guidelines for Assessing Cultural Impacts* (Office of Environmental Quality Control, Nov. 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 man made and natural which support such cultural beliefs...

We are asking you for any information that you or other individuals may have which would contribute to the knowledge of traditional cultural activities that were, or are currently, conducted in the vicinity of the subject property. We are also asking for any information pertaining to traditional cultural activities or traditional rights which may be impacted by the proposed construction of a single-family dwelling and farm. The results of the cultural impact assessment are dependent on the response and contributions made by knowledgeable individuals, such as yourself.

Enclosed are maps showing the proposed project areas. Please contact me at the Scientific Consultant Services, Honolulu, office at (808) 597-1182 or via e-mail (cathy@scshawaii.com) with any information or recommendations concerning this Cultural Impact Assessment.

Sincerely yours,

Cathleen Dagher
Senior Archaeologist
Enclosures (2)

cc: Ms. Hinaleimoana K.K. Wong-Kalu, Chair, O`ahu Island Burial Council; Kailua Hawaiian Civic Club; Ms. Nanette Napoleon, community member; Lanikai Canoe Club; Dr. Kamana`opono M. Crabbe, Chief Executive Officer, Office of Hawaiian Affairs; Mr. Aaron Mahi, O`ahu Island Burial Council, Ko`olaupoko District Representative; Mr. Kawika Farm, State Historic Preservation Division, Burial Sites Specialist; Ko`olaupoko Hawaiian Civic Club; Mr. Ricky Bermudez, Kahu and Traditional Cultural Practitioner; Mr. William Ho`ohuli, community member

APPENDIX B: LEGAL NOTICE AND AFFADAVIT

APPENDIX C: EXAMPLE FOLLOW-UP LETTER

Dear:

This is our follow-up letter to our September 16, 2013 letter, which was in compliance with the statutory requirements of the State of Hawai'i Revised Statute (HRS) Chapter 343 Environmental Impact Statements Law, and in accordance with the State of Hawai'i Department of Health's Office of Environmental Quality Control (OEQC) Guidelines for Assessing Cultural Impacts as adopted by the Environmental Council, State of Hawai'i, on November 19, 1997. Scientific Consultant Services, Inc. (SCS) is in the process of preparing a Cultural Impact Assessment (CIA) pertaining to the proposed construction of a single-family dwelling and farm located in Kailua Ahupua`a, Ko`olaupoko District, O`ahu, Hawai'i [TMK: (1) 4-2-004:001].

According to the *Guidelines for Assessing Cultural Impacts* (Office of Environmental Quality Control, Nov. 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 man made and natural which support such cultural beliefs...

We are asking you for any information that you or other individuals may have which would contribute to the knowledge of traditional cultural activities that were, or are currently, conducted in the vicinity of the subject property. We are also asking for any information pertaining to traditional cultural activities or traditional rights which may be impacted by the proposed construction of a single-family dwelling and farm. The results of the cultural impact assessment are dependent on the response and contributions made by knowledgeable individuals, such as yourself.

Please contact me at the Scientific Consultant Services, Honolulu, office at (808) 597-1182 or via e-mail (cathy@scshawaii.com) with any information or recommendations concerning this Cultural Impact Assessment.

Sincerely yours,

Cathleen Dagher
Senior Archaeologist

cc: Ms. Hinaleimoana K.K. Wong-Kalu, Chair, O`ahu Island Burial Council; Kailua Hawaiian Civic Club; Ms. Nanette Napoleon, community member; Lanikai Canoe Club; Dr. Kamana`opono M. Crabbe, Chief Executive Officer, Office of Hawaiian Affairs; Mr. Aaron Mahi, O`ahu Island Burial Council, Ko`olaupoko District Representative; Mr. Kawika Farm, State Historic Preservation Division, Burial Sites Specialist; Ko`olaupoko Hawaiian Civic Club; Mr. Ricky Bermudez, Kahu and Traditional Cultural Practitioner; Mr. Skip Byron, community member; Mr. John Leong, community member; Mr. Brian Isaacson; community member; Mr. William Ho`ohuli, community member

Mon, 30 Sep 2013 12:27:45 -0700 (PDT)
Date: Mon, 30 Sep 2013 09:27:45 -1000
Subject: Horn property Kaiwa Ridge sites
From: Brian Isaacson <bisaacso@hawaii.edu>
To: scs@scshawaii.com
X-Nospam: None
X-Antivirus: avast! (VPS 130930-0, 09/29/2013), Inbound message
X-Antivirus-Status: Clean

Hi, folks, looking over the Koolaupoko Sustainable Communities Plan, it appears that the recently purchased property owned by Dawn Horn is within the Conservation District Boundaries and that the ridge and associated topography may have historic sites on it. The Kaiwa ridge has a significant drainage area, and there are a number of known sites in the general area, so even though I have no personal knowledge of possible sites on the property, information in the plan seems to indicate that they may be there. I'm not sure that the plans that Ms. Horn has for developing the property are in accordance with the KSC plan or are consistent with preserving historic sites. Thank you.

Brian Isaacson
Kailua, HI

APPENDIX D: RESPONSES

Mon, 30 Sep 2013 12:27:45 -0700 (PDT)
Date: Mon, 30 Sep 2013 09:27:45 -1000
Subject: Horn property Kaiwa Ridge sites
From: Brian Isaacson <bisaacso@hawaii.edu>
To: scs@scshawaii.com
X-Nospam: None
X-Antivirus: avast! (VPS 130930-0, 09/29/2013), Inbound message
X-Antivirus-Status: Clean

Hi, folks, looking over the Koolaupoko Sustainable Communities Plan, it appears that the recently purchased property owned by Dawn Horn is within the Conservation District Boundaries and that the ridge and associated topography may have historic sites on it. The Kaiwa ridge has a significant drainage area, and there are a number of known sites in the general area, so even though I have no personal knowledge of possible sites on the property, information in the plan seems to indicate that they may be there. I'm not sure that the plans that Ms. Horn has for developing the property are in accordance with the KSC plan or are consistent with preserving historic sites. Thank you.

Brian Isaacson
Kailua, HI

Subject: Re: Cultural Impact Assessment for the Horn property (SCS Proj 1459)
From: Leimomi Kekina <leimomikekina@gmail.com>
Date: Thu, December 19, 2013 4:51 pm
To: cathy@scshawaii.com
Cc: Bruce Stewart <brucestewarthy@gmail.com>, Ellen Flaharty <miffalaharty@hotmail.com>

Aloha Cathy,

Thank you for attaching the maps. Greatly appreciate it. I was wondering if you had been in contact with Hawaii Cultural Surveys as well as Halau Mohala Ilima of Kailua and the Kailua Hawaiian Civic Club, Dr. Chuck Burrows, and if they were able to get back to you with any responses? They would be excellent groups to consult with and have a vast historical knowledge of the areas you are referring to.

Me ke aloha,
Leimomi

Subject: Response to Request RE Horn Property

From: jlbyron@hawaii.rr.com

Date: Mon, Sep 30, 2013 10:19 pm

To: cathy@scshawaii.com

Aloha Ms Dagher ...

I'm responding to your public request for information regarding "cultural resources and traditional, or ongoing, cultural activities on or near the proposed development of the Horn property located in Kailua Ahupua'a, Ko'olaupoko District, O'ahu, Hawai'i [TMK: (1) 4-2- 004:001]."

I recently reviewed the KOOLAUPOKO SUSTAINABLE COMMUNITIES Plan (SCP) and found the following:

- Page 2-8 (Figure 2-2) shows the Kaiwa Ridge within the a Conservation District Boundary
- Page 2-12 (Figure 2-4) shows the Kaiwa Ridge as a prominent land feature
- Page 2-13 (Figure 2-5) shows the Kaiwa Ridge contains Clusters of Historic Sites

The SCP reference indicates the Kaiwa Ridge is a prominent land feature and within the conservation district boundary. I believe the SCP also suggests the Kaiwa Ridge contains clusters of historic sites in an area on or near the Horn property.

Currently, I see trails being cut on the property in what appears to me to be arbitrary without regard for possible historic sites, disturbing the conservation land and scaring the scenic plain of this prominent land feature. I have heard the land owner report at public meetings that she intends to clear old roads across the land as well. I'm concerned the current and planned work on the property appears to be ongoing prior to and without consideration of a Cultural Impact Study.

I'm hopeful this public information helps meet your request.

Aloha!

Skip Byron
Kailua

----- Original Message -----

Subject: Re: Cultural Impact Assessment for the Horn Property

From: Teresa <tapaka53@aol.com>

Date: Tue, November 05, 2013 8:52 pm

To: cathy@scshawaii.com

Cathy,

Mahalo for the letter and maps. I've studied the maps and am having some difficulty determining the location of the proposed project(s). On the USGS Quad map, the project is indicated to be in the area contained between Kahako Street and Kahako Place, whereas the TMK map indicates the project as being located in the larger portion of this parcel of land. Can you clarify where Ms. Horn is proposing this project and how large the footprint will be?

The larger portion of the parcel is on the highest ground topographically and faces the ocean. There is evidence of cultural practices (possibly a he'iau?) on the higher elevation. Honestly, I am no longer in sufficient physical condition to climb in that region, but I can attest to seeing evidence in past years' hikes in the area.

The smaller portion of the parcel is incredibly rocky and unstable, so I typically avoid it since there are cracks in the ground rock the size to allow a foot and leg to be swallowed or trapped.

As you are able, I would appreciate clarification on the location of the proposed project.

With respect,
Teresa Parsons

APPENDIX E: LAND COMMISSION AWARDS

Document Delivery

Mahele Database Documents

Number: 00044MA

Claim Number: **00044MA**

Claimant: **Kalaau**

Other claimant:

Other name:

Island: **Oahu**

District: **Koolaupoko**

Ahupuaa: **Kailua**

Ili: **Kaulu**

Apana:	1	Awarded:	1
Loi:	0	FR:	
Plus:		NR:	
Mala Taro:	0	FT:	
Kula:	0	NT:	
House lot:	0	RP:	8262
Kihapai/Pakanu:	0	Number of Royal Patents:	1
Salt lands:	0	Koele/Poalima:	No
Wauke:	0	Loko:	No
Olona:	0	Lokoia:	No
Noni:	0	Fishing Rights:	No
Hala:	0	Sea/Shore/Dunes:	No
Sweet Potatoes:	0	Auwai/Ditch:	No
Irish Potatoes:	0	Other Edifice:	No
Bananas:	0	Spring/Well:	No
Breadfruit:	0	Pigpen:	No
Coconut:	0	Road/Path:	No
Coffee:	0	Burial/Graveyard:	No
Oranges:	0	Wall/Fence:	No
Bitter Melon/Gourd:	0	Stream/Muliwai/River:	No
Sugar Cane:	0	Pali:	No
Tobacco:	0	Disease:	No
Koa/Kou Trees:	0	Claimant Died:	No

Other Plants: 0 Other Trees: 0

Other Mammals: No

Miscellaneous:

No. 44 M.A., Kalaau

**No. 5749, Kalaau, Honolulu, 3 February 1848
N.R. 127v5**

To the Land Commissioners, Respectful Greetings: I hereby state that I have a share of land from the Mo`i and the Minister of the Interior and the Minister of Finance, of the Independent Kingdom. It is 1/2 of Kaulu 'Ili at Kailua, Koolau Poko, Oahu.

Respectfully,
KALAAU

F.T. 456v10

No. 5749, Kalaau, 2 March 1855

½ Kaulu ili for Kailua in Koolaupoko, Oahu.

I, hereby approve this distribution. It is correct and the ½ land portion written above is for Kalaau. I have given consent that it be presented to the land officers who settle claims.

(sign) Kamehameha

Royal Palace, 2 February 1848

True copy from Mahele Book, S. Spencer

[Award 44 M.A.; Royal Land Patent No. 8262; Kaulu Kailua Koolaupoko; 2 ap.; 204 Acs; No 5749 not awarded]

Number: 04452*O

Claim Number:	04452*O		
Claimant:	Kalama, Hazaleleponi		
Other claimant:	Govt		
Other name:			
Island:	Oahu		
District:	Koolalupoko, Kona		
Ahupuaa:	Hakipuu, Kailua, Kaneohe		
Ili:	Beretania, Aienui, Halehala, Waikahalulu, Nuuanu St. (Pamoo)		
Apana:	10	Awarded:	1
Loi:		FR:	
Plus:		NR:	603,605v3
Mala Taro:		FT:	456,548v3
Kula:		NT:	187,358v10,81v16
House lot:	1	RP:	7213,7427,7482,7530,7983,
Kihapai/Pakanu:		Number of Royal Patents:	9
Salt lands:		Koele/Poalima:	No
Wauke:		Loko:	No
Olona:		Lokoia:	No
Noni:		Fishing Rights:	No
Hala:		Sea/Shore/Dunes:	No
Sweet Potatoes:		Auwai/Ditch:	No
Irish Potatoes:		Other Edifice:	No
Bananas:		Spring/Well:	No
Breadfruit:		Pigpen:	No
Coconut:		Road/Path:	No
Coffee:		Burial/Graveyard:	No
Oranges:		Wall/Fence:	No
Bitter Melon/Gourd:		Stream/Muliwai/River:	No
Sugar Cane:		Pali:	No
Tobacco:		Disease:	No

Koa/Kou Trees:		Claimant Died:	No
Other Plants:		Other Trees:	
Other Mammals:	No	Miscellaneous:	claims

No. 4452*O, [Hazaleponi Kalama], C. Kanaina (for Kalama) Honolulu, Jan. 19, 1848
N.R. 603-605v3

To the President of the Land Commissioners, William L. Lee, Respectfully: By direction of Queen Hazaleponi Kalama, I hereby present her claims for house lots which have not previously been given. Therefore I hereby describe her house lots and her right to them.

1. Houselot of Naopala and Kauwila at Kamanuwai in Honolulu. This lot is for H. Kalama. It was originally unused land and her makuakane built the house and made the improvements before sailing with King Liholiho (this was the year 1822). It has been occupied since then, and no one has objected.
2. Lot of Kekai, mauka of Pelekane, in Honolulu. This lot is for H. Kalama. It was formerly unused land until the time of Kaomi, when she and her people made the improvements on it, and since then until the present time no one has objected.
3. Lot of Noi at Kaanaana in Honolulu. This lot was for Timothy Haalilio and it became the King's, who gave it to H. Kalama forever.
4. Lot of Keawehano, beyond Aienui. This lot is mine and Kalama's. It was formerly unused and when we returned here with King Liholiho from Hawaii in the year 1821, we and our people made the improvements on it and from then until this time no one has objected.
5. Lot to Kekukahiko beyond Mokuhinia at Lahaina, Maui, mauka of the Government Road. This lot is for H. Kalama. She and her people made the improvements on it in 1839 and it has been continuously occupied since then with no objections.
6. Lot of Kekai, beyond Mokuhinia at Lahaina, Maui, makai of the Government Road. This lot is for H. Kalama. She and her people made improvements on it in 1839 and it has been continuously occupied since then with no objections.

These are what I have described correctly to you, and on the day you send for me I will be prepared to bring the proper witnesses for the aforesaid claims.

I am, with thanks,
CHARLES KANAINA

P.S. Let it be done soon, after this week. I request that [you] do not defer it for a long time.

Wailuku, Lahaina 6 apana

N.R. 605v3

No. 4452, C. Kanaina, Honolulu, January 19, 1848

To the President of the Land Commissioners, William L. Lee, Respectfully: I hereby state this claim for a house lot of mine in Honolulu. It was an unused place. Before the death of David Kamehameha, I settled my man there and he and I made the improvements on it and he has continued to dwell on it until this time, with no dissent from any one.

I humbly say to you that I will bring the proper witnesses for this claim. I request that it be done soon after this week. Do not defer it. I am, with thanks,
CHARLES KANAINA

F.T. 456-460v3

No. 4452, H. Kalama, from 278 page, 31 March 1853, Counter the Government

C. Kanaina, sworn says, the ili of Waikehalulu was given to Kalama after the death of Kaomi, when Captain Belcher was here, and at the Division of lands in 1848, this ili was given to her again by the King, excepting only such parts of it as are occupied by the Government or by private parties.

This lele of Waikahalulu is bounded:
On Waikiki side by Kaakaukukui & Auwaiolimu
Makai by the sand point
Ewa side by the inner harbor
Mauka by Beretania Street.

This ili was formerly in the possession of Kaiama, a chief under Kamehameha I, from the time of the Battle of Nuuanu until it was given to Kaomi by His present Majesty.

After Kaomi died it was given to Kalama. The stone or coral on this ili was tabooed by Kinau for the government, but I cannot tell the year. But it was not tabooed so that the konohiki, who held the land, could not cut stone on it. No one else could do so however. I cut stone on it in the lifetime of Kaahumanu. No one was allowed to cut stone on it without Kinau's consent. Does not consider that this land belongs to the Government as a part of the harbor.

M. Kekuaaoa, sworn, says he knows the lele of Waikahalulu. Knows that Kinau tabooed the stone on this ili. When Kuakini was Governor he held this ili. After that it was given to Kaomi by the present King and subsequently to Kalama. Kinau tabooed the stone by her own authority. The Government was not organized at that time. If any of the Chiefs wanted to cut stone they had only to ask her, but if any kanaka cut stone there he had to divide [it] with her. I think the government can taboo the stone but not the substratum under it, for that belongs to the land.

A. Paki, sworn, says when I was acting Governor of Oahu, in 1822 perhaps, my father,

Hinau, had charge of Waikahalulu. After we were pau the land was given to Kaiama. In former times, the only taboos on these makai lands, as far as I know, were put on by the several konohikis. By the Organic Acts, the coral reefs were tabooed by the Legislature. But the taboo put on before that for the purpose of preventing the filling up of the Harbor was declared by myself, by order of the Governor of Oahu in 1844. But the soil and all the rights & privileges appertaining to the land belongs to the konohiki nevertheless.

John Young, sworn, says he thinks the mauka part of Waikahalulu belongs to Kalama. By the first laws it was declared that no private individual could take any property or land which the chiefs had set apart for the Government. This was confirmed by the new statutes, which declare the coral reefs on all the islands to be Government property. The rights of piscary, however, still remain with the konohikis. I have understood that cutting the stone on this land was tabooed to prevent the Harbor from being filled up, and since I was made Minister of the Interior none of the chiefs have been permitted to cut stone there without the consent of the Privy Council. The government had some idea of selling a part of it at one time, and had it surveyed by Mr. Metcalf. But by advice of Colonel Smith, in 1849, perhaps, they declined to sell it.

Kanaina never mentioned this claim on behalf of the Queen till recently when the N.P.S. Navigation Company applied for a part of the land. The Government has exercised the rights of ownership on it ever since I came to be Minister of the Interior and the taboo on the stone by A. Paki was done in his capacity as Government Agent. The Government has disposed of a part of the land to the N.P.S. N. Company.

L. Haalelea, sworn, says the stone on this land was tabooed by Kinau, who also forbid the women from gathering limu there &c. After her death these restrictions appeared to be discontinued, and the people indiscriminately went there for limu. I heard of the taboo declared by Paki in 1841 to prevent the harbor from being filled up.

G.P. Judd, sworn, When I came to the Islands, the Harbor and the land in question were in the hands of the Governor of Oahu. In the time of Kuakini (Governor of Oahu) the stone began to be tabooed by the Government & so it has been ever since. I never heard that the Queen claimed this makai lele of Waikahalulu till 1850, when her agent, Kanaina, started this claim. As I understand it, this lele belongs to the Government, as a part of the Harbor, and I do not think the Queen or any one else has a right to it. In former times, all the people were allowed indiscriminately to go and take limu there. I do not know that the people of Waikahalulu alone were privileged to take limu. (This is admitted by Kanaina.)

At the Division of lands in 1848, I understood that the mauka part only of this Ili was given to the Queen.

G.P. Kalama, sworn, says he acted as clerk at the Division of lands, in the Palace in 1848. At the Division of the Queen's lands, the ili of Waikahalulu was given to her, that is to say, the mauka part of it only, and it was distinctly stated by Mr. Young, Mr. Judd & others at the time that she did not take the makai lele now in dispute, which is was

understood the Government had previously set apart for its own purposes.

F.T. 548-550v3

No. 4452, H. Kalama, 28 April 1854

Kihe, sworn says, he knows the part of the Pa Moo claimed by the Queen. It is on the southeast side of the King's part.

It is bounded:

On the Waikiki side by J. Pukou's lot
Makai by the Canton Hotel premises
On the Ewa side by the King's part of the Pa Moo
Mauka by S.C. Damon's lot.

The Queen got this lot from His Majesty in the year 1845, since which time I and the other tenants have lived under her.

Wakea, sworn says, he knows this lot and formerly lived on it under the Queen. Confirms in full the testimony given by last witness. Knows also the lot belonging to the Queen in the possession of Keawehano, in Honolulu.

It is bounded:

On the Waikiki side by the lot called Aie Nui
makai by Marin Street
On Ewa side by John Meek's land
Mauka by King Street.

This lot formerly belonged to Kalaimoku and from him it came to C. Kanaina who gave it to the Queen about the year 1838 and she has held it ever since.

C. Kanaina, sworn says, the Queen got this lot from him about the year 1838. It is an old possession of the family and the Queen's title is undisputed.

Kekai, sworn says, he knows the lot claimed by Kalama in Honolulu, called "Halehala."

It is bounded:

Mauka by land belonging to the King
On Waikiki side by the British Consulate ground
Makai by the King's lot called "Beretane"
On Ewa side by the land called "Kaakopua."

The Queen got this lot from the King about the time of their marriage. It is present[ly] occupied by myself and others under the Queen.

Pulio, sworn says, he knows the house lot claimed by H. Kalama in Kalihi. It is enclosed by a wall.

It is bounded:
On Honolulu side by a fish pond belonging to Liholiho.
Makai by the sea beach
On Ewa side by John Ii
Mauka by the konohiki of Mokauea.

N.T. 187-188v10

No. 4452, Hazaleleponi Kalama

COPY HAZALELEPONI KALAMA'S DIVISION

Kula ahupuaa, Puna, Hawaii
Kapalaalaea ahupuaa, Kona, Hawaii
Kalahuipuaa ili of Waimea, Kohala, Hawaii
Anaehoomalu ili of Waimea, Kohala, Hawaii
Waipio ahupuaa, Hamakua, Hawaii

Kaohe ili for Wailuku, Maui
Puhiawaawa ili for Wailuku, Maui
Lemukee ili of Wailuku, Maui
Puohala, Wailuku, Maui
Manienie, Wailuku, Maui

Waikahalulu, Honolulu, Kona, Oahu
Kailua ahupuaa, Koolaupoko, Oahu
Kaneohe ahupuaa, Koolaupoko, Oahu.
Hakipuu ahupuaa, Koolaupoko, Oahu.

I have approved this land division, the lands listed above are for Hazaleleponi Kalama,
and they may be presented to the land officers.

(Sign) Kamehameha

Copied by S.P. Kalama (for H. Kalama) Secretary

Royal Palace, 11 February 1848

See page 358

N.T. 358v10

No. 4452, H. Kalama, (from page 187)

COPY

H. Kalama's land distributions.
Kula ahupuaa, Puna, Hawaii
Kapalaalaea ahupuaa, Kona, Hawaii
Kalahuipuaa ili for Waimea, Kohala, Hawaii
Anaehoomalu ili for Waimea, Kohala, Hawaii

Waipio ahupuaa, Hamakua, Hawaii
Kaohe ili for Wailuku Puali, West Hawaii

Puhiawawa, ili for Wailuku, Puali, West Hawaii [sic, Maui]
Lemukee ili for Wailuku, Puali, West Hawaii [sic, Maui]
Manienie, Ili for Wailuku, Puali, West Hawaii [sic, Maui]

Waikahalulu, ili for Honolulu, Kona, Oahu
Kailua ahupuaa, Koolaupoko, Oahu
Kaneohe ahupuaa, Koolaupoko, Oahu
Hakipuu ahupuaa, Koolaupoko, Oahu.

TRUE COPY
A.G. Thruston, Clerk
Interior Department, 26 April 1854

A decision has been made by the Privy Council on this 29th day of Aug. 1850, that all of those lands are for Hazaleleponi Kalama as fee simple without a half division for the government.
A.G. Thruston, Clerk

N.T. 81v16
No. 4452, H. Kalama, 15 May 1854

Kekai, sworn, says he knows the house lots of Queen Kalama, at Lahaina, Maui.

The first lot is in the ahupuaa of Waiokama and is bounded as follows:
Mauka by konohiki's land
Olowalu by Kaheana's land
Makai by public Road
Kaanapali by loko called "Mokuhinia."

Claimant received this lot from the King about the year 1836, and her retainers have occupied it ever since, without dispute.

The second lot is also in Waiokama and is bounded as follows:
Mauka by public road
Olowalu by konohiki's land
Makai by A. Paki's land
Kaanapali by loko called "Mokuhinia."

Claimant received this lot from the king at the same time as the first lot and has held it ever since.

Keawehano, sworn, says he knows these two lots and confirms in full the testimony of

Kekai.

[Award 4452; (Oahu) R.P. 7482; Hakipuu Koolaupoko; 1 ap.; 1165.03 Acs; R.P. 7427; Nuuanu Street (Pamoo)Honolulu Kona; R.P. 7530; Aienui Honolulu Kona; 1 ap.; 28020 sq. ft.; R.P. 7213; Halehala Honolulu Kona; 1 ap.; 3 Acs 20 perches; R.P. 7983; Kailua Koolaupoko, 11885 acres; R.P. 5683 & 7220; R.P. 7984, Kaneohe Koolaupoko, 9500 acres; R.P. 7255 & 7516; Waikahalulu Honolulu Kona; 1 ap.; 1.006 Ac.;(Maui) R.P. 7299 Wailuku; R.P. 7303 Wailuku; R.P.; 7300 Wailuku; 7302 Wailuku; 7301 Wailuku; (Lahaina award no R.P.); (Hawaii) R.P. 7523; Anaehoomalu Waimea S. Kohala; 1 ap.; 866 Acs; R.P. 7529; Waipio Hamakua; R.P. 7522; Kalahuipuaa Waimea S. Kohala; 1 ap.; 359 Acs; R.P. 7483; Puna; Kula & Halekamahina; 3 ap.; 2902 Acs; No R.P.; Kapalaalaea N. Kona; 1 ap; Ahupuaa]
