

**DRAFT**  
**ENVIRONMENTAL ASSESSMENT**

**DHHL Wailua Development Project**  
**Kuhio Highway**

**Wailua, Kaua‘i, Hawai‘i**

**TMK Nos. (4) 3-9-06, Parcels 9 and 11 and (4) 3-9-02, Parcels 3, 12, 17, 24, 25, 26, 27, and 35**



**DEPARTMENT OF HAWAIIAN HOME LANDS**

January, 2008

This Document is prepared pursuant to Chapter 343, Hawai‘i Revised Statutes

**The Applicant:**

The State of Hawai‘i Department of Hawaiian Home Lands

**Accepting Authority:**

The State of Hawai‘i Department of Hawaiian Home Lands

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**Kuhio Highway**  
**Wailua, Kaua'i, Hawai'i**  
**TMK (4) 3-9-06, Parcels 9 and 11 and (4) 3-9-02, Parcels 3, 12, 17, 24, 25, 26, 27, and 35**

**Latitude: 22° 1' 45" N to 22° 2' 47" N**  
**Longitude: 159° 20' 15" W to 159° 21' 8" W**

**EI Project No.: 407-048**

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**Accepting Authority:**  
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c/o  
Office of Environmental Quality Control  
236 South Beretania Street, Suite 702  
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January, 2008

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## *Acronyms and Abbreviations*

BMPs	best management practices
CCD	Census County Division
CDP	Census Demographic Profile
CFR	Code of Federal Regulations
CIA	Cultural Impacts Assessment
County-DWM	County of Kaua‘i Department of Public Works Division of Wastewater Management
CZM	Coastal Zone Management
dB	decibel
DHHL	State of Hawai‘i Department of Hawaiian Home Lands
DLNR	State of Hawai‘i Department of Land and Natural Resources
DLNR-CWRM	State of Hawai‘i Department of Land and Natural Resources – Commission on Water Resource Management
DLNR-DAR	State of Hawai‘i Department of Land and Natural Resources – Division of Aquatic Resources
DLNR-DFW	State of Hawai‘i Department of Land and Natural Resources – Division of Forestry and Wildlife
DLNR-ED	State of Hawai‘i Department of Land and Natural Resources – Engineering Division
DLNR-SHPD	State of Hawai‘i Department of Land and Natural Resources – State Historic Preservation Division
DLNR-SP	State of Hawai‘i Department of Land and Natural Resources – Division of State Parks
DOH	State of Hawai‘i Department of Health
DOT	State of Hawai‘i Department of Transportation
DOW	County of Kaua‘i, Department of Water
EA	Environmental Assessment
EI	Environet, Inc.
EIS	Environmental Impact Statement
EPA	United States Environmental Protection Agency
ESA	Environmental Site Assessment
FEMA	Federal Emergency Management Agency
FONSI	Finding of No Significant Impact
HAR	Hawai‘i Administrative Rules
HRS	Hawai‘i Revised Statutes
HsD	Hanamaulu silty clay, 15 to 25 percent slopes
HtE	Hanamaulu stony silty clay, 10 to 35 percent slopes
IWSs	individual wastewater systems
KavB	Kaena clay, brown variant, 1 to 6 percent slopes
KavC	Kaena clay, brown variant, 6 to 12 percent slopes
KI	Kimura International
KIUC	Kaua‘i Island Utility Cooperative
KvB	Koloa stony silty clay, 3 to 8 percent slopes
LhB	Lihue silty clay, 0 to 8 percent slopes
LhC	Lihue silty clay, 8 to 15 percent slopes
LhD	Lihue silty clay, 15 to 25 percent slopes
LOS	Level of Service
LUC	State of Hawai‘i Land Use Commission
mgd	million gallons per day
mg/L CL <sup>-</sup>	milligrams per liter of Chloride

mph	miles per hour
Mr	Mokuleia fine sandy loam
Mta	Mokuleia clay loam, poorly drained variant
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resource Conservation Service
OED	County of Kaua'i Office of Economic Development
OEQC	Office of Environmental Quality Control
OHA	Office of Hawaiian Affairs
QA/QC	quality assurance/quality control
SCS	Scientific Consultant Services, Inc.
SHPO	State Historic Preservation Officer
SMA	Special Management Area
SSSC	Side-Street Stop-Controlled
STP	sewage treatment plant
TIAR	Traffic Impact Analysis Report
TMDL	Total Maximum Daily Load
TMK	Tax Map Key
UBC	Uniform Building Code
U.S.	United States
USACE	United States Army Corps of Engineers
USFWS	United States Fish and Wildlife Service
V/C	volume to capacity
WSA	Wilbur Smith Associates
WWTP	wastewater treatment plant
°F	degrees Fahrenheit

## **SECTION 1 INTRODUCTION AND SUMMARY**

### **1.1 Scope and Authority**

This Environmental Assessment (EA) is prepared pursuant to Chapter 343, Hawai'i Revised Statutes (HRS) and associated Title 11, Chapter 200, Hawai'i Administrative Rules (HAR). The intent of the document is to ensure that systematic consideration is given to the environmental consequences of the proposed action. The action that triggers this assessment is the use of State of Hawai'i funds and State of Hawai'i lands. A Finding of No Significant Impact (FONSI) is anticipated for this project.

### **1.2 Project Information**

Project Name: State of Hawai'i Department of Hawaiian Home Lands (DHHL)  
Wailua Development Project  
Wailua, Kaua'i, Hawai'i

Applicant: DHHL  
P.O. Box 1879  
Honolulu, HI 96805  
Contact: Kamuela Cobb-Adams  
(808) 587-6449

Agent: Environet, Inc. (EI)  
2850 Pa'a Street, Suite 212  
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Accepting Authority: DHHL  
c/o Office of Environmental Quality Control (OEQC)  
236 South Beretania Street, Suite 702  
Honolulu, Hawai'i 96813

Project Location: Island of Kaua'i, Wailua District

Tax Map Key Nos.: 4th Division, Zone 3, Section 9, Plat 006: Parcels 009 and 011 or  
(4) 3-9-006:009 and 011 and 4th Division, Zone 3, Section 9, Plat  
002: Parcels 003, 012, 017, 024, 025, 026, 027, and 035 or (4) 3-9-  
002: 003, 012, 017, 024, 025, 026, 027, and 035

Total Affected Area: 526 acres

Existing Land Use: Currently vacant, undeveloped land. Some areas were formerly used  
for agriculture.

State Land Use District: Agricultural, Urban

DHHL Designation: Resort (RR-20), Residential, minimum lot size 10,000 square feet  
(R-4)

County Zoning Designation: Agriculture, Open

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## **SECTION 2 PROJECT DESCRIPTION**

### **2.1 Purpose and Need**

The primary *purpose* of the project is to prepare the property and complete development of a residential development on the mauka side of Kuhio Highway, funded by a ground lease for timeshare and other revenue-generating development within a buffer zone (“buffer”) on the makai side of Kuhio Highway. The DHHL needs to develop and distribute homestead lots to qualified native Hawaiian beneficiaries on its waiting list. The project proposed by DHHL is consistent with the Hawaiian Homes Commission Act, as amended. DHHL is a state agency that is eligible to use State of Hawai‘i funds for improvement projects to achieve the settlement of native Hawaiians on State of Hawai‘i lands.

At project completion, DHHL would be able to award up to 735 residential lots to native Hawaiians. DHHL administers the Hawaiian Homes Commission Act by providing benefits to native Hawaiians in the form of 99-year homestead leases at a nominal annual rental. The objective of the homesteading program is to increase the economic self-sufficiency of native Hawaiians through the provision of land. Since 1921, DHHL has provided over 7,000 homestead awards to native Hawaiians. The project is consistent with both the Wailua Regional Plan (DHHL, 2007) and the Kaua‘i Island Plan (DHHL, 2004), and its citing within Wailua is in accordance with a survey of beneficiaries conducted in 2004, in which Wailua was deemed the most desirable place for residential homesteading.

### **2.2 Project Location and Setting**

The property where project actions will occur is located in the Wailua ahupua‘a in the Lihue District on the east side of the Island of Kaua‘i, approximately 6 miles north of Lihue (see Figure 2-1). The project site is situated on a broad coastal plain at the base of Kalepa Forest Reserve, directly south of the Wailua River. The project site is divided by Kuhio Highway into two principal areas, including 52 acres makai of the highway (makai lands) and approximately 474 acres mauka of the highway (mauka lands). The project site consists of several parcels of land identified as Tax Map Key (TMK) numbers: (4) 3-9-006:009 (northern makai parcel) and 011 (southern makai parcel) and (4) 3-9-002: 003, 012, 017, 024, 025, 026, 027, and 035 (Figure 2-2).

The project site consists of vacant, undeveloped land owned by DHHL that is overgrown with a sparse cover of native and non-native vegetation. During the past 100 years, the majority of the project site was used for sugarcane cultivation. Lydgate Park, Wailua Golf Course, Kaha Lani Resort, Aloha Beach Resort, and Wailua Wastewater Treatment Plant (WWTP) border the makai lands. The mauka lands are bordered by Kalepa Ridge, Wailua River channels, the Kaua‘i Community Correctional facility, Wailua Golf Course, and undeveloped lands. The surrounding area is sparsely populated and characterized by small resort complexes, recreational parks and facilities, and lands utilized for grazing (Figure 2-3).

### **2.3 Project Features and Relevant Considerations.**

The Wailua Development project involves 52 acres makai of Kuhio Highway and approximately 474 acres on the mauka side of the highway. The makai portion of the development will be offered as a ground lease for revenue-generating purposes with possibly up to 800 timeshare units. The mauka

portion includes a residential community consisting of residential lots (735 lots of a minimum of 10,000 square feet each), neighborhood commercial lands, buffer lands, general agricultural lands, and community use lands including a pre-school, park, and a DHHL District office (Figure 2-4). The residential units would be constructed in a four-phase approach with approximately 200 units per phase (Table 2-1). A 120-foot wide bypass road (Kapa‘a Relief Route) is anticipated to be incorporated into the landscape of the project. Figure 2-5 shows the layout of the currently proposed development on the mauka lands.





**Table 2-1: Major Project Elements**

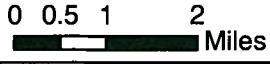
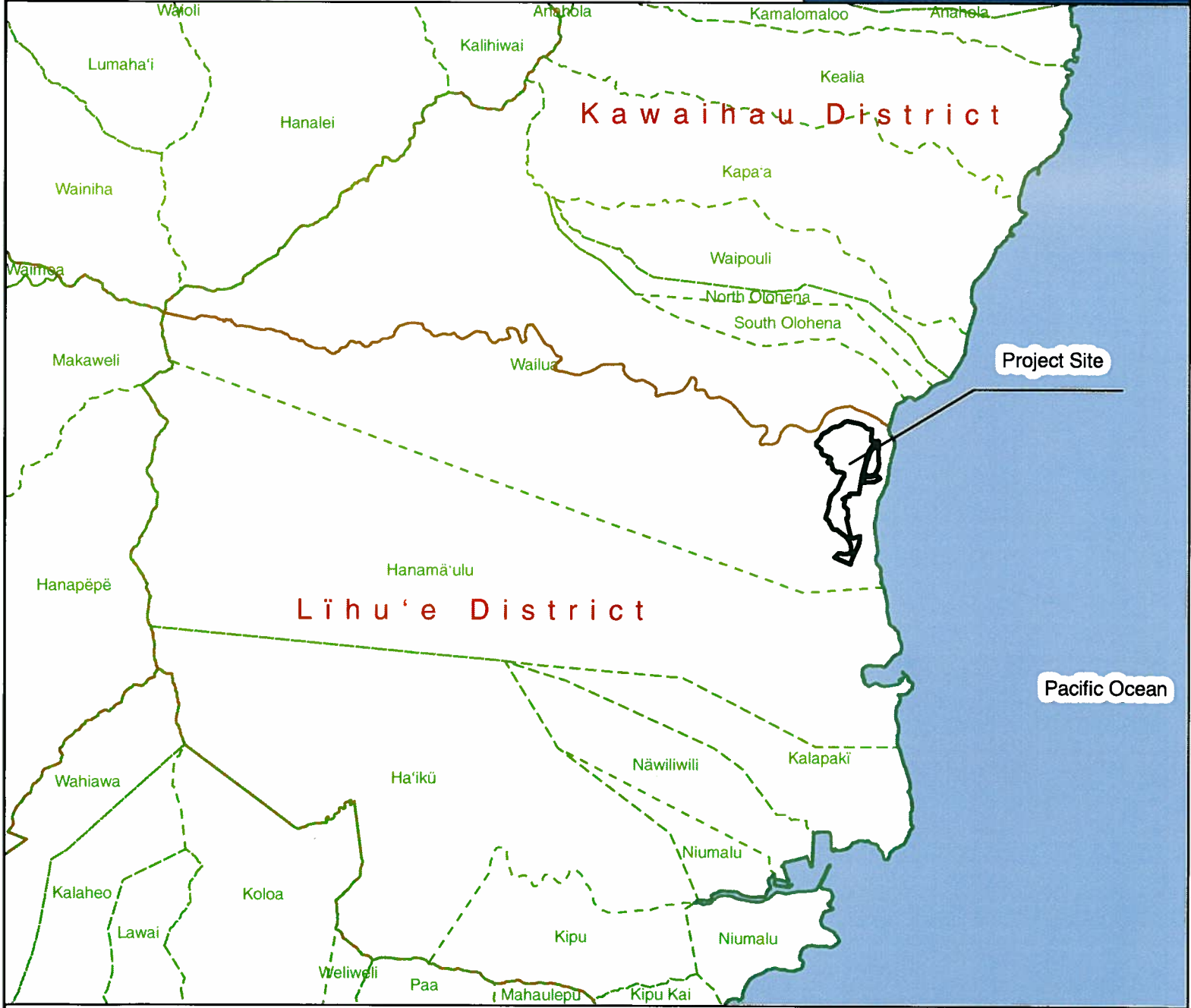
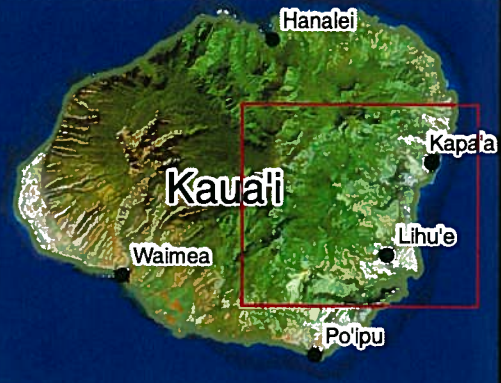
<b>Project Element</b>	<b>Location</b>	<b>Units</b>	<b>Acres</b>
<b>Residential Lands</b> <ul style="list-style-type: none"> <li>• Phase I (2008-2010)</li> <li>• Phase II (2010-2013)</li> <li>• Phase III (2013-2016)</li> <li>• Phase IV (2016-2019)</li> </ul>	Mauka	<b>735</b> <ul style="list-style-type: none"> <li>• 188 Phase I</li> <li>• 201 Phase II</li> <li>• 228 Phase III</li> <li>• 118 Phase IV</li> </ul>	233
<b>Revenue Generating Lands</b> <ul style="list-style-type: none"> <li>• Timeshare/Resort Development/Commercial</li> </ul>	Makai (2 parcels)	Maximum of 800 timeshare units	52
<b>Community Use Lands</b> <ul style="list-style-type: none"> <li>• Preschool</li> <li>• Park</li> <li>• Community Center</li> <li>• District Office</li> </ul>	Mauka		21.2
<b>Buffer Lands</b> <ul style="list-style-type: none"> <li>• Around the ridges</li> <li>• Around Malae Heiau</li> <li>• Mauka of Kuhio Highway</li> <li>• Mauka of State of Hawai‘i Department of Transportation (DOT) Bypass Road</li> </ul>	Mauka		57.4
<b>Undeveloped Agricultural Lands</b>	Mauka		Approximately 150
<b>Neighborhood Commercial Lands</b>	Mauka		11.3

Development of the proposed project would include all work necessary to prepare the land and complete build-out for residential awards to beneficiaries and revenue-generating purposes. The project would include site improvements for roadways, drainage systems, water systems, overhead electric and road lighting systems, and underground telecommunications. The proposed project would involve clearing and limited grading of the area to facilitate construction of roadways, drainage systems, and electrical/telecommunications/water systems that would service the development. In addition, the portion of individual residential lots occupied by the footprint of individual houses and driveways will also be cleared and graded.



# Legend

-  Ahupua'a Boundary
-  District Boundary
-  Development Boundary
-  Coastline



Source: U.S. Geological Survey



## DHHL Wailua Development Project

### Location Map

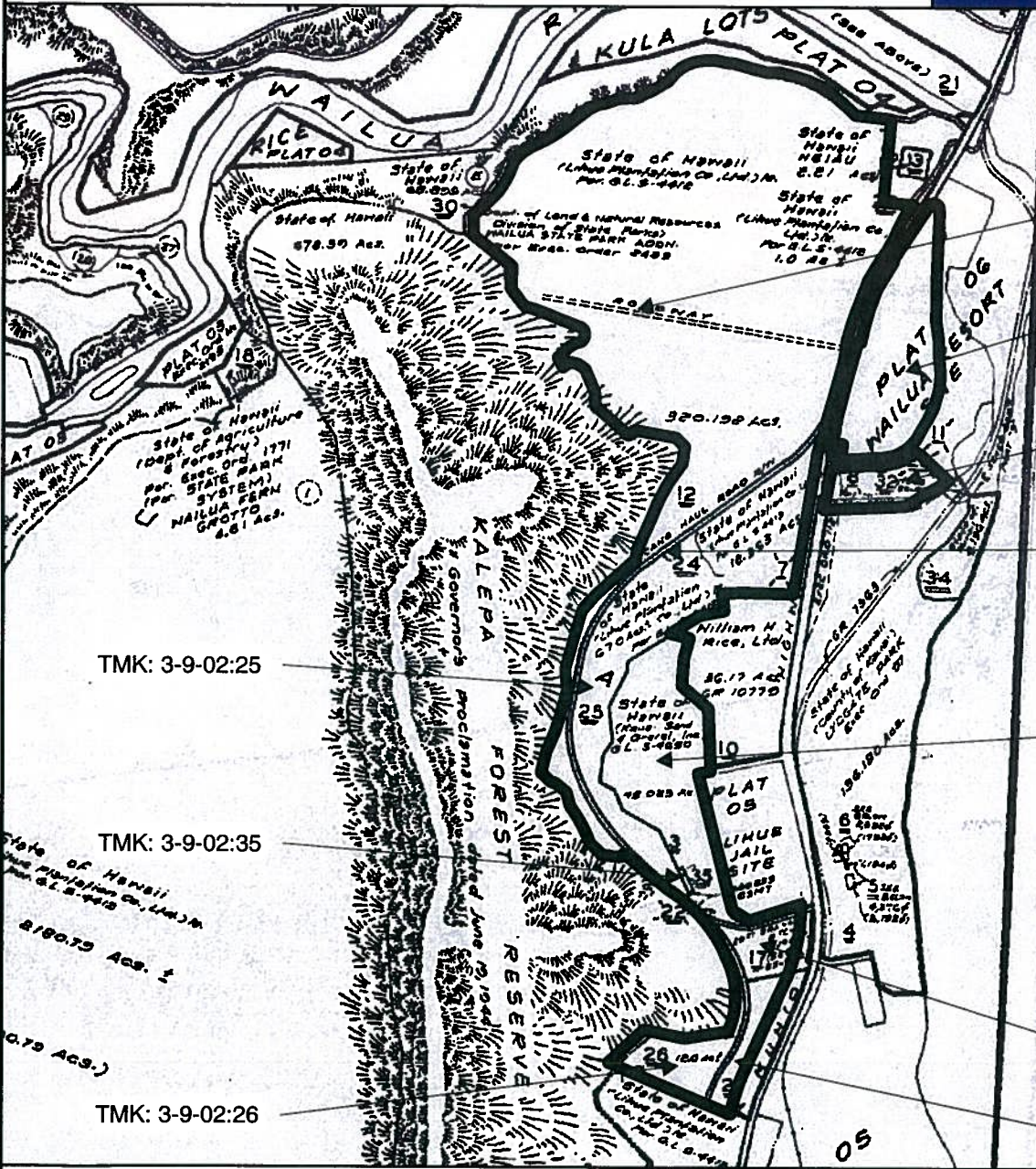
Figure 2-1

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**N Legend**



— Development Boundary



- TMK: 3-9-02:12 (portion)
- TMK: 3-9-06:9
- TMK: 3-9-06:11
- TMK: 3-9-02:24
- TMK: 3-9-02:25
- TMK: 3-9-02:35
- TMK: 3-9-02:26
- TMK: 3-9-02:17
- TMK: 3-9-02:27



Source: Realty Atlas, 40th Edition









**DHHL Wailua Development Project**

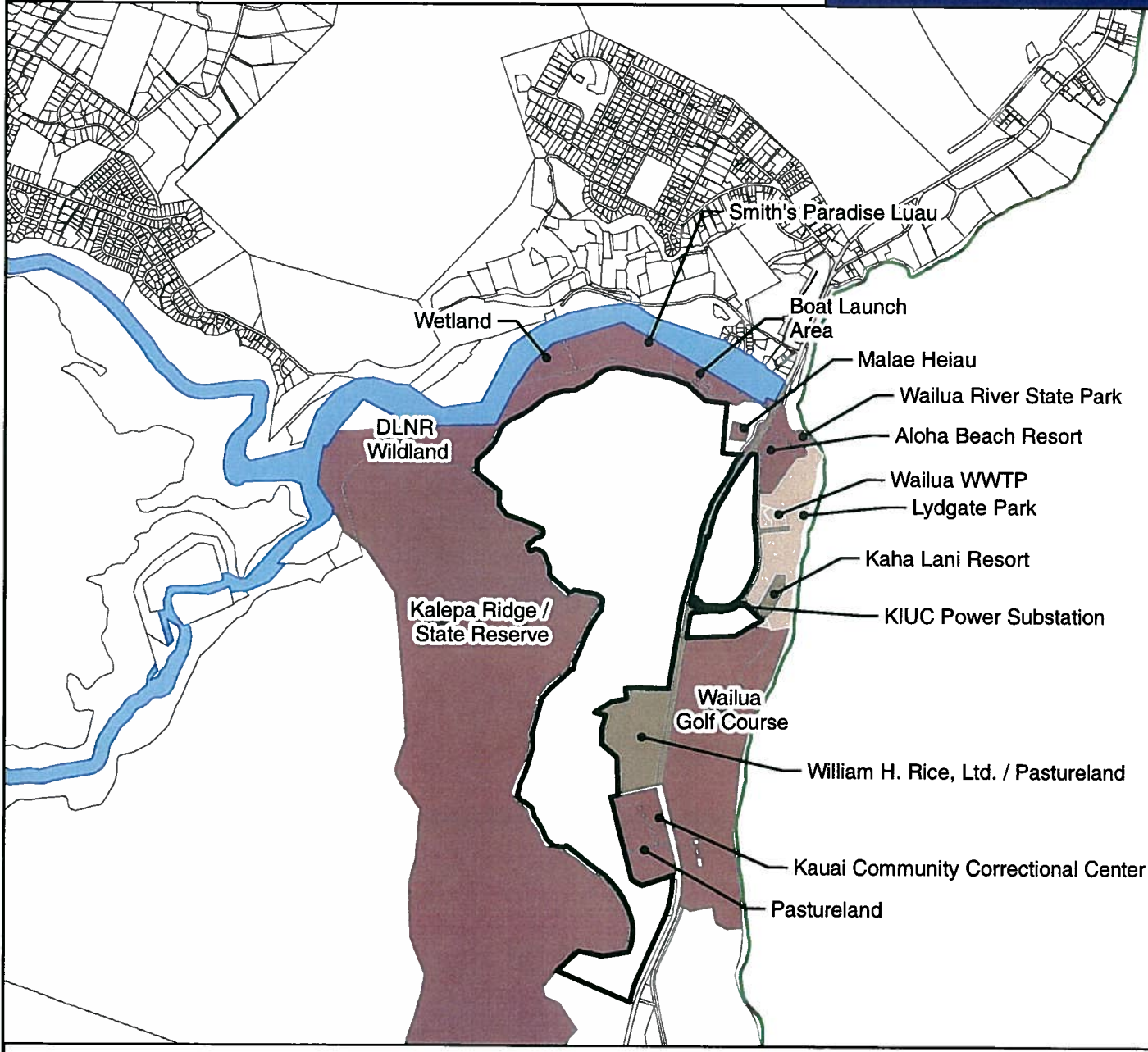
**TMK Map**

**Figure 2-2**

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**N Legend**

-  Development Boundary
-  Wailua River
-  TMK Boundaries
-  Govt. County of Kauai
-  Govt. State
-  Other



Source: State of Hawai'i



**DHHL Wailua Development Project**














**Surrounding Property Use**

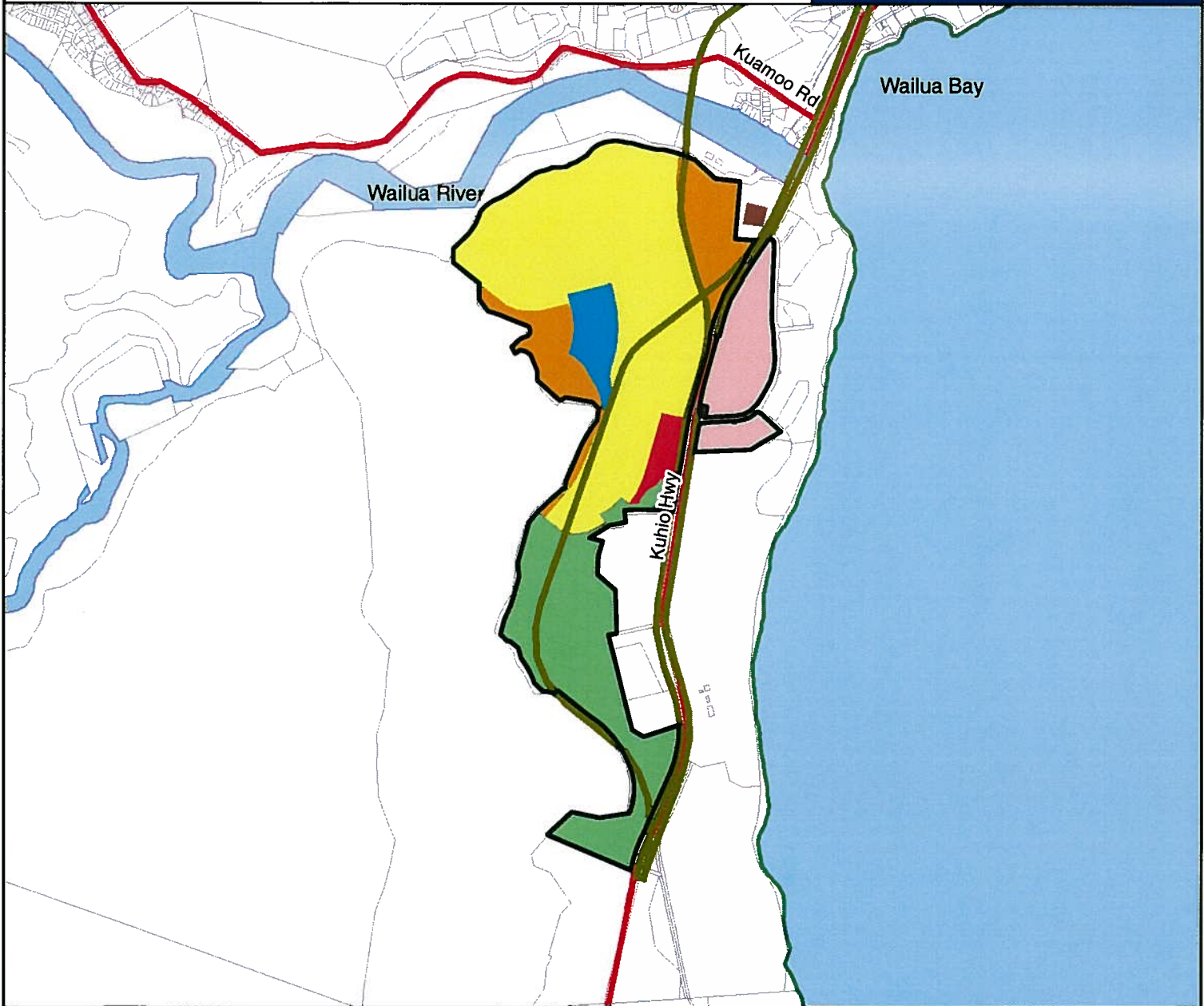
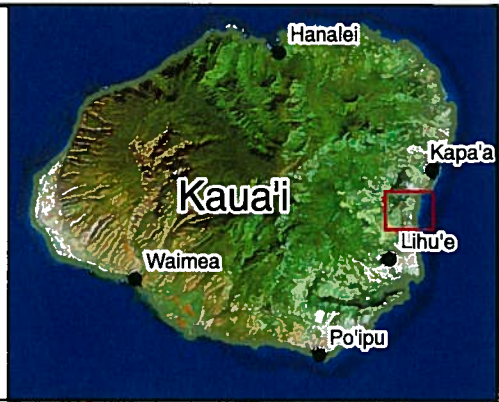
**Figure 2-3**

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**N Legend**

-  Coastline
-  Development Boundary
-  Major Roads
-  Possible Bypass Routes
-  Wailua River
-  TMK Boundaries
-  Malae Heiau
-  Buffer Lands
-  Community Park/Pre-School
-  General Agriculture
-  Neighborhood Commercial
-  Residential Lands
-  Revenue Generating Lands



0 0.25 0.5 1 Miles

Source: State of Hawai'i  
Akinaka & Associates, Ltd.

**DHHL Wailua Development Project**
















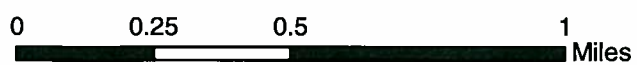
**Proposed Wailua Development Land Uses**

**Figure 2-4**

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**N Legend**

-  Coastline
-  Development Boundary
-  Major Roads
-  Possible Bypass Route
-  Malae Heiau
-  Wailua River
-  TMK Boundaries
-  Phase 1, 188 Units, (2008-2010)
-  Phase 2, 201 Units, (2010-2013)
-  Phase 3, 228 Units, (2013-2016)
-  Phase 4, 118 Units, (2016-2019)
-  General Agriculture
-  Revenue Generating Lands



Source: State of Hawai'i  
Akinaka & Associates, Ltd.



**DHHL Wailua Development Project**

**Phasing of the Proposed Wailua Development**

Figure 2-5

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## **2.4 Construction and Estimated Cost**

The budget for the project, which will be funded by DHHL through a private developer purchasing the ground lease of the makai lands, is highly dependent upon the design proposed by the developer, and thus cannot be estimated at the present time. The estimate will be presented and refined during the final design process. The design of this residential development would be finished and construction would be initiated after completion and acceptance of this draft EA. The first phase of the mauka development is expected to be completed and fully occupied by 2010.

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## **SECTION 3            ALTERNATIVES INCLUDING THE PROPOSED ACTION**

### **3.1            The Proposed Action: Affordable Residential Leasehold Subdivision Development and Low Density Revenue-Generating Land Development**

Under the proposed action, the majority of the mauka parcel of land would be developed into a subdivision comprising up to 735 affordable single-family residential units of 10,000 square feet each. In addition to the residential units, the mauka parcel of land would be improved with neighborhood commercial lands, buffer lands, undeveloped agricultural land, and neighborhood community use lands including a pre-school, park, and a DHHL District Office. A bypass road currently being designed by the DOT is anticipated to be incorporated into the landscape of the project (Figure 3-1). Other site improvements would include roadways, drainage system, water system, overhead electric and road lighting systems, and an underground telecommunications system. Improvements will be designed in accordance with the applicable standards of DHHL, Kauaʻi County, State of Hawaiʻi, and the United States (U.S.) Government.

In order to fund the development of the abovementioned affordable residential units, the Wailua Development Project would be enhanced by the inclusion of approximately 11 acres of revenue-generating neighborhood commercial lands on the mauka parcel of land, and a ground lease of the entire makai parcel of land for timeshare and revenue-generating development. The neighborhood commercial lands on the mauka parcel would include tenants such as restaurants and retail shops that target residents. The makai lands would include development of a revenue-generating area and time-share condominiums, with frontage onto Wailua Golf Course and Lydgate Beach Park. The condominiums will be multi-story structures in a landscaped setting, with a density of no more than 800 units. In addition, DHHL will grant the developer a long-term lease and ground lease waiver of up to 35 years for the makai lands as a means to fund the direct and unallocated infrastructure costs for the residential homestead community on its mauka lands (DHHL, 2005a).

The inclusion of neighborhood commercial lands and a ground lease of the makai parcel, in conjunction with affordable residential units for qualified applicants will fund the construction of the first phase of residential development. Without the inclusion of the revenue-generating uses into the project scope, it is unlikely that the construction of residential units could proceed. Selection of this option is expected to help DHHL meet the demand for affordable housing for qualified native Hawaiians on its waiting list in east Kauaʻi.

### **3.2            Alternative A: Affordable Residential Leasehold Subdivision Development and High Density Revenue-Generating Land Development**

This development scenario was identical to the proposed action, with the exception that the timeshare uses on the Makai parcel of land would be developed up to the zoning cap of 1,200 units. This higher density development would be less aesthetically pleasing, would require a greater investment in utilities and resources, and the extra revenue generated by the additional units would not be significant enough to warrant the higher-density development of the area. Therefore, this development scenario would not be acceptable at this time.

### **3.3 Alternative B: Affordable Residential Leasehold Subdivision Development with No Revenue Generating Land Development**

Consideration was given to developing the affordable residential leasehold units without the inclusion of revenue-generating uses. However, without this funding, it is unlikely that the residential units on the Mauka portion of the highway could be constructed. This alternative would thus not meet the project objectives and is thus eliminated from further consideration.

### **3.4 No Action**

In this scenario the project site would be left vacant and undeveloped, with the exception of the bypass road being designed by DOT. As a consequence, environmental conditions outside the immediate vicinity of the bypass road would remain unchanged and no potentially adverse impacts such as additional traffic, noise and degradation of air quality would result. However, beneficiaries on DHHL's waiting list would be denied the opportunity to gain access to housing opportunities in Wailua. The No-Action scenario would not enable DHHL to achieve its goals and objectives for Wailua to provide residential opportunities to its beneficiaries.

The No Action alternative would contribute to a further backlog and waiting period for qualified native Hawaiian beneficiaries waiting to receive their awards. Some applicants have been waiting as long as 30 years to receive a lot on DHHL land. Others have since passed on before given an opportunity to receive a land award. Thus the No Action position would further aggravate the situation and would not meet the objectives of the Hawaiian Homes Act.







Therefore, the No Action alternative is considered less favorable than the proposed action and is hereby dismissed from further consideration.

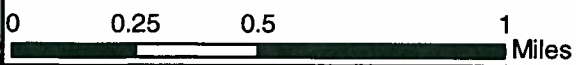


N



### Legend

-  Development Boundary
-  Alternative I Bypass
-  Alternative II Bypass
-  Alternative III Bypass
-  Alternative IV Bypass
-  Wailua River



Source: DOT



DHHL Wailua Development Project

**Proposed DOT Bypass Road Alignment Alternatives**

Figure 3-1

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## **SECTION 4 ENVIRONMENTAL SETTING AND IMPACTS**

The physical and social environmental setting of the project site and the probable impacts of the Proposed Action are described in this section of the report. The potential impacts described in this section relate to the Build Alternatives only since the No Action Alternative would result in no impact to existing conditions at the project site.

### **4.1 Physical Environment**

#### **4.1.1 Topography**

The project site is located on a gently sloping coastal plain on the eastern flank of Kalepa Ridge, which parallels the coast approximately one mile inland from the shore. The elevation in the 452-acre project site ranges from approximately 200 feet above mean sea level at the foot of the ridge to near sea level at the eastern boundary.

#### *Potential Impacts and Mitigation*

The project site exhibits no unique topographical features. Clearing, grading and grubbing would occur, but not to the extent that would significantly alter the general topography of the area. Grading activities are not expected to be extensive for the development of roads and infrastructure for the subdivision. The proposed project is not anticipated to have any adverse impact on the underlying topography of the area. No mitigation is required.

#### **4.1.2 Geology and Soils**

The Island of Kaua‘i consists of a single shield volcano, which is deeply eroded and partly veneered with volcanics that occurred after shield-building. The primary veneer on the old shield is composed of the Koloa Series volcanics. Lava flows of the Koloa Series cover about half the surface of the eastern part of Kaua‘i, including the project area; they form the entire floor of the Lihue basin except for two small kipuka (exposed mounds or depressions left uncovered by a lava flow) of Waimea Canyon Series volcanics (Macdonald et al., 1983).

The project site is located on a coastal plain extending up to one mile inland from the shore that was formed from recent alluvial and beach deposits. Major soils in the project area include those in the Lihue, Kaena, Hanamaulu, Koloa, and Mokuleia Series. The surface soil within the project site consists of the following soil types: Lihue silty clay, 0 to 8 percent slopes (LhB), Lihue silty clay, 8 to 15 percent slopes (LhC), Lihue silty clay, 15 to 25 percent slopes (LhD), Kaena clay, brown variant, 1 to 6 percent slopes (KavB), Kaena clay, brown variant, 6 to 12 percent slopes (KavC), Hanamaulu silty clay, 15 to 25 percent slopes (HsD), Hanamaulu stony silty clay, 10 to 35 percent slopes (HtE), Koloa stony silty clay, 3 to 8 percent slopes (KvB), Mokuleia fine sandy loam (Mr), and Mokuleia clay loam, poorly drained variant (Mta). Figure 4-1 presents the soil types found in the vicinity of the project site area, based on information from the Natural Resource Conservation Service (NRCS).

### *Potential Impacts and Mitigation*

The geologic conditions at the project site impose no overriding constraints on the project and no mitigation measures are expected to be required.

Potential erosion impacts could occur as a result of construction activities (e.g., clearing, grading, grubbing, excavation and trenching) that disturb the earth and soils. Exposed soils are susceptible to erosion, especially if it rains heavily during site work periods. Wind erosion may cause some unavoidable soil loss, but the greater concern is silt runoff. Adverse impacts would be minimized or avoided as a result of both temporary and permanent erosion and sedimentation control measures that shall be implemented during the development of roads and infrastructure for the subdivision. Proposed work shall comply with State and County erosion control standards and requirements including, but not limited to, preparation of a County approved erosion control plan.

#### 4.1.3 Fire Hazard

In a letter dated August 3, 2007 Mr. Glenn Sato of the County of Kaua'i Office of Economic Development (OED) noted that the project area and surrounding areas are prone to periodic brush fires. The threat of fire in the project area was also noted in a July 30, 2007 letter by the State of Hawai'i Department of Land and Natural Resources (DLNR) Division of Forestry and Wildlife (DLNR-DFW).

### *Potential Impacts and Mitigation*

In order to reduce the chance of a brushfire starting in the residential area and moving through the Kalepa forest reserve, a firebreak should be constructed along the mauka portion of the residential subdivision.

#### 4.1.4 Geologic Hazard

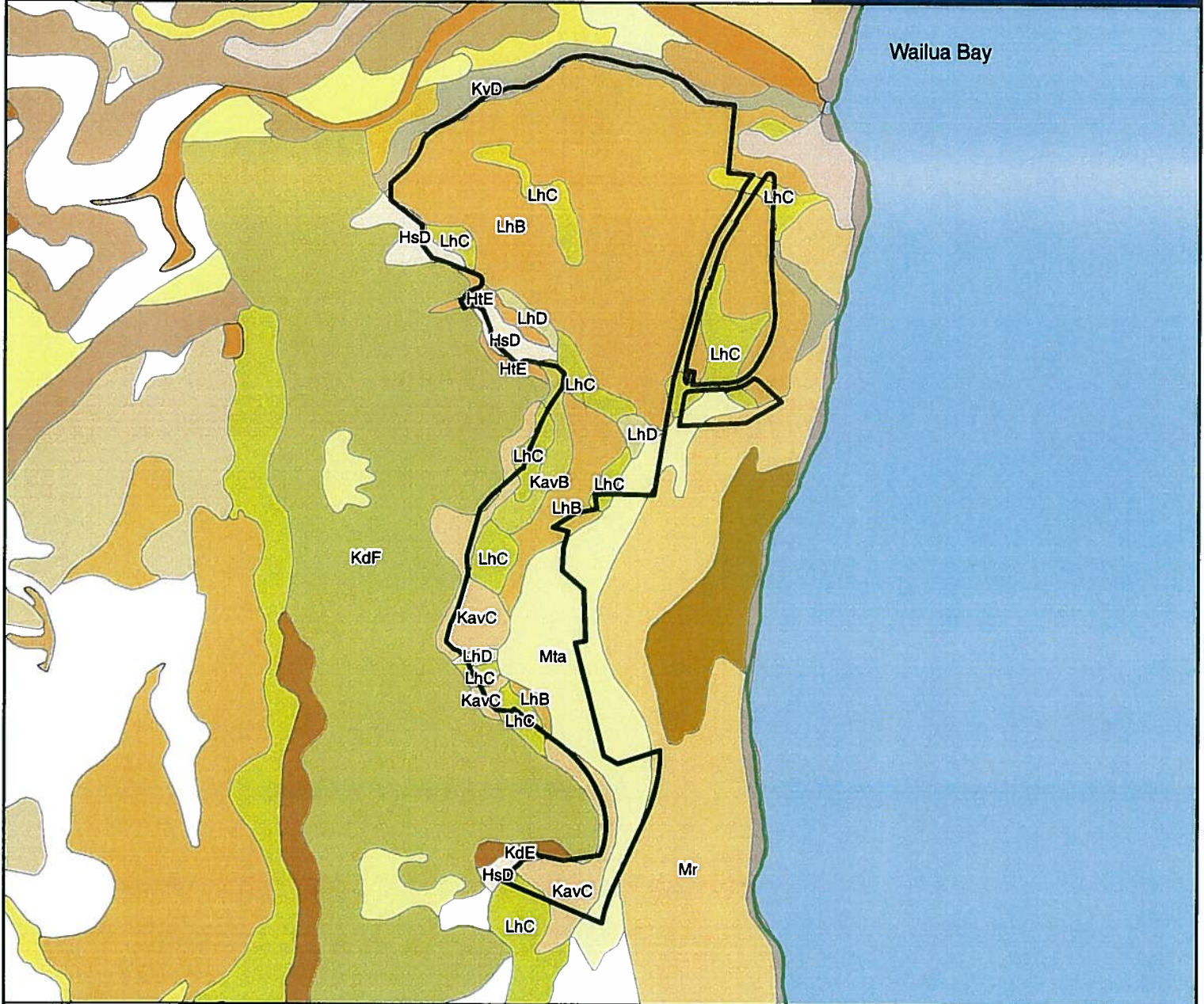
Earthquakes in the Hawaiian Islands are primarily related to volcanic activity and are caused by magma moving beneath the earth's surface. Earthquakes may occur before or during an eruption, or they may result from the underground movement of magma that comes close to the surface but does not erupt. The island of Kaua'i has experienced episodes of seismic activity of varying intensity, but available historical data indicates that the number of major earthquakes occurring on Kaua'i have generally been fewer and of lower intensity compared with other islands, such as the Big Island.

Strong earthquakes endanger people and property by shaking structures and by causing ground cracks, ground settling, and landslides. The size of an earthquake is commonly expressed by its magnitude on the Richter scale, which is a measure of the relative size of the earthquake wave recorded on seismographs. No strong earthquakes (magnitude 5 or greater) have been felt on Kaua'i. The Uniform Building Code (UBC) seismic provisions classify seismic hazards related to building construction. The UBC seismic provisions contain six seismic zones, ranging from 0 (no chance of severe ground shaking) to 4 (10% chance of severe shaking in a 50-year interval). The island of Kaua'i is designated UBC Seismic Zone 1.

The potential for rockfalls or landslides was introduced by the DLNR Land Division Special Projects Coordinator in an August 31, 2007 letter, and by the DLNR Engineering Division (DLNR-ED) in an August 30, 2007 letter. Several recommendations were included in the letter, including slope studies of any areas with a slope grade greater than 20%, and hazard buffer zones and disclosures to landowners in any areas with rockfall or landslide risks.

# N Legend

- Coastline
- Development Boundary
- BL - Badlands
- BS - Beaches
- DL - Dune Land
- HnA - Hanalei Silty Clay, 0-2% Slope
- HrB - Hanalei Silty Clay, Deep Water Table, 0-6%
- HsD - Hanalei Silty Clay, 15-25% Slope
- HE - Hanamaulu Silty Clay, 10-35% Slope
- KavB - Kaena Clay, Brown Variant, 1-6% Slope
- KavC - Kaena Clay, Brown Variant, 6-12% Slope
- KdE - Kalapa Silty Clay, 20-40% Slope
- KdF - Kalapa Silty Clay, 40-70% Slope
- KvB - Koioa Stony Silty Clay, 3-8% Slope
- KvD - Koioa Stony Silty Clay, 15-25% Slope
- Kw - Kolokolo Clay Loam
- LhB - Lihue Silty Clay, 0-8% Slope
- LhC - Lihue Silty Clay, 8-15% Slope
- LhD - Lihue Silty Clay, 15-25% Slope
- LhE2 - Lihue Silty Clay, 25-40% Slope (Eroded)
- MZ - Marsh
- Mr - Mokulele Fine Sandy Loam
- Mta - Mokulele Clay Loam, Poorly Drained Variant
- PnB - Puhi Silty Clay Loam, 3-8% Slope
- W - Water
- rRO - Rock Outcrop
- rRR - Rough Broken Land



0 0.25 0.5 1 Miles

Source: NRCS



DHHL Wailua Development Project

Soils Map

Figure 4-1

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### *Potential Impacts and Mitigation*

Earthquakes are unpredictable natural events, which have the potential to affect property and buildings; however, based on the UBC rating, impacts from earthquakes are highly unlikely. The threat from geologic hazards will always exist because humans have little control over the frequency and intensity of a natural event. Proposed activities for the development of roads and infrastructure for the subdivision shall be accomplished in accordance with accepted building and construction standards. No mitigation is required.

#### 4.1.5 Flora

A botanical field survey of the project site was performed on July 17 and 18, 2007. The survey area included the mauka and makai parcels, but did not include the area designated for undeveloped agricultural use. The full report by LeGrande Biological Surveys, Inc. (2007) is presented in Appendix A. The primary objectives of the botanical field study were to:

- provide a general description of the vegetation on the 452-acre project site;
- inventory the flora;
- search for threatened and endangered species as well as species of concern; and
- identify areas for potential environmental problems or concerns and propose appropriate mitigation measures.

The project site is dominated by non-native plant species, composed mostly of a koa haole (*Leucaena leucocephala*) and Guinea grass (*Panicum maximum*) scrub within the fallow agricultural fields (LeGrande, 2007). Large alien tree species dominate the natural drainages and edges of the fallow fields. A total of 88 plant species were observed within the survey area, 83 are alien, three are Polynesian introductions, and two are indigenous. Therefore, 98% of the plant species observed are alien (including the Polynesian introductions), and 2% are native. An inventory of all the plants observed within the survey area is presented in the species list at the end of Appendix A.

### *Potential Impacts and Mitigation*

None of the plants which occur on the project site is a threatened or endangered species or a species of concern (U.S. Fish and Wildlife Service (USFWS), 1999a, 1999b, 2004; Wagner et al., 1999) thus no special protection measures are warranted or proposed. A wetland exists within the area designated for undeveloped agricultural use, southeast of the mauka residential lands parcel. A potential wetland area was observed within the mauka area of the project site, although this has not been confirmed with a jurisdictional wetland delineation. This area is currently proposed to remain undeveloped agricultural lands. If, in the future, this area is proposed for development, EI recommends that a jurisdictional wetland delineation be performed at the project site to assess whether any wetlands exist. For a further discussion of known wetlands in the vicinity of the residential lands, refer to Section 4.1.7.

The survey area has been utilized in the past for agriculture, thus the disturbance level is high within the property and dominated by alien vegetation. The three Polynesian introduced plant species found during the survey are, ki or ti (*Cordyline fruticosa*), niu or coconut palm (*Cocos nucifera*), and noni (*Morinda*

*citrifolia*). Both native species observed within the survey area are indigenous (native to Hawai'i and elsewhere), milo (*Thespesia populnea*) and uhaloa (*Waltheria indica*).

Other than the potential presence of an on-site wetland, no issues or concerns were observed that would require mitigation during the development of the project site. Nevertheless, the following measures are recommended for implementation during the future development of the project site to further reduce potential impacts associated with clearing existing vegetation on the project site:

- Plants growing along the northern boundary of the mauka parcel (southern side of the Wailua River) should be preserved, as grading and building along the top of the slope may cause runoff and the extant plants growing along the slope could help to mitigate unwanted runoff into the river.
- The Wailua Golf course is in close proximity to the southern makai parcel. Stray golf balls were observed in all areas of the parcel. Mitigation to ensure that golf balls do not enter the area should be incorporated into the development plan.
- The proposed development of the three parcels is not expected to have significant negative impacts on the botanical resources of the project site. Landscaping with native or Polynesian introduced plants is recommended for the project, with the goal of improving the botanical resources of the area and preventing the spread of invasive species.

#### 4.1.6 Fauna

There are no critical habitat areas located on or in the near vicinity of the subject property (Figure 4-2). An ornithological and mammalian survey of the proposed development was completed by Phillip Bruner (2007). The full report can be found in Appendix B. The primary purpose of the survey was to determine if there were any federally listed endangered, threatened, proposed, or candidate avian or mammalian species on, or in the immediate vicinity of the project site, and to note any natural resources important to native and migratory species.

A field survey of the subject property was conducted from July 17 through July 20, 2007. The survey of mammals was limited to visual and auditory detection, and by searching for animal tracks. The findings of this mammalian survey are consistent with the results of other surveys conducted within the lowland areas of Kapa'a in the recent past. The survey was completed by walking the entire area each day during early morning and late afternoon hours when birds are most active and detectable. Evening searches for the endemic and endangered Hawaiian Hoary Bat or Ope'ape'a (*Lasiurus cinereus semotus*) were made using a Pettersson Elektronik AB Ultrasounds Detector D 100. No species either currently listed, or proposed for listing under either the USFWS or the State of Hawai'i's endangered species programs were detected during the course of this survey.

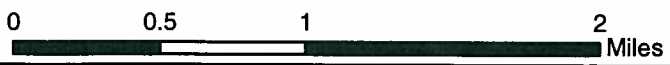
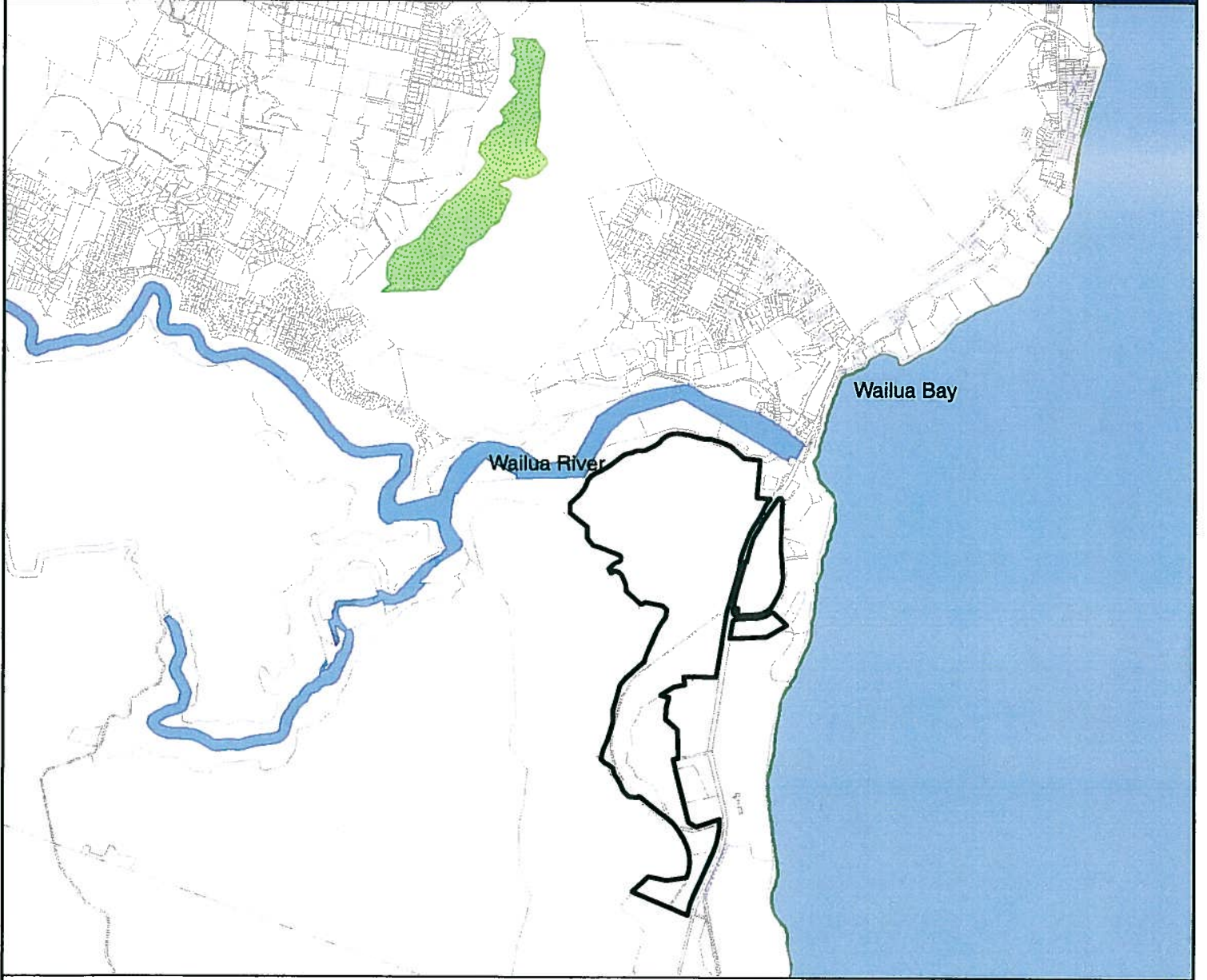
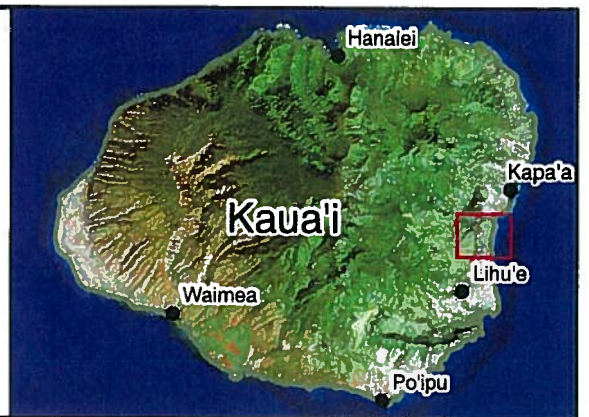
Mammals encountered during this survey included feral cats (*Felis catus*) and pigs (*Sus scrofa*). Although no Hawaiian Hoary Bats were recorded during the course of this survey, it is likely that bats do use resources within the general area. In addition, it is likely that roof rats and house mice are present within the project site. A previous feral mammal study conducted 1 mile north of the project area in Kapa'a (Bruner, 1994 in Kimura International (KI), 2002) reported the presence of cats, rats, and mice. This study also noted that the endemic and endangered Hawaiian Hoary Bat had been observed in the Wailua Bridge area.





### Legend

- Coastline
- Development Boundary
- Critical Habitat - Plants
- Wailua River
- TMK Boundaries



Source: USFWS



DHHL Wailua Development Project

Critical Habitat Map

Figure 4-2

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A total of eighteen alien bird species were recorded during the survey. No native land birds were recorded, but the potential presence of the Pueo or short-eared Owl in the vicinity of the project site was noted. One native waterbird was recorded: a subadult Black-crowned Night Heron or 'Auku'u (*Nycticorax nycticorax hoactli*). 'Auku'u are the only native waterbirds that are not listed as endangered or threatened. Two seabird species were observed flying over the property: the Great Frigatebird or 'Iwa (*Fregata minor palmerstoni*) and the White-tailed Tropicbird or Koa'e kea (*Phaethon lepturus dorotheae*). No migratory shorebirds were recorded, but the survey dates fell within the timeframe where these birds breed in the Arctic. The Pacific Golden-Plover or Kolea (*Pluvialis fulva*) is the most common migratory shorebird in Hawai'i, and would be expected to forage along the roads and other open areas on the mauka and makai sections of the property between August and the end of April.

The 1994 Bruner study recorded twenty-one species of introduced (exotic) birds, but no resident endemic land birds (KI, 2002). The 1994 study also noted that the threatened Newell Shearwater (*Puffinus newelli*) may occur within the vicinity of the Wailua River. These birds travel from their nesting sites in the mountains to the open sea, where they forage. During this trek, the birds likely use the Wailua River area as a flight path. The threatened Newell Shearwater can be impacted by the presence of street lights. When young birds leave their burrows and make their first trip out to sea in late fall they sometimes are attracted to urban lights and may strike power lines and fall on highways.

An August 16, 2007 letter from the DLNR-DFW Kaua'i District noted that the project site is located in an area known for high levels of seabird migration, specifically mentioning Newell's Shearwater and the Hawaiian petrel (*Pterodroma phaeopygia*). In an August 22, 2007 letter the USFWS noted that several species have been observed in the vicinity of the project, including the Newell's Shearwater, the Hawaiian Petrel, Hawaiian Hoary Bat, Hawaiian Goose, Hawaiian Duck, Hawaiian Moorhen, Hawaiian Coot, and Hawaiian Stilt. The USFWS letter also mentioned the potential for wetland habitats in the vicinity of the project (USFWS letter, August 22, 2007).

In a letter from the OED dated August 3, 2007 Mr. Glenn Sato pointed out the potential for invasive species such as coqui frogs to be introduced into the project area via landscaping materials.

#### *Potential Impacts and Mitigation*

The project site is not known to contain any threatened, endangered, or candidate avian or mammalian species; therefore, no adverse impacts are anticipated. The potential to introduce invasive species exists during construction activities, particularly the landscaping phase. Feral pigs were noted as a potential problem by the DLNR-DFW in their August 30, 2007 letter. In light of these considerations, project completion should include closely monitoring any imported materials for invasive species such as coqui frogs. Project design may take in to account the potential for feral pigs to enter the property along the mauka property boundary, and may incorporate design elements to discourage this occurrence.

Although wildlife surveys conducted did not detect the Hawaiian Hoary Bat within the project area, this species could possibly exist in the vicinity of the project area. The Hawaiian Hoary Bat is a federally listed endangered species. As a consideration for minimizing impacts to these species, if a Hawaiian Hoary Bat is sighted perched within the project area, the contractor shall temporarily suspend work activities in the immediate proximity of the animal until the bat moves on its own accord.

During the months of June through August, Hawaiian hoary bats could potentially be breeding in the vicinity of the project area. Young bats, which are unable to fly, cling to trees and possibly bushes and shrubs and could potentially be injured or killed by tree felling and vegetation clearing. DHHL will

consider scheduling the start of the project and the majority of the initial clearing and grubbing period to fall outside of the bat breeding season between June and August, as much as possible, in order to minimize the potential of harming young bats. If bats are inadvertently encountered during construction, adequate mitigation measures as defined by Section 7 of the Endangered Species Act will be implemented.

It is likely that small numbers of the endangered endemic Hawaiian Petrel and threatened Newell's Shearwater overfly the project site between the months of May and October. In order to reduce the potential for interactions between nocturnally flying Hawaiian Petrels and Newell's Shearwaters with external lights and man-made structures, it is recommended that any external lighting planned in conjunction with this development be shielded. No work will be conducted at night during the construction phase of the project in order to prevent potential collision injury with nocturnal avian species. DLNR-DFW Kaua'i District recommended the utilization of shielded lights, avoidance of tree-mounted lights, avoidance of outdoor up-lighting, avoidance of up-lighting and unshielded lighting in water features, and consultation with DLNR-DFW Kaua'i District and the USFWS prior to finalizing light plans, and incorporation of underground utilities where possible (August 16, 2007 letter, DLNR-DFW Kaua'i District).

USFWS recommended that project planning and development take into account the proximity of development to natural habitats, to assure the incorporation of an adequate buffer between man-made structures and natural or wetland habitats (August 22, 2007 letter, USFWS). USFWS also recommended attention to lighting, similar to that discussed in the previous paragraph.

#### 4.1.7 Wetlands

The USFWS 1978 National Wetland Inventory Map indicates the presence of wetlands due east and south of the southern portion of the mauka residential lands parcel (Figure 4-3, Wetlands Map), although no wetlands are depicted in the area slated for residential development. This wetland falls within the general agricultural lands parcel. The flora survey conducted within the project area from July 17 and 18, 2007 indicated the presence of on-site wetland plants, although the other two criteria necessary for an area to be designated a jurisdictional wetland (i.e., the presence of hydric soils and indications of hydrology) were not evaluated as part of the flora survey. The area identified as a potential wetland is shown on Figure 4-3. Because the potential wetland area is not intended for development, but is instead slated to remain undeveloped agricultural lands, a wetland delineation is not required. If future plans involve development of this area, a jurisdictional wetland delineation should be conducted to determine whether a wetland exists.

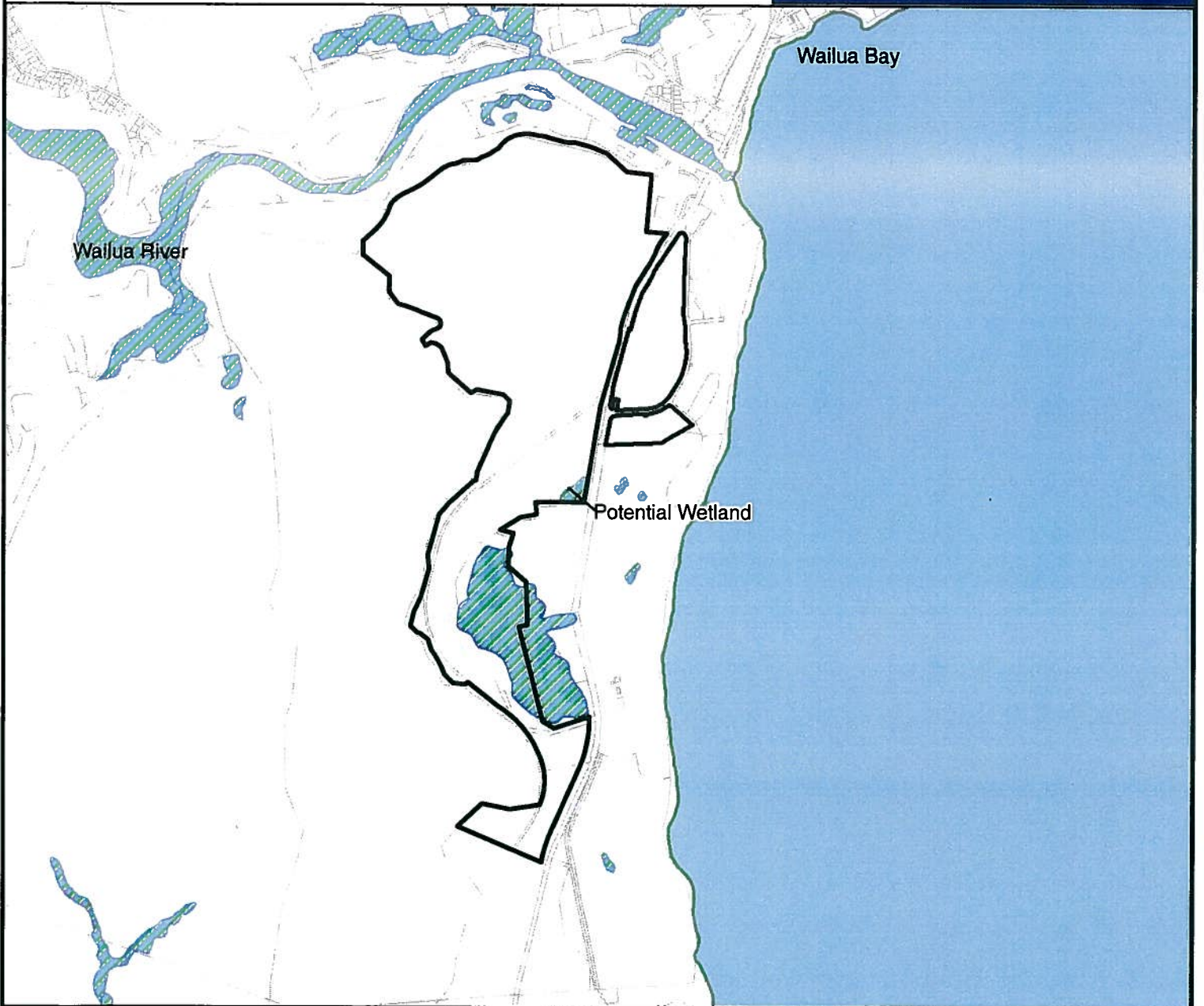
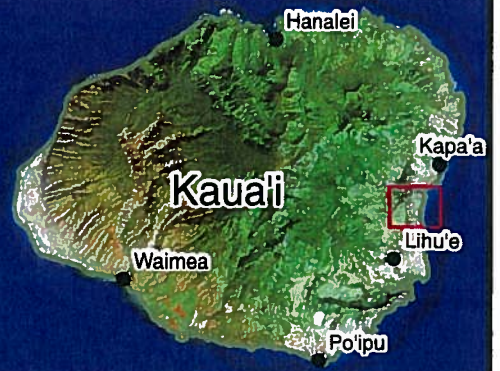
Surface water and groundwater from on-site move eastward toward the ocean. Drainage improvements are currently limited to the makai side of Kuhio Highway and along Leho Drive (DHHL, 2007). Surface water in the southern portion of the project area most likely drains into the stream running south and west between the mauka residential lands parcel and the wetland. This stream flows southwest and then southeast into a drainage ditch on the mauka side of Kuhio Highway, which eventually crosses Kuhio Highway and extends east toward the ocean. The stream would act as a barrier to surface water from on-site reaching the wetland. Therefore any on-site activities are not likely to discharge into the wetland.

#### *Potential Impacts and Mitigation*

The known wetland area located south of the mauka development area is intended to remain in undeveloped agricultural lands. The potential wetland area identified during the botany survey is also to

**N Legend**

- Development Boundary
- Coastline
- ▨ Wetlands
- TMK Boundaries



0 0.25 0.5 1 Miles

Source: USFWS



DHHL Wailua Development Project

**Wetlands Map**

Figure 4-3

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remain part of the undeveloped agricultural lands, thus a wetland delineation is not required. If future development plans include the area of the potential wetland, a jurisdictional wetland delineation should be conducted. If a wetland area is identified during the survey, designs and plans for development within the vicinity of the wetland must be in accordance with U.S. Army Corps of Engineers (USACE) rules and regulations.

USFWS recommended that project planning and development take into account the proximity of development to natural habitats, to assure the incorporation of an adequate buffer between man-made structures and natural or wetland habitats (August 22, 2007 letter, USFWS).

Surface water drainage patterns must be taken into account when designing the stormwater collection and conveyance systems of the proposed development. Systems should be designed to minimize the introduction of excess sediment or contaminants into the stream or the wetland area. Potential drainage improvements may include grassed shoulder swales along roads, outlet and/or transition structures, and detention basins (DHHL, 2007).

Construction activities should be timed and controlled to avoid excessive sediment runoff from the project area into the streams or the wetland. Site activities should incorporate silt fences and best management practices (BMPs) to minimize soil loss from the site. Construction activities should, as much as possible, be scheduled to avoid the rainy season.

#### 4.1.8 Water Resources

##### A. Groundwater

The project site overlies the Wailua aquifer system (Figure 4-4). According to Mink and Lau (1992), the northern portion of the project site is underlain by two aquifers. The upper aquifer, code 20103111 (21111), is listed as an unconfined (the aquifer is not confined under pressure beneath relatively impermeable rocks or soil), basal (fresh water in contact with seawater), dike-type (contained in horizontally extensive lavas) aquifer. This aquifer has potential use and is used as a drinking water source. This irreplaceable aquifer contains fresh water (less than 250 milligrams per liter of chlorine ions (mg/L Cl<sup>-</sup>)) and is listed as having a high vulnerability to contamination.

The lower aquifer, code 20103122 (21113), is listed as a confined (the aquifer is confined under pressure beneath relatively impermeable rocks or soil), basal (fresh water in contact with seawater), dike-type (contained in dike compartments) aquifer. This aquifer has potential use and is used as a drinking water source. This irreplaceable aquifer contains fresh water (less than 250 mg/L Cl<sup>-</sup>) and is listed as having low vulnerability to contamination (Mink and Lau, 1992).

The southern portion of the project site is underlain by two separate aquifers. The upper aquifer, code 20102116 (22211), is listed as an unconfined (the aquifer is not confined under pressure beneath relatively impermeable rocks or soil), basal (fresh water in contact with seawater), sedimentary-type (contained in non-volcanic lithology) aquifer. This aquifer has potential use and is ecologically important. This irreplaceable aquifer has low salinity (less than 250 to 1,000 mg/L Cl<sup>-</sup>) and is listed as having a high vulnerability to contamination.

The lower aquifer, code 20102111 (21212), is listed as unconfined (the aquifer is not confined under pressure beneath relatively impermeable rocks or soil), basal (fresh water in contact with seawater), flank-type (contained in horizontally extensive lavas) aquifer. This aquifer has potential use and is used as a

drinking water source. This irreplaceable aquifer contains low salinity (250 to 1000 mg/L Cl<sup>-</sup>) and is listed as having moderate vulnerability to contamination (Mink and Lau, 1992).

The entire aquifer system is contained within the Wailua drainage basin divides. Median annual rainfall over the aquifer ranges is 146 inches, reflecting extremely high rainfall in the interior where the boundary reaches to Mount Wai'ale'ale. The average annual rainfall at the project site is around 60 inches (Juvik, 1998).

The County of Kaua'i, Department of Water (DOW) has several well and tank sites in operation across the Wailua River in the Wailua and Kapa'a regions. The most recent (year 2006) annual water quality report available for the wells tapping the Wailua system indicate that the system was compliant with all current State of Hawai'i and the United States Environmental Protection Agency (EPA) drinking water standards (DOW, 2007). There is currently a shortage in water supply in the Wailua-Kapa'a region. DOW has many proposed improvements for the water system within the Wailua-Kapa'a region over the next 20 years. The proposed water supply and well improvements include three wells within the Kapa'a Homesteads area, a well and chlorination facility within the Wailua Homesteads, and a chlorination facility for the Nonou Well (DHHL, 2007). The DLNR Commission on Water Resource Management (DLNR-CWRM) recommended coordination with the County of Kaua'i to incorporate this project into the County's Water Use and Development Plan, and also recommended that the project look into feasible alternative non-potable water resources, including reclaimed wastewater.

## B. Surface Water

Surface runoff from the project site occurs by overland sheet flow to the east-southeast with the majority of the project site having gentle slopes. The ground cover generally consists of grasses, shrubs, and small trees. The potential for construction-related runoff was noted in a letter from the OED (August 3, 2007 letter, OED).

The mauka parcel of land currently receives excess water that is discharged from an irrigation reservoir located above Kālepa Ridge via an old water tunnel on the western property boundary. This is reportedly due to a broken valve at the bottom of the reservoir. The volume of water currently being discharged from the water tunnel is estimated at 800 gallons per minute or over one million gallons per day. The excess water drains into the irrigation ditch system that was established during sugarcane cultivation; however, due to erosion and lack of maintenance, much of the ditch system is damaged and does not adequately contain the excess water being discharged from the water tunnel. Therefore, low-volume trickles of water extend across the western portion of the mauka parcel, extending in a general east-southeasterly direction. This situation was observed during the July 17, 2007 site walk and also during a site visit conducted on September 27, 2007. The volume of water can reportedly reach much more significant volumes than that observed during the summertime site visits, particularly following periods of heavy rain. The disrepair of the water distribution system was noted in letters from Hui Kako'o 'Aina Ho'opulapula and Kipukai Kualii, although these respondents mistakenly referenced a collapsing tunnel as part of the problem. These two respondents expressed concern about the status of the area water distribution system, and recommended that the problem be addressed immediately. The DLNR Land Division Special Projects Coordinator also noted past flooding problems in the area as a result of the reservoir, and recommended that appropriate measures be taken to minimize future flooding of the area and a risk disclosure to future residents who could be impacted by flooding.

Urbanization of the Wailua River watershed was noted as a potential problem by the DLNR Division of Aquatic Resources (DLNR-DAR). Specifically, DLNR-DAR noted that current ordinances and laws do not adequately protect the quality or quantity of receiving waters such as the Wailua River and coastal



marine waters. The DLNR-CWRM also noted the potential for ground or surface water degradation. DLNR-DAR urged the project to consider following low impact urban development guidelines and laws recommended by the regional USEPA office, while DLNR-CWRM recommended that approvals for the project be conditioned upon a review by the State of Hawai'i Department of Health (DOH) and the developer's acceptance of any resulting requirements related to water quality.

If the irrigation ditch system was properly maintained and managed the excess water being discharged from the water tunnel would be transported through a network of ditches and eventually drain into either holding reservoirs or the irrigation ditches along the Cane Haul Road, which flow into a stream within the undeveloped agricultural lands parcel. This stream flows southwest and then southeast into a drainage ditch on the mauka side of Kuhio Highway, which eventually crosses Kuhio Highway and extends east toward the ocean. Figure 4-5 presents the surface water drainage features for the project area.

#### *Potential Impacts and Mitigation*

Proper maintenance and management of the excess surface water would allow continued water flow into the wetlands and the lands slated for agricultural use. This would require some repair of the eroded and damaged ditch system, which should be a priority during development of the mauka property. Any alteration of the stream channel, diversion of the stream, or new or expanded diversions of surface water would require getting the proper permits from DLNR. DHHL will work with DLNR (the neighboring land owner) to establish a water management plan for all water that flows from the Kālepa Ridge reservoir and through the project site.

The proposed project could potentially contribute to pollutant loads by way of runoff during construction and increased impermeable surfaces. In addition, the proposed project would add impervious surface areas to a presently undeveloped site, thereby increasing surface runoff volume and velocity within the project area. Roadway drainage and a drainage master plan would need to be designed and/or implemented prior to development of the area to properly channel and handle stormwater runoff (DHHL, 2007). These plans should take into account the urban planning suggestions introduced by the DLNR-DAR.

Concerns about these potential impacts and the need for proper permitting were raised in a letter from the DOH Clean Air Branch letter dated August 1, 2007. In an effort to mitigate such impacts, storm drain systems will be designed in accordance with the Total Maximum Daily Load (TMDL) objectives and guidelines established by the DOH. Other pollutant load reduction practices will be addressed during the construction phase of the proposed project through the National Pollutant Discharge Elimination System (NPDES) permit process and consultation with permitting agencies.

#### 4.1.9 Flood Hazard

As discussed in Section 4.1.8, the mauka parcel of land currently receives excess surface water that is discharged from an irrigation reservoir located above Kālepa Ridge via an old water tunnel on the western property boundary. Due to lack of maintenance and erosion of the on-site irrigation ditch system, low-volume trickles of water extend across the western portion of the mauka parcel, extending in a general east-southeasterly direction. This situation was observed during the July 17, 2007 site walk and also during a site visit conducted on September 27, 2007. The excess surface water runoff is currently causing minor flooding conditions in various portions of the mauka residential lands parcel and also along the Cane Haul Road near the neighborhood commercial lands parcel. Currently, the excess surface water

drains into a drainage ditch along the mauka side of Kuhio Highway and is eventually discharged into the ocean.

In addition to this overflow, small amounts of surface runoff may occur over short distances in portions of the project area, with the resultant overland sheet flow generally moving in an east-southeasterly direction across the mauka residential lands parcel. USFWS maps show a wetland occurring southeast of the mauka residential lands parcel, with a stream running south and west between the mauka residential lands parcel and the wetland. Surface water flow in the southern portion of the mauka residential lands parcel likely drains to this stream, and as a result is carried southwest and then southeast toward the ocean rather than draining into the wetland. Significant volumes of surface water flow within the makai parcels of land are unlikely. Small amounts of surface runoff may occur over short distances, with the resultant overland sheet flow generally moving in an easterly or southeasterly direction.

The project site does not lie within either the 100-year or the 500-year flood zone, as defined by the Federal Emergency Management Agency (FEMA). The DLNR-ED noted that the project site falls within Flood Zone X, and thus is not regulated by the National Flood Insurance Program (August 15, 2008 letter, DLNR-ED). The northeast corner of the mauka parcel, however, is included in the Tsunami Inundation Zone (Figure 4-6). Mr. Sato of the OED pointed out the need for a clear tsunami evacuation response plan for the subdivision (August 3, 2007 letter, OED), however because the area of the project that occurs within the Tsunami Inundation Zone is undeveloped buffer, an evacuation response plan will not be necessary.

#### *Potential Impacts and Mitigation*





Project development will be impacted by the current flood condition resulting from the excess surface water runoff. Excess water being discharged from the water tunnel should be properly managed so that it will serve as an asset to the development. DHHL will work with DLNR (the neighboring land owner) to establish a water management plan for all water that flows from the Kālepa Ridge reservoir and through the project site. Aside from the current flood condition associated with the excess water being discharged from the water tunnel, which can be mitigated with proper management, no adverse impacts are anticipated from flood hazards.

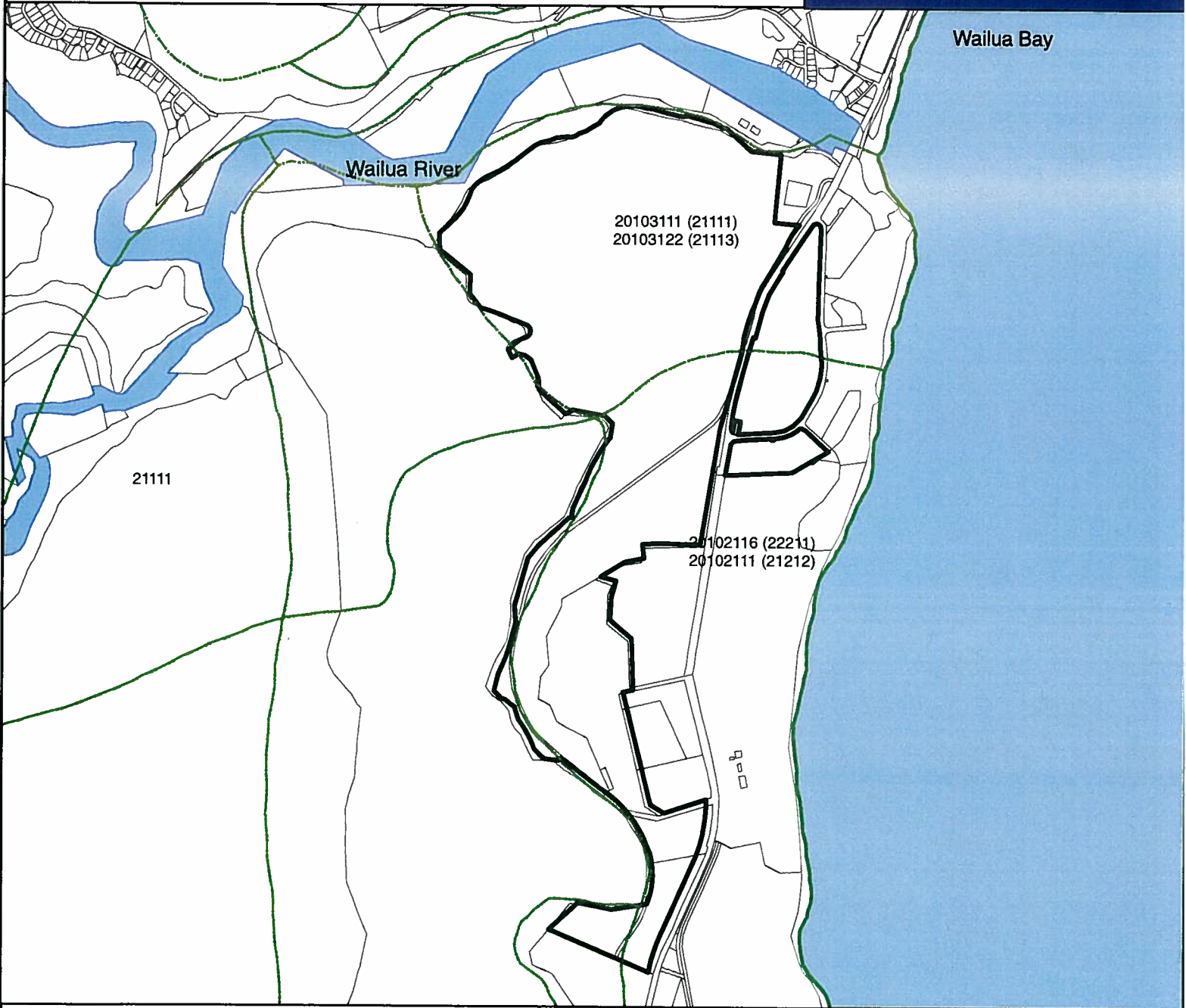
Although a small portion of the mauka parcel is located within the Tsunami Inundation Zone, since it is not planned for residential development, no mitigation is required. Development plans should take this into account when designing uses in this area of the subject property, and include plans for a tsunami warning and evacuation system if residences are planned in this area.

#### 4.1.10 Hazardous and Toxic Materials Considerations

The southern makai parcel has never been developed and as a result no known hazardous substances are believed to exist on the property, either currently or historically. No evidence of hazardous waste was observed on the southern makai parcel during a site visit conducted on July 17, 2007. Discarded automobile parts including a muffler and a tire were observed inside the fenced lot, along with scattered rubbish items such as a machine fan and an aerosol can. A few cattle were grazing within the southwestern area of the lot. Visible portions of the remainder of the southern makai parcel appeared free of additional trash disposal or discarded items.

**N Legend**

-  Aquifer Boundary
-  Development Boundary
-  Coastline
-  Wailua River



0 0.25 0.5 1 Miles

Source: Mink & Lau



**DHHL Wailua Development Project**

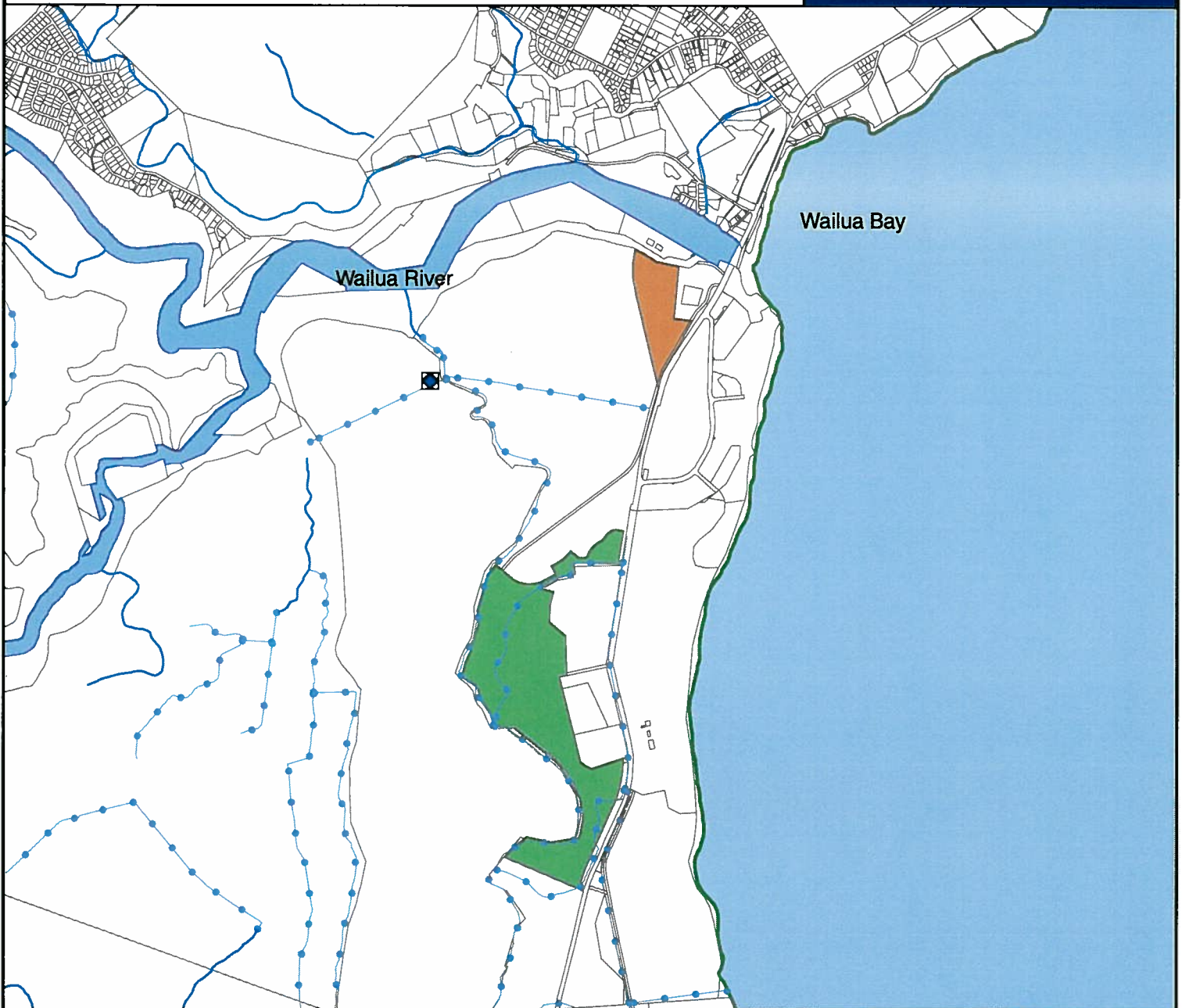
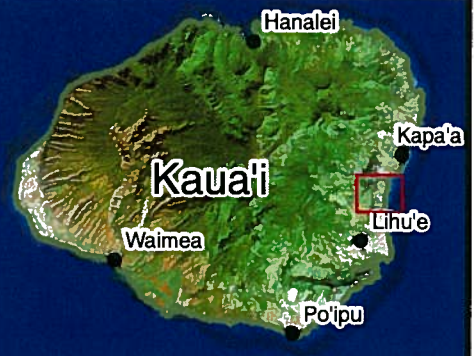
**Aquifer Map**

**Figure 4-4**

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# N Legend

- Agricultural Ditch or Canal
- Coastline
- Stream
- Development Boundary
- Tunnel Discharge Point
- General Agriculture
- Wailua River
- Buffer Lands



0 0.25 0.5 1 Miles

Source: USGS and EI, 2007

## DHHL Wailua Development Project



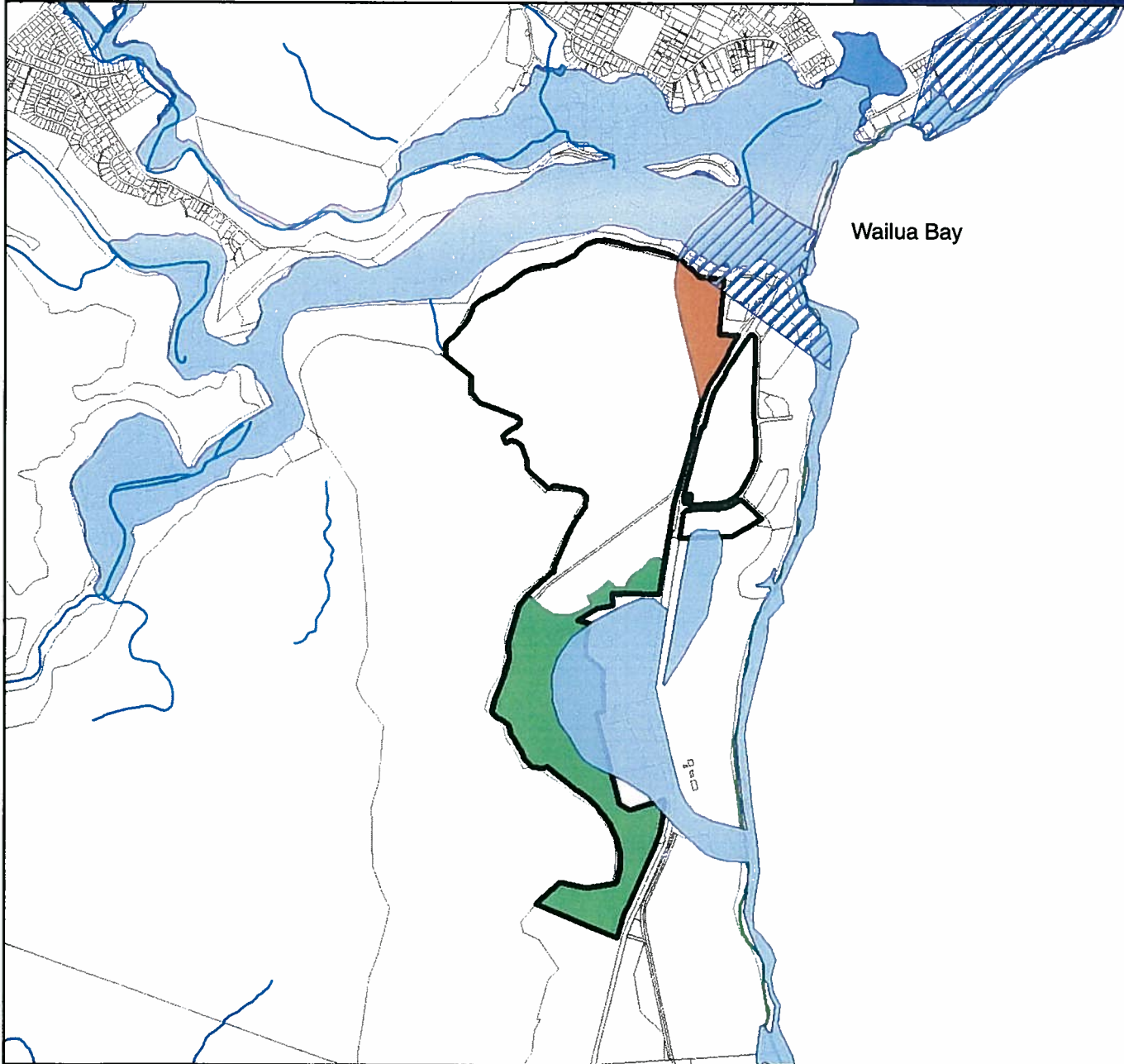
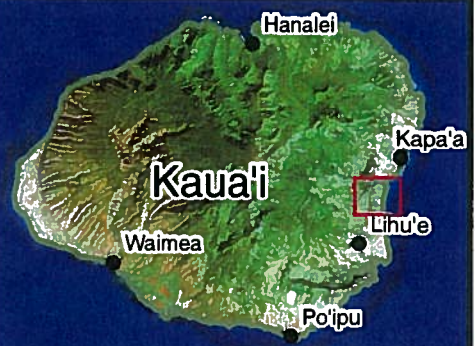
### On-Site Surface Water Drainage Features

Figure 4-5

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# N Legend

- Stream
- Tsunami Inundation Zone
- 100 Year Floodplain
- 500 Year Floodplain
- Development Boundary
- Buffer Lands
- General Agriculture



0 0.25 0.5 1 Miles

Source: FEMA



DHHL Wailua Development Project

FEMA Flood Insurance Rate Map

Figure 4-6

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The northern makai parcel and the mauka parcel of land were used for growing sugarcane between the early 1900's and 2002. On-site indications of this use included metal irrigation aqueducts left on both the northern makai parcel and the mauka parcel, as well as an irrigation pump system with filtering/fertilizer tanks located near the northwestern corner of the mauka property. The tanks were presumed to be a means for mixing fertilizer or pesticides into irrigation water to be distributed over the fields. Interviews conducted during the Phase I Environmental Site Assessment (ESA) confirmed that herbicide and pesticide applications were conducted regularly and included three applications to each crop. Applied pesticide/herbicide chemicals included atozin, pentamethylene, amatrane, and carmax.

A small section of the mauka portion of the project site adjacent to Kuhio Highway was formerly used as a temporary debris dump following Hurricane Iniki. Underlying soil (to a depth of approximately three inches below grade surface) in the area of the onsite waste disposal site was reportedly removed after the termination of these activities. Under contract with the County, an environmental firm provided quality assurance/quality control (QA/QC) monitoring of all cleanup tasks performed by a construction contractor. The site was then cleared of all debris on the surface and from trenches. Area soils where debris was removed and excavated were tested to ensure that no residuals remained. Clean soil backfill was placed, grading occurred to restore original grades. The project was completed in 1995 (email communication, Troy Tanigawa, 2007).

The project site reportedly receives excess runoff from an irrigation reservoir located above Kālepa Ridge via an old water tunnel. It is unknown whether this runoff contains hazardous chemicals/wastes or agricultural chemicals.

EI's review of a 1910 topographic map noted a railroad spur in the central portions of the mauka property side of the project site. Railroad spurs are typically considered environmental concerns because of the propensity for material dumping and spillage at these railroad dead ends.

The Phase I environmental site assessment conducted by EI is included in Appendix C.

#### *Potential Impacts and Mitigation*

Herbicide and pesticide application (reported to include atozin, pentamethylene, amatrane, and carmax) was conducted regularly on the project site and included three applications to each crop. Although there were no visual indications of potential impacts at the project site or surrounding properties during EI's site reconnaissance, based on EI's experience with former sugarcane lands, it is possible that the application of pesticides applied to the sugarcane fields, over time, may have accumulated in the underlying soil, both at the project site and surrounding properties. The potential presence of chemicals in the soil was noted as a concern by two of the preconsultation respondents: Hui Kako'o 'Aina Ho'pluplupa and Kipukai Kualii.

The following have been identified as potential impacts:

- the project site's durational use for agricultural land, and its planned development as residential lots;
- the former presence of a railroad through the mauka portion of the property, because of the propensity for material dumping and spillage at these railroad dead ends; and
- The potential for excess runoff from an upgradient irrigation tunnel to contain hazardous chemicals/wastes or agricultural chemicals.

These potential impacts will be mitigated by designing and conducting a screening-level site investigation prior to any on-site development activities. The investigation protocol will be designed in accordance with DOH rules and regulations, and will most likely consist of multi-incremental soil sampling. Sample sites would be randomly chosen, with the exception of targeted sampling in the vicinity of the irrigation pump system, the vicinity of the former railroad terminus, and in the path of surface water runoff from the upgradient irrigation tunnel. Based on the results of the screening, additional investigation or remediation would be designed as necessary for worker protection and to prepare the land for residential development.

#### 4.1.11 Climate and Air Quality

The regional and local climate together with the amount and type of human activity generally dictate the air quality of a given location. The climate of the project area is affected by its near coastal situation. Prevailing winds are northeasterly trade winds, which are more prevalent during the summer months than in the winter. Temperatures in the project area are generally very consistent and moderate with average daily temperatures ranging from about 60 degrees Fahrenheit (°F) to 80°F. The closest air quality station is in Lihue (DOH, 2005). The project area meets the standards of the Clean Air Act, and thus is considered to be within an attainment area (ibid).

##### *Potential Impacts and Mitigation*

The major potential short-term air quality impact of the project will occur from the emission of fugitive dust during construction. Uncontrolled fugitive dust emissions from construction activities are estimated to roughly amount to about 1.2 tons per acre per month under conditions of “medium” activity (EPA, 1995). The need to control fugitive dust during construction was highlighted by the OED (August 3, 2007 letter, OED). An effective dust control plan will need to be implemented in order to eliminate emissions of fugitive dust from future construction activities at the property line in order to comply with State of Hawai'i Air Pollution Control regulations.

In order to control dust, active work areas and any temporary unpaved work roads should be watered at least twice daily on days without rainfall. Use of wind screens and/or limiting the area that is disturbed at any given time will also help to contain fugitive dust emissions. Wind erosion of inactive areas of the project site that have been disturbed could be controlled by mulching or by the use of chemical soil stabilizers. Dirt-hauling trucks will be covered when traveling on roadways to prevent dust generation during transport. A routine road cleaning and/or tire washing program will also help reduce fugitive dust emissions that may occur as a result of trucks tracking dirt onto paved roadways in the project area. Paving of parking areas and establishment of landscaping early in the construction schedule will also help control dust. Monitoring dust at the project boundary during the period of construction could be considered as a means to evaluate the effectiveness of the project dust control program and to adjust the program if necessary.

During construction phases, emissions from engine exhausts (primarily consisting of carbon monoxide and nitrogen oxides) will also occur both from on-site construction equipment and from vehicles used by construction workers and from trucks traveling to and from the project site. Increased vehicular emissions due to disruption of traffic by construction equipment and/ or commuting construction workers can be alleviated by moving equipment and personnel to the project site during off-peak traffic hours.

Any long term impacts on air quality due to indirect emissions created from supplying the project with electricity and from the disposal of waste materials generated by the project will likely be small based on the relatively small magnitudes of these emissions. Nevertheless, indirect emissions from project

electrical demand could likely be reduced somewhat by incorporating energy-saving features into project design requirements. This might include the use of solar water heaters; designing building space so that window positions maximize indoor light without unduly increasing indoor heat; using landscaping where feasible to provide afternoon shade to cut down on the use of air conditioning; installation of insulation and double glazed doors to reduce the effects of the sun and heat; providing movable, controlled openings for ventilation at opportune times; and possibly installing automated room occupancy sensors.

Solid waste related air pollution would be reduced somewhat by the promotion of conservation and recycling programs within the proposed development. This would reduce solid waste volumes, which would in turn reduce any related air pollution emissions proportionately.

#### 4.1.12 Noise

Noise in the vicinity of the project site is not anticipated to be a finding of concern for the Wailua area. Current noise-generating activities in the area are limited to motor vehicle traffic along Kuhio Highway and the Aloha Beach Resort, comprising a resort and condominiums. In the vicinity of the coastline, ambient noise levels will be affected by the sounds of ocean waves, although this noise tends to mask other less-favorable noises such as traffic. Proposed development of the project site will include residential and revenue-generating uses, neither of which would be expected to generate significant increases in the noise levels of the area. No noise study was required for this project.

##### *Potential Impacts and Mitigation*

During the construction phase of the project, typical construction noise would be audible in the area in the immediate vicinity of construction work sites. Noise from construction activities must comply with the DOH noise regulations as specified for construction related activities. Such regulations include the use of properly muffled construction equipment, maintaining hours during which construction is permitted, and ensuring that noise levels fall within permitted levels during those hours. According to DOH regulations, noisy construction activities are not allowed during the nighttime hours or on Sundays and holidays. Use of curfew periods during the construction phase should help to minimize risks of adverse noise impacts.

After construction is complete, noise generated from stationary mechanical equipment on the project site must meet the DOH noise regulations, which allow adjustments for existing ambient noise levels. According to DOH regulations, maximum permissible noise levels for construction equipment during nighttime hours in residential areas is 45 decibels (dB) and 55 dB during daytime hours or the ambient noise level—whichever is higher.

Noise from vehicular traffic in the area due to the project is not expected to significantly increase over the existing ambient noise levels. The increase in project generated traffic noise is anticipated to be less than 1 dB.

## **4.2 Social Environment**

### 4.2.1 Land Use Considerations

The project site encompasses 52 acres makai of Kuhio Highway (TMK numbers (4) 3-9-006:009 and 011) and approximately 474 acres mauka of the highway (TMK numbers (4) 3-9-002:012, 024, and 025 (portions)). Ownership history is from historical records maintained by the City and County of Honolulu

Real Property Tax Division and the County of Kaua'i Real Property Tax Office. Existing records indicate that the affected parcels have been owned by the State of Hawai'i since their establishment, and specifically by DHHL since 1995 (EI, 2007). Real property records dating back to 1939 indicate that portions of the project site have been leased to the Lihue Plantation Company primarily for agricultural purposes (EI, 2007).

The earliest available aerial photograph from 1950 shows the project site as agriculturally cultivated land (EI, 2007). A roadway and railroad along with several cane haul roads and a network of aqueducts were visible on the project site. No significant development was shown in the surrounding area with the exception of the farm town known as Wailua, which is located approximately 2,500 feet to the north of the project site. Subsequent aerial photographs from 1959 and 1965 show the project site continued to remain in agricultural cultivation. The most recent aerial photograph from 2007 depicts the project site and vicinity in the same condition as observed during site reconnaissance of the property on July 17, 2007 (EI, 2007). The project site is generally vacant land containing fallow sugarcane fields, several dirt roadways, a paved cane haul road, and a number of ditches and aqueducts. A recent fire in the area has burned a majority of the ground vegetation; the remaining areas are covered with guinea grass, koa haole, and small bushes and shrubs.

Photographs taken along the boundaries of the project site during site reconnaissance on July 17, 2007 are provided in Figure 4-7. The surrounding property land uses include agricultural, recreational, and commercial/residential. Denser commercial and residential development begins in Kapa'a, which is located roughly 0.75 mile north of the project site. The area surrounding the project site is sparsely populated and characterized by undeveloped and vacant land, small resort complexes, recreational parks and facilities, and lands utilized for grazing.

The project site falls within the State of Hawai'i Land Use Commission (LUC) designation of Agricultural (mauka parcel and northern makai parcel) and Urban (southern Makai parcel) Districts (Figure 4-8). The LUC designations for surrounding areas include Conservation, Agricultural, and Urban. The majority of the mauka lands and the northern makai parcel fall within the area designated as "prime lands" under the State Department of Agriculture's Agricultural Lands of Importance to the State of Hawai'i (Figure 4-9). The proposed use of the project site for residential and revenue-generating uses is not consistent with this designation. The Hawaiian Homes Commission is the legal entity with authority regarding the use of Hawaiian home lands and has developed the proposed project plan that is consistent with its Wailua Regional Plan (DHHL, 2007) and Kaua'i Island Plan (DHHL, 2004).

According to the County of Kaua'i Planning Department, the project site is zoned as *A-Agriculture District* and *O-Open District* (Figure 4-10). The purpose of the Agriculture District is to: "1) protect the agriculture potential of lands within the County of Kauai'i to ensure a resource base adequate to meet the needs and activities of the present and future; 2) assure a reasonable relationship between the availability of agriculture lands for various agriculture uses and the feasibility of those uses; and 3) limit and control the dispersal of residential and urban use within agriculture lands" (Kauai'i County Code, Kauai'i Board of Realtors website <http://Kauai'i-realtor.com/czo.htm>).

**Figure 4-7  
Site Photographs**



**Photo 1:** Site viewed from the western boundary, facing northeast.



**Photo 2:** Site viewed from the north, facing south-southwest.



**Photo 3:** View of makai portion (Parcel 9) of Site, facing east.



**Photo 4:** View from southeast corner of makai portion (Parcel 11) of Site, facing west.



**Photo 5:** Metal irrigation piping observed throughout the northern half of the mauka portion of the Site.



**Photo 6:** Old irrigation pump system located near the northwestern corner of the Site.

**Figure 4-7  
Site Photographs**



**Photo 7: Kauai Island Utility Cooperative electric substation on an adjacent property.**



**Photo 8: Stained soil observed along the edge of Leho Drive in front of the KIUC electric substation.**



**Photo 9: Aboveground propane AST observed at the Kaha Lani Resort.**

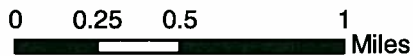
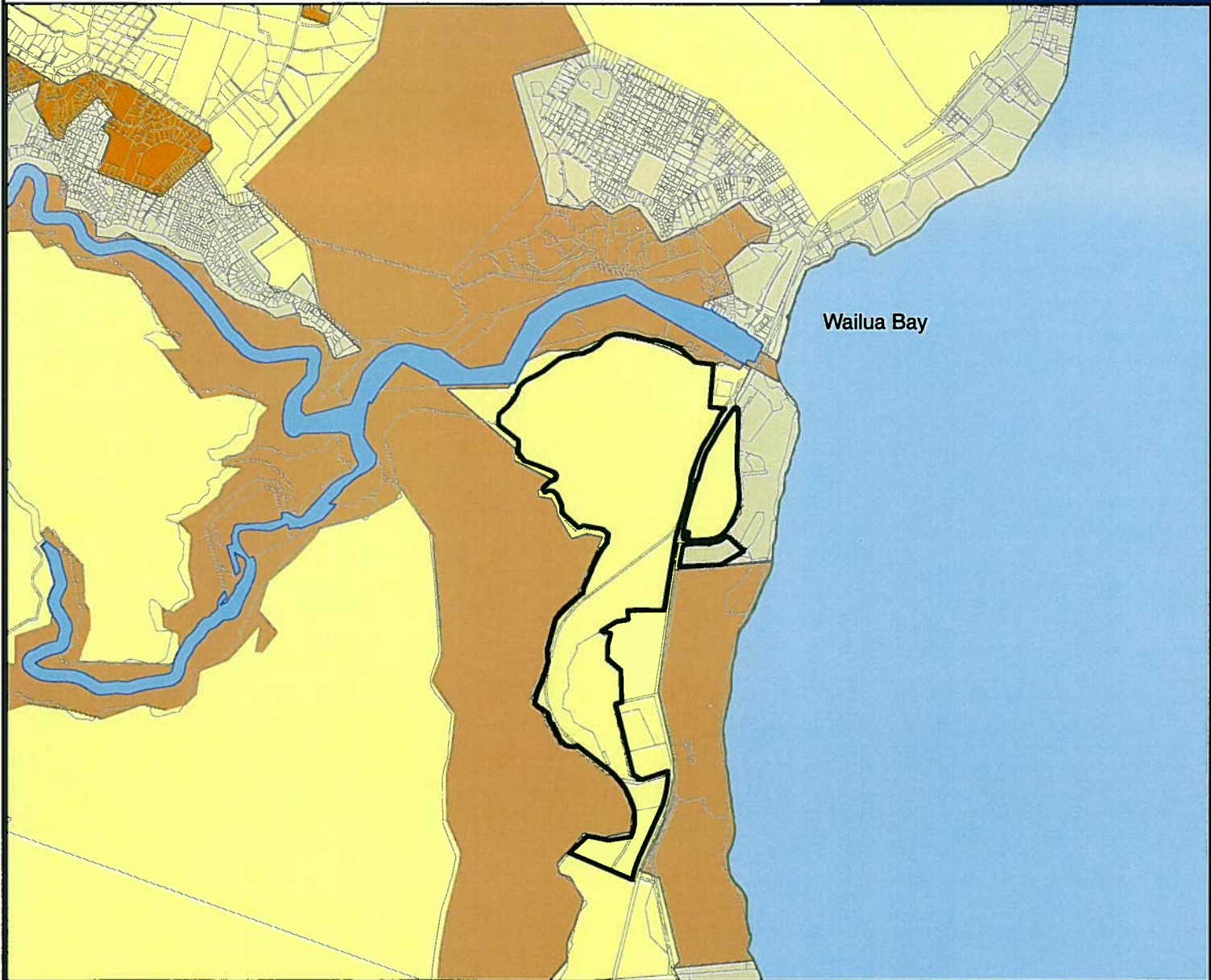
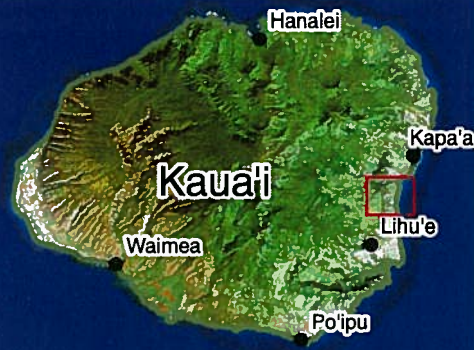


### Legend

- Development Boundary
- TMK Boundary
- Wailua River

### Land Use

- Agricultural
- Conservation
- Rural
- Urban



Disclaimer: Digitized from State Land Use Boundaries Map  
To be used for planning purposes only.  
Source: State of Hawai'i Land Use Commission

DHHL Wailua Development Project




State Land Use and Zoning

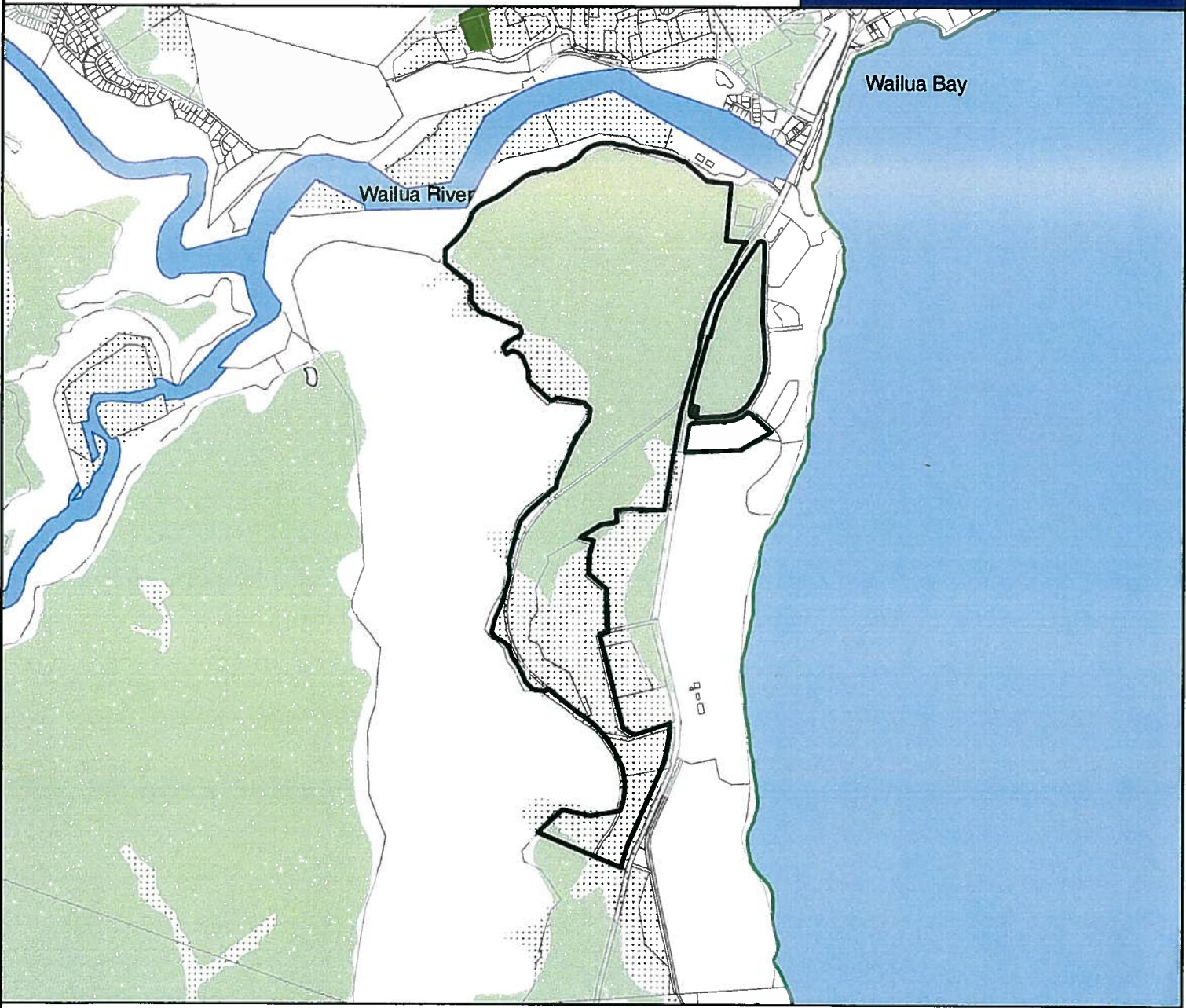
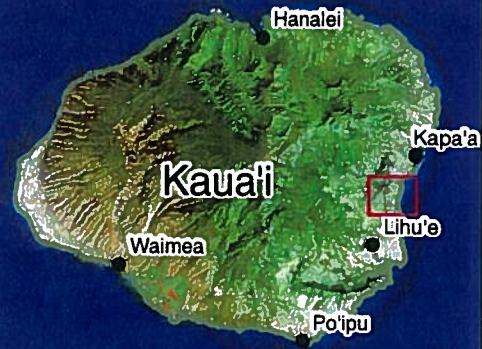
Figure 4-8

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**N Legend**

-  Coastline
-  Development Boundary
-  TMK Boundaries
-  Wailua River
-  Unclassified
-  Prime Lands
-  Unique Lands
-  Other Lands



0 0.25 0.5 1 Miles

Source: State of Hawai'i, Department of Agriculture











**DHHL Wailua Development Project**

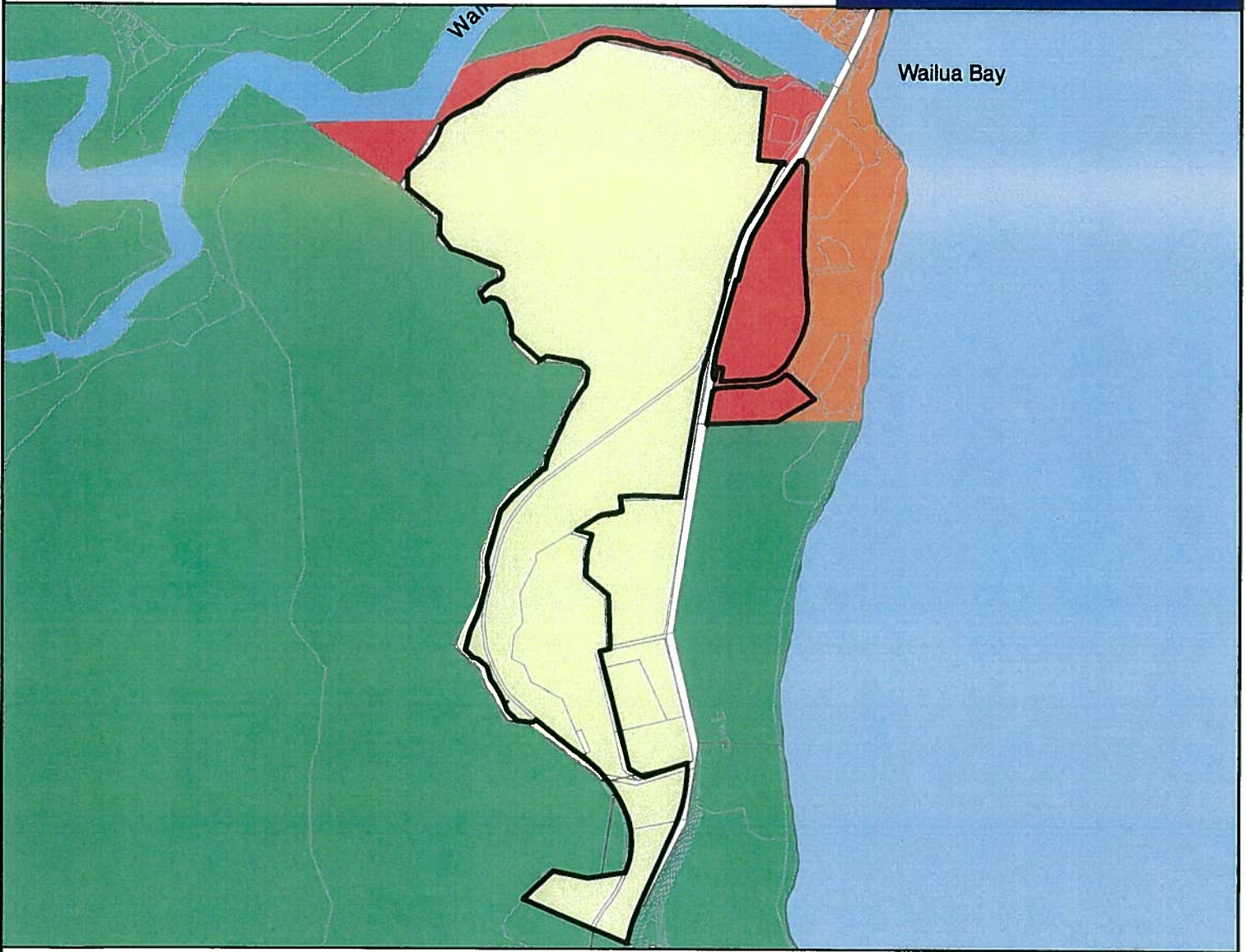
**Agricultural Lands of Importance to the State of Hawai'i**

**Figure 4-9**

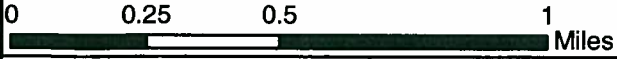
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**N Legend**

-   Development Boundary
-  Wailua River
-  Other
-  Agriculture
-  Conservation
-  Open
-  Urban



Disclaimer: Digitized from County Zoning Map and interviews with Kauai County Planning Department personnel.  
To be used for planning purposes only.



Source: County of Kauai, Department of Planning



DHHL Wailua Development Project

County Zoning Map

Figure 4-10

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The purpose of the Open District is to: “1) preserve, maintain or improve the essential characteristics of land and water areas that are: of significant value to the public as scenic or recreational resources; important to the overall structure and organization of urban areas and which provide accessible and usable open areas for recreational and aesthetic purposes; and, necessary to insulate or buffer the public and places of residence from undesirable environmental factors caused by, or related to, particular uses such as noise, dust, and visually offensive elements; 2) preserve, maintain or improve the essential functions of physical and ecological systems, forms or forces which significantly affect the general health, safety and welfare; 3) define and regulate use and development within areas which may be potentially hazardous; 4) include areas indicated on the County General Plan as open or as parks; and 5) provide for other areas which because of more detailed analysis, or because of changing settlement characteristics, are determined to be of significant value to the public” (Kaua'i County Code, Kaua'i Board of Realtors website <http://Kaua'i-realtor.com/czo.htm>).

County zoning designations for the surrounding land uses consist of agricultural, conservation, open and urban. State and county zoning designations differ for the makai lands. The northern makai parcel has a State zoning designation of agricultural but a county zoning designation of open, and the southern makai parcel has a state designation of urban and a county zoning designation of open.

#### *Potential Impacts and Mitigation*

The development of roads and infrastructure on the project site for the purpose of allowing DHHL to distribute Hawaiian homestead lots to eligible beneficiaries is considered to be consistent with surrounding land uses and long-term land use planning objectives, with the exception of the designation of the project site as prime agricultural lands by the Department of Agriculture, and as agricultural lands by the State of Hawai'i and the County of Kaua'i. DHHL Lands are exempt from land classification requirements for homestead development, thus no district boundary amendment will be necessary for the proposed project. DHHL has the full authority to designate land uses on Hawaiian home lands. The planned development is in full accordance with the DHHL General Plan, the DHHL Kaua'i Island Plan, and the DHHL Wailua Regional Plan. No mitigation is required.

The County and DHHL share common goals in planning for the use of DHHL lands: both support the orderly development of those lands for the benefit of native Hawaiians and both are committed to the integration of planning by DHHL and Kaua'i County. The Hawaiian Homes Commission is responsible for determining land use on Hawaiian home lands, and has the full authority to do so. The County cannot use its land use and zoning powers to prevent the Hawaiian Homes Commission from controlling the use of Hawaiian home lands.

### 4.2.2 Historic and Cultural Resources

#### A. Historical and Archaeological Considerations

The proposed project falls within the Wailua ahupua'a, in an area known for its historical and cultural significance to the island. The Wailua River, along both shores, was the pre-contact royal center where royalty entertained visitors and conducted business (Scientific Consultant Services, Inc. (SCS), 2007a; KI, 2007). Decision-making and religious activities were conducted in the seven heiau in the area, one of which (the Malae Heiau) is located immediately adjacent to the mauka parcel (Figure 4-11). The Wailua Complex of Heiau, on both sides of the river, was the focus of political and religious activity. Among the seven heiau of Wailua, Malae Heiau and Poli'ahu Heiau (on the north side of the river inland atop

Poli'ahu Ridge) were two large companion heiau. All heiau were believed to be connected religiously and politically during the annual makahiki festival as well as other state events

Remaining components of the royal center include the heiau, said to contain burials, the Pu'uhonua (place of refuge), often called by the ancient place name for this beach, "Hau'ola" and located at the north end of the Hikinaakalā structural complex adjacent to Malae Heiau, the birthstones, Pōhaku Piko, the bellstone, and the royal fishponds. Other components of the royal center have left no identified surface remnants, including the chiefly homes, the supporting lo'i and kula lands, the places of recreation, the burial place called Mahunapu'uone (just makai of Kapule's fishponds), the fish traps, and the canoe landings.

Most of the daily life of royal families was centered around the north side of the river mouth, although some of the house sites were south of the river, makai of Kuhio Highway and close to the mauka property. The Kapa'a Bike Path EA (KI, 2007) noted that "a burial area is associated with these house lots on the dune and archaeological work shows there are still present remains of the habitation layer and the burials."

Other historically significant areas are or were present north of the Wailua river, including the Kapule fishponds, the home area in and around Kalaeokamanu/Holoholokū Heiau, Pōhaku Piko, and the birthstones sites (or former historic sites) located within the Wailua River valley, at the mouth of the valley, and in the flat coastal lands on the north side of the river mouth. The Wailua petroglyph site (Ka Pae Ki'i Mahu o Wailua), located at the mouth of the Wailua River, is also a culturally important site.

The archaeological designation of the Wailua Complex of Heiau National Historic Landmark (1988) consists of five discontinuous properties: Site -104, Malae Heiau; Site -105, Hikinaakalā Heiau (and petroglyphs); Site -106, Holoholokū (Kalaeokamanu) Heiau and Pōhaku Ho'ohānau, Site -107, Poli'ahu Heiau; and Site -335, the Wailua Bellstone(s). The arbitrary designation of these properties for the National Register/National Historic Landmark listing is five circles each centered in the middle of each of the sites but only slightly greater than the radius of the sites themselves. The Wailua petroglyph site can also be considered a contributing element of the Wailua Complex of Heiau. However, *mo'olelo* mention the sacredness and connection of areas not included under this designation.

The project's Archaeological Inventory Survey, conducted by SCS, included a full pedestrian survey of the property, with backhoe excavated subsurface testing, mapping of test units with reference to existing surface features, site analysis, interpretation and reporting. The draft report identified three sites: Plantation era agricultural water diversion (ditches, culverts, and a haul road), a scatter of prehistoric stone artifacts covering approximately three acres northwest of Malae Heiau, and a possible traditional Hawaiian terrace located along the southern edge of the project area (SCS, 2007b). None of these sites appear to warrant preservation and all appear to be significant under Criterion D (of The National Register of Historic Places (Title 36, part 60 of the Code of Federal Regulations (CFR))). The draft report from SCS is included in Appendix D.

In a preconsultation letter date August 24, 2007 the State of Hawai'i Office of Hawaiian Affairs (OHA) requested that a comprehensive archaeological survey be performed, and that OHA be given the opportunity to comment on the criteria assigned to any cultural or archaeological sites identified in the survey. OHA also requested that consideration be afforded to any individual accessing the project area for constitutionally protected traditional and customary purposes. The cultural importance of the Malae Heiau and its line of sight with other heiau, especially Poli'ahu, was noted in letters from multiple parties during the preconsultation phase, including the OED, DLNR State Historic Preservation Division (DLNR-SHPD), the DLNR Division of State Parks (DLNR-SP), and Hui Kako'o 'Aina Ho'opulapula. The approximate visual corridor between the two Heiau is shown in Figure 4-11. The visual integrity of the area will be adversely affected by the development of residential and commercial buildings blocking the previously open view from the mountain to the sea. The importance of designated road access to the

Malae Heiau parcel was highlighted in the DLNR-SP pre-consultation letter (August 8, 2007 letter, DLNR-SP). Very little in the way of adverse impacts is anticipated in the development of any of the former sugar cane lands back from the coast.

### *Potential Impacts and Mitigation*

The National Register of Historic Places (Title 36, part 60 of the CFR), defines the criteria for legally evaluating the significance of cultural resources. It states that “the quality of significance in American history, architecture, archaeology, engineering, and culture is present in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association,” and

- (A) that are associated with events that have made a significant contribution to the broad patterns of our history; or
- (B) that are associated with the lives of persons significant in our past; or
- (C) that embody the distinctive characteristics of type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or
- (D) that have yielded, or may be likely to yield, information important in prehistory or history (U.S. Department of Interior, 1991, p. 37).

The proposed project represents a potential impact to the Malae Heiau. This potential impact would be mitigated by including a buffer area surrounding the heiau and designated road access. The buffer might include an information and education center, native Hawaiian cultural center or a low-intensity Polynesian Cultural Center development catering to tourists (DHHL, 2004). The line of sight between the Malae Heiau and its companion heiau, Poli'ahu Heiau, would also be retained in the design of the residential area. DHHL in consultation with the DLNR-SHPD and other consulted parties should prepare an agreement document that specifies the condition of preservation assuring the no adverse effects determination.

The three sites identified during the cultural inventory survey were noted as not warranting preservation, although significant under Criterion D above. As such, additional measures including data recovery at the sites is recommended prior to development of the area in question.

In the event that cultural artifacts or human remains are inadvertently encountered during the development of roads and infrastructure on the project site, all operations in the vicinity of the discovery will immediately cease. The discovery and its surrounding area will be secured and protected from further damage. The SHPD will be notified of the discovery, and immediate consultation with the Kaua'i Island Burial Council will be sought before commencement of construction activities.

#### B. Cultural Resources, Practices Consultation

A cultural impacts assessment (CIA) conducted by SCS pursuant to Act 50, approved by the Governor on April 26, 2000, and in accordance with the OEQC *Guidelines for Assessing Cultural Impacts*, adopted by the Environmental Council in 1997 is included in Appendix E. The assessment involved evaluation the probability of impacts on identified cultural resources, including values, rights, beliefs, objects, records, properties, and stories occurring within the project area and its vicinity. The assessment included archival research as well as interviews with knowledgeable individuals.

The CIA identified the Wailua ahupua'a as one of the most important cultural regions in the Hawaiian Islands, with components spanning all phases of Hawaiian culture. The complex of heiau mentioned in the section above were specifically mentioned as culturally important features.

A response letter received from the OHA stressed the importance of the Malae and Hikinaakala Heiau, and suggested consideration of view planes and adequate buffers to allow cultural protocol and/or ceremonies to occur (SCS, 2007a). Responses from contacted individuals have not yet been received by SCS, but are anticipated. Any responses received will be addressed and incorporated into the final environmental assessment. Letters received by EI (addressed in the section above) included concerns from the OED and DLNR-SP that appropriate buffers and view corridors be established.








The CIA discussed the visual impact of the proposed project on the cultural resources of the area, notably the Heiau, finding it to be a major concern for the proposed project. The study expressed the concern that "native Hawaiian cultural beliefs and practices are continually being affected by the loss of land to development that intrudes into the natural setting" (SCS, 2007a). Letters from Hui Kako'o 'Aina Ho'opulapula and Kipukai Kualii expressed concerns that use of trust lands for timeshare and resort development is not an acceptable use of trust lands, and that this use compromises the intent of the trust purpose. The CIA specifically found that the makai project area "impacts the integrity of the experience of anyone wishing to perform 'constitutionally protected' ... native Hawaiian activities, such as traditional ceremonies and protocol at these sacred sites." The ultimate finding of the CIA is that the proposed project may be reasonably assumed to affect Hawaiian cultural activities such that there is an adverse effect upon cultural resources, practices, and beliefs. The CIA recommended consultation with the developers, the DLNR-SP, the OHA Kauai'i Branch, the Queen Debra Kapule Hawaiian Civic Club, and Na Kahu Hikina A Ka La.

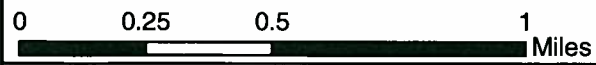
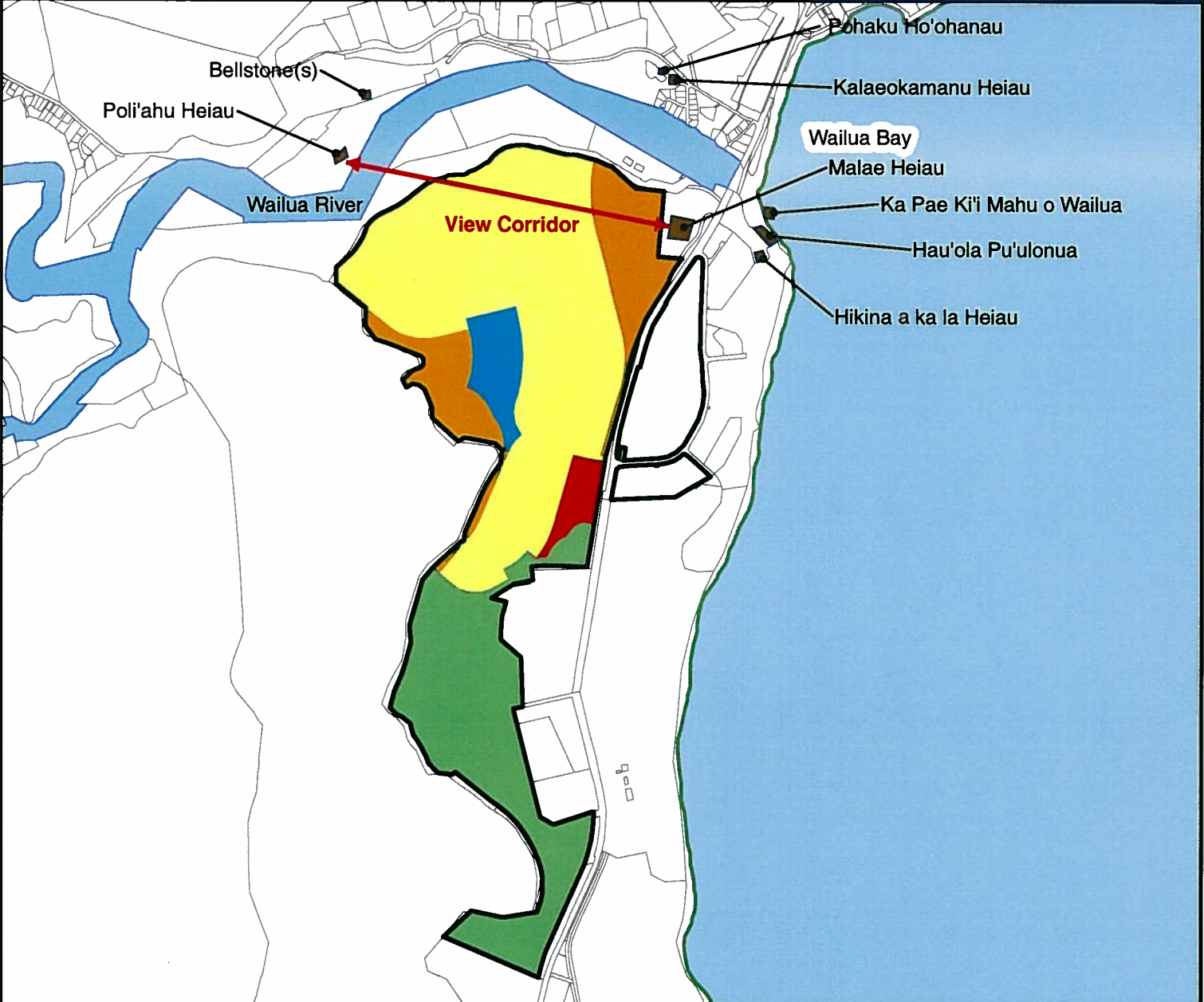
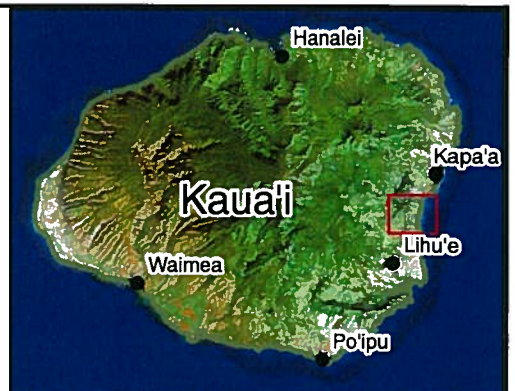
The overarching goal of the DHHL Wailua Development Project is to make the Wailua region a living cultural resource. The mauka parcel will be developed with a large buffer around the Malae heiau (Figure 4-11), and with project elements designed to enhance the experience of visitors to this sacred site. Bringing native Hawaiian residents to settle in the Wailua region, providing them with job opportunities and community facilities in the same area, and designing the project such that the makai uses support the mauka residential development embodies the intent of the ahupua'a concept. Beneficiaries will be brought back to one of the most culturally important areas of the island, with more opportunities to partake in traditional ceremonies or experiences at the heiau. In addition, the selection of the Wailua region for DHHL residential development came after extensive research and surveys of residents. The overwhelming majority of individuals selected Wailua as the site for this project.

In order to ensure that the integrity of the cultural sites is protected throughout the development, DHHL will continue to consult with all affected parties throughout the EA process. In addition, an on-call archaeologist will be retained during initial grubbing to ensure an appropriate and timely response to any unanticipated discoveries. A monitoring plan will be prepared and submitted to the DLNR-SHPD by the project's consulting archaeologist prior to issuance of a county grubbing/grading permit.



**N Legend**

-  Coastline
-  Development Boundary
-  Archeological/Historical Sites
-  Wailua River
-  TMK Boundaries
-  Buffer Lands
-  Residential Lands
-  Community/Park/School
-  Neighborhood Commercial
-  General Agriculture



Source: Various Sources  
 Disclaimer: Location of archeological and historic sites are approximate.



**DHHL Wailua Development Project**

**Archeological and Cultural Resources**

**Figure 4-11**

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### *Potential Impacts and Mitigation*

As discussed in the previous section, DHHL will ensure proper protection of the Malae Heiau through continued consultation with affected parties, and by instituting an approved monitoring plan for construction activities that will be reviewed and approved by the State Historic Preservation Officer (SHPO).

Execution of the above described mitigation measures will help to ensure that no cultural practices and beliefs, integrity of sites, or associated cultural resources will be adversely affected by the proposed DHHL Wailua Development Project.

#### 4.2.3 Circulation and Traffic

A Traffic Impact Analysis Report (TIAR) was prepared by Wilbur Smith Associates (WSA) in conjunction with this EA, and has been included as Appendix F.

The project area includes several major roadways that serve regional trips within Kauaʻi, as well as local roads that provide access to the commercial and residential areas adjacent to the project area.

Kapule Highway is a two-lane roadway that extends north-to-south between northeast Lihue and Kuhio Highway. It provides one lane in each direction and allows traffic on this roadway to travel at 50 miles per hour (mph).

Kuhio Highway (Highway 56) acts as a two-lane roadway south of Kapule Highway and a three-lane roadway north of Kapule Highway. It is one of the major roadways that connects Lihue with the eastern and northern sections of the island. North of Kapule Highway, Kuhio Highway operates as a contra flow facility. During the AM peak hours, two lanes are provided in the southbound direction and one lane in the northbound direction from Kamoʻa Road in Waipouli to the intersection with Kapule highway. During the PM peak hour, two lanes are provided in the northbound direction and one lane in the southbound direction. In addition, traffic south of Kapule Highway is allowed to run at 35 mph while the traffic north of Kapule Highway is posted at 50 mph. It should also be noted that the posted speed limit on Kuhio Highway is 25 mph south of, and 35 mph north of the Wailua River.

The existing local roadway system in the vicinity of the project site comprises four local roads. Leho drive is a two-lane, looped arterial with one lane in each direction. It provides direct access to Kuhio Highway at both its origin and terminus, and also provides local access to the Aloha Beach Hotel resort. The posted speed limit is 25 mph. Kuamoo Road is a two-lane collector road providing access to the Wailua Homesteads Area from Kuhio Highway, and local access to Kamokila Village. The posted speed limit on Kuamoo Road is 35 mph. Haleilio road is a two-lane, east-to-west collector roadway extending from Kaulana Road to Kuhio Highway. The posted speed limit is 35 mph. Wailua Marina Driveway is an east-west roadway that connects with Kuhio Highway and provides access to the Wailua Marina and River.

A Level of Service (LOS) analysis was performed to qualitatively measure the traffic flow in the vicinity of the proposed project (WSA, 2007). LOS is measured by grades A through F, with A representing the best conditions and F being the worst. LOS C describes average delays and is considered desirable for rural areas and LOS D is considered acceptable. A total of six intersections were analyzed under existing conditions of which three are signalized, and three are Side-Street Stop-Controlled (SSSC). Two separate

analyses were run: one for the AM Peak Hour and one for the PM Peak Hour. Results of the analysis are provided in Tables 4-1 and 4-2 below.

**Table 4-1: Existing AM Peak Hour Level of Service**

Intersection	Control	V/C Ratio	Delay (seconds)	LOS
Haleilio Road / Kuhio Highway	Signal	0.68	14.6	B
Kuamoo Road / Kuhio Highway	Signal	0.9	33.7	C
Wailua Driveway / Kuhio Highway	SSSC		>80	<b>F</b>
Leho Drive / Kuhio Highway (end of loop)	SSSC		>80	<b>F</b>
Leho Drive / Kuhio Highway (start of loop)	SSSC		50.8	<b>F</b>
Kapule Highway / Kuhio Highway	SSSC	0.88	22.2	C

**Bold** – Unacceptable Conditions  
 V/C – volume to capacity

Three of the intersections analyzed presented unacceptable conditions during the AM Peak Hours. These conditions existed despite the contra-flow arrangement of Kuhio Highway: two lanes running in the southbound direction and one lane in the northbound direction. Two of the three intersections with unacceptable conditions occurred in the region of Kuhio Highway between the Mauka and Makai subject property parcels.

**Table 4-2: Existing PM Peak Hour Level of Service**

Intersection	Control	V/C Ratio	Delay (seconds)	LOS
Haleilio Road / Kuhio Highway	Signal	0.67	101	B
Kuamoo Road / Kuhio Highway	Signal	0.97	26.4	C
Wailua Driveway / Kuhio Highway	SSSC		>80	<b>F</b>
Leho Drive / Kuhio Highway (end of loop)	SSSC		>80	<b>F</b>
Leho Drive / Kuhio Highway (start of loop)	SSSC		>80	<b>F</b>
Kapule Highway / Kuhio Highway	SSSC	0.98	51.4	D

**Bold** – Unacceptable Conditions

The PM peak hour LOS analysis found unacceptable conditions at the same three intersections as in the AM peak hour LOS analysis. The delay at the intersection of Leho Drive and Kuhio Highway (start of loop) was greater in the PM analysis than the AM analysis. The three intersections with acceptable conditions also had longer delays in the PM analysis than the AM analysis, although the only change in LOS category was that of Kapule Highway and Kuhio Highway, which moved from a level C to a level D.

Two similar LOS analyses were run for the project area: Future Year 2015, which predicts the future scenario without the proposed project, and Future Year 2015 With Project Conditions, which assumes that the proposed project is constructed. For a detailed description of assumptions and calculations used for the analyses, refer to Appendix F. Table 4-3 presents a summary of the data and findings of the TIAR.

**Table 4-3: Future Year 2015 Scenarios, With and Without Project**

Intersection	Future Year 2015 AM Peak		Future Year 2015 PM Peak	
	Without Project	With Project	Without Project	With Project
	LOS	LOS	LOS	LOS
Haleilio Road / Kuhio Highway	B	C	B	B
Kuamoo Road / Kuhio Highway	<b>F</b>	<b>F</b>	D	D
Wailua Driveway / Kuhio Highway	<b>F</b>	<b>F</b>	<b>F</b>	<b>F</b>
Leho Drive (end of loop) / Kuhio Highway	<b>F</b>	<b>F</b>	<b>F</b>	<b>F</b>
Leho Drive (start of loop) / Kuhio Highway	<b>F</b>	<b>F</b>	<b>F</b>	<b>F</b>
Kapule Highway / Kuhio Highway	E	<b>F</b>	<b>F</b>	<b>F</b>
Mauka Project Driveway / Kuhio Highway	-	<b>F</b>	-	<b>F</b>

**Bold** – Unacceptable Conditions

\* - Significant impact

The three intersections identified as having a significant impact under Year 2015 With Project conditions are addressed in the mitigation measures section below.

*Potential Impacts and Mitigation*

The DOT Highways Division requested that a TIAR be prepared for DOT review and approval (DOT letter dated August 31, 2007). The DOT requested that the report include an analysis and evaluation of project impacts not limited to Kuhio Highway, and any roadway improvement mitigation measures. DOT also requested that the project be coordinated with other projects in the vicinity, and that required roadway mitigation measures be implemented by the developer at their own cost. Finally, DOT requested that a drainage/grading report and construction plans be prepared for their review and approval. Preparation of the TIAR included in Appendix F satisfies the DOT request. Ongoing coordination throughout the project between DHHL, the developer, and DOT will ensure that all other requests are met.

The proposed project would cause transportation impacts during both AM and PM peak periods at the following three study intersections under Year 2015 Baseline with Project conditions:

- Potential Impact #1: Leho Drive (End of Loop) / Kuhio Highway
- Potential Impact #2: Leho Drive (Start of Loop) / Kuhio Highway
- Potential Impact #3: Mauka Project Driveway / Kuhio Highway

Proposed improvements to mitigate these three potential impacts are as follows:

Potential Impact #1: Leho Drive (End of Loop) / Kuhio Highway

The unacceptable conditions at this intersection could be improved by using traffic control devices, and constructing two exclusive left-bound lanes: one along the southbound approach to provide two southbound lanes, and one along the westbound approach to provide a dedicated right-turn and a

dedicated left-turn lane. With the incorporation of these mitigation measures, this intersection's operating condition would improve from a LOS F to LOS C during both the AM and PM peak hours.

Potential Impact #2: Leho Drive (start of loop) / Kuhio Highway

The unacceptable conditions at this intersection could be improved by using traffic control devices, and constructing three exclusive left-bound lanes: one along the northbound approach to provide northbound traffic an exclusive through lane, one along the eastbound approach to provide a dedicated left-turn lane and shared through right line, and one along the westbound approach to provide a dedicated left-turn lane and shared through right lane. With the incorporation of these mitigation measures, this intersection's operating condition would improve from a LOS F to LOS E during the AM and PM peak hours. Based on input from the DOT, Kuhio Highway is proposed to be a four-lane roadway in the future. This will further improve the operations at this intersection.

Potential Impact #3: Mauka Project Driveway / Kuhio Highway

The unacceptable conditions at this intersection could be improved by restricting the proposed Mauka Project Driveway to a right-in/right-out operation. Incorporating this mitigation measure would mitigate the potential impact to a less-than-significant level.

Three other intersections in the vicinity of the project have been identified as operating at LOS F in Year 2015 baseline and with project conditions. No additional improvements are required to mitigate the additional traffic generated by the proposed development. Some improvements planned by DOT and/or the County of Kaua'i will assist in relieving this traffic congestion, including the proposed future widening of Kuhio Highway to a four-lane roadway, and the mitigation measures proposed as part of the Hanamaulu Triangle Project.

Concerns about traffic in the vicinity of the residential development were raised in letters from Hui Kako'o 'Aina Ho'opulapula and Kipukai Kualii. These two respondents specifically requested the inclusion of traffic calming measures to prevent speeding in residential areas. Posted traffic limits within the residential areas could be engineered to inhibit speeding.

#### 4.2.4 Social Factors and Community Identity

The project site is located within a region identified by the U.S. Census Bureau as the Puhi-Hanamaulu area. Not much census data are available for the Puhi-Hanamaulu region, as the subject property currently exists as undeveloped land. The nearest census division is the Wailua-Anahola Census County Division (CCD), immediately north of and adjacent to the subject property.

In comparison to the total Wailua-Anahola CCD as a whole, the native Hawaiian population subset has a lower median age (29.9 compared to 38.3), a slightly lower median household income (\$40,815 compared to \$44,482), a higher percentage of families (80.5% compared to 72.5%) and a larger average household size (3.57 compared to 2.85) (DHHL, 2007).

A second area used for comparison is the Wailua Homesteads Census Demographic Profile (CDP), also north of the project site. Occupied housing units in the Wailua Homesteads CDP area totaled 94.1% compared to 87.6% state-wide, and vacant housing units in Wailua totaled 5.9% compared to 12.4% state-wide, indicating a more pronounced shortage of available housing. The median household income and

family income were lower in the Wailua Homesteads CDP area compared to the State as a whole (U.S. Census Fact Sheets, downloaded 2007).

The project site is located in a currently undeveloped, scenic area that has a great deal of character and identity to the community. Development in the project area has the potential to impact that character. The Wailua Development Project is laid out in a compact area, in part to preserve the existing open green spaces and maintain the distinct identity of the Wailua community.

#### *Potential Impacts and Mitigation*

No residences, businesses, community facilities, farms, or other activities would be displaced as a result of the proposed project because the site is currently undeveloped and vacant. Development layout is in a compact area to preserve existing open green spaces and maintain the identity of the Wailua community. It is the long-term goal of the project to foster a Hawaiian lifestyle. No adverse impacts are anticipated and no mitigation is required. The resulting settlement of the area by native Hawaiians may be regarded as a benefit of the proposed project since the goal of the homesteading program is to increase the economic self-sufficiency of native Hawaiians through the provision of land. The neighborhood that would result from the proposed project would reflect the culture and values of the past Hawaiian communities.

#### 4.2.5 Economic Considerations

Kaua'i's economy has transitioned from its former status as a plantation economy to one with a broader subset of industries, including agriculture, tourism, construction, retail, and professional businesses. The largest number of jobs for the island are found in retail/wholesale trade and services. The unemployment rate as of July 2007 was 2.7 (not seasonally adjusted), compared to an unemployment rate in the State of Hawai'i of 2.9 and a U.S. rate of 4.9 (Hawaii Department of Labor and Industrial Relations website, <http://www.hiwi.org>).

The selected alternative will generate short-term economic vitality for the island by providing temporary construction opportunities for the duration of the project. Longer-term economic vitality for the region will be boosted by the creation of permanent jobs for the revenue-generating tenants on both the mauka and makai portions of the project.

#### *Potential Impacts and Mitigation*

No adverse impacts are anticipated and no mitigation is required.

#### 4.2.6 Recreational and Public Facilities

The project area is located in a relatively undeveloped portion of the Island of Kaua'i. State Land Use surrounding the project site includes predominantly agricultural and conservation land, with some urban areas east and north of the project site (Figure 2-3, Figure 4-8). Lydgate Park is a 136-acre state-owned park that adjoins the southern boundary of the smaller makai parcel. Other facilities located in Wailua are the Wailua River State Park, the Wailua Golf Course, a Hindu Monsatery, Kaua'i Community Correctional Facility and two small community park/playgrounds for Wailua Homesteads and Wailua House Lots residents (DHHL, 2007).

The public school system in Wailua is under the jurisdiction of the State Department of Education. The project area is serviced by King Kaumuali'i Elementary and Kapa'a Middle and High Schools. The 2005-2006 actual enrollment for these three schools was 532 (King Kaumuali'i Elementary), 719 (Kapa'a Middle), and 1,290 (Kapa'a High) (DHHL, 2007). No threshold for population growth has been set that would specify the need for additional schools (ibid), and it is envisioned that the State Department of Education would work with developers and other state agencies to determine if the need exists for additional schools.

Two hospital facilities in the vicinity of the project area are the Samuel Mahelona Memorial Hospital (1.5 miles north of the project site) and Wilcox Memorial Hospital (1 mile south of the project site) (DHHL, 2007).

The nearest police station to the proposed project site is the Lihu'e Police Station located roughly 3.4 miles south of the project area. The nearest fire station is the Kapa'a Fire Station, located approximately 2.6 miles north of the project site in Kapa'a. The present level of public facilities and services provides adequate services to handle the current demand.

#### *Potential Impacts and Mitigation*

No recreational and public facilities would be displaced as a result of the development of roads and infrastructure on the project site. The proposed project includes setting aside 12 acres for a school and community park site, and an additional 18 acres for a community center and park. Both community plots are planned for inclusion in the mauka parcel of land. Because the existing public schools in the vicinity of the project site are anticipated to possess sufficient capacity to service the planned development, the 12 acre school/park site on the mauka parcel of land may be used for a pre-school or other childcare facility. If the need for additional schools is identified, the State Department of Education will work with the developers and other state agencies to design proper mitigation.

In general, the proposed project is not expected to place enough of a demand to result in the need to increase the level of current facilities and services in the project area. The planned community facilities would benefit the surrounding community. No mitigation is required.

#### 4.2.7 Visual and Aesthetic Resources

Views from along the project site boundaries are of the sparsely populated surrounding area, the golf course, Lydgate Park, Aloha Beach Resort, and the ocean to the east, the Wailua River and Wailua House Lots subdivision to the north, and undeveloped hills to the west. Kuhio Highway from Lydgate Park to the coconut grove in Waipoli has been identified as a scenic roadway corridor (Kaua'i General Plan, 2000; KI, 2007). Low-density residences, archaeological features, and lands utilized for agriculture contribute to the overall aesthetic quality of the project area.

The importance of views between the Malae Heiau and the Poliahu Heiau have been stressed by multiple consulted parties, including the DLNR-SP, DLNR-SHPD, and the OED. A more complete discussion is included in section 4.2.2. The DLNR-SP indicated that a 100-foot buffer on the mauka side of the Malae Heiau is not adequate to preserve the historical and cultural setting of the site. The DHHL, in consultation with the community and appropriate agencies, will work to achieve a design that incorporates a sufficient amount of buffer on the mauka side of the Malae Heiau, and that will also maintain the line of sight between the Malae Heiau and the Poliahu Heiau.



The proposed development will introduce 52 acres of timeshare units on the makai parcel of land. These units will be lower-density units in a landscaped setting. The development of timeshare units on the makai parcel should be an aesthetically pleasing feature that does not block views to the ocean. The proposed mauka development will also include approximately 30 acres of buffer along Kuhio Highway. This area will be designed in such a way to minimize impact to the aesthetics of the area. The residential lots planned for development on the mauka parcel will be a minimum of 10,000 square feet each, and the residential units will be designed to fit in to the natural setting.

The DLNR-SP noted the importance of the natural setting of the Wailua River to the visitor industry, and requested that a setback from the edge of the bluff or open space buffer be included into the design of the subdivision (August 8, 2007 letter, DLNR-SP). Residential lots along the banks of the Wailua River will be set back from the edge such that residences are not visible from Wailua River State Park or the neighboring Wailua House Lots subdivision.

#### *Potential Impacts and Mitigation*

The proposed project to develop roads and infrastructure on the project site would not significantly impact important visual and aesthetic resources of the project site and surrounding area such as mauka-makai view corridors, views of significant landmarks or natural resources, or ridge line views from outside or within the project boundaries. The proposed project would further the establishment of residential homesteads that would be consistent with the visual characteristics of the surrounding area. The DHHL, in consultation with the community and appropriate agencies, will work to achieve a design that incorporates a sufficient amount of buffer on the mauka side of the Malae Heiau, and that will also maintain the line of sight between the Malae Heiau and the Poliahu Heiau. No other mitigation is required.

#### 4.2.8 Infrastructure Systems and Utilities

The project site is currently vacant and undeveloped; therefore, there are no existing infrastructure or utility systems within the area that are proposed for residential homesteads or timeshare units. The planned development will add the demand for potable water, wastewater conveyance, drainage, and solid waste collection, as well as the demand for utility services such as electricity, telephone, and cable television.

Current sources of potable water will not be able to support additional development in the area. The DOW has several improvement projects planned for the Wailua-Kapa'a area. These proposed improvement projects include three wells within the Kapa'a Homesteads area, a well and chlorination facility within the Wailua Homesteads, and a chlorination facility for the Nonou Well (DHHL, 2007). In a letter dated August 16, 2007, the DOW reiterated that the proposed development is outside the full growth service area of the DOW, that the source and storage facilities for the Lihue water system are operating at capacity, and that DHHL will be required to prepare and receive DOW approval of a Water Master Plan for full development of the lots (August 16, 2007 letter, DOW). According to the Wailua Regional Plan (DHHL, 2007), the additional residences and timeshare units will require their own water source, storage, and transmission/distribution system, or contribute its fair share to DOW projects to serve water commitments. In addition, DLNR-ED has requested that the DHHL provide them with the water demands and calculations to be included in the State Water Projects Plan update (August 15, 2007 letter, DLNR-ED).

The Wailua WWTP does not have sufficient capacity to service the planned development of the subject property. Sewer capacity of the WWTP is currently 1.5 million gallons per day (mgd), and project wastewater flow from the DHHL development would increase plant flow to approximately 1.65 mgd. The scheduled far-term upgrade will increase the daily capacity to 2.0 mgd (DHHL, 2007; County of Kaua'i Department of Public Works Division of Wastewater Management (County-DWM), 2006). Mr. Glenn Sato of the OED indicated that the Lydgate sewage treatment plant (STP) should be utilized by both the mauka residential units as well as the timeshare units in the buffer area (August 3, 2007 letter, OED). Hui Kako'o 'Aina Ho'opulapula and Kipukai Kualii noted the need to upgrade the current STP to ensure protection of the coastal area adjacent to the plant. In a letter from the DLNR-DAR, the existing WTP was also noted to be outdated and inefficient. DLNR-DAR recommended the incorporation of a more ecologically sound, economically viable system for Wailua.

DHHL intends to continue discussing and coordinating with the County-DWM to discuss the Wailua WWTP expansion plans, with the ultimate goal of connecting the mauka residential development and the makai timeshare and resort areas to the Wailua WWTP. According to Mr. Edward Tschupp of the County-DWM, the County is committed to continued discussion and coordination of these plans, but recognizes that a funding source must be identified in order to achieve this goal of both expanding and connecting to the Wailua treatment plant (personal communication, Mr. Edward Tshupp, October 4, 2007). DHHL plans to require the timeshare/resort/commercial developer to install the new sewer infrastructure and pay for DHHL's fair-share of the WWTP expansion costs. In the event that adequate capacity of the WWTP is not available to support Phase 1 of DHHL's development, DHHL will pursue a wastewater variance for the use of individual wastewater systems (IWSs) for Phase 1. The variance would be required due to current Department of Health regulations, which specify that IWSs can only be installed in subdivisions of fewer than 50 homes. In addition, IWSs can only be installed in lots having a minimum size of ¼ acre; however, this requirement would be met for the Phase 1 homes. Dry sewer lines will be installed concurrently with the IWSs during construction of Phase 1 with the goal of hooking up to the WWTP once expansion is achieved.

The island of Kaua'i has one landfill, located in Kekaha. Refuse collection is managed by the County of Kaua'i, Department of Public Works, Solid Waste Division (KI, 2007).

Electrical power to island residents is currently provided by Kaua'i Island Utility Cooperative (KIUC). There are two substations in the vicinity of the subject property: the Lydgate Substation and the Kapa'a Substation. A major pole-line system runs overhead along the Kuhio Highway corridor in the vicinity of the project area. Power is distributed either under- or aboveground from the pole-line system to individual pole-mounted or pad-mounted transformers. Street lights in the vicinity of the project area generally are high pressure sodium lamps attached to metal arms, which in turn are mounted on wooden poles. In a letter dated August 3, 2007 Mr. Sato of the OED stressed the importance of consulting with KIUC in the planning for infrastructure improvements, and requested that electrical lines be sited underground if possible. Mr. Sato also stressed the need to shield street lights to reduce impacts to Newell Shearwaters, use renewable energy such as solar water heater systems to reduce the infrastructure burden on KIUC, employ the use of Energy Star appliances in the residential and revenue-generating units, and utilize energy-efficient lighting in residential units, timeshare units, schools, and parks.

Land line telecommunication services in the vicinity of the project area are provided by Hawaiian Telcom (formerly Verizon Hawai'i), although service to the project area itself will be provided by Sandwich Isles Communication. In a letter dated August 9, 2007, Hawaiian Telcom personnel indicated that they do not anticipate impacts to their facilities from the Wailua Development Project. Overhead and underground cable (copper and fiber optic) lines run along Kuhio Highway (KI, 2007), with the poles along the Kuhio Highway corridor jointly owned by Hawaiian Telcom and KIUC (August 9, 2007 letter, Hawaiian

Telcom). Overhead and/or underground cable and any associated structures (i.e., poles) constructed on DHHL property will be owned by Sandwich Isles Communication.

Traffic signal cables are owned and operated by the DOT Highways Division, but are routed overhead on poles shared by Hawaiian Telcom and/or KIUC. Mr. Sato of the OED indicated that traffic in the vicinity of the project site is a concern, and that additional traffic signals may be required (August 3, 2007 letter, OED).

Wired cable television is provided by Oceanic Time Warner Cable. The distribution system for this service generally consists of overhead lines (coaxial and fiber optic) routed on utility poles running the length of Kuhio Highway.

#### *Potential Impacts and Mitigation*

The proposed project to provide the necessary infrastructure and utilities for homestead development would be accomplished in accordance with County of Kaua'i standards, with the exception that a variance to install IWSs may be pursued if the Wailua WWTP has not been expanded to a capacity adequate to handle the Phase 1 residences by the time their construction is complete. All infrastructure and utilities are planned for integration with existing systems, with upgrades to the wastewater conveyance system required to meet the full capacity of the proposed development. The development of the production well with its appurtenances is expected to provide adequate supply to Hawaiian homesteads in the project area.

The Proposed Action to develop the project site for Hawaiian homestead lots is considered to be consistent with long-term planning objectives pertaining to infrastructure. No adverse impacts are anticipated and no mitigation is required.

#### 4.2.9 Probable Adverse Impacts Which Cannot be Avoided

As stated in previous sections, temporary noise and sedimentation impacts during construction are unavoidable. Noise and sedimentation problems will be mitigated to the extent possible through the use of BMPs during construction. There would be a minimal change in the visual appearance of the scenic Kuhio Highway vista in the corridor adjacent to the makai land parcels, although the selected construction style will mitigate this to a level of insignificance. The aesthetic surroundings of the Malae Heiau would be altered with the construction of housing units, utilities, and roadways, but the construction design and large buffer would maintain the culturally significant surroundings of the Malae Heiau as well as the 'line of sight' between the Malae Heiau and the Poliahu Heiau.

The benefits of creating new homes for Hawaiian homesteaders outweigh the drawbacks of temporary noise and sedimentation, and the alteration of the Kuhio Highway vista. These impacts will be mitigated to the extent possible through BMPs during construction, and through careful design and planning of buildings along the Makai parcel.

#### 4.2.10 Irreversible and Irrecoverable Commitment of Resources

DHHL believes that the project should not be avoided due to the need to provide affordable housing for qualified native Hawaiians who have been waiting for years. Long term negative impacts include slight alteration of the scenic Kuhio Highway corridor and the surroundings of the Malae Heiau, although the line of sight between the Malae Heiau and the Poliahu Heiau would be maintained.

#### 4.2.11 Cumulative Impacts

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

Planned developments in the vicinity of the proposed action include the Hanamaulu Triangle and the Coco Palms Resort. Both will introduce additional traffic in the vicinity of the project site. The TIAR included in Appendix F and discussed in section 4.2.3 incorporated these projected increases into the overall project analysis, and determined that three intersections in the vicinity of the project could have a significant impact. Mitigation measures proposed in section 4.2.3, however, reduced all three impacts to a level of insignificance.

The Kapa‘a Bypass Route is anticipated to be constructed in the near vicinity of the proposed project, but may not happen prior to 2015. Design and construction of the bypass road should take into consideration similar mitigation measures to those proposed as part of this project. No other projects are planned in the near future or near vicinity of the proposed project, thus no negative cumulative impacts are anticipated for the project.

## **SECTION 5 RELATIONSHIP TO PLANS, POLICIES, AND CONTROLS**

### **5.1 State Land Use Plans and Policies**

Hawai'i State Plan. The Hawai'i State Plan, Chapter 226, HRS was developed as a guideline for the future growth of the State of Hawai'i. The State Plan identifies goals, objectives, policies, and priorities for the development and growth of the State. It provides a basis for prioritizing and allocating the limited resources such as public funds, services, human resources, land, energy, and water. The State Plan establishes a system for the formulation and program coordination of State and County plans, policies, programs, projects, and regulatory activities. The State Plan also facilitates the integration of all major State and county activities.

The proposed project would be in conformance with the State Plan's objectives and policies for socio-cultural advancement of the Hawaiian people. The proposed development will foster safe, sanitary and decent homes. By allowing the beneficiaries who are Hawaiian in ethnicity the opportunity to use the property as residential lots with the necessary infrastructure improvement, beneficiaries will be able to develop a community that fosters increased knowledge and understanding of the Hawaiian culture and lifestyle.

The project would also conform to the State Plan's policy to promote housing for the Hawaiian lifestyle. It is the long-term goal of the project to foster such a lifestyle. The neighborhood that would result from this project would reflect the culture of past Hawaiian communities.

State Functional Plan. The twelve State Functional Plans were adopted by the State Legislature in April 1984. These plans were formulated to specify in greater detail the policies, guidelines and priorities set forth in the Hawai'i State Plan. The twelve functional plans include; Energy, Transportation, Water Resources, Historic Preservation, Health, Education, Housing, Conservation Lands, Higher Education, Agriculture, Recreation, and Tourism.

The project is consistent with the policies and objectives of the State Functional Plans. This project provides the needed housing and infrastructure requirements for the people of Hawaiian ancestry and returns them to their land.

State of Hawai'i Land Use Law. Chapter 205, HRS promulgates the State Land Use Law. This law is intended to preserve, protect, and encourage the development of lands in the State of Hawai'i for uses that are best suited to the public health and welfare of its people. The LUC classifies all land into four districts: Urban, Conservation, Agriculture, and Rural. Most of the project area is designated within the State Agricultural District, with the exception of TMK 3-9-06:011 which is situated within the State's Urban Land Use District. DHHL Lands are exempt from land classification requirements for homestead development, thus no district boundary amendment will be necessary for the proposed project.

Coastal Zone Management (CZM) Program. The CZM Program is promulgated by Chapter 205A, HRS. The objectives and policies of the program are administered by the Office of State Planning. Through the CZM Program, each county is required to establish Special Management Areas (SMAs) and shoreline setbacks within which permits are required for development (see section 5.2 below).

## 5.2 County Land Use Plans and Policies

### Kaua‘i County General Plan.

The General Plan for the County of Kaua‘i is a policy document that expresses the broad goals and policies for the long-range development of the island of Kaua‘i. The plan was adopted in 2000. The General Plan is organized into multiple elements, with policies, objectives, standards, and principles for each. There are also discussions of the specific applicability of each element to the nine judicial districts comprising the County of Kaua‘i. Sections of the Plan that relate to project actions are presented verbatim in the following sections:

#### *SECTION 3 – CARING FOR LAND, WATER, AND CULTURE*

##### *(3.2) SCENIC VIEWS*

*In developing public facilities and in administering land use regulations, the County shall seek to preserve scenic resources and public views. Public views are those from a public place, such as a park, highway, or along the shoreline.*

##### *(3.3) HISTORIC AND ARCHAEOLOGICAL RESOURCES*

*In developing public facilities and in administering land use regulations, the County shall seek to preserve scenic resources and public views. Public views are those from a public place, such as a park, highway, or along the shoreline.*

##### *(3.6) NATIVE HAWAIIAN RIGHTS*

*Under the State Constitution and the County Charter, the County of Kaua‘i is empowered to promote the health, safety and welfare of all inhabitants without discrimination as to ethnic origin. As part of carrying out its responsibilities under the Constitution and the Charter, the County recognizes the rights of native Hawaiians and the laws concerning lands and waters that have been established through the State Constitution, State and Federal laws, and State and Federal court decisions. No County ordinance or rule shall modify or diminish these rights*

#### *SECTION 5 – PRESERVING KAUA‘I’S RURAL CHARACTER*

##### *(5.1) POLICY FRAMEWORK FOR LAND AND DEVELOPMENT*

*Allow build-out of properties in existing low-density agricultural communities, including the homestead areas of Wailua, Kapa‘a, Ōmao and Kalāheo and existing agricultural subdivisions in other parts of the island, while taking measures to assure the adequacy of County road, drainage, and water supply systems.*

##### *(5.2) AGRICULTURAL LANDS*

*Lands included within the Agriculture designation shall be predominantly used for or held in reserve to be used in the future for agricultural activities. These activities include the breeding, planting, nourishing and caring for, gathering, and processing of any animal or plant organism, including aquatic animals and plants, for the purpose of producing food or material for non-food products; the commercial growing of flowers or other ornamental plants; the commercial growing of forest products; and the commercial breeding and caring for domestic animals and pets.*

*(5.3) OPEN LANDS*

*The intent of the Open designation is to preserve, maintain or improve the natural characteristics of non-urban land and water areas that are of significant value to the public as scenic or recreation resources;*

*Lands designated Open shall remain predominantly free of development involving buildings, paving and other construction. With the exception of kuleanas and other small lots of record, any construction that is permitted shall be clearly incidental to the use and open character of the surrounding lands.*

*SECTION 6 – ENHANCING TOWNS AND COMMUNITIES AND PROVIDING FOR GROWTH*

*(6.3.3)(LIHUE) ISSUES AND OPPORTUNITIES*

*DHHL Wailua Lands. The Department of Hawaiian Home Lands has acquired 345 acres mauka of Kūhiō Highway, at the northern end of Kālepa Ridge. The land abuts Wailua River State Park, and surrounds the Mālae Heiau. Most of this property is suitable for urban development – potentially resort and commercial as well as residential. A portion of the property may be needed for the Kapa‘a By-Pass Highway. This property offers many opportunities for DHHL, and its eventual use will be important to the County and this region of the island.*

*DHHL also owns property on the makai side of Kūhiō Highway, overlooking Lydgate Park south of the Holiday Inn hotel. The property has good potential as a future resort and may be developed by DHHL as an income-producing asset. As of 1999, DHHL had no specific plans for the site.*

Heritage resources in the vicinity of the proposed project identified in the Kaua‘i General Plan include the Malae Heiau, the Hikina o Kala Heiau Hauola, the Kuhio Highway scenic roadway corridor, the project site land (open space, parks, agriculture, conservation), and Lydgate Park (resource parks and sites). The Land Use Map for the Lihue Planning District in the Kaua‘i General Plan designates the project site as agriculture land surrounded by open lands (Kalepa Ridge and Wailua River area), resort lands (Aloha Beach Resort), and park lands (Lydgate Park).

County Zoning. Zoning is a method by which the County of Kaua‘i regulates land use in accordance with the adopted land use policies mentioned above. DHHL’s mauka lands are situated entirely within the County’s Agriculture zoning district. The makai lands are situated within the County’s Open district (Figure 4-10). Because DHHL was elected to exempt development of its lands from the County’s land use policies, no rezoning actions will be necessary.

Special Management Area. The CZM Program, as previously mentioned, promulgates the creation of SMAs. SMAs are specially designated areas governed by specific county guidelines. Any development within a SMA requires a SMA permit from the appropriate county. An accepted EA fulfills a portion of the information necessary to apply for a SMA permit. The northeast corner of the mauka parcel is located within the SMA that extends primarily along all shoreline areas (Figure 5-1); therefore, a SMA Use Permit will be required for project actions.

### **5.3 Other Relevant Plans and Policies**

DHHL Wailua Regional Plan. The *Wailua Regional Plan* (DHHL, 2007) recommends the subject property for a combination of residential and revenue-generating uses. Specifically, the

plan recommends timeshare units on the makai parcel and single-family residential on the mauka parcel, with the developer bearing the costs of infrastructure installation and improvement for the residential subdivision development. Wailua was deemed the most desirable place for residential homesteading in a survey of beneficiaries conducted in 2004 as part of the Kauai'i island Plan. The proposed project is consistent with this plan.

DHHL Kaua'i Island Plan. The DHHL Kaua'i Island Plan designates the following land uses within the boundaries of the project site: residential, special district, commercial, community use, and subsistence agriculture (DHHL, 2005b). The proposed project is consistent with these planned use designations.

#### **5.4 Necessary Permits and Approvals**

Several permits and approvals would be required prior to construction of the project. Application for most of these permits cannot be made until the environmental review process (HRS Chapter 343) is completed. They are listed here under their granting agencies.

##### **State of Hawai'i**

Department of Health

Clean Water Branch

- NPDES Permits for hydrotesting and grading

Noise, Radiation and Indoor Air Quality Branch

- Noise Variance

##### **County of Kaua'i**

Department of Public Works

- Grading Permit
- Building Permits for all proposed house construction work

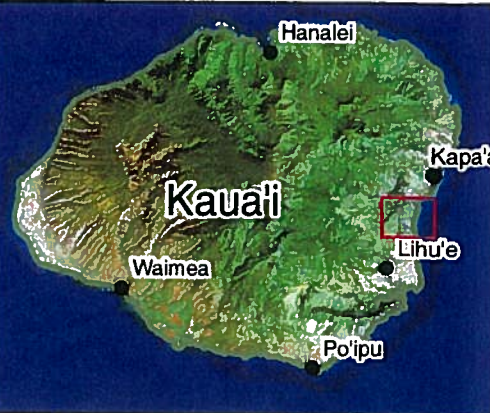
Planning Commission

- SMA Permit



# N Legend

- Coastline
- Development Boundary
- TMK Boundaries
- Heiau
- Special Management Area
- Buffer Lands
- Wailua River



Source: County of Kauai



## DHHL Wailua Development Project

### SMA Map

Figure 5-1

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## **SECTION 6 FINDINGS AND DETERMINATIONS**

In accordance with the provisions set forth in Chapter 343, HRS, this EA has preliminarily determined that the project will not have significant adverse impacts on the environment. DHHL is considering the issuance of a FONSI. Anticipated impacts will be temporary and will not adversely impact the environmental quality of the area. Therefore, it is recommended that an Environmental Impact Statement (EIS) not be required.

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

**(1) Involves an irrevocable commitment to loss or destruction of any natural or cultural resources.**

Development of the project will involve the irrevocable loss of certain environmental resources. However, the development of additional lots with improved infrastructure will benefit the Hawaiian beneficiaries of the State of Hawai'i by providing residential lots to those on the waiting list. The County of Kaua'i will benefit in terms of additional consumer spending on construction materials, home furnishings, and appliances and associated tax revenues.

**(2) Curtails the range of beneficial uses of the environment.**

The project will not curtail the range of beneficial uses of the environment. All properties proposed for this project are currently undeveloped vacant lands. Many of the surrounding areas are maintained as conservation and state park lands.

**(3) Conflicts with the State's long-term environmental policies or goals and guidelines as expressed in Chapter 343, HRS; and any revisions thereof and amendments thereto, court decisions, or executive orders;**

The project would be in conformance with the Chapter 343, HRS, State Environmental Policy, to enhance the quality of life. It is the long-term goal of the project to foster a Hawaiian lifestyle. The neighborhood that would result from this project would reflect the culture and values of the past Hawaiian communities.

The project involves developing lands that are currently designated prime agricultural lands by the State Department of Agriculture. This planned development is in conflict with the State's land designation, however DHHL Lands are exempt from land classification requirements for homestead development, thus no district boundary amendment or mitigation measures will be necessary for the proposed project.

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

The proposed low-density homestead development is not anticipated to have significant effects on the economic or social welfare of the community or the state. The proposed revenue-generating uses would provide a long-term benefit to the local economy.

**(5) Substantially affects public health;**

The proposed low-density project is not anticipated to have substantial effects on public health. Short-term impacts associated with construction are generally unavoidable and would be mitigated according to the measures described in Chapter 4.0 of this EA. DHHL will improve existing facilities and provide infrastructure necessary to support the proposed development. The development of basic support infrastructure such as drainage, water, communication and electrical utilities, will be done in accordance with county standards and integrated with existing systems.

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

The proposed homestead development will result in some secondary impacts; however, the proposed project is not expected to place enough of a demand to result in the need to increase the level of current facilities and services in the project area. In addition, area will be set aside for future development of a park and community center to provide both future residents of the development and the surrounding community with additional recreational opportunities.

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

The proposed project is not anticipated to involve a substantial degradation of environmental quality. The project site is currently undeveloped vacant land that is covered by an increasing greater percentage of introduced, invasive species.

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

The proposed low-density development is not anticipated to result in cumulative effects; therefore, it would not involve a commitment to larger actions.

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

The proposed project is not anticipated to have substantial effects on a rare, threatened, or endangered species, or any critical habitat. The botanical survey conducted in July 2007 did not find any flora listed or proposed for listing as Threatened or Endangered. No Threatened or Endangered fauna were seen or heard during a recent survey also conducted in July 2007.

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

No significant impacts on the area's long-term air or water quality or ambient noise levels are anticipated to result from the project. There will be some short-term impacts on the air quality and noise levels as a result of project construction. Adequate mitigation measures will be implemented as described in Section 4.0 of this EA.

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

The project is not anticipated to affect environmentally sensitive areas. However, the northeast corner of the mauka parcel is located within the tsunami inundation zone and the Special

Management Area. A discussion of these issues can be found in sections 4.1.9 and 5.2 of this EA.

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

The proposed low-density development and revenue-generating uses, including commercial areas and timeshare units, will affect the scenic view of the coast from Kuhio Highway, although this will be mitigated to a level of insignificance by incorporating low-rise buildings in a well-maintained, landscaped setting.

**(13) Requires substantial energy consumption.**

The proposed project will not require substantial energy consumption relative to other similar projects.

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**SECTION 8 AGENCIES AND ORGANIZATIONS CONSULTED**

	<b>Consulted Agency or Group</b>	<b>Response Received</b>
<b>Federal Agencies</b>	U.S. Army Corps of Engineers	
	U.S. Fish and Wildlife Service	✓
	U.S. Geological Survey	
<b>State Agencies</b>	Department of Health – Clean Water Branch	✓
	DLNR – Land Division	✓
	DLNR – State Historic Preservation Division	✓
	DLNR – Engineering Division	✓
	DLNR – Division of Forestry and Wildlife	✓
	DLNR – Division of State Parks	✓
	DLNR – Forestry and Wildlife, Kaua'i District	✓
	DLNR – Land Division, Kaua'i District	✓
	DLNR – Commission on Water Resource Management	✓
	DLNR – Division of Aquatic Resources	✓
	Department of Transportation	✓
<b>County of Kaua'i</b>	Planning Department	
	Department of Parks and Recreation	
	Department of Public Works	
	Office of Economic Development	✓
	Department of Water	✓
	Council Services	
<b>Individuals and Groups</b>	Sierra Club	
	Hawai'i Council Chairman James Arakaki	
	Kaua'i Island Utility Cooperative	
	Hawaiian Telcom	✓
	Office of Hawaiian Affairs – O'ahu	✓
	Office of Hawaiian Affairs – Kaua'i	
	Hui Kako'o Ho'opulapula	✓
	Kaua'i Community College	
	Kipukai Kualii	✓

**Individuals**

**Agencies**

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**APPENDIX A**  
**BOTANICAL SURVEY**



**BOTANICAL RESOURCES ASSESSMENT FOR THE  
DHHL WAILUA DEVELOPMENT, WAILUA, KAUAI**

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## INTRODUCTION

This report was prepared for use in the developmental plan for the DHHL Wailua Development Project. The botanical field survey was carried out on the 17<sup>th</sup> & 18<sup>th</sup> of July 2007. The primary objectives of the field studies were to:

- 1) provide a general description of the vegetation on the project site;
- 2) inventory the flora;
- 3) search for threatened and endangered species as well as species of concern; and
- 4) identify areas for potential environmental problems or concerns and propose appropriate mitigation measures.

Federal and State of Hawaii listed species status follows U.S. Fish and Wildlife (USFWS) (1999a and 1999b, 2004) and Federal Register (2002).

## SURVEY METHODS

Prior to undertaking the field studies, a search was made of the pertinent literature to familiarize the principal investigator with other botanical studies conducted in the general area. Topographic maps were examined to determine terrain characteristics, access, boundaries, and reference points.

A walk-through survey method was used. Notes were made on plant associations and distribution, disturbances, topography, substrate types, exposure, drainage, etc. Plant identifications were made in the field; plants which could not be positively identified were collected for later determination in the herbarium, and for comparison with the recent taxonomic literature.

## GENERAL SITE DESCRIPTION

The area proposed for development is located on the island of Kauai in the Wailua District just south of the Wailua River. Three main parcels, totaling approximately 450 acres were included in the botanical survey, 'southern makai parcel', 'northern makai parcel', and 'mauka parcel'. The substrate consists of reddish soils throughout and is defined as LhC (Lihue silty clay, 8 to 15 percent slope) and KdF (Kalapa silty clay, 40 to 70 percent slopes); both are well-drained soils (Foote et al., 1972).

The majority of the survey site is characterized by fallow agricultural fields. Several fires have recently swept through sections of the mauka parcel as well as the southern section of the northern makai parcel. There are several natural drainages in the mauka parcel that run mauka to makai, as well as agricultural ditches contouring the parcel. A large heiau is located in the northeast corner of the mauka parcel, but was not included in the botanical survey.

## DESCRIPTION OF THE VEGETATION

The project site is dominated by non-native plant species, composed mostly of a koa haole (*Leucaena leucocephala*) and Guinea grass (*Panicum maximum*) scrub within the fallow agricultural fields. Large alien tree species dominate the natural drainages and edges of the fallow fields. A total of 88 plant species were observed within the survey area, 83 are alien, three are Polynesian introductions, and two are indigenous. Therefore, 98% of the plant species observed are alien (including the Polynesian introductions), and 2% are native.

An inventory of all the plants observed within the survey area is presented in the species list at the end of the report.

### NORTHERN MAKAI PARCEL

This parcel is encompassed by Leho Drive on the south, east, and north, and by Kuhio Highway along the western delineation. The entire parcel appears to be fallow agriculture land with a recent fire burning the entire southern half of the parcel. The remaining vegetation within the northern section is characterized by Guinea grass with scattered scrub tree species.

Thick clumps of Guinea grass 6 to 8 feet tall with scattered trees of koa haole (*Leucaena leucocephala*) and macaranga (*Macaranga tanarius*) trees up to 28 feet tall are the dominant plants in the parcel. Other trees include, java plum (*Syzygium cumini*), Christmas berry (*Schinus terebinthifolius*), umbrella tree (*Schefflera actinophylla*), and African tulip tree (*Spathodea campanulata*). Coconut trees (*Cocos nucifera*) and Chinese banyan (*Ficus microcarpa*) line the property boundary along Leho Drive. Manienie (*Cynodon dactylon*) is the dominant grass species along the mowed section of Leho Drive. Several vines or twining species were observed in the koa haole understory including; white thunbergia (*Thunbergia fragrans*), *Ipomoea obscura*, and maunaloa (*Canavalia cathartica*). The recently burned section also appears to have been a koa haole/Guinea grass scrub land.

### SOUTHERN MAKAI PARCEL

The parcel is a relatively flat sloping away to the southwest corner. The vegetation is characterized by Koa haole scrub with scattered ironwood and java plum trees. Several sections of the parcel had been recently dozed down to bare soil. Two mules appear to be residing within the fenced site. There appears to be a small natural drainage at the northern end of the property along Leho Drive. Exposed boulders and evidence of intermittent flowing water was observed in the shallow drainage.

Most of the project site consists of a thick stand of koa haole trees up to 3 m tall. Scattered trees include, kolomona (*Senna surattensis*), common ironwood (*Casuarina equisetifolia*), java plum (*Syzygium cumini*), Christmas berry (*Schinus terebinthifolius*),



and macaranga (*Macaranga tanarius*). A Chinese banyan (*Ficus microcarpa*) is located on the southern fenceline between the property and the golf course. Several *Tabebuia pallida* trees line the eastern side of the property along Nehe Road. Coconut trees (*Cocos nucifera*) are located just outside the fence along Leho Drive. Guinea grass (*Panicum maximum*) and California grass (*Brachiaria mutica*) are the dominant grass species. Several vines or twining species were observed in the koa haole understory including; white thunbergia (*Thunbergia fragrans*), *Ipomoea obscura*, and maunaloa (*Canavalia cathartica*). Shrubs include sourbush (*Pluchea carolinensis*), slender mimosa (*Desmanthus pernambucans*), coral berry (*Rivina humilis*), and coffee senna (*Senna occidentalis*).

Two small noni (*Morinda citrifolia*) trees are located in the eastern section of the parcel. These plants along with the coconut trees were the only Polynesian introduced species observed within the makai parcels.

### MAUKA PARCEL

The mauka parcel is the largest of the three parcels and is located to the west or mauka of Kuhio Highway. The land slopes towards the Highway from the western boundary, delineated by a dirt road that contours along the top of the fallow fields. The northern boundary is a steep slope that is the southern bank of the Wailua River. The southern boundary was determined by a natural drainage that runs makai from the western boundary. The majority of the northern half of the parcel had been recently burned by wild fire, but the koa haole/ Guinea grass scrub vegetation was still recognizable as the koa haole stumps were still obvious and the Guinea grass was already starting to resprout.

Along with koa haole and Guinea grass, the vegetation observed within the unburned sections of the agricultural fields includes *Boerhavia coccinea*, creeping indigo (*Indigofera spicata*), castor bean (*Ricinus communis*), macaranga (*Macaranga tanarius*), maunaloa (*Canavalia cathartica*), and coat buttons (*Tridax procumbens*). The steep bank along the Wailua River, is dominated by alien tree and shrub species including, java plum (*Syzygium cumini*), Christmas berry (*Schinus terebinthifolius*), umbrella tree (*Schefflera actinophylla*), Chinese banyan (*Ficus microcarpa*), autograph tree (*Clusia rosea*), and sourbush (*Pluchea carolinensis*). Along the western boundary several large tree species are growing along the dirt road including, java plum, padang cassia (*Cinnamomum burmanii*), *Chrysophyllum oliviforme*, and milo (*Thespesia populnea*). These same trees, with the addition of several mango (*Mangifera indica*) also dominate the drainages that run mauka to makai through the parcel.

The northern drainage has a breach that allows a small trickle of water to run out of the drainage and through the fields creating a small wet stream that harbor plants such as nutgrass (*Cyperus rotundus*), kili`o`opu (*Kyllinga brevifolia*), Asiatic pennywort (*Centella asiatica*), and primrose willow (*Ludwigia octovalvis*). Weedy grass and shrub species were observed along the old cane haul roads within the survey area. They included, sourgrass (*Digitaria insularis*), natal redtop (*Melinis repens*), *Sida rhombifolia*,

golden crown-beard (*Verbesina encelioides*), khaki weed (*Alternanthera pungens*), field bindweed (*Ipomoea obscura*), and hairy abutilon (*Abutilon grandifolium*).

Three Polynesian introduced plant species were observed in this parcel. Several coconut trees (*Cocos nucifera*) are scattered throughout the parcel, noni (*Morinda citrifolia*) plants were observed along roadsides, and ti (*Cordyline fruticosa*) plants are growing along the flume at the upper or western boundary. Both indigenous plant species noted during this survey are found in the mauka parcel as well. Milo trees are growing at the western boundary and uhaloa (*Waltheria indica*) plants were observed abundantly scattered throughout the parcel.

## DISCUSSION AND RECOMMENDATIONS

The survey area has been utilized in the past for agriculture, thus the disturbance level is high within the property and dominated by alien vegetation. The three Polynesian introduced plant species found during the survey are, ki or ti (*Cordyline fruticosa*), niu or coconut palm (*Cocos nucifera*), and noni (*Morinda citrifolia*). Both native species observed within the survey area are indigenous (native to Hawaii and elsewhere), milo (*Thespesia populnea*) and uhaloa (*Waltheria indica*). Plants growing along the northern boundary of the mauka parcel (southern side of the Wailua River) should be preserved as grading and building along the top of the slope may cause runoff and the extant plants growing along the slope could help to mitigate unwanted runoff into the river.

The Wailua Golf course is in close proximity to the southern makai parcel. Stray golf balls were observed in all areas of the parcel. Mitigation to ensure that golf balls do not enter the area should be incorporated into the development plan.

None of the plants which occur on the project site is a threatened and endangered species or a species of concern (U.S. Fish and Wildlife Service, 1999a, 1999b, 2004; Wagner et. al., 1999). The proposed development of the three parcels is not expected to have significant negative impacts on the botanical resources of the site. Landscaping with native or Polynesian introduced plants is recommended for the project, with the goal of improving the botanical resources of the area.

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## PLANTS SPECIES LIST – DHHL Wailua Development

The following checklist is an inventory of all the plant species observed within the survey areas for the planned DHHL Development Project. The plant names are arranged alphabetically by family and then by species into each of three groups: Pteridophytes (Ferns and Fern Allies), Monocots, and Dicots. The taxonomy and nomenclature of the Ferns and Fern Allies follow Palmer (2002), while the flowering plants, Monocots and Dicots, are in accordance with Wagner *et al.* (1990) and Wagner and Herbst (1999). Recent name changes are those recorded in the Hawaii Biological Survey series (Evehuis and Eldredge, eds. 1999-2002).

For each species, the following name is provided:

1. Scientific name with author citation.
2. Common English and/or Hawaiian name(s), when known.
3. Biogeographic status. The following symbols are used:

I= indigenous= native to the Hawaiian Islands and elsewhere.

I?= questionably indigenous= data not clear if dispersal to the islands by natural or human-related mechanisms, but weight of evidence suggests probably indigenous.

P=Polynesian introduced=species that were introduced by the Polynesian migration to Hawaii, either intentionally or unintentionally, and are now naturalized.

X=introduced or alien = all those plants brought to the Hawaiian Islands by humans, intentionally or accidentally, after Western contact, that is Cook's arrival in the islands in 1778.

DHHL WAILUA DEVELOPMENT  
JULY 2007

SCIENTIFIC NAME	COMMON NAME	STATUS
<b>PTERIDOPHYTES</b>		
<b>THELYPTERIDACEAE</b>		
<i>Christella parasitica</i> (L.) Lev.	none	X
<b>MONOCOTS</b>		
<b>AGAVACEAE</b>		
<i>Cordyline fruticosa</i> (L.) A.Chev.	Ki, ti	P
<b>ARECACEAE</b>		
<i>Cocos nucifera</i> L	niu	P
<i>Phoenix</i> hybrid	Date palm	X
<b>COMMELINACEAE</b>		
<i>Commelina diffusa</i> N.L. Burm.	honohono	X
<b>CYPERACEAE</b>		
<i>Cyperus rotundus</i> L.	Nutgrass, nut sedge	X
<i>Kyllinga brevifolia</i> Rottb.	Kili`o`opu	X
<b>POACEAE</b>		
<i>Andropogon virginicus</i> L.	broomesedge	X
<i>Brachiaria mutica</i> (Forssk.) Stapf	California grass, para grass	X
<i>Cenchrus echinatus</i> L.	Common sandbur	X
<i>Chloris barbata</i> (L.) Sw	Swollen fingergrass, mau`u lei	X
<i>Cynodon dactylon</i> (L.) Pers.	manienie	X
<i>Digitaria insularis</i> (L.) Mez ex Ekman	sourgrass	X
<i>Melinis repens</i> (Willd.) Zizka	Natal redtop	X
<i>Panicum maximum</i> Jacq.	Guinea grass	X
<i>Paspalum fimbriatum</i> Kunth	Panama paspalum	X
<i>Saccharum officinarum</i> L.	Sugar cane, Ko	X
<i>Setaria verticillata</i> (L.) P. Beauv.	Bristly foxtail	X
<b>DICOTS</b>		
<b>ACANTHACEAE</b>		
<i>Asystasia gangetica</i> (L.) T. Anderson	Chinese violet	X
<i>Thunbergia fragrans</i> Roxb.	white thunbergia	X
<b>AMARANTHACEAE</b>		
<i>Alternanthera pungens</i> Kunth	Khaki weed	X

ANACARDIACEAE		
<i>Mangifera indica</i> L.	mango	X
<i>Schinus terebinthifolius</i> Raddi	Christmas berry	X
APIACEAE		
<i>Centella asiatica</i> (L.) Urb.	Asiatic pennywort	X
<i>Ciclospermum leptophyllum</i> (Pers.) Sprague ex Britton & Wilson	Fir-leaved celery	X
ARALIACEAE		
<i>Schefflera actinophylla</i> (Endl.) Harms	Octopus tree	X
ASTERACEAE		
<i>Bidens pilosa</i> L.	Spanish needle	X
<i>Emilia sonchifolia</i> (L.) DC. var. <i>sonchifolia</i> (L.) DC.	Flora's paintbrush	X
<i>Parthenium hysterophorus</i> L.	False ragweed	X
<i>Pluchea carolinensis</i> (Jacq.) G. Don	sourbush	X
<i>Sonchus oleraceus</i> L.	Sow thistle	X
<i>Synedrella nodiflora</i> (L.) Gaertn.	nodeweed	X
<i>Tridax procumbens</i> L.	Coat buttons	X
<i>Verbesina encelioides</i> (Cav.) Benth. & Hook.	Golden crown-beard	X
<i>Xanthium strumarium</i> L. var. <i>canadense</i> (Miller)	kikania	X
BIGNONIACEAE		
<i>Spathodea campanulata</i> P. Beauv.	African tulip tree	X
<i>Tabebuia pallida</i> (Lindley) Miers	tabebuia	X
BORAGINACEAE		
<i>Heliotropium amplexicaule</i> Vahl	heliotropium	X
BRASSICACEAE		
<i>Lepidium virginicum</i> L.	pepperwort	X
CASUARINACEAE		
<i>Casuarina equisetifolia</i> L.	Common ironwood	X
CLUSIACEAE		
<i>Clusea rosea</i> Jacq.	Autograph tree	X
CONVOLVULACEAE		
<i>Ipomoea obscura</i> (L.) Ker-Gawl	field bindweed	X
<i>Ipomoea triloba</i> L.	Little bell	X

CUCURBITACEAE		
<i>Momordica charantia</i> L.	Wild bittermelon	X
EUPHORBIACEAE		
<i>Chamaesyce hirta</i> (L.) Millsp.	Garden spurge	X
<i>Chamaesyce hyperocifolia</i> (L.) Millsp.	graceful spurge	X
<i>Chamaesyce prostrata</i> (Aiton) Small	Prostrate spurge	X
<i>Euphorbia cyathophora</i> J.A. Murray	Mexican fireplant	X
<i>Macaranga tanarius</i> (L.) Mull.Arg	none	X
<i>Phyllanthus debilis</i> Klein ex Willd.	niruri	X
<i>Ricinus communis</i> L.	Castor bean, Pa`aila	X
FABACEAE		
<i>Albizia saponaria</i> (Lour.) Blume ex Miq.		X
<i>Canavalia cathartica</i> Thouars	maunaloa	X
<i>Chamaecrista nictitans</i> (L.) Moench	Partridge pea	X
<i>Crotalaria incana</i> L.	Fuzzy rattlepod	X
<i>Desmanthus pernambucanus</i> (L.) Thell.	Slender or virgate mimosa	X
<i>Desmodium incanum</i> DC.	Spanish clover	X
<i>Indigofera spicata</i> Forssk.	Creeping indigo	X
<i>Indigofera suffruticosa</i> Mill.	indigo	X
<i>Leucaena leucocephala</i> (Lam.) de Witt	Koa haole	X
<i>Macroptilium lathyroides</i> (L.) Urb.	Wild bean, cow pea	X
<i>Mimosa pudica</i> var. <i>unijuga</i> (Duchass. & Walp.) Griseb.	Sensitive plant	X
<i>Senna alata</i> (L.) Roxb.	Candle bush	X
<i>Senna occidentalis</i> (L.) Link	coffee senna	X
<i>Senna surattensis</i> (Jacq.) Merr.	kolomona	X
LAMIACEAE		
<i>Salvia coccinea</i> Juss. Ex Murray	Scarlet or texas sage	X
LAURACEAE		
<i>Cinnamomum burmanii</i> (Nees) Blume	Padang cassia	X
MALVACEAE		
<i>Abutilon grandifolium</i> (Willd.) Sweet	hairy abutilon	X
<i>Malachra alceifolia</i> Jacq.		X
<i>Malvastrum coromandelianum</i> (L.) Garcke	false mallow	X
<i>Sida acuta</i> Burm. f. ssp. <i>Carpinifolia</i> (L.f.) Borss. Waalk.		X
<i>Sida rhombifolia</i> L.	none	X
<i>Thespesia populnea</i> (L.) Sol. Ex Correa	milo	I?

MORACEAE		
<i>Ficus microcarpa</i> L.f.	Chinese or Malayan banyan	X
MYRTACEAE		
<i>Syzygium cumini</i> (L.) Skeels	Java plum	X
NYCTAGINACEAE		
<i>Boerhavia coccinea</i> Mill.	none	X
<i>Bougainvillea sp.</i> A.L. Jussieu	bougainvillea	X
ONAGRACEAE		
<i>Ludwigia octovalvis</i> (Jacq.) P.H.Raven	Primrose willow	X
OXALIDACEAE		
<i>Oxalis corniculata</i> L.	Yellow wood sorrel	X
PASSIFLORACEAE		
<i>Passiflora edulis</i> Sims	Passion fruit	X
PHYTOLACCACEAE		
<i>Rivina humilis</i> L.	coral berry	X
PLANTAGINACEAE		
<i>Plantago major</i> L.	Common plantain	X
RUBIACEAE		
<i>Morinda citrifolia</i> L.	noni	P
<i>Spermacoce assurgens</i> Ruiz & Pav.	buttonweed	X
SAPOTACEAE		
<i>Chrysophyllum oliviforme</i> L.	none	X
STERCULIACEAE		
<i>Waltheria indica</i> L.	uhaloa	I
VERBENACEAE		
<i>Lantana camara</i> L.	Lantana, lakana	X
<i>Stachytarpheta cayennensis</i> (Rich.) Vahl	owi	X



**APPENDIX B**  
**FAUNAL STUDY**



**AVIFAUNAL AND FERAL MAMMAL FIELD SURVEY OF THE  
PROPOSED DHHL RESIDENTIAL DEVELOPMENT AT  
WAILUA, KAUAI**

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**25 July 2007**



## INTRODUCTION

The purpose of this report is to present the findings of a four (17-20 July 2007) field survey of the birds and mammals found on or near DHHL property, Wailua, Kauai (Fig. 1). In addition, pertinent published and unpublished sources of information on the fauna in similar habitat in this general region of Kauai are also noted to supplement the field survey data. The goals of the field survey were:

- 1- To document what species of birds and mammals currently occur on and near the property, with special attention to any native or migratory species.
- 2- Note any natural resources important to native and migratory species.

## SITE DESCRIPTION

Large areas of both the mauka and makai sections were recently burned. Those areas untouched by the fire contain a mix of largely alien grass, brush and trees. A small irrigation ditch on the mauka section contained a limited amount of running water.

Surrounding lands include: residential property; feral agricultural lands; golf course; Wailua River and riparian habitat.

## **SURVEY METHODS**

The property was surveyed for birds and mammals by walking the entire area each day during early morning and late afternoon when birds are most active and detectable. All species of birds seen or heard were noted and relative abundance estimates of alien birds (Table One) were determined by averaging the morning and afternoon total counts for each species. Observations of feral mammals were restricted to visual sightings and tracks. No attempts were made to trap mammals in order to obtain relative abundance estimates for each species. Such effort was impractical given the limited scope of the survey. Evening searches for the endangered Hawaiian Hoary Bat (*Lasiurus cinereus semotus*) were made using a Pettersson Elektronik AB Ultrasound Detector D 100. The weather during the survey was partly cloudy. Winds were 10-15 mph from the NE.

Scientific names used in this report follow Pyle (2002) and Honacki et al. (1982). These sources employ the taxonomy used in the current scientific literature.

## **RESULTS AND DISCUSSION**

### **Native Land Birds:**

No native land birds were recorded on the survey. The only possible species that might on occasion forage in this area is the Short-eared Owl or Hawaiian Owl known as

Pueo in Hawaiian (*Asio flammeus sandwichensis*). This species is listed as endangered by the State of Hawaii on the island of Oahu but not on Kauai. They range over a wide array of habitats including forest (both native and second growth) and agricultural lands. They nest on the ground in grass (Hawaii Audubon Society 2005).

#### **Native Waterbirds:**

The only waterbird recorded on the survey was a subadult Black-crowned Night Heron or 'Auku'u (*Nycticorax nycticorax hoactli*). This bird was seen along the ditch at the mauka boundary on 19 July. 'Auku'u' are the only native waterbird that is not listed as endangered or threatened. The endangered Hawaiian Goose (*Branta sandvicensis*) was reintroduced to Kauai in the 1990's. None were seen on this faunal survey but do on occasion frequent the Wailua Golf Course (pers. observ.). Their success on Kauai is believed to be due in part to the absence of the Small Indian Mongoose (*Herpestes auropunctatus*). The endangered Black-necked Stilt or Ae'o (*Himantopus mexicanus knudseni*) may forage in flooded areas following heavy rains or irrigation overflow.

#### **Seabirds:**

Two seabird species were observed flying over the property, the Great Frigatebird or 'Iwa (*Fregata minor palmerstoni*) and White-tailed Tropicbird or Koa'e kea (*Phaethon lepturus dorotheae*). The Newell Shearwater (*Puffinus auricularis newelli*), a

threatened species, nests in the mountains of Kauai and crosses over this property when flying from its nest burrows to the sea where it forages. When young birds leave the burrow and make their first trip out to sea in late fall they sometimes are attracted to urban lights and may strike power lines and fall on highways. Hawaii Audubon Society (2005) notes that a joint effort between state and federal biologists as well as Kauai residents rescue “nearly 1000 such birds annually”. Shields designed to direct the light downwards are being used on street lights to address the problem. Denny (1999) points out that despite these efforts the Newell Shearwater population continues to decline.

**Migratory Birds:**

No migratory shorebirds were recorded. This was not unexpected due to the time of year the survey was conducted. Migratory shorebirds breed in the arctic between May and August. The Pacific Golden-Plover or Kolea (*Pluvialis fulva*) is the most common migratory shorebird in Hawaii. They arrive from their breeding grounds in August and most establish foraging territories on lawns and in other open habitats which they actively defend until they depart back to the arctic in late April. The life history of this species has been extensively researched (Johnson et al. 1981, 1989, 1993, 2001a, 2001b). Kolea are protected by the Migratory Bird Treaty Act. They are not listed as threatened or endangered. Kolea would be expected to forage along the roads and other open areas on the mauka and makai sections of the property between August and the end of April.



**Alien (Introduced) Birds:**

A total of 18 alien species were recorded on the survey. Table One gives the names of these species and information on their relative abundance. None of these alien birds are listed as threatened or endangered. The array of alien birds at this location was typical of this type of habitat (Bruner 1988, 1990, 1992, 1993, 1999, 2002, 2005a, 2005b).

**Feral Mammals:**

The only feral mammals observed on the survey were pigs (*Sus scrofa*) and cats (*Felis catus*). A total of 16 pigs were observed along with five cats. Roof Rat (*Rattus rattus*) and House Mouse (*Mus musculus*) likely occur in this area. The endangered Hawaiian Hoary Bat or Ope'ape'a (*Lasiurus cinereus semotus*) was not seen despite three evenings of searching using an ultrasound detector. Ope'ape'a are seen frequently on Kauai. I have observed them both mauka and makai of the Kuhio Highway Wailua Bridge as recently as 2005. They are not restricted to native forest but can be seen in urban and agricultural areas as well as over bays and ponds (Tomich 1986, Kepler and Scott 1990).

## **EXECUTIVE SUMMARY**

This property has been significantly altered from its natural state by years of agricultural development dating before and after western contact. No endangered or threatened species were found on the survey. The proposed residential development will create a more diversified array of habitats which may result in an increase in the relative abundance of some alien birds which prefer more landscaped habitats and a decrease in the number of those species that prefer agricultural lands. These shifts in the local populations of alien birds will not significantly alter their overall abundance on Kauai. The threatened Newell Shearwater could be impacted by the increase of street lights due to the residential development. Some mitigation such as light shields to direct the light downwards can be of some help. The migratory Pacific Golden-Plover probably occurs on the property in low numbers during August to April. Following development the endangered Hawaiian Hoary Bat may frequent the site to forage for flying insects around lighted areas as they do elsewhere on Kauai (pers. observ.). Feral pigs and cats were observed on this site.

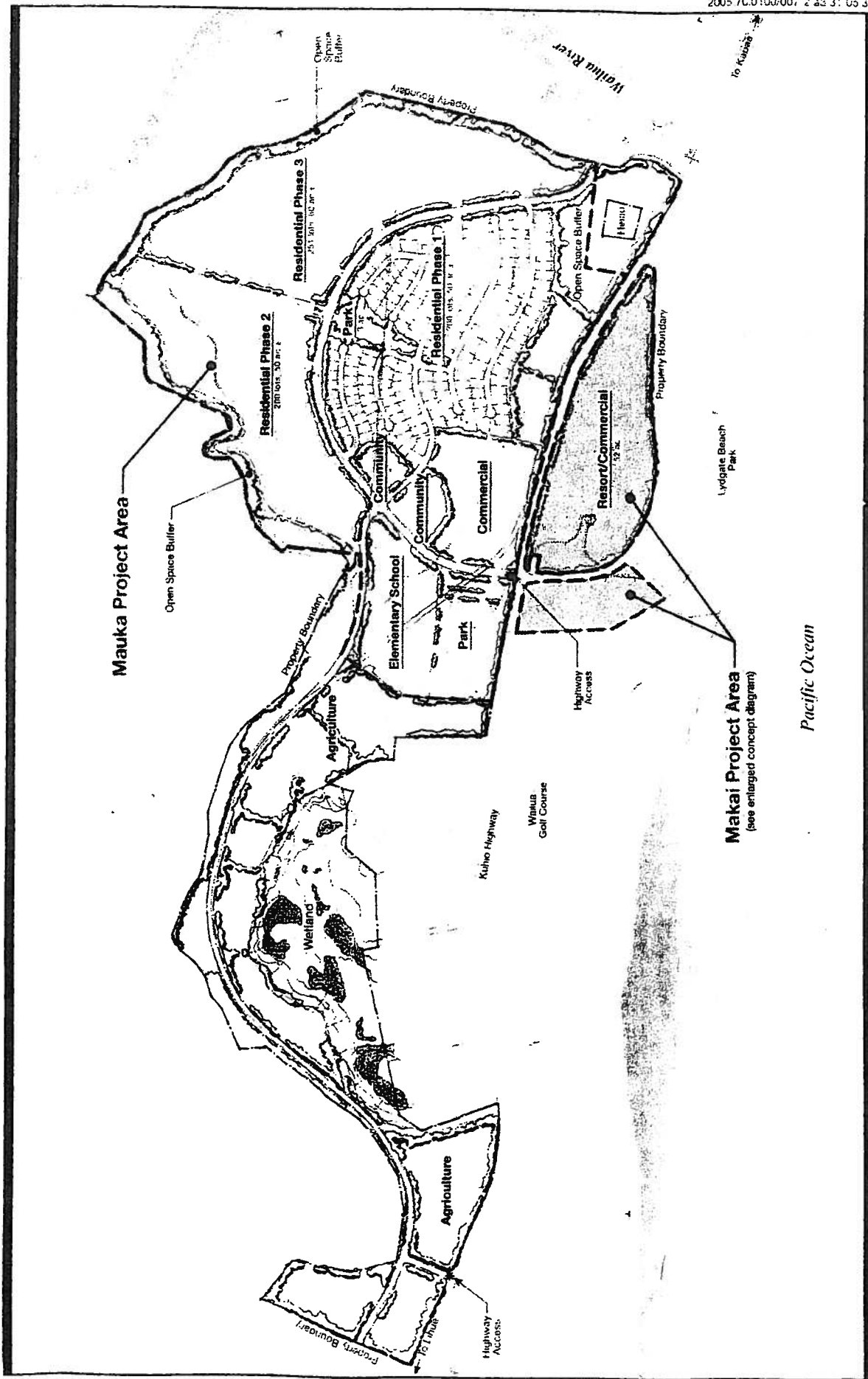


Fig. 1. Location of faunal (bird and mammal) field survey.

**TABLE 1**

Alien birds recorded on 17-20 July 2007 at the proposed DHHL Residential Development at Wailua, Kauai. Relative abundance estimates were calculated using the average of morning and late afternoon counts. Relative abundance: A=abundant (ave. 20+), C=common (ave. 10-19), U=uncommon (ave. less than 10), R=total number recorded over the course of the survey.

COMMON NAME	SCIENTIFIC NAME	RELATIVE ABUNDANCE
Cattle Egret	<i>Bubulcus ibis</i>	C
Red jungle Fowl	<i>Gallus gallus</i>	A
Ring-necked Pheasant	<i>Phasianus colchicus</i>	R=2
Spotted Dove	<i>Streptopelia chinensis</i>	A
Zebra Dove	<i>Geopelia striata</i>	A
Barn Owl	<i>Tyto alba</i>	R=1
White-rumped Shamma	<i>Copsychus malabaricus</i>	R=3
Hwamei	<i>Garrulax canorus</i>	U
Japanese White-eye	<i>Zosterops japonicus</i>	A
Common Myna	<i>Acridotheres tristis</i>	C
Red-crested Cardinal	<i>Paroaria coronata</i>	C
Northern Cardinal	<i>Cardinalis cardinalis</i>	C
House Finch	<i>Carpodacus mexicanus</i>	A
House Sparrow	<i>Passer domesticus</i>	U
Red Avadavat	<i>Amandava amandava</i>	A
Nutmeg Mannikin	<i>Lonchura punctulata</i>	C
Chestnut Munia	<i>Lonchura atricapilla</i>	C
Java sparrow	<i>Padda oryzivora</i>	R=2

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**APPENDIX C**  
**PHASE I ENVIRONMENTAL SITE ASSESSMENT**





**PHASE I  
ENVIRONMENTAL SITE ASSESSMENT**

**DHHL Wailua Development Project  
Kuhio Highway**

**Wailua, Kaua'i, Hawai'i 96746**

**TMK (4) 3-9-006, Parcels 9 and 11 and (4) 3-9-002, Parcels 3, 12, 17, 24, 25, 26, 27, and 35**

**Latitude: 22° 1' 45" N to 22° 2' 47" N  
Longitude: 159° 20' 15" W to 159° 21' 8" W**

**EI Project No.: 407-052**

**Prepared by:  
Environet, Inc.  
2850 Pa'a Street, Suite 212  
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**Prepared for:  
Community Planning and Engineering, Inc.  
1100 Alakea Street, Suite 600  
Honolulu, Hawai'i 96813**

**October 10, 2007**



Phase I Environmental Site Assessment  
DHHL Wailua Development Project  
TMK (4) 3-9-6, Parcels 9 and 11 and (4) 3-9-002, Parcels 3, 12, 17, 24, 25, 26, 27, and 35  
Wailua, Kaua'i, Hawai'i

A Report Prepared for:

Community Planning and Engineering, Inc.  
1100 Alakea Street, Suite 600  
Honolulu, Hawai'i 96813

**PHASE I ENVIRONMENTAL SITE ASSESSMENT  
DHHL WAILUA DEVELOPMENT PROJECT  
KUHIO HIGHWAY  
WAILUA, KAUA'I, HAWAI'I 96746  
TMK (4) 3-9-006, PARCELS 9 AND 11 AND (4) 3-9-002, PARCELS 3, 12, 17,  
24, 25, 26, 27, AND 35**

EI Project No.: 407-052

*We declare that, to the best of our professional knowledge and belief, we meet the definition of Environmental Professional as defined in §312.10 of 40 CFR 312.*

*We have the specific qualifications based on education, training, and experience to assess a property of the nature, history, and setting of the subject property. We have developed and performed the all appropriate inquires in conformance with the standards and practices set forth in 40 CFR Part 312.*

Prepared By:



Stephanie Mandina  
Project Manager



Colette Sakoda  
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October 10, 2007



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## EXECUTIVE SUMMARY

This report presents the results of Environet, Incorporated's (EI's) Phase I Environmental Site Assessment (ESA) of the Department of Hawaiian Homelands (DHHL) Wailua Development Project located on the property identified as tax map key (TMK) (4) 3-9-006, Parcels 9 and 11 and (4) 3-9-002, Parcels 3, 12, 17, 24, 25, 26, 27, and 35 (hereinafter referred to as the Site). The Site address is Kuhio Highway, which is located in Wailua, Hawai'i on the Island of Kaua'i. Our assessment and report has been performed in general accordance with the United States Environmental Protection Agency (EPA) "All Appropriate Inquiry" (40 Code of Federal Regulation (CFR) Part 312), as well as the American Society for Testing and Materials (ASTM) "Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process" (ASTM Designation E 1527-05; ASTM, 2005).

Our assessment was conducted to evaluate existing conditions, investigate the environmental history, and identify the presence of recognized environmental conditions (RECs) within and around the Site. A REC is *the presence or likely presence of any hazardous substances or petroleum products on a property under conditions that indicate an existing release, a past release, or a material threat of a release of any hazardous substances or petroleum products into structures on the property or into the ground, ground water, or surface water of the property* (ASTM E 1527-05).

Our research consisted of a review of historical and regulatory records, present conditions, site geology and hydrogeology, and interviews with persons knowledgeable of the Site. The Site is a multi-parcel property, which consists of 526 acres and is zoned Agriculture (A) and Open (O). EI's research shows that the Site was historically used for sugarcane cultivation from the early 1900s to approximately 2002. Subsequently, the Site has remained as undeveloped, vacant land. Surrounding properties have been used for agricultural, recreational, and commercial/residential land use purposes.

EI interviewed various persons who were familiar with past and current conditions at the Site and conducted a reconnaissance of the Site on Tuesday, July 17, 2007. Based on responses from interview questions and the Site reconnaissance, the Site is currently vacant land containing fallow sugarcane fields, several dirt roadways, a paved cane haul road, a number of irrigation ditches, and open wild lands. A recent fire in the area burned a majority of the ground vegetation; the remaining areas were covered with guinea grass, *koa haole*, and small bushes and shrubs. Kuhio Highway divides the Site into two portions: the *mauka* (landward) and *makai* (seaward) portions. The *mauka* portion of the Site is bordered by Kalepa Ridge to the west; Wailua River to the north; the County Correctional Facility and the Wailua Golf Course to the east; and undeveloped lands to the south. The *makai* portion of the Site is bordered by Lydgate Park, the Kaha Lani Resort, the Aloha Beach Resort, and the Wailua Wastewater Treatment Plant to the east, and the Wailua Golf Course to the southeast.

This assessment has not revealed evidence of current RECs in connection with the Site but has revealed historical evidence of a REC associated with the Site. The historic REC is described in detail in the body of the report and summarized below.

### **Historic REC**

Based upon EI's review of historical sources, including aerial photographs, topographic maps, tax assessor records, and interviews conducted with personnel closely associated with the Site, the Site had been previously occupied by sugar cane fields from the early 1900s to 2002. Herbicide and pesticide application (reported to include atozin, pentamethylene, amatrane, and carmax) was conducted regularly on the Site and included three applications to each crop. Although there were no visual indications of recognized environmental conditions at the Site or surrounding properties during EI's site reconnaissance, based on EI's experience with former sugarcane lands, it is possible that the application of pesticides applied to the sugarcane fields, over time, may have accumulated in the underlying soil, both at the Site and surrounding properties. Based upon the durational usage of the Site as agriculturally cultivated land and the proposed usage of the Site for residential development, the Site's agricultural land usage is considered a historic REC.

### **Historic REC at Adjacent Site**

A Leaking Underground Storage Tank (LUST) site (Wailua Wastewater Treatment Plant) located adjacent to the Site has reportedly been cleaned up and received a no further action (NFA) letter. This LUST site is a historic REC at an adjacent site (Section 4.8).

### **Other Items of Environmental Concern**

- The Site reportedly receives excess water that is discharged from an irrigation reservoir located above Kalepa Ridge via an old water tunnel. It is unknown whether this water contains hazardous chemicals/wastes or agricultural chemicals.
- The Site was also reportedly used as a temporary waste disposal site soon after the initial destruction caused by Hurricane Iniki in 1992. According to Site personnel, underlying soil (to a depth of approximately three inches below grade surface) in the area of the onsite waste disposal site was removed after the termination of these land use activities. According to Mr. Troy Tanigawa, Administrative Officer for the County of Kaua'i Solid Waste Program, soil testing was conducted to ensure that no residual contaminants were present in the area of the waste disposal site and clean backfill was brought in to restore the area to original grade.
- EI's review of the 1910 topographic map noted a railroad spur in the central portions of the *mauka* property side of the Site. Railroad spurs are typically considered environmental concerns because of the propensity for material dumping and spillage at these railroad dead ends.



- Refuse or fugitive dumping was observed on Parcel 11 of the *mauka* portion of the Site during the course of EI's reconnaissance activities. Items disposed of included automotive parts or containers. The observed refuse is a general house-keeping issue and is not expected to environmentally impact the Site.

### **Data Gaps**

- During the due diligence process for the Site, EI requested building permit information from the County of Kaua'i's Real Property Assessment Division. Results of this request are still pending. This data gap may have the potential to impact our ability to identify RECs at the Site because we were unable to confirm historical permits for the Site. These permits may have included facilities, such as underground storage tanks. It is EI's opinion, however, that this does not represent a significant data gap, and should findings of this permit search affect the conclusions of this report, an addendum to this report will be provided.
- During the site reconnaissance activities for the Site, some portions were completely covered with dense undergrowth and low-lying vegetation. Therefore, EI was unable to completely view some portions of the Site for the presence of material storage or evidence of historical facilities, such as underground storage tanks. This data gap may have the potential to impact our ability to identify RECs at the Site because we were unable to observe certain portions of the Site. It is EI's opinion, however, that based on interview material and other historical sources, this does not represent a significant data gap.

## 1.0 INTRODUCTION

This report presents the results of Environet, Incorporated's (EI's) Phase I Environmental Site Assessment (ESA) of the Department of Hawaiian Homelands (DHHL) Wailua Development Project, a property located at Kuhio Highway in Wailua on the Island of Kaua'i (hereinafter referred to as the Site). The property is denoted by TMK: (4) 3-9-006, Parcels 9 and 11 and (4) 3-9-002, Parcels 3, 12, 17, 24, 25, 26, 27, and 35 (Figure 1; Appendix A: Photos 1 through 9).

The purpose of this assessment was to evaluate, on the basis of readily available information, the presence of recognized environmental conditions (RECs) at and surrounding the Site. EI's assessment of the Site has been performed by qualified environmental professionals as defined by, and in general accordance with the United States Environmental Protection Agency (EPA) "All Appropriate Inquiry" (40 Code of Federal Regulation (CFR) Part 312), as well as the American Society for Testing and Materials (ASTM) E 1527-05; which defines a REC as *the presence or likely presence of any hazardous substances or petroleum products on a property under conditions that indicate an existing release, past release, or a material threat of a release of any hazardous substances or petroleum products into structures on the property or into the ground, ground water, or surface water of the property* (ASTM E 1527-05). The scope of work for this ESA includes the following six elements:

1. **REVIEW OF SITE GEOLOGY AND HYDROGEOLOGY** - Includes a review of pertinent, available documents and maps regarding local geology and hydrogeology.
2. **REVIEW OF REGULATORY RECORDS** - Includes a review of publicly available federal, state, and local databases of known or potential hazardous waste sites, landfills, and sites currently under investigation for environmental violations within the ASTM recommended search distance of the Site.
3. **REVIEW OF SITE HISTORY** - Includes a review and interpretation of available historical sources, such as Sanborn Fire Insurance maps, archival topographic maps, and aerial photographs. Maps and photographs of the area surrounding the Site were examined to obtain information regarding historical land use that may or could have involved the manufacture, generation, use, storage and/or disposal of hazardous substances. This review also includes the gathering of information regarding past and/or current Site development and/or land use provided by the County of Kaua'i Building Permits and Land Use Department.
4. **SITE RECONNAISSANCE** - Includes performing a reconnaissance of the Site and adjoining areas to make visual observations of existing site conditions, improvements, and/or operations; types of land use; and nature of businesses.
5. **PERSONNEL INTERVIEWS** - Includes interviews with current and historical property representatives, past owners, operators, and occupants at the property, who are familiar with the Site, and who are likely to have material information regarding the potential for contamination in order to obtain specialized Site knowledge and

Phase I Environmental Site Assessment  
DHHL Wailua Development Project  
TMK (4) 3-9-6, Parcels 9 and 11 and (4) 3-9-002, Parcels 3, 12, 17, 24, 25, 26, 27, and 35  
Wailua, Kaua'i, Hawai'i

evaluate Site land use, Site history, Site operations, and Site maintenance procedures. Potential interviewees include: subject property owner(s), property manager(s), tenants, maintenance workers, and adjacent property owner(s) (for abandoned properties).

6. **DATA EVALUATION AND REPORT PREPARATION** - Includes a compilation of all the information gathered and preparation of this report. This report describes the research performed, EI's findings, professional opinions, and conclusions.

## 2.0 SITE DESCRIPTION

This section describes the Site location and general environmental characteristics based on record reviews. Detailed descriptions of Site conditions observed during the Site reconnaissance are provided in Section 6.1.

### 2.1 General Site and Vicinity Characteristics and Zoning

The Site is a multi-parcel property which encompasses 526 acres of land in the Wailua area on the Island of Kaua'i (Figures 1 through 3), including 52 acres "*makai*" (seaward) of Kuhio Highway and approximately 474 acres "*mauka*" (landward) of the Kuhio Highway. The Site is currently vacant, undeveloped land which was previously used for agricultural cultivation.

According to the County of Kaua'i Planning Department, the Site is zoned as *A-Agriculture District* and *O-Open District*. The purpose of the Agriculture District is to: "1) protect the agriculture potential of lands within the County of Kaua'i to ensure a resource base adequate to meet the needs and activities of the present and future; 2) assure a reasonable relationship between the availability of agriculture lands for various agriculture uses and the feasibility of those uses; and 3) limit and control the dispersal of residential and urban use within agriculture lands" (Kaua'i County Code, Kaua'i Board of Realtors website <http://kauai-realtor.com/czo.htm>).

The purpose of the Open District is to: "1) preserve, maintain or improve the essential characteristics of land and water areas that are: of significant value to the public as scenic or recreational resources; important to the overall structure and organization of urban areas and which provide accessible and usable open areas for recreational and aesthetic purposes; and, necessary to insulate or buffer the public and places of residence from undesirable environmental factors caused by, or related to, particular uses such as noise, dust, and visually offensive elements; 2) preserve, maintain or improve the essential functions of physical and ecological systems, forms or forces which significantly affect the general health, safety and welfare; 3) define and regulate use and development within areas which may be potentially hazardous; 4) include areas indicated on the County General Plan as open or as parks; and 5) provide for other areas which because of more detailed analysis, or because of changing settlement characteristics, are determined to be of significant value to the public" (Kaua'i County Code, Kaua'i Board of Realtors website <http://kauai-realtor.com/czo.htm>).

Historically the surrounding Wailua area has been used for commercial, recreational, and agricultural purposes. The uses of the properties immediately adjacent to the Site are shown on Figure 3.

## 2.2 Physical Setting

This section presents a summary of the Site's physical environment based on published information.

### 2.2.1 Topographic Review

The 1996 USGS Topographic Map of the area (Figure 1) shows the Site as gently sloping from west to east with an elevation ranging from approximately 200 feet above mean sea level (msl) along the base of Kalepa Ridge to near sea level at the eastern boundary. The Site is approximately 300 feet south of Wailua River and approximately 500 feet west of the Pacific Ocean. According to a National Wetland Inventory Map (United States Fish and Wildlife Service (USFWS), 1978), a wetland is present on the southern portion of the Site. There are also several irrigation and drainage ditches crossing the Site. There are no other significant topographic features near the Site.

### 2.2.2 Geologic Review

EI reviewed published geologic and hydrogeologic reports and maps to obtain available information regarding subsurface conditions in the general area of the Site.

#### *Geology*

Kaua'i is the northernmost of the five major Hawaiian Islands. It is part of a group of northwest trending summits of semi-submerged shield volcanoes. Kaua'i was formed from numerous olivine basalt flows originating from a single great shield volcano, Wai'ale'ale. The rocks of the shield volcano are named the Waimea Canyon Volcanic Series and were deposited approximately three million years ago. The volcano remained quiet for the next 1.5 million years while erosion bit deeply into the shield. This extensive erosion removed much of the shield form, leaving behind well-developed ridges and valleys. This was followed by a period of renewed volcanism, which spread new volcanic rocks over large areas of the eroded surface. This period of renewed volcanism, together with the closely associated sedimentary rocks, is known as the Koloa Volcanic Series (Macdonald, *et al.*, 1983; Stearns, 1985).

The Site is located on a coastal plain extending up to one mile inland from the shore that was formed from recent alluvial and beach deposits.

#### *Soil*

Soil in the Site area includes soil from five series: Lihue, Kaena, Hanamaulu, Koloa, and Mokuleia (Foote *et al.*, 1972). The surface soil within the Site consists of the following soil types: Lihue silty clay, 0 to 8 percent slopes (LhB), Lihue silty clay, 8 to 15 percent slopes (LhC), Lihue silty clay, 15 to 25 percent slopes (LhD), Kaena clay, brown variant, 1 to 6 percent slopes (KavB), Kaena clay, brown variant, 6 to 12 percent slopes (KavC), Hanamaulu silty clay, 15 to 25 percent slopes (HsD), Hanamaulu stony silty clay, 10 to 35 percent slopes (HtE), Koloa

stony silty clay, 3 to 8 percent slopes (KvB), Mokuleia fine sandy loam (Mr), and Mokuleia clay loam, poorly drained variant (Mta) (Foote *et al.*, 1972). The individual soil series and soil types are described below.

#### Lihue Series

This series consists of well-drained soils on uplands of Kaua'i. These soils developed in material weathered from basic igneous rock. They are gently sloping to steep; elevations range from sea level to 800 feet. Annual rainfall amounts to 40 to 60 inches. Lihue soils are geographically associated with Ioleau and Puhi soils.

#### Lihue silty clay, 0 to 8 percent slopes (LhB)

This soil is on the tops of broad interfluves in the uplands. The surface layer is a dusky red silty clay approximately 12 inches thick. The subsoil, more than 48 inches thick, is dark-red and dark reddish-brown, compact silty clay that has subangular blocky structure. The substratum is soft, weathered rock. The surface layer is strongly acid and the subsoil is slightly acid to neutral. Permeability is moderately rapid, runoff is slow, and the erosion hazard is no more than slight. Available water capacity is 1.5 inches per foot of soil and roots penetrate to a depth of 5 feet or more.

#### Lihue silty clay, 8 to 15 percent slopes (LhC)

Refer to Lihue silty clay, 0 to 8 percent slopes (LhB). On this soil runoff is slow and the erosion hazard is slight.

#### Lihue silty clay, 15 to 25 percent slopes (LhD)

Refer to Lihue silty clay, 0 to 8 percent slopes (LhB). On this soil runoff is medium and the erosion hazard is moderate.

#### Kaena Series

This series consists of very deep, poorly drained soils on alluvial fans and talus slopes on O'ahu and Kaua'i. These soils developed in alluvium and colluvium from basic igneous material. They are gently sloping to steep and are commonly stony. Elevations range from 50 to 150 feet. The annual rainfall amounts to 30 to 45 inches. Kaena soils are geographically associated with Honouliuli, Lualualei, and Waialua soils.

#### Kaena clay, brown variant, 1 to 6 percent slopes (KavB)

This soil occurs on alluvial fans on Kaua'i. It is geographically associated with Kalapa soils. This variant is somewhat poorly drained, and the surface layer is browner than typical Kaena series soils. It occurs at elevations up to 500 feet and the rainfall amounts to 50 to 75 inches per year. Permeability is slow to moderately slow. Runoff is slow and the erosion hazard is slight. The available water capacity is about 1.5 inches per foot of soil and roots penetrate up to a depth of 5 feet or more.

Kaena clay, brown variant, 6 to 12 percent slopes (KavC)

This soil occurs on Kaua'i. It is geographically associated with Kalapa soils. It is similar to Kaena clay, brown variant, 1 to 6 percent slopes, except for the slope. Runoff is medium and the erosion hazard is slight to moderate.

Hanamaulu Series

This series consists of well-drained soils on stream terraces and steep terrace breaks on the island of Kaua'i. These soils developed in alluvium washed from upland soils. They are nearly level to strongly sloping. Elevations range from 200 to 700 feet. The annual rainfall amounts to 60 to 100 inches. Hanamaulu soils are geographically associated with Kapa'a and Hihimanu soils.

Hanamaulu silty clay, 15 to 25 percent slopes (HsD)

On this soil, runoff is medium and the erosion hazard is moderate. Included in mapping were some areas that have a dark reddish-brown surface layer.

Hanamaulu stony silty clay, 10 to 35 percent slopes (HtE)

This soil has a profile like that of Hanamaulu silty clay, 3 to 8 percent slopes, except that it is stony and the slope is as much as 35 percent. The stones interfere with the operation of farm machinery. Runoff is medium to rapid and the erosion hazard is moderate to severe. Included in mapping were some areas that have a dark reddish-brown surface layer.

Koloa Series

This series consists of well-drained soils on slopes of old volcanic vents and upland ridges on the island of Kaua'i. These soils are underlain by hard rock at a depth of 20 to 40 inches. They developed in material weathered from basic igneous rock. They are gently sloping to moderately steep. Elevations range from nearly sea level to 300 feet. The annual rainfall amounts to 40 to 60 inches. Koloa soils are geographically associated with Mamala and Waikomo soils.

Koloa stony silty clay, 3 to 8 percent slopes (KvB)

This soil occurs on upland slopes. Included in mapping were small areas that are more than 40 inches deep. In a representative profile the surface layer is dark reddish-brown stony silty clay about 7 inches thick. The subsoil, about 13 inches thick, is dark-red and dark reddish-brown stony silty clay that has subangular blocky structure. The substratum is hard rock. The soil is slightly acid to neutral throughout the profile. Permeability is moderately rapid. Runoff is slow and the erosion hazard is slight.

### Mokuleia Series

This series consists of well-drained soils along the coastal plains on the islands of O'ahu and Kaua'i. These soils formed in recent alluvium deposited over coral sand. They are shallow and nearly level. Elevations range from nearly sea level to 100 feet. The annual rainfall amounts to 15 to 40 inches on O'ahu and 50 to 100 inches on Kaua'i. Mokuleia soils are geographically associated with Hanalei, Jaucas, and Keaau soils.

#### Mokuleia fine sandy loam (Mr)

This soil occurs on the eastern and northern coastal plains of Kaua'i. It is nearly level. This soil has a profile like that of Mokuleia clay loam, except for the texture of the surface layer. Permeability is moderately rapid in the surface layer and rapid in the subsoil. Runoff is very slow and the erosion hazard is slight.

#### Mokuleia clay loam, poorly drained variant (Mta)

This soil occurs on Kaua'i. It is nearly level. The soil is poorly drained, and in this way, it differs from other soils of the Mokuleia series. The surface layer is dark brown to black and is mottled (Foote *et al.*, 1972).

### *Hydrogeology*

Drinking water in the Hawaiian Islands is primarily drawn from basal groundwater. Basal groundwater is formed by rainwater percolating down through the residual soils and permeable volcanic rock. The entire island situated below sea level, except within rift zones of the volcanoes, is saturated with ocean salt water. Percolating fresh water moving downward floats on and displaces the denser salt water and thus forms a basal lens called the "Ghyben-Herzberg" lens. A zone of transition between the fresh groundwater and the ocean salt water occurs due to the constant movement of the interface as a result of tidal fluctuations, seasonal fluctuations in recharge and discharge, and of aquifer development (Macdonald *et al.*, 1983).

Impermeable layers, such as dense lava flows, alluvial clay layers, and volcanic ash, may stop downward percolation of rainwater. The groundwater then forms a perched or high-level aquifer, which is not in contact with salt water. Recharge of the aquifer occurs in areas of high rainfall, which are the interior mountainous areas. The groundwater flows from the recharge areas to the areas of discharge along the shoreline. Frictional resistance to groundwater flow causes it to pile up within the island until it attains sufficient hydraulic head to overcome the friction. For this reason basal groundwater acquires a slope toward the shoreline.

Due to the complex geology of the island, and the varying permeability of the lava flows, the development of a large Ghyben-Herzberg lens is not favorable on Kaua'i. Massive, low permeability flows may inhibit the development of a lens, and in areas of high permeability strata, structures like dikes or faults or low recharge often inhibit or preclude well-developed fresh water lenses (Macdonald *et al.*, 1983). Therefore, basal groundwater may be discontinuous across the island.



The site rests upon Koloa lavas, which overlie Palikea lava flows. Koloa lavas usually contain small amounts of groundwater, mostly in clinker beds, and perched groundwater is found in discontinuous bodies. Basal groundwater is usually found in the Palikea formation, at depth (Macdonald *et al.*, 1983).

According to Mink and Lau (1992), the northern portion of the Site is underlain by two aquifers. The upper aquifer, code 20103111 (21111), is listed as an unconfined (the aquifer is not confined under pressure beneath relatively impermeable rocks or soil), basal (fresh water in contact with seawater), flank-type (contained in horizontally extensive lavas) aquifer. This aquifer has potential use and is used as a drinking water source. This irreplaceable aquifer contains fresh water [less than 250 milligrams per liter of chlorine ions (mg/L Cl<sup>-</sup>)] and is listed as having a high vulnerability to contamination.

The lower aquifer, code 20103122 (21113), is listed as confined (the aquifer is confined under pressure beneath relatively impermeable rocks or soil), basal (fresh water in contact with seawater), dike-type (contained in dike compartments) aquifer. This aquifer has potential use and is used as a drinking water source. This irreplaceable aquifer contains fresh water (less than 250 mg/L Cl<sup>-</sup>) and is listed as having low vulnerability to contamination (Mink and Lau, 1992).

The southern portion of the Site is underlain by two separate aquifers. The upper aquifer, code 20102116 (22211), is listed as an unconfined (the aquifer is not confined under pressure beneath relatively impermeable rocks or soil), basal (fresh water in contact with seawater), sedimentary-type (contained in non-volcanic lithology) aquifer. This aquifer has potential use and is ecologically important. This irreplaceable aquifer has low salinity (less than 250 to 1,000 mg/L Cl<sup>-</sup>) and is listed as having a high vulnerability to contamination.

The lower aquifer, code 20102111 (21212), is listed as unconfined (the aquifer is not confined under pressure beneath relatively impermeable rocks or soil), basal (fresh water in contact with seawater), flank-type (contained in horizontally extensive lavas) aquifer. This aquifer has potential use and is used as a drinking water source. This irreplaceable aquifer contains low salinity (250 to 1000 mg/L Cl<sup>-</sup>) and is listed as having moderate vulnerability to contamination (Mink and Lau, 1992).

Groundwater resources in the area are listed as being in the Wailua and Hanamaulu aquifer systems of the Lihue aquifer sector. The Mink and Lau aquifer designation for the Site is shown in Figure 1. Annual rainfall for the Site area is approximately 60 inches (Juvik, 1998).

Based on the elevation of the Site, which ranges from approximately 200 feet above msl along the base of Kalepa Ridge to near sea level at the eastern boundary, the depth to groundwater at the Site varies greatly depending on the topography. Generally, groundwater travels downgradient towards the ocean. Therefore, the groundwater gradient in the vicinity of the Site is probably to the east-southeast toward the Pacific Ocean.

### 2.2.3 Wells and Drinking Water Sources

In the vicinity of the Site, the Underground Injection Control (UIC) line runs along Kuhio Highway, which divides the *mauka* and *makai* portions of the Site (Figure 1). The UIC line was established by the State of Hawai'i Department of Health (HDOH) to protect groundwater resources. Groundwater *mauka* of the UIC line is considered a potential drinking water source. Groundwater seaward *makai* of the UIC line is considered as non-potable and saline. Injection wells are prohibited above (*mauka* of) the UIC line.

Wells within approximately one mile of the Site are shown on Figure 1 and in the Environmental Data Resources, Inc. (EDR) well search report (Appendix B). The wells illustrated in Figure 1 are from the HDOH UIC program and are based on information from July 6, 1984. The wells illustrated and listed in the EDR report (Appendix B) include information up to approximately 2005. Some wells are illustrated in both Figure 1 and the EDR map.

There is one irrigation well located on the Site, which is owned by the County of Kauai. This irrigation well is reportedly used to irrigate the Wailua Golf Course. Offsite wells in the vicinity of the Site included two drinking water wells, which were located approximately 3,000 feet to the north of the Site in the town of Wailua, and one injection well located approximately 2,000 feet southeast of the Site. Based on the relative distance and location of the vicinity wells, it is unlikely that any previous Site activities would have impacted the drinking water wells. Likewise, the injection well located southeast of the Site is not expected to represent an environmental concern for the Site.

## **2.3 Past Land Use of Site and Surrounding Properties**

The following subsections discuss EI's findings regarding the Site and surrounding area history that could be gleaned from historic building permits, aerial photographs, maps, tax records, and tax assessment records. There were no Sanborn Fire Insurance maps available for the Site.

### 2.3.1 Building Permits

EI submitted a request to review building permits for the Site at the County of Kaua'i Real Property Assessment Division. Results of this request are pending. Should the findings of these permits affect the conclusions of this report, an addendum will be provided.

### 2.3.2 Aerial Photographs and Maps

Past land use was evaluated by reviewing historical topographic maps (1910, 1941, 1963, 1983, and 1996) and aerial photographs (1950, 1959, 1965, and 2007) which were available at the State Archives library. The 2007 aerial photograph was obtained using *Google Earth* and is included as Figure 2. EI selected representative documents for discussion below to show the evolution of the Site and the surrounding area.

The 1910 Kapa'a Quadrangle *Territory of Hawai'i* map depicted the Site area and surrounding areas as undeveloped land. The *mauka* side of the Site was composed of a hillside, which sloped moderately towards the east in the direction of the Pacific Ocean. A two-lane, north-to-south directional road (currently Kuhio Highway) bisected the eastern perimeter of the *mauka* side of the Site and the western perimeter of the *makai* portion of the Site. A railroad track was also depicted parallel along the western side of the roadway, with a railroad spur ending within the northeast quadrant of the *mauka* side of the Site. An east-to-west directional irrigation ditch or cane haul road was depicted across the middle of the *mauka* side of the Site. No developments or improvements were indicated on the *makai* side of the Site.

The 1941 Kapa'a Quadrangle USGS map did not differ significantly from the 1910 map. The only major difference was that the *mauka* side of the Site had less of a slope, indicating that it may have been graded or substantially affected by natural causes.

The 1950 aerial photograph showed the Site, both the *mauka* and *makai* portions, as agriculturally cultivated land. The roadway and railroad along with several cane haul roads and a network of irrigation ditches were visible on the Site. No significant development was shown in the area with the exception of the farm town of Wailua, which is located approximately 2,500 feet to the north of the Site.

The 1959 aerial photograph showed the Site and the surrounding area conditions similar to the previous 1950 aerial photograph.

A 1963 Kapa'a Quadrangle USGS map depicted the Site similarly to the 1941 topographic map. The most significant difference was that the railroad, which previously aligned the roadway (currently Kuhio Highway), was no longer indicated in the 1963 topographic map. A heiau ("Malae Heiau"), or Hawaiian temple, was depicted at the northeast corner of the Site. A roadway was also depicted circumventing the eastern perimeter of the Site's *makai* portions.

The 1965 aerial photograph showed the Site and the surrounding area conditions similar to the previous 1959 aerial photograph.

The 1983 Kapa'a Quadrangle USGS map was similar to the previous 1963 topographic map. A sewage disposal facility was notated just east of the "*makai* property" portion of the Site.

The 1996 Kapa'a Quadrangle USGS map was similar to the 1983 topographic map. The Site was undeveloped and previously depicted cane haul roads and irrigation ditch systems were no longer indicated on the Site.

In the 2007 aerial photograph, the Site and vicinity were shown to be in the same condition as observed during EI's site reconnaissance of the property.

In summary, the historic topographic maps and aerial photographs indicate that the Site consisted of agriculturally cultivated land. The only major developments on the Site depicted or viewed in the above historical sources were various roadways, railroads, and irrigation ditch

systems. The maps and photographs did not reveal evidence, such as unusual structures, that would indicate a current REC; however the long-term historical use of the Site for sugarcane cultivation represents a REC because it is possible that the application of pesticides applied to the sugarcane fields, over time, may have accumulated in the underlying soil, both at the Site and surrounding properties.

**2.3.3 Tax Records**

EI reviewed available County of Kaua'i Real Property tax records for the Site to assess the chain of title for Site uses that may indicate a REC. The Site is represented by 10 tax map key parcels; however, EI was only able to review tax records for five of the parcels. EI submitted a request to the County of Kaua'i Real Property tax office for tax records for the remaining five parcels and this information is still pending. The results of our tax records review is listed below:

**Mauka Side of Site**

**TMK (4) 3-9-002: Parcel 12:**

<b>Date</b>	<b>Transaction/Event</b>	<b>Area</b>	<b>Fee Owner (s)</b>	<b>Lessee(s)</b>
1939	Part of TMK (4) 3-9-002: Parcel 1	6,858.183 acres	Territory of Hawai'i	Lihue Plantation Company
1953	Approximately 450 acres from TMK (4) 3-9-002: Parcel 1 dropped into new parcel TMK (4) 3-9-002: Parcel 12	~450 acres	Territory of Hawai'i	Lihue Plantation Company
1953-1963	Acres of the parcel were allocated to various outlying parcels	320.192 acres	State of Hawai'i	Lihue Plantation Company
2000	Assessment	320.192 acres	State of Hawai'i	Lihue Plantation Company

**TMK (4) 3-9-002: Parcel 24:**

<b>Date</b>	<b>Transaction/Event</b>	<b>Area</b>	<b>Fee Owner (s)</b>	<b>Lessee(s)</b>
1961	This parcel was allotted acreage from TMK (4) 3-9-002: Parcel 12 (see above)	12.353 acres	State of Hawai'i	Lihue Plantation Company

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2000	Assessment	12.353 acres	State of Hawai'i	Lihue Plantation Company
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**TMK (4) 3-9-002: Parcel 25:**

Date	Transaction/Event	Area	Fee Owner (s)	Lessee(s)
1963	This parcel was allotted acreage from TMK (4) 3-9-002: Parcel 12 (see above)	41.547 acres	State of Hawai'i	Lihue Plantation Company
2000	Assessment	41.547 acres	State of Hawai'i	Lihue Plantation Company

**Makai Side of Site**

**TMK (4) 3-9-006: Parcel 9:**

Date	Transaction/Event	Area	Fee Owner (s)	Lessee(s)
1939	Allotted acreage from TMK (4) 3-9-002: Parcel 10	6,858.180 acres	Territory of Hawai'i	Lihue Plantation Company
1961	Allotted acreage from TMK (4) 3-9-002: Parcel 9	76.052 acres	State of Hawai'i	Lihue Plantation Company
1961	The Site parcel (TMK (4) 3-9-006: Parcel 9) was allotted acreage from TMK (4) 3-9-002: Parcel 9	41.547 acres	State of Hawai'i	Lihue Plantation Company
1982	Assessment	41.547 acres	State of Hawai'i	Lihue Plantation Company
1995	New land patent grant	41.547 acres	Hawaiian Homelands	Lihue Plantation Company

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**TMK (4) 3-9-006: Parcel 11:**

<b>Date</b>	<b>Transaction/Event</b>	<b>Area</b>	<b>Fee Owner (s)</b>	<b>Lessee(s)</b>
1951	Originally from TMK (4) 3-9-002: Parcel 4	131.24 acres	State of Hawai'i	None
1961	Allotted acreage from TMK (4) 3-9-002: Parcel 9	76.052 acres	State of Hawai'i	Lihue Plantation Company
1961	The Site parcel (TMK (4) 3-9-006: Parcel 11) was allotted acreage from TMK (4) 3-9-002: Parcel 4	5.621 acres	State of Hawai'i	Wailua Beach Club and Cottage
1964	5.861 acres from TMK (4) 3-9-006: Parcel 18 (3) dropped into Site parcel TMK (4) 3-9-006: Parcel 11	11.482 acres	State of Hawai'i	Wailua Beach Club and Cottage
1985	Assumed Lease	11.482 acres	State of Hawai'i	George B. Fernandez
1995	New land patent grant	11.482 acres	Hawaiian Homelands	Lihue Plantation Company

The tax records show no evidence of title use that would indicate a current REC. However, the majority of the Site was previously leased to the Lihue Plantation Company, which used the Site for sugarcane cultivation. Based on EI's experience with former sugarcane lands, it is possible that the application of pesticides applied to the sugarcane fields, over time, may have accumulated in the underlying soil, both at the Site and surrounding properties. Therefore, the Site's past land use is considered a historic REC.

### 3.0 USER PROVIDED INFORMATION

ASTM E1527-05 outlines the responsibilities of the user (i.e. the user of this Phase I ESA report, in context of completing a Phase I ESA. A user is defined as *the party seeking to use the Phase I ESA to complete an environmental site assessment of a property. A user may include a potential purchaser of property, a potential tenant of property, an owner of property, a lender, or a property manager* (ASTM E 1527-05). In line with this definition, EI regards the user as the person/organization hiring EI to conduct this Phase I ESA. As part of completing a Phase I ESA, the user has the following duties:

- Review title and judicial records to identify environmental liens or activity and use limitations, if any, that are currently recorded against the property.
- Communicate to EI, in advance of the Site reconnaissance, any specialized knowledge or experience of the user that is material to recognized environmental conditions.
- Communicate to EI, in advance of the Site reconnaissance, any actual knowledge or any environmental lien or activity and use limitations encumbering the property or in connection with the property.
- Consider the relationship of the purchase price of the property to the fair market value of the property if the property was not affected by hazardous substances or petroleum products.
- Communicate to EI, in advance of the Site reconnaissance, any commonly known or reasonably ascertainable information within the local community about the property that is material to recognized environmental conditions in connection with the property.
- Make known to EI the reason why the user wants to have the Phase I ESA performed.

EI interviewed Mr. Noel Akamu on July 30, 2007, for information regarding user responsibilities associated with the Phase I ESA. Mr. Akamu is the property development manager for DHHL, the owner of the Site, and has been familiar with the Site for nine years. A copy of the completed user (client) interview form is included in Appendix C.

Mr. Akamu indicated that the reason for conducting the Phase I ESA is to determine potential impacts the proposed development could have on the environment. He stated that the Site was in sugarcane cultivation until approximately 2002.

Mr. Akamu indicated that no environmental liens or other activity and use limitations have been served against the Site. He was unaware of any activities or use limitations, such as engineering controls, land use restrictions, or institutional controls being put in place at the Site.

It is EI's opinion that the user (client), Noel Akamu, met all user responsibilities for this Phase I ESA, as described in ASTM E 1527-05.

## **4.0 RECORDS REVIEW**

EI reviewed state and federal regulatory agency records for information on known or potential sources of hazardous waste, petroleum products, or other RECs at or near the Site. The following records and lists were reviewed for sites within the ASTM-specified minimum search distance from the property, which is located between the coordinates 22° 1' 45" N to 22° 2' 47" N latitude and 159° 20' 15" W to 159° 21' 8" W longitude.

### **Sites Within One Mile of the Subject Site**

- EPA National Priority List (NPL)
- EPA Resource Conservation and Recovery Act (RCRA) Corrective Action Site (CORRACTS) List
- HDOH State Hazardous Waste Sites (SHWS)

### **Sites Within 0.5 Mile of the Subject Site**

- EPA Delisted National Priority List
- Federal Comprehensive Environmental Response, Compensation and Liability Information System (CERCLIS) List
- CERCLIS No Further Remedial Action Planned (NFRAP) List
- EPA RCRA non-CORRACTS, Treatment, Storage, and/or Disposal (TSD) Facilities List
- HDOH Landfill and/or Solid Waste Disposal Site Lists
- HDOH Leaking Underground Storage Tank (LUST) List

### **On the Site and Adjoining Properties**

- HDOH Registered Underground Storage Tank (UST) List
- RCRA Generators List

### **On the Site**

- Federal Emergency Response Notification System (ERNS) List
- EPA Institutional Controls and Engineering Controls Lists
- HDOH Institutional Control and Engineering Control Lists
- HDOH Voluntary Response Program List
- HDOH Brownfields List



Explanations of each federal record or list are provided in EDR's report attached in Appendix B. State of Hawai'i records are defined within this report, because they are not all included in the EDR report.

#### **4.1 EPA National Priorities List**

There are no NPL sites listed on or within one mile of the Site (EDR, 2007; Appendix B).

#### **4.2 EPA RCRA CORRACTS Facilities List**

There are no RCRA CORRACTS facilities located on or within one mile of the Site (EDR, 2007; Appendix B).

#### **4.3 HDOH SHWS List**

The SHWS records are the states' equivalent to CERCLIS. These sites may or may not be listed on the federal CERCLIS list. The SHWS list contains information on sites identified by the State of Hawai'i as abandoned, inactive, or uncontrolled hazardous waste sites that may require cleanup. There are three SHWS facilities located within one mile of the Site, one of those is adjacent to the Site, and the Site is not listed (EDR, 2007; Appendix B). None of the SHWS-listed sites were provided with a high priority rating and two of the three sites have been provided a no further action (NFA) status by the HDOH. Based on the location of the listed sites and their HDOH ratings, a SWHS REC does not exist near the Site.

#### **4.4 EPA Delisted National Priorities List**

There are no delisted NPL sites located on or within half a mile of the Site (EDR, 2007; Appendix B).

#### **4.5 EPA CERCLIS List**

There are no CERCLIS sites located on or within half a mile of the Site (EDR, 2007; Appendix B).

#### **4.6 EPA RCRA non-CORRACTS TSD Facilities List**

There are no RCRA non-CORRACTS TSD facilities located on or within half a mile of the Site (EDR, 2007; Appendix B).

#### **4.7 HDOH Landfill and/or Solid Waste Disposal Site Lists**

There are no permitted landfills or solid waste disposal sites located on or within half a mile of the Site (EDR, 2007; Appendix B).

#### **4.8 HDOH Leaking UST List**

The Site is not listed as a leaking underground storage tank (LUST) site, but there are two LUST sites located within half a mile of the Site (EDR, 2007; Appendix B). While the case status of one of the LUST sites was indicated as being transferred to the Hazardous Evaluation and Emergency Response (HEER) Office, this LUST site is located nearly half a mile away in a relative crossgradient position to the north of the Site. The second LUST site is in the Wailua Wastewater Treatment Plant, which is located adjacent to the Site. This facility received a NFA letter dated August 3, 1999. Based upon the locations and current status of these LUST facilities, a historic REC does exist adjacent to the Site.

#### **4.9 HDOH UST Section Database Listing**

The subject Site is not listed on the HDOH UST Section database list; however, there was one adjacent UST facility located at the Wailua Wastewater Treatment Plant (EDR, 2007; Appendix B). This UST was discussed above in Section 4.8 and does represent a historic REC at adjacent site.

#### **4.10 EPA CERCLIS-NFRAP List**

There are no CERCLIS-NFRAP sites located on or within half a mile of the Site (EDR, 2007; Appendix B).

#### **4.11 EPA RCRA Generators List**

The subject Site is not listed on the RCRA generators list and there were no adjacent property RCRA generators (EDR, 2007; Appendix B).

#### **4.12 EPA ERNS List**

The subject Site is not listed on the ERNS list. There were no reported incidents on the Site (EDR, 2007; Appendix B).

#### **4.13 EPA Institutional Controls and Engineering Controls Lists**

The subject Site is not listed on the EPA Institutional Controls List or Engineering Controls List (EDR, 2007; Appendix B).

#### **4.14 HDOH Institutional Controls and Engineering Controls Lists**

The HDOH Institutional Controls List and Engineering Controls Lists are the states' equivalent to the federal Institutional Controls and Engineering Controls lists maintained by the EPA. These sites are part of the HDOH HEER Office's State Response Program. These sites may or may not be listed on the federal equivalent lists.

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The subject Site is not listed on the HDOH Institutional Controls List or Engineering Controls List (EDR, 2007; Appendix B).

#### **4.15 HDOH Voluntary Response Program List**

There are no Voluntary Response Program facilities located on or within a half mile of the Site (EDR, 2007; Appendix B).

#### **4.16 HDOH Brownfields List**

There are no Brownfields sites located on or within a half mile of the Site (EDR, 2007; Appendix B).

## **5.0 PERSONNEL INTERVIEWS**

EI conducted multiple interviews with persons knowledgeable of the Site in order to gain information regarding land use, Site history and Site operations.

### **5.1 Current Personnel Interviews**

#### **5.1.1 Owner(s) Interview**

EI interviewed Noel Akamu on July 30, 2007, for information and knowledge regarding any RECs that might be associated with the Site. Noel Akamu is the Project Development Manager with the DHHL, which currently owns the Site, and has been familiar with the Site for nine years. He stated that as the user of this environmental site assessment, he had no specialized knowledge or experience related to the Site or nearby properties. Completed interview documentation is included in Appendix C.

According to Mr. Akamu, the Site consists of undeveloped, vacant land which has been used for agricultural cultivation purposes (sugar cane) for several decades prior. Mr. Akamu indicated that these cultivation activities were terminated in approximately mid-2002. Portions of the Site have also been used for livestock grazing and pastoral land uses.

Mr. Akamu stated that he was unaware of any environmental cleanup liens being served against the Site. He was also unaware of any previous site activities or land use limitations, such as engineering controls, restrictions, or institutional controls being in place at the Site.

#### **5.1.2 Site Manager(s)/Property Manager(s) Interview**

Mr. Akamu, in addition to being the Project Development Manager, is also the current site manager of the Site. Completed interview documentation is included in Appendix C.

Mr. Akamu stated that the Site has been used for pastoral and agricultural cultivation purposes. Mr. Akamu further indicated that no utilities, other than irrigation water supplies, have serviced the Site and that no water/stormwater permits, wells, floor drains/sumps, or electrical transformers have existed for the Site. Mr. Akamu was also unaware of underground or aboveground storage tanks being operated on the Site presently or in the past.

Mr. Akamu stated to the best of his knowledge that no environmental hazards including, hazardous materials/chemicals/wastes have been used or stored on the premises. He was also unaware of the presence of ponds, pits, or lagoons being located onsite presently or historically. There have been no previous environmental investigations or cleanup activities reported for the Site. He did state that on occasion, the Site receives excess water that is discharged from an old irrigation reservoir located above Kalepa Ridge via an old water tunnel. Mr. Akamu did not indicate whether this water has been found to contain hazardous wastes or agricultural chemicals.

### **5.1.3 Occupant(s) Interview**

The Site consists of vacant, undeveloped land which was previously used for agricultural cultivation purposes. Therefore, no current Site occupants exist.

## **5.2 Historical Personnel Interviews**

### **5.2.1 Past Owner(s), Operator(s), and Occupant(s) Interview**

EI interviewed Mr. Robin Robinson on August 1, 2007, for information and knowledge regarding RECs associated with the Site. Mr. Robinson was a Quality Control Superintendent for the Lihue Plantation Company, who was a former occupant of the subject Site, and has been familiar with the Site for 12 years. Completed interview documentation is included in Appendix C.

According to Mr. Robinson, the Site was used for the agricultural cultivation of sugarcane dating back from the early 1900s to 2002. Mr. Robinson stated that the need for fertilizer application to the land was based upon laboratory results of routine agricultural soil analysis. In addition, herbicide and pesticide application was conducted regularly and included three applications to each crop. Applied pesticide/herbicide chemicals included atozin, pentamethylene, amatrane, and carmax. Mr. Robinson stated that these materials were applied individually and not in combination.

Mr. Robinson stated that underground or aboveground storage tanks used to store hazardous materials or wastes (e.g., petroleum hydrocarbon-based materials) were not stored or operated onsite; however, previous agricultural tenants used 1,200 gallon plastic storage units to store various fertilizer materials.

Mr. Robinson also stated that the Site was also previously used as a temporary waste disposal site soon after the destruction caused by Hurricane Iniki in 1992. Underlying soil (to a depth of approximately three inches below grade surface) in the area of the onsite waste disposal site was reportedly removed after the termination of these activities.

According to Mr. Robinson, the only permit which applied to the Site during the Lihue Plantation Company's operations was an NPDES permit for stormwater discharge and no reportable environmental incidences were associated with this permit.

## **5.3 Additional Interviews**

### **5.3.1 State or Local Official(s) Interview**

On August 9, 2007, EI contacted Mr. Rick Palmer who is a project case manager with the HDOH HEER Office's State Response Program. Mr. Palmer provided oversight for the Lihue Plantation Company on the island of Kaua'i and was considered a source of information

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regarding any applicable RECs associated with the Site. According to Mr. Palmer, no releases, incidences of spillage, or previous subsurface investigations have been reported for the Site.

On August 14, 2007, Mr. Troy Tanigawa, Administrative Officer for the County of Kaua'i Solid Waste Program, sent a correspondence to DHHL stating that following the closure of the temporary waste disposal site soil testing was conducted to ensure that no residual contaminants were present in the area of the waste disposal site and clean backfill was brought in to restore the area to original grade.

## 6.0 SITE RECONNAISSANCE

EI conducted a reconnaissance of the Site for visual observations of RECs.

### 6.1 Site Reconnaissance

On Tuesday, July 17, 2007, EI personnel conducted a reconnaissance of the Site. All observations are based on the Site's condition at the time of EI's reconnaissance. Permission to access the Site was given by Mr. Kamuela Cobb-Adams of DHHL. All accessible areas of the Site are shown in Figure 4 and in Photos 1 through 9 (Appendix A).

The Site was generally vacant land containing fallow sugarcane fields, several dirt roadways, a paved cane haul road, a number of irrigation ditches, and open wild lands (Photos 1 through 3). A recent fire in the area had burned a majority of the ground vegetation; the remaining areas were covered with guinea grass, *koa haole*, and small bushes and shrubs (Photos 1 through 4). Kuhio Highway divides the Site into two portions: the *mauka* and *makai* portions. Malae Heiau is located immediately adjacent to the Site, at the northeast corner of the *mauka* portion (Figure 3).

Numerous pieces of metal irrigation piping were observed throughout the northern half of the *mauka* portion (Photo 5). An old irrigation pump system with filtering/fertilizer tanks was located near the northwestern corner of the Site (Figure 4, Photo 6). A small section of the *mauka* portion of the Site adjacent to Kuhio Highway was formerly used as a temporary debris dump following Hurricane Iniki (Figure 4). Parcel 11 of the *makai* portion of the Site was fenced and is currently used as cattle grazing land. Discarded automotive parts and general rubbish were observed in the northwest corner of Parcel 11 of the *makai* portion (Figure 4); however, there did not appear to be any petroleum-containing parts or containers. EI did not observe obvious indications of significant staining or releases anywhere on the Site.

There were no buildings or structures on the Site, and there are currently no utilities or services being provided to the Site.

No USTs, ASTs, oil/water separators, or pipelines (other than water/irrigation piping) were observed at the Site.

### 6.2 Adjacent Properties

EI did not walk the individual adjacent properties; however, EI performed an offsite visual inspection of the properties located immediately adjacent to the Site to observe visible environmental conditions (Figure 3). EI did not note observable indications of RECs at any of the adjacent properties during the course of EI's site reconnaissance activities.

Kaua'i Island Utility Cooperative (KIUC) owns and operates an electric substation on an adjacent property (TMK 3-9-006, Parcel 26) (Figure 3, Photo 7). Hazardous materials may be

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present within some of the electrical equipment; however, EI did not observe any leaks or indications of damaged equipment. *De minimus* petroleum staining (approximately two feet by three feet) was observed on the soil along the edge of Leho Drive in front of the KIUC electric substation (Photo 8). This staining is likely the result of fugitive dumping of some type of petroleum product and is not considered significant and is therefore not a REC.

An aboveground propane AST was observed at the Kaha Lani Resort (Photo 9) but is not considered a REC because of its stored contents.



## 7.0 DATA GAPS

In performing this Phase I ESA, EI identified a few data gaps. A data gap is *a lack or inability to obtain information required by ASTM E 1527-05 despite good faith efforts by the environmental professional to gather such information. Data gaps may result from incompleteness in any of the activities required by this practice (ASTM E 1527-05).* EI identified the following data gaps relating to this Phase I ESA:

During the due diligence process for the Site, EI requested building permit information from the County of Kaua'i's Real Property Assessment Division. Results of this request are pending. This data gap may have the potential to impact our ability to identify RECs at the Site because we were unable to confirm historical permits for the Site which may have possibly included facilities, such as underground storage tanks. It is EI's opinion, however, that this does not represent a significant data gap, and should findings of these permits result, and addendum to this report will be provided.

During the site reconnaissance activities for the Site, some portions were completely covered with dense undergrowth and low-lying vegetation. Therefore, EI was unable to completely view some portions of the Site for the presence of material storage or evidence of historical facilities, such as underground storage tanks. This data gap may have the potential to impact our ability to identify RECs at the Site because we were unable to observe portions of the Site. It is EI's opinion, however, that based on interview material and other historical sources, this does not represent a significant data gap.

## **8.0 CONCLUSIONS AND OPINIONS**

We have performed a Phase I ESA in conformance with the scope and limitations of ASTM E 1527-05 of the DHHL Wailua Development Project located on the property identified as TMK (4) 3-9-006, Parcels 9 and 11; and (4) 3-9-002, Parcels 3, 12, 17, 24, 25, 26, 27, and 35, which is located at the physical address of Kuhio Highway, in Wailua, Hawai'i on the Island of Kaua'i. Any exceptions to, or deletions from, this practice are described in Section 9.0 of this report.

This assessment has not revealed evidence of current RECs in connection with the Site but has revealed historical evidence of a REC associated with the Site. The historic REC is described in detail in the body of the report and summarized below.

### **Historic REC**

Based upon EI's review of historical sources, including aerial photographs, topographic maps, tax assessor records, and interviews conducted with personnel closely associated with the Site, the Site had been previously occupied by sugar cane fields from the early 1900s to 2002. Herbicide and pesticide application (reported to include atozin, pentamethylene, amatrane, and carmax) was conducted regularly on the Site and included three applications to each crop. Although there were no visual indications of recognized environmental conditions at the Site or surrounding properties during EI's site reconnaissance, based on EI's experience with former sugarcane lands, it is possible that the application of pesticides applied to the sugarcane fields, over time, may have accumulated in the underlying soil, both at the Site and surrounding properties. Based upon the durational usage of the Site as agriculturally cultivated land and the proposed usage of the Site for residential development, the Site's agricultural land usage is considered a historic REC.

### **Historic REC at Adjacent Site**

A LUST site (Wailua Wastewater Treatment Plant) located adjacent to the Site has reportedly been cleaned up and received a NFA letter. This LUST site is a historic REC at an adjacent site (Section 4.8).

### **Other Items of Environmental Concern**

- The Site reportedly receives excess water that is discharged from an irrigation reservoir located above Kalepa Ridge via an old water tunnel. It is unknown whether this water contains hazardous chemicals/wastes or agricultural chemicals.
- The Site was also reportedly used as a temporary waste disposal site soon after the initial destruction caused by Hurricane Iniki in 1992. According to Site personnel, underlying soil (to a depth of approximately three inches below grade surface) in the area of the onsite waste disposal site was removed after the termination of these land

use activities. According to Mr. Troy Tanigawa, Administrative Officer for the County of Kaua'i Solid Waste Program, soil testing was conducted to ensure that no residual contaminants were present in the area of the waste disposal site and clean backfill was brought in to restore the area to original grade.

- EI's review of the 1910 topographic map noted a railroad spur in the central portions of the *mauka* property side of the Site. Railroad spurs are typically considered environmental concerns because of the propensity for material dumping and spillage at these railroad dead ends.
- Refuse or fugitive dumping was observed on Parcel 11 of the *makai* portion of the Site during the course of EI's reconnaissance activities. Items disposed of included automotive parts or containers. The observed refuse is a general house-keeping issue and is not expected to environmentally impact the Site.

## 9.0 LIMITATIONS

We have based our conclusions and recommendations on our interpretation of the available historical and regulatory information and documents reviewed and a visual Site inspection performed on Tuesday, July 17, 2007. We cannot guarantee or warrant that the Site is free of contamination. We do warrant that our services are performed with the usual competence and thoroughness of the consulting profession, in accordance with the standard operating procedures of this time. EI does not provide any other guarantee or warranty.

This Phase I ESA is not a comprehensive site characterization and should not be construed as such. The opinions presented in this report are based on findings derived from a Site reconnaissance and a review of specified regulatory records and historical sources. This Phase I ESA did not include any investigation with respect to lead, asbestos, arsenic, radon, methane, regulatory compliance, cultural and historic resources, industrial hygiene, health and safety, ecological resources, endangered species, indoor air quality, or site geotechnical concerns. All information on UST and LUST sites is based on information reported to the HDOH Solid and Hazardous Waste Branch (HDOH, 2004a and 2004b). All information on HEER site and release sites is based on information reported to the HDOH HEER Office (HDOH, 2000a and 2000b).

There are no exceptions or deletions to ASTM practice in this Phase I ESA.

Phase I Environmental Site Assessment  
DHHL Wailua Development Project  
TMK (4) 3-9-6, Parcels 9 and 11 and (4) 3-9-002, Parcels 3, 12, 17, 24, 25, 26, 27, and 35  
Wailua, Kaua'i, Hawai'i

## 10.0 REFERENCES

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Phase I Environmental Site Assessment  
DHHL Wailua Development Project  
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Wailua, Kaua'i, Hawai'i

## **FIGURES**







	Project Site		UIC Line	(From HDDH UIC Program 1983 quadrangles - effective July 6, 1984)
	Mink & Lau Line (from WRRRC Technical Report 185, Feb 1990)		Drinking Water Source (i.e. Well, Spring, or Tank) or Cluster of Sources	
			Injection Well	




## SITE LOCATION MAP

DHHL Wallua Development Project,  
Kuhlo Highway, Wallua, Kauai, HI 96746

EI Project No. 407-052	Date 09-28-2007	Figure 1
------------------------	-----------------	----------

Base Map Source: Lihue Quadrangle, 7.5-Minute Series (Topographic), USGS, 1996

TRUE NORTH







Environet, Inc.

## SATELLITE IMAGE MAP

DHHL Wallua Development Project,  
Kuhlo Highway, Wallua, Kaua'i, HI 96746

EI Project  
No. 406-052

Date  
09-28-2007

Figure  
2

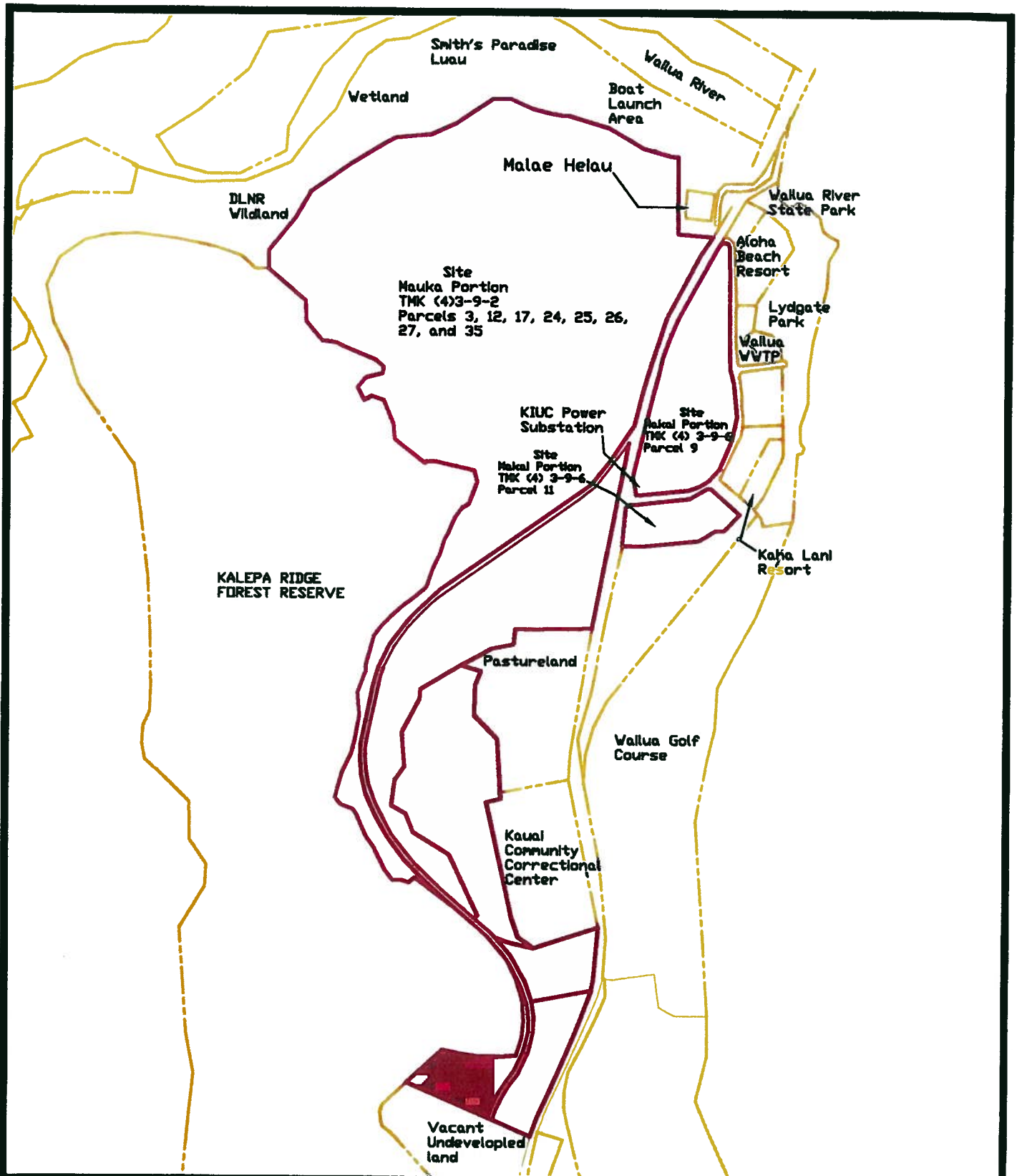
Map not a survey.  
Map data are based  
on field measurements  
and available plans,  
and are approximate.

Map not to Scale

Base Map Source,  
Google Earth, 2005







Environet, Inc.

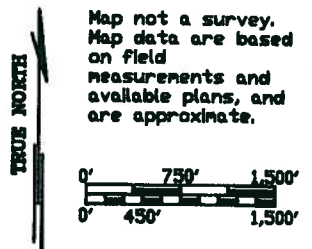
## SITE AREA MAP

DHHL Wallua Development Project,  
Kuhio Highway, Wallua, Kaua'i, HI 96746

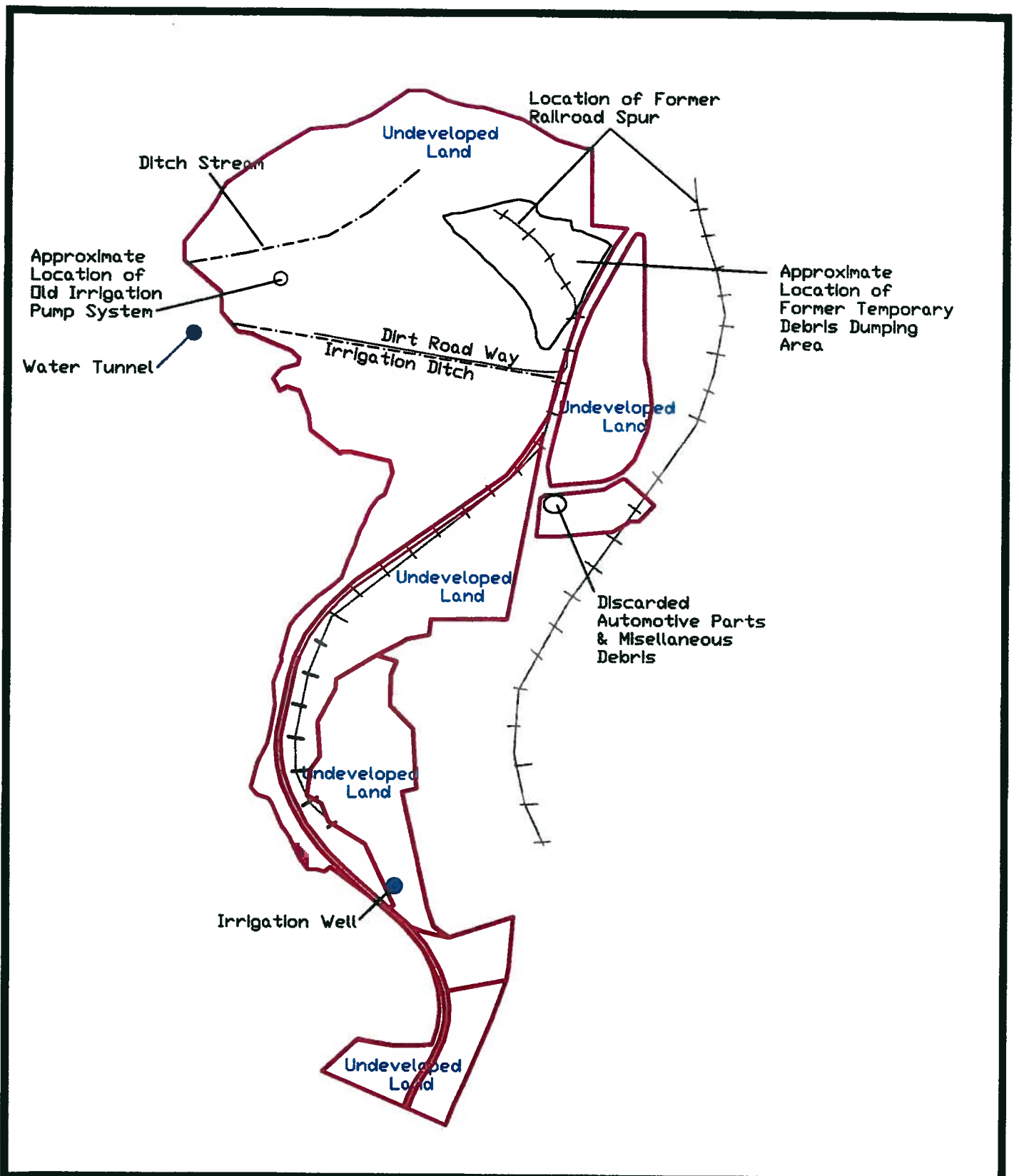
EI Project  
No. 407-052

Date  
09-28-2007

Figure  
3







Environet, Inc.

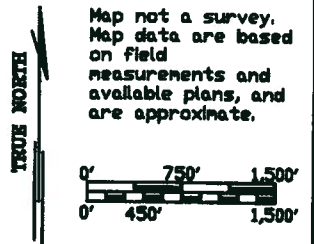
## SITE PLAN

DHHL Wallua Development Project,  
Kuhio Highway, Wallua, Kaua'i, HI 96746

EI Project  
No. 407-052

Date  
09-28-2007

Figure  
4







**Phase I Environmental Site Assessment  
DHHL Wailua Development Project  
TMK (4) 3-9-6, Parcels 9 and 11 and (4) 3-9-002, Parcels 3, 12, 17, 24, 25, 26, 27, and 35  
Wailua, Kaua'i, Hawai'i**

## **APPENDIX A**

### **Photographs**



**Photo Log**



**Photo 1:** Site viewed from the western boundary, facing northeast.



**Photo 2:** Site viewed from the north, facing south-southwest.



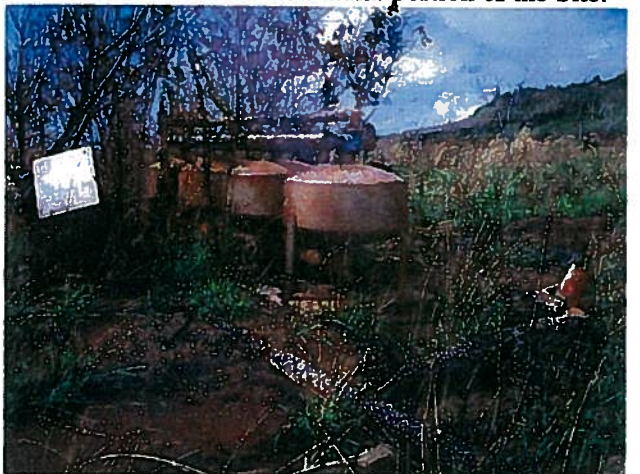
**Photo 3:** View of makai portion (Parcel 9) of Site, facing east.



**Photo 4:** View from southeast corner of makai portion (Parcel 11) of Site, facing west.



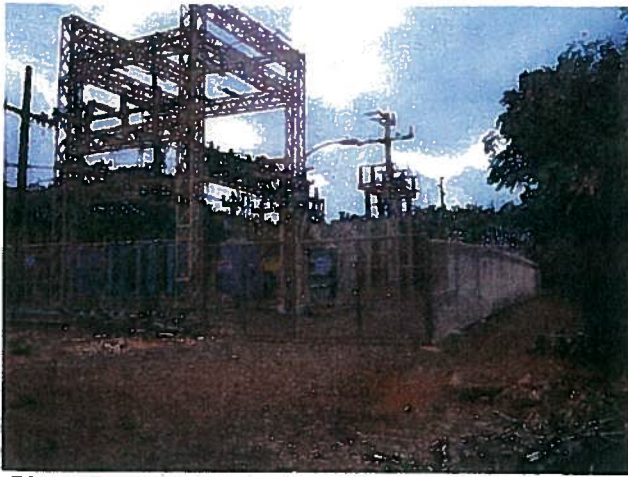
**Photo 5:** Metal irrigation piping observed throughout the northern half of the mauka portion of the Site.



**Photo 6:** Old irrigation pump system located near the northwestern corner of the Site.



**Photo Log**



**Photo 7: Kauai Island Utility Cooperative electric substation on an adjacent property.**



**Photo 8: Stained soil observed along the edge of Leho Drive in front of the KIUC electric substation.**



**Photo 9: Aboveground propane AST observed at the Kaha Lani Resort.**



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Wailua, Kaua'i, Hawai'i**

**APPENDIX B**

**EDR Database Search  
01984765.3r, July 25, 2007**







**EDR**® Environmental  
Data Resources Inc

**EDR DataMap®  
Area Study**

**DHHL Wailua  
Wailua, HI 96746**

**July 25, 2007**

**Inquiry number 01984765.3r**

**The Standard in  
Environmental Risk  
Information**

440 Wheelers Farms Road  
Milford, Connecticut 06461

**Nationwide Customer Service**

Telephone: 1-800-352-0050  
Fax: 1-800-231-6802  
Internet: [www.edrnet.com](http://www.edrnet.com)

**Thank you for your business.**  
Please contact EDR at 1-800-352-0050  
with any questions or comments.

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## EXECUTIVE SUMMARY

A search of available environmental records was conducted by Environmental Data Resources, Inc. (EDR).

### TARGET PROPERTY INFORMATION

#### ADDRESS

WAILUA, HI 96746  
WAILUA, HI 96746

### DATABASES WITH NO MAPPED SITES

No mapped sites were found in EDR's search of available ("reasonably ascertainable ") government records within the requested search area for the following databases:

#### FEDERAL RECORDS

NPL.....	National Priority List
Proposed NPL.....	Proposed National Priority List Sites
Delisted NPL.....	National Priority List Deletions
NPL LIENS.....	Federal Superfund Liens
CERCLIS.....	Comprehensive Environmental Response, Compensation, and Liability Information System
CERC-NFRAP.....	CERCLIS No Further Remedial Action Planned
CORRACTS.....	Corrective Action Report
RCRA-TSDF.....	Resource Conservation and Recovery Act Information
RCRA-LQG.....	Resource Conservation and Recovery Act Information
RCRA-SQG.....	Resource Conservation and Recovery Act Information
ERNS.....	Emergency Response Notification System
HMIRS.....	Hazardous Materials Information Reporting System
US ENG CONTROLS.....	Engineering Controls Sites List
US INST CONTROL.....	Sites with Institutional Controls
DOD.....	Department of Defense Sites
FUDS.....	Formerly Used Defense Sites
US BROWNFIELDS.....	A Listing of Brownfields Sites
CONSENT.....	Superfund (CERCLA) Consent Decrees
ROD.....	Records Of Decision
UMTRA.....	Uranium Mill Tailings Sites
ODL.....	Open Dump Inventory
TRIS.....	Toxic Chemical Release Inventory System
TSCA.....	Toxic Substances Control Act
FTTS.....	FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)
SSTS.....	Section 7 Tracking Systems
US CDL.....	Clandestine Drug Labs
DOT OPS.....	Incident and Accident Data
RADINFO.....	Radiation Information Database
HIST FTTS.....	FIFRA/TSCA Tracking System Administrative Case Listing
LUCIS.....	Land Use Control Information System
LIENS 2.....	CERCLA Lien Information

## EXECUTIVE SUMMARY

ICIS.....	Integrated Compliance Information System
PADS.....	PCB Activity Database System
MLTS.....	Material Licensing Tracking System
MINES.....	Mines Master Index File
FINDS.....	Facility Index System/Facility Registry System
RAATS.....	RCRA Administrative Action Tracking System

### STATE AND LOCAL RECORDS

SWF/LF.....	Permitted Landfills in the State of Hawaii
UST.....	Underground Storage Tank Database
INST CONTROL.....	Sites with Institutional Controls
VCP.....	Voluntary Response Program Sites
DRYCLEANERS.....	Permitted Drycleaner Facility Listing
BROWNFIELDS.....	Brownfields Sites
AIRS.....	List of Permitted Facilities

### TRIBAL RECORDS

INDIAN RESERV.....	Indian Reservations
INDIAN LUST.....	Leaking Underground Storage Tanks on Indian Land
INDIAN UST.....	Underground Storage Tanks on Indian Land

### EDR PROPRIETARY RECORDS

Manufactured Gas Plants... EDR Proprietary Manufactured Gas Plants

### SURROUNDING SITES: SEARCH RESULTS

Surrounding sites were identified.

Page numbers and map identification numbers refer to the EDR Radius Map report where detailed data on individual sites can be reviewed.

Sites listed in *bold italics* are in multiple databases.

Unmappable (orphan) sites are not considered in the foregoing analysis.

### STATE AND LOCAL RECORDS

**SHWS:** The State Hazardous Waste Sites records are the states' equivalent to CERCLIS. These sites may or may not already be listed on the federal CERCLIS list. Priority sites planned for cleanup using state funds (state equivalent of Superfund) are identified along with sites where cleanup will be paid for by potentially responsible parties. The data come from the Department of Health.

A review of the SHWS list, as provided by EDR, and dated 07/24/2006 has revealed that there are 3 SHWS sites within the searched area.

<u>Site</u>	<u>Address</u>	<u>Map ID</u>	<u>Page</u>
<b><i>COCO PALMS SEWAGE PUMP STATION</i></b>	<b><i>4511 HALEILIO RD</i></b>	<b><i>1</i></b>	<b><i>3</i></b>
<b><i>COCO PALMS RESORT</i></b>	<b><i>4-241 KUHIO HWY</i></b>	<b><i>2</i></b>	<b><i>4</i></b>
<b><i>HOLIDAY INN SUNSPREE RESORT- K</i></b>	<b><i>3-5920 KUHIO HWY</i></b>	<b><i>3</i></b>	<b><i>4</i></b>

## EXECUTIVE SUMMARY

**LUST:** The Leaking Underground Storage Tank Incident Reports contain an inventory of reported leaking underground storage tank incidents. The data come from the Department of Health's Active Leaking Underground Storage Tank Log Listing.

A review of the LUST list, as provided by EDR, and dated 01/30/2007 has revealed that there is 1 LUST site within the searched area.

<u>Site</u>	<u>Address</u>	<u>Map ID</u>	<u>Page</u>
COCO PALMS PUMP STATION Facility Status: Case Transferred to HEER	4511 HALEILIO RD	1	3

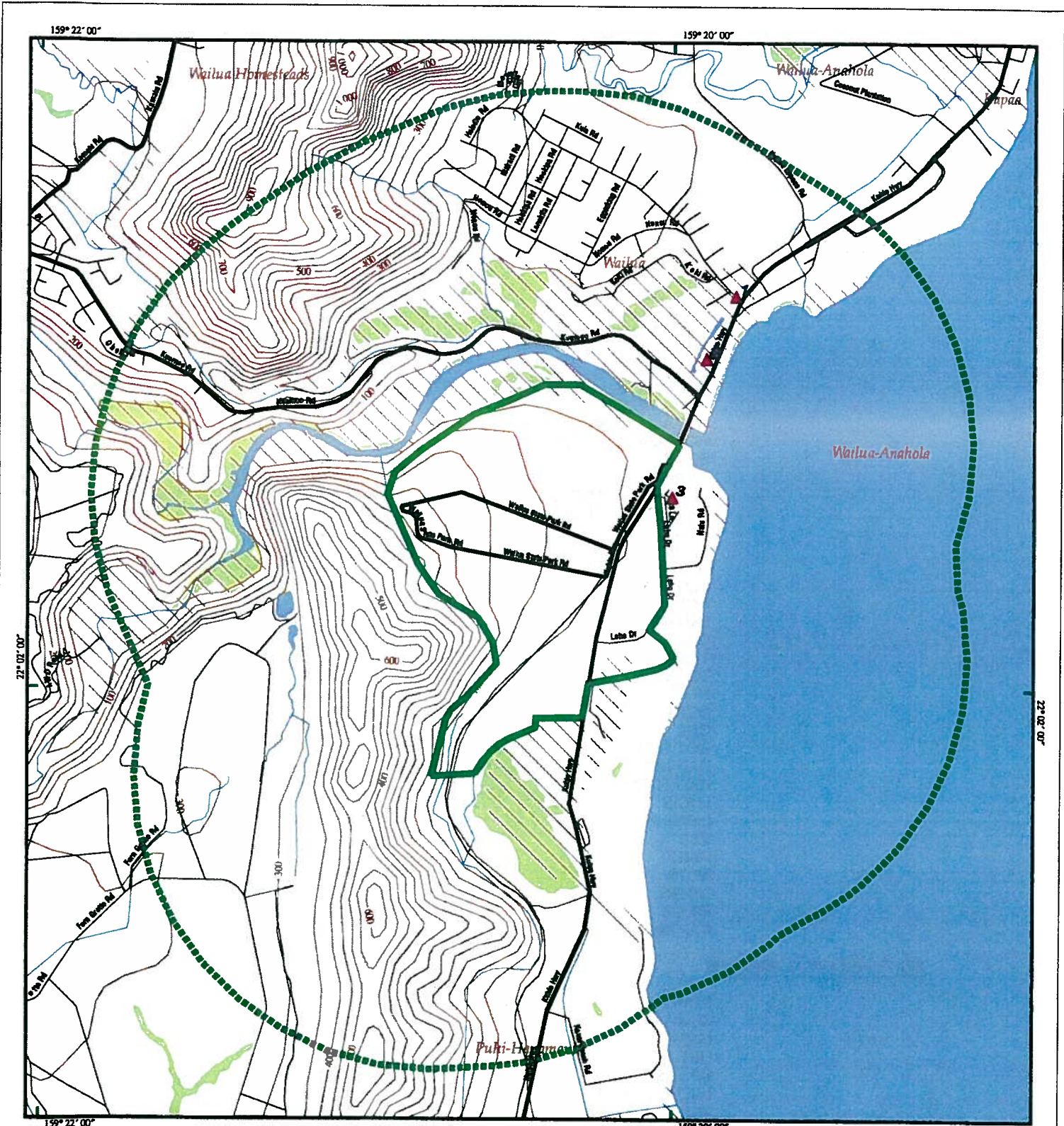
**SPILLS:** Releases of hazardous substances to the environment reported to the Office of Hazard Evaluation and Emergency Response since 1988.

A review of the SPILLS list, as provided by EDR, and dated 07/24/2006 has revealed that there are 3 SPILLS sites within the searched area.

<u>Site</u>	<u>Address</u>	<u>Map ID</u>	<u>Page</u>
<b>COCO PALMS SEWAGE PUMP STATION</b>	<b>4511 HALEILIO RD</b>	<b>1</b>	<b>3</b>
<b>COCO PALMS RESORT</b>	<b>4-241 KUHIO HWY</b>	<b>2</b>	<b>4</b>
<b>HOLIDAY INN SUNSPREE RESORT- K</b>	<b>3-5920 KUHIO HWY</b>	<b>3</b>	<b>4</b>

## **EXECUTIVE SUMMARY**

Please refer to the end of the findings report for unmapped orphan sites due to poor or inadequate address information.



EDR DataMap® – Area Study

# DHHL Wailua



EDR® Environmental  
Data Resources Inc

- |   |               |                            |
|---|---------------|----------------------------|
| Listed Sites                                    | Waterways     | Water                      |
| Earthquake Epicenters<br>(Richter 5 or greater) | Railroads     | Superfund Sites            |
| Search Boundary                                 | Contour Lines | Federal DOD Sites          |
| Roads   | Pipelines     | Indian Reservations BIA    |
| Major Roads                                     | Powerlines    | 100-Yr Flood Zones         |
|   | Fault Lines   | National Wetland Inventory |



Scale in Miles

**MAP FINDINGS SUMMARY**

<u>Database</u>	<u>Total Plotted</u>
<b><u>FEDERAL RECORDS</u></b>	
NPL	0
Proposed NPL	0
Delisted NPL	0
NPL LIENS	0
CERCLIS	0
CERC-NFRAP	0
CORRACTS	0
RCRA TSD	0
RCRA Lg. Quan. Gen.	0
RCRA Sm. Quan. Gen.	0
ERNS	0
HMIRS	0
US ENG CONTROLS	0
US INST CONTROL	0
DOD	0
FUDS	0
US BROWNFIELDS	0
CONSENT	0
ROD	0
UMTRA	0
ODI	0
TRIS	0
TSCA	0
FTTS	0
SSTS	0
CDL	0
DOT OPS	0
RADINFO	0
HIST FTTS	0
LUCIS	0
LIENS 2	0
ICIS	0
PADS	0
MLTS	0
MINES	0
FINDS	0
RAATS	0
<b><u>STATE AND LOCAL RECORDS</u></b>	
SHWS	3
State Landfill	0
LUST	1
UST	0
SPILLS	3
INST CONTROL	0
VCP	0
DRYCLEANERS	0



**MAP FINDINGS SUMMARY**

<u>Database</u>	<u>Total Plotted</u>
BROWNFIELDS	0
AIRS	0
<b><u>TRIBAL RECORDS</u></b>	
INDIAN RESERV	0
INDIAN LUST	0
INDIAN UST	0
<b><u>EDR PROPRIETARY RECORDS</u></b>	
Manufactured Gas Plants	0

**NOTES:**

Sites may be listed in more than one database

MAP FINDINGS

Map ID			EDR ID Number
Direction			
Distance			
Distance (ft.)	Site	Database(s)	EPA ID Number

1	<b>COCO PALMS PUMP STATION</b> <b>4511 HALEILIO RD</b> <b>LIHUE, HI 96766</b>	LUST	1006843189 N/A
---	---	------	-------------------

LUST:

Facility ID:	9-701079
Release ID:	940055
Facility Status Date:	1994-12-19 00:00:00
Facility Status:	Case Transferred to HEER
Project Officer:	HEER

1	<b>COCO PALMS SEWAGE PUMP STATION</b> <b>4511 HALEILIO RD</b> <b>WAILUA, HI 96746</b>	SHWS SPILLS	S106816752 N/A
---	---	----------------	-------------------

SHWS:

File Under:	County of Kauai, Department of Public Works, Wastewater Division
Supplement:	Not reported
Restricted Use:	Not reported
Restricted Use Comm:	Not reported
ic Relied On in Remedy:	Not reported
Unit:	Coco Palms Sewer Pump Station
Fed Id:	Not reported
Funding:	Not reported
Agreement/program:	State Site
Sitelist Name:	Coco Palms Sewer Pump Station
Activity Type:	File Review
Assignment Date:	3/3/2003
Activity Lead:	Unassigned (medium)
Assignment End Date:	Not reported
End fill:	7/24/2006
Result fill:	Ongoing
Overall Status:	Ongoing

HI SPILLS:

Island:	Kauai
Supplemental Loc. Text:	Not reported
Case Number:	19950321-6
Units:	Coco Palms Sewer Pump Station
Substances:	Diesel Fuel
Less Or Greater Than:	Not reported
Numerical Quantity:	Not reported
Units:	Not reported
Activity Type:	Response
Assignment Date:	Not reported
Activity Lead:	Chris Takeno
Assignment End Date:	Not reported
Result:	7
Incident:	according to the site characterization by Geolabs in May 1993, they believed a high TPH concentration in a bore hole (26,000 ppm) is due to a temporary aboveground diesel tank
Initial:	none at this time
Report:	Not reported

MAP FINDINGS

Map ID  
 Direction  
 Distance  
 Distance (ft.) Site

EDR ID Number

Database(s) EPA ID Number

**2**      **COCO PALMS RESORT**  
**4-241 KUHIO HWY**  
**KAPAA, HI 96746**

**SHWS**    **S106816751**  
**SPILLS**    **N/A**

**SHWS:**

File Under:                    Coco Palms Resort  
 Supplement:                    Not reported  
 Restricted Use:                Not reported  
 Restricted Use Comm:        Not reported  
 ic Relied On In Remedy:    Not reported  
 Unit:                            Coco Palms Resort USTs  
 Fed Id:                         Not reported  
 Funding:                        Not reported  
 Agreement/program:        State Site  
 Sitelist Name:                Coco Palms Resort USTs  
 Activity Type:                ISST  
 Assignment Date:            4/8/1999  
 Activity Lead:                Amy Playdon  
 Assignment End Date:        7/5/2001  
 End fill:                        7/5/2001  
 Result fill:                    ISST Ranked NFA  
 Overall Status:                SDAR NFA

**HI SPILLS:**

Island:                         Kauai  
 Supplemental Loc. Text: Not reported  
 Case Number:                19980803-1411  
 Units:                         Coco Palms UST Leaking  
 Substances:                 Diesel Fuel  
 Less Or Greater Than:      Not reported  
 Numerical Quantity:        Not reported  
 Units:                         Not reported  
 Activity Type:                Response  
 Assignment Date:            8/3/1998  
 Activity Lead:                Terry Corpus  
 Assignment End Date:        Not reported  
 Result:                        8  
 Incident:                      3 different areas/Leaking fuel oil UST. Total of 7 USTs; 3 LUSTs; removed all 7 USTs.  
 Initial:                        Over excavate soil remove source material.  
 Report:                        Not reported

**3**      **HOLIDAY INN SUNSPREE RESORT- KAUAI**  
**3-5920 KUHIO HWY**  
**KAPAA, HI 96746**

**SHWS**    **S106817752**  
**SPILLS**    **N/A**

**SHWS:**

File Under:                    Holiday Inn SunSpree Resort- Kauai  
 Supplement:                    Not reported  
 Restricted Use:                Not reported  
 Restricted Use Comm:        Not reported  
 ic Relied On In Remedy:    Not reported  
 Unit:                            Wailua Bay Resort Tank Removal  
 Fed Id:                         Not reported  
 Funding:                        Not reported  
 Agreement/program:        State Site  
 Sitelist Name:                Wailua Bay Resort Tank Removal  
 Activity Type:                ISST  
 Assignment Date:            6/28/1997

MAP FINDINGS

Map ID  
Direction  
Distance  
Distance (ft.)Site

EDR ID Number

Database(s) EPA ID Number

**HOLIDAY INN SUNSPREE RESORT- KAUAI (Continued)**

**S106817752**

Activity Lead: Unknown  
Assignment End Date: 6/27/1997  
End fill: 6/27/1997  
Result fill: ISST Ranked NFA  
Overall Status: SDAR NFA

**HI SPILLS:**

Island: Kauai  
Supplemental Loc. Text: Not reported  
Case Number: 20011015-0904  
Units: Stairwell at Sunspree unknown white powdery substance  
Substances: Not reported  
Less Or Greater Than: Not reported  
Numerical Quantity: Not reported  
Units: Not reported  
Activity Type: Response  
Assignment Date: 10/15/2001  
Activity Lead: Liz Galvez  
Assignment End Date: Not reported  
Result: 8  
Incident: Not reported  
Initial: Provided technical assistance. KFD decontaminated.  
Report: Not reported

ORPHAN SUMMARY

City	EDR ID	Site Name	Site Address	Zip	Database(s)
HANAIEI	1003879118	HANAIEI LDFL	KAUAI BELT RD & KUNIO HWY	96766	CERC-NFRAP
KAPAA	S107023116	WAILUA HOMESTEAD WELLS 0421-01& 02	KIOWAI PL	96746	SPILLS
KAPAA	S106821034	WAILUA HOMESTEAD WELLS 0421-01& 02	KIOWAI PL	96746	SHWS
KAPAA	1009797002	WAILUA HOMESTEAD WELLS 0421-01& 02	KIOWAI PL	96746	FINDS
KAPAA	1006819735	WAILUA HOMESTEAD WELLS 0421-01& 2	KIOWAI PL	96746	FINDS
KAPAA	1005415817	SHELL SERVICE STATION	4 350 KUHIO HWY	96746	RCRA-SQG, FINDS
KAPAA	1006820066	KAPAA SUPER SERVICE	1125 KUHIO HWY	96746	LUST
KAPAA	1006841856	KODANI SERVICE STATION	1191 KUHIO HWY	96746	FINDS, LUST
KAPAA	1008890415	CHEVRON 92866	994 KUHIO HWY	96746	RCRA-SQG
KAPAA	1009398540	SHELL OIL PRODUCTS SAP 139567	1125 KUHIO HWY	96746	RCRA-SQG
KAPAA	S106818758	LEONARD'S, INC	994 KUHIO HWY	96746	SHWS, SPILLS
KAPAA	U003155355	KOOL KUTZ III	1467 KUHIO HWY #A	96746	UST
KAPAA	1009958388	WAILUA WASTEWATER TREATMENT PLANT	4460 NALU ROAD	96746	ICIS
KAPAA	1005640350	WAILUA WASTEWATER TREATMENT PLANT	4460 NALU ROAD	96746	FINDS
KAPAA	1006819737	WAILUA BAY RESERVOIR	EAST SHORE	96746	FINDS
KEKAHA, KAUAI	S106401331	KEKAHA LANDFILL PHASE II	KAUMUALII HIGHWAY	96766	SWF/LF
LIHUE	U003222424	DOLLAR RENT A CAR - HAWAII	AKUHINI RD AT KAUAI AIRPORT	96766	UST
LIHUE	U003541959	WAIMEA TREATMENT PLANT	DEPT. OF PUBLIC WORKS COUNTY OF KAUAI 4444 RICE ST	96766	UST
LIHUE	1006820955	HALEHAKA LANDFILL	HALEHAKA RD	96766	SHWS, FINDS
LIHUE	1000297903	FARMER PESTICIDE DISPOSAL PROJECT	KAUMUALII HWY PUHI	96766	RCRA-SQG, FINDS
LIHUE	1000313719	WAYNES AUTO REPAIR	3-3601 KUHIO HIGHWAY	96766	RCRA-SQG, FINDS
LIHUE	1000906736	STATE OF HAWAII WAINIHA BRIDGE 3	KUHIO HIGHWAY WAINIHA BRIDGE 3	96766	RCRA-SQG, FINDS
LIHUE	1004688861	WILCOX HOSPITAL	3420 KUHIO HWY	96766	RCRA-SQG, FINDS
LIHUE	1004688937	WAL MART NO 2308	3 3300 KUHIO HWY	96766	RCRA-SQG, FINDS
LIHUE	1008890400	CHEVRON 97619	3187 KUHIO HWY	96766	RCRA-SQG
LIHUE	1009398539	SHELL OIL PRODUCTS SAP 139572	3178 KUHIO HWY	96766	RCRA-SQG
LIHUE	1009398559	HANAMAULU SERVICE	3 4280 KUHIO HWY	96766	RCRA-SQG
LIHUE	S106816238	ANAHOLA PROJECT FAITH	KUIHIO HWY	96766	SHWS, BROWNFIELDS
LIHUE	S108008416	ANAHOLA PROJECT FAITH	KUIHIO HWY	96766	INST CONTROL
LIHUE	S108008471	• LIHUE PLANTATION CO., LTD. - SETTLING POND	OFF HOOMANA RD	96766	SHWS
LIHUE	S106819278	NAWILIWILI HARBOR PIER 3 BOLLARD FOUNDATION CONSTR	WAAPA RD	96766	SHWS
LIHUE	1006874147	WAILUA AUTO STORAGE	WAILUA AUTO STORAGE	96766	FINDS
LIHUE	1006873948	WAILUA PUNA AUTO STORAGE	WAILUA PUNA AUTO STORAGE	96766	FINDS
WAILUA	S106818241	KAUAI AGRICULTURAL RESEARCH CENTER (AGENT ORANGE/P	7370-A KUAMOO ROAD	96746	SHWS
WAILUA	U003222442	WAILUA TREATMENT PLANT	4460 NALU RD	96746	LUST, UST
WAILUA	1009797424	WAILUA WASTEWATER TREATMENT PLANT	4460 NALU RD	96746	FINDS
WAILUA	1001814617	KAUAI AGRICULTURAL RESEARCH CENTER	NEAR UNIV. OF HI WAILUA AG. STATION	96746	CERCLIS

# GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

To maintain currency of the following federal and state databases, EDR contacts the appropriate governmental agency on a monthly or quarterly basis, as required.

**Number of Days to Update:** Provides confirmation that EDR is reporting records that have been updated within 90 days from the date the government agency made the information available to the public.

## FEDERAL RECORDS

### **NPL: National Priority List**

National Priorities List (Superfund). The NPL is a subset of CERCLIS and identifies over 1,200 sites for priority cleanup under the Superfund Program. NPL sites may encompass relatively large areas. As such, EDR provides polygon coverage for over 1,000 NPL site boundaries produced by EPA's Environmental Photographic Interpretation Center (EPIC) and regional EPA offices.

Date of Government Version: 04/20/2007	Source: EPA
Date Data Arrived at EDR: 05/03/2007	Telephone: N/A
Date Made Active in Reports: 07/05/2007	Last EDR Contact: 05/03/2007
Number of Days to Update: 63	Next Scheduled EDR Contact: 07/30/2007
	Data Release Frequency: Quarterly

### **NPL Site Boundaries**

#### **Sources:**

EPA's Environmental Photographic Interpretation Center (EPIC)  
Telephone: 202-564-7333

EPA Region 1  
Telephone 617-918-1143

EPA Region 6  
Telephone: 214-655-6659

EPA Region 3  
Telephone 215-814-5418

EPA Region 7  
Telephone: 913-551-7247

EPA Region 4  
Telephone 404-562-8033

EPA Region 8  
Telephone: 303-312-6774

EPA Region 5  
Telephone 312-886-6686

EPA Region 9  
Telephone: 415-947-4246

EPA Region 10  
Telephone 206-553-8665

### **Proposed NPL: Proposed National Priority List Sites**

A site that has been proposed for listing on the National Priorities List through the issuance of a proposed rule in the Federal Register. EPA then accepts public comments on the site, responds to the comments, and places on the NPL those sites that continue to meet the requirements for listing.

Date of Government Version: 04/20/2007	Source: EPA
Date Data Arrived at EDR: 05/03/2007	Telephone: N/A
Date Made Active in Reports: 07/05/2007	Last EDR Contact: 05/03/2007
Number of Days to Update: 63	Next Scheduled EDR Contact: 07/30/2007
	Data Release Frequency: Quarterly

### **DELISTED NPL: National Priority List Deletions**

The National Oil and Hazardous Substances Pollution Contingency Plan (NCP) establishes the criteria that the EPA uses to delete sites from the NPL. In accordance with 40 CFR 300.425.(e), sites may be deleted from the NPL where no further response is appropriate.

Date of Government Version: 04/20/2007	Source: EPA
Date Data Arrived at EDR: 05/03/2007	Telephone: N/A
Date Made Active in Reports: 06/25/2007	Last EDR Contact: 05/03/2007
Number of Days to Update: 53	Next Scheduled EDR Contact: 07/30/2007
	Data Release Frequency: Quarterly

# GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

## **NPL LIENS: Federal Superfund Liens**

Federal Superfund Liens. Under the authority granted the USEPA by CERCLA of 1980, the USEPA has the authority to file liens against real property in order to recover remedial action expenditures or when the property owner received notification of potential liability. USEPA compiles a listing of filed notices of Superfund Liens.

Date of Government Version: 10/15/1991  
Date Data Arrived at EDR: 02/02/1994  
Date Made Active in Reports: 03/30/1994  
Number of Days to Update: 56

Source: EPA  
Telephone: 202-564-4267  
Last EDR Contact: 05/21/2007  
Next Scheduled EDR Contact: 08/20/2007  
Data Release Frequency: No Update Planned

## **CERCLIS: Comprehensive Environmental Response, Compensation, and Liability Information System**

CERCLIS contains data on potentially hazardous waste sites that have been reported to the USEPA by states, municipalities, private companies and private persons, pursuant to Section 103 of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). CERCLIS contains sites which are either proposed to or on the National Priorities List (NPL) and sites which are in the screening and assessment phase for possible inclusion on the NPL.

Date of Government Version: 02/27/2007  
Date Data Arrived at EDR: 03/21/2007  
Date Made Active in Reports: 04/27/2007  
Number of Days to Update: 37

Source: EPA  
Telephone: 703-412-9810  
Last EDR Contact: 06/20/2007  
Next Scheduled EDR Contact: 09/17/2007  
Data Release Frequency: Quarterly

## **CERCLIS-NFRAP: CERCLIS No Further Remedial Action Planned**

Archived sites are sites that have been removed and archived from the inventory of CERCLIS sites. Archived status indicates that, to the best of EPA's knowledge, assessment at a site has been completed and that EPA has determined no further steps will be taken to list this site on the National Priorities List (NPL), unless information indicates this decision was not appropriate or other considerations require a recommendation for listing at a later time. This decision does not necessarily mean that there is no hazard associated with a given site; it only means that, based upon available information, the location is not judged to be a potential NPL site.

Date of Government Version: 03/21/2007  
Date Data Arrived at EDR: 04/27/2007  
Date Made Active in Reports: 05/25/2007  
Number of Days to Update: 28

Source: EPA  
Telephone: 703-412-9810  
Last EDR Contact: 06/15/2007  
Next Scheduled EDR Contact: 09/17/2007  
Data Release Frequency: Quarterly

## **CORRACTS: Corrective Action Report**

CORRACTS identifies hazardous waste handlers with RCRA corrective action activity.

Date of Government Version: 03/14/2007  
Date Data Arrived at EDR: 03/20/2007  
Date Made Active in Reports: 04/27/2007  
Number of Days to Update: 38

Source: EPA  
Telephone: 800-424-9346  
Last EDR Contact: 06/04/2007  
Next Scheduled EDR Contact: 09/03/2007  
Data Release Frequency: Quarterly

## **RCRA: Resource Conservation and Recovery Act Information**

## GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. RCRAInfo replaces the data recording and reporting abilities of the Resource Conservation and Recovery Information System (RCRIS). The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Conditionally exempt small quantity generators (CESQGs) generate less than 100 kg of hazardous waste, or less than 1 kg of acutely hazardous waste per month. Small quantity generators (SQGs) generate between 100 kg and 1,000 kg of hazardous waste per month. Large quantity generators (LQGs) generate over 1,000 kilograms (kg) of hazardous waste, or over 1 kg of acutely hazardous waste per month. Transporters are individuals or entities that move hazardous waste from the generator off-site to a facility that can recycle, treat, store, or dispose of the waste. TSDFs treat, store, or dispose of the waste.

Date of Government Version: 06/13/2006  
Date Data Arrived at EDR: 06/28/2006  
Date Made Active in Reports: 08/23/2006  
Number of Days to Update: 56

Source: EPA  
Telephone: (415) 495-8895  
Last EDR Contact: 07/16/2007  
Next Scheduled EDR Contact: 09/17/2007  
Data Release Frequency: Quarterly

### **ERNS: Emergency Response Notification System**

Emergency Response Notification System. ERNS records and stores information on reported releases of oil and hazardous substances.

Date of Government Version: 12/31/2006  
Date Data Arrived at EDR: 01/24/2007  
Date Made Active in Reports: 03/12/2007  
Number of Days to Update: 47

Source: National Response Center, United States Coast Guard  
Telephone: 202-267-2180  
Last EDR Contact: 07/23/2007  
Next Scheduled EDR Contact: 10/22/2007  
Data Release Frequency: Annually

### **HMIRS: Hazardous Materials Information Reporting System**

Hazardous Materials Incident Report System. HMIRS contains hazardous material spill incidents reported to DOT.

Date of Government Version: 03/05/2007  
Date Data Arrived at EDR: 04/17/2007  
Date Made Active in Reports: 05/14/2007  
Number of Days to Update: 27

Source: U.S. Department of Transportation  
Telephone: 202-366-4555  
Last EDR Contact: 07/18/2007  
Next Scheduled EDR Contact: 10/15/2007  
Data Release Frequency: Annually

### **US ENG CONTROLS: Engineering Controls Sites List**

A listing of sites with engineering controls in place. Engineering controls include various forms of caps, building foundations, liners, and treatment methods to create pathway elimination for regulated substances to enter environmental media or effect human health.

Date of Government Version: 04/20/2007  
Date Data Arrived at EDR: 04/26/2007  
Date Made Active in Reports: 05/25/2007  
Number of Days to Update: 29

Source: Environmental Protection Agency  
Telephone: 703-603-8905  
Last EDR Contact: 07/02/2007  
Next Scheduled EDR Contact: 10/01/2007  
Data Release Frequency: Varies

### **US INST CONTROL: Sites with Institutional Controls**

A listing of sites with institutional controls in place. Institutional controls include administrative measures, such as groundwater use restrictions, construction restrictions, property use restrictions, and post remediation care requirements intended to prevent exposure to contaminants remaining on site. Deed restrictions are generally required as part of the institutional controls.

Date of Government Version: 04/20/2007  
Date Data Arrived at EDR: 04/26/2007  
Date Made Active in Reports: 05/25/2007  
Number of Days to Update: 29

Source: Environmental Protection Agency  
Telephone: 703-603-8905  
Last EDR Contact: 07/02/2007  
Next Scheduled EDR Contact: 10/01/2007  
Data Release Frequency: Varies



# GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

## **DOD: Department of Defense Sites**

This data set consists of federally owned or administered lands, administered by the Department of Defense, that have any area equal to or greater than 640 acres of the United States, Puerto Rico, and the U.S. Virgin Islands.

Date of Government Version: 12/31/2005  
Date Data Arrived at EDR: 11/10/2006  
Date Made Active in Reports: 01/11/2007  
Number of Days to Update: 62

Source: USGS  
Telephone: 703-692-8801  
Last EDR Contact: 05/11/2007  
Next Scheduled EDR Contact: 08/06/2007  
Data Release Frequency: Semi-Annually

## **FUDS: Formerly Used Defense Sites**

The listing includes locations of Formerly Used Defense Sites properties where the US Army Corps of Engineers is actively working or will take necessary cleanup actions.

Date of Government Version: 12/31/2005  
Date Data Arrived at EDR: 09/20/2006  
Date Made Active in Reports: 11/22/2006  
Number of Days to Update: 63

Source: U.S. Army Corps of Engineers  
Telephone: 202-528-4285  
Last EDR Contact: 07/02/2007  
Next Scheduled EDR Contact: 10/01/2007  
Data Release Frequency: Varies

## **US BROWNFIELDS: A Listing of Brownfields Sites**

Included in the listing are brownfields properties addresses by Cooperative Agreement Recipients and brownfields properties addressed by Targeted Brownfields Assessments. Targeted Brownfields Assessments-EPA's Targeted Brownfields Assessments (TBA) program is designed to help states, tribes, and municipalities--especially those without EPA Brownfields Assessment Demonstration Pilots--minimize the uncertainties of contamination often associated with brownfields. Under the TBA program, EPA provides funding and/or technical assistance for environmental assessments at brownfields sites throughout the country. Targeted Brownfields Assessments supplement and work with other efforts under EPA's Brownfields Initiative to promote cleanup and redevelopment of brownfields. Cooperative Agreement Recipients-States, political subdivisions, territories, and Indian tribes become Brownfields Cleanup Revolving Loan Fund (BCRLF) cooperative agreement recipients when they enter into BCRLF cooperative agreements with the U.S. EPA. EPA selects BCRLF cooperative agreement recipients based on a proposal and application process. BCRLF cooperative agreement recipients must use EPA funds provided through BCRLF cooperative agreement for specified brownfields-related cleanup activities.

Date of Government Version: 04/04/2007  
Date Data Arrived at EDR: 04/04/2007  
Date Made Active in Reports: 05/25/2007  
Number of Days to Update: 51

Source: Environmental Protection Agency  
Telephone: 202-566-2777  
Last EDR Contact: 06/11/2007  
Next Scheduled EDR Contact: 09/10/2007  
Data Release Frequency: Semi-Annually

## **CONSENT: Superfund (CERCLA) Consent Decrees**

Major legal settlements that establish responsibility and standards for cleanup at NPL (Superfund) sites. Released periodically by United States District Courts after settlement by parties to litigation matters.

Date of Government Version: 08/23/2006  
Date Data Arrived at EDR: 03/06/2007  
Date Made Active in Reports: 04/10/2007  
Number of Days to Update: 35

Source: Department of Justice, Consent Decree Library  
Telephone: Varies  
Last EDR Contact: 07/24/2007  
Next Scheduled EDR Contact: 10/22/2007  
Data Release Frequency: Varies

## **ROD: Records Of Decision**

Record of Decision. ROD documents mandate a permanent remedy at an NPL (Superfund) site containing technical and health information to aid in the cleanup.

Date of Government Version: 03/27/2007  
Date Data Arrived at EDR: 03/27/2007  
Date Made Active in Reports: 04/27/2007  
Number of Days to Update: 31

Source: EPA  
Telephone: 703-416-0223  
Last EDR Contact: 07/02/2007  
Next Scheduled EDR Contact: 10/01/2007  
Data Release Frequency: Annually

# GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

## **UMTRA: Uranium Mill Tailings Sites**

Uranium ore was mined by private companies for federal government use in national defense programs. When the mills shut down, large piles of the sand-like material (mill tailings) remain after uranium has been extracted from the ore. Levels of human exposure to radioactive materials from the piles are low; however, in some cases tailings were used as construction materials before the potential health hazards of the tailings were recognized.

Date of Government Version: 12/31/2005  
Date Data Arrived at EDR: 11/08/2006  
Date Made Active in Reports: 01/29/2007  
Number of Days to Update: 82

Source: Department of Energy  
Telephone: 505-845-0011  
Last EDR Contact: 07/05/2007  
Next Scheduled EDR Contact: 09/17/2007  
Data Release Frequency: Varies

## **ODI: Open Dump Inventory**

An open dump is defined as a disposal facility that does not comply with one or more of the Part 257 or Part 258 Subtitle D Criteria.

Date of Government Version: 06/30/1985  
Date Data Arrived at EDR: 08/09/2004  
Date Made Active in Reports: 09/17/2004  
Number of Days to Update: 39

Source: Environmental Protection Agency  
Telephone: 800-424-9346  
Last EDR Contact: 06/09/2004  
Next Scheduled EDR Contact: N/A  
Data Release Frequency: No Update Planned

## **TRIS: Toxic Chemical Release Inventory System**

Toxic Release Inventory System. TRIS identifies facilities which release toxic chemicals to the air, water and land in reportable quantities under SARA Title III Section 313.

Date of Government Version: 12/31/2005  
Date Data Arrived at EDR: 04/27/2007  
Date Made Active in Reports: 07/05/2007  
Number of Days to Update: 69

Source: EPA  
Telephone: 202-566-0250  
Last EDR Contact: 06/19/2007  
Next Scheduled EDR Contact: 09/17/2007  
Data Release Frequency: Annually

## **TSCA: Toxic Substances Control Act**

Toxic Substances Control Act. TSCA identifies manufacturers and importers of chemical substances included on the TSCA Chemical Substance Inventory list. It includes data on the production volume of these substances by plant site.

Date of Government Version: 12/31/2002  
Date Data Arrived at EDR: 04/14/2006  
Date Made Active in Reports: 05/30/2006  
Number of Days to Update: 46

Source: EPA  
Telephone: 202-260-5521  
Last EDR Contact: 07/16/2007  
Next Scheduled EDR Contact: 10/15/2007  
Data Release Frequency: Every 4 Years

## **FTTS: FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)**

FTTS tracks administrative cases and pesticide enforcement actions and compliance activities related to FIFRA, TSCA and EPCRA (Emergency Planning and Community Right-to-Know Act). To maintain currency, EDR contacts the Agency on a quarterly basis.

Date of Government Version: 04/13/2007  
Date Data Arrived at EDR: 04/25/2007  
Date Made Active in Reports: 07/05/2007  
Number of Days to Update: 71

Source: EPA/Office of Prevention, Pesticides and Toxic Substances  
Telephone: 202-566-1667  
Last EDR Contact: 06/15/2007  
Next Scheduled EDR Contact: 09/17/2007  
Data Release Frequency: Quarterly

## **FTTS INSP: FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)** A listing of FIFRA/TSCA Tracking System (FTTS) inspections and enforcements.

Date of Government Version: 04/13/2007  
Date Data Arrived at EDR: 04/25/2007  
Date Made Active in Reports: 07/05/2007  
Number of Days to Update: 71

Source: EPA  
Telephone: 202-566-1667  
Last EDR Contact: 06/15/2007  
Next Scheduled EDR Contact: 09/17/2007  
Data Release Frequency: Quarterly

# GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

## **SSTS: Section 7 Tracking Systems**

Section 7 of the Federal Insecticide, Fungicide and Rodenticide Act, as amended (92 Stat. 829) requires all registered pesticide-producing establishments to submit a report to the Environmental Protection Agency by March 1st each year. Each establishment must report the types and amounts of pesticides, active ingredients and devices being produced, and those having been produced and sold or distributed in the past year.

Date of Government Version: 12/31/2005  
Date Data Arrived at EDR: 03/13/2007  
Date Made Active in Reports: 04/27/2007  
Number of Days to Update: 45

Source: EPA  
Telephone: 202-564-4203  
Last EDR Contact: 07/16/2007  
Next Scheduled EDR Contact: 10/15/2007  
Data Release Frequency: Annually

## **CDL: Clandestine Drug Labs**

A listing of clandestine drug lab locations. The U.S. Department of Justice ("the Department") provides this web site as a public service. It contains addresses of some locations where law enforcement agencies reported they found chemicals or other items that indicated the presence of either clandestine drug laboratories or dumpsites. In most cases, the source of the entries is not the Department, and the Department has not verified the entry and does not guarantee its accuracy. Members of the public must verify the accuracy of all entries by, for example, contacting local law enforcement and local health departments.

Date of Government Version: 12/01/2006  
Date Data Arrived at EDR: 01/08/2007  
Date Made Active in Reports: 01/11/2007  
Number of Days to Update: 3

Source: Drug Enforcement Administration  
Telephone: 202-307-1000  
Last EDR Contact: 06/29/2007  
Next Scheduled EDR Contact: 09/24/2007  
Data Release Frequency: Quarterly

## **DOT OPS: Incident and Accident Data**

Department of Transportation, Office of Pipeline Safety Incident and Accident data.

Date of Government Version: 05/14/2007  
Date Data Arrived at EDR: 05/30/2007  
Date Made Active in Reports: 07/05/2007  
Number of Days to Update: 36

Source: Department of Transportation, Office of Pipeline Safety  
Telephone: 202-366-4595  
Last EDR Contact: 05/30/2007  
Next Scheduled EDR Contact: 08/27/2007  
Data Release Frequency: Varies

## **HIST FTTS: FIFRA/TSCA Tracking System Administrative Case Listing**

A complete administrative case listing from the FIFRA/TSCA Tracking System (FTTS) for all ten EPA regions. The information was obtained from the National Compliance Database (NCDB). NCDB supports the implementation of FIFRA (Federal Insecticide, Fungicide, and Rodenticide Act) and TSCA (Toxic Substances Control Act). Some EPA regions are now closing out records. Because of that, and the fact that some EPA regions are not providing EPA Headquarters with updated records, it was decided to create a HIST FTTS database. It included records that may not be included in the newer FTTS database updates. This database is no longer updated.

Date of Government Version: 10/19/2006  
Date Data Arrived at EDR: 03/01/2007  
Date Made Active in Reports: 04/10/2007  
Number of Days to Update: 40

Source: Environmental Protection Agency  
Telephone: 202-564-2501  
Last EDR Contact: 06/15/2007  
Next Scheduled EDR Contact: 09/17/2007  
Data Release Frequency: No Update Planned

## **ICIS: Integrated Compliance Information System**

The Integrated Compliance Information System (ICIS) supports the information needs of the national enforcement and compliance program as well as the unique needs of the National Pollutant Discharge Elimination System (NPDES) program.

Date of Government Version: 02/21/2007  
Date Data Arrived at EDR: 04/03/2007  
Date Made Active in Reports: 05/14/2007  
Number of Days to Update: 41

Source: Environmental Protection Agency  
Telephone: 202-564-5088  
Last EDR Contact: 06/22/2007  
Next Scheduled EDR Contact: 07/16/2007  
Data Release Frequency: Quarterly

# GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

## **RADINFO:** Radiation Information Database

The Radiation Information Database (RADINFO) contains information about facilities that are regulated by U.S. Environmental Protection Agency (EPA) regulations for radiation and radioactivity.

Date of Government Version: 05/01/2007

Date Data Arrived at EDR: 05/03/2007

Date Made Active in Reports: 05/25/2007

Number of Days to Update: 22

Source: Environmental Protection Agency

Telephone: 202-343-9775

Last EDR Contact: 05/03/2007

Next Scheduled EDR Contact: 07/30/2007

Data Release Frequency: Quarterly

## **LUCIS:** Land Use Control Information System

LUCIS contains records of land use control information pertaining to the former Navy Base Realignment and Closure properties.

Date of Government Version: 12/09/2005

Date Data Arrived at EDR: 12/11/2006

Date Made Active in Reports: 01/11/2007

Number of Days to Update: 31

Source: Department of the Navy

Telephone: 843-820-7326

Last EDR Contact: 06/11/2007

Next Scheduled EDR Contact: 09/10/2007

Data Release Frequency: Varies

## **LIENS 2:** CERCLA Lien Information

A Federal CERCLA ('Superfund') lien can exist by operation of law at any site or property at which EPA has spent Superfund monies. These monies are spent to investigate and address releases and threatened releases of contamination. CERCLIS provides information as to the identity of these sites and properties.

Date of Government Version: 03/08/2007

Date Data Arrived at EDR: 04/12/2007

Date Made Active in Reports: 05/14/2007

Number of Days to Update: 32

Source: Environmental Protection Agency

Telephone: 202-564-6023

Last EDR Contact: 05/21/2007

Next Scheduled EDR Contact: 08/20/2007

Data Release Frequency: Varies

## **PADS:** PCB Activity Database System

PCB Activity Database. PADS Identifies generators, transporters, commercial storers and/or brokers and disposers of PCB's who are required to notify the EPA of such activities.

Date of Government Version: 10/17/2006

Date Data Arrived at EDR: 11/29/2006

Date Made Active in Reports: 01/11/2007

Number of Days to Update: 43

Source: EPA

Telephone: 202-566-0500

Last EDR Contact: 06/08/2007

Next Scheduled EDR Contact: 08/06/2007

Data Release Frequency: Annually

## **MLTS:** Material Licensing Tracking System

MLTS is maintained by the Nuclear Regulatory Commission and contains a list of approximately 8,100 sites which possess or use radioactive materials and which are subject to NRC licensing requirements. To maintain currency, EDR contacts the Agency on a quarterly basis.

Date of Government Version: 04/05/2007

Date Data Arrived at EDR: 04/25/2007

Date Made Active in Reports: 05/25/2007

Number of Days to Update: 30

Source: Nuclear Regulatory Commission

Telephone: 301-415-7169

Last EDR Contact: 07/02/2007

Next Scheduled EDR Contact: 10/01/2007

Data Release Frequency: Quarterly

## **MINES:** Mines Master Index File

Contains all mine identification numbers issued for mines active or opened since 1971. The data also includes violation information.

Date of Government Version: 02/06/2007

Date Data Arrived at EDR: 03/28/2007

Date Made Active in Reports: 05/14/2007

Number of Days to Update: 47

Source: Department of Labor, Mine Safety and Health Administration

Telephone: 303-231-5959

Last EDR Contact: 06/28/2007

Next Scheduled EDR Contact: 09/24/2007

Data Release Frequency: Semi-Annually

# GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

## **FINDS: Facility Index System/Facility Registry System**

Facility Index System. FINDS contains both facility information and 'pointers' to other sources that contain more detail. EDR includes the following FINDS databases in this report: PCS (Permit Compliance System), AIRS (Aerometric Information Retrieval System), DOCKET (Enforcement Docket used to manage and track information on civil judicial enforcement cases for all environmental statutes), FURS (Federal Underground Injection Control), C-DOCKET (Criminal Docket System used to track criminal enforcement actions for all environmental statutes), FFIS (Federal Facilities Information System), STATE (State Environmental Laws and Statutes), and PADS (PCB Activity Data System).

Date of Government Version: 04/12/2007  
Date Data Arrived at EDR: 05/17/2007  
Date Made Active in Reports: 07/05/2007  
Number of Days to Update: 49

Source: EPA  
Telephone: (415) 947-8000  
Last EDR Contact: 07/02/2007  
Next Scheduled EDR Contact: 10/01/2007  
Data Release Frequency: Quarterly

## **RAATS: RCRA Administrative Action Tracking System**

RCRA Administration Action Tracking System. RAATS contains records based on enforcement actions issued under RCRA pertaining to major violators and includes administrative and civil actions brought by the EPA. For administration actions after September 30, 1995, data entry in the RAATS database was discontinued. EPA will retain a copy of the database for historical records. It was necessary to terminate RAATS because a decrease in agency resources made it impossible to continue to update the information contained in the database.

Date of Government Version: 04/17/1995  
Date Data Arrived at EDR: 07/03/1995  
Date Made Active in Reports: 08/07/1995  
Number of Days to Update: 35

Source: EPA  
Telephone: 202-564-4104  
Last EDR Contact: 06/04/2007  
Next Scheduled EDR Contact: 09/03/2007  
Data Release Frequency: No Update Planned

## **BRS: Biennial Reporting System**

The Biennial Reporting System is a national system administered by the EPA that collects data on the generation and management of hazardous waste. BRS captures detailed data from two groups: Large Quantity Generators (LQG) and Treatment, Storage, and Disposal Facilities.

Date of Government Version: 12/31/2005  
Date Data Arrived at EDR: 03/06/2007  
Date Made Active in Reports: 04/13/2007  
Number of Days to Update: 38

Source: EPA/NTIS  
Telephone: 800-424-9346  
Last EDR Contact: 06/12/2007  
Next Scheduled EDR Contact: 09/10/2007  
Data Release Frequency: Biennially

## **PWS: Public Water System Data**

This Safe Drinking Water Information System (SDWIS) file contains public water systems name and address, population served and the primary source of water

Date of Government Version: 02/24/2000  
Date Data Arrived at EDR: 04/27/2005  
Date Made Active in Reports: N/A  
Number of Days to Update: 0

Source: EPA  
Telephone: N/A  
Last EDR Contact: 05/21/2007  
Next Scheduled EDR Contact: 08/20/2007  
Data Release Frequency: N/A

## **USGS WATER WELLS: National Water Information System (NWIS)**

This database consists of well records in the United States. Available site descriptive information includes well location information (latitude and longitude, well depth, site use, water use, and aquifer).

Date of Government Version: 03/25/2005  
Date Data Arrived at EDR: 03/25/2005  
Date Made Active in Reports: N/A  
Number of Days to Update: 0

Source: USGS  
Telephone: N/A  
Last EDR Contact: 03/25/2005  
Next Scheduled EDR Contact: N/A  
Data Release Frequency: N/A

# GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

## STATE AND LOCAL RECORDS

### **SHWS: Sites List**

Facilities, sites or areas in which the Office of Hazard Evaluation and Emergency Response has an interest, has investigated or may investigate under HRS 128D (includes CERCLIS sites).

Date of Government Version: 07/24/2006  
Date Data Arrived at EDR: 07/27/2006  
Date Made Active in Reports: 08/30/2006  
Number of Days to Update: 34

Source: Department of Health  
Telephone: 808-586-4249  
Last EDR Contact: 06/22/2007  
Next Scheduled EDR Contact: 09/17/2007  
Data Release Frequency: Semi-Annually

### **SWF/LF: Permitted Landfills in the State of Hawaii**

Solid Waste Facilities/Landfill Sites. SWF/LF type records typically contain an inventory of solid waste disposal facilities or landfills in a particular state. Depending on the state, these may be active or inactive facilities or open dumps that failed to meet RCRA Subtitle D Section 4004 criteria for solid waste landfills or disposal sites.

Date of Government Version: 05/19/2004  
Date Data Arrived at EDR: 05/20/2004  
Date Made Active in Reports: 06/22/2004  
Number of Days to Update: 33

Source: Department of Health  
Telephone: 808-586-4245  
Last EDR Contact: 07/24/2007  
Next Scheduled EDR Contact: 10/22/2007  
Data Release Frequency: Varies

### **LUST: Leaking Underground Storage Tank Database**

Leaking Underground Storage Tank Incident Reports. LUST records contain an inventory of reported leaking underground storage tank incidents. Not all states maintain these records, and the information stored varies by state.

Date of Government Version: 01/30/2007  
Date Data Arrived at EDR: 02/13/2007  
Date Made Active in Reports: 03/12/2007  
Number of Days to Update: 27

Source: Department of Health  
Telephone: 808-586-4228  
Last EDR Contact: 07/20/2007  
Next Scheduled EDR Contact: 09/24/2007  
Data Release Frequency: Semi-Annually

### **UST: Underground Storage Tank Database**

Registered Underground Storage Tanks. UST's are regulated under Subtitle I of the Resource Conservation and Recovery Act (RCRA) and must be registered with the state department responsible for administering the UST program. Available information varies by state program.

Date of Government Version: 01/30/2007  
Date Data Arrived at EDR: 02/13/2007  
Date Made Active in Reports: 03/21/2007  
Number of Days to Update: 36

Source: Department of Health  
Telephone: 808-586-4228  
Last EDR Contact: 07/20/2007  
Next Scheduled EDR Contact: 09/24/2007  
Data Release Frequency: Semi-Annually

### **SPILLS: Release Notifications**

Releases of hazardous substances to the environment reported to the Office of Hazard Evaluation and Emergency Response since 1988.

Date of Government Version: 07/24/2006  
Date Data Arrived at EDR: 07/27/2006  
Date Made Active in Reports: 08/30/2006  
Number of Days to Update: 34

Source: Department of Health  
Telephone: 808-586-4249  
Last EDR Contact: 06/22/2007  
Next Scheduled EDR Contact: 09/17/2007  
Data Release Frequency: Varies

### **INST CONTROL: Sites with Institutional Controls**

Voluntary Remediation Program and Brownfields sites with institutional controls in place.

Date of Government Version: 07/24/2006  
Date Data Arrived at EDR: 07/27/2006  
Date Made Active in Reports: 08/30/2006  
Number of Days to Update: 34

Source: Department of Health  
Telephone: 808-586-4249  
Last EDR Contact: 06/22/2007  
Next Scheduled EDR Contact: 09/17/2007  
Data Release Frequency: Varies

# GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

## **VCP: Voluntary Response Program Sites**

Sites participating in the Voluntary Response Program. The purpose of the VRP is to streamline the cleanup process in a way that will encourage prospective developers, lenders, and purchasers to voluntarily cleanup properties.

Date of Government Version: 07/24/2006  
Date Data Arrived at EDR: 07/27/2006  
Date Made Active in Reports: 08/30/2006  
Number of Days to Update: 34

Source: Department of Health  
Telephone: 808-586-4249  
Last EDR Contact: 06/22/2007  
Next Scheduled EDR Contact: 09/17/2007  
Data Release Frequency: Varies

## **DRYCLEANERS: Permitted Drycleaner Facility Listing**

A listing of permitted drycleaner facilities in the state.

Date of Government Version: 05/16/2007  
Date Data Arrived at EDR: 05/17/2007  
Date Made Active in Reports: 06/14/2007  
Number of Days to Update: 28

Source: Department of Health  
Telephone: 808-586-4200  
Last EDR Contact: 04/30/2007  
Next Scheduled EDR Contact: 07/30/2007  
Data Release Frequency: Varies

## **BROWNFIELDS: Brownfields Sites**

With certain legal exclusions and additions, the term 'brownfield site' means real property, the expansion, redevelopment, or reuse of which may be complicated by the presence or potential presence of a hazardous substance, pollutant, or contaminant.

Date of Government Version: 07/24/2006  
Date Data Arrived at EDR: 07/27/2006  
Date Made Active in Reports: 08/30/2006  
Number of Days to Update: 34

Source: Department of Health  
Telephone: 808-586-4249  
Last EDR Contact: 06/22/2007  
Next Scheduled EDR Contact: 09/17/2007  
Data Release Frequency: Varies

## **AIRS: List of Permitted Facilities**

A listing of permitted facilities in the state.

Date of Government Version: 09/07/2006  
Date Data Arrived at EDR: 09/08/2006  
Date Made Active in Reports: 10/13/2006  
Number of Days to Update: 35

Source: Department of Health  
Telephone: 808-586-4200  
Last EDR Contact: 04/30/2007  
Next Scheduled EDR Contact: 07/30/2007  
Data Release Frequency: Varies

## **TRIBAL RECORDS**

### **INDIAN RESERV: Indian Reservations**

This map layer portrays Indian administered lands of the United States that have any area equal to or greater than 640 acres.

Date of Government Version: 12/31/2005  
Date Data Arrived at EDR: 12/08/2006  
Date Made Active in Reports: 01/11/2007  
Number of Days to Update: 34

Source: USGS  
Telephone: 202-208-3710  
Last EDR Contact: 05/11/2007  
Next Scheduled EDR Contact: 08/06/2007  
Data Release Frequency: Semi-Annually

### **INDIAN LUST R9: Leaking Underground Storage Tanks on Indian Land**

LUSTs on Indian land in Arizona, California, New Mexico and Nevada

Date of Government Version: 06/18/2007  
Date Data Arrived at EDR: 06/18/2007  
Date Made Active in Reports: 07/05/2007  
Number of Days to Update: 17

Source: Environmental Protection Agency  
Telephone: 415-972-3372  
Last EDR Contact: 05/21/2007  
Next Scheduled EDR Contact: 08/20/2007  
Data Release Frequency: Quarterly

# GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

**INDIAN LUST R7: Leaking Underground Storage Tanks on Indian Land**  
LUSTs on Indian land in Iowa, Kansas, and Nebraska

Date of Government Version: 06/01/2007	Source: EPA Region 7
Date Data Arrived at EDR: 06/14/2007	Telephone: 913-551-7003
Date Made Active in Reports: 07/05/2007	Last EDR Contact: 05/21/2007
Number of Days to Update: 21	Next Scheduled EDR Contact: 08/20/2007
	Data Release Frequency: Varies

**INDIAN LUST R6: Leaking Underground Storage Tanks on Indian Land**  
LUSTs on Indian land in New Mexico and Oklahoma.

Date of Government Version: 01/04/2005	Source: EPA Region 6
Date Data Arrived at EDR: 01/21/2005	Telephone: 214-665-6597
Date Made Active in Reports: 02/28/2005	Last EDR Contact: 05/21/2007
Number of Days to Update: 38	Next Scheduled EDR Contact: 08/20/2007
	Data Release Frequency: Varies

**INDIAN LUST R4: Leaking Underground Storage Tanks on Indian Land**  
LUSTs on Indian land in Florida, Minnesota, Mississippi and North Carolina.

Date of Government Version: 03/20/2007	Source: EPA Region 4
Date Data Arrived at EDR: 04/16/2007	Telephone: 404-562-8677
Date Made Active in Reports: 05/14/2007	Last EDR Contact: 05/21/2007
Number of Days to Update: 28	Next Scheduled EDR Contact: 08/20/2007
	Data Release Frequency: Semi-Annually

**INDIAN LUST R1: Leaking Underground Storage Tanks on Indian Land**  
A listing of leaking underground storage tank locations on Indian Land.

Date of Government Version: 12/01/2006	Source: EPA Region 1
Date Data Arrived at EDR: 12/01/2006	Telephone: 617-918-1313
Date Made Active in Reports: 01/29/2007	Last EDR Contact: 05/21/2007
Number of Days to Update: 59	Next Scheduled EDR Contact: 08/20/2007
	Data Release Frequency: Varies

**INDIAN LUST R10: Leaking Underground Storage Tanks on Indian Land**  
LUSTs on Indian land in Alaska, Idaho, Oregon and Washington.

Date of Government Version: 05/23/2007	Source: EPA Region 10
Date Data Arrived at EDR: 05/24/2007	Telephone: 206-553-2857
Date Made Active in Reports: 07/05/2007	Last EDR Contact: 05/21/2007
Number of Days to Update: 42	Next Scheduled EDR Contact: 08/20/2007
	Data Release Frequency: Quarterly

**INDIAN LUST R8: Leaking Underground Storage Tanks on Indian Land**  
LUSTs on Indian land in Colorado, Montana, North Dakota, South Dakota, Utah and Wyoming.

Date of Government Version: 05/30/2007	Source: EPA Region 8
Date Data Arrived at EDR: 05/31/2007	Telephone: 303-312-6271
Date Made Active in Reports: 07/05/2007	Last EDR Contact: 05/21/2007
Number of Days to Update: 35	Next Scheduled EDR Contact: 08/20/2007
	Data Release Frequency: Quarterly

**INDIAN UST R8: Underground Storage Tanks on Indian Land**

Date of Government Version: 05/30/2007	Source: EPA Region 8
Date Data Arrived at EDR: 05/31/2007	Telephone: 303-312-6137
Date Made Active in Reports: 07/05/2007	Last EDR Contact: 05/21/2007
Number of Days to Update: 35	Next Scheduled EDR Contact: 08/20/2007
	Data Release Frequency: Quarterly



# GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

## INDIAN UST R4: Underground Storage Tanks on Indian Land

Date of Government Version: 03/20/2007	Source: EPA Region 4
Date Data Arrived at EDR: 04/16/2007	Telephone: 404-562-9424
Date Made Active in Reports: 05/14/2007	Last EDR Contact: 05/21/2007
Number of Days to Update: 28	Next Scheduled EDR Contact: 08/20/2007
	Data Release Frequency: Semi-Annually

## INDIAN UST R7: Underground Storage Tanks on Indian Land

Date of Government Version: 06/01/2007	Source: EPA Region 7
Date Data Arrived at EDR: 06/14/2007	Telephone: 913-551-7003
Date Made Active in Reports: 07/05/2007	Last EDR Contact: 05/21/2007
Number of Days to Update: 21	Next Scheduled EDR Contact: 08/20/2007
	Data Release Frequency: Varies

## INDIAN UST R6: Underground Storage Tanks on Indian Land

Date of Government Version: 06/06/2007	Source: EPA Region 6
Date Data Arrived at EDR: 06/07/2007	Telephone: 214-665-7591
Date Made Active in Reports: 07/05/2007	Last EDR Contact: 05/21/2007
Number of Days to Update: 28	Next Scheduled EDR Contact: 08/20/2007
	Data Release Frequency: Semi-Annually

## INDIAN UST R5: Underground Storage Tanks on Indian Land

Date of Government Version: 12/02/2004	Source: EPA Region 5
Date Data Arrived at EDR: 12/29/2004	Telephone: 312-886-6136
Date Made Active in Reports: 02/04/2005	Last EDR Contact: 05/21/2007
Number of Days to Update: 37	Next Scheduled EDR Contact: 08/20/2007
	Data Release Frequency: Varies

## INDIAN UST R10: Underground Storage Tanks on Indian Land

Date of Government Version: 05/23/2007	Source: EPA Region 10
Date Data Arrived at EDR: 05/24/2007	Telephone: 206-553-2857
Date Made Active in Reports: 07/05/2007	Last EDR Contact: 05/21/2007
Number of Days to Update: 42	Next Scheduled EDR Contact: 08/20/2007
	Data Release Frequency: Quarterly

## INDIAN UST R9: Underground Storage Tanks on Indian Land

Date of Government Version: 06/18/2007	Source: EPA Region 9
Date Data Arrived at EDR: 06/18/2007	Telephone: 415-972-3368
Date Made Active in Reports: 07/05/2007	Last EDR Contact: 05/21/2007
Number of Days to Update: 17	Next Scheduled EDR Contact: 08/20/2007
	Data Release Frequency: Quarterly

## INDIAN UST R1: Underground Storage Tanks on Indian Land

A listing of underground storage tank locations on Indian Land.

Date of Government Version: 12/01/2006	Source: EPA, Region 1
Date Data Arrived at EDR: 12/01/2006	Telephone: 617-918-1313
Date Made Active in Reports: 01/29/2007	Last EDR Contact: 05/21/2007
Number of Days to Update: 59	Next Scheduled EDR Contact: 08/20/2007
	Data Release Frequency: Varies

## EDR PROPRIETARY RECORDS

### **Manufactured Gas Plants: EDR Proprietary Manufactured Gas Plants**

The EDR Proprietary Manufactured Gas Plant Database includes records of coal gas plants (manufactured gas plants) compiled by EDR's researchers. Manufactured gas sites were used in the United States from the 1800's to 1950's to produce a gas that could be distributed and used as fuel. These plants used whale oil, rosin, coal, or a mixture of coal, oil, and water that also produced a significant amount of waste. Many of the byproducts of the gas production, such as coal tar (oily waste containing volatile and non-volatile chemicals), sludges, oils and other compounds are potentially hazardous to human health and the environment. The byproduct from this process was frequently disposed of directly at the plant site and can remain or spread slowly, serving as a continuous source of soil and groundwater contamination.

# GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Date of Government Version: N/A  
Date Data Arrived at EDR: N/A  
Date Made Active in Reports: N/A  
Number of Days to Update: N/A

Source: EDR, Inc.  
Telephone: N/A  
Last EDR Contact: N/A  
Next Scheduled EDR Contact: N/A  
Data Release Frequency: No Update Planned

## OTHER DATABASE(S)

Depending on the geographic area covered by this report, the data provided in these specialty databases may or may not be complete. For example, the existence of wetlands information data in a specific report does not mean that all wetlands in the area covered by the report are included. Moreover, the absence of any reported wetlands information does not necessarily mean that wetlands do not exist in the area covered by the report.

**Sensitive Receptors:** There are individuals deemed sensitive receptors due to their fragile immune systems and special sensitivity to environmental discharges. These sensitive receptors typically include the elderly, the sick, and children. While the location of all sensitive receptors cannot be determined, EDR indicates those buildings and facilities - schools, daycares, hospitals, medical centers, and nursing homes - where individuals who are sensitive receptors are likely to be located.

### **AHA Hospitals:**

Source: American Hospital Association, Inc.  
Telephone: 312-280-5991

The database includes a listing of hospitals based on the American Hospital Association's annual survey of hospitals.

### **Medical Centers: Provider of Services Listing**

Source: Centers for Medicare & Medicaid Services  
Telephone: 410-786-3000

A listing of hospitals with Medicare provider number, produced by Centers of Medicare & Medicaid Services, a federal agency within the U.S. Department of Health and Human Services.

### **Nursing Homes**

Source: National Institutes of Health  
Telephone: 301-594-6248

Information on Medicare and Medicaid certified nursing homes in the United States.

### **Public Schools**

Source: National Center for Education Statistics  
Telephone: 202-502-7300

The National Center for Education Statistics' primary database on elementary and secondary public education in the United States. It is a comprehensive, annual, national statistical database of all public elementary and secondary schools and school districts, which contains data that are comparable across all states.

### **Private Schools**

Source: National Center for Education Statistics  
Telephone: 202-502-7300

The National Center for Education Statistics' primary database on private school locations in the United States.

**Flood Zone Data:** This data, available in select counties across the country, was obtained by EDR in 1999 from the Federal Emergency Management Agency (FEMA). Data depicts 100-year and 500-year flood zones as defined by FEMA.

**NWI:** National Wetlands Inventory. This data, available in select counties across the country, was obtained by EDR in 2002 and 2005 from the U.S. Fish and Wildlife Service.

## STREET AND ADDRESS INFORMATION

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**EDR®** Environmental  
Data Resources Inc

# **EDR DataMap® EDR Well Search Report**

**DHHL Wailua  
Wailua, HI 96746**

**July 25, 2007**

**Inquiry number 01984765.3w**

**The Standard in  
Environmental Risk  
Information**

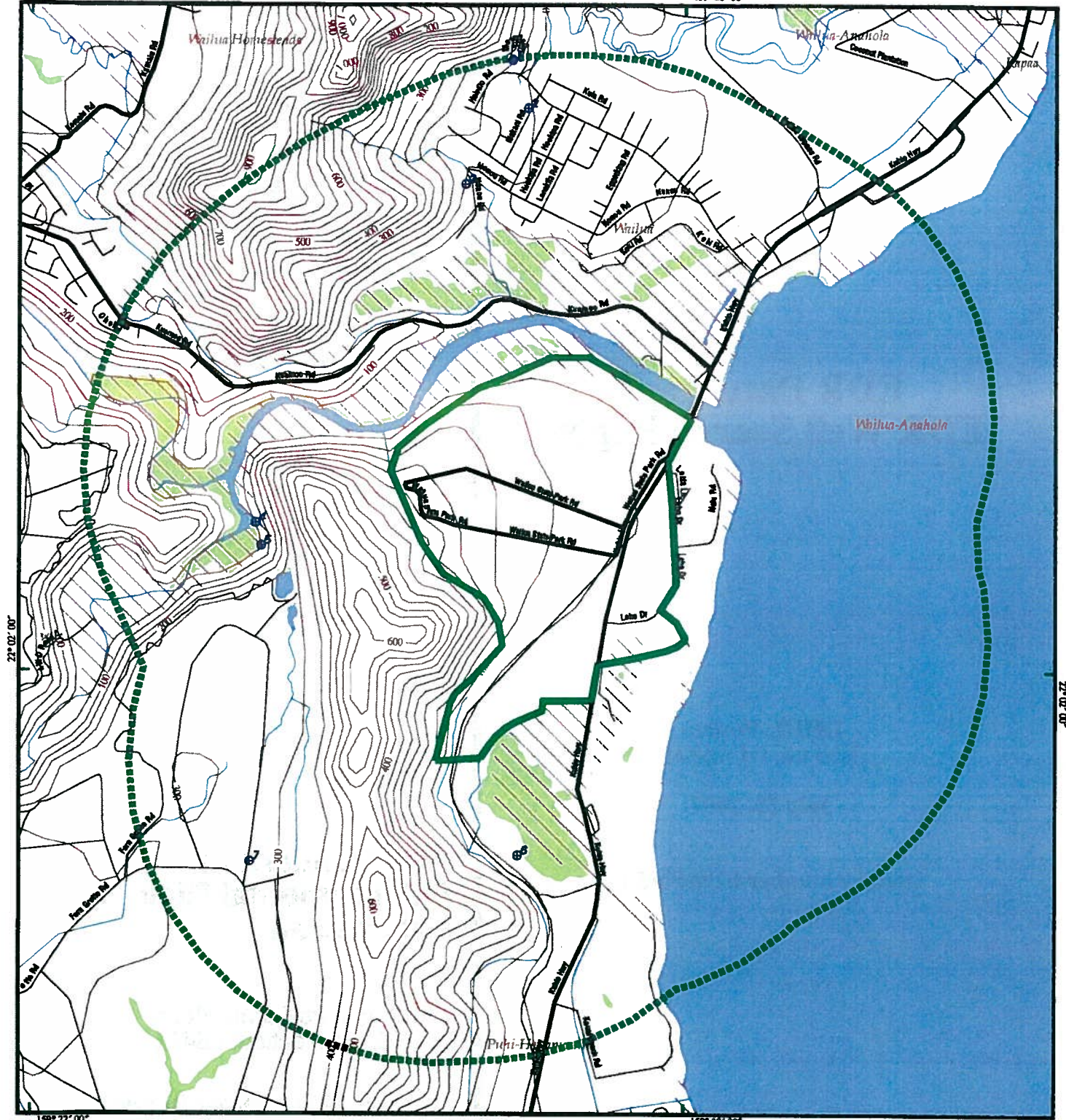
**440 Wheelers Farms Road  
Milford, Connecticut 06461**

**Nationwide Customer Service**

**Telephone: 1-800-352-0050  
Fax: 1-800-231-6802  
Internet: [www.edrnet.com](http://www.edrnet.com)**

159° 22' 00"

159° 20' 00"



159° 22' 00"

159° 20' 00"

### EDR DataMap - Well Search

## DHHL Wailua



Wailua, HI

- |                    |               |                    |
|--------------------|---------------|--------------------|
| Listed Water Wells | Waterways     | Water              |
| Study Boundary     | Railroads     | Superfund Sites    |
| Roads              | Contour Lines | 100-Yr Flood Zones |
| Major Roads        | Fault Lines   | Wetlands           |



**Thank you for your business.**  
Please contact EDR at 1-800-352-0050  
with any questions or comments.

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# GEOCHECK VERSION 2.1 SUMMARY

## FEDERAL DATABASE WELL INFORMATION

MAP ID \_\_\_\_\_ WELL ID \_\_\_\_\_

NO WELLS FOUND

## STATE WATER WELL INFORMATION

MAP ID	WELL ID
1	2-0320-001
2	2-0320-002
3	2-0321-001
4	2-0221-002
5	2-0221-001
6	2-0120-001
7	2-0121-001
6	2-0120-002

## PUBLIC WATER SUPPLY SYSTEM INFORMATION

Map ID: 1  
PWS ID: HI0000413  
PWS Name: DW WAILUA-KAPAA  
WAILUA-KAPAA  
KAPAA, KAUAI, HI 96746  
PWS currently has or had major violation(s) or enforcement: Yes

Map ID: 3  
PWS ID: HI0000413  
PWS Name: DW WAILUA-KAPAA  
WAILUA-KAPAA  
KAPAA, KAUAI, HI 96746  
PWS currently has or had major violation(s) or enforcement: Yes

## USGS TOPOGRAPHIC MAP(S)

22159-A3 KAPAA, HI

## AREA RADON INFORMATION

Federal Area Radon Information for Zip Code: 96746

Number of sites tested: 9

Area	Average Activity	% <4 pCi/L	% 4-20 pCi/L	% >20 pCi/L
Living Area - 1st Floor	-0.011 pCi/L	100%	0%	0%
Living Area - 2nd Floor	Not Reported	Not Reported	Not Reported	Not Reported
Basement	Not Reported	Not Reported	Not Reported	Not Reported

## GEOCHECK VERSION 2.1 SUMMARY

### AREA RADON INFORMATION

Federal Area Radon Information for Zip Code: 96768

Number of sites tested: 13

Area	Average Activity	% <4 pCi/L	% 4-20 pCi/L	% >20 pCi/L
Living Area - 1st Floor	0.131 pCi/L	100%	0%	0%
Living Area - 2nd Floor	Not Reported	Not Reported	Not Reported	Not Reported
Basement	2.300 pCi/L	100%	0%	0%

Federal EPA Radon Zone for KAUAI County: 3

- Note: Zone 1 indoor average level > 4 pCi/L.  
 : Zone 2 indoor average level >= 2 pCi/L and <= 4 pCi/L.  
 : Zone 3 indoor average level < 2 pCi/L.

Federal Area Radon Information for KAUAI COUNTY, HI

Number of sites tested: 44

Area	Average Activity	% <4 pCi/L	% 4-20 pCi/L	% >20 pCi/L
Living Area - 1st Floor	0.146 pCi/L	100%	0%	0%
Living Area - 2nd Floor	Not Reported	Not Reported	Not Reported	Not Reported
Basement	1.100 pCi/L	100%	0%	0%

## GEOCHECK VERSION 2.1 STATE DATABASE WELL INFORMATION

### Water Well Information:

Map ID:	1	Island:	2
Well id:	2-0320-001	Well name:	Nonou 9-1A
Well #:	0320-01	Yr drilled:	1960
Old name:	Not Reported	Quad map:	10
Driller:	SAMSON-SMOCK	Latitude27:	220354
Longitude2:	1592056	Latitude83:	220342
Longitude8:	1592046		
Long83dd:	-159.34611		
Lat83dd:	22.06167		
Gps:	1	Utm:	0
Owner user:	Kauai DWS	Old number:	9-1A
Well type:	PER	Casing dia:	8
Elevation:	155	Well depth:	240
Solid casing Depth:	193	Perfor. casing:	Not Reported
Use:	MUNCO	Use year:	72
Init water:	20.0		
Init head:	20		
Init chloride:	35		
Current chloride:	35		
Test date:	02/17/1960 00:00:00	Test gpm:	300
Test ddown:	5.8	Test chloride:	35
Test temp:	26.0	Temp units:	C
Pump gpm:	450		
Draft mgy:	98	Head feet:	20.0
Max chloride:	51	Min chloride:	41
Geology:	TWN	Pump yr:	72
Draft yr:	76	Head yr:	60
Max chl:	01/01/1987 00:00:00	Max chl yr:	87
Min chl:	01/01/1987 00:00:00	Min chl yr:	87
Bot hole:	-85	Bot solid:	-38
Bot perf:	Not Reported	Spec capac:	52
Pump mgd:	.65	Draft mgd:	0.3
Aquifer:	20104	Trmk:	4-1-012:010
Old aquifer:	Not Reported	Aquifer code:	20104
Latest head:	20		
Current head:	Not Reported	Current chloride:	Not Reported
Current temp:	Not Reported	Wcr:	02/25/1960 00:00:00
Pir:	Not Reported	Surveyor:	Not Reported
Transmissivity:	0		
Pump elev:	Not Reported	Pump depth:	Not Reported

---

Map ID:	2	Island:	2
Well id:	2-0320-002	Well name:	Walua
Well #:	0320-02	Yr drilled:	1952
Old name:	Not Reported	Quad map:	10
Driller:	SAMSON-SMOCK	Latitude27:	220346
Longitude2:	1592053	Latitude83:	220334
Longitude8:	1592043		
Long83dd:	-159.34528		
Lat83dd:	22.05944		
Gps:	0	Utm:	1
Owner user:	State DOA	Old number:	9



**GEOCHECK VERSION 2.1**  
**STATE DATABASE WELL INFORMATION**

Well type:	PER	Casing dia:	6
Elevation:	90	Well depth:	230
Solid casing Depth:	172	Perfor. casing:	Not Reported
Use:	UNU	Use year:	72
Init water:	55.*		
Init head:	55		
Init chloride:	Not Reported		
Current chloride:	0		
Test date:	Not Reported	Test gpm:	Not Reported
Test ddown:	Not Reported	Test chloride:	Not Reported
Test temp:	Not Reported	Temp units:	Not Reported
Pump gpm:	0		
Draft mgy:	Not Reported	Head feet:	Not Reported
Max chloride:	Not Reported	Min chloride:	Not Reported
Geology:	TWN	Pump yr:	Not Reported
Draft yr:	Not Reported	Head yr:	Not Reported
Max chl:	Not Reported	Max chl yr:	0
Min chl:	Not Reported	Min chl yr:	0
Bot hole:	-140	Bot solid:	-82
Bot perf:	Not Reported	Spec capac:	Not Reported
Pump mgd:	Not Reported	Draft mgd:	Not Reported
Aquifer:	20104	Trmk:	Not Reported
Old aquifer:	Not Reported	Aquifer code:	20104
Latest head:	0		
Current head:	Not Reported	Current chloride:	Not Reported
Current temp:	Not Reported	Wcr:	01/01/1952 00:00:00
Pir:	Not Reported	Surveyor:	Not Reported
Transmissivity:	0		
Pump elev:	Not Reported	Pump depth:	Not Reported

---

Map ID:	3	Island:	2
Well id:	2-0321-001	Well name:	Nonou 9-1C
Well #:	0321-01	Yr drilled:	1971
Old name:	Not Reported	Quad map:	10
Driller:	ROSCOE MOSS	Latitude27:	220331
Longitude2:	1592104	Latitude83:	220320
Longitude8:	1592054		
Long83dd:	-159.34833		
Lat83dd:	22.05556		
Gps:	1	Utm:	0
Owner user:	Kauai DWS	Old number:	9-1C
Well type:	PER	Casing dia:	14
Elevation:	72	Well depth:	275
Solid casing Depth:	90	Perfor. casing:	130
Use:	MUNCO	Use year:	Not Reported
Init water:	17.4		
Init head:	17.4		
Init chloride:	55		
Current chloride:	55		
Test date:	06/16/1971 00:00:00	Test gpm:	1180
Test ddown:	25.0	Test chloride:	64

## GEOCHECK VERSION 2.1 STATE DATABASE WELL INFORMATION

Test temp:	24.2	Temp units:	C
Pump gpm:	1000	Head feet:	Not Reported
Draft mgy:	Not Reported	Min chloride:	Not Reported
Max chloride:	64	Pump yr:	Not Reported
Geology:	TWN	Head yr:	Not Reported
Draft yr:	Not Reported	Max chl yr:	0
Max chl:	Not Reported	Min chl yr:	0
Min chl:	06/19/1971 00:00:00	Bot solid:	-18
Bot hole:	-203	Spec capac:	47
Bot perf:	-58	Draft mgd:	Not Reported
Pump mgd:	1.43	Trmk:	4-1-009:056
Aquifer:	20103	Aquifer code:	20103
Old aquifer:	Not Reported	Current chloride:	Not Reported
Latest head:	0	Wcr:	06/22/1971 00:00:00
Current head:	Not Reported	Surveyor:	Not Reported
Current temp:	Not Reported	Pump depth:	Not Reported
Pir:	Not Reported		
Transmissivity:	0		
Pump elev:	Not Reported		

---

Map ID:	4	Island:	2
Well id:	2-0221-002	Well name:	Fern Grotto 2
Well #:	0221-02	Yr drilled:	1991
Old name:	Not Reported	Quad map:	10
Driller:	FRANSEN DRLG	Latitude27:	220233
Longitude2:	1592143	Latitude83:	220222
Longitude8:	1592133		
Long83dd:	-159.35917	Utm:	1
Lat83dd:	22.03944	Old number:	Not Reported
Gps:	0	Casing dia:	6
Owner user:	State Parks	Well depth:	36
Well type:	PER	Perfor. casing:	36
Elevation:	Not Reported	Use year:	Not Reported
Solid casing Depth:	21		
Use:	OTH	Test gpm:	37
Init water:	Not Reported	Test chloride:	28
Init head:	0	Temp units:	Not Reported
Init chloride:	Not Reported	Head feet:	Not Reported
Current chloride:	0	Min chloride:	Not Reported
Test date:	05/22/1991 00:00:00	Pump yr:	Not Reported
Test ddown:	12.5	Head yr:	Not Reported
Test temp:	Not Reported	Max chl yr:	0
Pump gpm:	25	Min chl yr:	0
Draft mgy:	Not Reported	Bot solid:	Not Reported
Max chloride:	Not Reported	Spec capac:	3
Geology:	Not Reported		
Draft yr:	Not Reported		
Max chl:	Not Reported		
Min chl:	Not Reported		
Bot hole:	Not Reported		
Bot perf:	Not Reported		

**GEOCHECK VERSION 2.1**  
**STATE DATABASE WELL INFORMATION**

Pump mgd:	.04	Draft mgd:	Not Reported
Aquifer:	Not Reported	Tmk:	3-9-003:006
Old aquifer:	Not Reported	Aquifer code:	20103
Latest head:	0		
Current head:	Not Reported	Current chloride:	Not Reported
Current temp:	Not Reported	Wcr:	01/01/1991 00:00:00
Pir:	Not Reported	Surveyor:	Not Reported
Transmissivity:	0		
Pump elev:	Not Reported	Pump depth:	Not Reported

Map ID:	5	Island:	2
Well id:	2-0221-001	Well name:	Fern Grotto 1
Well #:	0221-01	Yr drilled:	1986
Old name:	Not Reported	Quad map:	10
Driller:	P R DRILLING	Latitude27:	220229
Longitude2:	1592142	Latitude83:	220218
Longitude8:	1592132		
Long83dd:	-159.35889		
Lat83dd:	22.03833	Utm:	1
Gps:	0	Old number:	Not Reported
Owner user:	State Parks	Casing dia:	5
Well type:	PER	Well depth:	61
Elevation:	17	Perfor. casing:	61
Solid casing Depth:	36	Use year:	87
Use:	UNU		
Init water:	4.7		
Init head:	4.7		
Init chloride:	75		
Current chloride:	75		
Test date:	02/24/1987 00:00:00	Test gpm:	30
Test ddown:	7.5	Test chloride:	63
Test temp:	Not Reported	Temp units:	Not Reported
Pump gpm:	0		
Draft mgy:	Not Reported	Head feet:	Not Reported
Max chloride:	Not Reported	Min chloride:	Not Reported
Geology:	Not Reported	Pump yr:	Not Reported
Draft yr:	Not Reported	Head yr:	Not Reported
Max chl:	Not Reported	Max chl yr:	0
Min chl:	Not Reported	Min chl yr:	0
Bot hole:	-44	Bot solid:	-19
Bot perf:	-44	Spec capac:	4
Pump mgd:	Not Reported	Draft mgd:	Not Reported
Aquifer:	20103	Tmk:	3-9-003:006
Old aquifer:	Not Reported	Aquifer code:	20103
Latest head:	0		
Current head:	Not Reported	Current chloride:	Not Reported
Current temp:	Not Reported	Wcr:	02/01/1986 00:00:00
Pir:	Not Reported	Surveyor:	Not Reported
Transmissivity:	0		
Pump elev:	Not Reported	Pump depth:	Not Reported

**GEOCHECK VERSION 2.1  
STATE DATABASE WELL INFORMATION**

Map ID:	6	Island:	2
Well id:	2-0120-001	Well name:	Kalepa Ridge
Well #:	0120-01	Yr drilled:	1899
Old name:	Not Reported	Quad map:	10
Driller:	MCCANDLESS	Latitude27:	220136
Longitude2:	1592055	Latitude83:	220125
Longitude8:	1592045		
Long83dd:	-159.34583		
Lat83dd:	22.02361		
Gps:	0	Utm:	1
Owner user:	Kauai County	Old number:	Not Reported
Well type:	PER	Casing dia:	12
Elevation:	12	Well depth:	240
Solid casing Depth:	60	Perfor. casing:	Not Reported
Use:	IRR	Use year:	60
Init water:	10.*		
Init head:	10		
Init chloride:	40		
Current chloride:	40		
Test date:	01/01/1960 00:00:00	Test gpm:	750
Test ddown:	14.0	Test chloride:	146
Test temp:	25.6	Temp units:	C
Pump gpm:	670		
Draft mgy:	182	Head feet:	Not Reported
Max chloride:	165	Min chloride:	123
Geology:	TWN	Pump yr:	72
Draft yr:	Not Reported	Head yr:	Not Reported
Max chl:	01/01/1973 00:00:00	Max chl yr:	73
Min chl:	01/01/1961 00:00:00	Min chl yr:	73
Bot hole:	-228	Bot solid:	-48
Bot perf:	Not Reported	Spec capac:	54
Pump mgd:	.96	Draft mgd:	0.5
Aquifer:	20102	Trnk:	Not Reported
Old aquifer:	Not Reported	Aquifer code:	20102
Latest head:	0		
Current head:	Not Reported	Current chloride:	Not Reported
Current temp:	Not Reported	Wcr:	01/01/1899 00:00:00
Pir:	Not Reported	Surveyor:	Not Reported
Transmissivity:	0		
Pump elev:	Not Reported	Pump depth:	Not Reported

---

Map ID:	7	Island:	2
Well id:	2-0121-001	Well name:	South Wailua
Well #:	0121-01	Yr drilled:	1995
Old name:	Not Reported	Quad map:	10
Driller:	U S G S	Latitude27:	220134
Longitude2:	1592144	Latitude83:	220123
Longitude8:	1592134		
Long83dd:	-159.35944		
Lat83dd:	22.02306		
Gps:	0	Utm:	1
Owner user:	U S G S	Old number:	Not Reported

**GEOCHECK VERSION 2.1**  
**STATE DATABASE WELL INFORMATION**

Well type:	ROT	Casing dia:	4
Elevation:	289	Well depth:	1143
Solid casing Depth:	Not Reported	Perfor. casing:	Not Reported
Use:	OBS	Use year:	95
Init water:	Not Reported		
Init head:	115.2		
Init chloride:	Not Reported		
Current chloride:	0		
Test date:	Not Reported	Test gpm:	Not Reported
Test ddown:	Not Reported	Test chloride:	Not Reported
Test temp:	Not Reported	Temp units:	Not Reported
Pump gpm:	0		
Draft mgy:	Not Reported	Head feet:	Not Reported
Max chloride:	Not Reported	Min chloride:	Not Reported
Geology:	Not Reported	Pump yr:	Not Reported
Draft yr:	Not Reported	Head yr:	Not Reported
Max chl:	Not Reported	Max chl yr:	0
Min chl:	Not Reported	Min chl yr:	0
Bot hole:	-854	Bot solid:	Not Reported
Bot perf:	Not Reported	Spec capac:	Not Reported
Pump mgd:	Not Reported	Draft mgd:	Not Reported
Aquifer:	Not Reported	Trmk:	3-9-002:020
Old aquifer:	Not Reported	Aquifer code:	20102
Latest head:	0		
Current head:	Not Reported	Current chloride:	Not Reported
Current temp:	Not Reported	Wcr:	10/19/1995 00:00:00
Pir:	Not Reported	Surveyor:	U S G S
Transmissivity:	0		
Pump elev:	Not Reported	Pump depth:	Not Reported

---

Map ID:	6	Island:	2
Well id:	2-0120-002	Well name:	Kalepa Ridge
Well #:	0120-02	Yr drilled:	1897
Old name:	Well 8	Quad map:	10
Driller:	MCCANDLESS	Latitude27:	220134
Longitude2:	1592054	Latitude83:	220123
Longitude8:	1592044		
Long83dd:	-159.34556		
Lat83dd:	22.02306		
Gps:	0	Utm:	1
Owner user:	State Of Haw	Old number:	Not Reported
Well type:	PER	Casing dia:	10
Elevation:	12	Well depth:	312
Solid casing Depth:	60	Perfor. casing:	Not Reported
Use:	ABNLOS	Use year:	01
Init water:	Not Reported		
Init head:	0		
Init chloride:	Not Reported		
Current chloride:	0		
Test date:	Not Reported	Test gpm:	Not Reported
Test ddown:	Not Reported	Test chloride:	130

**GEOCHECK VERSION 2.1**  
**STATE DATABASE WELL INFORMATION**

Test temp:	25.6	Temp units:	C
Pump gpm:	0	Head feet:	10.0
Draft mgy:	Not Reported	Min chloride:	95
Max chloride:	142	Pump yr:	Not Reported
Geology:	TWN	Head yr:	47
Draft yr:	Not Reported	Max chl yr:	44
Max chl:	01/01/1944 00:00:00	Min chl yr:	44
Min chl:	01/01/1942 00:00:00	Bot solid:	-48
Bot hole:	-300	Spec capac:	Not Reported
Bot perf:	Not Reported	Draft mgd:	Not Reported
Pump mgd:	Not Reported	Trmk:	Not Reported
Aquifer:	20102	Aquifer code:	20102
Old aquifer:	Not Reported	Current chloride:	Not Reported
Latest head:	10	Wcr:	01/01/1897 00:00:00
Current head:	Not Reported	Surveyor:	Not Reported
Current temp:	Not Reported	Pump depth:	Not Reported
Pir:	Not Reported		
Transmissivity:	0		
Pump elev:	Not Reported		

**GEOCHECK VERSION 2.1**  
**PUBLIC WATER SUPPLY SYSTEM INFORMATION**

**PWS SUMMARY:**

PWS ID: HI0000413 PWS Status: Not Reported  
 Date Initiated: Not Reported Date Deactivated: Not Reported  
 PWS Name: DW WAILUA-KAPAA  
 WAILUA-KAPAA  
 KAPAA, KAUAI, HI 96746

Source: Ground water  
 Treatment Objective: DISINFECTION Process: GASEOUS CHLORINATION, POST

Addressee / Facility: System Owner/Responsible Party  
 MR. RAYMOND SATO, MANAGER  
 DEPT OF WATER  
 P.O. BOX 1706  
 LIHUE, HI 96766

Facility Latitude:	22 3 33.0000	Facility Longitude:	159 21 5.0000
Facility Latitude:	22 3 54.0000	Facility Longitude:	159 20 56.0000
Facility Latitude:	22 4 16.0000	Facility Longitude:	159 21 36.0000
Facility Latitude:	22 4 32.0000	Facility Longitude:	159 21 36.0000
Facility Latitude:	22 6 7.0000	Facility Longitude:	159 23 40.0000
Facility Latitude:	22 6 21.0000	Facility Longitude:	159 23 21.0000
Facility Latitude:	22 6 28.0000	Facility Longitude:	159 23 31.0000
Facility Latitude:	22 6 31.0000	Facility Longitude:	159 22 13.0000
City Served:	KAPAA		
City Served:	WAILUA		
City Served:	WAIPOULI		
Treatment Class:	Treated	Population:	15000

PWS currently has or had major violation(s) or enforcement: Yes

Violations information not reported.

**ENFORCEMENT INFORMATION:**

System Name:	WAILUA-KAPAA		
Violation Type:	3		
Contaminant:	GROSS ALPHA, EXCL. RADON & U		
Compliance Period:	1/1/2000 0:00:00 - 12/8/2003 0:00:00		
Violation ID:	20104		
Enforcement Date:	4/12/2007 0:00:00	Enf. Action:	Not Reported
System Name:	WAILUA-KAPAA		
Violation Type:	3		
Contaminant:	GROSS ALPHA, EXCL. RADON & U		
Compliance Period:	1/1/2000 0:00:00 - 12/8/2003 0:00:00		
Violation ID:	20104		
Enforcement Date:	No Enf Action as of	Enf. Action:	10/17/2006 0:00:00
System Name:	DW WAILUA-KAPAA		
Violation Type:	Initial Tap Sampling for Pb and Cu		
Contaminant:	LEAD & COPPER RULE		
Compliance Period:	1992-07-01 - 2015-12-31		
Violation ID:	93V0001		
Enforcement Date:	1993-12-15	Enf. Action:	Fed Compliance Achieved

**CONTACT INFORMATION:**

Name:	WAILUA-KAPAA	Population:	17179
Contact:	DW KAUAI	Phone:	808-245-5434
Address:	DEPARTMENT OF WATER		
Address 2:	P. O. BOX 1706		
	LIHUE, HI 96766		

# GEOCHECK VERSION 2.1

## PUBLIC WATER SUPPLY SYSTEM INFORMATION

**PWS SUMMARY:**

PWS ID: HI0000413 PWS Status: Not Reported  
 Date Initiated: Not Reported Date Deactivated: Not Reported  
 PWS Name: DW WAILUA-KAPAA  
 WAILUA-KAPAA  
 KAPAA, KAUAI, HI 96746

Source: Ground water  
 Treatment Objective: DISINFECTION Process: GASEOUS CHLORINATION, POST

Addressee / Facility: System Owner/Responsible Party  
 MR. RAYMOND SATO, MANAGER  
 DEPT OF WATER  
 P.O. BOX 1706  
 LIHUE, HI 96766

Facility Latitude:	22 3 33.0000	Facility Longitude:	159 21 5.0000
Facility Latitude:	22 3 54.0000	Facility Longitude:	159 20 56.0000
Facility Latitude:	22 4 16.0000	Facility Longitude:	159 21 36.0000
Facility Latitude:	22 4 32.0000	Facility Longitude:	159 21 36.0000
Facility Latitude:	22 6 7.0000	Facility Longitude:	159 23 40.0000
Facility Latitude:	22 6 21.0000	Facility Longitude:	159 23 21.0000
Facility Latitude:	22 6 28.0000	Facility Longitude:	159 23 31.0000
Facility Latitude:	22 6 31.0000	Facility Longitude:	159 22 13.0000
City Served:	KAPAA		
City Served:	WAILUA		
City Served:	WAIPOULI		
Treatment Class:	Treated	Population:	15000

PWS currently has or had major violation(s) or enforcement: Yes

Violations information not reported.

**ENFORCEMENT INFORMATION:**

System Name: WAILUA-KAPAA  
 Violation Type: 3  
 Contaminant: GROSS ALPHA, EXCL. RADON & U  
 Compliance Period: 1/1/2000 0:00:00 - 12/8/2003 0:00:00  
 Violation ID: 20104  
 Enforcement Date: 4/12/2007 0:00:00 Enf. Action: Not Reported

System Name: WAILUA-KAPAA  
 Violation Type: 3  
 Contaminant: GROSS ALPHA, EXCL. RADON & U  
 Compliance Period: 1/1/2000 0:00:00 - 12/8/2003 0:00:00  
 Violation ID: 20104  
 Enforcement Date: No Enf Action as of Enf. Action: 10/17/2006 0:00:00

System Name: DW WAILUA-KAPAA  
 Violation Type: Initial Tap Sampling for Pb and Cu  
 Contaminant: LEAD & COPPER RULE  
 Compliance Period: 1992-07-01 - 2015-12-31  
 Violation ID: 93V0001  
 Enforcement Date: 1993-12-15 Enf. Action: Fed Compliance Achieved

**CONTACT INFORMATION:**

Name: WAILUA-KAPAA Population: 17179  
 Contact: DW KAUAI Phone: 808-245-5434  
 Address: DEPARTMENT OF WATER  
 Address 2: P. O. BOX 1706  
 LIHUE, HI 96766



# HAWAII GOVERNMENT WELL RECORDS SEARCHED

## **PWS: Public Water Systems**

Source: EPA/Office of Drinking Water

Telephone: 202-564-3750

Public Water System data from the Federal Reporting Data System. A PWS is any water system which provides water to at least 25 people for at least 60 days annually. PWSs provide water from wells, rivers and other sources.

## **PWS ENF: Public Water Systems Violation and Enforcement Data**

Source: EPA/Office of Drinking Water

Telephone: 202-564-3750

Violation and Enforcement data for Public Water Systems from the Safe Drinking Water Information System (SDWIS) after August 1995. Prior to August 1995, the data came from the Federal Reporting Data System (FRDS).

## **Area Radon Information**

Source: USGS

Telephone: 703-356-4020

The National Radon Database has been developed by the U.S. Environmental Protection Agency (USEPA) and is a compilation of the EPA/State Residential Radon Survey and the National Residential Radon Survey. The study covers the years 1986 - 1992. Where necessary data has been supplemented by information collected at private sources such as universities and research institutions.

## **EPA Radon Zones**

Source: EPA

Telephone: 703-356-4020

Sections 307 & 309 of IRAA directed EPA to list and identify areas of U.S. with the potential for elevated indoor radon levels.

## **USGS Water Wells: USGS National Water Inventory System (NWIS)**

This database contains descriptive information on sites where the USGS collects or has collected data on surface water and/or groundwater. The groundwater data includes information on wells, springs, and other sources of groundwater.

## **Well Index Database**

Source: Department of Land and Natural Resources

Telephone: 808-587-0214

CWRM maintains a Well Index Database to track specific information pertaining to the construction and installation of production wells in Hawaii

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# Certified Sanborn® Map Report



Sanborn® Library search results  
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**DHHL Wailua  
DHHL Wailua  
Wailua, HI 96746**

**Inquiry Number 1984765.5s**

**July 23, 2007**



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# Certified Sanborn® Map Report

7/23/07

**Site Name:**

DHHL Wailua  
DHHL Wailua  
Wailua, HI 96746

**Client Name:**

BEI Environmental Services  
311 Pacific Street  
Honolulu, HI 96817



**EDR** Environmental  
Data Resources Inc

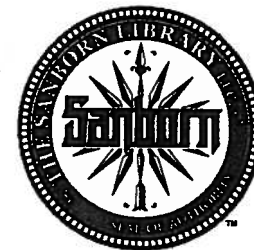
EDR Inquiry # 1984765.5s

Contact: Stephanie Mandina

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## Certified Sanborn Results:

**Site Name:** DHHL Wailua  
**Address:** DHHL Wailua  
**City, State, Zip:** Wailua, HI 96746  
**Cross Street:**  
**P.O. #** NA  
**Project:** NA  
**Certification #** 4FA3-4675-BD47



Sanborn® Library search results  
Certification # 4FA3-4675-BD47

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This report certifies that the complete holdings of the Sanborn Library, LLC collection have been searched based on client supplied target property information, and fire insurance maps covering the target property were not found.

Total Maps: 0

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- ✓ Library of Congress
- ✓ University Publications of America
- ✓ EDR Private Collection

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Phase I Environmental Site Assessment  
DHHL Wailua Development Project  
TMK (4) 3-9-6, Parcels 9 and 11 and (4) 3-9-002, Parcels 3, 12, 17, 24, 25, 26, 27, and 35  
Wailua, Kaua'i, Hawai'i

## **APPENDIX C**

### **Interview Documentation**



ENVIRONET, INC.  
ENVIRONMENTAL SITE ASSESSMENT USER QUESTIONNAIRE

DATE: 7/30/07  
FACILITY NAME AND ADDRESS: Vacant land - Wailua, Kauai  
JOB NAME: Wailua Phase I ESA  
OWNER: Department of Hawaiian Home Lands  
JOB NO.: \_\_\_\_\_

**NOTE:** Failure to provide this information to Environet, Inc. could result in a determination that "all appropriate inquiry" is not complete.

1. NAME/TITLE/PHONE NUMBER OF PERSON BEING INTERVIEWED  
Noel Akamu, Property Development Manager (808)587-6432

2. JOB DESCRIPTION/NO. OF YEARS FAMILIAR WITH THE SITE  
Income Property Branch Chief - 9 years

3. WHAT IS THE REASON FOR CONDUCTING THIS ENVIRONMENTAL SITE ASSESSMENT?  
To determine potential impacts proposed development could have on the environment.

4. GENERAL SITE INFORMATION, BACKGROUND, NATURE OF OPERATIONS  
HOW LONG HAS THE FACILITY BEEN HERE? WHAT WAS THERE BEFORE?

Land has been in sugar cane cultivation since I have been familiar with the site. Sugar cane cultivation stopped in approx. mid-2002.

5. ARE YOU AWARE OF ANY ENVIRONMENTAL CLEANUP LIENS THAT HAVE BEEN FILED OR RECORDED FOR YOUR PROPERTY UNDER FEDERAL, TRIBAL, STATE, OR LOCAL LAW? No.

Also month to month pastoral use of a portion of the site.

6. ARE YOU AWARE OF ANY ACTIVITY AND USE LIMITATIONS, SUCH AS ENGINEERING CONTROLS, LAND USE RESTRICTIONS, OR INSTITUTIONAL CONTROLS THAT ARE IN PLACE AT THE SITE? ARE YOU AWARE OF ANY ACTIVITY AND USE LIMITATIONS THAT HAVE BEEN FILED OR RECORDED IN A REGISTRY UNDER FEDERAL, TRIBAL, STATE, OR LOCAL LAW? **No**

7. AS THE USER OF THIS ENVIRONMENTAL SITE ASSESSMENT DO YOU HAVE ANY SPECIALIZED KNOWLEDGE OR EXPERIENCE RELATED TO THE PROPERTY OR NEARBY PROPERTIES? **No**

8. DOES THE PURCHASE PRICE BEING PAID FOR THIS PROPERTY REASONABLY REFLECT FAIR MARKET VALUE OF THE PROPERTY? IF YOU CONCLUDE THERE IS A DIFFERENCE, DO YOU FEEL THAT THE LOWER PRICE FOR THE PROPERTY IS A RESULT OF KNOWN OR SUSPECTED CONTAMINATION AT THE PROPERTY? **Yes. price set by independent market value appraisal.**

9. ARE YOU AWARE OF ANY COMMONLY KNOWN OR REASONABLY ASCERTAINABLE INFORMATION ABOUT THE PROPERTY THAT WOULD HELP TO IDENTIFY CONDITIONS INDICATIVE OF RELEASES OR THREATENED RELEASES (e.g. PAST USES OF PROPERTY, CHEMICALS PRESENT ON THE PROPERTY, SPILLS OR RELEASES AT THE PROPERTY, ENVIRONMENTAL CLEANUPS AT THE PROPERTY)?

**No... only those typical of sugar cultivation.**



10. AS THE USER OF THIS ENVIRONMENTAL SITE ASSESSMENT, BASED ON YOUR KNOWLEDGE AND EXPERIENCE RELATED TO THE PROPERTY ARE THERE ANY OBVIOUS INDICATORS THAT POINT TO THE PRESENCE OF LIKELY PRESENCE OF CONTAMINATION AT THE PROPERTY? **NO**

*I hereby authorize that the aforementioned statements are true to the best of my available knowledge.*

Noel Akamu            7/30/07  
Print Name                                  Signature                                  Date

**ENVIRONET, INC.**  
**ENVIRONMENTAL SITE ASSESSMENT SITE CONTACT QUESTIONNAIRE**

DATE: 7/30/07  
 FACILITY NAME AND ADDRESS: Vacant Land, Wailua, Kauai  
 OWNER: Dept. of Hawaiian Home Lands  
 JOB NO.: \_\_\_\_\_

1. NAME/TITLE/PHONE NUMBER OF PERSON BEING INTERVIEWED

Noel Akamu Property Development Manager - 587-6402

2. JOB DESCRIPTION/NO. OF YEARS FAMILIAR WITH THE SITE

Income Property Porouch Chief - 9 years

3. GENERAL SITE INFORMATION, BACKGROUND, NATURE OF OPERATIONS, HOW LONG HAS THE FACILITY BEEN HERE? WHAT WAS ITRE BEFORE?

Ever since I became familiar with the site it has been used for sugar cane cultivation and livestock pasture.

4. DO YOU HAVE ANY ENVIRONMENTAL PERMITS FROM THE COUNTY, STATE OR FEDERAL GOVERNMENT FOR OPERATION OF THE FACILITY (e.g. solid or hazardous waste disposal, wastewater, NPDES, UIC)?

NO

5. WHAT IS THE SOURCE OF WATER (county/well/catchment)?

No potable water. Only irrigation water was available during sugar cultivation. Uncertain where current pastoral users get stock water.

6. WHAT TYPE OF SEWER SYSTEM DO YOU HAVE (county/cesspool/septic tank/other)?

No existing wastewater system on the site to my knowledge.

7. DO YOU DISCHARGE WASTEWATER OR STORMWATER? DO YOU HAVE A WASTEWATER DISCHARGE PERMIT OR NPDES PERMIT (i.e. dewatering)?

No permits to my knowledge as discharge unknown.

8. ARE THERE ANY WELLS ON THE PROPERTY (drywell/injection/drinking water/other)?

Not to my knowledge.

9. ARE THERE ANY FLOOR DRAINS OR SUMPS? WHAT DO THEY DRAIN? WHERE DO THEY DISCHARGE?

Not to my knowledge.

10. ARE THERE ANY ELECTRICAL TRANSFORMERS ON THE PROPERTY (pole-mounted or ground-mounted)? WHO OWNS THE TRANSFORMERS? HAVE THEY BEEN TESTED FOR PCBs?

Not on land owned by DHHL however, adjacent to intersection of Lehu Drive & Kuhio Hwy there is an electrical transformer substation operated by Kauai Island Utility Cooperative.

11. ARE THERE ANY ABOVEGROUND OR UNDERGROUND STORAGE TANKS?

SIZE/TYPE CONTENT AGE REGISTERED WITH HDOH? REPORTED LEAKS?

*Not to my knowledge*

12. ARE THERE OIL/WATER SEPARATORS OR SUMPS (usually located in the ground, oil with waste water is disposed)?

*Not to my knowledge*

13. IS OR WAS THERE A DRY CLEANER, PHOTO PROCESSING SHOP, GAS STATION, MOTOR REPAIR FACILITY, COMMERCIAL PRINTING FACILITY, JUNKYARD, LANDFILL, WASTE DISPOSAL, OR RECYCLING FACILITY ON THE PROPERTY? IF SO, WHAT SUBSTANCES ARE/WERE USED/PRODUCED BY THEM?

*Not to my knowledge*

14. IS THERE A MAINTENANCE SHOP ON THE PROPERTY? WHAT KIND OF ACTIVITIES TAKE PLACE THERE?

*Not to my knowledge*

15. ARE THERE ANY HYDRAULIC LIFTS?

*Not to my knowledge*

16. ARE THERE ANY WASTE OR CHEMICAL PIPELINES, PITS, PONDS, OR LAGOONS ON THE PROPERTY?

*Not to my knowledge*

17. DO YOU OR HAVE YOU USED ANY OF THE FOLLOWING MATERIALS? IF SO, HOW MUCH DO YOU GENERATE, STORE, OR DISPOSE? HOW DO YOU DISPOSE OF THEM? HOW DID YOU PREVIOUSLY DISPOSE OF THESE MATERIALS? HOW DO YOU DISPOSE OF THE CONTAINERS USED TO HOLD ANY OF THESE MATERIALS? WHAT ARE THESE CONTAINERS MADE OF (Plastic/steel/vinyl)?

*I have not used any.*

- FERTILIZERS/PESTICIDES/HERBICIDES (Are they EPA-registered herbicides?)  
*may have been used in sugar cane cultivation*
- PCBs  
*may have exposure from transformer substation site.*
- PETROLEUM PRODUCTS/OILS/LUBRICANTS (waste oil)  
*unknown, if any*
- RADIOACTIVE MATERIALS  
*unknown, if any*
- SOLVENTS (cleansers, degreasers, paint thinners, coolants)  
*unknown, if any*
- ACIDS/BASES (lead-acid batteries)  
*unknown, if any*
- IGNITABLE OR REACTIVE MATERIALS  
*unknown, if any*
- HEAVY METALS (As, Ba, Cd, Cr, Pb, Hg, Se, Ag)  
*unknown, if any*
- ASBESTOS (brake pads, shoes)  
*unknown, if any*

18. DO YOU KNOW OF ANY LEAKS OR SPILLS OF THESE MATERIALS? *No*

19. DO YOU HAVE MSDSs FOR ANY HAZARDOUS MATERIALS? IF SO, WHAT TYPES OF CHEMICALS? *No*

20. DO YOU GENERATE ANY OTHER WASTES? *No*

21. DO YOU HAVE A SPILL PREVENTION COUNTERMEASURE AND CONTROL (SPCC) PLAN? *No*

22. ARE YOU AWARE OF ANY CONTAMINATION OR WASTE DISPOSAL AREAS ON THE PROPERTY? *No*

23. IS THERE ANY RUNOFF FROM ADJACENT PROPERTIES ONTO YOUR PROPERTY? *Yes. Old irrigation reservoir above Kalepa Ridge (on DLNR land) regularly discharge excess water onto subject land*

24. ARE YOU AWARE OF ANY PAST OR CURRENT ENVIRONMENTAL VIOLATIONS/LAWSUITS OR ANY ENVIRONMENTAL CLEANUP LIENS ASSOCIATED WITH THE PROPERTY? *No* *via old water tunnel.*

25. HAVE THERE BEEN OTHER ENVIRONMENTAL INVESTIGATIONS OR CLEANUPS PERFORMED ON YOUR PROPERTY? DO YOU HAVE ANY PREVIOUS ENVIRONMENTAL REPORTS FOR THESE INVESTIGATIONS? (report type: lead, asbestos, compliance audits, risk assessments, geotechnical studies, site assessments, remedial investigations; prepared by whom; request available report copy) *No*

26. DO YOU HAVE ANY ADDITIONAL COMMENTS OR CONCERNS? *No*

*I hereby authorize that the aforementioned statements are true to the best of my available knowledge.*

*Abel Akamu* *Neil Ouma* *7/30/07*  
\_\_\_\_\_  
Print Name Signature Date

Telephone interview 8/21/07

ENVIRONET, INC.  
ENVIRONMENTAL SITE ASSESSMENT SITE CONTACT QUESTIONNAIRE

DATE: Aug. 1, 2007  
FACILITY NAME AND ADDRESS: DHHL Waialua Lands  
OWNER: DHHL  
JOB NO.: 407-052

1. NAME/TITLE/PHONE NUMBER OF PERSON BEING INTERVIEWED 808-635-6467  
Robin Robinson <sup>Quality</sup> Control superintendent for Arafac (former)
2. JOB DESCRIPTION/ NO. OF YEARS FAMILIAR WITH THE SITE  
with Arafac 12 yrs, left in 1996
3. GENERAL SITE INFORMATION, BACKGROUND, NATURE OF OPERATIONS, HOW LONG HAS THE FACILITY BEEN HERE? WHAT WAS HERE BEFORE?  
early 1900's, closed in 2001 or 2002  
planted in cane
4. DO YOU HAVE ANY ENVIRONMENTAL PERMITS FROM THE COUNTY, STATE OR FEDERAL GOVERNMENT FOR OPERATION OF THE FACILITY (e.g. solid or hazardous waste disposal, wastewater, NPDES, UIC)? wastewater / NPDES permits
5. WHAT IS THE SOURCE OF WATER (county/well/catchment)?  
N/A
6. WHAT TYPE OF SEWER SYSTEM DO YOU HAVE (county/cesspool/septic tank/other)?  
N/A
7. DO YOU DISCHARGE WASTEWATER OR STORMWATER? DO YOU HAVE A WASTEWATER DISCHARGE PERMIT OR NPDES PERMIT (i.e. dewatering)?  
yes, discharge stormwater - had NPDES  
no discharge of wastewater
8. ARE THERE ANY WELLS ON THE PROPERTY (drywell/injection/drinking water/other)?  
wells at base of Kalepa ridge - domestic well
9. ARE THERE ANY FLOOR DRAINS OR SUMPS? WHAT DO THEY DRAIN? WHERE DO THEY DISCHARGE?  
N/A
10. ARE THERE ANY ELECTRICAL TRANSFORMERS ON THE PROPERTY (pole-mounted or ground-mounted)? WHO OWNS THE TRANSFORMERS? HAVE THEY BEEN TESTED FOR PCBs?  
yes at backyard in Hanalei

18. DO YOU KNOW OF ANY LEAKS OR SPILLS OF THESE MATERIALS?

NO

19. DO YOU HAVE MSDSs FOR ANY HAZARDOUS MATERIALS? IF SO, WHAT TYPES OF CHEMICALS?

N/A

20. DO YOU GENERATE ANY OTHER WASTES?

NO

21. DO YOU HAVE A SPILL PREVENTION COUNTERMEASURE AND CONTROL (SPCC) PLAN?

for irrigation water - NPDES permit  
outfalls - Alaikini + Hanalei, not Waialeale

22. ARE YOU AWARE OF ANY CONTAMINATION OR WASTE DISPOSAL AREAS ON THE PROPERTY?

maybe 3' depth of soil removal

1 yr. dump from Hurricane Iniki  
removed soil after dump closed

23. IS THERE ANY RUNOFF FROM ADJACENT PROPERTIES ONTO YOUR PROPERTY?

NO, not at the time

24. ARE YOU AWARE OF ANY PAST OR CURRENT ENVIRONMENTAL VIOLATIONS/LAWSUITS OR ANY ENVIRONMENTAL CLEANUP LIENS ASSOCIATED WITH THE PROPERTY?

NO

25. HAVE THERE BEEN OTHER ENVIRONMENTAL INVESTIGATIONS OR CLEANUPS PERFORMED ON YOUR PROPERTY? DO YOU HAVE ANY PREVIOUS ENVIRONMENTAL REPORTS FOR THESE INVESTIGATIONS? (report type: lead, asbestos, compliance audits, risk assessments, geotechnical studies, site assessments, remedial investigations; prepared by whom; request available report copy)

not known

26. DO YOU HAVE ANY ADDITIONAL COMMENTS OR CONCERNS? NO

*I hereby authorize that the aforementioned statements are true to the best of my available knowledge.*

*telephone interview done by S. Mendina*

Print Name

Signature

Date

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TMK (4) 3-9-6, Parcels 9 and 11 and (4) 3-9-002, Parcels 3, 12, 17, 24, 25, 26, 27, and 35  
Wailua, Kaua'i, Hawai'i

## **APPENDIX D**

### **Qualifications**





## **ENVIRONET, INC. STATEMENT OF QUALIFICATIONS**

Environet, Inc. (EI) conducts Phase I Environmental Site Assessments (ESAs) that comply with and exceed the requirements of the American Society of Testing Materials (ASTM E 1527-05) guidelines. In observance to the guidelines, EI's goal in accomplishing ESAs is to "perform all appropriate inquiry into the previous ownership and uses of the property consistent with good commercial or customary practice." EI's personnel are trained to identify recognized environmental conditions on commercial properties. EI has conducted hundreds of ESAs throughout Hawai'i and the Pacific. EI has been exposed to a variety of projects including automotive repair shops, powerplants, and abandoned sugar mills. Specific project experience and a brief background of EI's trained personnel is provided below:

### **Neil Ledbetter**

Mr. Ledbetter is an upper level environmental engineer with broad experience in regulatory compliance. In his more than two decades of management experience, he has established and administered QA/QC procedures and ensured adherence to stringent rules and regulations while supervising administrative and technical teams. Throughout his career he has worked with an array of government agencies, members of the public and the media. His past project work has included: NPDES permitting, monitoring and compliance; facilities inspections for compliance with environmental regulations; large scale industry ESAs; large scale Department of Defense EBSs; soil and groundwater contamination investigations and remediation; site process engineering for water quality systems; development, implementation, and evaluation of hazardous waste reduction processes, air emission reduction processes, water discharge requirements, and sampling procedures for chemical matrix analysis; design and construction of gas sampling systems; coordination and management of air quality programs, including permit applications, equipment modification and selection, and extensive interaction with the EPA and State and Local Air Districts; preparation of EPA, CARB, and BAAQMD regulatory letters of agreement; preparation of permit applications for major source projects, NSR, and PSD; coordination and review of environmental impact reports and health risk assessments; and expert witness testimony.

### **Colette Sakoda**

Ms. Sakoda has over two decades of environmental and community planning experience in both the public and private sectors. She has managed and staffed multi-disciplinary environmental planning projects which have included community consultation, field reconnaissance, documentation, preparation of NEPA environmental impact statements, NEPA Categorical Exclusions evaluations and assessments and Chapter 343, HRS environmental evaluation. She has prepared waterfront redevelopment and new community master plans and processed land use and environmental permits for new developments. She has extensive experience in acquiring State Historic Preservation Officer approvals, has coordinated Section 106 consultation tasks and has managed Section 7 Endangered Species Biological Assessment preparation and consultation with USFWS and NMFS. She is adept at communicating technical engineering, legal, and environmental concepts to the general public and has participated in the community involvement and neighborhood participation phases of project planning with the

focus on obtaining consensus and project acceptance. Over her many years of experience she has conducted numerous Phase I ESAs, and EBSs.

### **Patrick Lineberger**

Mr. Lineberger has managed and conducted more than 60 ESAs for the purpose of due diligence according to ASTM E 1527-00. Most of these ESAs were conducted for commercial properties on the islands of O'ahu, Maui, Kaua'i, and Hawai'i over a period of 6 years. Duties included communication with potential clients, providing proposals, coordinate scheduling of site visit, researching of historical and government records, interviews, and report writing. He has also conducted several Transaction Screen Processes for private homes.

### **Stephanie Mandina**

Ms. Mandina has over seven years of experience in the environmental sciences field. She has gained a working knowledge of environmental regulations through her experience with the Department of Fish and Wildlife and the National Oceanic and Atmospheric Administration. She has conducted numerous ESAs in Hawai'i for commercial and residential buildings, resort hotels, auto body shops, maintenance facilities, and undeveloped land. Ms. Mandina is aware of all current ESA standards and regulations.

### **Vilma C. Dupra**

Ms. Dupra has over 13 years of experience in environmental science. She has conducted many Phase I ESAs in Hawai'i for commercial and residential properties, and undeveloped lands. Ms. Dupra is aware of all current ESA standards and regulations.

### **Steven Cho**

Mr. Cho has nearly six years of experience in the environmental sciences field. His experience spans several disciplines within the field, which include compliance audits, litigation support, environmental permitting, Phase II investigations/workplan, and environmental health and safety. He has conducted over 200 ESAs throughout the States of Hawai'i and California working with small private landowners, real estate firms, small business owners, financial and lending institutions, corporations, and industrial facilities to assess their properties for areas of potential environmental concern. Mr. Cho has performed ESAs for a wide variety of land uses and facilities, including: mixed-use apartment complexes, present and former auto body and repair/maintenance shops, large-acre undeveloped properties, resort hotels, food, industrial properties, commercial office buildings, conservation land, and cellular phone tower sites. Mr. Cho is aware of the continuous changes in the environmental industry and keeps current with all ESA standards and regulations.

### **Scott Duzan**

Mr. Duzan has conducted over 50 Phase I ESAs in Hawai'i for commercial and residential properties including shopping complexes, transportation facilities, and undeveloped land. He has also completed numerous indoor air quality investigations, FCC-NEPA

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Wailua, Kaua'i, Hawai'i**

environmental compliance assessments, and Phase II soil and groundwater surveys. He has research experience with freshwater crustacean ecology, sustainable design-architecture, and the ecological and economic impacts of golf courses on communities. Mr. Duzan has attended multiple training sessions focusing on Phase I ESA standards and regulations.

## **ENVIRONET, INC.**

In addition to ESAs, EI is well qualified to perform numerous other environmental tasks, which include, but are not limited to the following:

### **Due Diligence and Property Services**

- Phase II investigations and remedial investigations
- Corporate lender, buyer, consultation, and environmental project management
- Litigation support, litigation expert and expert witness, forensic chemical analysis
- Hazardous waste removal

### **Subsurface Investigations**

- Soil and groundwater contamination delineation and remediation
- Passive and active soil-gas analysis
- Groundwater gradient and tidal studies
- Bioplume, bioscreen, and modflow modeling

### **Remediation**

- Phase II remedial investigations
- Soil removal actions
- Hazardous waste characterization and removal
- Groundwater treatment and remediation

### **Environmental Planning**

- Environmental Assessments/Impact Statements
- Water resources planning and surface water quality investigations
- Alien plant mitigation and native plant enhancement
- Coastal resources/natural resources management planning

### **Government CERCLA Services**

- Preliminary Assessment and Site Investigation (PA/SI)
- Remedial Investigation and Feasibility Study (RI/FS)
- Air monitoring, modeling, and visualization
- Engineering Evaluation and Cost Analysis (EECA)

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Engineering Services

- *In-situ* and *ex-situ* soil remediation
- Landfill/golf course environmental monitoring design and implementation
- Spill Prevention Control and Countermeasure (SPCC) Plans
- Risk management plans

Should you encounter a need for any of these services, please contact EI at 808-833-2225 and we would be happy to work with you.



**APPENDIX D**  
**ARCHAEOLOGICAL SURVEY**





***-DRAFT-***  
**AN ARCHAEOLOGICAL INVENTORY SURVEY REPORT  
FOR THE PROPOSED WAILUĀ RESIDENTIAL SUBDIVISION  
LOCATED ADJACENT TO THE WAILUĀ RIVER STATE PARK  
WAILUĀ AHUPUA`A, PUNA DISTRICT, KAUA`I ISLAND, HAWAII  
[TMKs: (4) 3-9-02: 12, 24, 25 AND 3-9-06: 09]**

Prepared by:  
**Trisha M. Drennan, M.Sc.**  
October 2007

Prepared for:  
**Environet, Inc.**  
**2850 Pa`a Street, Suite 212**  
**Honolulu, HI 96819**

## ABSTRACT

At the request of Environet, Inc., Scientific Consultant Services, Inc. (SCS) conducted an Archaeological Inventory Survey on Department of Hawaiian Home Lands (DHHL) parcels in Wailuā, Wailuā Ahupua`a, Puna District, Kaua`i Island, Hawai`i [TMKs: (4) 3-9-02: 12, 24, 25 and 3-9-06: 09]. The project area encompassed approximately 240 acres. The overall project included an Archaeological Inventory Survey (covered here) and a Cultural Impact Assessment (under separate cover). The archaeological work consisted of 100 percent pedestrian survey of the project area, revealing mostly charred sugarcane fields (roughly 70% of project area) and selected survey of unburned and peripheral areas.

The survey led to the identification of three new archaeological sites comprised of nine features. In addition, a historic feature (rock wall) was identified through archival research, and was later relocated as an earthen berm heavily obscured by vegetation. Site TS-1 is an historic site (agricultural water diversion and irrigation features) associated with the Plantation Era on Kaua`i. Site TS-2 consists of a prehistoric surface lithic (stone tool) scatter. TS-3 is composed of one rock wall (TS-3, Feature 1) with traditional construction, two rock terrace remnants (TS-3, Features 2 and 3), and one multi-tiered enclosure (TS-3, Feature 4). Subsurface testing at these sites and selected sections of the project area yielded only negative results. One significant, previously identified site occurs just outside the project boundary (northeast corner) Malae Heiau (Site -104).

Sites TS-1 and TS-2 are significant under Criteria D of the State Register of Historic Places; no further work is recommended for TS-1. However, further investigation into extending the boundary of Site-104 to include TS-2, Locus A, is required. Site TS-3 is significant under Criteria D and possibly E. In addition, Data Recovery is recommended for Sites TS-2 and TS-3 to investigate possible connections between Site -502 and *kapu* lands, which the attending commercial development may affect. Data Recovery should include testing at the historic wall site to verify its existence and location. Further, construction activities immediately outside the Buffer Zone (100 m) of Site -104 (Malae Heiau) at Site TS-2, as well as the northern border of the project area which includes areas of lithic concentrations and TS-1 Feature 5, are recommended for Monitoring.

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## **INTRODUCTION**

At the request of Environet, Inc., Scientific Consultant Services, Inc. (SCS) conducted an Archaeological Inventory Survey of Hawaiian Home Lands (DHHL) parcels in Wailuā, Wailuā Ahupua`a, Puna District, Kaua`i Island, Hawai`i [TMKs: (4) 3-9-02: 12, 24, 15 and 3-9-06: 09]. This survey was conducted in conjunction with an Environmental Assessment of the proposed Wailuā Residential Subdivision (Figures 1 and 2). The Inventory Survey consisted of historical background and archival research; a full pedestrian survey of the parcels; backhoe-excavated subsurface testing; mapping of test units; and the analysis, interpretation, and reporting of all relevant data. Fieldwork was conducted by SCS archaeologists, including Jim Powell, B.A., Randy Ogg, B.A., Guerin Tome, B.A, and Sonya Niess, B.A., on several visits to the project areas from July through August 2007. Analysis of artifacts was conducted by Guerin Tome, B.A. and Dr. Robert Spear. The Principal Investigator for this project was Michael Dega, Ph.D.

Portions of TMK: 3-9-02: 12, 24 and 25 contain 30+ acres zoned for commercial use along Kuhio Highway. Proposed use for this land includes 700–1,000 Single Family Residential lots, 12 acres for a school/park site, a 120-foot wide by-pass road, and 18 acres being set aside for a community center and park site. The proposed development related to TMK: 3-9-06: 9 contains 52 acres of land zoned for commercial development (800–1,000 units).

The Wailuā River State Park includes one archaeological site, the Malae Heiau, (listed on the National and State Registers of Historic Places, Site 50-30-08-502), which borders the project area. A large variety, and number, of traditional and historic sites have been documented in Wailuā Ahupua`a, and this is an important area for Kaua`i history and traditions. No previous archaeological survey or subsurface testing has occurred within the immediate project area; however, the project area is adjacent to one of the four *heiau* (Malae) that comprise the Wailuā Complex of Heiau, Malae Heiau, a National Historic Landmark. The *heiau*, which has been previously documented, contains a 100-foot wide buffer on the east and west sides and a 300-foot buffer on its north and south sides (Figure 3) (Yent 2005: 1).

## **INVENTORY SURVEY SUMMARY**

The present Inventory Survey research led to the identification of three new archaeological sites that were assigned temporary site numbers TS-1, TS-2, and TS-3 (see Figure 1) (Table 1). Nine total features were identified in these three sites. Archival research identified the existence of an historic rock wall that was not evident through pedestrian survey but its location is shown on an historic map (Figure 4); the approximate location of this historic wall

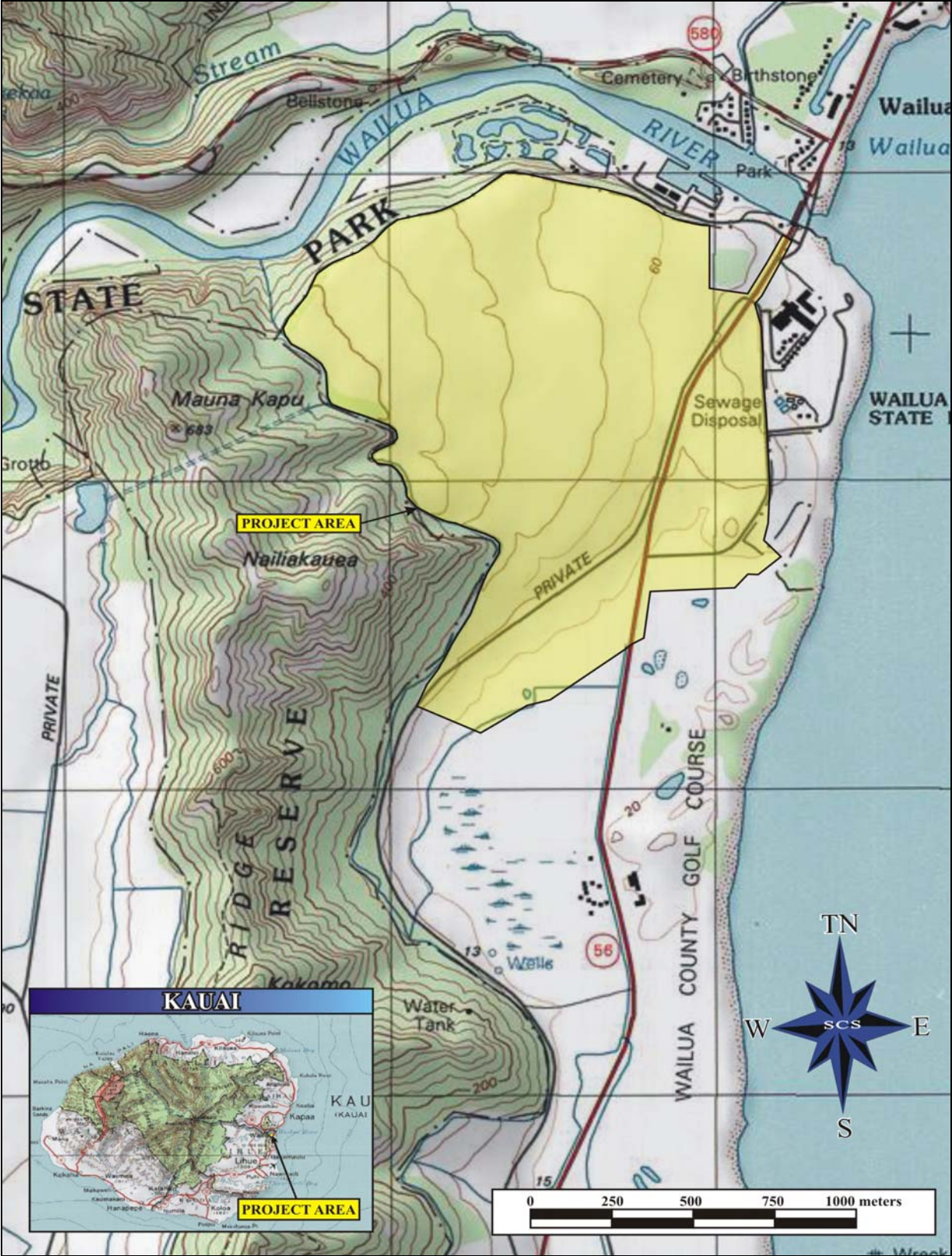


Figure 1: USGS Wailuā Quadrangle Map Showing Project Area.

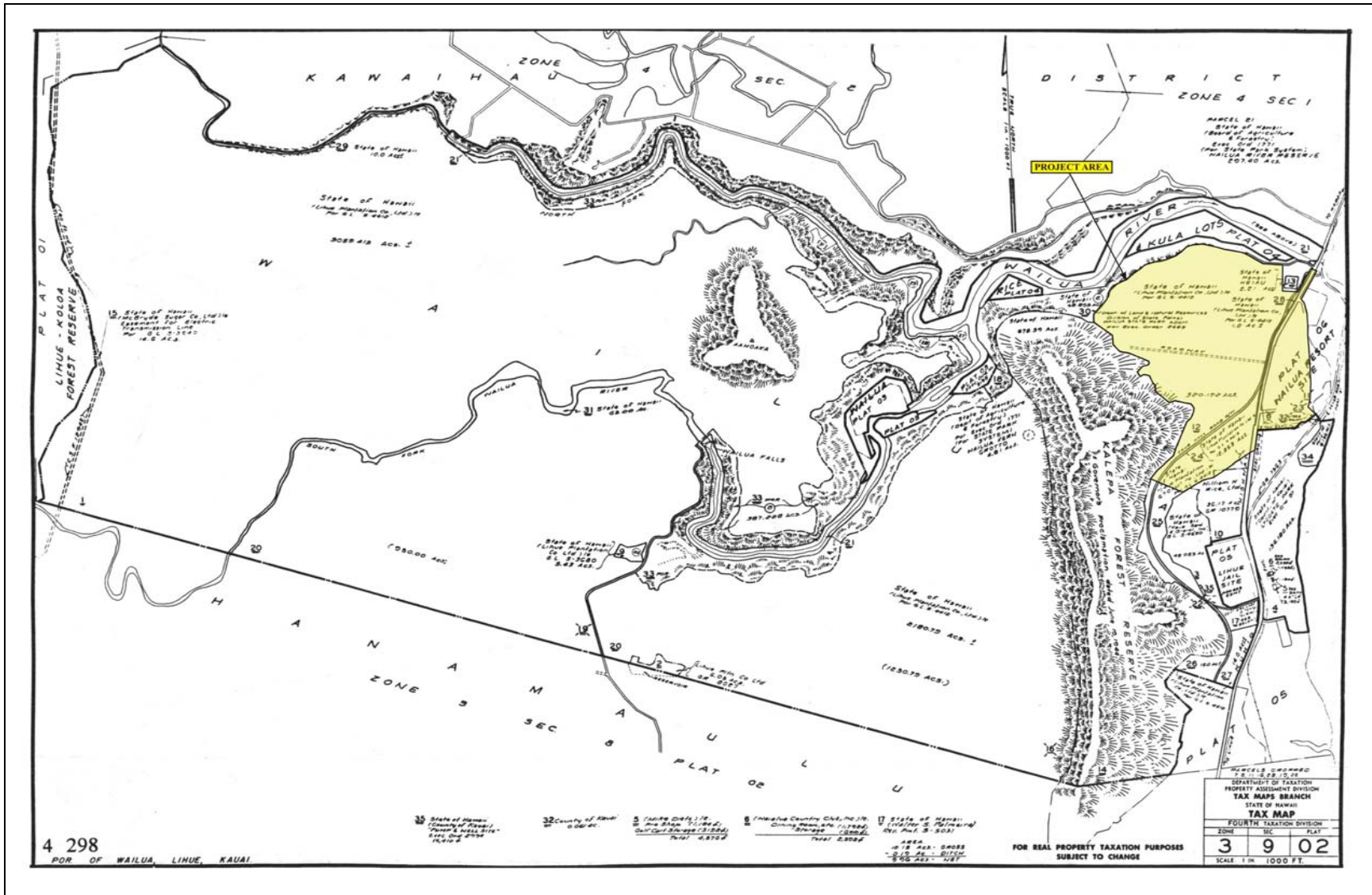


Figure 2: Tax Map Key [TMK] Showing Project Location.



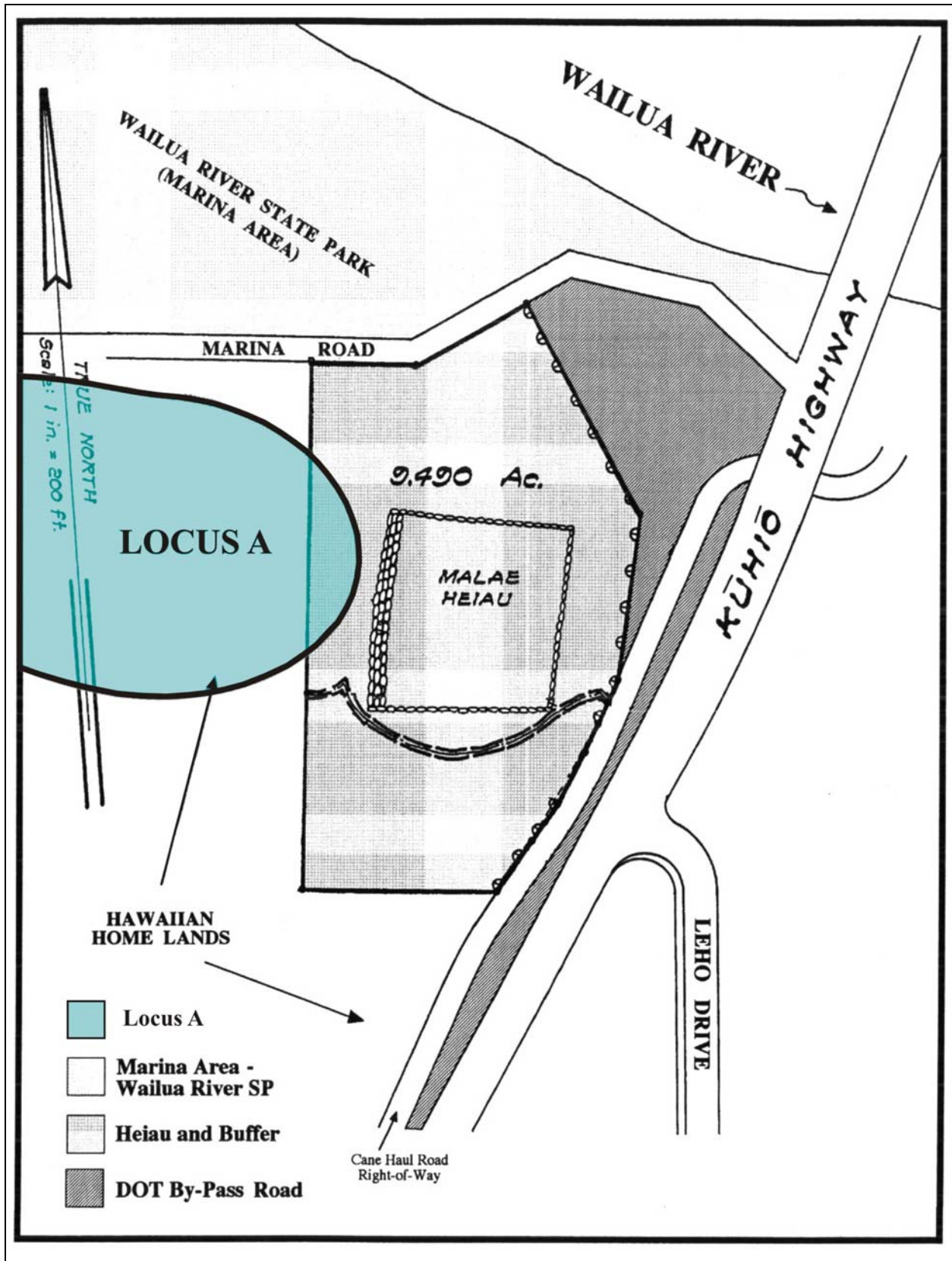
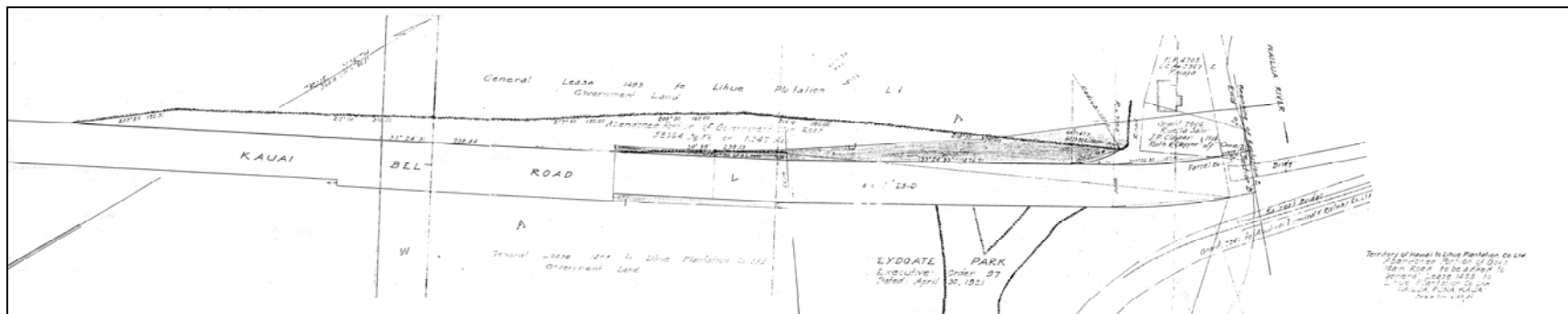


Figure 3: Malae Heiau and current buffer delineation. (Adapted from Yent 2005: Fig. 5).



**Figure 4: Historical Map ca. 1933, Conveyance of Abandoned Government Road, Territory of Hawaii, to The Lihue Plantation Co., LTD.**

**Table 1: Wailua DHHL Project Summary Data.**

ARS (SCS Temp Site No.)	State Site No. 50-30-08	Feature(s)	Site Form	Function	Time Period	Test	Significance Assessments	Comments
TS-1		5	1A) Earthen reservoir 1B) Earthen reservoir 1C) Concrete watergate 2) Watergate 3) Watergate with culvert 4) Bridge with irrigation diversion ditch 5) Ditch	Water transportation	Plantation Era	N	Criteria D	No further work required
TS-2		4 Loci + 1 outlier	Lithic scatters	Lithic Workshop and Chipping Stations	Pre-Contact	Y	Criteria D	Data Recovery
TS-3		4	1) Rock wall 2) Rock terrace remnant 3) Rock terrace remnant 4) Rock enclosure	Agriculture; Habitation	Pre-Contact To Plantation Era	N	Criteria D/ Criteria E?	Data Recovery

was later verified on the ground as an earthen berm after the conclusion of the field portion of the survey (Figure 5). Twenty-eight backhoe trenches (ST-1 through ST-28) were excavated at two locations during field survey (e.g. Site TS-2 (Test Area 1) at the northeastern boundary of the project area, and Test Area 2 at the southeastern corner of the project area) (Figure 6).

The first site, TS-1, an agricultural water diversion, contained five features and three sub-features. Site TS-1 was an historic site associated with the Plantation Era in Kaua'i. Since Site TS-1 contained historic construction typifying water transportation features, no test units were placed in this site.

Site TS-2 consisted of a prehistoric surface lithic (stone tool) scatter. The artifacts occurred within four main locations and one outlier. Locus A contained the highest concentration of lithics (N=111); the remaining loci consisted of a total 25 artifacts. The artifacts are associated with pre-Contact times. Five backhoe trenches were placed in Locus A; no cultural materials were recovered (see Figure 4). All cultural resources associated with Site TS-2 were from a surface context.

Site TS-3 consisted of three features and nine sub-features: two rock terrace remnants (Features 2 and 3) and one rock wall (Feature 1). A fourth feature, a substantial enclosure with



**Figure 5: USGS Wailua Quadrangle Map Showing Probable Location of Historic Rock Wall.**

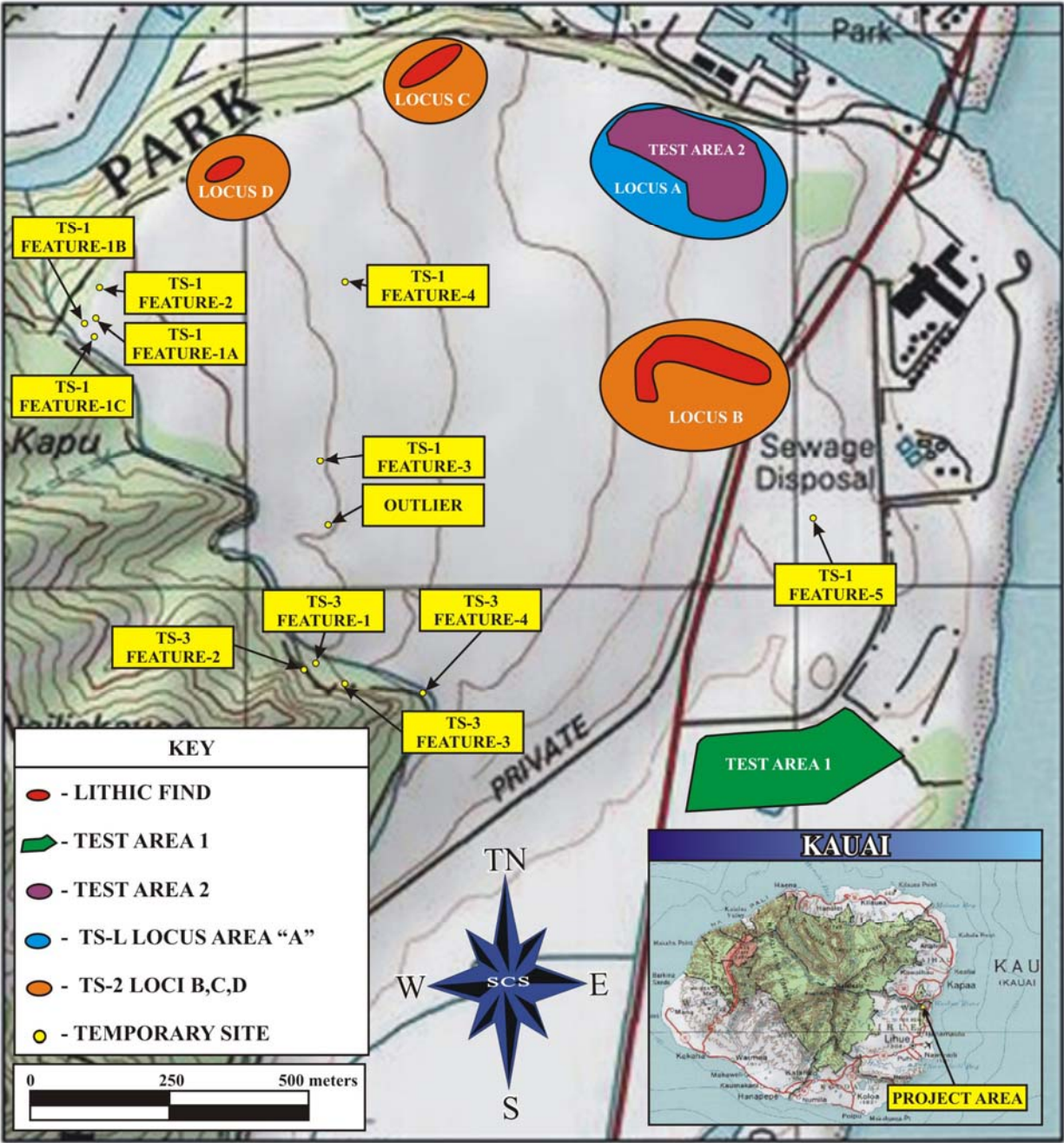


Figure 6: USGS Wailua Quadrangle Map Showing Site and Testing Locations.

abutting terracing, appeared just outside the project boundaries; however, was minimally recorded due to its complex construction and perceived uniqueness and association with Features 1 through 3. No archaeological test units were placed in Site TS-3.

Nine features were identified at three sites. An historic 1933 map provides the location of an historic rock wall which lies between the Lihue Plantation leased land on its western boundary, and the abandoned Government Rd. property and Kauai Belt Road on its eastern side (Kaua`i Historical Society) (see Figure 4). Twenty-three stratigraphic trench (ST) units were excavated in the southeastern portion of the project area adjacent to the golf course and closest to the shoreline (see Figure 6). The results for trench excavations again produced negative results.

## **BACKGROUND**

### **PROJECT AREA LOCATION**

The project area is situated on the eastern side of the island of Kaua`i, on sloping lands below Kālepa Ridge, parallel to the coastal plain and upslope of the southern banks of the Wailuā River. The Wailuā River is one of the largest in the Hawaiian Islands, with a broad floodplain primarily composed of overbank sediments transported by the river.

Wailuā River State Park, established in 1954, is composed of 1,092.6 acres and is located immediately north-northwest of the project area (see Figure 1). Seven *heiau* (places of worship) extend from the mouth of the Wailuā River to Mt. Wai`ale`ale. The Park contains four *heiau* that comprise the Wailuā Complex of Heiau (National Historic Landmark); one borders the project area. At this important seat of chiefly power lie the remains of these *heiau*; the Complex also contains *pu`uhonua* (places of refuge), birthstones at Holoholokū (Pōhaku Ho`ohānau), and the Bell Stone. The Park hosts river fishing, restaurants, and picnicking along a riverside coconut grove and boating from its marina.

The western portion of the project area is bounded by Kālepa Ridge. Two prominent landmarks mark the horizon: Sleeping Giant to the north, in the Nounou Forest Reserve, and the topographical feature Mauna Kapu, part of the Kālepa Forest Reserve to the south. Leho Drive and Nehe Road mark the eastern boundary of the project area. Kuhio Highway, a major north-south transportation artery, passes through the project area. A cane-haul road, which once facilitated transport of sugarcane during harvest, runs between Malae Heiau and Kuhio Highway. Directly east is the shoreline, once a part of State Parks, is now a part of Kaua`i County Parks.

## PROJECT AREA DESCRIPTION

In geological terms, the *mokupuni* (island) of Kaua`i is described as a dissected basaltic dome of a single large shield volcano; it is the oldest of the major, inhabited Hawaiian Islands. According to Clague and Dalrymple (1994), the age of the shield-building phase of Kaua`i is approximately 3.9–5.8 million years ago (mya). Starting approximately 1.4 mya, post-shield eruptions from volcanic vents centered on Kōloa spread surface lava flows over half of the eastern portion of the island, including the project area. The Kōloa flows occurred on top of the older (shield-phase) Waimea lava flows. A large cinder cone, Hanahanapuni, is located in the upper drainage basin of the Wailuā River. Wailuā Falls was formed from the Wailuā River over a thick lava flow of the Kōloa volcanic series, where the river undercut the weak underlying tuff, mudflow, and pillow lavas (Stearns 1966).

The project area is situated on the Lihue flood plain (Elevation: 9' to 270' amsl) along the southern banks of the Wailuā River (see Figures 1 and 2). The terrain has been modified in historic times by the planting of sugar cane. This remodeling of the landscape has extended up to several feet deep into the subsurface, in some places, as confirmed in testing by SCS (see TESTING).

## VEGETATION

In June of 2007, approximately 225 acres of land burned in a series of brush fires; most of this land was part of the Department of Hawaiian Home Land (current project area). The rest of the damage was sustained in the Kālepa Mountain Forest Reserve; however, rainfall stopped the fire from reaching the top of the Kālepa ridgeline.

Approximately 70 percent of the vegetation in the project area has been burned or affected by the fire. Several plants were identified in the project area: banyan (*Ficus benghalensis* L.), Java plum (*Eugenia jambolana* Lam.), umbrella tree (*Brassaia actinophylla*), common guava (*Psidium guajava* L.), Christmas berry (*Schinus terebinthifolius*), koa haole (*Leucaena glauca*), various species of exotic palms (Arecaceae), ferns, (Felicides), *Boervahia* sp. *lantana* (*Lantana camara*) and `aki`aki haole (buffalo grass, *Buchloe dactyloides*), and various miscellaneous grasses, vines, and weeds. A botanical survey conducted of Malae Heiau (outside northeast corner of project area) in 1991 showed a variety of exotic plants and trees (Flynn 1991).

## HYDROLOGY

Compared with other locations in Windward Kaua`i, the project area is only moderately wet, with an average annual rainfall between 50 and 60 inches (1270–1520 mm) (Armstrong

1983). Particularly in pre-Contact times, a much greater amount of through-flowing, fresh water would have been locally available in the Wailuā River that drain the uplands to the west of the project area.

## **SOILS**

The soils dominating the majority of the project area were contained in the Lihue Series, but also portions of which encountered were of the Kalapa, Kaena and Hanamaulu Series (Foote *et al.* 1972:39, 50–51, 55–56, 82–83) (Figure 7).

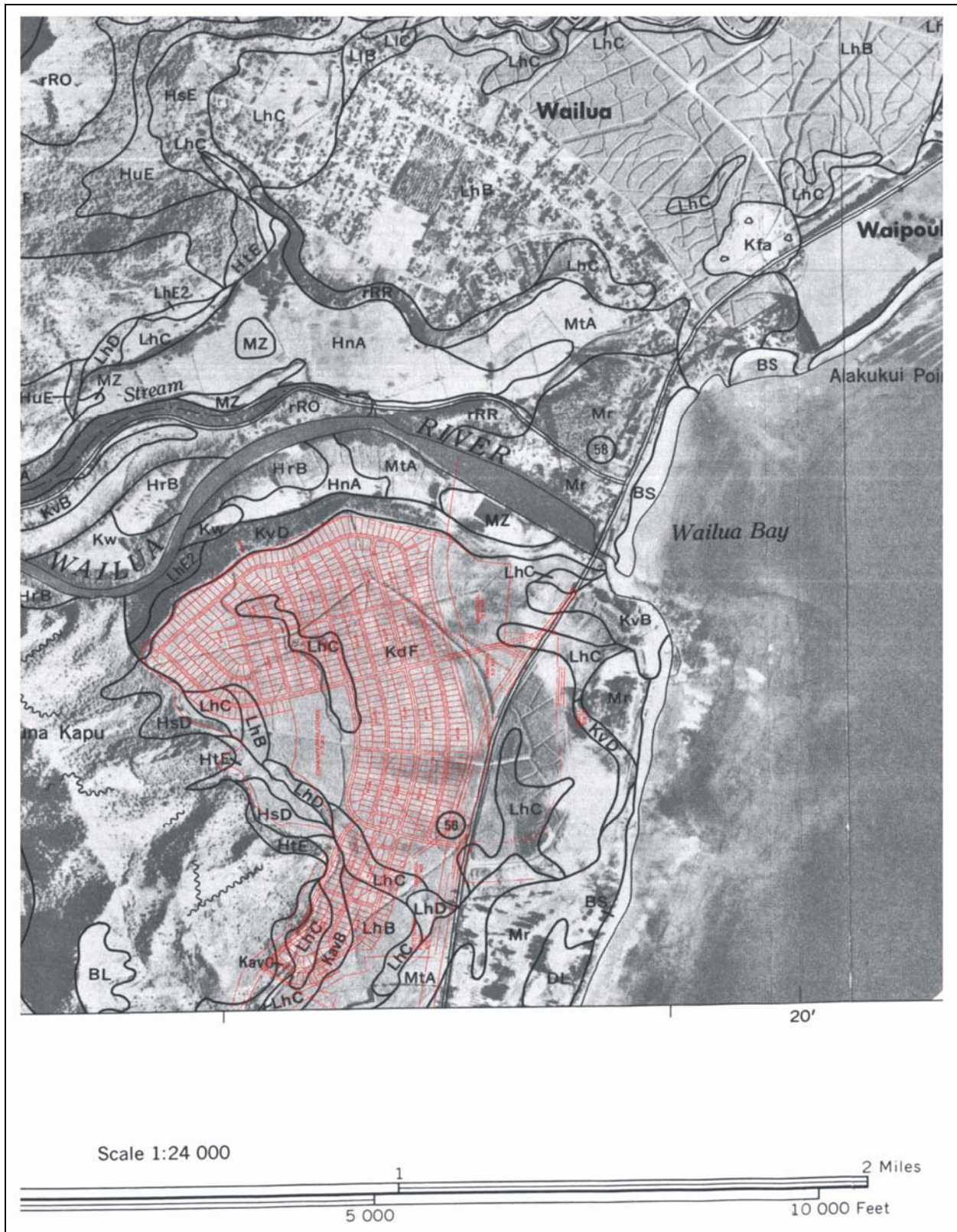
The soils of the Lihue Series consists of well-drained soils located in the uplands of Kaua`i Island and are formed in materials weathered from igneous rock. The slope ranges from gentle to steep, and elevations extend from around sea level to 300 feet amsl. Rainfall ranges from 40 to 60 inches annually and the mean soil temperature is 73 degrees Fahrenheit. Soils in this series area used for commercial agriculture including, sugarcane, pineapple, pasture, truck crops, orchards, wildlife habitat, and home sites (*ibid*: 82–83).

Lihue silty clay soils (LhB, LhC, and LhD) are the three types of soils of the Lihue Soil Series present in the current project area. The basic difference between these soils is the slope percentage, the rate of runoff, and the erosion hazard. LhB soils contain slopes that range from 0 to 8 percent and are found on the tops of broad interfluves in the uplands. In a representative profile, the surface layer of these soils is approximately 12 inches thick, the subsoil is more than 48 inches thick, and the substratum consists of soft, weathered rock. In this type of soil, permeability is moderately rapid, runoff is slow, and the erosion hazard is slight. LhC soils have a slope ranging from 8 to 15 percent, slow runoff, and pose a slight erosion hazard. The LhD soils have slopes ranging from 15 to 25 percent, medium runoff, and are a moderate erosion hazard (*ibid*: 82–83).

The Hanamaulu Series consist of well-drained soils on stream terraces and steep terrace breaks on the island of Kaua`i. These soils were developed in alluvium washed from upland soils (*ibid*: 39–40).

The surface layer of Hanamaulu silty clay (HsD) is brown and very dark grayish-brown silty clay about 11 inches thick. The subsoil is 60 inches thick is dark brown and dark reddish brown subangular blocky silty clay. Runoff is medium, the slope is 15 to 25 percent, and the erosion hazard is moderate. This soil is used for sugarcane, pasture, water supply and wildlife habitat (*ibid*).





**Figure 7: USDA Soil Survey Map Showing Soils in Project Area.**

The surface layer of Hanamaulu stony silty clay (HtE) is brown and very dark grayish-brown silty clay about 11 inches thick. The subsoil is 60 inches thick is dark brown and dark reddish brown subangular blocky silty clay that is stony. Runoff is medium to rapid, the slope is between 10 and 35 percent, and the erosion hazard is moderate to severe. This soil is used for pasture, woodland, wildlife habitat, and water supply (*ibid*).

The Kaena Series consists of a very deep, poorly drained soils on alluvial fans and talus slopes on the islands of O`ahu and Kaua`i. These soils developed in alluvium and colluvium from basic igneous material. They are gently sloping to steep and commonly are stony. Elevations range from 50 to 150 feet (*ibid*: 49–50).

Kaena clay (KavB), a brown variant with 1 to 6 percent slopes, occurs on alluvial fans on Kaua`i. It is geographically associated with Kalapa soils. This variant is somewhat poorly drained; it occurs at elevations up to 500 feet. Permeability is slow to moderately slow; runoff is slow and erosion hazard is slight. This soil is used for sugarcane and pasture (*ibid*).

The Kalapa Series consists of well-drained soils at the base of slopes on the island of Kaua`i. These soils developed in material weathered from basic igneous rock and in colluvium. They are moderately sloping to very steep and occur at elevations ranging from 200 to 1,200 feet (*ibid*: 55—56).

Kalapa silty clay (KdF), which is commonly found in upland areas, has a representative profile with a dark brown silty clay surface layer that is 10 inches thick. The subsoil (40 inches thick) ranges from dark red to dark reddish brown silty clay; it has a subangular blocky structure. The substratum is dark brown dusky red and dark red silty clay with soft highly weathered rock; the soil is strongly acidic throughout. Permeability is moderately rapid and runoff is very rapid, the erosion hazard is severe, and the soil has a 40 to 70 percent slope. This soil is used for water supply, pasture and woodland (*ibid*).

## **CULTURAL AND HISTORIC BACKGROUND**

A large body of oral history, including legends and myths, historical documents, like Land Commission Awards, and archaeological studies dealing with Wailuā Ahupua`a makes it one of the best known and most important traditional land divisions on the island of Kaua`i. Wailuā Ahupua`a was clearly an important social, political, religious, and economic center in pre-Contact times.

## LEGENDS AND MYTHOLOGY

Numerous accounts deal with the legends and myths of Wailuā Ahupua`a, including Kalakaua (1972), Dickey (1917), Fornander (1916-1919), Rice (1923), and Flores (1995).

Dickey, a longtime resident of Wailuā, recorded numerous legends associated with specific sites throughout Wailuā Ahupua`a. Primary figures associated with the rich mythological history of Wailuā Ahupua`a include Pele, Maui, Kapo/Laka, Kawelo, Pikoikaala, Laieikawai, Mo`ikeha, La`amaikahiki, and Kaililauokeoa, among others (including the *menehune*). These legends recant such famous events, like when Pele and her sisters surfed outside the mouth of the Wailuā River, and when Maui rode that same surf in his great canoe as he pulled the islands together. Other legends associated with this *ahupua`a* recount the benevolent actions of the famous *mo`o*, goddesses of the waterfalls.

These authors and more recount a variety of other legends associated with the upland regions of Wailuā Ahupua`a. Almost all of the legends are associated with the principal figures of both the pan-Polynesian and Hawai`i-specific cosmologies, in particular, the *akua* (god) Maui and the volcano goddess Pele. Additional notoriety is ascribed to the prominence of Mount Wai`ale`ale as a sacred site. Many legends refer to spiritual and religious pilgrimages by various *ali`i* (chief) to the summit of Mount Wai`ale`ale and to the Ka`awakō Heiau on the trail known as Kaluawehe. This trail, also known as the King's Highway, originated at the mouth of the Wailuā River. Today, the trail has been replaced by Kuamoo Road.

## PRE-CONTACT ERA

The Wailuā River is the largest river in the Hawaiian archipelago. It is navigable by large canoes for quite a distance upstream. The river valley cuts between two mountains just before the river enters the sea. During the pre-Contact period, the lower portion of this *ahupua`a*, where Wailuā Stream meets the ocean, was considered to be one of the most attractive places to live in the Islands. The area, once called Wailuā Nui Hoano (Great Sacred Wailuā), was one of the two most sacred areas in the Hawaiian archipelago and was *kapu* (taboo) to commoners. It was crucial that all the Kaua`i *ali`i* were birthed at the Birthstones which were located in an area of Wailuā called Holoholokū. During periods “[w]hen the chiefly class became diminished for some reason, the King selected women of common birth to deliver children at the Birthstones. Legend says such a child would be a chief” (Joesting 1987:5–9). The important role the Birthstones of Holoholokū played during ancient times is exemplified in an ancient chant:

The child of a chief born at Holoholo-ku is a high chief;  
The child of a commoner born at Holuholu-ku becomes a chief also;  
The child of a high chief born outside of Holoholo-ku is no chief, a commoner  
he! (*ibid*)

In pre-Contact times, Wailuā and Waimea were known as the alternate seasonal ruling centers of the Kingdom of Kaua`i. Island-wide unification was finally achieved with the acquisition of Kaua`i by Kamehameha in 1810, through a strategically arranged marriage, rather than by outright or direct warfare. The association of Wailuā with the *ali`i nui* (high chief) Wailuānuiahō`ano and Mo`ikeha suggest the area was a recognized social and political center of the kingdom of Kaua`i as early as A.D. 1300–1350.

The naming of Wailuā is likely attributed to its association with the Ali`i Wailuānuiahō`ano. Kamakau (1976), while discussing land divisions, provides insight into understanding the nature of the naming of the *ahupua`a*. He suggests that some localities may have been named for a particularly famous chief. Referring specifically to Wailuā Ahupua`a, Kamakau writes:

Wailuānui-a Hoa`ano was born at `Ewa, Oahu, and his descendants went to Kaua`i and to Maui, and wherever they settled they called the land after the name of their ancestor. Wailuā was a son of La`akona, ancestor of the `Ewa family by Ka-ho`ano-o-kalani. His name, Wailuānui-a-Ho`ano, came from adding the name of his mother. Thus, some names were derived from those of ancestors.  
(*ibid*: 7)

The large number of heiau located along the Wailuā River demonstrates the prominence of Wailuā as a religious and political center. Seven *heiau* were recorded in coastal portions of Wailuā Ahupua`a (Ching 1968). In addition, a significant amount of archaeological sites representing a broad spectrum of habitation related activities centered on the cultivation of *taro* (*Colocasia esculenta*), has been gleaned. Most of these sites are concentrated along the main forks of the river and extend up to at least three miles inland of the river mouth (Carpenter and Yent 1997).

## **HISTORIC TIMES**

Wailuā is often described as an area reserved for *ali`i nui*. However, research on Land Commission Awards (LCAs) by Stauffer (1993) for the Division of State Parks suggests that only portions of Wailuā Ahupua`a were reserved for *ali`i*, and that portions were used by

*maka`āinana* (commoners). At the time of the Māhele (*i.e.*, middle-19<sup>th</sup> century), portions of Wailuā were used by *maka`āinana* for *pāhale* (houselots), *ala nui* (access routes, trails, throughways), *lo`i* (irrigated terraces), and *kula* (agricultural lands). Of the overall 29 original LCA claims in Wailuā, 28 were from the *maka`āinana* and only one was from a high *ali`i* agent. The latter came from Deborah Kapule's son, Iosia Kaumuali`i, who included in his claim the *pō`alima* of Wailuā. The *pō`alima* were *lo`i* worked by the *maka`āinana* for the *ali`i* of the area; literally, the 'royal taro patch.'

The LCAs awarded to the former *ali`i*, Deborah Kapule, included house lots and agricultural parcels for herself, her son, and her *hānai* (foster, adopted) daughter, Juliana Nahinu. The land claimed by Kapule, much of which had been received from Ka`ahumanu, included fishponds near the coast and land in the vicinity of Kalaeokamanu Heiau, at Holoholokū, indicating that these may have been part of the areas formerly reserved for *ali`i* or personages of high status, such as *kahuna* (priest, sorcerer, master of an art) and advisors. In 1835, Kapule after having moved from her home in Waimea to Wailuā, since converting to Christianity, is said to have made Malae Heiau into a cattle pen and Kalaeokamanu Heiau into a pig pen [Bennett (1931: 125); Dickey (1917: 25-26); Stauffer (1994: 86)].

It is interesting to note that an additional claim came from King Kamehameha III (Kauikeaouli), who claimed everything else in the *ahupua`a*, including water rights and the fishing grounds offshore. This claim was later turned over to the new government. Additionally, later surveys and the testimonies of officials of the land commission indicate as many as 35 additional potential claimant documents were never filed, likely due to the inadequacies of the system of land registration and ownership introduced in the nineteenth century. These claims show a similar pattern of land use compared with awarded claims, and consisted of *pāhale*, *lo`i* (irrigated taro), *kula* (dryland agriculture), and *mo`o`āina* (land parcel) (Stauffer 1993). Most of these awards were located on the north side of the Wailuā River extending from the back beach areas in coastal portions of the *ahupua`a* along the river and along `Ōpaeka`a Stream, and were passed to *kuleana* by Debora Kapule and her son Iosia (Yent 1997: 7, Fig. 4; Yent 2001: 8, Fig. 4).

In traditional times, a system of *`auwainui* (great, big ditch) and *`auwai* (ditch), part of the communal land stewardship system within the *ahupua`a*, would have functioned to divert and deliver water to *lo`i* throughout the *ahupua`a*. This system of wetland taro cultivation was converted largely to rice during the historic period. Additional *loko i`a* (fishponds) were located in the back beach area on the north side of the river mouth.

The Wailuā Complex of Heiau was declared a National Historic Landmark in 1962 (Table 2). In addition to the four heiau, Malae, Kalaeokamanu, Poli`ahu, and Hikinaakalā Heiau, the Complex includes Holoholokū Heiau, Pōhaku Ho`ohānau (Birthstones), the Bell Stone Site, and *pu`uhonua* and petroglyph stones.

The northern half of Wailuā State Park contains Poli`ahu Heiau, Holoholokū Heiau, Pōhaku Ho`ohānau (Birthstones), and the Bell Stone Site. Holoholokū and the Pōhaku Ho`ohānau are recorded as the birthplace of *ali`i*, similar to the Kūkaniloko Site in Wahiawā (O`ahu). This was also a *pu`uhonua*, where *kapu* breakers could obtain immunity and refuge seekers could find safety during war (Īī 1959). In addition, Holoholokū is reported to be the place associated with Mo`ikeha's arrival from Kahiki (Fornander 1916). Holoholokū is believed to be an area that was set aside exclusively for *ali`i nui*, their priests, family, and attendants. Malae Heiau is reported to have been the oldest *heiau* on the island and the first one built by the Menehune. Thrum reported the Heiau as a walled and paved structure 273 feet by 324 feet with walls 13 feet thick (at base), a traditional form of Menehune construction.

#### **THE SUGAR PLANTATION ERA IN KAUA`I**

The second oldest sugar plantation on Kaua`i, after Kōloa, was the Lihue Plantation Company, founded in 1849 (Wilcox 1996) (Figure 8). Sugar was actively planted by the Wailuā Plantation in 1879 and 1880 (Dorrance 2000: 25). The Plantation continued to expand and in 1974, leased some of Grove Farm's cane lands operating strictly on gravity flow. By 1931, 79 percent of 6,712 acres of plantation land were irrigated by gravity flow. Of the reservoirs, Wailuā produced the largest flow at 242 million gallons (*ibid*: 73). Finally, in 1994, in an effort to reduce costs, the Lihue Plantation announced the consolidation of many operations; six years later, it officially closed business.

#### **PREVIOUS ARCHAEOLOGY**

Wailuā Ahupua`a is one of the most archaeologically rich areas in the Hawaiian Islands. This section of the report presents a sampling of previous archaeological studies in and around the project area. In general, coastal portions of the *ahupua`a* have been more studied as compared to upland areas, which have received less study. Results of these studies have been used to predict the types of sites and features expected in the project area (see EXPECTED FINDINGS).

**Table 2: Heiau Located in the Vicinity of Wailua Ahupua`a (Adapted from Yent 2001: 23, Table 4).**

<i>Heiau</i>	<b>State Site Number 50-30-08</b>	<b>Location</b>	<b>Form/ Size</b>	<b>Function</b>	<b>References (Age/association)</b>	<b>Comments</b>
Malae* ( <i>Malaeha`akoa</i> ) ( <i>Makaukiu</i> )	-104	(In current project area, northeast corner); south side of Wailua River bank; west of Kuhio Highway	Large, square walled enclosure (273 by 324 feet)	Multi-functional: (Luakini, assembly area, habitation)	Menehume Mo'ikeha Flores (1995: II-3) (ca 1300)	Lithic concentration (SCS Site TS-2, Loci A-D)
Hikinaakalā*	-105	South side of Wailua River bank; east of Kuhio Highway at shoreline	Large, rectangular Walled enclosure (395 by 80 feet)	Pu'uhonua Astronomy	Wailuanuiaho'āno Bennett (1931) (ca 1320—1350)	Munch of the stone removed
Kalaeokamanu* ( <i>Ka Lae o Ka Manu</i> )	-106	North side of River; inland at Pu'ukī and Holoholokū	Small, rectangular Walled enclosure (115 by 65 feet)	Multi-functional: (Luakini, Pu'uhonua, animal pen)	Mo'ikeha and His Son, La'anaikahiki Formander (1916) li (1959) Kikuchi (1976) (ca 1300—1340)	Adjacent to Birthsite
Poli'ahu*	-107	Bluff between Wailua River and 'Ōpaeka'a Stream	Large, square Walled enclosure With notch (242 by 165 feet)	Luakini	Menehume Bennett (1931)	
Kukui ( <i>Kaikīhaunakā</i> ) ( <i>Kūhua</i> )	-108	Boundary Olohena and Wailua at Lae Alakukui	Walled enclosure Terraced on makai side	Luakini Navigational	Kāwelo Thrum (1906) Davis and Bordner (1977)	Much of the stone removed; Cultural material: stone lamps
Kapu'ukoa	-109	North bluff of Wailua River; 1.0 m <i>mauka</i> of shore in cane field	Walled enclosure (165 by 66 feet)	Unknown	Bennett (1931) Damon (1931)	Not relocated
Pōhaku'ele'ele	Ching Site 47	Bluff between Wailua River and 'Ōpaeka'a Stream; same ridge as Poli'ahu Heiau	Not recorded	Unknown	Dickey (1917: 29)	Not relocated
Unknown Name	-345 (Ching Site 58)	Bluff at convergence of Wailua River North and South Fork	Square, walled enclosure with notch (87 by 70 feet)	Unknown	Metcalf's map (1846)	Relocated in 1992, State Parks
Meleaha'anounou	??	Makai of Malae Heiau	Not recorded	Unknown	Wailuanuiaho'āno n.a. 1885 (ca 1320—1350)	Destroyed

\*The Wailua Complex of Heiau (State Site No. 50-30-08-502) a National Historic Landmark

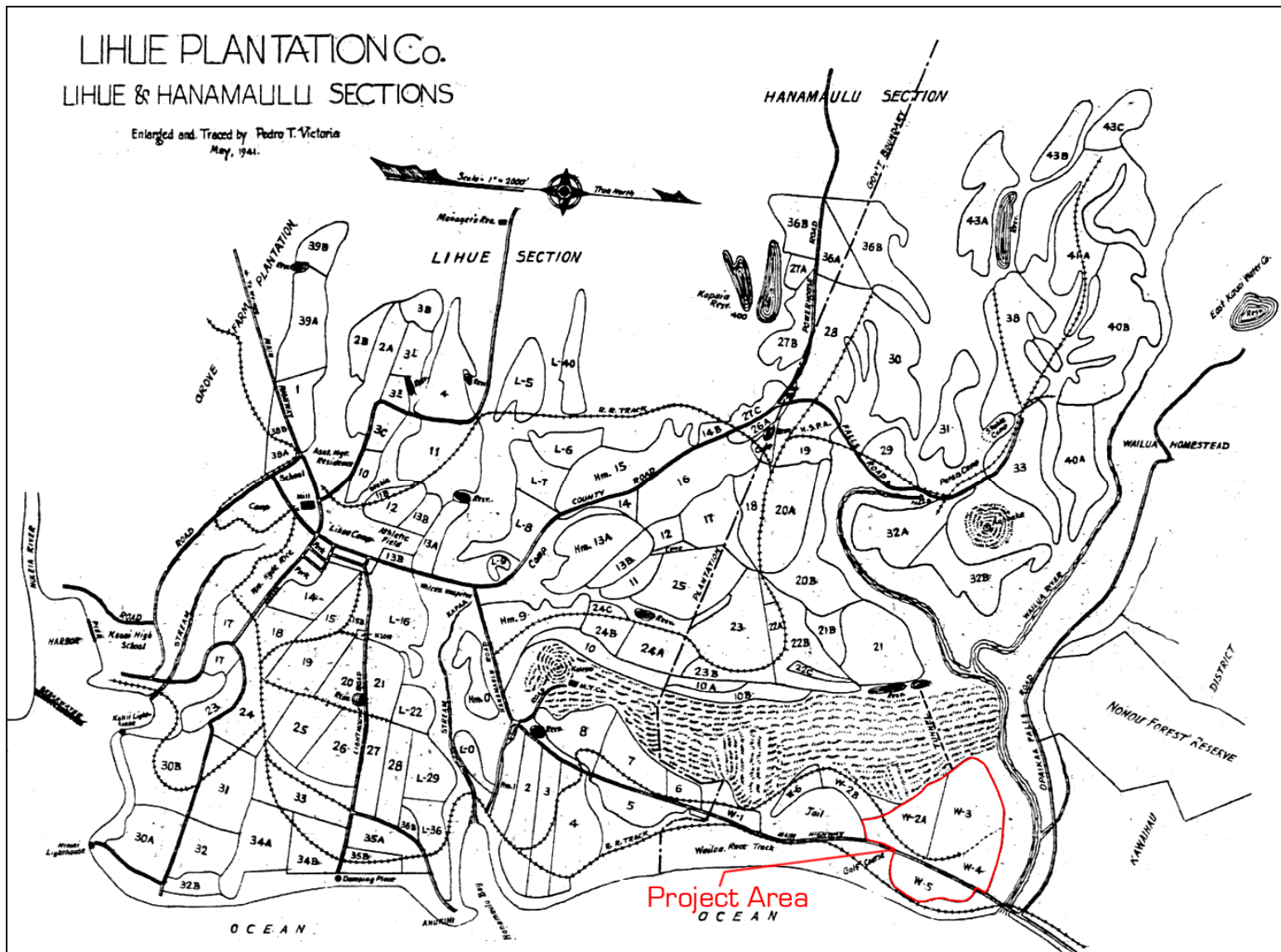


Figure 8: Ca. 1941 Lihue Sugar Plantation Field Map.



Cultural Surveys Hawai'i, Inc. (CSH) conducted an Archaeological Inventory Survey for a proposed bikeway within the Wailuā River State Park. Fieldwork was undertaken in September 2000 and involved the coastal boundary the length of the current DHHL project (*makai*). While the survey's findings were negative for new archaeological sites, the study synthesized previous archaeological work for the immediate project area and vicinity providing a traditional Hawaiian and historic land-use settlement model (Creed, Shideler, and Hammett 2001).

Dega (2001) encountered negative results in a study of bridge footings at the Kamalani Kai Community Built Bridge. During trenching activities, Dega and Powell (2003) identified intact sand layers along Kuhio Highway. These sand layers, excavated to more than 1.60 meters below the graded surface, were sterile.

Several important sites are located on the south bank of the mouth of the Wailuā River, in the coastal portion of the Wailuā River State Park, directly east of the project area. Thrum (1907) recorded Hikinaakala Heiau in his statewide inventory of *heiau*. This *heiau* is now considered to be part of the Wailuā Heiau Complex (SIHP No. 50-30-08-502), which also includes Malae (bordering the immediate project area) and Kalaeokamanu Heiau, and an unnamed *heiau* in the area of Kālepa and Nounou Ridges, and another unnamed shrine at the confluence of the North and South Forks of the river. This site complex is listed on the National Register of Historic Places (see Table 2). In addition to the various *heiau*, Site 502 includes a *pu`uhonua* named Hauola, and petroglyphs named Ka pae ki`i mähū o Wailuā, or Paemahuo Wailuā, located on the boulder-strewn beach adjacent to Hikinaakala Heiau (Kikuchi 1973). The origins of this petroglyph site, which incorporate legendary figures into the landscape of coastal Wailuā, are referenced in many epic Hawaiian legends.

An Archaeological Survey of the north fork of the Wailuā River was conducted by the State Parks in 1997. Carpenter and Yent (1997) recorded 15 sites previously identified by Soehren (1967) and Ching (1968); several sites could not be relocated. A variety of features consistent with permanent habitation was re-identified during the 1997 work. Other archaeological sites documented during the 1997 survey include: multiple *auwai* of varying sizes; extensive agricultural terrace complexes (one with 100 discrete components); sunken or depressed pond fields; several stone platforms interpreted by Ching as house platforms or shrines (a few have upright stones within the construction); irrigated and non-irrigated terraces; and, several enclosures. Pilgrimages to Mount Wai`ale`ale by *ali`i* originated in Wailuā on the trail known as Kaluawehe, often referred to as the King's Highway. This trail starts at the mouth of

the Wailuā River, and goes up the ridge between the North Fork and `Ōpaeka`a Steams to an area named Ka`awakō, where a small shrine (SIHP No. 50-30-08-216) is located. Historic sites include a *poi* mill that was in operation until 1930, and the remains of a wooden flume used to transport water across the river (Carpenter and Yent 1997).

Rechtman and Clark (2001) conducted an Archaeological Inventory Survey of a parcel located just west of the confluence of Opaeka`a Stream and the Wailuā River [TMK: (4) 4-2-003: 002, LCA 3551:2]. No archaeological sites were recorded during this survey. Surface topography and two backhoe trenches indicated extensive disturbance from previous construction in the modern era.

Various restoration work and vegetation removal have been completed for Hikinaakalā Heiau (Yent 1997a; Yent 2000) and Malae Heiau (Yent 1997b), as well as Kalaeokamanu Heiau and Pōhaku Ho`ohānau (Birthstones) at Holoholokū (Yent 2000; Yent 2001).

Kikuchi (1973) recorded SIHP No. 50-30-07-4000, an adze workshop located at the site of the Keahua Arboretum, in Kauakahi. Site 4000 is one of only three known adze workshops in Kaua`i. The site consists of a lithic scatter on a level terrace area, located on the northeast side of Uhau `Iole Stream (Yent 1988). Kikuchi recorded basalt flakes and debitage, worked flakes and cobbles, cores, hammerstones, and adze blanks and performs. The absence of finished adzes at the site suggests that finishing occurred elsewhere. The source of the basalt at Site 4000 has yet to be identified. Likely source areas, including *mauka* sections of Wailuā, have not yet been systematically surveyed.

## **MALAE HEIAU**

Malae, an abbreviated version of the name Malaeha`akoa, is adjacent to the current project area (northeast corner), which covers an area consisting of approximately 9.5 acres. On February 1994 (Exec. Order No. 3608), Malae became the fourth *heiau* included in the Wailuā River State Park system. It is hypothesized that Malae Heiau has functioned in various capacities from pre-Contact to the Historic Period. Tradition says, Malae Heiau was built by the Menehune and initially may have functioned as a *luakini* (temple, shrine, place of sacrifice) (Thrum 1917; Bennett 1931). Historical records indicate that Malae no longer functioned as a *heiau* and was utilized for animal husbandry (Bennett 1931:125; Dickey 1917: 25-26; Stauffer 1993: 86).

Following the earliest surveys and reports on Malae Heiau conducted by Thrum (1907), Dickey (1917) and Bennett (1931), Francis Ching, Jr. completed an Archaeological Survey in 1968 for State Parks. A compendium of these sources and other historical references to the Heiau may be found in Flores (1995).

Kikuchi surveyed the Malae Heiau area after a 1973 sugarcane harvest and located an adze scatter (Kikuchi 1973). Of notable interest were the findings from the surface survey conducted as part of the Environmental Assessment by State Parks to include Malae Heiau into the Wailuā River State Park system. The survey located lithic scatter that included stone tools, primarily adze performs and worked flakes that were found on the exterior of the *heiau* near the northeast corner of the walled enclosure; the site was designated Site -104A (State Parks 1991).

Flores (1999: III-4) noted that very few reports and surveys exist which detail the design and construction of Malae. In an effort to seek assistance regarding preservation, stabilization and interpretation matters concerning Malae Heiau, the Division of State Parks (DLNR) formed the Malae Heiau Advisory Committee in 1994. The Committee noted the Heiau has functioned in various capacities over time and space (2000: 4); and suggested that its large size and strategic location within Wailuā offered a certain vantage point from which to conduct governance activities.

State Parks (1991) conducted archaeological investigations which compared the existing heiau structure to what was recorded previously by Thrum, ca 1906 and Bennett ca. 1931; reported findings revealed a number of structural changes (Yent 2005: 29, Table 3).

Between August 1996 and February 1997, the State Parks conducted archaeological test excavations. Seven test units were excavated throughout the *heiau* interior in order to address research questions concerning age, function and construction sequence (Yent 2005: 43–44, Fig. 12, Table 5).

Three samples of concentrated charcoal deposits taken from test units TP2 and TP7 were radiocarbon dated (*ibid*: 70, Table 20); three distinct cultural deposits and periods of construction and site usage were revealed. The upper deposit was associated with the *`ili`ili* (pebble, small stone) paving evident at the ground surface of the wall architecture throughout the *heiau* interior and corresponds with a late pre-Contact to early historic date A.D. 1720 to 1840 (*ibid*). The middle cultural deposit corresponded to the foundation of the *heiau* enclosure walls which pre-date the construction of the interior walls and *`ili`ili* paving; the radiocarbon date closely

associated with this deposit indicated a late pre-Contact age of A.D. 1700 to 1800 (*ibid*). The lower cultural deposit was obtained from a charcoal lens and postholes 30 cm below the base of the *heiau* enclosure wall. The radiocarbon date obtained from this deposit suggested that the *heiau*'s construction date postdated A.D. 1500. Further testing was recommended to procure additional radiocarbon dates, which would clarify the discrepancies between the cultural history associated construction dates of Malae Heiau<sup>1</sup>.

Midden analysis revealed that lithics were the predominate type of artifact; a limited amount of faunal material (dog and pig teeth and mammalian bone fragments) and small quantities of shell were found. The general lack of midden suggested the *heiau* function was not related to habitation.

Basalt artifacts were found throughout the interior of the *heiau* and at the northeast corner enclosure exterior, which was suggestive of basalt tool manufacture. Testing revealed human remains in the southeastern interior corner of Male Heiau (TP-5), which appeared to pre-date the construction of the interior features of the *heiau*. (*ibid*: 72). Radiocarbon dates obtained from lower cultural deposits were obtained from fire pits (TP2 and TP7), as well as from postholes or small pit features (TP4 and TP7). The stratigraphic location of these features was suggested to predate the *heiau* wall.

Various impacts were affected due to sugarcane production (early 1900s to 1991), as well as disturbances by vegetation overgrowth on the interior and exterior walls of the *heiau*. Vegetation clearing projects were undertaken in Years 1997 and 2000 to prevent further damage to walls of the *heiau* (Yent 1997; Na Kahu Hikinaakalā).

An Archaeological Inventory Survey conducted at Malae Heiau has established its significance in close alignment with the Wailuā Complex of Heiau; Malae Heiau is deemed significant under Criterion B through E. Further data recovery has been recommended by State Parks in order to supplement research concerning site function, age, construction sequence, role of adze manufacture and future land use impacts (*ibid*).

#### **DOCUMENTATION OF BURIALS NEAR THE PROJECT AREA**

Ongoing studies conducted south of the Wailuā River, in and around the Wailuā Golf Course, have documented many pre- and post-Contact burials. Bennett (1931:125), for example, recorded Site 103, about which he stated: “In the sand dunes that run along the shore half way

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<sup>1</sup> Mo`ikeha suggested Male Heiau was initially constructed around A.D. 1300–1350.

between Hanama`ulu and Wailuā River are many burials.” Cox (1977) documented 13 burials and scattered human remains at the Wailuā Golf Course. Erkelens and Welch (1993) conducted interviews and documented historical knowledge from long-time local residents of the Wailuā area who stated that “hundreds” of *iwi* (bones) were uncovered when the central driving range was constructed in the mid-1960s. Studies conducted by Folk *et al.* (1991), Folk and Hammett (1991, 1995), and Beardsley (1994) led to the identification of nine more burials within and near the Wailuā Golf Course. Fager and Spear (2000) documented 44 burials and 42 isolated finds of human remains during renovation of the golf course irrigation system. They also documented a subsurface cultural layer (with traditional artifacts) and three fire pit features. Charcoal from one of the fire pit features yielded a calibrated date range (2 Sigma) of A.D. 1440 to 1670, firmly within pre-Contact times.

Ida and Hammatt (1998) documented SIHP No. 50-30-08-761, a burial site located in an easement between Wailuā River and a fence line [TMK: (4) 4-1-004: 019]. This fence line creates an easement providing access to residential properties fronting the river. The burial was discovered (i.e., disturbed) during the removal of a coconut palm tree during clearing and brush-removal operations within the easement. The burial site was eventually assessed as having been previously disturbed. Two LCAs (3557 and 3405) awarded on the property indicate that the area was being used for habitation and for *kalo* cultivation; fourteen *lo`i* were awarded to Kaniwi (Kaniui) at this location.

Morawski and Dega (2004) recorded several, previously disturbed burials in addition to a subsurface cultural layer. The cultural layer, designated SIHP No. 50-30-08-356, demonstrates a lengthy occupation of the area now known as Lydgate Park. The radiocarbon sample submitted from excavations conducted at Site 356 yielded a calibrated date range (2 Sigma) of A.D. 1440 to 1660, firmly within pre-Contact times.

An Archaeological Inventory Survey was conducted at the Old Smith’s Landing and Kaumuali`i for the new Comfort Stations for Wailuā River State Park by SCS, Inc. (Morawski and Monahan 2007, *in preparation*). The APE was located south of the existing comfort station building, and north and east of the paved entry road and parking area. To the west of the APE is a low rock wall bordering residential areas on the west side of Kuamoo Road from the parks parking and comfort station facilities. Surface topography and natural stratigraphy within this area were likely disturbed during the construction of the existing building and grading for the parking lot. Soils in this area consisted of surface layers of claylike fill soils overlying disturbed river sands and alluvial soils.

Subsurface testing by SCS amounted to nine shovel probes excavated at two locations in the project area. One incomplete burial along with several subsurface pit features and several artifacts were recorded at Smiths Landing and several lithic artifacts were recorded within excavations at Kaumuali'i Park. The incomplete burial was temporarily preserved in place and is awaiting final determination for preservation or data recovery burial treatment.

### **EXPECTED FINDINGS**

Given all available oral, historical and archaeological evidence regarding Wailuā Ahupua`a, and the project area in particular, there was a relatively high probability of encountering subsurface cultural deposits around Malae Heiau, along the confluence of the Wailuā River, and on the lower slopes of Kālepa Ridge (southwestern boundary). In addition, there was also high expectation of encountering traditional Hawaiian burials along the eastern boundary of the project area directly adjacent to the Wailuā Golf Course. With regard to the majority of the project area that was once cultivated in sugar, it was expected that historic artifacts and archaeological features relating to agriculture dating from the Sugar Plantation period to Historic times would be found.

### **METHODOLOGY**

The work described in this Inventory Survey consisted of archival research, fieldwork, and laboratory analysis. Specifics on all of these research activities are described in detail below.

#### **GPS/SITE POSITIONING FIELD SURVEY METHODS AND POSTPROCESSING**

The archaeological field survey was primarily accomplished utilizing a Trimble Pathfinder Pro-XR Global Positioning System (GPS) Rover Unit apparatus. The GPS equipment was configured to operate in the Carrier Mode, with minimum threshold settings of four satellite vehicles connected/operating, 6.0 PDOP. The NAD 83 system was used to provide coordinate datum control. The appropriate GPS base station data was later obtained during post-processing of the field data at the SCS office in Honolulu, in order to accomplish the differential correction of our GPS and site position field data files.

Archaeological sites were flagged and recorded; drawings, maps and photographs were produced. As part of the site recordation process, a GPS reading was taken and logged. With regard to the recordation of TS-2, four main locations (Loci) were established. GPS position

numbers were given for each find spot (N=78). Up to three artifacts were counted for each given find spot located within 1.0 m<sup>2</sup>. The GPS position number, the site and feature designations, and other pertinent data were entered into the GPS data log/field data file, while each GPS reading was being recorded. All GPS coordinates were manually entered onto the site survey field recording form as well. When conducting the trench excavations, one GPS reading was taken located at the north or the west end of the trench. Once the fieldwork and testing were finished, the digital GPS field data files were delivered to the SCS, Inc. Honolulu office.

The specific purpose of this GPS/site survey fieldwork was to register at least one accurate GPS position reading for each newly recorded site, or multiple readings in the case of find spots for lithics, or linear features such as historic roads, railroad paths, and ditches, and to plot the acquired information onto a USGS topographic map. The archaeological field survey and GPS recording efforts were not carried out during the wettest part of the year; therefore 100 percent of the recorded site locations were recorded utilizing GPS. A certain degree of vegetation clearing and trimming was performed to photograph and record Site TS-3's features, as well as to facilitate the GPS reception. The locations of specific topographic features or landmarks (e.g., distinctive trees, rock outcrops, or vegetation types) were also useful when referenced in the individual site descriptions.

Field GPS data was electronically downloaded from the Trimble Recon data logger for post-processing at the SCS Archaeology GIS lab. In GPS Pathfinder Office 3.0 computer program, the data was differentially corrected using CORS, Honolulu Tide Gauge HI as the base data provider, and then exported into Arc View 8.0 with the coordinate system set to UTM, Zone 4 North, NAD 1983 (Hawaii) Mean Sea Level. A GIS layered map was produced with the GPS data layered onto a MrSid Raster Dataset Map of Kaua'i's East side together with Kaua'i County's TMK parcels. GPS site positions were later added to a software-mapping program TOPO, version 3.2.0, which was helpful in delineating survey boundaries, elevations, and distances between sites and trench excavations.

## **CONSULTATION**

SCS consulted with archaeologists from State Parks (Yent; McEldowney), who provided updated research conducted by Parks relative to the project area and Malae Heiau. After the completion of fieldwork, Project Director Jim Powell (SCS) conducted a field inspection with Randy Wickman of the Kaua'i Historical Society, who provided SCS with Kaua'i Historical Society historic maps of the project area (see Figures 4 and 5).

State Parks (Yent) concurred with a recommendation for Data Recovery utilizing GIS. As of yet, no GIS have been performed in order to study the relationship between the *heiau* and Mauna Kapu and *kapu* lands.

### **ARCHIVAL RESEARCH**

Background research was conducted by Trisha Drennan, primarily using previous research authored by Chris Monahan and Lauren Morawski (2007) in their work with Wailuā River State Parks, but also using resources available through Randy Wickman of the Kauaʻi Historical Society, Yent and McEldowney (State Parks), State Parks Library, the SHPD library in Kapolei, and the SCS database

Fieldwork consisted of a systematic field inspection and mechanical excavation in two locations of the project area (see Figure 6). The test units were excavated in areas most likely to present cultural remains related to either prehistoric Hawaiian cultural remains (Test Area 2), and to determine the presence of a beach dune sand matrix in which traditional Hawaiian burials might be found (Test Area 1). The primary objective of the subsurface testing was to target areas of proposed excavation, based on construction plans provided to SCS by Environet, Inc. Test units were excavated mechanically by backhoe, and selected soils were screened with standard, ¼-inch metal mesh. All subsurface features and soil anomalies were recorded on standard plan view maps and stratigraphic profiles. Each test unit was photographed and described in standard sedimentological terms (*e.g.*, sediment size, consistency, color, and inclusions) using Munsell *Soil Color Charts*.

Subsurface testing occurred at the Project in two general locations (Test Area 1 [TA-1]; Test Area 2 [TA-2]) (see Figure 6). Twenty-eight Stratigraphic Trench Units (ST-1 through ST-28) were excavated at these two locations (TA-1: ST-1 through ST-23; TA-2: ST-24 through ST-28). Stratigraphic trenches varied in size (area) up to 18.5 m long by 0.80 m wide to 1.36 m deep.

### **LABORATORY ANALYSIS**

All significant finds (*i.e.*, portable artifacts over 50 years in age) were transported to the SCS laboratory in Honolulu. These artifacts and other materials (*e.g.*, midden) were catalogued, analyzed, and interpreted in the SCS laboratory. Laboratory work also consisted of digital drafting of stratigraphic profiles, maps and feature drawings. The traditional artifacts were analyzed by SCS Archaeology lab personnel. All field notes, maps, photographs, and artifacts pertaining to this project are being curated at the SCS laboratory in Honolulu until further notice. No charcoal samples were submitted for radiocarbon dating.



## **RESULTS**

### **OVERVIEW**

Three significant sites were identified during the Inventory Survey at Wailuā-DHHL (see Table 1) (Figure 9). Site TS-1 is an historic site (agricultural water diversion and irrigation features) associated with the Plantation Era on Kauaʻi. Site TS-2 consists of a prehistoric surface lithic (stone tool) scatter. TS-3 is composed of two rock terrace remnants (TS-3, Features 2 and 3), one rock wall (TS-3, Feature 1), with traditional construction, and one multi-tiered enclosure (Feature 4). An historic map (ca. 1933) provided by Randy Wickman of the Kauaʻi Historical Society, revealed an historic rock wall existed along the eastern border of the project area (see Figure 4). Following the field portion of the inventory survey, a SCS archaeologist revisited the location as exemplified by the historic map and located an earthen berm extensively covered with vegetation. Further investigation and testing will be required to ascertain the berm's form, function and temporal association.



**Figure 9: TS-1, Overview of DHHL Lands. View to West.**

## SITE DESCRIPTIONS

### SCS SITE TS-1

TS-1 was an historic agricultural water transportation system that consisted of five features and three subfeatures. One GPS coordinate was recorded (datum) located at the southwest corner of Feature 1A (Reservoir). Site TS-1 was assessed as having over one hundred features throughout the project area that was constructed as part of the water transportation system (Figure 10). Due to time constraints, a representative sample of these features was recorded. An historic map provided by Randy Wickman of the Kaua`i Historical Society, shows the layout of the water transportation system, which includes the reservoir, a tunnel, and many pipe features (see Figure 10).

The water transportation features recorded during the present survey appeared in fair condition, but alteration was noted from weathering and the recent fire. Since Site TS-1 contained historic construction typifying water transportation features, no test units were placed at this site.

Feature 1 was located along the upper northwest boundary of DHHL property and consisted of a reservoir complex (Figure 11). The topography consisted of flat to rolling cane fields; the vegetation has been cleared by the recent burn. Features 1A and 1B were two discrete features consisting of earthen reservoirs.

Feature 1A was a cane field earthen reservoir with concrete watergate (Feature 1C) (see Figure 11). A dozer push pile created a small basin to hold the irrigation water; the feature was contained by an earthen berm. Two pipes enter the reservoir from the eastern (*mauka*) side. No outlet was observed. The interior dimensions of the feature were 24.0 m long by 16.5 m wide and 3.0 m high. The wall thickness of the earthen berm measured from 4.0 to 6.0 m in width. The long axis of the feature is oriented northwest-southeast (360°/20° TN). Small amounts of coral were noted on the features surface. The feature's function was for water storage.

Feature 1B was a second earthen reservoir located 6.0 m east of Feature 1A (see Figure 11). The terrain contained small trees and grass. The reservoir was an irregular bean shape, which was contained by an earthen berm. No outlet exists for this feature. The interior dimensions of the feature were 18.0 m long by 8.0 m wide; the feature's exterior height was from 3.0 m to 0.9 m high with an interior height from 0.8 to 1.5 m high. The wall thickness of the earthen berm measured 4.0 m wide. The long axis of the feature was oriented northwest-

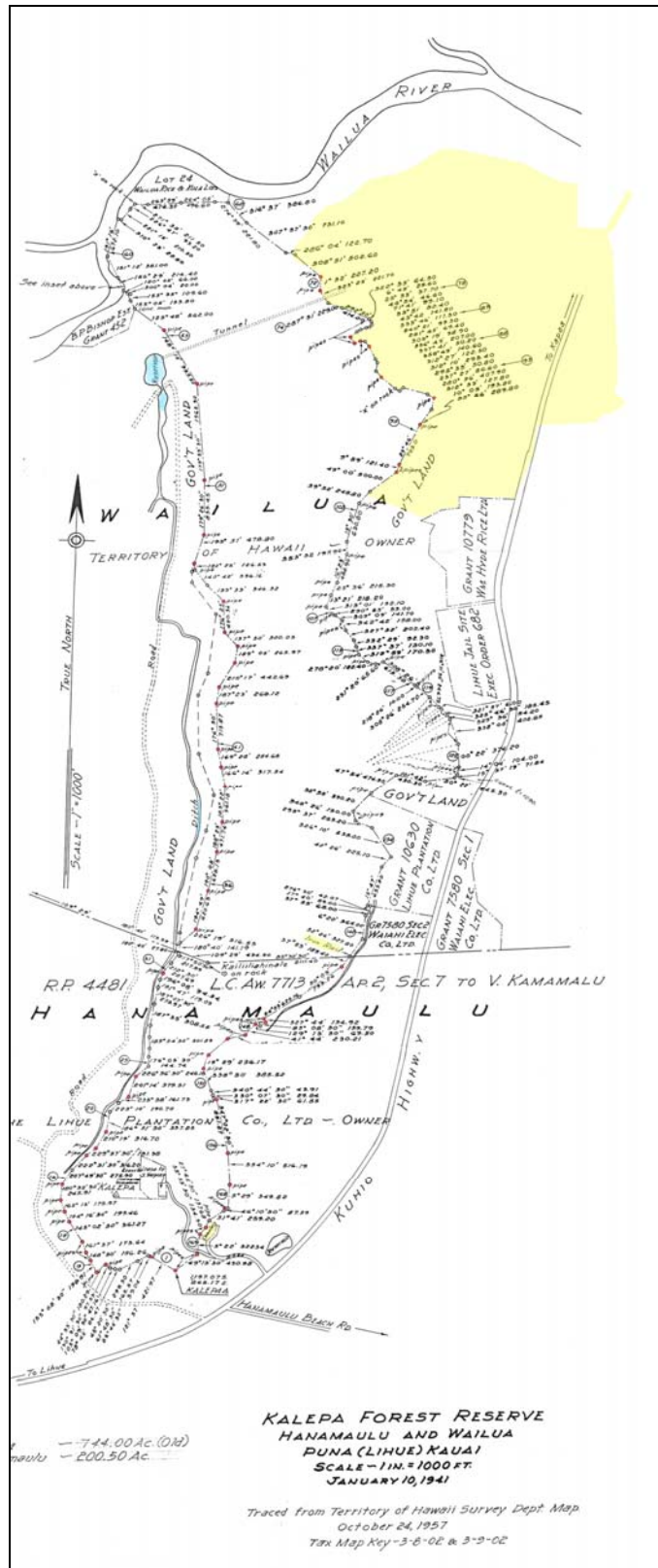


Figure 10: Territory of Hawaii Survey Map, January 10, 1941, Kalepa Forest Reserve (TMK: 3-8-02 & 3-3-02).

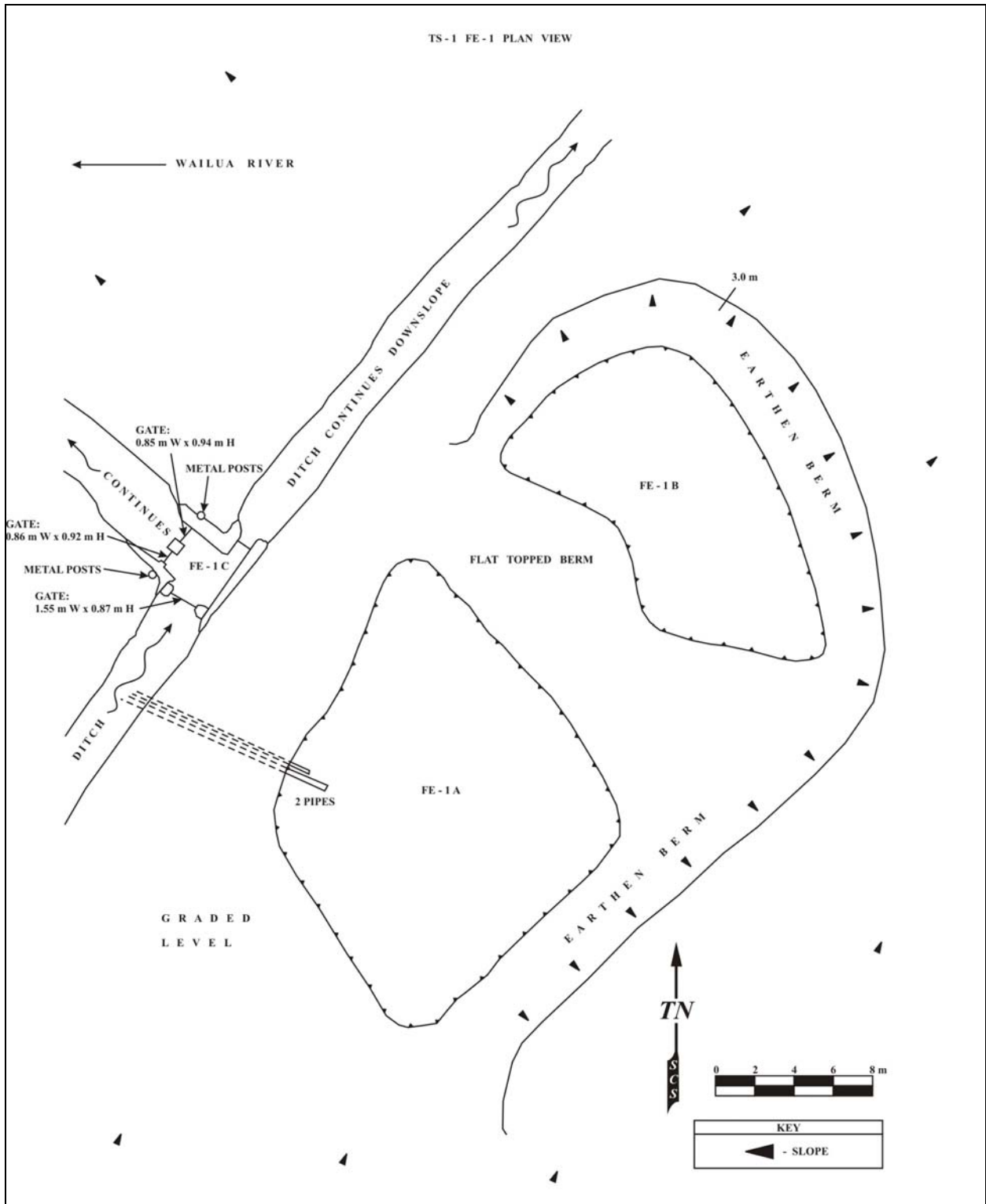


Figure 11: Site TS-1, Feature 1. Plan View.

southeast (20°/360° TN). Feature 1B functioned for water storage; however, no connecting water pipes to the ditch feature were observed as with Feature 1A.

Feature 1C is a three-way watergate, which possibly functioned for water diversion located approximately 7.0 m northeast of FE-1A (reservoir). Three subfeatures composed the concrete structure: one inlet (FE-1C-1), two gate outlets to Wailuā River (FE-1C-2), and one outlet to irrigation ditch (FE-1C-3). Java plum (*Eugenia jambolana* Lam.), grasses and shrubs were observed around the features. Feature 1C-2 directed water down the slope to the Wailuā River; each contained a cylindrical metal lock box, which functioned to regulate the flow of water to the river. The exterior dimensions of the feature were 5.6 m long by 5.6 m wide; the interior dimensions of the feature were 2.6 m long by 2.8 m wide. The feature's interior height was from 0.87 to 0.94 m high. The wall thickness measured 4.0 to 0.6 m wide. The long axis of the feature was oriented southwest-northeast (40°/220° TN).

Feature 2 was a watergate that was burned in the recent fire; it was in poor condition as the wooden components to the feature have burned (Figure 12). The feature was located on the western side of a cane field approximately 100 m above Feature 1A & B (Reservoirs) situated on a small bluff on the south side of the Wailuā River tree line. The feature was constructed of cement, metal wood and basalt; wood and metal forms were filled with earth to make a dam. The slots on the gate are of wood, and the wood posts are enclosed by metal. There is a date in concrete of "7/6/61"; however the feature construction appears to have been exclusive of concrete, but added later for reinforcement.

The exterior dimensions of the feature were 2.4 m long by 4.1 m wide; its height was 0.96 m. The gate portion measured 0.96 m high by 0.71 m wide. The dam's thickness was 0.90 m; the interior dimensions of the feature were 2.6 m long by 2.8 m wide. The feature's interior height ranged from 0.87 to 0.94 m high. The wall thickness measured 4.0 to 0.6 m wide. The long axis of the feature was oriented west-east (84°/204° TN).

Feature 3 was a watergate and culvert situated on a gentle east-facing slope in a cane field. The field was vegetated with *koa haole* (*Leucaena glauca*), grasses and small trees (Figure 13). The feature was constructed of mostly small boulders (20–30 cm diameter), with cement, mortar and stone, supplemented by cinder blocks and metal frame for the wood gate. The boulders were stacked five to seven courses high. The feature contained stacking first, with cinder blocks two to three courses, then with two to four courses of small boulders.

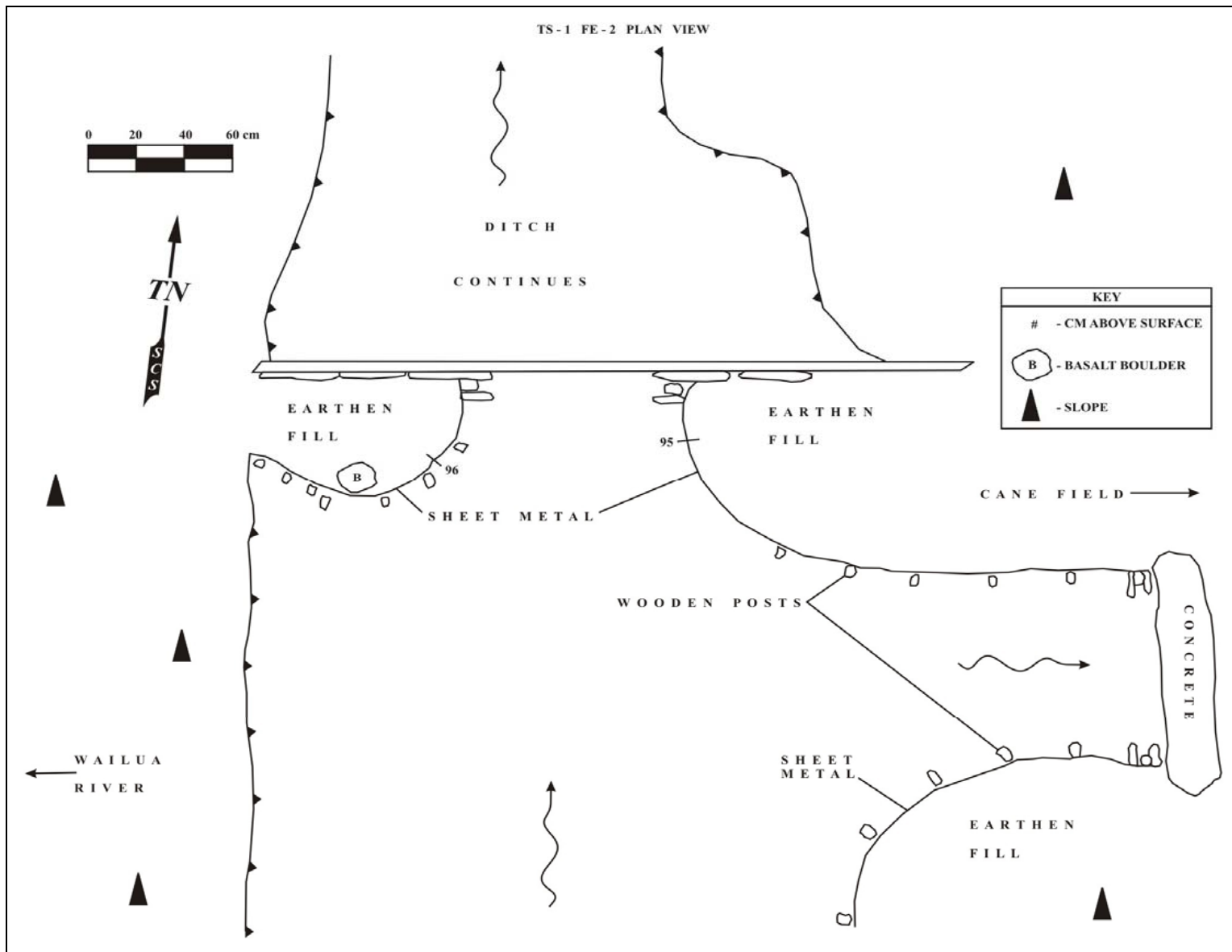


Figure 12: Site TS-1, Feature 2. Plan View.

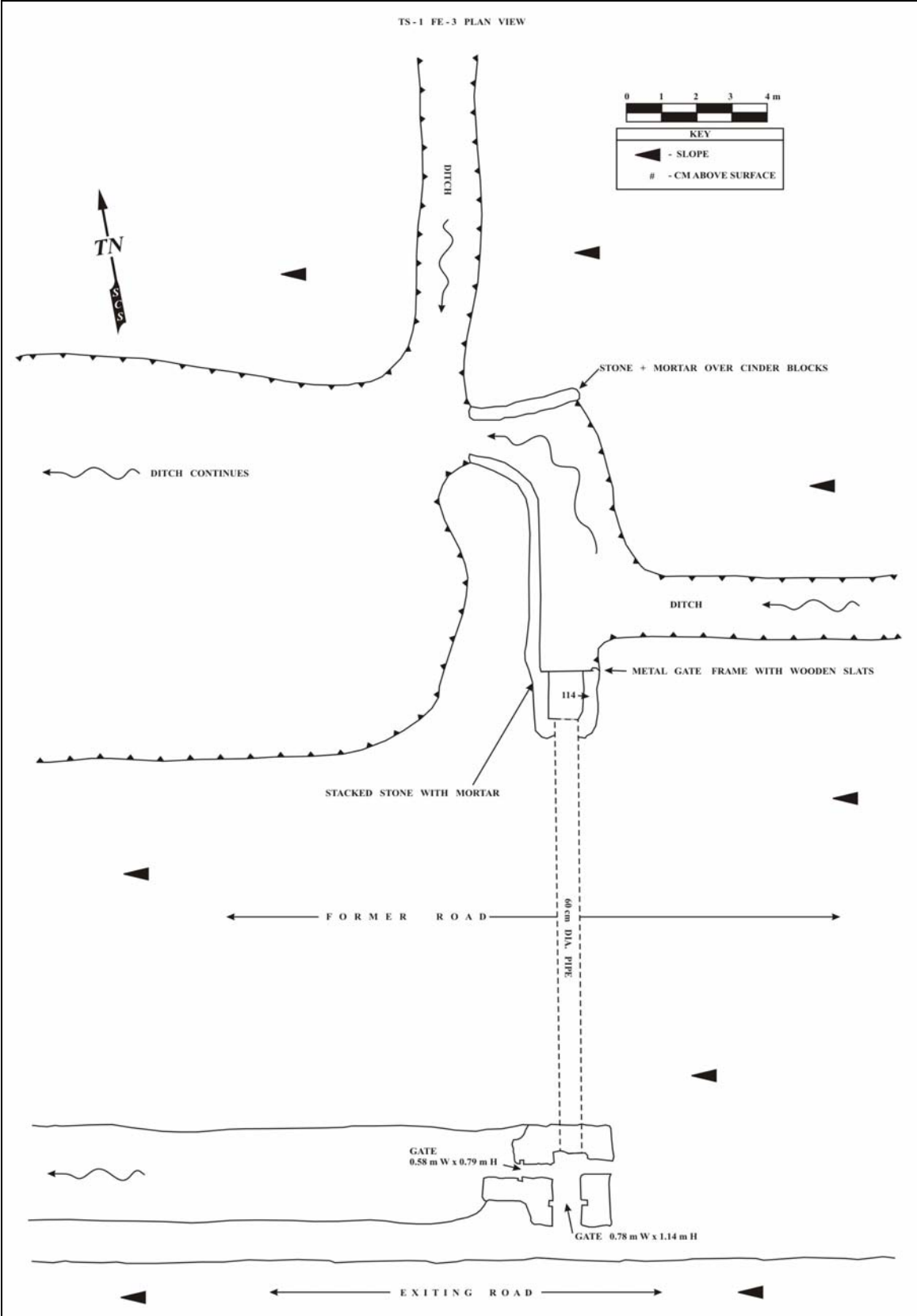


Figure 13: Site TS-1, Feature 3. Plan View.

The exterior dimensions of the feature were 25.0 m long by 3.0 m wide; its height was from 0.79 to 1.14 m. The wall thickness measured 0.4 to 0.5 m wide. The long axis of the feature was oriented north-south (10°/190° TN). The integrity of Feature 3 is poor since it has been damaged by the fire.

Feature 4 contained a bridge with irrigation diversion ditch located mid-slope above a cane field. It was composed of a metal culvert constructed of basalt cobbles (20 cm dia.) which were set in concrete (see Figure 6). A date of “1961” was inscribed in cement on the north side of the bridge. The bridge functioned as transportation corridor for cane haul trucks and plantation equipment since it is situated between cane fields. The feature was in poor condition, its integrity having been affected by erosion and gravity.

Feature 5 was a ditch that descends in elevation from 226 to 81 ft. amsl and is 1280 m in length; it is 3.0 m wide (see Figure 6). The ditch was curvilinear and was oriented northwest-southeast (136°/316°). The feature was U-shaped and was excavated along the base contour of the northeast side of Kālepa Ridge.

Site TS-1 was an historic site associated with the Plantation Era in Kauaʻi, which functioned to supply water to cane fields (numbered W-3, W-4, W-5, and W-2A) (see Figure 8).

#### **SCS SITE TS-2**

Site TS-2 consisted of a pre-Contact surface lithic (stone tool) scatter (Figure 14). The artifacts occurred within four main locations and one outlier (see Figure 6). Locus A contained the highest concentration of lithics (N=111); the remaining loci consisted of a total 25 artifacts (Appendix A). Locus A was located on level terrain; the closest observable artifact was noted 48.0 m west of Malae Heiau (Site 104); this places the eastern edge of the Locus within the 100-foot buffer zone of the site’s western boundary (see Figure 3). Locus A measured 313.0 m long by 242.0 m wide; its longitudinal axis was oriented northwest-southeast. Locus B was situated 249.0 m south of Malae Heiau. The artifact spread was oriented in an east-west direction and measured approximately 200.0 m in length. Loci C and D were situated along the southern banks of Wailuā River. Locus C was located 658.0 m northwest of the Heiau; its artifact spread measured approximately 200.0 m in length. Locus D was situated between Malae Heiau (1.02 km west) and Poliʻahu Heiau (528 m southeast) on the southern banks of Wailuā River; the artifact spread measured 44.0 m in length. The artifacts were associated with pre-Contact times. Five backhoe trenches were placed in Locus A (Test Area 2 [TA-2]), which produced negative results for cultural material (Figure 15) (see STRATIGRAPHIC TEST EXCAVATION).





Figure 14: TS-2, Overview. View to West.

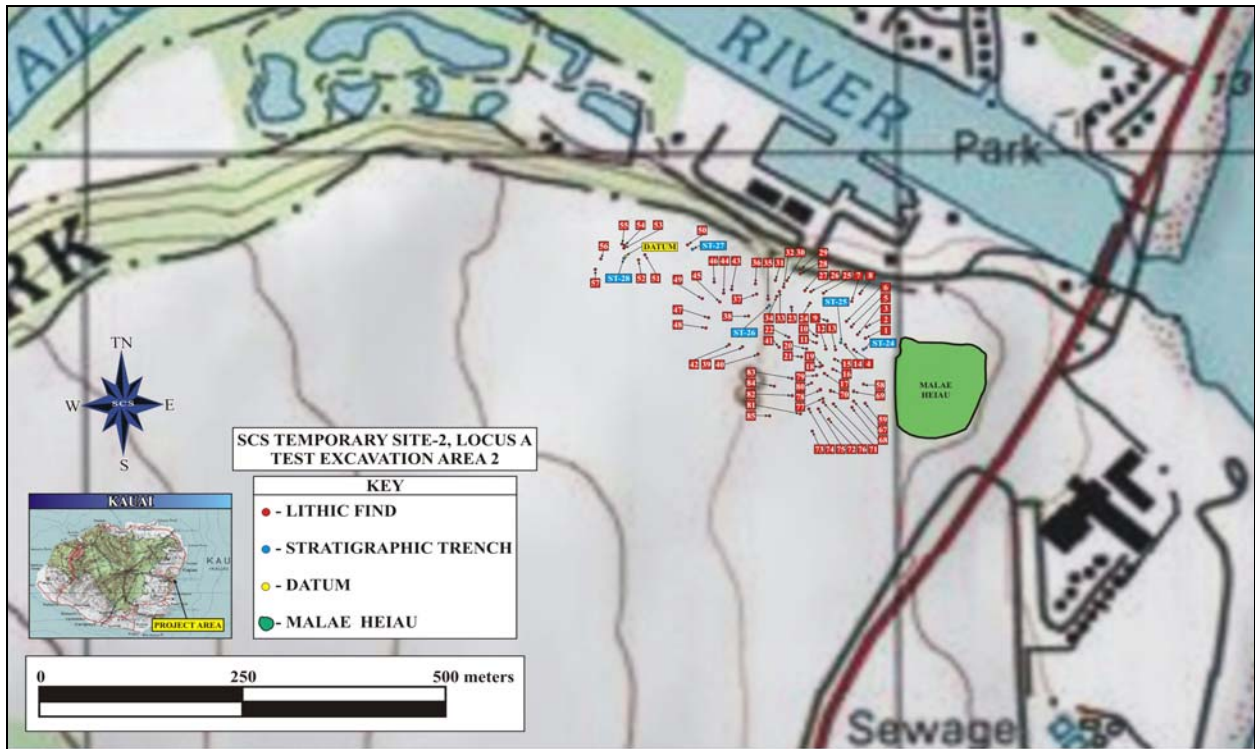


Figure 15: USGS Stratigraphic Trench Locations (TA-2), Site TS-2, Locus A, Plan View Utilizing GPS Points.

### SCS SITE TS-3

Site TS-3 contains four features situated along a narrow contour line of a moderately steep northeastern-facing slope of Nailiakauea Ridge between the mountain and the lower plain (Figure 16). Site TS-3, Feature 4 was located just outside the project boundary, but was also recorded due to its significance and possible relation to the other three features. Features 2 and 3 were composed of two rock terrace remnants and one rock wall (TS-3, Feature 1). The site vegetation consisted of umbrella tree (*Brassaia actinophylla*), Christmas berry (*schinus terebinthifolius*), common guava (*Psidium guajava L.*), Java plum (*Eugenia jambolana Lam.*), and *lantana* (*Lantana camara*). No archaeological test units were placed in Site TS-3.



**Figure 16: DHHL Lands. View to West Overlooking TS-3.**

Feature 1 was a linear rock wall located at the base of Nailiakauea Ridge, along the southwestern boundary of the project area (Figure 17). The length of the wall (Feature 1) stretched 119.0 m in length, which suggested an historic temporal affiliation; however, the feature was traditionally constructed. The feature was constructed of piled sub-rounded basalt boulders, with intermittently placed cobbles and pebbles. There was some evidence of facing where the boulders were piled two to three courses high (Figure 18). Some large boulders were used in wall segments. The wall measured 119.0 m long and 2.0 to 6.0 m wide with wall



Figure 17: Site TS-3, Feature 1. View to Southwest.

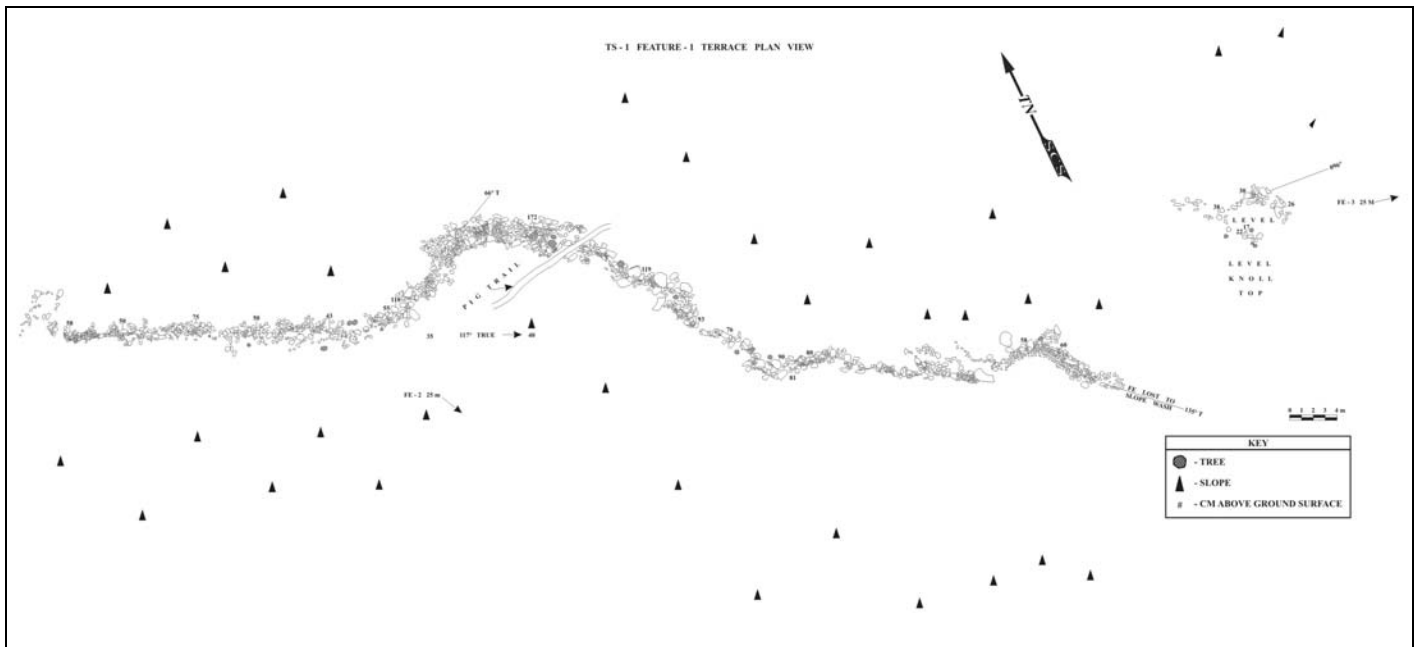


Figure 18: Site TS-3, Feature 1. Plan View.

thickness on average 1.0 m wide, the wall height was from 0.30 m to 1.72 m high. The feature was curvilinear and was oriented northwest-southeast (125°/305° TN). Stacking was still evident along portions of the wall, and its southeastern terminus was suggestive of possible habitation. The feature was in fair condition as it has suffered alteration from erosion, gravity and animal disturbances.

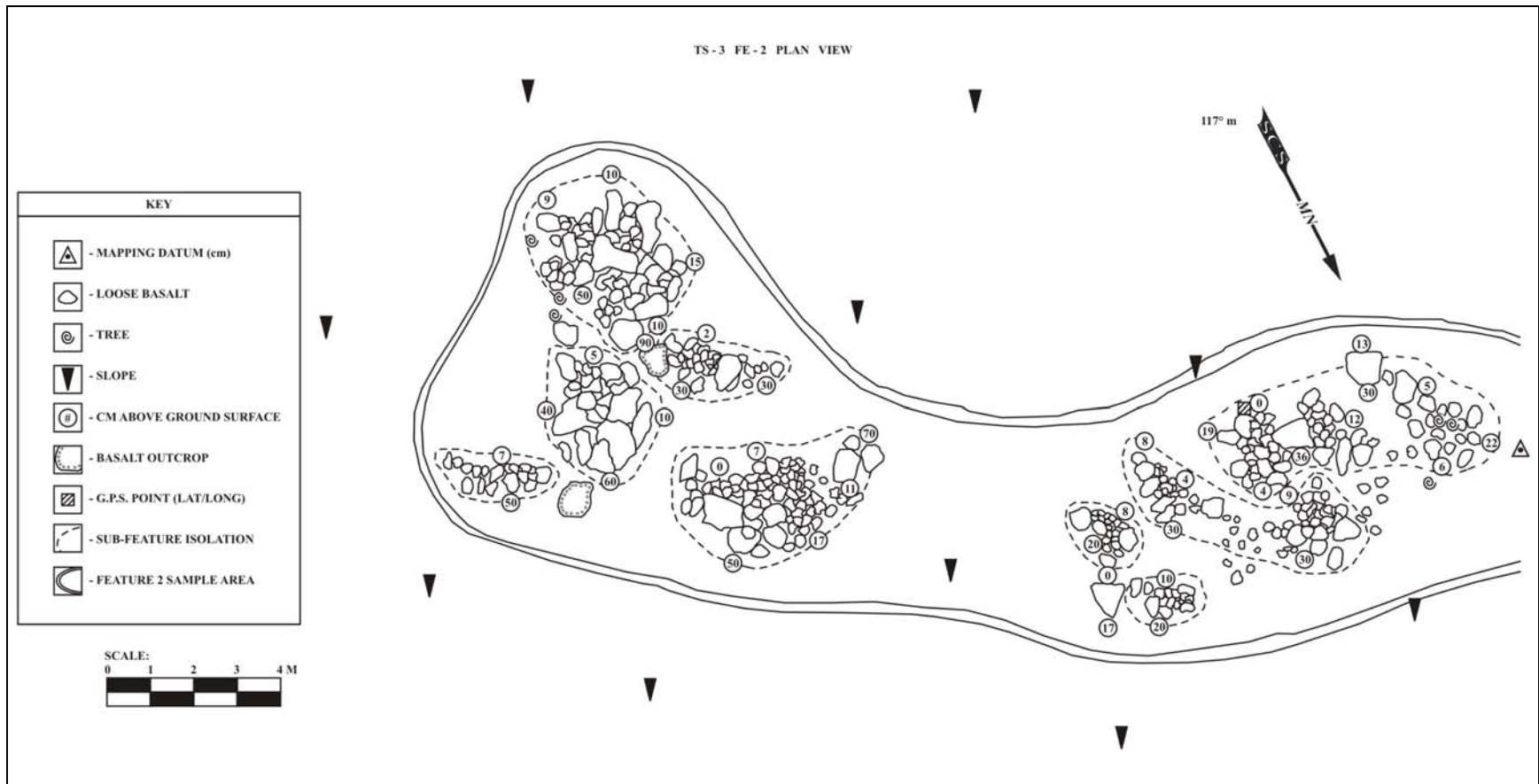
Feature 2 was located 40.0 m upslope from the Feature 1 (rock wall) on a moderate to very steep slope. Feature 2 is divided into two clusters (Figure 19) (Figure 20). Since the slope was steep enough to compromise the stability of the upper portions of the subfeatures, there was evidence of tumbling. The terrace remnants were constructed of piled subrounded boulders, cobbles, and pebbles, which included very large boulders (109.0 by 80.0 by 50.0 cm) that were possible bedrock. There was no evidence of facing throughout the subfeatures. The feature measured 25.0 m long by 8.0 m wide on average, and was oriented northwest-southeast (120°/300° MN). Feature 2 was in fair condition with alteration due to erosion, gravity and animal disturbances.

Feature 3 was a linear terrace situated mid-slope between the cliff face of Nailiakauea Ridge and the Līhu`e plain, and was located at the southwestern boundary of the project area (Figure 21) (Figure 22). The length of the terrace was 4.9 m long with wall thickness of 0.44 m. The features height was from 0.38 m to 0.78 m. The feature was constructed of piled subrounded basalt boulders (0.30 to 0.40 m), three to four courses high, with intermittently placed cobbles and pebbles, and was oriented northwest-southeast (144°/324° TN). Stacking was still evident along portions of the terrace; its southeastern terminus is suggestive of possible habitation. The feature appeared to be in good condition and was relatively unaltered.

Feature 4 was a large multi-tiered rectangular enclosure situated at the bottom of the ridge of Mauna Kapu (Figure 23) (Figure 24) (Figure 25). It was located 10.0 m upslope (south) of an irrigation ditch (TS-1, Feature 5). A linear rock terrace extended from the enclosure's northwestern wall. Portions of a terrace that may have extended from the enclosure's southwestern side were still evident; however, current usage of a motocross trail has damaged the feature's southwestern corner.

### **STRATIGRAPHIC TEST EXCAVATION (ST)**

Testing at Wailuā-DHHL was conducted on the southeast corner (TA-1) (Figure 26), and the northeastern portion (TA-2) of the Project area (see Figure 15). Twenty-eight Stratigraphic Trench units (ST-1 through ST-28) were excavated, revealing several, discrete stratigraphic layers, with some, relatively-minimal variation from unit to unit (Appendix B). Some of this



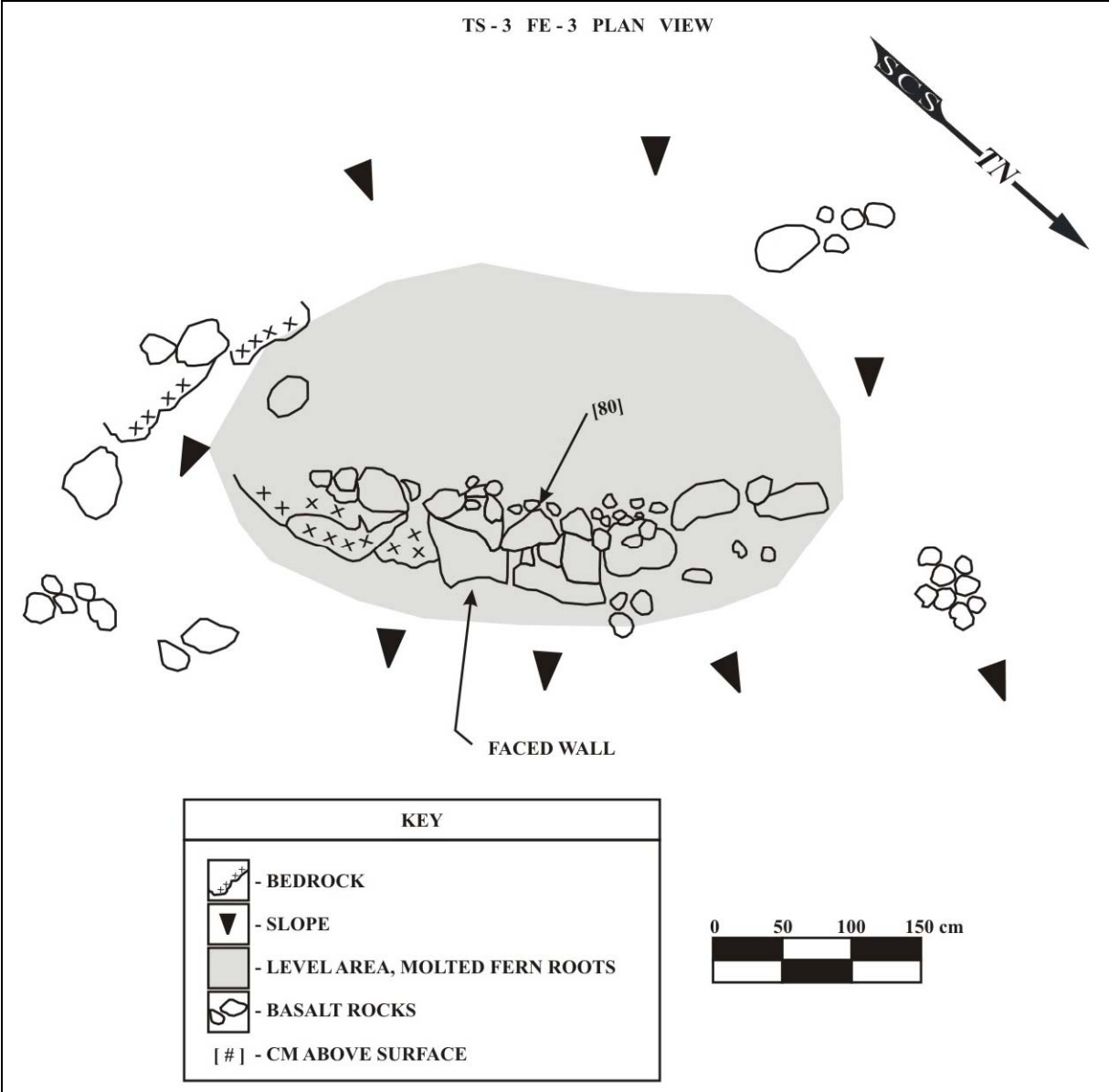
**Figure 19: Site TS-3, Feature 2. Plan View.**



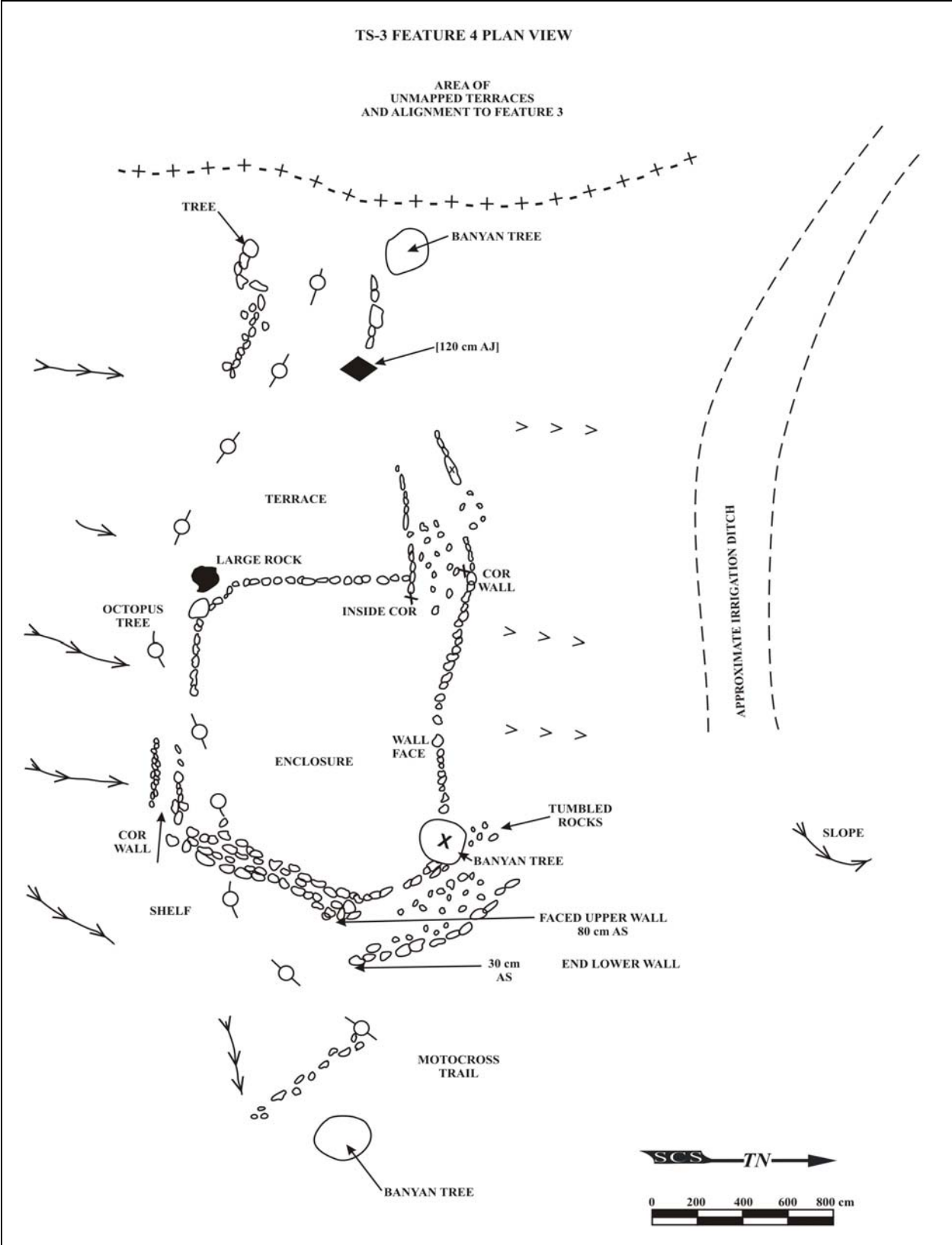
**Figure 20: Site TS-3, Feature 2. View to North.**



**Figure 21: Site TS-3, Feature 3. View to Northwest.**



**Figure 22: Site TS-3, Feature 3. Plan View.**



**Figure 23: Site TS-3, Feature 4. Plan View.**





**Figure 24: Site TS-3, Feature 4. View to North.**



**Figure 25: Site TS-3, Feature 4. View to East.**

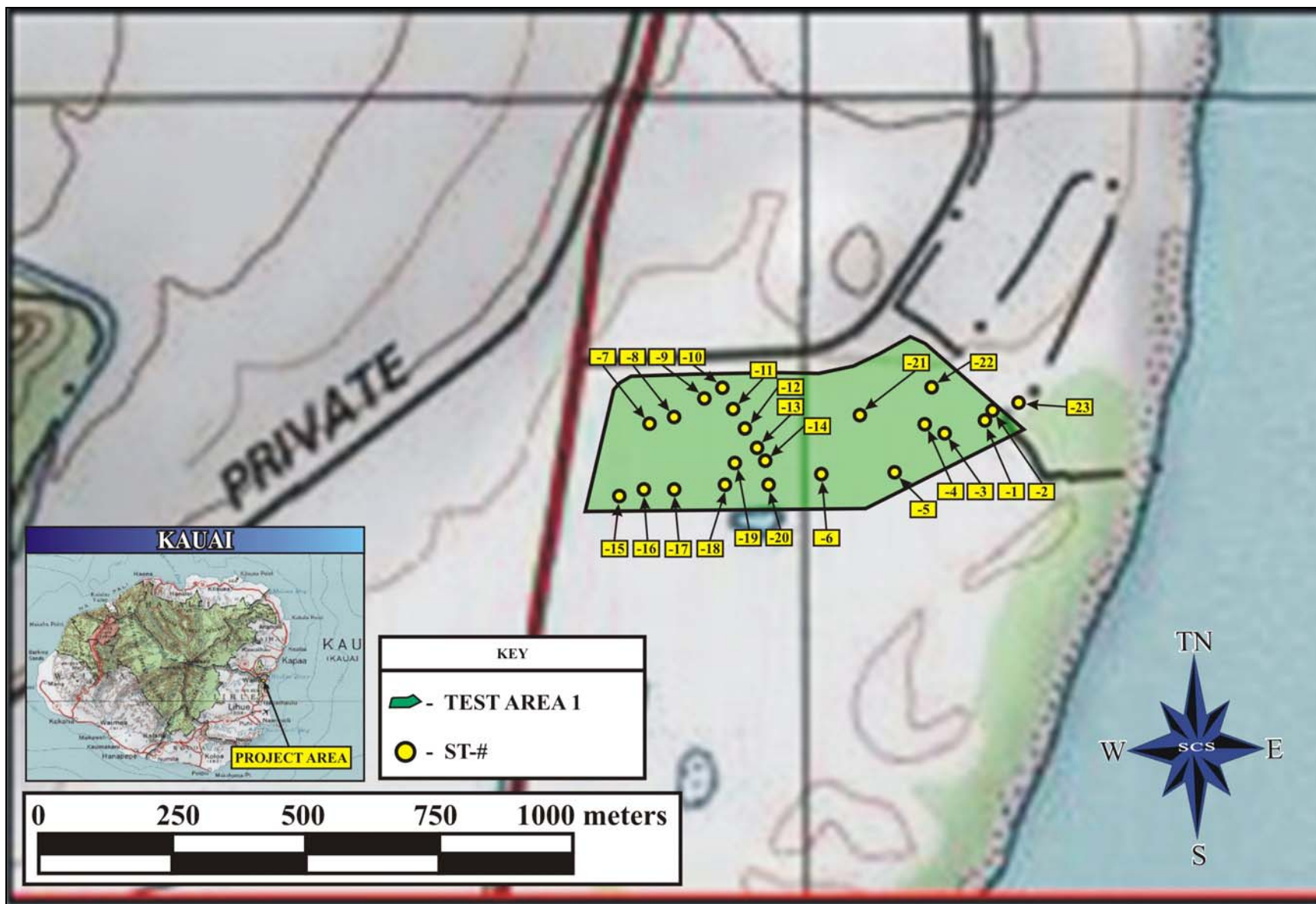


Figure 26: USGS Stratigraphic Trench Locations (TA-1). Plan View Utilizing GPS Points.

variation is likely the result of prior disturbances by agriculture. All trenches were devoid of cultural material, with the results of each listed in Table 3.

### **SUMMARY AND CONCLUSION**

The current Archaeological Inventory Survey led to the identification of three new archaeological sites. Site TS-1 is an historic site that includes agricultural water diversion and irrigation features; it is associated with the Plantation Era on Kaua`i. Site TS-2 consists of a pre-Contact surface lithic (stone tool) scatter associated with Malae Heiau. TS-3 is composed of two rock terrace remnants (TS-3, Features 2 and 3), one rock wall (TS-3, Feature 1) with traditional construction, and one multi-tiered enclosure (TS-3, Feature 4). Subsurface testing at Site TS-2 and selected sections of the project area yielded only negative results. One significant, previously identified site occurs adjacent to the project area, Malae Heiau (State Site -104).

Site TS-3, Feature 4 consisted of a large multi-tiered enclosure, which has been impacted by a trail currently utilized for motocross. Site TS-3, Feature 4 was interpreted as a possible *heiau* or structure that is significant to Malae and Poli`ahu Heiau. This feature borders the project boundary; however, due to its possible affiliation to the other three features, and neighboring Heiau Complex, this site was recorded for Preservation. Although no test excavation was conducted because of the location of the feature at the Project boundary, Data Recovery is recommended for this site in order to answer questions concerning relationship of Mauna Kapu, the Heiau Complex and neighboring *kapu* lands (the immediate Project Area).

### **LITHIC ANALYSIS RESULTS**

Site TS-2 consists of a pre-Contact surface lithic (stone tool) scatter that is concentrated in four Loci and one outlier. Locus A has been interpreted as a pre-Contact lithic workshop whose function is associated with Malae Heiau. One hundred thirty-six total artifacts were located and collected from the ground surface; the majority found in Locus A situated 48.0 m from the *Heiau* (see Appendix B). The artifact assemblage was composed of flaked stone tools and debitage (debris produced during flaked stone tool manufacture). The stone tool assemblage consisted of basalt adze performs, hammerstones, graters, biface and uniface fragments, a chisel fragment, basalt cores, polished flakes and edge altered flakes (Figure 27) (Appendix C). As suggested by artifact analysis and flake typology, this was a multi-use site where activities involved food procurement and processing, craft manufacture, and tool manufacture and refinement (Figure 28). Three adze quarries have been identified thus far on Kaua`i, one of which is Site 4000, located in Wailuā. In Kikuchi's 1973 survey of the Malae Heiau, lithic scatter was noted in and around Malae Heiau. The assemblage was relocated in 1991 (Designated as Site-104A) when State Parks revisited Malae Heiau as part of its inclusion into the State Park System.

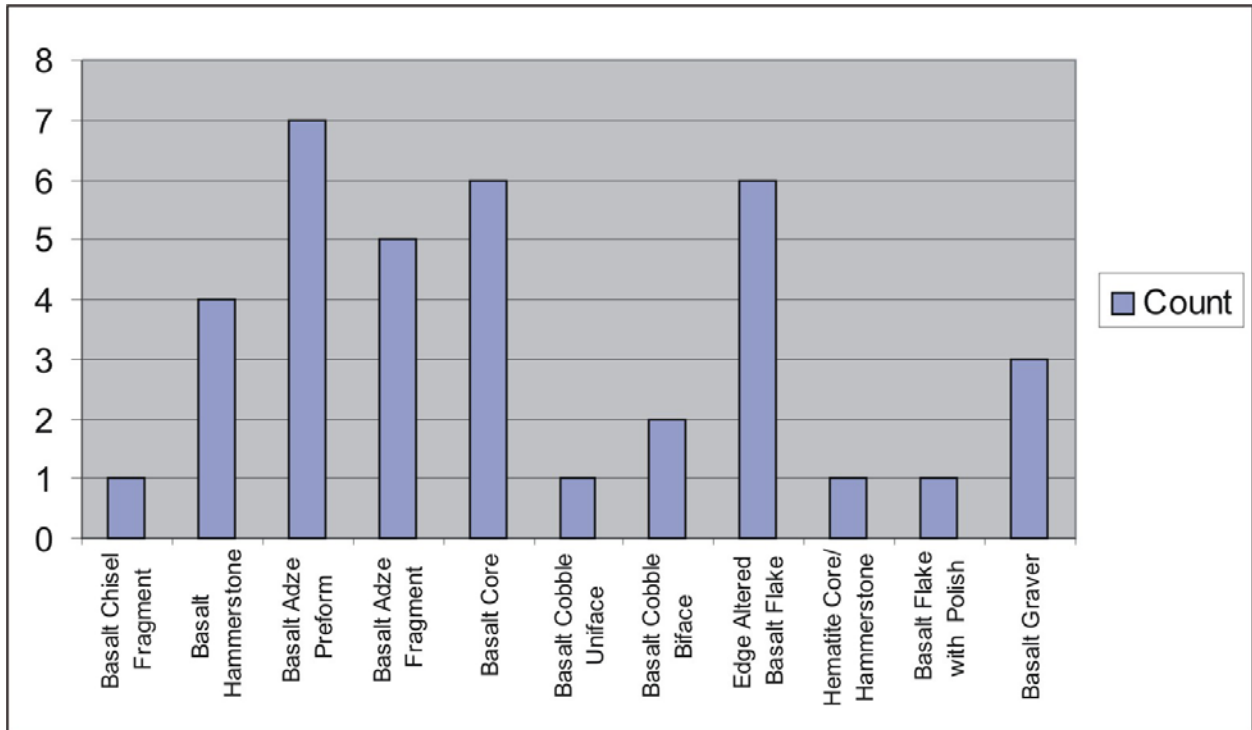
**Table 3: ST Units at Wailuā-DHHL.**

Test Location Area	ST #	Unit Size LxWxD (m)	Orientation (°)	Profile/ Strata	Munsell/Layers/Soil Description	Culture Material
TA-2	ST-1	7.0 by 0.8 by 0.78	NE-SW 74/254	Southeast 3	Layer I: Dark Brown (7.5 YR 3/2) SILT Loam, Moderate Very Fine Sub-Blocky, Few Micro To Crushed Rootlet, Few Basalt Boulder Limestone And Gravel Rocks, Wavy Clear Boundary, No Cultural Materials. Layer II: Light Gray (7.5 YR 6/4) Sand, Weak Very Fine Single Grain, Few Micro To Fine, Very Few Limestone Gravel, Wavy Abrupt Boundary, No Cultural Remains. Layer III: Limestone	None
	ST-2	4.2 by 0.8 by 1.09	SE-NW 160/340	East 2	Layer I: Dark Brown (7.5 YR 3/2) Silt Loam, Moderate Very Fine Sub-Blocky, Few Micro To Crushed Rootlet, Few Basalt Boulder And Pebble Rocks, Smooth Abrupt Boundary, No Cultural Materials. Layer II: Light Yellowish Brown (10 YR 6/4) Sand, Weak Very Fine Single Grain, Very Few Micro To Medium, No Cultural Remains.	None
	ST-3	8.2 by 0.8 by 1.25	NE-SW 58/238	Southeast 3	Layer I: Dark Brown (7.5 YR 3/2) Silt Loam, Moderate Very Fine Sub-Blocky, Common Micro To Crushed Rootlet, Very Few Basalt Boulder Rocks, Wavy Clear Boundary, No Cultural Materials. Layer II: Light Gray (2.5 Y 7/2) Clay Loam, Structure Less Very Fine Massive, Very Few Micro To Medium, Smooth Clear Boundary, No Cultural Remains. Layer III: Dark Greenish Gray (10 Y 4/1) Sandy Clay, Structure Less Very Fine Massive, No Cultural Remains.	None
	ST-4	18.5 by 0.8 by 1.36	N-S 5/185	West 2	Layer I: Dark Brown (7.5 YR 3/2) Silt Loam, Moderate Very Fine Sub-Blocky, Few Micro To Crushed Rootlet, Very Few Basalt Pebble Rocks, Wavy Clear Boundary, No Cultural Materials. Layer II: Light Yellowish Brown (10 Yr 6/4) Sand, Weak Very Fine Single Grain, Wavy Abrupt Boundary, No Cultural Remains.	None
	ST-5	8.6 by 0.75 by 0.98	SE-NW 144/324	Northeast 2	Layer I: Very Dark Grayish Brown (7.5 YR 3/3) Sandy Loam, Weak Very Fine Sub-Blocky, Common Micro To Fine Rootlet, Wavy Boundary, No Cultural Remains. Layer II: Light Yellowish Brown (2.5 Y 6/6) Sand, Weak Very Fine Single Grain, Few Micro To Medium Rootlet, No Cultural Remains.	None
	ST-6	8.6 by 0.75 by 0.98	SE-NW 142/322	East 2	Layer I: Very Dark Grayish Brown (7.5 YR 3/3) Sandy Loam; Weak Very Fine Sub-Blocky, Common Micro to Fine Rootlet, Wavy Boundary, No Cultural Remains. Layer II: Light Yellowish Brown (2.5 Y 6/6) Sand, Weak very Fine, Single Grain, Few Micro to Medium Rootlet, No Cultural Material.	None
	ST-7	6.3 by 0.8 by 0.68	NE-SW 68/248	Northwest 2	Layer I: Dark Brown (7.5 YR 3/3) Loam, Moderate Very Fine Sub-Blocky, Few Micro To Crushed Rootlet, Very Few Basalt Gravel Rocks, Wavy Clear Boundary, No Cultural Remains. Layer II: Reddish Yellow To Very Pale Brown (7.5 Yr 6/6 - 10 Yr 8/3) Sand, Weak Very Fine Massive, Very Few Micro To Fine Rootlet, Very Few Limestone Gravel, No Cultural Remains.	None

Test Location Area	ST #	Unit Size LxWxD (m)	Orientation (°)	Profile/ Strata	Munsell/Layers/Soil Description	Culture Material
	ST-8	3.1 by 1.0 by 0.58	E-W 70/250	-- 2	Layer I: Dark Brown (7.5 YR 3/3) Loam, Moderate Very Fine, Sub-Blocky, Few Micro To Crushed Rootlet, Very Few Basalt Gravel Rocks, Wavy Clear Boundary, No Cultural Remains. Layer II: Reddish Yellow To Very Pale Brown (7.5 Yr 6/6 - 10 Yr 8/3) Sand, Weak Very Fine Massive, Very Few Micro To Fine Rootlet, Very Few Limestone Gravel, No Cultural Remains.	
	ST-9	3.5 by 0.78 by 0.48	NE-SW 68/248	-- 2	Layer I: Dark Brown (7.5 YR 3/3) Loam, Moderate Very Fine Sub-Blocky, Few Micro To Crushed Rootlet, Very Few Basalt Gravel Rocks, Wavy Clear Boundary, No Cultural Remains. Layer II: Very Pale Brown (10 Yr 8/3) Sand, Weak Very Fine Massive, Very Few Micro To Fine Rootlet, Very Few Limestone Gravel, No Cultural Remains.	
	ST-10	3.8 by 0.75 by 0.45	SE-NW 158/338	-- 2	Layer I: Dark Brown (7.5 YR 3/3) Loam, Moderate Very Fine Sub-Blocky, Few Micro To Crushed Rootlet, Very Few Basalt Gravel Rocks, Wavy Clear Boundary, No Cultural Remains. Layer II: Very Pale Brown (10 Yr 8/3) Sand, Weak Very Fine Massive, Very Few Micro To Fine Rootlet, Very Few Limestone Gravel, No Cultural Remains.	
	ST-11	3.3 by 0.7 by 0.51	S-N 172/352	-- 2	Layer I: Dark Brown (7.5 YR 3/3) Loam, Moderate Very Fine Sub-Blocky, Few Micro To Crushed Rootlet, Very Few Basalt Gravel Rocks, Wavy Clear Boundary, No Cultural Remains. Layer II: Very Pale Brown (10 Yr 8/3) Sand, Weak Very Fine Massive, Very Few Micro To Fine Rootlet, Very Few Limestone Gravel, No Cultural Remains.	None
	ST-12	3.9 by 0.8 by 0.74	SE-NW 142/322	Northeast 2	Layer I: Dark Brown (7.5 YR 3/3) Loam, Moderate Very Fine Sub-Blocky, Few Micro To Crushed Rootlet, Very Few Basalt Gravel Rocks, Wavy Clear Boundary, No Cultural Remains. Layer II: Very Pale Brown (10 Yr 8/3) Sand, Weak Very Fine Massive, Very Few Micro To Fine Rootlet, Very Few Limestone Gravel, No Cultural Remains.	None
	ST-13	4.3 by 0.75 by 0.70	SE-NW 148/328	Southwest 2	Layer I: Dark Brown (7.5 YR 3/3) Loam, Moderate Very Fine Sub-Blocky, Few Micro To Crushed Rootlet, Very Few Basalt Gravel Rocks, Wavy Clear Boundary, No Cultural Remains. Layer II: Very Pale Brown (10 Yr 8/3) Sand, Weak Very Fine Massive, Very Few Micro To Fine Rootlet, Very Few Limestone Gravel, No Cultural Remains.	None
	ST-14	4.0 by 0.8 by 0.84	S-N 166/346	Southwest 3	Layer I: Very Pale Brown (10 YR 7/3) Sand, Weak Very Fine Single Grain, Common Micro To Crushed Rootlet, 80% Crushed Coral Sub Gravel To Gravel Rocks, Smooth Abrupt Artificial Boundary, No Cultural Materials With Crushed Coral Line Rock Mixed With Sand For Old Road Surface. Layer II: Dark Brown (7.5 YR 3/3) Loam, Weak Very Fine Sub-Blocky, Few Micro To Medium Rootlet, Very Few Basalt Pebble Rocks, Wavy Abrupt Boundary, No Cultural Remains. Layer III: Very Pale Brown (10 Yr 7/4) Sand, Moderate Very Fine Single Grain, No Cultural Remains.	None
	ST-15	5.5 by 0.8 by 1.00	E-W 88/268	North 2	Layer I: Dark Brown (7.5 Yr 3/2) Loam, Common Micro To Crushed Rootlet, No Cultural Remains. Layer II: Very Pale Brown (10 Yr 7/3) Sand, Very Few Micro To Medium Rootlet, No Cultural Remains.	None
	ST-16	5.2 by 0.8 by	E-W	South	Layer I: Dark Brown (7.5 YR 3/2) Loam, Common Micro To Crushed Rootlet, No Cultural	None

Test Location Area	ST #	Unit Size LxWxD (m)	Orientation (°)	Profile/ Strata	Munsell/Layers/Soil Description	Culture Material
		0.86	92/272	2	Remains. Layer II: Very Pale Brown (10 YR 7/3) Sand, Very Few Micro To Medium Rootlet, No Cultural Remains.	
	ST-17	4.3 by 0.75 by 0.87	E-W 90/270	South 2	Layer I: Dark Brown (7.5 YR 3/2) Loam, Common Micro To Crushed Rootlet, No Cultural Remains. Layer II: Very Pale Brown (10 YR 7/3) Sand, Very Few Micro To Medium Rootlet, No Cultural Remains.	None
	ST-18	4.1 by 0.8 by 0.95	E-W 103/283	North 2	Layer I: Dark Grayish Brown (10 YR 4/2) Loam, Weak Very Fine Sub-Blocky, Few Micro To Fine Rootlet, Very Few Basalt Gravel Rocks, Smooth Abrupt Boundary, No Cultural Remains. Layer II: Light Yellowish Brown (10 YR 6/4) Sand, Weak Very Fine Single Grain, Very Few Micro To Medium Rootlet, No Cultural Remains.	None
	ST-19	5.6 by 0.8 by 1.32	N-S 2/182	East 2	Layer I: Dark Grayish Brown (10 YR 4/2) Loam, Weak Very Fine Sub-Blocky, Common Micro To Crushed Rootlet, Common Coral Gravel Rocks, Wavy Abrupt Boundary, No Cultural Remains. Layer II: Light Yellowish Brown (10 Yr 6/4) Sand, Weak Very Fine Sub-Blocky, Very Few Micro To Medium Rootlet, No Cultural Remains.	None
	ST-20	7.0 by 0.8 by 0.69	E-W 91/271	North 2	Layer I: Dark Grayish Brown (10 YR 4/2) Loam, Moderate Very Fine Sub-Blocky, Common Micro To Medium Rootlet, Very Few Basalt Gravel Rocks, Smooth Abrupt Boundary, No Cultural Remains. Layer II: Pale Yellow (2.5 Y 8/2) Sand, Weak Very Fine Single Grain, Very Few Micro To Fine Rootlet, Very Few Limestone Gravel Rocks, No Cultural Remains.	None
	ST-21	4.0 by 0.75 by 1.4	SE-NW 128/308	Northeast 2	Layer I: Dark Brown (7.5 YR 3/4) Silty Clay Loam, Weak Very Fine Sub-Blocky, Few Micro To Corse Rootlet, Few Basalt Cobble Gravel Pebble Rocks, Smooth Clear Boundary, No Cultural Remains. Layer II: Dark Brown (7.5 YR 3/2) Silty Clay, Weak Very Fine Sub-Blocky, Very Few Micro To Medium Rootlet, Very Few Basalt Cobble Pebble Rocks, No Cultural Remains.	None
	ST-22	5.7 by 0.8 by 1.22	N-S 8/248	Northwest 2	Layer I: Dark Brown (7.5 YR 3/3) Silty Clay Loam, Weak Very Fine Sub-Blocky, Few Micro To Medium Rootlet, Few Basalt Bolder Cobble Pebble Rocks, Smooth Clear Boundary, No Cultural Remains. Layer II: Dark Brown (7.5 YR 3/4) Silty Clay, Weak Very Fine Sub-Blocky, Very Few Micro To Fine Rootlet, No Cultural Remains.	None
	ST-23	6.7 by 0.8 by 0.78	SE-NW 130/310	-- 4	Layer I: Dark Reddish Brown (5 YR 3/3) Loam, Moderate Very Fine Sub-Blocky, Few Micro To Med Rootlet, Very Few Sub Basalt Pebble Rocks, Wavy Abrupt Boundary, Modern Trash Materials. Layer II: Yellowish Brown (10 YR 5/6) Sand, Weak Very Fine Single Grain, Very Few Micro To Fine Rootlet, Smooth Abrupt Boundary, No Cultural Remains. Layer III: Light Yellowish Brown (10 YR 6/4) Sand, Weak Very Fine Single Grain, Very Few Micro To Fine Rootlet, Smooth Abrupt Boundary, No Cultural Remains. Layer IV: Dark Brown (7.5 YR 3/2) Silty Clay, Weak Very Fine Sub-Blocky, Very Few Micro To	None

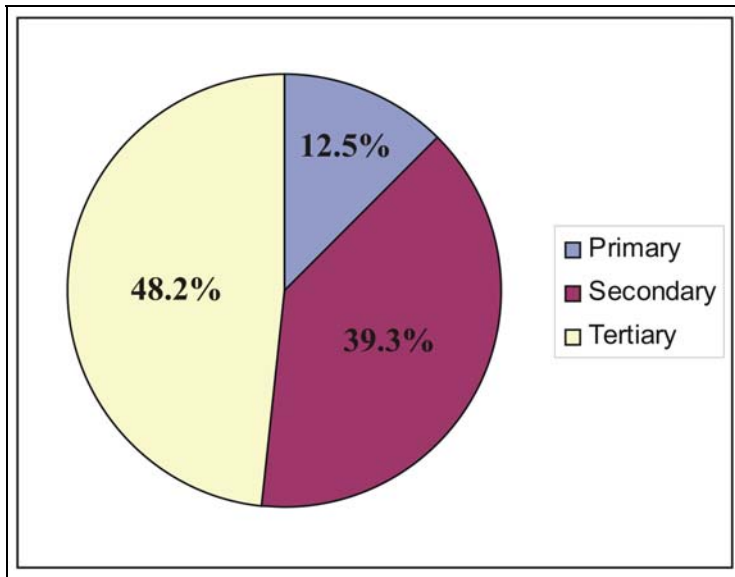
<b>Test Location Area</b>	<b>ST #</b>	<b>Unit Size LxWxD (m)</b>	<b>Orientation (°)</b>	<b>Profile/ Strata</b>	<b>Munsell/Layers/Soil Description</b>	<b>Culture Material</b>
					Fine Rootlet, No Cultural Remains.	
TA-1	ST-24	2.5 by 0.6 by 0.55	E-W 103/283	-- 2	Layer I: Reddish Brown (2.5 YR 5/4) Plow Zone, Clay/ Roots. No Cultural Material. Layer II: Yellowish Red (5 YR 5/8) Compact Clay/ No Roots. No Cultural Material.	None
	ST-25	2.6 by 0.6 by 0.56	E-W 82/262	-- 2	Layer I: Reddish Brown (2.5 YR 5/4) Plow Zone, Clay/ Roots. No Cultural Material. Layer II: Yellowish Red (5 YR 5/8) Compact Clay/ No Roots. No Cultural Material.	None
	ST-26	2.3 by 0.6 by 0.56	SE-NW 110/290	-- 2	Layer I: Reddish Brown (2.5 YR 5/4) Plow Zone, Clay/ Roots. No Cultural Material. Layer II: Yellowish Red (5 YR 5/8) Compact Clay/ No Roots. No Cultural Material.	None
	ST-27	2.0 by 0.6 by 0.35	SE-NW 125/305	-- 2	Layer I: Reddish Brown (2.5 YR 5/4) Plow Zone, Clay/ Roots. No Cultural Material. Layer II: Yellowish Red (5 YR 5/8) Compact Clay/ No Roots. No Cultural Material.	None
	ST-28	2.3 by 0.6 by 0.53	E-W 90/270	-- 2	Layer I: Reddish Brown (2.5 YR 5/4) Plow Zone, Clay/ Roots. No Cultural Material. Layer II: Yellowish Red (5 YR 5/8) Compact Clay/ No Roots. No Cultural Material.	None



Tool	Count
Basalt Chisel Fragment	1
Basalt Hammerstone	4
Basalt Adze Preform	7
Basalt Adze Fragment	5
Basalt Core	6
Basalt Cobble Uniface	1
Basalt Cobble Biface	2
Edge Altered Basalt Flake	6
Hematite Core/ Hammerstone	1
Basalt Flake with Polish	1
Basalt Graver	3

**Figure 27: Basalt Artifact Counts for Site TS-2 Stone Tool Assemblage.**





Basalt Debitage	Counts
Primary	7
Secondary	22
Tertiary	27

**Figure 28: Site TS-2 Stone Tool Flake Typology Summary.**

Loci B, C and D have been interpreted as pre-Contact lithic chipping stations, areas of the "floor" within an archaeological site that yields more stone flakes than any other kind of artifact. Such features are frequently interpreted as places used for the chipping of stone, where tools were sharpened and possibly finished.

Locus B contained four pieces of ground surface debitage and one tool that consisted of an edge altered basalt flake. The other four pieces consisted of two tertiary flakes, one secondary flake and one non-diagnostic flake.

Locus C contained one basalt tool and three pieces of debitage; one was from volcanic glass, collected from the ground surface. The basalt core displayed multiple striking platforms. The debitage consisted of one secondary, one tertiary, and one non-diagnostic flake.

Locus D contained 3 basalt tools and 12 pieces of debitage. The basalt tools consisted of two basalt adze performs and one basalt adze fragment. The debitage contained two secondary flakes, eight tertiary flakes and two non-diagnostic flakes.

The outlier consisted of one non-diagnostic flake.

## CONCLUSION

Concerning the immediate project area, Malae Heiau is an integral part of the Complex, one whose function remains poorly understood. It is hypothesized that Malae Heiau has functioned in various capacities from pre-Contact to the Historic Period; it is reported to have been built by the Menehune and may have functioned originally as a *luakini* (Thrum 1917; Bennett 1931). Thrum (1907:41) noted that the other *heiau* on Kauai were “connected in their workings” in the manner of Malae and Poli`ahu. Research questions remain unanswered with regard to the connectedness of the sites in the Complex. The petroglyph boulders located at Hauola (Place of Refuge, Site -105) contain important legendary associations associated with *heiau* functions that took place during festivals. The petroglyphs showed evidence of sharpening and stone tool refinement by the early Hawaiians. Investigation into the various stages of lithic reduction taking place along Wailuā River, including newly discovered site (TS-2, Loci A through D), could address certain research questions. Further work is required that necessitates cultural landscape analysis utilizing GIS to understand Malae’s relationship to the rest of the Complex. As noted in the National Register nomination application form (1989) under significance:

“The Wailuā Complex of Heiau is one of the most important archeological site complexes in the Hawaiian Islands with components spanning all phases of Hawaiian culture.” Relative to modern day concerns: “Most of the heiau and sacred sites in the NHL complex are associated with legends, rulers and events that played an important role in Hawaiian culture and are of traditional significance to contemporary Hawaiians of native descent.”

Even after the abolishment of the *kapu* system and ancient religion by 1819, the sites containing *heiau* continue to be regarded as *wahi pana* (legendary places), places imbued with *mana* (supernatural power; authority, power), and hold significance to today’s Hawaiian people (Kirch 1996: 11).

Where are the sacred sites of the Hawaiians today? Can their boundaries be properly delineated? Further work is required in order to address these questions specifically; can the Wailuā Heiau Complex be construed as a web of culturally significant spiritual locales spread across a larger ancestral landscape whose connection remains significant, both in terms of site and for designated sacred open space? These questions can only be addressed with further investigation and consultation.

Hawai’i State Law, Article XII, Section 76; Act 50, mandates the protection of cultural site integrity, therefore further work is recommended in the way of consultation as proposed in the attendant cultural impact assessment (McGerty and Spear 2007). Since the early 1980s, the federal government has listed traditional cultural places (TCPs) on the National Register of Historic Places, which is managed by the Department of the Interior. Many TCPs are sacred sites. In keeping with the protocol concerning traditional cultural practices of the Hawaiian people and their sacred sites, the proper spiritual atmosphere must be observed.

### **SIGNIFICANCE ASSESSMENTS**

Sites TS-1, TS-2 and TS-3 have been evaluated for significance according to the criteria established for the State and National Register of Historic Places. The five criteria are listed below:

Criterion A: Site is associated with events that have made a significant contribution to the broad patterns of our history;

Criterion B: Site is associated with the lives of persons significant to our past;

- Criterion C: Site is an excellent site type; embodies distinctive characteristics of a type, period, or method of construction, or represents the work of a master, or possesses high artistic values, or represents a significant and distinguishable entity whose components may lack individual construction;
- Criterion D: Site has yielded or has the potential to yield information important in prehistory or history;
- Criterion E: Site has cultural significance; probable religious structures or burials present (State of Hawai'i criteria only).

Site TS-1 and TS-2 are significant under Criteria D; Portions of TS-2 (Locus A) may be affiliated with the Malae Heiau (Site -104/104A), of the State and National Register of Historic Places. Site TS-3 is significant under D. TS-3, Feature 4 falls outside of the project boundaries; however, since the cultural significance of feature is yet undetermined, further work is recommended to investigate the site's function through time.

## RECOMMENDATIONS

The proposed project would visually affect the surrounding cultural landscape from certain vantage points, notably the *heiau*. The potential impact on these culturally affiliated resources is of major concern for the proposed project. The Wailuā Complex of Heiau (Site -502) is one of the few remaining places in the Hawaiian Islands where one can enjoy a relatively unaltered view from one *heiau* to another. Concerning the immediate project area, Malae Heiau is an integral part of the Complex, one whose function remains poorly understood. Further work is required that necessitates cultural landscape analysis utilizing GIS to understand Malae's relationship to the rest of the Complex. Investigation into the various stages of lithic reduction taking place along Wailuā River, including newly discovered site (TS-2, Loci A through D), could also address certain research questions. In addition, a historic feature (rock wall) was identified through archival research, and was later relocated as an earthen berm heavily obscured by vegetation.

Sites TS-1 (agricultural water diversion and irrigation features) and TS-2 (Lithic [stone tool] workshop) are significant under Criteria D of the State Register of Historic Places; no further work is recommended for TS-1. However, further attention is needed to address a possible western boundary extension of Site -104 to include TS-2, Locus A (Lithic Workshop), as an extension of Site -104A. Site TS-3 is significant under Criteria D and possibly E, and requires further archaeological study. Data Recovery is recommended for this site in addition to further investigation into possible connections between Site -502 and *kapu* lands, which the attending commercial development would affect.

Archival research identified the existence of an historic rock wall that was not evident through pedestrian survey but its location is shown on an historic map; the approximate location of this historic wall was later verified on the ground as an earthen berm after the conclusion of the field portion of the survey. Data Recovery should include testing at the historic wall site to verify its existence and location.

Further, construction activities immediately outside the current Buffer Zone of Site -104 (Malae Heiau) at Site TS-2, as well as the northern border of the project area which includes areas of lithic concentrations and TS-1 Feature 5, should be monitored by a qualified Archaeologist during ground penetrating phases of construction.

At this juncture, Data Recovery is strongly recommended, and concurred with by State Parks, in order to further investigate both visual and lineal ties from the Malae Heiau to neighboring *heiau* and relationship to *kapu* lands and Mauna Kapu (including Site TS-3). This Data Recovery will involve study utilizing GIS. In addition, further consideration is recommended on extending the site boundaries of Site -104A, to encompass the cultural activities that were being conducted there. All such boundaries should be properly delineated before the commencement of any construction activities and clearly marked with construction-type fencing.

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**APPENDIX A: LOCUS A ARTIFACTS**

SCS PROJECT 864 SITE TS-2 LOCUS A SURFACE MIDDEN INVENTORY					
Field Bag	Find Spot ID	Unit	Identification	Count	Remarks
1	1	-	Basalt Debitage	1	Interior flake
2	2	-	Basalt Debitage	1	Secondary flake
3	3	-	Basalt Debitage	1	Secondary flake
4	4	-	Basalt Debitage	2	1- Secondary flake, 1- interior flake
5	5	-	Basalt Debitage	1	Interior flake
6	6	-	Basalt Debitage	1	Secondary flake
7	7	-	Basalt Debitage	1	Interior flake
7	7	-	Basalt Chisel Fragment	1	Trapezoidal in cross-section, cutting edge beveled on top and bottom
8	8	-	Basalt Hammerstone	1	Waterworn cobble, elongated with opposite ends battered
9	9	-	Basalt Debitage	1	Secondary flake
10	10	-	Fractured Basalt	1	Waterworn, non-artifact
11	11	-	Basalt Debitage	1	Interior flake
12	12	-	Basalt Adze Preform Fragment	1	Fractured, trapezoidal in cross-section

13	13	-	Basalt Debitage	1	Non-diagnostic flake
14	14	-	Basalt Core	1	Single striking platform
14	14	-	Basalt Debitage	1	Secondary flake
15	15	-	Fractured Basalt	1	Waterworn, non-artifact
16	16	-	Basalt Debitage	1	Secondary flake
17	17	-	Basalt Cobble Uniface	1	-
18	18	-	Basalt Debitage	1	Interior flake
19	19	-	Edge Altered Basalt Flake	1	Fractured, thin rectangle in cross-section; possible adze preform
20	20	-	Edge Altered Basalt Flake	1	Artifact based on primary flake; 2 unifacial edges; Edge #1: 3.0 cm length, Edge #2: 4.8 cm length
21	21	-	Basalt Debitage	2	1-Interior flake, 1-non-diagnostic flake
22	22	-	Basalt Adze Preform	1	Artifact based on secondary flake; semi-circular in cross-section

23	23	-	Basalt Adze Blank Fragment	1	Fractured, bevel end present, rectangular in cross- section
24	24	-	Basalt Debitage	2	1- Secondary flake, 1- non- diagnostic flake
25	25	-	Basalt Debitage	1	Secondary flake
26	26	-	Fractured Basalt	1	Possible debitage
27	27	-	Basalt Debitage	2	1-Interior flake, 1- non- diagnostic flake
28	28	-	Basalt Debitage	1	Interior flake
29	29	-	Basalt Debitage	1	Secondary flake
30	30	-	Basalt Adze Preform	1	Fractured, irregular trapezoid in cross- section
31	31	-	Basalt Debitage	1	Interior flake
32	32	-	Hematite Core/ Hammerstone	1	Fragment, multiple striking platforms
33	33	-	Basalt Debitage	2	1- Secondary flake, 1- interior flake
34	34	-	Basalt Debitage	1	Secondary flake

35	35	-	Basalt Adze Fragment	1	Back end only, rectangular in cross-section, possibly preform fragment
36	36		Basalt Hammerstone	1	Slightly elongated, opposite ends battered
37	37	-	Basalt Debitage	1	Interior flake
38	38	-	Basalt Hammerstone	1	Irregular diamond shape, one end battered
39	39	-	Basalt Core	1	Multiple striking platforms
40	40	-	Basalt Debitage	1	Primary flake
41	41	-	Edge Altered Basalt Flake	1	Unifacial, 3.0 cm length (worked edge)
42	42	-	Basalt Cobble Biface	1	Based on waterworn cobble, 2 edges flaked; Edge #1: unifacial, 5.0 cm length, Edge #2: bifacial, 15.0 cm length
43	43	-	Basalt Debitage	1	Interior flake



44	44	-	Basalt Core	1	Artifact based on waterworn cobble, fragmented, multiple striking platforms
45	45	-	Basalt Hammerstone	1	Vesicular, one end battered
46	46	-	Basalt Debitage	1	Secondary flake
47	47	-	Basalt Debitage	1	Secondary flake
47	47	-	Basalt Flake with Polish	1	2-Facets polished
48	48	-	Basalt Debitage	1	Interior flake
49	49	-	Basalt Debitage	1	Non-diagnostic flake
49	49	-	Basalt Adze Preform Fragment	1	Bevel end only, rectangular in cross-section
50	50	-	Basalt Debitage	2	Interior flakes
51	51	-	Basalt Debitage	1	Secondary flake
52	52	-	Basalt Debitage	3	1-Primary flake, 1-secondary flake, 1-interior flake
53	53	-	Basalt Debitage	1	Secondary flake
54	54	-	Basalt Debitage	1	Interior flake
55	55	-	Basalt Debitage	3	1-Primary flake, 1-secondary flake, 1-non-diagnostic flake

56	56	-	Basalt Debitage	1	Primary flake
57	57	-	Basalt Debitage	1	Interior flake
58	58	-	Basalt Debitage	1	Interior flake
59	59	-	Basalt Adze Fragment	1	Back end only, trapezoidal in cross-section, 3-facets polished
67	67	-	Basalt Debitage	3	Interior flakes
68	68	-	Basalt Debitage	1	Interior flake
69	69	-	Basalt Adze Preform	1	Trapezoidal in cross-section
70	70	-	Edge Altered Basalt Flake	1	Artifact based on interior flake; unifacial 2.2 cm curved length
71	71	-	Basalt Debitage	2	1- Secondary flake, 1- interior flake
72	72	-	Basalt Debitage	1	Secondary flake
73	73	-	Basalt Cobble Biface	1	Artifact based on waterworn cobble
73	73	-	Edge Altered Basalt Flake/ Graver	1	-
74	74	-	Basalt Debitage	1	Interior flake
75	75	-	Basalt Debitage	1	Primary flake

76	76	-	Basalt Debitage	2	1-Interior flake, 1-non-diagnostic flake
77	77	-	Basalt Debitage	1	Interior flake
78	78	-	Basalt Debitage	1	Non-diagnostic flake
79	79	-	Basalt Graver	1	2-Worked edges; Edge #1: unifacial, 2.9 cm length, Edge #2: bifacial, 2.0 cm length
80	80	-	Basalt Debitage	1	Interior flake
81	81	-	Basalt Adze Preform Fragment	1	Fragment, bevel end
82	82	-	Basalt Debitage	1	Non-diagnostic flake
83	83	-	Fractured Basalt	1	Waterworn cobble, non-artifact
84	84	-	Basalt Debitage	2	Non-diagnostic flakes
84	84	-	Edge Altered Basalt Flake	1	Artifact based on interior flake, unifacial, 6.5 cm length (altered edge)
84	84	-	Basalt Core Fragment	1	Multiple striking platforms
85	85	-	Basalt Graver	1	Point missing

91	91	-	Basalt Pebble	1	Manuport, naturally worn
91	91	-	Basalt Debitage	6	2-Primary flakes, 2-secondary flakes, 2-interior flakes
92	-	ST-24	Basalt Debitage	1	Secondary flake
93	-	-	Basalt Debitage	3	2-Secondary flakes, 1-interior flake
93	-	-	Basalt Core	1	Multiple striking platforms

<b>SCS PROJECT 864 SITE TS-2 LOCUS B SURFACE MIDDEN INVENTORY</b>					
<b>Field Bag</b>	<b>Find Spot ID</b>	<b>Unit</b>	<b>Identification</b>	<b>Count</b>	<b>Remarks</b>
86	86	-	Edge Altered Basalt Flake	1	Unifacial, 3.0 cm length (altered edge)
87	87	-	Basalt Debitage	1	Secondary flake
88	88	-	Basalt Debitage	1	Interior flake
89	89	-	Basalt Debitage	1	Interior flake
90	90	-	Basalt Debitage	1	Non-diagnostic flake

<b>SCS PROJECT 864 SITE TS-2 LOCUS C SURFACE MIDDEN INVENTORY</b>					
<b>Field Bag</b>	<b>Find Spot ID</b>	<b>Unit</b>	<b>Identification</b>	<b>Count</b>	<b>Remarks</b>
60	60	-	Basalt Core Fragment	1	Multiple striking platforms
60	60	-	Basalt Debitage	1	Non-diagnostic flake

61	61	-	Basalt Debitage	1	Interior flake
65	65	-	Volcanic Glass Debitage	1	Secondary flake

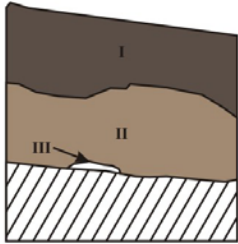
<b>SCS PROJECT 864 SITE TS-2 LOCUS D SURFACE MIDDEN INVENTORY</b>					
<b>Field Bag</b>	<b>Find Spot ID</b>	<b>Unit</b>	<b>Identification</b>	<b>Count</b>	<b>Remarks</b>
62	62	-	Basalt Adze Preform	1	Trapezoidal in cross-section
63	63	-	Basalt Debitage	1	Non-diagnostic flake
64	64	-	Basalt Debitage	1	Secondary flake
94	-	-	Basalt Adze Fragment	1	Back end only, rectangular in cross-section, 3-facets polished
95	-	-	Basalt Debitage	5	1- Secondary flake, 3- interior flakes, 1- non-diagnostic flake
96	-	-	Basalt Debitage	5	Interior flakes
96	-	-	Basalt Adze Preform	1	Fragment, bevel end only, triangular in cross-section

<b>SCS PROJECT 864 SITE TS-2 OUTLIER SURFACE MIDDEN INVENTORY</b>					
<b>Field Bag</b>	<b>Find Spot ID</b>	<b>Unit</b>	<b>Identification</b>	<b>Count</b>	<b>Remarks</b>
66	66	-	Basalt Debitage	1	Non-diagnostic flake

**APPENDIX B: STRATIGRAPHIC TRENCH EXCAVATION PROFILE DRAWINGS**

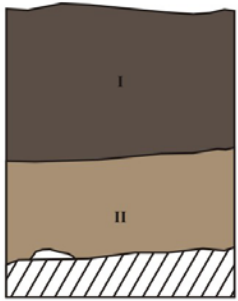
ST - 1 THROUGH ST - 3 PROFILE

ST - 1 SOUTH EAST PROFILE



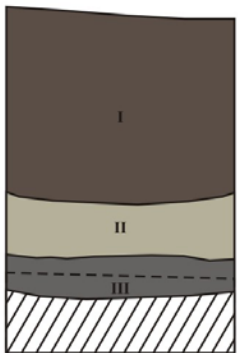
- I** - LAYER I: DARK BROWN (7.5 YR 3/2) SILT LOAM, MODERATE VERY FINE SUB-BLOCKY, FEW MICRO TO CRUSHED ROOTLET, FEW BASALT BOULDER LIMESTONE AND GRAVEL ROCKS, WAVY CLEAR BOUNDARY, NO CULTURAL MATERIALS.
- II** - LAYER II: LIGHT GRAY (7.5 Y 6/4) SAND, WEAK VERY FINE SINGLE GRAIN, FEW MICRO TO FINE, VERY FEW LIMESTONE GRAVEL, WAVY ABRUPT BOUNDARY, NO CULTURAL REMAINS.
- III** - LAYER III: LIMESTONE

ST - 2 EAST WALL PROFILE



- I** - LAYER I: DARK BROWN (7.5 YR 3/2) SILT LOAM, MODERATE VERY FINE SUB-BLOCKY, FEW MICRO TO CRUSHED ROOTLET, FEW BASALT BOULDER AND PEBBLE ROCKS, SMOOTH ABRUPT BOUNDARY, NO CULTURAL MATERIALS.
- II** - LAYER II: LIGHT YELLOWISH BROWN (10 YR 6/4) SAND, WEAK VERY FINE SINGLE GRAIN, VERY FEW MICRO TO MEDIUM, NO CULTURAL REMAINS.

ST - 3 PROFILE

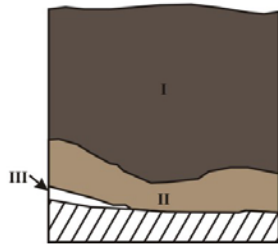


- I** - LAYER I: DARK BROWN (7.5 YR 3/2) SILT LOAM, MODERATE VERY FINE SUB-BLOCKY, COMMON MICRO TO CRUSHED ROOTLET, VERY FEW BASALT BOULDER ROCKS, WAVY CLEAR BOUNDARY, NO CULTURAL MATERIALS.
- II** - LAYER II: LIGHT GRAY (2.5 Y 7/2) CLAY LOAM, STRUCTURE LESS VERY FINE MASSIVE, VERY FEW MICRO TO MEDIUM, SMOOTH CLEAR BOUNDARY, NO CULTURAL REMAINS.
- III** - LAYER III: DARK GREENISH GRAY (10 Y 4/1) SANDY CLAY, STRUCTURE LESS VERY FINE MASSIVE, NO CULTURAL REMAINS.

WATER LINE

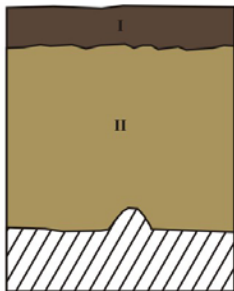
ST - 4 THROUGH ST - 6 PROFILE

ST - 4 PROFILE



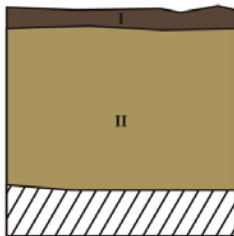
- I** - LAYER I: DARK BROWN (7.5 YR 3/2) SILT LOAM, MODERATE VERY FINE SUB-BLOCKY, FEW MICRO TO CRUSHED ROOTLET, VERY FEW BASALT PEBBLE ROCKS, WAVY CLEAR BOUNDARY, NO CULTURAL MATERIALS.
- II** - LAYER II: LIGHT YELLOWISH BROWN (10 YR 6/4) SAND, WEAK VERY FINE SINGLE GRAIN, WAVY ABRUPT BOUNDARY, NO CULTURAL REMAINS.
- III** - LAYER III: LIMESTONE ROCK

ST - 5 PROFILE



- I** - LAYER I: VERY DARK GRAYISH BROWN (7.5 YR 3/3) SANDY LOAM, WEAK VERY FINE SUB-BLOCKY, COMMON MICRO TO MEDIUM ROOTLET, VERY FEW BASALT PEBBLE ROCKS, SMOOTH BOUNDARY, NO CULTURAL REMAINS.
- II** - LAYER II: LIGHT YELLOWISH BROWN (2.5 Y 6/6) SAND, WEAK VERY FINE SINGLE GRAIN, FEW MICRO TO MEDIUM ROOTLET, NO CULTURAL REMAINS.

ST - 6 PROFILE

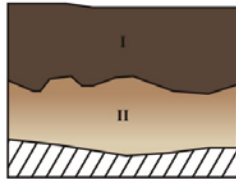


- I** - LAYER I: VERY DARK GRAYISH BROWN (7.5 YR 3/3) SANDY LOAM, WEAK VERY FINE SUB-BLOCKY, COMMON MICRO TO FINE ROOTLET, WAVY BOUNDARY, NO CULTURAL REMAINS.
- II** - LAYER II: LIGHT YELLOWISH BROWN (2.5 Y 6/6) SAND, WEAK VERY FINE SINGLE GRAIN, FEW MICRO TO MEDIUM ROOTLET, NO CULTURAL REMAINS.



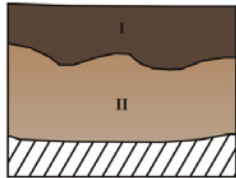
ST - 7 THROUGH ST - 10 PROFILE

ST - 7 PROFILE



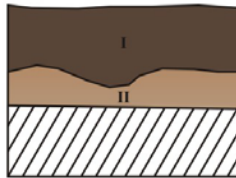
- I** - LAYER I: DARK BROWN (7.5 YR 3/3) LOAM, MODERATE VERY FINE SUB-BLOCKY, FEW MICRO TO CRUSHED ROOTLET, VERY FEW BASALT GRAVEL ROCKS, WAVY CLEAR BOUNDARY, NO CULTURAL REMAINS.
- II** - LAYER II: REDDISH YELLOW TO VERY PALE BROWN (7.5 YR 6/6 - 10 YR 8/3) SAND, WEAK VERY FINE MASSIVE, VERY FEW MICRO TO FINE ROOTLET, VERY FEW LIMESTONE GRAVEL, NO CULTURAL REMAINS.

ST - 8 PROFILE



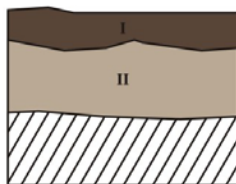
- I** - LAYER I: DARK BROWN (7.5 YR 3/3) LOAM, MODERATE VERY FINE SUB-BLOCKY, FEW MICRO TO CRUSHED ROOTLET, VERY FEW BASALT GRAVEL ROCKS, WAVY CLEAR BOUNDARY, NO CULTURAL REMAINS.
- II** - LAYER II: REDDISH YELLOW TO VERY PALE BROWN (7.5 YR 6/6 - 10 YR 8/3) SAND, WEAK VERY FINE MASSIVE, VERY FEW MICRO TO FINE ROOTLET, VERY FEW LIMESTONE GRAVEL, NO CULTURAL REMAINS.

ST - 9 PROFILE



- I** - LAYER I: DARK BROWN (7.5 YR 3/3) LOAM, MODERATE VERY FINE SUB-BLOCKY, FEW MICRO TO CRUSHED ROOTLET, VERY FEW BASALT GRAVEL ROCKS, WAVY CLEAR BOUNDARY, NO CULTURAL REMAINS.
- II** - LAYER II: VERY PALE BROWN (10 YR 8/3) SAND, WEAK VERY FINE MASSIVE, VERY FEW MICRO TO FINE ROOTLET, VERY FEW LIMESTONE GRAVEL, NO CULTURAL REMAINS.

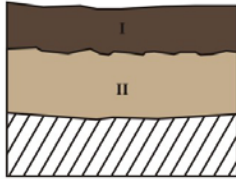
ST - 10 PROFILE



- I** - LAYER I: DARK BROWN (7.5 YR 3/3) LOAM, WEAK VERY FINE SUB-BLOCKY, COMMON MICRO TO MEDIUM ROOTLET, WAVY ABRUPT BOUNDARY, NO CULTURAL REMAINS.
- II** - LAYER II: VERY PALE BROWN (10 YR 7/3) SAND, WEAK VERY FINE SUB-BLOCKY, FEW FINE TO FINE ROOTLET, NO CULTURAL REMAINS.

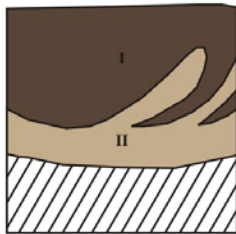
ST - 11 THROUGH ST - 14 PROFILE

ST - 11 PROFILE



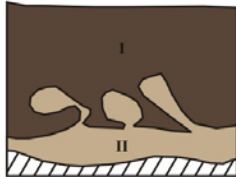
- I** - LAYER I: DARK BROWN (7.5 YR 3/3) LOAM, WEAK VERY FINE SUB-BLOCKY, COMMON MICRO TO MEDIUM ROOTLET, SMOOTH ABRUPT BOUNDARY, NO CULTURAL REMAINS.
- II** - LAYER II: VERY PALE BROWN (10 YR 7/4) SAND, MODERATE VERY FINE SINGLE GRAIN, FEW FINE TO CRUSHED ROOTLET, NO CULTURAL REMAINS.

ST - 12 NORTH EAST WALL PROFILE



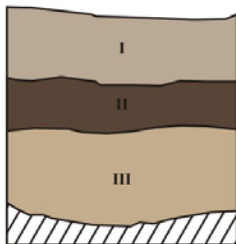
- I** - LAYER I: DARK BROWN (7.5 YR 3/3) LOAM, WEAK VERY FINE SUB-BLOCKY, COMMON MICRO TO MEDIUM ROOTLET, SMOOTH ABRUPT BOUNDARY, NO CULTURAL REMAINS.
- II** - LAYER II: VERY PALE BROWN (10 YR 7/4) SAND, MODERATE VERY FINE SINGLE GRAIN, FEW FINE TO CRUSHED ROOTLET, NO CULTURAL REMAINS.

ST - 13 SOUTH WEST WALL PROFILE



- I** - LAYER I: DARK BROWN (7.5 YR 3/3) LOAM, WEAK VERY FINE SUB-BLOCKY, COMMON MICRO TO MEDIUM ROOTLET, SMOOTH ABRUPT BOUNDARY, NO CULTURAL REMAINS.
- II** - LAYER II: VERY PALE BROWN (10 YR 7/4) SAND, MODERATE VERY FINE SINGLE GRAIN, FEW FINE TO CRUSHED ROOTLET, NO CULTURAL REMAINS.

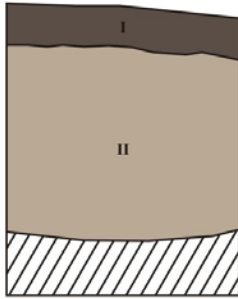
ST - 14 SOUTH WEST WALL PROFILE



- I** - LAYER I: VERY PALE BROWN (10 YR 7/3) SAND, WEAK VERY FINE SINGLE GRAIN, COMMON MICRO TO CRUSHED ROOTLET, 80% CRUSHED CORAL SUB GRAVEL TO GRAVEL ROCKS, SMOOTH ABRUPT ARTIFICIAL BOUNDARY, NO CULTURAL MATERIALS WITH CRUSHED CORAL LINE ROCK MIXED WITH SAND FOR OLD ROAD SURFACE.
- II** - LAYER II: DARK BROWN (7.5 YR 3/3) LOAM, WEAK VERY FINE SUB-BLOCKY, FEW MICRO TO MEDIUM ROOTLET, VERY FEW BASALT PEBBLE ROCKS, WAVY ABRUPT BOUNDARY, NO CULTURAL REMAINS.
- III** - LAYER III: VERY PALE BROWN (10 YR 7/4) SAND, MODERATE VERY FINE SINGLE GRAIN, NO CULTURAL REMAINS.

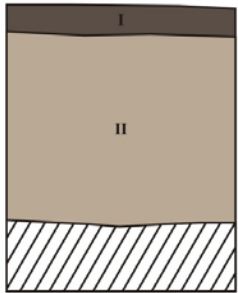
ST - 15 THROUGH ST - 17 PROFILE

ST - 15 NORTH WALL PROFILE



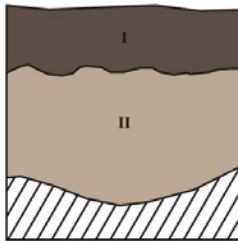
- I** - LAYER I: DARK BROWN (7.5 YR 3/2) LOAM, COMMON MICRO TO CRUSHED ROOTLET, NO CULTURAL REMAINS.
- II** - LAYER II: VERY PALE BROWN (10 YR 7/3) SAND, VERY FEW MICRO TO MEDIUM ROOTLET, NO CULTURAL REMAINS.

ST - 16 SOUTH WALL PROFILE



- I** - LAYER I: DARK BROWN (7.5 YR 3/2) LOAM, COMMON MICRO TO CRUSHED ROOTLET, NO CULTURAL REMAINS.
- II** - LAYER II: VERY PALE BROWN (10 YR 7/3) SAND, VERY FEW MICRO TO MEDIUM ROOTLET, NO CULTURAL REMAINS.

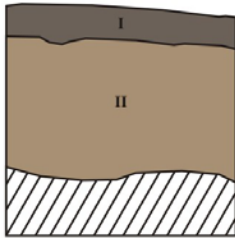
ST - 17 SOUTH WALL PROFILE



- I** - LAYER I: DARK BROWN (7.5 YR 3/2) LOAM, COMMON MICRO TO CRUSHED ROOTLET, NO CULTURAL REMAINS.
- II** - LAYER II: VERY PALE BROWN (10 YR 7/3) SAND, VERY FEW MICRO TO MEDIUM ROOTLET, NO CULTURAL REMAINS.

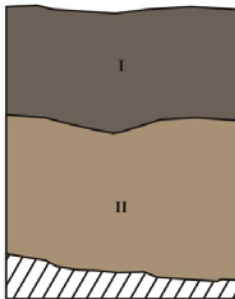
ST - 18 THROUGH ST - 20 PROFILE

ST - 18 NORTH WALL PROFILE



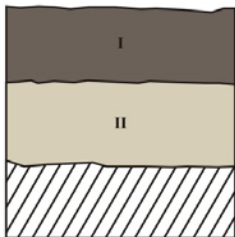
- I** - LAYER I: DARK GRAYISH BROWN (10 YR 4/2) LOAM, WEAK VERY FINE SUB-BLOCKY, FEW MICRO TO FINE ROOTLET, VERY FEW BASALT GRAVEL ROCKS, SMOOTH ABRUPT BOUNDARY, NO CULTURAL REMAINS.
- II** - LAYER II: LIGHT YELLOWISH BROWN (10 YR 6/4) SAND, WEAK VERY FINE SINGLE GRAIN, VERY FEW MICRO TO MEDIUM ROOTLET, NO CULTURAL REMAINS.

ST - 19 EAST WALL PROFILE



- I** - LAYER I: DARK GRAYISH BROWN (10 YR 4/2) LOAM, WEAK VERY FINE SUB-BLOCKY, COMMON MICRO TO CRUSHED ROOTLET, COMMON CORAL GRAVEL ROCKS, WAVY ABRUPT BOUNDARY, NO CULTURAL REMAINS.
- II** - LAYER II: LIGHT YELLOWISH BROWN (10 YR 6/4) SAND, WEAK VERY FINE SUB-BLOCKY, VERY FEW MICRO TO MEDIUM ROOTLET, NO CULTURAL REMAINS.

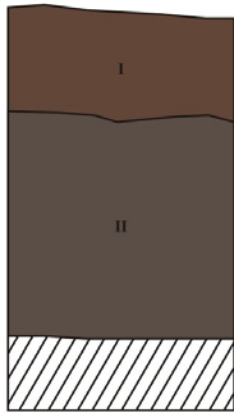
ST - 20 NORTH WALL PROFILE



- I** - LAYER I: DARK GRAYISH BROWN (10 YR 4/2) LOAM, MODERATE VERY FINE SUB-BLOCKY, COMMON MICRO TO MEDIUM ROOTLET, VERY FEW BASALT GRAVEL ROCKS, SMOOTH ABRUPT BOUNDARY, NO CULTURAL REMAINS.
- II** - LAYER II: PALE YELLOW (2.5 Y 8/2) SAND, WEAK VERY FINE SINGLE GRAIN, VERY FEW MICRO TO FINE ROOTLET, VERY FEW LIMESTONE GRAVEL ROCKS, NO CULTURAL REMAINS.

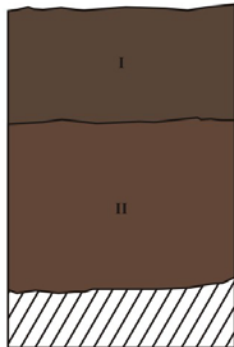
ST - 21 THROUGH ST - 22 PROFILE

ST - 21 NORTH EAST WALL PROFILE



- I** - LAYER I: DARK BROWN (7.5 YR 3/4) SILTY CLAY LOAM, WEAK VERY FINE SUB-BLOCKY, FEW MICRO TO CORSE ROOTLET, FEW BASALT COBBLE GRAVEL PEBBLE ROCKS, SMOOTH CLEAR BOUNDARY, NO CULTURAL REMAINS.
- II** - LAYER II: DARK BROWN (7.5 YR 3/2) SILTY CLAY, WEAK VERY FINE SUB-BLOCKY, VERY FEW MICRO TO MEDIUM ROOTLET, VERY FEW BASALT COBBLE PEBBLE ROCKS, NO CULTURAL REMAINS.

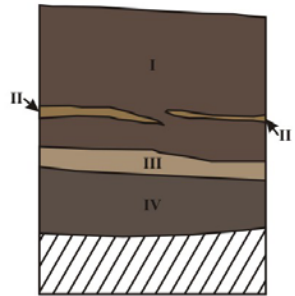
ST - 22 NORTH WEST WALL PROFILE



- I** - LAYER I: DARK BROWN (7.5 YR 3/3) SILTY CLAY LOAM, WEAK VERY FINE SUB-BLOCKY, FEW MICRO TO MEDIUM ROOTLET, FEW BASALT BOLDER COBBLE PEBBLE ROCKS, SMOOTH CLEAR BOUNDARY, NO CULTURAL REMAINS.
- II** - LAYER II: DARK BROWN (7.5 YR 3/4) SILTY CLAY, WEAK VERY FINE SUB-BLOCKY, VERY FEW MICRO TO FINE ROOTLET, NO CULTURAL REMAINS.

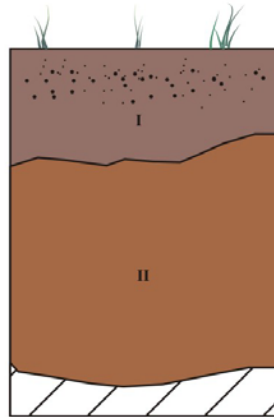
ST - 23 THROUGH ST - 27 PROFILE

ST - 23 PROFILE

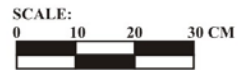


- I** - LAYER I: DARK REDDISH BROWN (5 YR 3/3) LOAM, MODERATE VERY FINE SUB-BLOCKY, FEW MICRO TO MED ROOTLET, VERY FEW SUB BASALT PEBBLE ROCKS, WAVY ABRUPT BOUNDARY, MODERN TRASH MATERIALS.
- II** - LAYER II: YELLOWISH BROWN (10 YR 5/6) SAND, WEAK VERY FINE SINGLE GRAIN, VERY FEW MICRO TO FINE ROOTLET, SMOOTH ABRUPT BOUNDARY, NO CULTURAL REMAINS.
- III** - LAYER III: LIGHT YELLOWISH BROWN (10 YR 6/4) SAND, WEAK VERY FINE SINGLE GRAIN, VERY FEW MICRO TO FINE ROOTLET, SMOOTH ABRUPT BOUNDARY, NO CULTURAL REMAINS.
- IV** - LAYER IV: DARK BROWN (7.5 YR 3/2) SILTY CLAY, WEAK VERY FINE SUB-BLOCKY, VERY FEW MICRO TO FINE ROOTLET, NO CULTURAL REMAINS.

TYPICAL PROFILE TO ST - 24 THROUGH ST - 27



- I** - LAYER I: REDDISH BROWN (2.5 YR 5/4) PLOW ZONE, CLAY/ ROOTS. NO CULTURAL MATERIAL.
- II** - LAYER II: YELLOWISH RED (5 YR 5/8) COMPACT CLAY/ NO ROOTS. NO CULTURAL MATERIAL.



**APPENDIX C: SELECTED ARTIFACT PHOTOGRAPHS**



DSC03206\_REV: Field Bag 96-Basalt Adze Preform (left), Field Bag 7-Basalt Chisel (middle), Field Bag 49-Basalt Adze (right).





DSC03208\_REV: Field Bag 73-Basalt Cobble Uniface (upper left), Field Bag 79-Basalt Graver (upper right), Field Bag 70-Edge Altered Basalt Flake (lower left), Field Bag 14-Basalt Core (lower right).

**APPENDIX E**  
**CULTURAL IMPACT ASSESSMENT REPORT**



**A DRAFT CULTURAL IMPACT ASSESSMENT  
ON SEVERAL PARCELS LOCATED IN  
WAILUA AHUPUA`A, PUNA DISTRICT,  
KAUA`I ISLAND, HAWAII  
[TMK 3-9-06; 3-9-02]**

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September 2007

Prepared For:  
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## INTRODUCTION

At the request of Colette Sakoda of Environet, Inc., Scientific Consultant Services, Inc. (SCS) conducted a Cultural Impact Assessment, on several parcels (TMK: 3-9-06; 3-9-02) located in Wailua Ahupua`a, Puna District, Kaua`i Island (Figure 1). According to documents supplied by Ms. Sadoka, the project consists of proposed resort and commercial development on the *makai* side of Kūhiō Highway and residential, community, and commercial on the *mauka* side of the highway (Figure 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 requires the State to “protect all rights, customarily and traditionally exercised for subsistence, cultural and religious purposes and possessed by *ahupua`a* tenants who are descendants of native Hawaiians who inhabited the Hawaiian Islands prior to 1778” (2000). In spite of the establishment of the foreign concept of private ownership and western-style government, Kamehameha III (Kauikeaouli) preserved the 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 Hawaii (2000) with House Bill 2895, relating to Environmental Impact Statements, proposes that:

...there is a need to clarify that the preparation of environmental assessments or environmental impact statements should identify and address effects on Hawaii’s culture, and traditional and customary rights... [H.B. NO. 2895].

Act 50 requires state agencies and other developers to assess the effects of proposed land use or shore line developments on the “cultural practices of the community and State” as part of the HRS Chapter 343 environmental review process (2001). Its

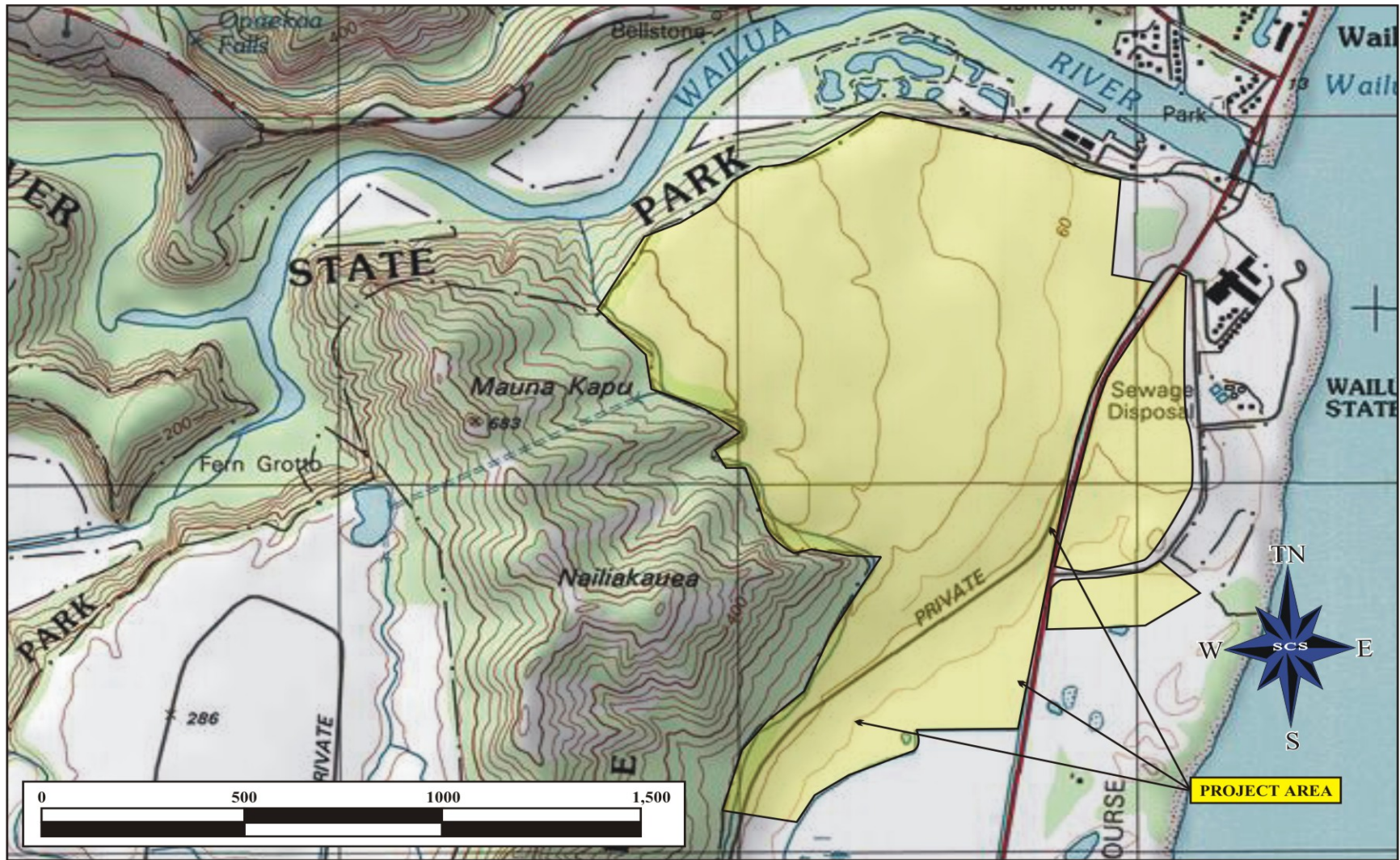
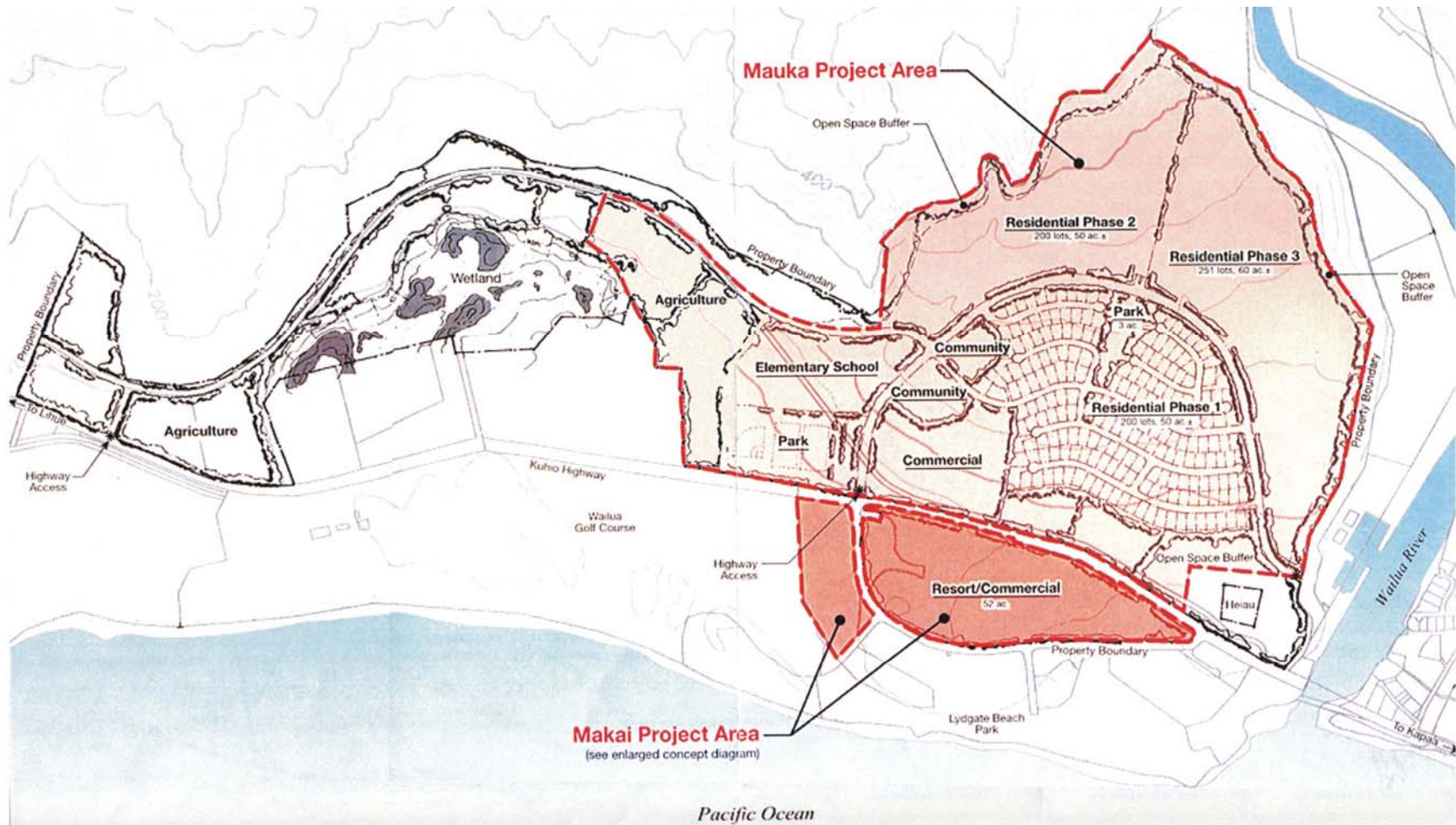


Figure 1: USGS Quadrangle Map Showing Project Area Location.



**Figure 2: Plan View Map of Project Area.**



purpose has broadened, “to promote and protect cultural beliefs, practices and resources of native Hawaiians [and] other Ethnic groups, and it also amends the definition of ‘significant effect’ to be re-defined as “the sum of effects on the quality of the environment including actions that are...contrary to the State’s environmental policies...or adversely affect the economic welfare, social welfare, or cultural practices of the community and State” (H.B. 2895, Act 50, 2000).

Thus, Act 50 requires an assessment of cultural practices to be included in the Environmental Assessments and the Environmental Impact Statements, and to be taken into consideration during the planning process. The concept of geographical expansion is recognized by using, as an example, “the broad geographical area, e.g. district or *ahupua`a*” (OEQC 1997). It was decided that the process should identify ‘anthropological’ cultural practices, rather than ‘social’ cultural practices. For example, *limu* (edible seaweed) gathering would be considered an anthropological cultural practice, while a modern-day marathon would be considered a social cultural practice.

According to the Guidelines for Assessing Cultural Impacts established by the Hawaii State Office of Environmental Quality Control (OEQC 1997):

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

This Cultural Impact Assessment involves evaluating the probability of impacts on identified cultural resources, including values, rights, beliefs, objects, records, properties, and stories occurring within the project area and its vicinity (H.B. 2895, Act 50, 2000).

## **METHODOLOGY**

This Cultural Impact Assessment was prepared in accordance with the methodology and content protocol provided in the Guidelines for Assessing Cultural Impacts (OEQC 1997). In outlining the “Cultural Impact Assessment Methodology”, the OEQC stated:

...information may be obtained through scoping, community meetings, ethnographic interviews and oral histories... (1997).

The report contains archival and documentary research, as well as communication with organizations having knowledge of the project area, its cultural resources, and its practices and beliefs. This Cultural Impact Assessment was prepared in accordance with the methodology and content protocol provided in the Guidelines for Assessing Cultural Impacts (OEQC 1997). The assessment concerning cultural impacts should address, but not be limited to, the following matters:

- (1) a discussion of the methods applied and results of consultation with individuals and organizations identified by the preparer as being familiar with cultural practices and features associated with the project area, including any constraints or limitations which might have affected the quality of the information obtained;
- (2) a description of methods adopted by the preparer to identify, locate, and select the persons interviewed, including a discussion of the level of effort undertaken;
- (3) ethnographic and oral history interview procedures, including the circumstances under which the interviews were conducted, and any constraints or limitations which might have affected the quality of the information obtained;
- (4) biographical information concerning the individuals and organizations consulted, their particular expertise, and their historical and genealogical relationship to the project area, as well as information concerning the persons submitting information or interviewed, their particular knowledge and cultural expertise, if any, and their historical and genealogical relationship to the project area;
- (5) a discussion concerning historical and cultural source materials consulted, the institutions and repositories searched, and the level of effort undertaken, as well as the particular perspective of the authors, if appropriate, any opposing views, and any other relevant constraints, limitations or biases;
- (6) a discussion concerning the cultural resources, practices and beliefs identified, and for the resources and practices, their location within the broad geographical area in which the proposed action is located, as well as their direct or indirect significance or connection to the project site;
- (7) a discussion concerning the nature of the cultural practices and beliefs, and the significance of the cultural resources within the project area, affected directly or indirectly by the proposed project;
- (8) an explanation of confidential information that has been withheld from public disclosure in the assessment;
- (9) a discussion concerning any conflicting information in regard to identified cultural resources, practices and beliefs;

- (10) an analysis of the potential effect of any proposed physical alteration on cultural resources, practices or beliefs; the potential of the proposed action to isolate cultural resources, practices or beliefs from their setting; and the potential of the proposed action to introduce elements which may alter the setting in which cultural practices take place, and;
- (11) the inclusion of bibliography of references, and attached records of interviews, which were allowed to be disclosed.

Based on the inclusion of the above information, assessments of the potential effects on cultural resources in the project area and recommendations for mitigation of these effects can be proposed.

### **ARCHIVAL RESEARCH**

Archival research focused on a historical documentary study involving both published and unpublished sources. These included legendary accounts of native and early foreign writers; early historical journals and narratives; historic maps and land records such as Land Commission Awards, Royal Patent Grants, and Boundary Commission records; historic accounts, and previous archaeological project reports.

### **INTERVIEW METHODOLOGY**

Interviews are conducted in accordance with Federal and State laws and guidelines. Individuals and/or groups who have knowledge of traditional practices and beliefs associated with a project area or who know of historical properties within a project area are sought for consultation. Individuals who have particular knowledge of traditions passed down from preceding generations and a personal familiarity with the project area are invited to share their relevant information. Often people are recommended for their expertise, and indeed, organizations, such as Hawaiian Civic Clubs, the Island Branch of Office of Hawaiian Affairs, historical societies, Island Trail clubs, and Planning Commissions are depended upon for their recommendations of suitable informants. These groups are invited to contribute their input, and suggest further avenues of inquiry, as well as specific individuals to interview.

If knowledgeable individuals are identified, personal interviews are sometimes taped and then transcribed. These draft transcripts are returned to each of the participants for their review and comments. After corrections are made, each individual signs a release form, making the information available for this study. When telephone interviews occur, a summary of the information is often sent for correction and approval, or dictated by the informant and then incorporated into the document. Key topics discussed with the interviewees vary from project to project, but usually include: personal association to the *ahupua`a*, land use in the project's vicinity; knowledge of traditional trails, gathering areas, water sources, religious sites; place names and their meanings; stories that were handed down concerning special places or events in

the vicinity of the project area; evidence of previous activities identified while in the project vicinity.

In this case, letters briefly outlining the development plans along with maps of the project area were sent to individuals and organizations whose jurisdiction includes knowledge of the area with an invitation for consultation. Initial Consultation was sought from Kai Markell, Office of Hawaiian Affairs (OHA), O`ahu Branch; Kanani Kagawa, Office of Hawaiian Affairs, Kaua`i Branch; Warren Perry and Gilbert Kea of The Order of Kamehameha, John Kruse of the Kaua`i Burial Council, Lionel Kaohi of the Kaumuali`i Hawaiian Civic Club, and Chris Kauwe of Historic Preservation. If cultural resources are identified based on the information received from these organizations and additional informants, an assessment of the potential effects on the identified cultural resources in the project area and recommendations for mitigation of these effects can be proposed.

A month is given as a reasonable time period in which to receive responses from contacts. Additional informants suggested by OHA, Kaua`i Branch, Liberta Albo of the Queen Debra Kapule Hawaiian Civic Club, Walter Smith of Wailua Marina, Valentine Aka, Mark Boiser (a telephone call), and Kumu Hula, Beverly Muraoka, did not have the allotted time period before the DCIA was due. Therefore, this is considered a Draft report in the event more information will be forthcoming from further knowledgeable individuals.

### **PROJECT AREA AND VICINITY**

The site is located *mauka* of Lydgate Beach Park and is bordered on the north by Wailua River State Park, to the east Lydgate Beach Park, Hau`ola, identified as a *pu`uhonua*, or Place of Refuge, and Hikinaokalā Heiau, to the south by old sugar cane lands, and to the west by Kalepa Forest Reserve, including Nā`ili Ka`auea and Mauna Kapu (Figures 3 and 4).

### **CULTURAL HISTORICAL CONTEXT**

#### **PAST POLITICAL BOUNDARIES**

Kaua`i is the fourth largest and the oldest of the main Hawaiian Islands. It is the only island not susceptible to drought and famine due to the rivers and streams constantly replenished by waters from Mount Wai`ale`ale, one of the wettest spots on Earth. It is said that many years ago, the fire goddess Pele and her family briefly stopped on Kaua`i to explore the possibility of finding a permanent home. She dug a deep pit, but it was instantly fill with water so they left Kaua`i and traveled on, eventually settling in Halema`uma`u where she resides to this day (Beckwith 1976).

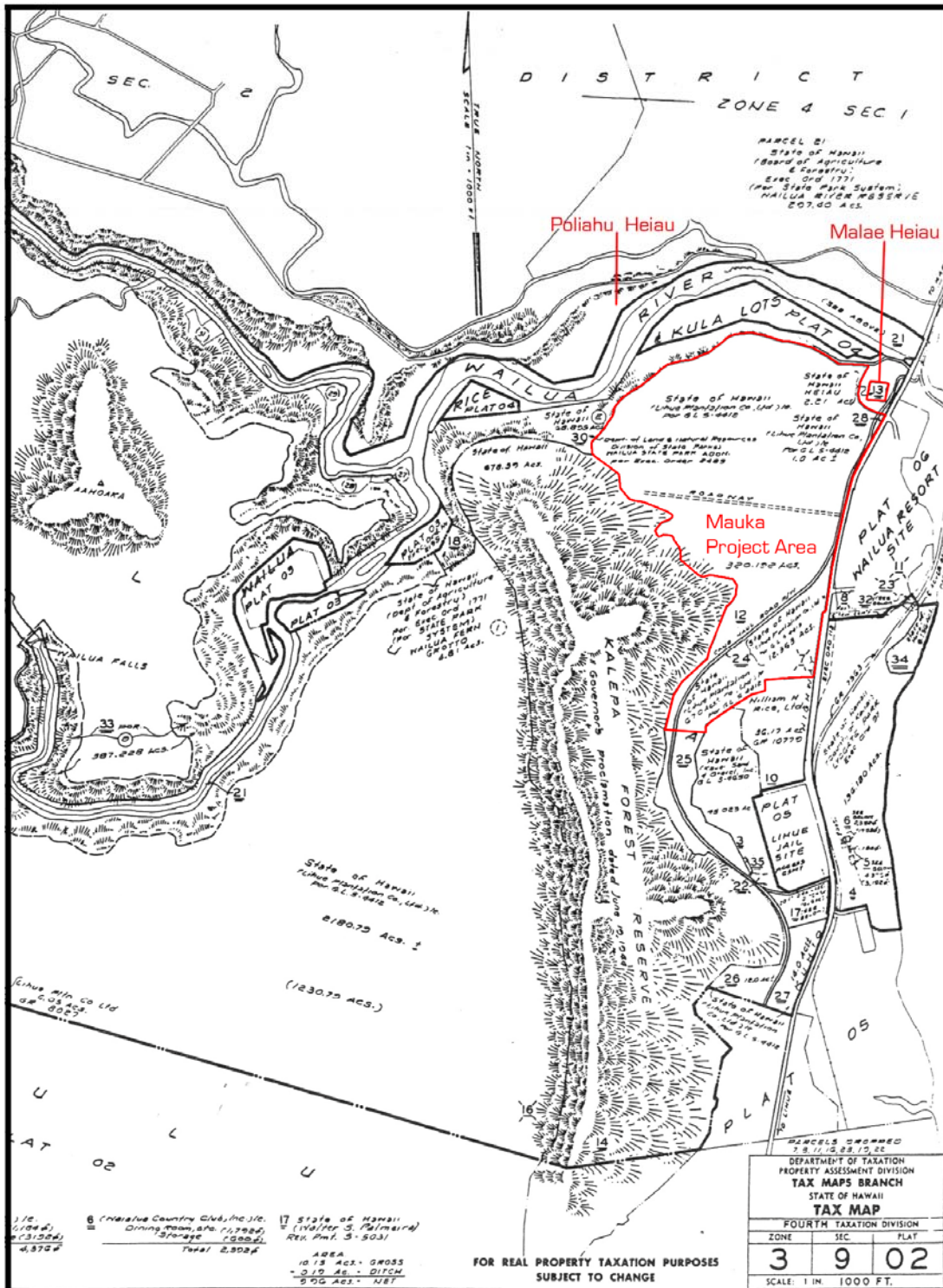


Figure 3: Tax Map Key [TMK] Showing Mauka Project Area.

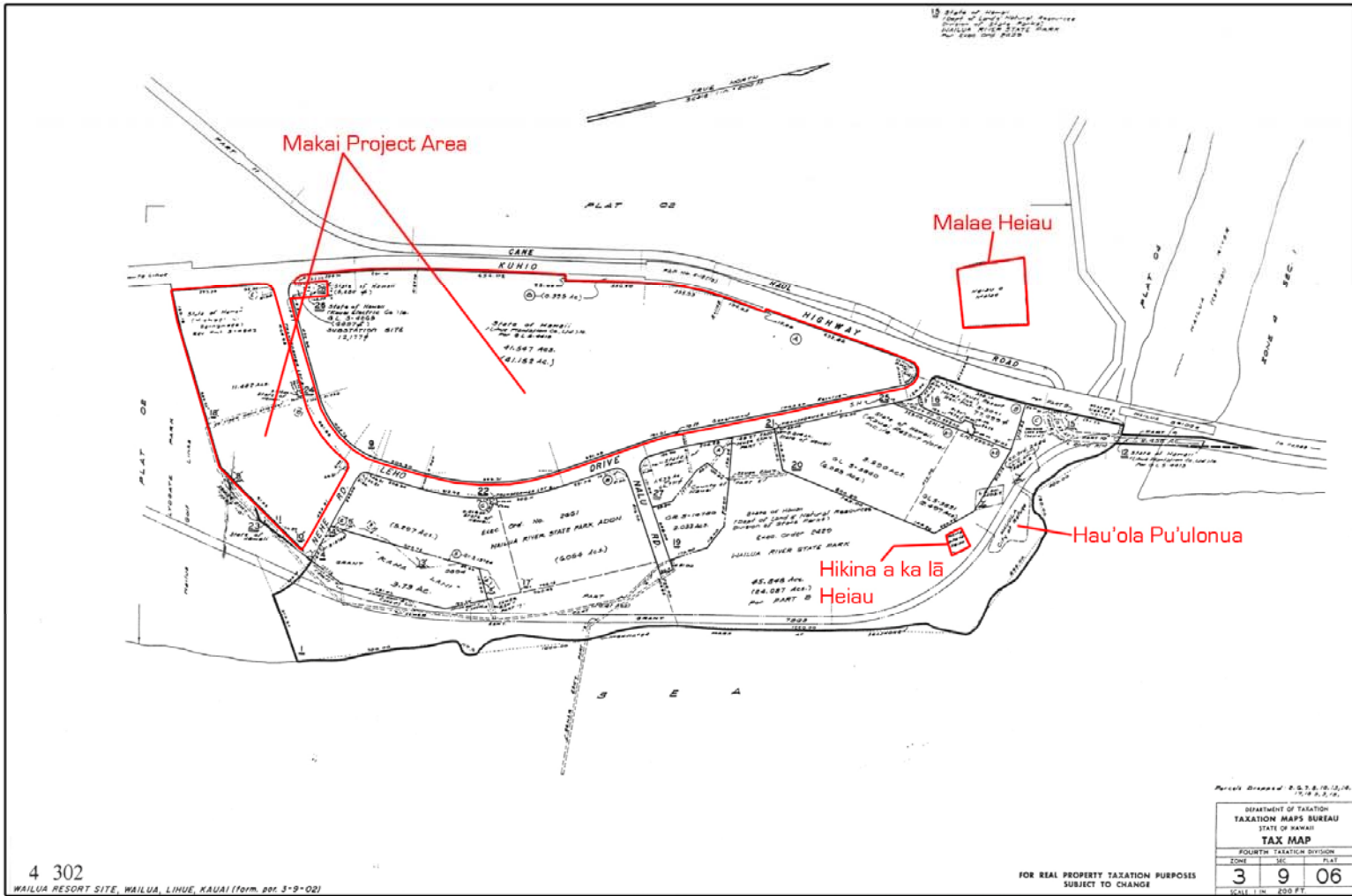


Figure 4: Tax Map Key [TMK] Showing Makai Project Area.

Although greatly desired for its fecundity and the genealogical purity of its ruling chiefs, Kaua`i remained unconquered and politically independent. By A.D. 1300, Kaua`i had formed six large political districts, or *moku*: East and West Kona, Puna, Ko`olau, Halele`a, and Nāpili. Land was considered 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. The 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, distributed smaller parcels to lesser chiefs. The *maka`āinana* (commoners) worked the individual plots of land.

In general, several terms, such as *moku*, *ahupua`a*, *`ili* or *`ili`āina* were used to delineate 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. Ideally, this situation 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 to importance to the *ahupua`a* and were administered by the chief who controlled the *ahupua`a* in which it was 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 a *ahupua`a* was called a *kuleana* (Lucas 1995:61). The project area is located in the *ahupua`a* of Wailua, meaning literally “two waters” (Pukui *et al.* 1974:224).

## **TRADITIONAL SETTLEMENT PATTERNS**

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 and Sahlins 1992, Vol. 1:5, 119; Kirch 1985).

At Wailua, both terrestrial and marine resources were available to support successive royal courts and a thriving population. As Wailua River is the largest river in the Hawaiian Islands, the abundance of freshwater and fertile agricultural terraces along its North and South

Forks and `Ōpaeka`a Stream made this *ahupua`a* an ideal location for the ruling chiefs and their many *kaukauali`i* (lesser chiefs; Handy and Handy 1972). The extensive irrigated taro fields, the fishponds constructed behind the dunes, (e.g., *loko pu`uone*), sweet potato growing along the coastal plain, and the marine resources of Wailua Bay provided the subsistence base needed to support the developing ruling center. The upland areas of Wailua were resource zones favorable for procuring natural flora and fauna necessary to the manufacturing things of wood and feathers and used as medicines, adornment, and *kapa*-making.

### **WAHI PANA (LEGENDARY PLACES)**

Scattered amongst the agricultural and habitation sites of the *ali`i*, were other places of cultural significance to the *kama`āina* of the district. Trails extended from the coast to the mountains, linking the two for both economic and social reasons. Most of the *ahupua`a* on the eastern coast of Kaua`i have been overshadowed by Wailua Ahupua`a that was the principal residence as well as administrative and religious center of Kaua`i's paramount chief, or *ali`i nui* for most of the year (Hadley 1970). The sites and features of Wailua are associated with legends, rulers, and events that played important roles in Hawaiian culture and are of traditional significance to present day native Hawaiians. Its eminence continued well into the historic period when King David Kalākaua trace his family's lineage back to Kawanākoa and hence, to Wailua born *ali`i*. According to The National Park Service (1989), the cultural remains in this area are some of the most important in the Hawaiian Islands with components spanning all phases of Hawaiian culture.

The *mo`olelo* are many and varied concerning Wailua. One related that an ocean voyaging canoe from southern lands arrived on Kaua`i. Their leader, Punanuikaia`āina, decided to settle on the banks of the Wailua River, calling the area "Puna" (Wichman 2003). Soon, he placed a *kapu* on land on either side of the river from the sea to Mauna Kapu, the cliffs of the Kalepa Ridge in back of the project area. Originally named Wailua-nui-a-ho`āno (great sacred Wailua), also the name of a 13<sup>th</sup> century Wailua chief, this land was suffused with *mana* and *kapu* and was considered so sacred that *maka`āinana* were not allowed access (Dickey 1916; Wichman 1998). It became an important center for the formation of marital alliances of the highest ranking *ali`i* and was where the future chiefs would be born, raised and trained, in similar function to Waipi`o on Hawai`i Island and Kualoa on O`ahu.

According to legend, the great grandchild of Punanuikaia`āina was a girl named Hina-`a-ulu-ā who married the *ali`i*, Mo`ikeha, the Pacific voyager and priest originally from O`ahu and who had just returned from Tahiti. It was the great Mo`ikeha who built Kalaeokamanu



(Holoholokū) Heiau, across the river from the project area, which bestowed special blessings on all who were born within its precincts. This *heiau* is considered the oldest manmade temple on Kaua`i.

The cultural importance of Wailua has been illustrated in the area's numerous legends and historical traditions suggesting that many items and cultural practices from southern Polynesian islands were first introduced at Wailua, such as the first sharkskin temple drum (*pahu*), used in announcing the birth of an *ali`i* child, and *luakini* traditions practiced at Holoholokū. Mo`ikeha may have introduced the first taro (*kalo*) and sweet potato (*`uala*) to this region (Fornander 1916).

Holoholokū Heiau, traditionally known as Kalaeokamanu Heiau (Crest of the Bird) was a *luakini heiau* dedicated to Kū and was said to have been built by Mo`ikeha. The Pōhaku Pilo, or sacrificial stone where the offerings would have been placed is still in place to this day. Believed to have been built prior to A.D. 1200, it had legendary connections to unknown southern Polynesian islands from where the custom of human sacrifice had been brought. Associated with the birthstones (Pōhaku Ho`ohānau) and ceremonial niche, Pōhaku Piko, for the hiding of the newborn's umbilical cord and used for generations of *ali`i*, this *heiau* was considered especially sacred. The shark skin drum (named Kukaniloko), said to have been brought from Kahiki by La`amaikahiki. Mo`ikeha's foster son, and placed here, would announce the birth of a new *ali`i*. Although Kalaeokamanu functioned as a *luakini* in late pre-Contact period, `I`i stated that it also functioned as a *pu`uhonua* in the early historic period (1959). `I`i (1959) stated Kalaeokamanu was known as place of refuge (*pu`uhonua*), although Kamakau (1964) stated that all the lands of Wailua were *pu`uhonua*.

A chant incorporated in the *mo`olelo* of Kawelo expresses unequivocally the importance of the Pōhaku Ho`ohānau (birthstones) associated with Kalaeokamanu, to any *ali`i* who wished to eventually rule Puna.

Hanau ke `ili iloko o Holoholoku he alii nui;  
Hanau ke kanaka iloko o Holoholoku, he alii no;  
Hanau ke alii nui mawaho a`e Holoholoku, a`ohe alii, he kanaka ia!

The child of a chief born at Holoholoku is a high chief;  
The child of a commoner born at Holoholoku becomes a chief, also;  
The child of a high chief born outside Holoholoku is no chief, a commoner he!

The significance of the *ali`i* chiefs born at the Pōhaku Ho`ohānau was illustrated by Fornander:

That the ruling families of Kauai were the highest tabu chiefs in the group is evident from the avidity with which chiefs and chiefesses of the other islands sought alliance with them. They were always considered as the purest of the “blue blood” of the Hawaiian aristocracy . . . [1969:Vol II: 291].

Kikuchi has recorded a tradition concerning the *ali`i* born at Pōhaku Ho`ohānau that states:

. . . If the child really were a great chief, the heavens allegedly would burst forth with thunder and lightning, and there would be a heavy downpour of rain. The rainbow would arch over the area, with one end indicating the spot where the child had been born [1976:9]

Hikinaakalā Heiau is located on the coast directly to the north of the proposed *makai* project area slated to contain resort and commercial development. According to oral tradition, Hikinaakalā Heiau (The rising of the Sun) was built by *menehune* and is associated with Wainuiahoano, a ruling chief who ordered its construction in the time of Mo`ikeha (Kikuchi 1974). This *heiau* along with Kalaekamanu/ Holoholukū, and Malae Heiau, also have a connection with the southern islands of the Pacific. Indeed, there are distinctive construction features attributed to these three *heiau* that are unique to the Hawaiian Islands and may have arrived when Mo`ikeha returned from his travels. In addition, Hikinaakalā is believed to contain burials. The ancient place name for this beach was “Hau`ola”, which has come to designate the *pu`uhonua* (place of refuge during war) that is thought to be located at the north end of the structural complex. Historic records are not as clear about the location and extent of the *pu`uhonua* or place of refuge which was supposedly an integral part of the Wailua Ahupua`a and ruling center. Some suggest that the *pu`uhonua* was known as Hau`ola and was the area around Hikinaakalā Heiau (Bennett 1931:125; Dickey 1917:15-16). However, some Hawaiian scholars suggested that the entire *ahupua`a* of Wailua was a *pu`uhonua* (Kamakau 1976:17).

After inter-island wars, island *pu`uhonua* would often be changed as political circumstances placed new land sections under new chiefs. It was known that Kamehameha I abolished the old locations of *pu`uhonua*, establishing his own (including his favorite wife, Ka`ahumanu). However, Kaua`i was never conquered by Kamehameha, so the *pu`uhonua* lands are some of the few that remained in place under the hereditary chiefs (Kamakau 1964). This is a rare occurrence, allowing its history to be traced back many generations and establishing a connection of constancy in this sacred place.

Ka pae ki`i mahu o Wailua are petroglyph boulders located at the mouth of the Wailua river and were said to be surfers that felt the anger of Kapo, the sister of Pele. Several stories have survived describing their significance.

It was told that Pele's sister, Kapo `ula kīna`u, and her entourage traveled from Ni`ihau to Wailua where they watched a surfing contest. Maka`iwa was the name of the famous surf break where the men invited Kapo and her sisters to join them. On the first wave, they rode in pairs with the men. On the second wave, they left the men behind, landing on the beach by using their supernatural powers. The third wave, as big as a mountain, threw the men under the water where they were crushed. They were then turned into the boulders at the mouth of the Wailua River and are now known as "the row of images" (Kikuchi 1984).

Another explanation for the sacredness of these boulders involved Maui the demigod and his eight brothers (Dickey 1917; Colum 1960). Maui wanted to bring all the Hawaiian Islands together, but needed the help of a powerful fish named Lu`ehu who could bring the islands together. Maui and his eight brothers would venture out every month on the night of Lono, the only night when it was said he could be caught. His mother, Hina, had warned him to not disturb any canoe bailing bucket floating in the water at the mouth of the river as it would be his beautiful sister, Hinakeka`a. However, Maui saw the floating bailer and picked it up, and hid it after telling his brothers not to look behind them on pain of death. Hidden in back of Maui, the bailer turned into a beautiful woman. Once Lu`ehu was caught, the islands began to move together. Great crowds gathered on the shores of O`ahu to watch as the island moved closer to Kaua`i. All was fine until the brothers heard the throng praise the beauty of the woman sitting with Maui. Immediately, all the brothers turned to look, the great fish came off the hook and the islands moved apart. When Maui and his brothers returned to Wailua, the brothers were turned into stones and set across the mouth of the river.

A *hula* was associated with the petroglyph rocks and some previously standing wooden images. It was chanted by children even into the 20<sup>th</sup> century as they returned to the beach from a swim:

Poki` ke ki`i,  
Ho`oki`iki`I ke ki`i,  
Ho`ona`ana`a ke ki`i,  
Ho`oualehe ke ki`i,  
Kaunalewa ke ki`i,  
Hi`uwai i Wailua,

The Poki`i dance of the images,  
The images that tilt,  
The images with protruding abdomen,  
The images with knees spread out and bent,  
The images that sway,  
Is this row of sexless images,

Ua ike a.

They are well known.

Located directly to the east of phase one of the project area and to the north of resort/commercial coastal development, is Malae Heiau, reputed to be built by *menehune* and was traditionally connected to Poli`ahu, inland, high on a bluff. Thrum recorded, “. . . The companion heiau of Malae was Poliahu situated some little distance from it, further inland, but the two were in plain site of each other.” Malae is the largest remaining *heiau* on Kaua`i and one of the largest in Hawai`i.

*Mo`olelo* have said that Malae Heiau was also built in the time of Mo`ikeha when Wailuanuihoano ruled, c. A.D. 1200. The granddaughter of Mo`ikeha, named Ka`ililauokekoa, was reputedly born in a part of Malae Heiau closest to the sea. She was courted by Kauakahiali`i who invented the first *`ohehanoihu* (nose flute) from a type of bamboo still growing in Wailua. With his skillful playing of the flute named “Kanikawi”, he lured Ka`ililauokekoa from Malae to his house made of flowering *`ōhi`a lehua* decorated with red feathers in Pihanakalani in the uplands (Dickey 1916).

Poli`ahu Heiau was one of the *luakini* class and the personal temple of the paramount chief who preformed the principal royal rituals. Located on the mountain above the valley, it overlooks all other *heiau* including Malae with which it was associated, and the proposed project area (National Park Service 1989). Although of exceptional size, its construction was also attributed to the *menehune*. Nearby, was the Bellstone thought to have been drummed when announcing the approach of chiefly or religious processions arriving along the ancient trail (now the paved road) that led from the coast to the mountains and connected a series of *heiau* and that were immensely significant during the annual *makahiki* celebration as well as during other state occasions. It is also associated with the time of Mo`ikeha and is thought to have been constructed, along with Malae and Hikinaakalā Heiau, c. A.D. 1200 (Yent 1989).

It would seem these sacred structures were re-dedicated from time to time to allow them continual use into the post-Contact period, which undoubtedly helped preserve the traditional lore and chiefly associations alive in *mo`olelo*, as well as preserving *mo`o kū`auhau* (genealogies).

## **HISTORIC LAND USE**

While early contact on Kaua`i took place on the western side of the island at Waimea, Captain Vancouver (1791:221-222) recorded the following brief observations of Wailua:

“This part seemed to be very well watered, as three other rapid small streams were observed to flow into the sea within the limits above mentioned. This portion Attouai, the most fertile and pleasant district of the island, is the principal residence of the King, or, in his absence, of the superior chief, who generally takes up his abode in an extensive village, about a league to the southward of the north-east point of the island.”

## THE GREAT MĀHELE

In the 1840s, traditional land tenure shifted drastically with the introduction of private land ownership based on Western law. While it is a complex issue, many scholars believe that in order to protect Hawaiian sovereignty from foreign powers, Kauikeaouli (Kamehameha III) was forced to establish laws changing the traditional Hawaiian economy to that of a market economy (Kame`eleihiwa 1992:169–70, 176; Kelly 1983:45, 1998:4; Daws 1962:111; Kuykendall 1938 Vol. I:145). The Great 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, *`okipū* (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 were issued a Royal Patent after which they could take possession of the property (Chinen 1961:16). Only 25 individuals were awarded their claims in Wailua amounting to approximately 75 acres. The rest of the Wailua lands were kept by Kauikeaouli (Kamehameha III) as Crown Lands.

During the Great Māhele of 1848, Debora Kupule, previously married to Kaumuali`i last king of Kaua`i, and their son claimed a large portion of lower Wailua lands, including the fishponds and the Kalaeokamanu (Holoholokū) area where Kapule, as an *ali`i*, was born and had her house site (Stauffer 1993:87-90). Much of this land was given to her from Ka`ahumanu in her capacity of *kuhina nui* (prime minister) after the death of Kamehameha. Other *kuleana* were claimed by individuals on the flat agricultural lands *makai* of `Ōpaeka`a Stream. Almost all the claimants received their lands from Kapule. Three claims in the area of Malae Heiau and Hikinaakalā Heiau formed the village of Makaukue on the southern riverbank (*ibid.* 113).

By the end of the 19<sup>th</sup> century, much of the land was utilized for sugar cane, ranching, and rice cultivation endeavors, the latter predominantly done by Chinese farmers (The Garden Isle, 2/23/1932).

In the 1920s a railroad was laid from Anahola to Hanama`ulu to transport sugar, labor, and freight. This railroad ran along the shoreline near the present project area. A section of the Ahukini Terminal and Railway Co. railroad was constructed through the present golf course area. The railroad track is shown on the Lihu`ē Plantation Co. map, Lihu`ē & Hanamaulu Sections, May 1941 (Condé 1973:168) (Figure 5). Lydgate Park, occurring just to the north of the present project area, was created in 1923.

### **CIA GUIDLINES**

The “level of effort undertaken” to identify potential effect by a project to cultural resources, places or beliefs (OEQC 1997) has not been officially defined and is left up to the investigator. A good faith effort can mean contacting agencies by letter, interviewing people who may be affected by the project or who know its history, research identifying sensitive areas and previous land use, holding meetings in which the public is invited to testify, notifying the community through the media, and other appropriate strategies based on the type of project being proposed and its impact potential. 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 present parcel, letters of inquiry were sent to organizations whose expertise would include the project area. Consultation was sought from Kai Markell, Office of Hawaiian Affairs, O`ahu Branch; Kanani Kagawa, Office of Hawaiian Affairs, Kaua`i Island; Warren Perry and Gilbert Kea of The Order of Kamehameha, John Kruse of the Kaua`i Burial Council, Lionel Kaohi of the Kaumuali`i Hawaiian Civic Club, and Chris Kauwe of Historic Preservation. The Office of Hawaiian Affairs, Kaua`i Branch suggested a number of individuals and subsequently, additional letters were sent to Liberta Albo of the Queen Debra Kapule Hawaiian Civic Club, Walter Smith of Wailua Marina, Valentine Aka, Mark Boiser (a telephone call), and Kumu Hula, Beverly Muraoka.

Historical and cultural source materials were extensively used and can be found listed in the References Cited portion of the report. Such scholars as I`i, Kamakau, Beckwith, Chinen, Kame`eleihiwa, Fornander, Kuykendall, Kelly, Handy and Handy, Puku`i and Elbert, Thrum, Sterling, and Kikuchi have contributed, and continue to contribute to our knowledge and understanding of Hawai`i, past and present. The works of these and other authors were

# LIHUE PLANTATION Co. LIHUE & HANAMAULU SECTIONS

Enlarged and Traced by Pedro T. Victoria  
May, 1941.

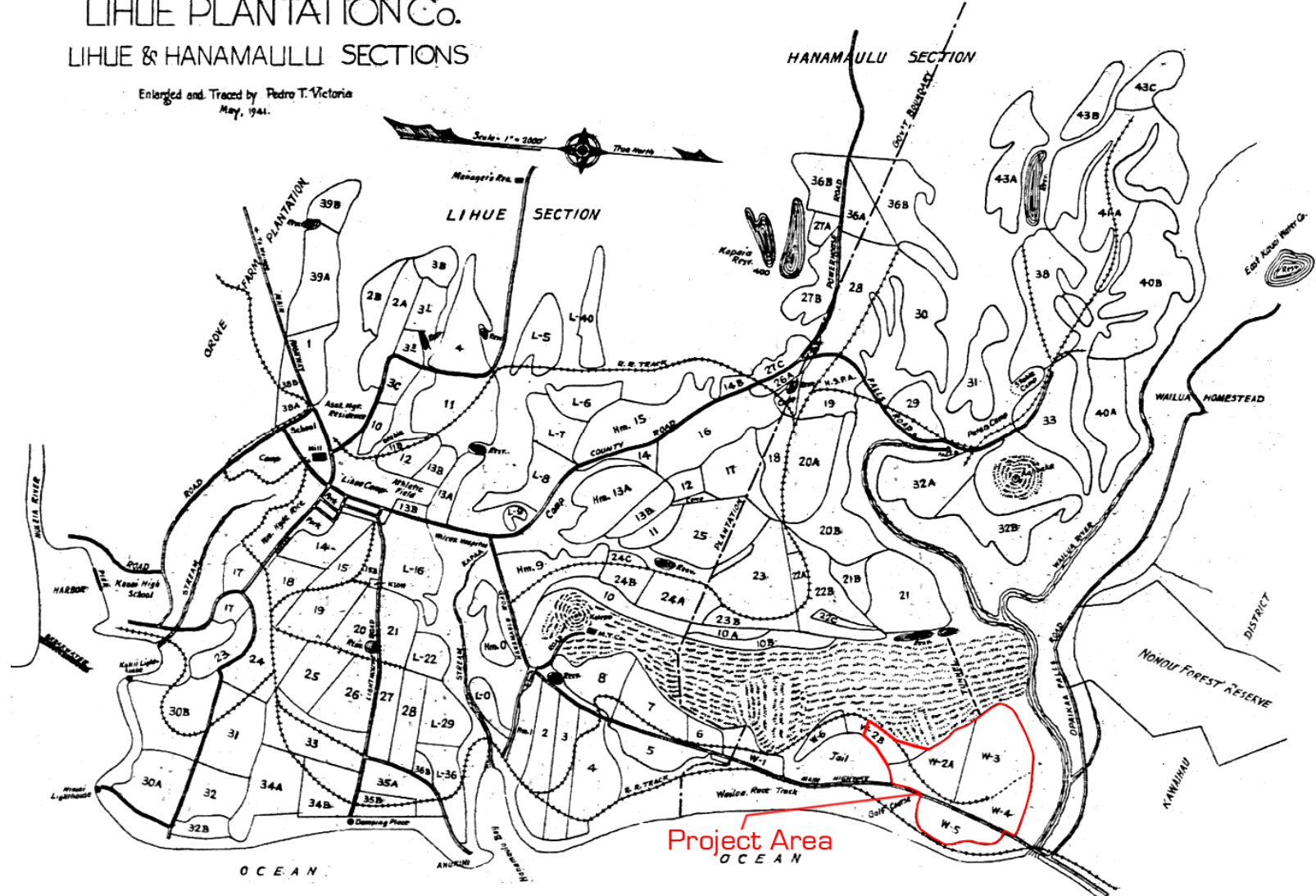


Figure 5: Lihue Plantation Co. Showing Railroad through Project Area (From Condé 1973:168).

consulted and incorporated in the report where appropriate. Land use document research was supplied by the Waihona `Aina 2007 Data base.

### **CIA INQUIRY RESPONSE**

As suggested in the “Guidelines for Accessing Cultural Impacts” (OEQC 1997), CIAs incorporating personal interviews should include ethnographic and oral history interview procedures, circumstances attending the interviews, as well as the results of this consultation. It is also permissible to include organizations with individuals familiar with cultural practices and features associated with the project area.

As stated above, consultation was sought Consultation was sought from Kai Markell, Office of Hawaiian Affairs, O`ahu Branch; Kanani Kagawa, Office of Hawaiian Affairs, Kaua`i Island; Warren Perry and Gilbert Kea of The Order of Kamehameha, John Kruse of the Kaua`i Burial Council, Lionel Kaohi of the Kaumuali`i Hawaiian Civic Club, and Chris Kauwe of Historic Preservation. The Office of Hawaiian Affairs, Kaua`i Branch suggested a number of individuals and subsequently, additional letters were sent to Liberta Albo of the Queen Debra Kapule Hawaiian Civic Club, Walter Smith of Wailua Marina, Valentine Aka, Mark Boiser, and Kumu Hula, Beverly Muraoka. A month is given as a reasonable time period in which to receive responses from contacts. The informants suggested by OHA, Kaua`i Branch did not have the allotted time period before the DCIA was due. Therefore, this is considered a Draft report in the event more comments will be forthcoming from further knowledgeable individuals.

The Office of Hawaiian Affairs responded to our inquires by stating:

Two heiau within the National Historic Landmark, Malae and Hinknaakalā are immediately adjacent to the project boundary and consideration should be given to view planes and the establishment of an adequate buffer which will allow appropriate cultural protocol and/or ceremonies to occur in these areas. [letter of Sept. 7, 2007, HRD07\_3133B to Leann McGerty, Senior Archaeologist, SCS]

In addition, Environet Inc. received a letter from the Department of Land and Natural Resources (DLNR) suggesting consultation with State Parks, OHA and Na Kahu Hikina A Ka Lā. They prescribed appropriate buffers and new corridors be established “. . . to help protect these (sic) area and historic properties.” They stressed “We all must agree on what are the appropriate buffers” (Letter from DLNR to Environet, Inc, August 20, 2007).



A letter from the Division of State Parks was written to Environet, Inc. on August 8, 2007, expressing several concerns including, the protection of the cultural and historic connection between Malae and Poliahu Heiau, as the proposed project has the “. . . potential to impact the culturally significant view plane . . .”, between the two *heiau*; maintaining “. . . the natural setting for boating and recreational activities along the river, which “. . . development on the bluff along the southern riverbank has the potential to disrupt. . . .” ; and road access to Malae Heiau besides the presently used Marina Road.

The County of Kaua`i Office of Economic Development expressed numerous considerations, among which was the issue of the protection of nearby *heiau* during and after construction to minimize any damage (Letter August 3, 2007 to Environet, Inc.).

Mitigation measures recommended by the DLNR included securing appropriate buffers and view corridors to help protect the historic properties, to be done in consultation with State Parks, OHA, and Na Kahu Hikina A Ka Lā.

The Division of Parks also recommended the establishment of more appropriate buffers and view corridors around Malae Heiau, as the present ones are “. . . not adequate for preserving the historical and cultural setting of this site.” In addition, the delineation of additional open space buffers between Malae Heiau and the proposed development and an effort to maintain the view corridors between Malae Heiau and Poliahu Heiau. Figure 6 is a map illustrating the view corridor between the two *heiau* which, when compared to Figure 2, the project area, appears to impact the visual plane between the two *heiau* with a portion of Phase 1 and 3 residential developments.

## **DISCUSSION**

A requirement of the OEQC (No. 10, 1997) is an analysis of the potential effect of the proposed project on cultural resources, practices or beliefs, the proposed project’s potential to isolate cultural resources, practices or beliefs from their setting, and the potential of the proposed project to introduce elements which may alter the setting in which cultural practices take place. The visual impact of the proposed project from surrounding vantage points, notably the *heiau*, and its potential impact on these culturally affiliated resources is of major concern for the proposed project. Other than Punalu`u on Hawaii Island, the *heiau* complex at Wailua has been

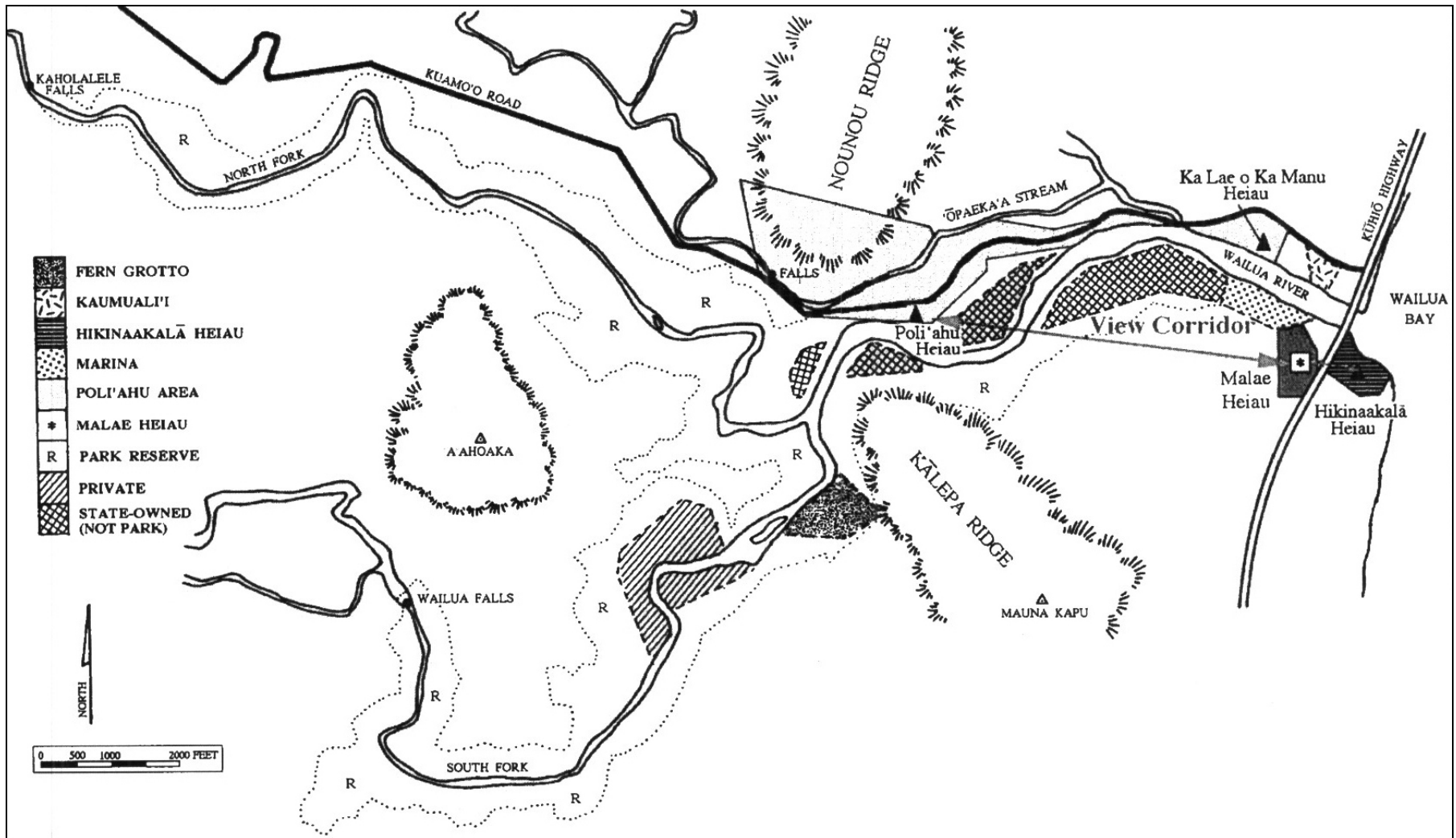


Figure 6: Map Showing View Corridors Between Poliahu and Malae Heiau (From Dept. of Land and Natural Resources, Aug. 8, 2007).

one of the few places where one can enjoy a relatively unaltered view from one *heiau* to another and where the integrity of the landscape has been mostly retained.

Hawai`i Revised Statutes (HRS) § 198-1(2) discusses the importance of preserving and protecting the structural integrity and physical appearance of cultural landscapes, resources, and sites which perpetuate indigenous native Hawaiian culture. Indirectly, a development may not seem to necessarily impose a negative cultural impact, especially when located on previous agricultural parcels. However, it is known that Wailua Ahupua`a has been sacred to the *ali`i* of Kaua`i since at least the 1200s (or, to place this time period from an European perspective, around the time of the Magna Carta). All the historical research from such primary sources as Kamakau, I`i, and Fornander agree to the significance of Wailua. The *mauka* and *makai* sections of the project area were considered *kapu* lands, established by Punanuikaia`āina, from the ocean to Mauanakapu. The *ahupua`a* was called Wailua-nui-a-ho`āno (great sacred Wailua), and it was so suffused with *mana* and *kapu* that the *maka`āinana* were not allowed access. Its sacredness and association with ancient genealogical lines of *ali`i* was extant many, many generations before western Contact and it was still venerated into historic times (Debra Kapule was born at Kalaeokamanu in 1800).

It is important to recognize that native Hawaiian cultural beliefs and practices are continually being affected by the loss of land to development that intrudes into the natural setting. Surrounding the *heiau*, once a part of a cohesive religious and political complex, with residential, commercial, and resort development alters the physical appearance of the cultural landscape which perpetuates indigenous native Hawaiian culture, as well as impacting native Hawaiian cultural practices.

State *luakini heiau*, like Poliahu, were frequently built in elevated locations in the landscape selected to impress; locations that along with the immensity of the structure, would convey a sense of power and awe. The view, to and from, Poliahu would not only include a *mauka* residential development, but busy resort and commercial enterprises on the coast. Two of the objectives of the Coastal Zone Management Act (CZMA) HRS §§ 205A-2(c)(1) and (3), include ensuring adequate public access to the shoreline and allowing for open space and scenic resources. The Makai Project Area, as it is depicted in Figure 2, not only impacts the coastal region and negates open and scenic resources, but, as it is in the view plane of Poliahu and in immediate proximity to Malae and Hikinaakalā Heiau and Hau`ola *pu`uhonua*, seriously impacts the integrity of the experience of anyone wishing to perform “constitutionally protected” (OHA

letter of September 7, 2007) native Hawaiian activities, such as traditional ceremonies and protocol at these sacred sites.

Isolation of individual features from their setting within the religious complex is another issue. All of the above listed *heiau* were a part of early integrated religious and political complex; including the *kapu* lands. The fact that modern delineations have been made does not negate the traditional association that was established in the 13<sup>th</sup> century, if not before. It is also important to recognize that native Hawaiian cultural beliefs and practices are being continually affected by the loss of land to development that intrudes into the natural setting, changing the landscape, disturbing sites, and isolating sections that were originally part of native Hawaiian cultural systems.

### **ASSESSMENT AND RECOMMENDATIONS**

In keeping with the intent of the OEQC Guidelines; the injunctions imposed by the Hawaii Revised Statutes and the mandate of Act 50 to assess effects of development on the cultural practices of the community and native Hawaiian rights; HRS Chapter 343, HRS §§ 205A-2 , (1) (2) and (3), for the preservation of open space and scenic resources, and support the state goals for protection, restoration, interpretation, and display of historic resources; (HRS) § 198-1(2), referring to the preserving and protecting the structural integrity and physical appearance of cultural landscapes, resources and sites which perpetuate indigenous native Hawaiian culture; it is reasonable to assume the proposed project will affect Hawaiian cultural activities and there will be adverse effect upon cultural resources, practices and beliefs.

In order to preserve the exercising of native Hawaiian rights under Hawai`i State Law, Article XII, Section 76; Act 50, and the protection of the integrity of cultural sites it is recommended that consultation between the project developers, the Division of State Parks, OHA Kaua`i Branch, Queen Debra Kapule Hawaiian Civic Club and Na Kahu Hikina A Ka Lā take place as soon as possible. In this way appropriate mitigation measures can be put in place and non-renewable resources protected.

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**APPENDIX F**  
**TRAFFIC IMPACT ANALYSIS REPORT**





# Final Traffic Impact Analysis Report (TIAR)



submitted to  
**Environet, Inc.**  
by **Wilbur Smith Associates**  
**October 8, 2007**

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# EXECUTIVE SUMMARY

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To assess the transportation impacts associated with the construction of the proposed Wailua Water Development Project in Kaua'i, Hawaii, a Traffic Impact Analysis Report was conducted. The analysis evaluated the operations of six key intersections under Existing Conditions, six key intersections for Future Year 2015 (Baseline) Conditions, and seven key intersections for Future Year 2015 with Project Conditions during the morning and evening peak hours.

The proposed Project includes two phases, the Mauka Project Area and the Makai Project Area. The first phase will consist of development for the Mauka Project Area approximately will include the construction of 700 residential single-family units, an 8 acre preschool, a 4 acre local neighborhood park, an 18 acre community center, and 32.5 acres of commercial shopping centers as per the Project Description. The Makai Project Area will include the construction of 800 residential townhomes/condominiums. The Project site straddles Kuhio Highway to the east and west in close the proximity to the Wailua River. The proposed Project under Future Year 2015 with Project is estimated to generate 11,467 daily trips, 876 morning peak hour trips (233 inbound and 644 outbound), and 1,087 evening peak hour trips (625 inbound and 459 outbound).

Impacts of the proposed project on the study intersections were evaluated with level of service calculations. The results of the analysis indicate that the proposed Project would result in significant impacts to 3 intersections under Future Year 2015 with Project conditions. Based upon our analysis, measures to mitigate the impacts at the 3 intersections were identified. It should be noted that these mitigation measures are recommended suggestions. All planned intersection improvements resulting from implementation of the Wailua Development Project should be closely coordinated with the State DOT Highways Division and the County of Kauai.

Vehicular access to the proposed Project site would be made possible via multiple points. From the north and south, vehicles would approach the Mauka Project Area from Kuhio Highway and have access to the site at the Mauka Project Driveway / Kuhio Highway. Access to the Makai Project Area for vehicles traveling from the north or south would also be provided at intersection Leho Drive (End of Loop) / Kuhio Highway.

# CHAPTER 1

## INTRODUCTION

---

The following document is a Transportation Impact Analysis Report (TIAR) which presents the existing transportation conditions and assesses the transportation impacts associated with the proposed Wailua Development Project (herein referred to as the “proposed Project”) in the County of Kaua’i, Hawai’i. The following transportation impacts were analyzed in the study:

- Traffic conditions
- Traffic operations
- Transit conditions
- Bicycle conditions

### 1.1 PROJECT DESCRIPTION

The project is proposed as being comprised of two portions; the Mauka Project Area and the Makai Project Area, Figure 1-1 presents the Project location while Figure 1-2 presents the Project Site Plan. As proposed, the Mauka Project area will be a mixed use development that will include the construction of residential single-family units, a preschool, a local neighborhood park, a community center, and commercial shopping centers. This study includes all the development that will be built by 2015. It should be noted that the commercial component of the Mauka Project Area is not expected to be built by 2015. As such, the commercial component was not included as part of this study. The Makai Project Area would include construction of approximately 800 residential condominium units.

### 1.2 STUDY SCOPE AND APPROACH

The transportation analysis was prepared according to the scope of work approved by the County of Kaua’i, the Hawai’i State Department of Transportation, and the Department of Hawaiian Homelands (DHHL). For the analysis of the proposed Project, the following transportation scenarios were examined:

- Existing Conditions
- Future without Project Conditions (Year 2015)
- Future with Project Conditions (Year 2015)



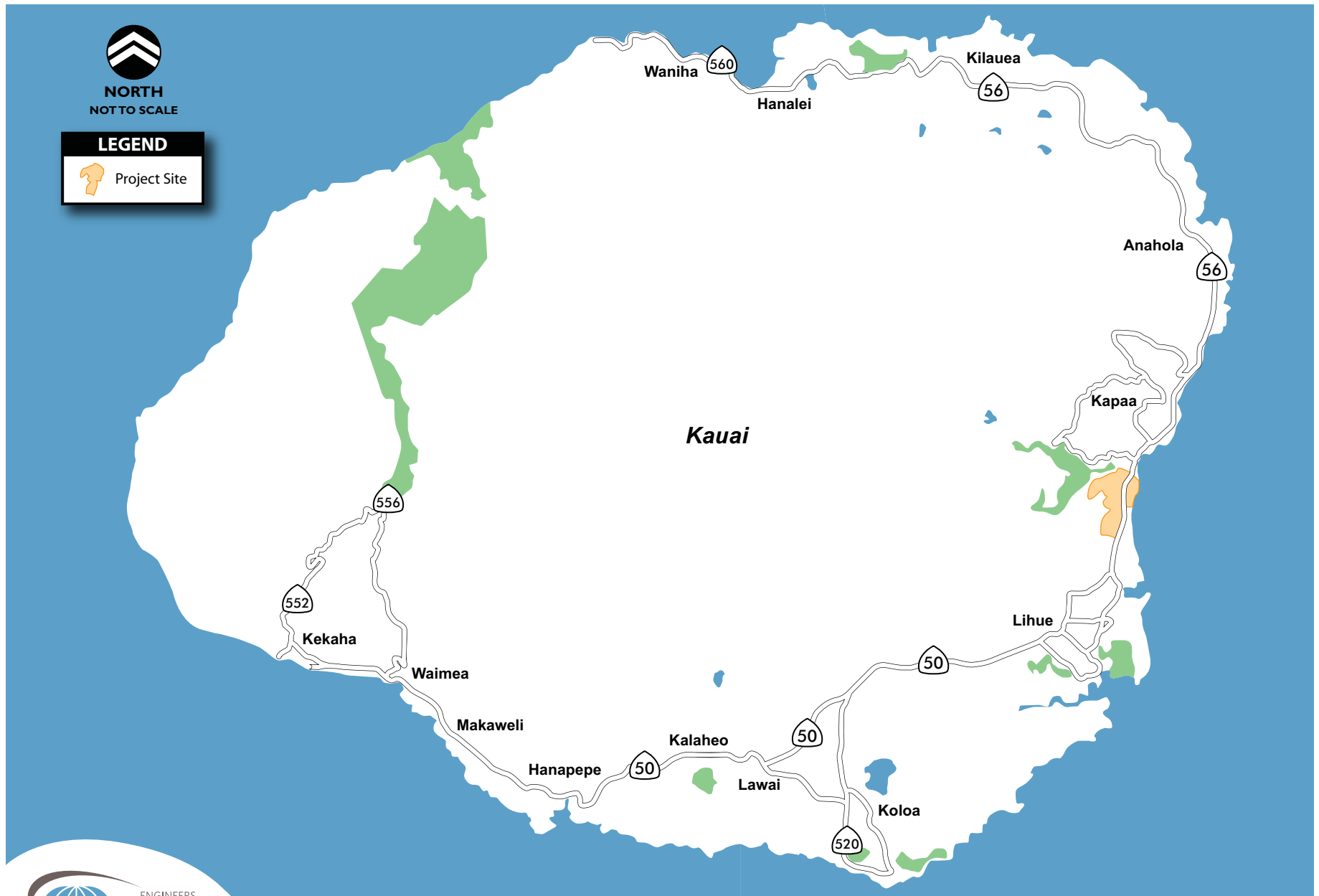
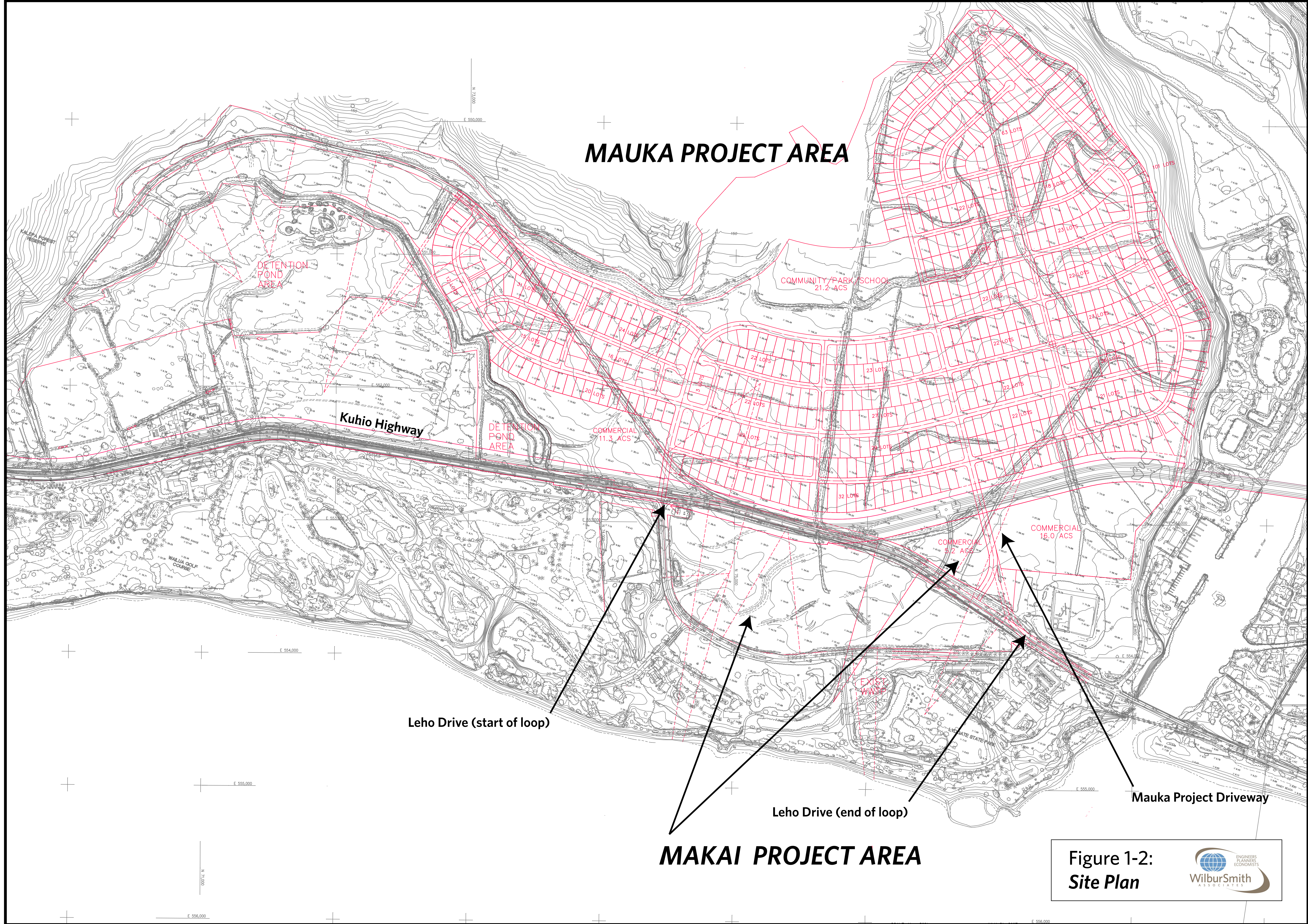


Figure 1-1  
**PROJECT LOCATION**

# MAUKA PROJECT AREA

# MAKAI PROJECT AREA



Leho Drive (start of loop)

Leho Drive (end of loop)

Mauka Project Driveway

Figure 1-2:  
Site Plan



The purpose of this analysis is to identify the potential impacts of the proposed Project on the transportation system in the vicinity of the site that would be most directly impacted by the Project. As part of the existing traffic network, the following key intersections were analyzed during the weekday morning (7:00 to 9:00 AM) and evening (4:00 to 6:00 PM) peak traffic periods:

1. Haleilio Road/ Kuhio Highway
2. Kuamoo Road/ Kuhio Highway
3. Wailua Driveway/ Kuhio Highway
4. Leho Drive (End of Loop)/ Kuhio Highway
5. Leho Drive (Start of Loop)/ Kuhio Highway
6. Kapule Highway/ Kuhio Highway

Figure 2 in Chapter 2 illustrates the analysis intersections located in the project study area.

The remainder of the report is divided into six chapters. Chapter 2 describes Existing Conditions with regards to roadway facilities, transit services, pedestrian and bicycle facilities and analysis methodologies. Intersection operations under Future Year 2015 (Baseline) Conditions with traffic from approved but not yet constructed developments are discussed in Chapter 3. Chapter 3 provides a baseline from which to identify Project impacts.

Chapter 4 describes the methodology used to estimate the project traffic and the project's impact on the transportation system. Chapter 5 describes the future (Year 2015) transportation conditions including intersection operations that will be a result of the construction of the Wailua Development Project. The results of the Project condition analysis as compared to the results of the 2015 Baseline Conditions (Chapter 3) analysis are used to identify significant project impacts. In Chapter 6, these significant impacts are identified, recommended improvements are proposed, and a phasing plan for improvement implementation is described. Chapter 6 also includes an assessment of site access, on-site circulation, transit services & pedestrian facilities and a review of the proposed roadway cross-sections for internal roadways and roadways adjacent to the project site. The study conclusions are presented in Chapter 7.

## CHAPTER 2

# EXISTING CONDITIONS

---

This chapter provides the Existing Conditions in the vicinity of the proposed Wailua Development Project. Included in this chapter are descriptions of the existing roadway and transit networks, documentation of existing traffic, transit, pedestrian, and bicycle conditions. Figure 2 presents the existing roadway network in the vicinity of the proposed Project sites, plus the analysis intersections.

## 2.1 EXISTING ROADWAY

The project area includes several major roadways that serve regional trips within Kaua'i, as well as local roads that provide access to the commercial and residential areas adjacent to the project area.

### 2.1.1 Regional Access

The existing regional roadway network in the vicinity of the proposed Project site is defined by the following major roads, including the location of their nearest access points.

**Kapule Highway** is a two-lane roadway that extends north-south between northeast Lihu'e and Kuhio Highway. It provides one lane in each direction and allows traffic on this roadway to travel at 50 miles per hour.

**Kuhio Highway** acts as a two-lane roadway south of Kapule Highway and a three-lane roadway north of Kapule Highway. Kuhio Highway is one of the major roadways that connects Lihu'e with the eastern and northern portions of the island. North of Kapule Highway, Kuhio Highway operates as a contra flow facility. During the AM peak hour, two lanes are provided in the southbound direction and one lane in the northbound direction from Kamoia Road in Waipouli to the intersection with Kapule Highway. During the PM peak hour, two lanes are provided in the northbound direction, and one lane in the southbound direction. In addition, traffic south of Kapule Highway is allowed to run 35 miles per hour while the speed limit north of Kapule highway is posted at 50 miles per hour. It should also be noted that the posted speed limit on Kuhio Highway is 25 miles per hour (MPH) before and 35 miles per hour (MPH) after the Wailua River.

### 2.1.2 Local Access

The existing local roadway system in the vicinity of the proposed Project site is comprised of the following local roads.

**Leho Drive** is a two-lane looped arterial with one lane in each direction in the vicinity of the proposed Project. It provides direct access to Kuhio Highway at both its origin and terminus. Leho Drive also provides local access to the Aloha Beach and Hotel Resort. The posted speed limit on Leho Drive is 25 miles per hour (MPH).



*Leho Drive (End of Loop) / Kuhio Highway*

**Kuamoo Road** is a two-lane collector road, with one lane in each direction, which provides access to the Wailua Homesteads Area from Kuhio Highway. Kuamoo Road also provides local access to the Kamokila Village. The posted speed limit on Kuamoo Road is 35 miles per hour (MPH).

**Haleilio Road** is a two-lane east-west collector roadway that extends from Kaulana Road to Kuhio Highway. The posted speed limit on Haleilio Road is 25 miles per hour (MPH).

**Wailua Marina Driveway** is an east-west roadway that connects with Kuhio Highway and provides access to the Wailua Marina and River.



*Looking North on Kuhio Highway near Wailua River*

## 2.2 INTERSECTION OPERATING CONDITIONS

### 2.2.1 Methodology for Intersection Analysis

Operations of the study intersections were evaluated using Level of Service (LOS) calculations. LOS is a qualitative description of the performance of an intersection based on the average delay per vehicle. Intersection levels of service range from LOS A, which indicates free flow or excellent conditions with short delays, to LOS F, which indicates congested or overloaded conditions with extremely long delays.

### Signalized Intersections

Levels of Service for signalized intersections were calculated using the Highway Capacity Manual 2000 (HCM 2000) methodology. The LOS is based on the average delay (in seconds per vehicle) for the various movements within the intersection. A combined weighted average delay and LOS are presented for each of the signalized intersections. The average delay for signalized intersections was calculated using the Synchro analysis software and is correlated to the level of service designation as shown in Table 2-1.

**Table 2-1**  
**Level of Service Criteria – Signalized Intersections**

Level of Service	Description of Operations	Average Delay
A	Operations with very low delay occurring with favorable progression and/or short cycle length.	≤ 10.0
B	Operations with low delay occurring with good progression and/or short cycle lengths.	10.1 – 20.0
C	Operations with average delays resulting from fair progression and/or longer cycle lengths. Individual cycle failures begin to appear.	20.1 – 35.0
D	Operations with longer delays due to a combination of unfavorable progression, long cycle lengths, or high V/C ratios. Many vehicles stop and individual cycle failures are noticeable.	35.1 – 55.0
E	Operations with high delay values indicating poor progression, long cycle lengths, and high V/C ratios. Individual cycle failures are frequent occurrences. This is considered to be the limit of acceptable delay.	55.1 – 80.0
F	Operation with delays unacceptable to most drivers occurring due to over saturation, poor progression, or very long cycle lengths.	≥ 80.1

Source: Highway Capacity Manual, Transportation Research Board, 2000

**NOTES:**

Delay presented in seconds per vehicle.

**Unsignalized Intersections**

Unsignalized intersections were evaluated using the Highway Capacity Manual 2000 methodology. The LOS rating is based on the weighted average control delay expressed in seconds per vehicle as illustrated in Table 2-2. Control delay includes initial deceleration delay, queue move-up time, stopped delay, and final acceleration. At two-way controlled intersections, LOS is calculated for each controlled movement, as opposed to the intersection as a whole. For all-way stop controlled locations, LOS is computed for the intersection as a whole.

**Table 2-2  
Level of Service Criteria – Unsignalized Intersections**

Level of Service	Description of Operations	Average Delay
A	No Delay for stop-controlled approaches.	≤ 10.0
B	Operations with minor delays.	10.1 – 15.0
C	Operations with moderate delays.	15.1 – 25.0
D	Operations with some delays.	25.1 – 35.0
E	Operations with high delays, and long queues.	35.1 – 50.0
F	Operations with extreme congestion, with very high delays and long queues unacceptable to most drivers.	≥ 50.1

Source: Highway Capacity Manual, Transportation Research Board, 2000

NOTES:

Delay presented in seconds per vehicle.



*Haleilio Road / Kuhio Highway*



*Leho Drive / Kuhio Highway*

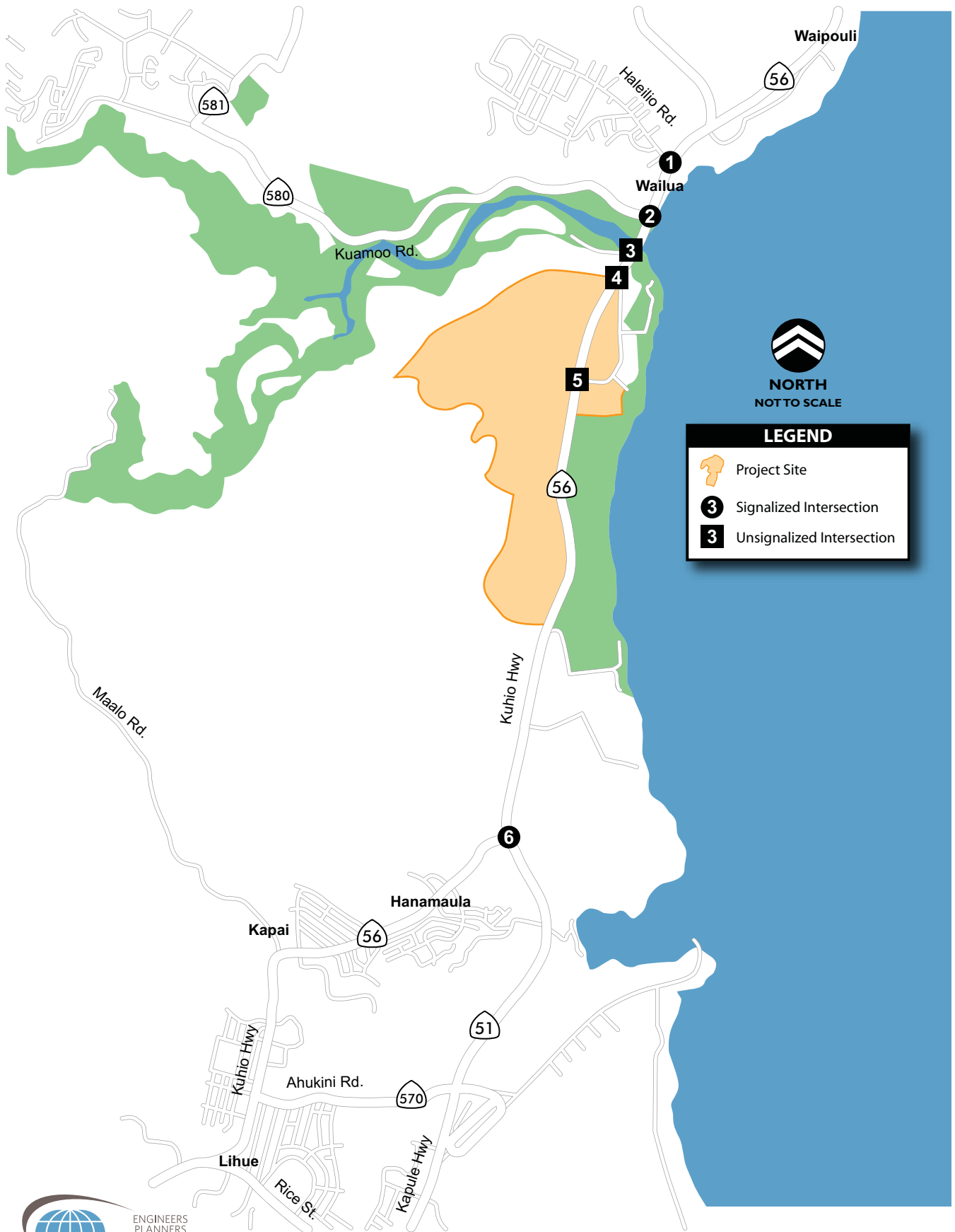


Figure 2  
PROJECT STUDY AREA

101647/BASE - 08/30/07



## 2.3 EXISTING TRAFFIC CONDITIONS

### 2.3.1 Existing Intersection Operating Conditions

Existing intersection operating conditions were evaluated for the morning peak hour (7:00 AM to 9:00 AM) and evening peak hour (4:00 PM to 6:00 PM) using Synchro software. It should be noted that Existing commute peak hour traffic volumes at key intersections were developed from manual intersection turning movement counts conducted by Wilbur Smith Associates in July 2007. Appendix A-1 presents the AM and PM peak intersection volumes. The traffic movements were counted and recorded by traffic surveyors in 15 minute intervals during the peak commute periods. These counts were then analyzed to determine the peak one-hour traffic volumes at each intersection. Figures 2-1A and 2-1B presents the existing weekday AM and PM peak hour configurations while Figures 2-2A and 2-2B present the existing traffic volumes for the study intersections. Figures 2-3A and 2-3B present the Level of Service and delay values for each of the study intersections.

A total of six (6) intersections were analyzed under existing conditions of which three (3) are signalized, and three (3) are Side-Street Stop-Controlled (SSSC) intersections. A field visit was conducted to verify the existing intersection lane configurations, intersection control devices, and signal cycle lengths. The existing lane configurations and peak hour turning movement volumes were used to calculate the levels of service for the 6 study intersections under existing peak hour conditions. As previously mentioned, Kuhio Highway operates as a contra flow facility. During the AM peak hour, two lanes are provided in the southbound direction and one lane in the northbound direction from Kamoia Road in Waipouli to the intersection with Kapule Highway. During the PM peak hour, two lanes are provided in the northbound direction, and one lane in the southbound direction. The results of the LOS existing AM peak analysis are presented in Table 2-3, and the calculation worksheets are included in Appendix B-1.

#	Intersection	Control	V/C Ratio	Delay <sup>1</sup>	LOS
1	Haleilio Road/Kuhio Highway	Signal	0.68	14.6	B
2	Kuamoo Road/Kuhio Highway	Signal	0.90	34.4	C
3	Wailua Marina Driveway/Kuhio Highway	SSSC	0.59 (EB)	>50	<b>F</b>
4	Leho Drive(End of Loop) /Kuhio Highway	SSSC	0.45 (WB)	>50	<b>F</b>
5	Leho Drive(Start of Loop)/Kuhio Highway	SSSC	0.60 (WB)	>50	<b>F</b>
6	Kapule Highway/Kuhio Highway	Signal	0.88	22.2	C

Source: Wilbur Smith Associates

**Notes:**

SSSC – Side-Street STOP Controlled

**1** – Delay is presented in seconds

**Bold** – Unacceptable Conditions

Under existing AM peak hour conditions, 3 of the 6 study intersections operate at LOS C or better (acceptable conditions). The remaining 3 intersections operate under unacceptable

conditions, LOS F, they include: Wailua Marina Driveway / Kuhio Highway, Leho Drive (End of Loop) / Kuhio Highway, and Leho Drive (Start of Loop) / Kuhio Highway.

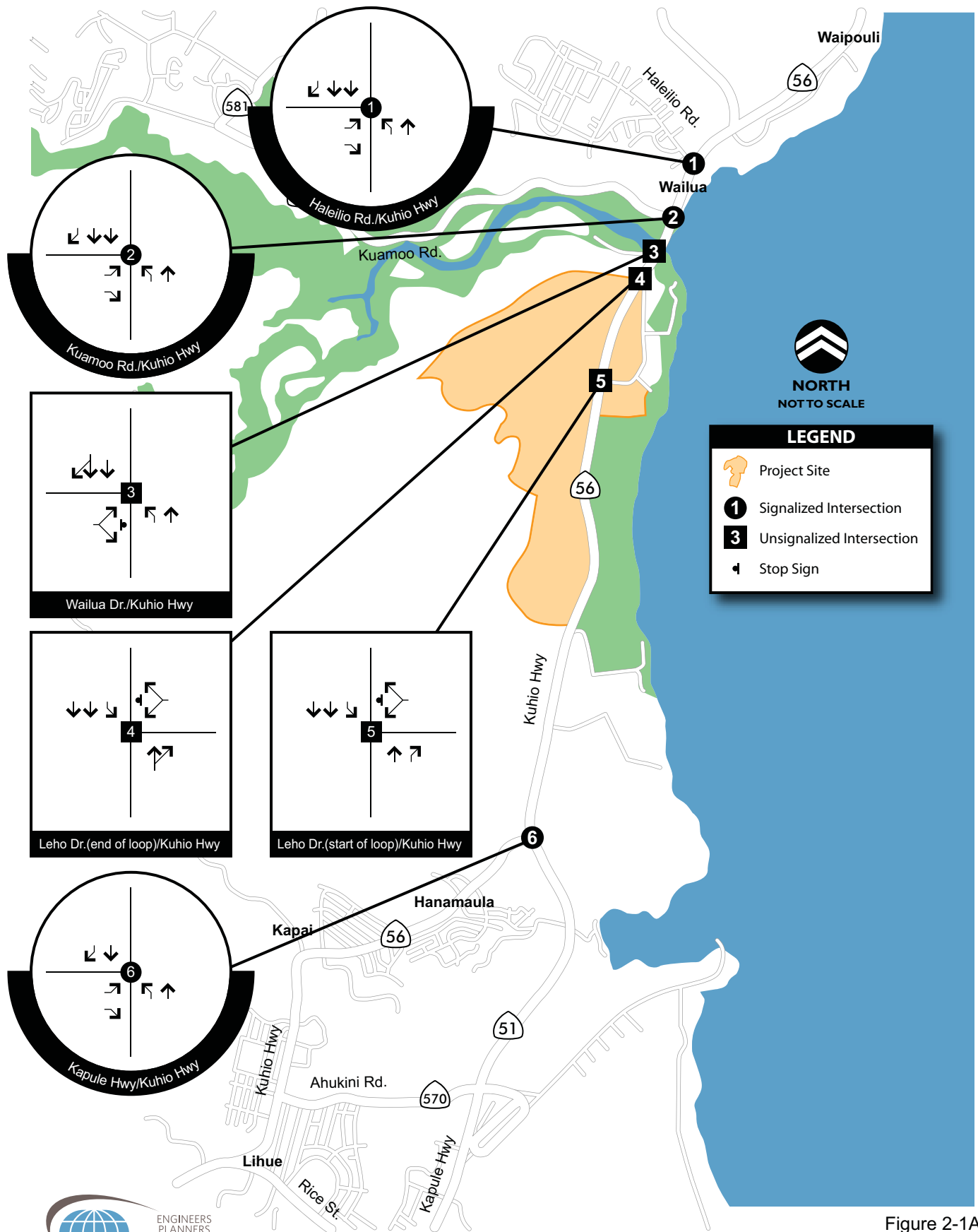
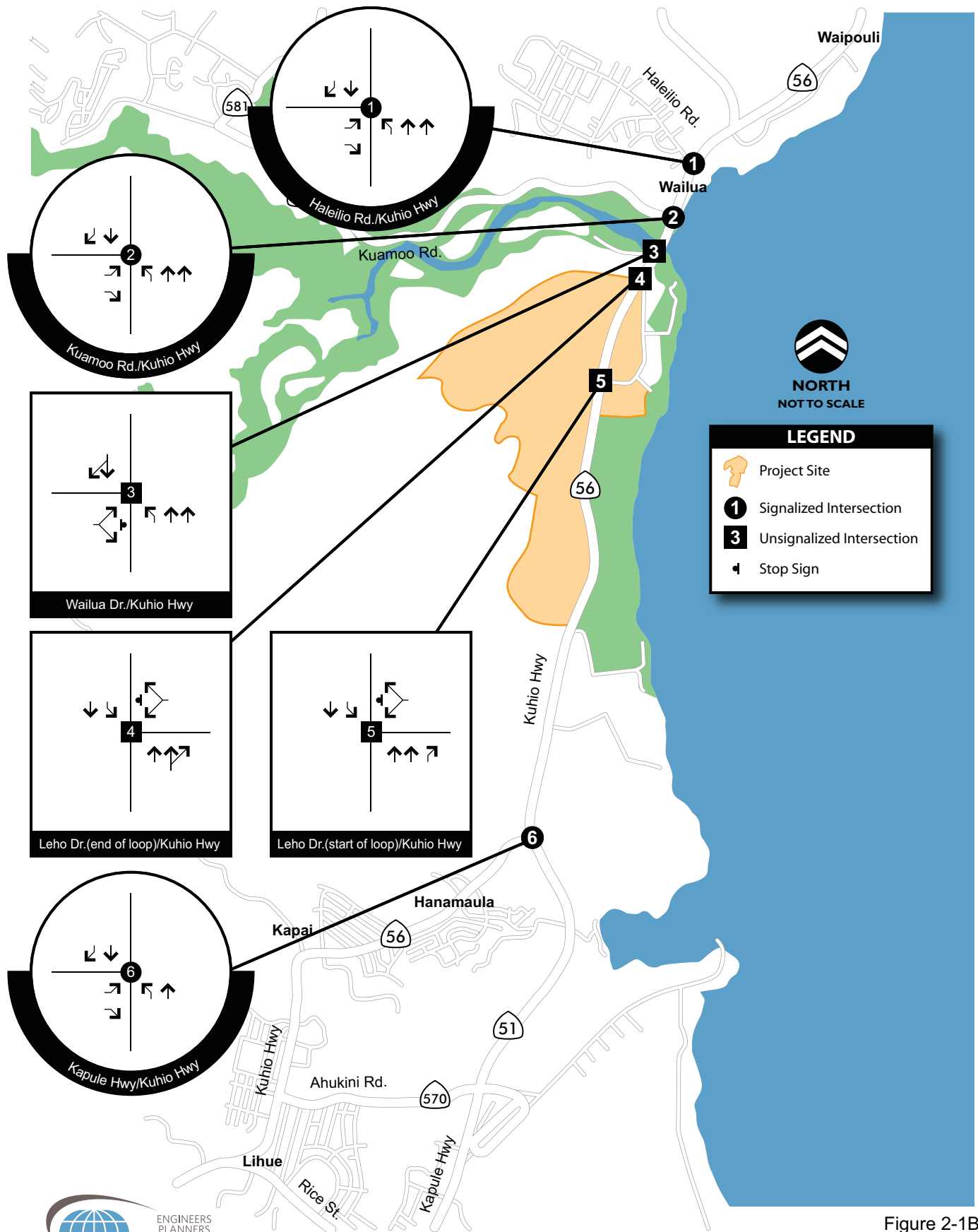


Figure 2-1A  
INTERSECTION GEOMETRIC CONFIGURATIONS  
EXISTING CONDITIONS AM



**LEGEND**

- Project Site
- 1** Signalized Intersection
- 3** Unsignalized Intersection
- Stop Sign

Figure 2-1B  
**INTERSECTION GEOMETRIC CONFIGURATIONS  
EXISTING CONDITIONS PM**

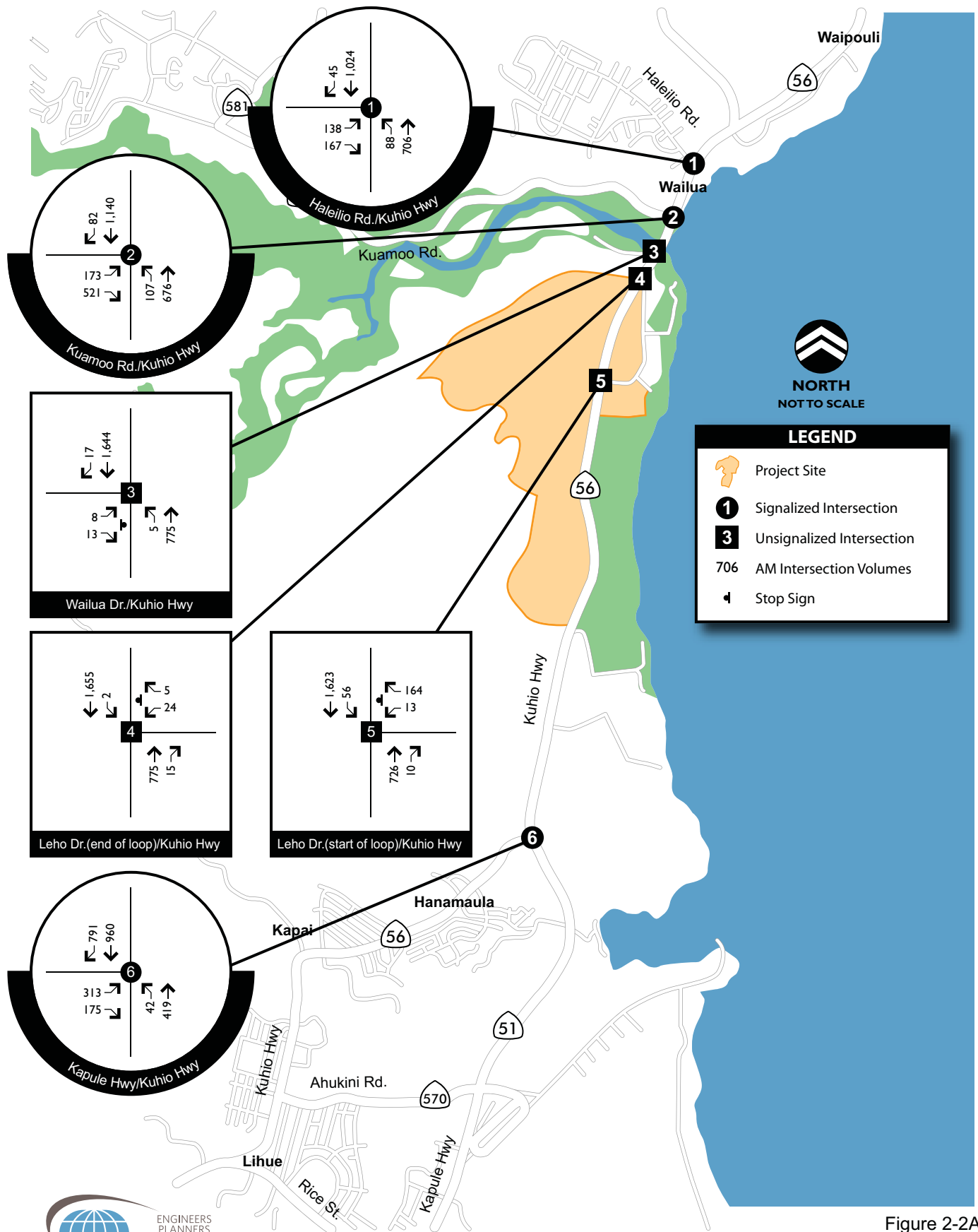


Figure 2-2A  
**AM PEAK HOUR INTERSECTION VOLUMES  
 EXISTING CONDITIONS**

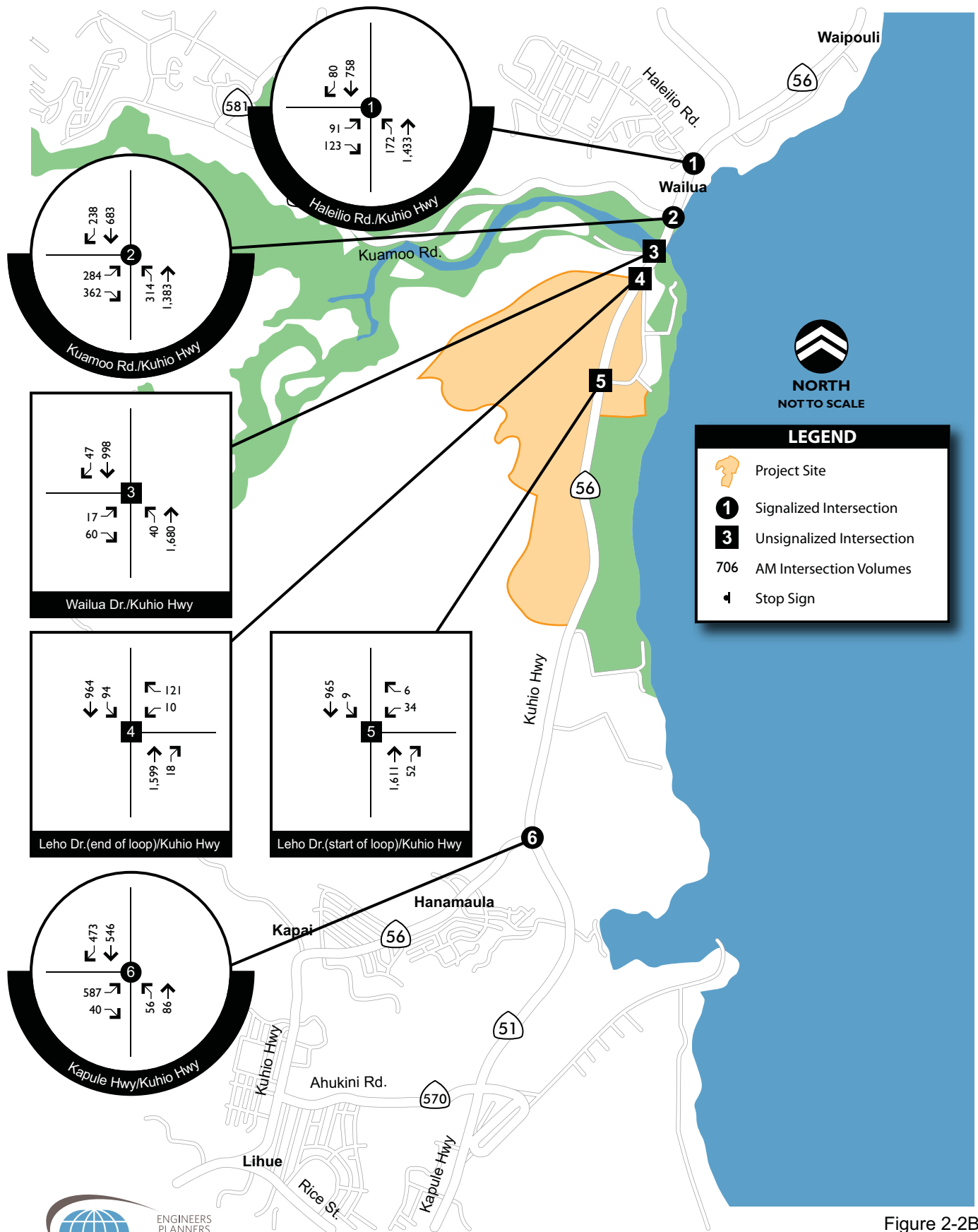


Figure 2-2B  
**PM PEAK HOUR INTERSECTION VOLUMES  
 EXISTING CONDITIONS**

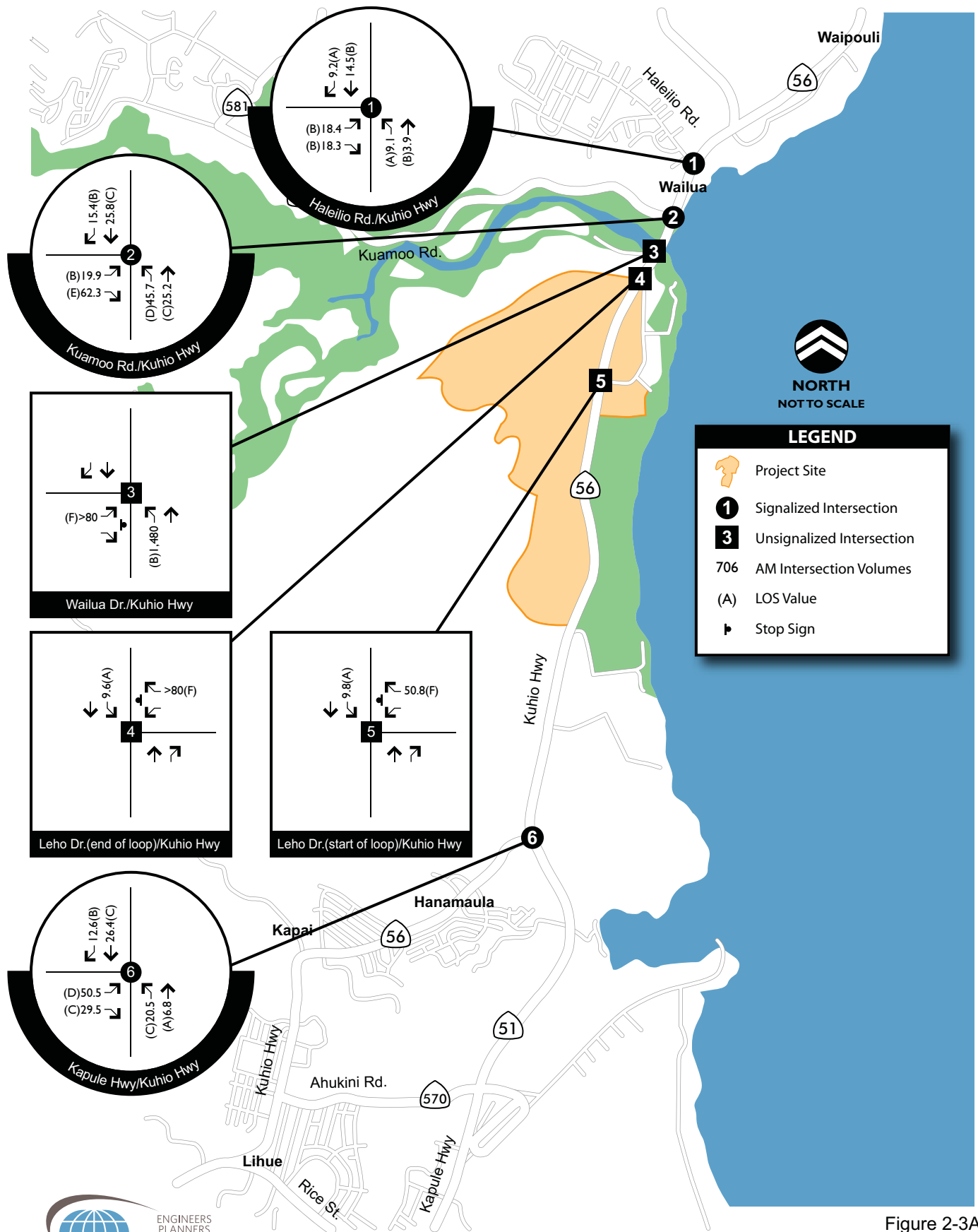


Figure 2-3A  
**AM PEAK HOUR INTERSECTION LOS AND DELAY VOLUMES  
 EXISTING CONDITIONS**

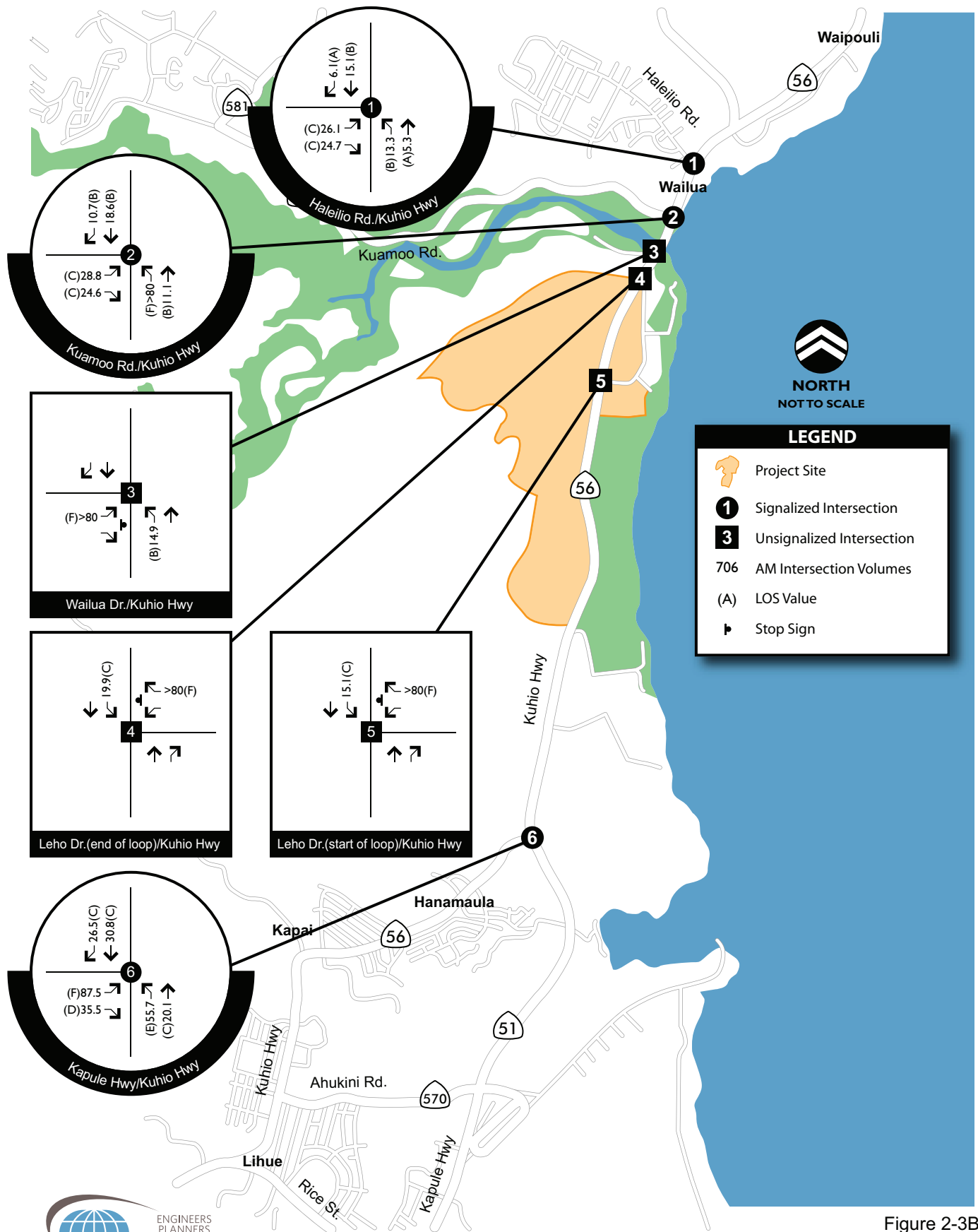


Figure 2-3B  
**PM PEAK HOUR INTERSECTION LOS AND DELAY VOLUMES  
 EXISTING CONDITIONS**



A similar analysis was conducted during the PM peak hour under existing conditions. The results of the existing PM peak hour LOS analysis are presented in Table 2-4, and the calculation worksheets are included in Appendix B-1.

#	Intersection	Control	V/C Ratio	Delay	LOS
1	Haleilio Road/Kuhio Highway	Signal	0.73	10.0	A
2	Kuamoo Road/Kuhio Highway	Signal	0.98	25.8	C
3	Wailua Driveway/Kuhio Highway	SSSC	2.93 (EB)	>50	<b>F</b>
4	Leho Drive/Kuhio Highway (End of Loop)	SSSC	2.63 (WB)	>80	<b>F</b>
5	Leho Drive/Kuhio Highway (Start of Loop)	SSSC	3.51 (WB)	>80	<b>F</b>
6	Kapule Highway/Kuhio Highway	Signal	0.98	51.4	D

Source: Wilbur Smith Associates

**Notes:**

SSSC – Side-Street STOP Controlled

**Bold** – Unacceptable Conditions

Under existing PM peak hour conditions, the same three (3) study intersections operate under unacceptable conditions as were noted during the AM peak hour conditions.

## 2.4 TRANSIT NETWORK

The City and County of Kaua'i operates fixed-route service to the communities adjacent to and in the general vicinity of the proposed Project site on a daily basis. Table 2-5 presents the existing bus routes providing service in the proposed Project's immediate vicinity.

Route	From	To	Hours of Operation	Headways During Commute Times	
				AM	PM
400	Kapa`a	Lihu`e	7:03 AM -7:03 PM	60 Minutes	60 Minutes
450	Kapa`a	Lihu`e	6:03 AM – 6:03 PM	60 Minutes	60 Minutes
500	Lihu`e	Kapa`a	6:21 AM- 6:21 PM	60 Minutes	60 Minutes
550	Lihu`e	Kapa`a	7:21 AM-7:21 PM	60 Minutes	60 Minutes
800	Wailua	Lihu`e	6:55 AM -7:55 AM	60 Minutes	--- <sup>1</sup>
850	Lihu`e	Wailua	12:30 PM -5:30 PM	--- <sup>2</sup>	

Source: The Kaua'i Bus, July 2007

Notes:

1. Service on Route 800 is only provided in the morning hours

2. Service on Route 850 is provided at 12:30 PM, 4:30 PM, and 5:30 PM.

**Routes 400 (Kapa`a - Lihue) / 450 (Lihue - Kapa`a)** - These routes provide service between the Kapa`a and Lihue areas, Monday through Friday at one-hour intervals, from approximately 6:00 AM to 7:00 PM. It should be noted however that service on these routes make their last passenger pick up at the Laukona Road and only make the remaining stops to drop off-passengers.

**Routes 500 (Lihue - Kapa`a) / 550 (Kapa`a -Lihue)** - These routes provide service between the Lihue and Kapa`a areas, Monday through Friday at one-hour intervals between 6:21 AM and 6:21 PM. For desired stops for the following locations: Chiefess Middle School, Sun Village, and Friendship House, on-call requests must be made.

**Route 800 (Wailua -Lihu'e)** - This route provides two outbound trips that service the Wailua and Lihu'e areas, Monday through Friday. Route 800 makes those trips at 6:55 AM and 7:55 AM, with passenger pick up stops at Kapa`a Ball Park Pavillion, Wailua Houselots Park, and Wailua Homesteads Park. The remaining stops are "drop only," where passengers must request their stop and no pick up of passengers is made.

**Route 850 (Lihu'e -Wailua)** - This route provides three inbound trips from Lihue to Wailua, Monday through Friday between the hours of 12:30 and 5:30 PM.

## **2.5 PEDESTRIAN CONDITIONS**

Within the vicinity of the proposed Project, sidewalk facilities are provided along both sides of Kuhio Highway at its intersection with Haleilio Road. Sidewalks are also provided along one side of Kuhio Highway at its intersection with Leho Drive. Additionally, sidewalks are present on one side of the street on Haleilio Road. Crosswalks have been provided along certain approaches to the intersections of Haleilio Road/Kuhio Highway and Kuamoo Road/Kuhio Highway to support the sidewalks at these locations.

## **2.6 BICYCLE CONDITIONS**

The island's existing bikeway system consists of a bike route along Kapule Highway in Lihu'e and a bike path along the coast fronting Kapa`a Beach Park. It should be noted however that the Bike Plan Hawai'i proposed for an additional 173 miles of bikeways islandwide.

## **CHAPTER 3**

# **FUTURE YEAR 2015 CONDITIONS**

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This chapter discusses the methodology involved in the development of Future Year 2015 (Baseline) Conditions (without the proposed Project) traffic volumes, and the operations of the study intersections. These conditions form the basis against which transportation impacts related to the proposed Project would be identified.

Future Year 2015 represents the full buildout year of the Wailua Development Project, with all phases of the proposed Project expected to be completed with the exception of the 32.5 acres of commercial space. As such, year 2015 has been selected as the future year of analysis to identify the operating conditions of the transportation network located in the vicinity of the proposed Project under with and without Project conditions.

### **3.1 FUTURE YEAR 2015 TRANSPORTATION SYSTEM IMPROVEMENTS**

This section documents the planned transportation and circulation system improvements currently identified and approved by the State of Hawai'i, Department of Transportation (DOT). The regional circulation improvements in the vicinity of the study area are located along the following corridors.

- Kuhio Highway; and
- Wailua Cane Haul Bridge

Based on information provided by the Kaua'i DOT, by year 2015, Kuhio Highway is expected to be widened to a four-lane facility extending from Kuamoo Road beyond Haleilio Road, in the vicinity of the proposed Project.

In addition, the State of Hawaii DOT also proposes to make improvements to the Wailua Cane Haul Bridge between Kuamoo Road and Leho Drive (End of Loop), such that it would widen Kuhio Highway to include two (2) northbound through lanes and two (2) southbound through lanes between these locations. A detailed site plan of the Wailua Cane Haul Bridge widening is included in Appendix C-1

### **3.2 STUDY AREA – FUTURE YEAR 2015 CONDITIONS**

Due to the planned improvement of the existing transportation network near the project site, geometric lane configurations as Presented in Figures 3-1A and 3-1B, would be changed at the following intersections for both the AM and PM peak hours:

- Haleilio Road/ Kuhio Highway
- Kuamoo Road/ Kuhio Highway
- Marina Driveway / Kuhio Highway
- Leho Drive (End of Loop) / Kuhio Highway

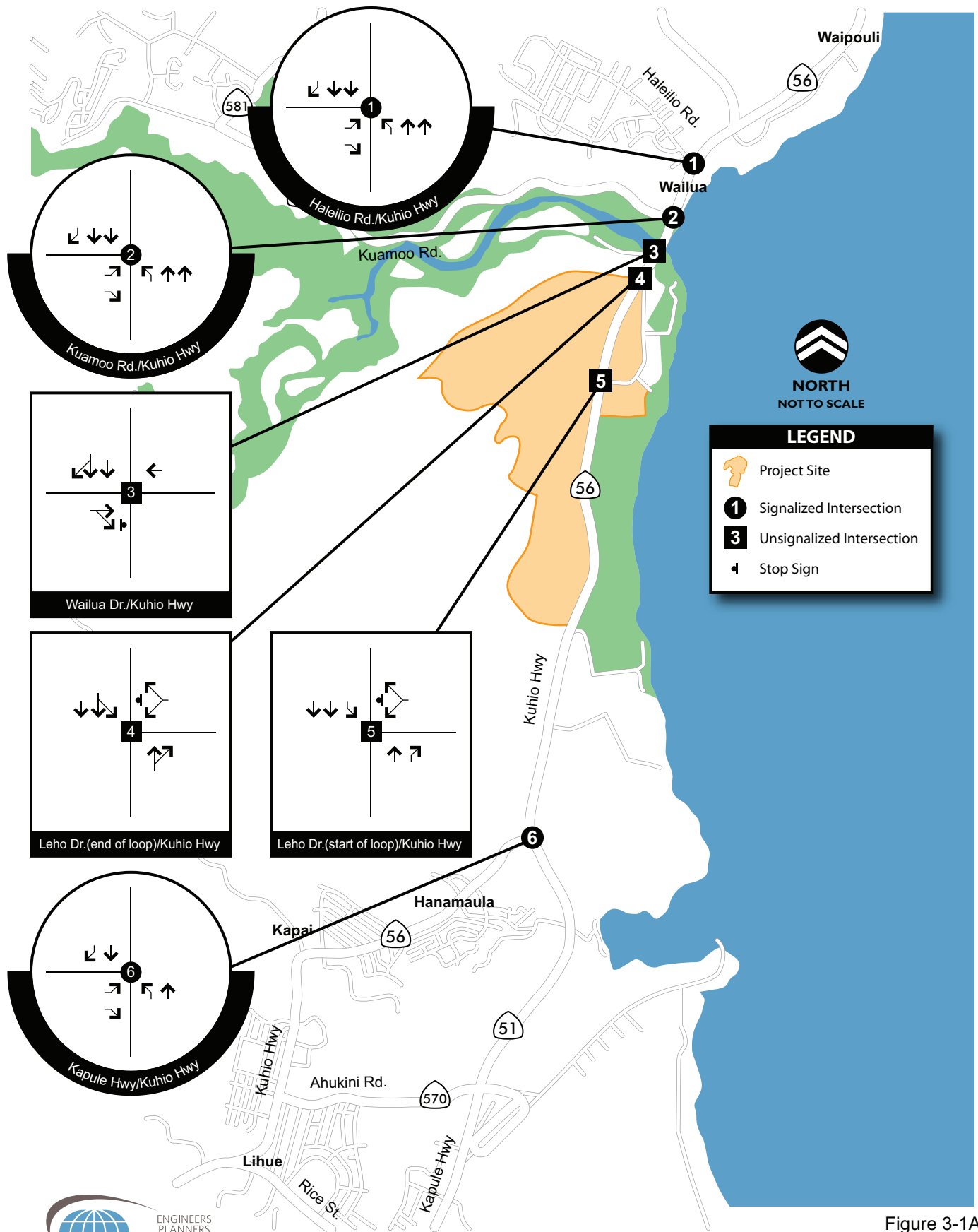
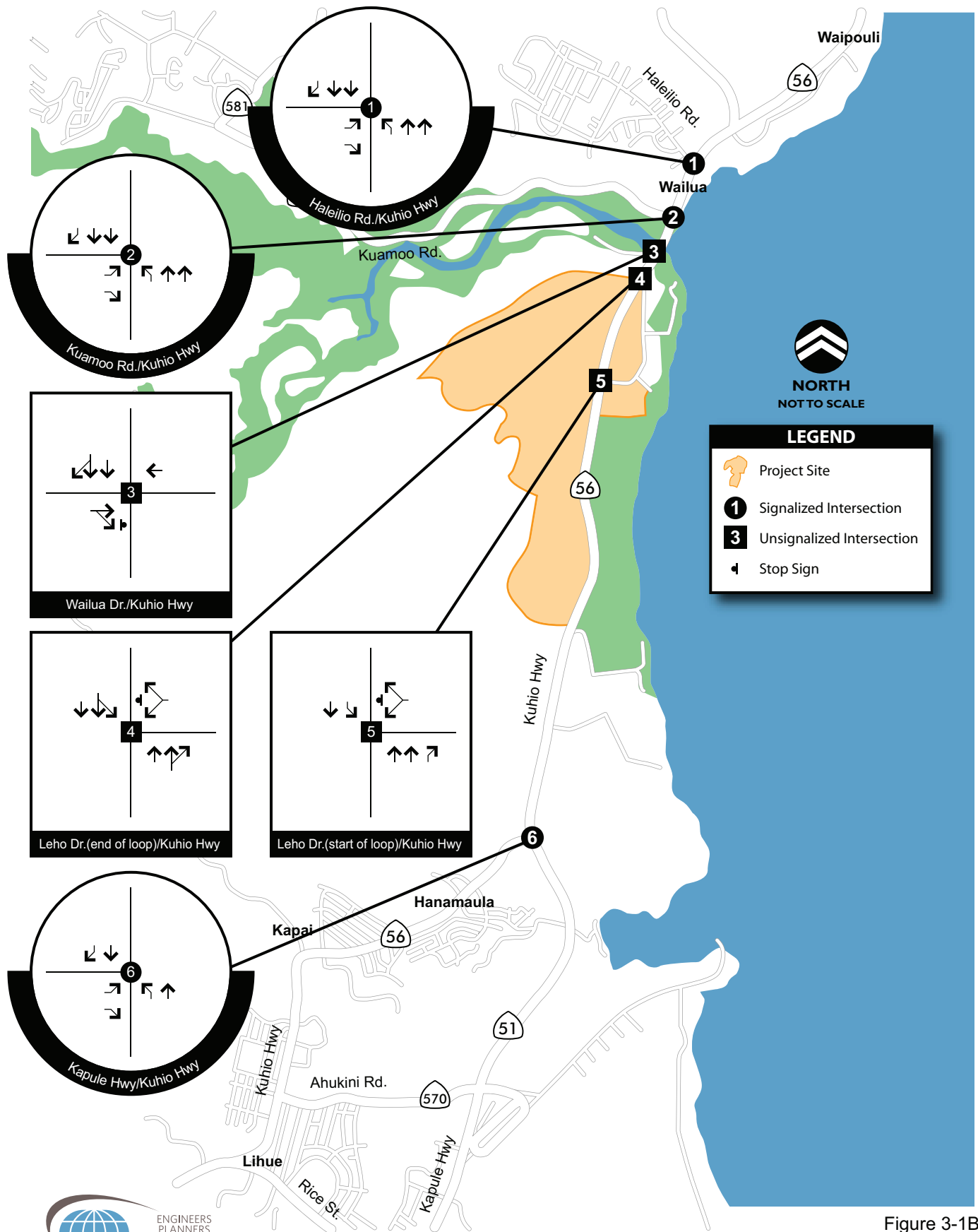


Figure 3-1A  
**INTERSECTION GEOMETRIC CONFIGURATIONS  
 FUTURE YEAR 2015 CONDITIONS AM**

101647/BASE - 08/30/07



**LEGEND**

- Project Site
- 1 Signalized Intersection
- 3 Unsignalized Intersection
- 4 Stop Sign

Figure 3-1B  
INTERSECTION GEOMETRIC CONFIGURATIONS  
FUTURE YEAR 2015 CONDITIONS PM

### 3.3 FUTURE YEAR 2015 CONDITIONS TRAFFIC ESTIMATE

Traffic volumes under Future Year 2015 Conditions were estimated based on planned development traffic and historical traffic growth. This approach results in a cumulative impact assessment for future conditions and takes into account any anticipated developments expected by year 2015 near the Project, plus the expected growth in housing and employment for the remainder of the region.

#### 3.3.1 Methodology for Traffic Estimate

To identify future intersection turning movement volumes, the AM and PM peak hour roadway segment volumes for each of the approaches of the intersections under year 2015 conditions, both approved development traffic and historical traffic growth, were considered:

#### Planned Development Traffic

Planned development traffic is generated by specific planned, but not yet constructed, projects within the vicinity of the proposed Project. According to the Kaua'i General Plan, the following developments are proposed for the immediate area:

- Hanamaulu Triangle; and
- Coco Palms Resort

The Hanamaulu Triangle is proposed as a residential development that would be built in four phases consisting of a total of 118 single-family homes and 318 townhomes / condominiums. This project is expected to generate 3,348 daily trips, 272 AM trips and 328 PM trips.

The Coco Palms Resort is proposed as a renovation project to the existing facilities that would include a total of 149 hotel units and approximately 204 condominium units. This project is expected to generate 170 AM trips and 251 PM trips.

Appendix D presents the analysis worksheets for the distribution of the trips associated with the projects above.

#### Historical Traffic Growth

Historical growth traffic is the increase in traffic volumes due to usage increases and non-specific growth throughout the area. In Appendix C-1 of the Kaua'i General Plan, the 1997-2020 increase in total jobs is expected to range from 1.1% to 1.6%. The 1997-2020 increase in resident population is expected to range from 0.6% to 1.2% with an increase in daily visitors of 1.7% to 2.4%. According to traffic counts provided by HDOT for Kapule and Kuhio Highways in the TIAR for Hanamaulu Triangle, Kaua'i, Hawaii, traffic in the area has historically increased from less than 1% to 3.1%. For this project, volumes were increased by 3 percent per year to reflect anticipated background traffic volumes.

**Total Traffic**

To obtain the total 2015 build out traffic volumes, historical traffic growth was added to the existing traffic volumes in addition to the planned development traffic. The AM and PM peak hour turning movements for the studied site accesses and intersections were then calculated and analyzed for the build out years.

Figures 3-2A and 3-2B depict the Future Year 2015 peak hour intersection turning movement volumes as developed using the methodology described in the preceding paragraphs.

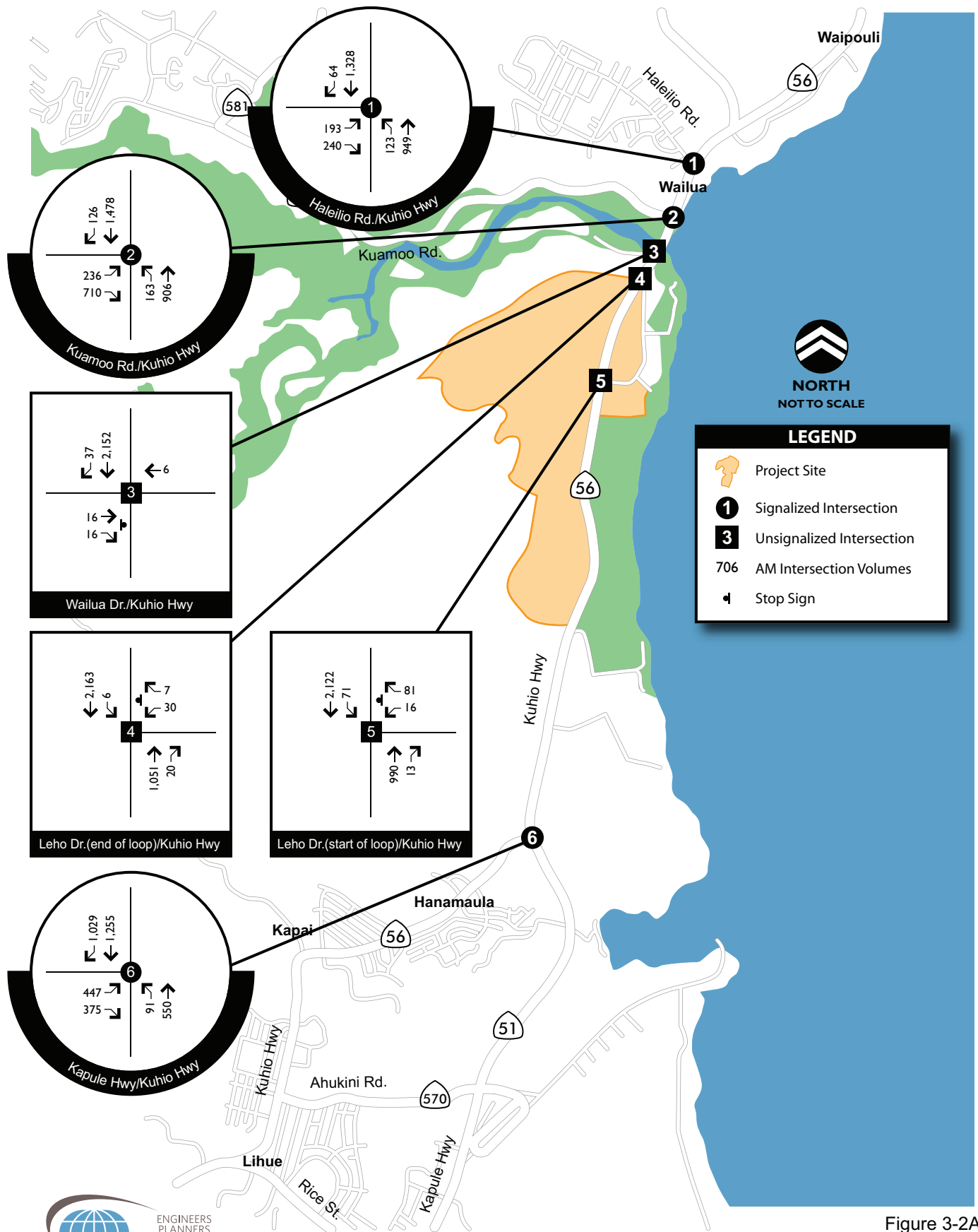


Figure 3-2A  
**AM PEAK HOUR INTERSECTION VOLUMES  
 FUTURE YEAR 2015 CONDITIONS**



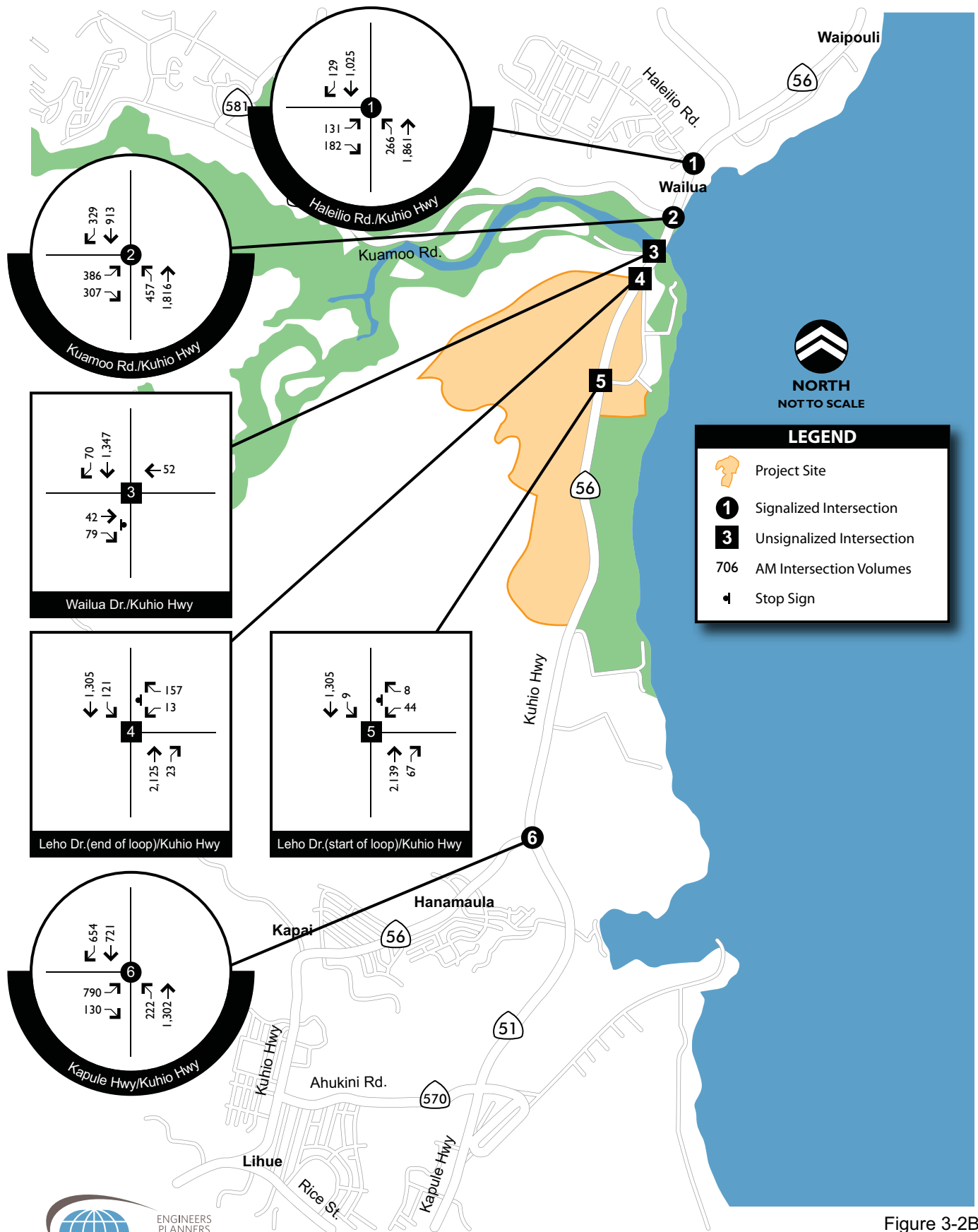


Figure 3-2B  
**PM PEAK HOUR INTERSECTION VOLUMES**  
**FUTURE YEAR 2015 CONDITIONS**

### **3.4 FUTURE YEAR 2015 INTERSECTION OPERATING CONDITIONS**

Using the volumes presented in Figures 3-2A and 3-2B, with the proposed improvements plans in Future Year 2015 as discussed in Section 3.2, the traffic conditions at the study intersections were calculated for the Future Year 2015 AM and PM peak hours. Table 3-1 presents the Future Year 2015 delays and LOS values of the study intersections, while the intersection analysis worksheets are included in Appendix B-2.

During the Future Year 2015 AM peak hour, 1 of the 6 study intersections would operate under acceptable conditions (LOS D or better). The 5 study intersections that would operate under unacceptable conditions (LOS E or worse) are:

- Kuamoo Road / Kuhio Highway
- Marina Driveway / Kuhio Highway
- Leho Drive (End of Loop) / Kuhio Highway
- Leho Drive (Start of Loop) / Kuhio Highway
- Kapule Highway / Kuhio Highway

During the Future Year 2015 PM peak period, 2 of the 6 study intersections would operate at LOS D or better. The following 4 intersections would operate under unacceptable conditions (LOS E or worse):

- Wailua Driveway / Kuhio Highway
- Leho Drive (End of Loop) / Kuhio Highway
- Leho Drive (Start of Loop) / Kuhio Highway; and
- Kapule Highway / Kuhio Highway

Figures 3-3A and 3-3B exhibits the LOS and delay values for each of the turning movements at the study intersections.

**Table 3-1  
Peak Hour Intersection Operations - Future Year 2015 Conditions**

#	Intersection	Control	Year 2015					
			AM Peak			PM Peak		
			Delay	V/C Ratio	LOS	Delay	V/C Ratio	LOS
1	Haleilio Drive/ Kuhio Highway	Control	19.4	0.72	B	13.2	0.79	B
2	Kuamoo Road / Kuhio Highway	Control	>80	1.23	F	37.2	0.87	D
3	Wailua Driveway/ Kuhio Highway	SSSC	>50 (WB)	0.19	F	>50 (WB)	0.59	F
4	Leho Drive (End of Loop)/ Kuhio Highway	SSSC	>50 (WB)	1.53	F	>50(WB)	10.59	F
5	Leho Drive (Start of Loop)/ Kuhio Highway	SSSC	>50 (WB)	1.68	F	>50 (WB)	19.70	F
6	Kapule Highway/ Kuhio Highway	Control	68.9	1.13	E	>80	1.33	F

Source: Wilbur Smith Associates, August 2007

Notes:

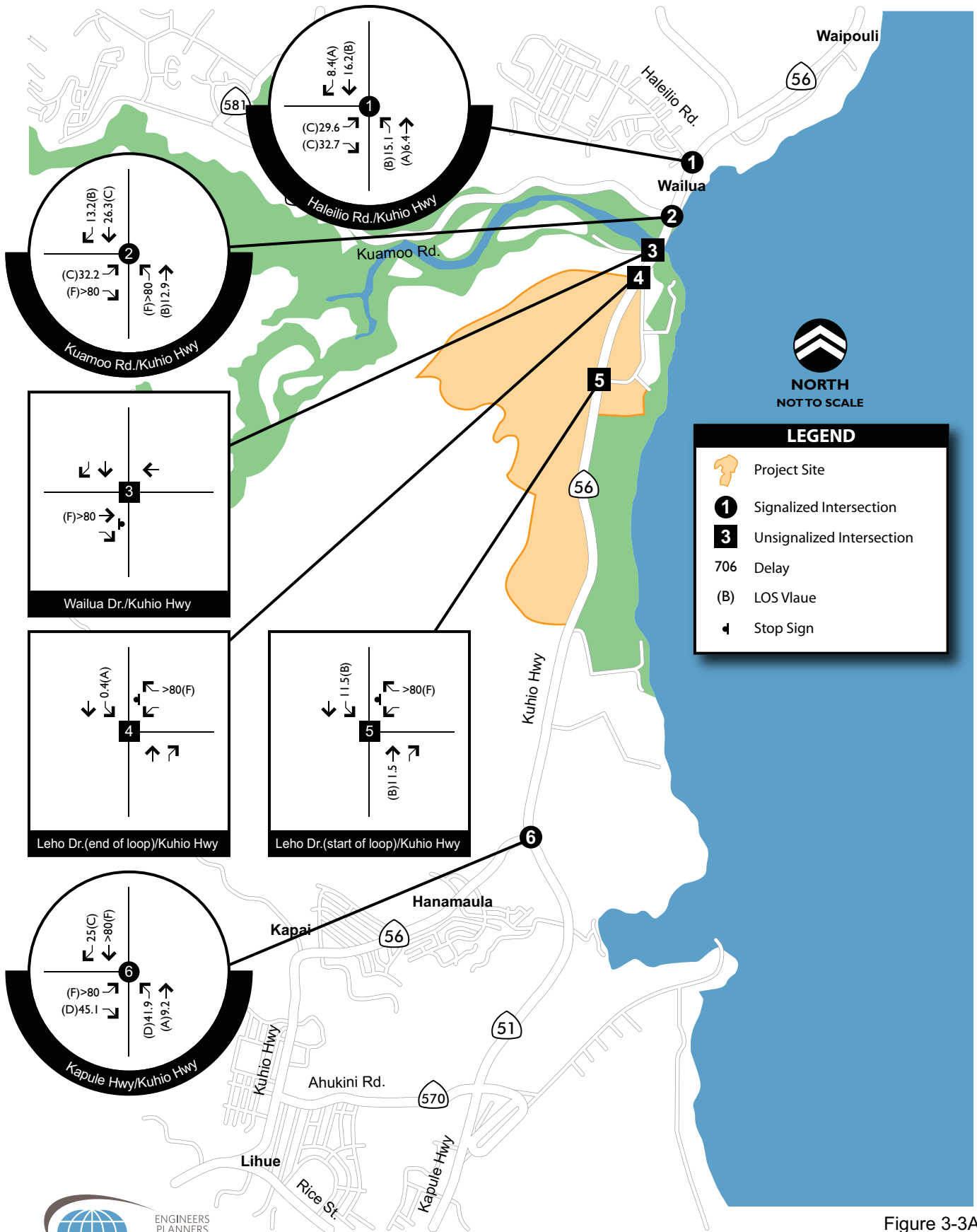


Figure 3-3A  
 AM PEAK HOUR LOS VALUES AND DELAYS  
 FUTURE YEAR 2015 CONDITIONS

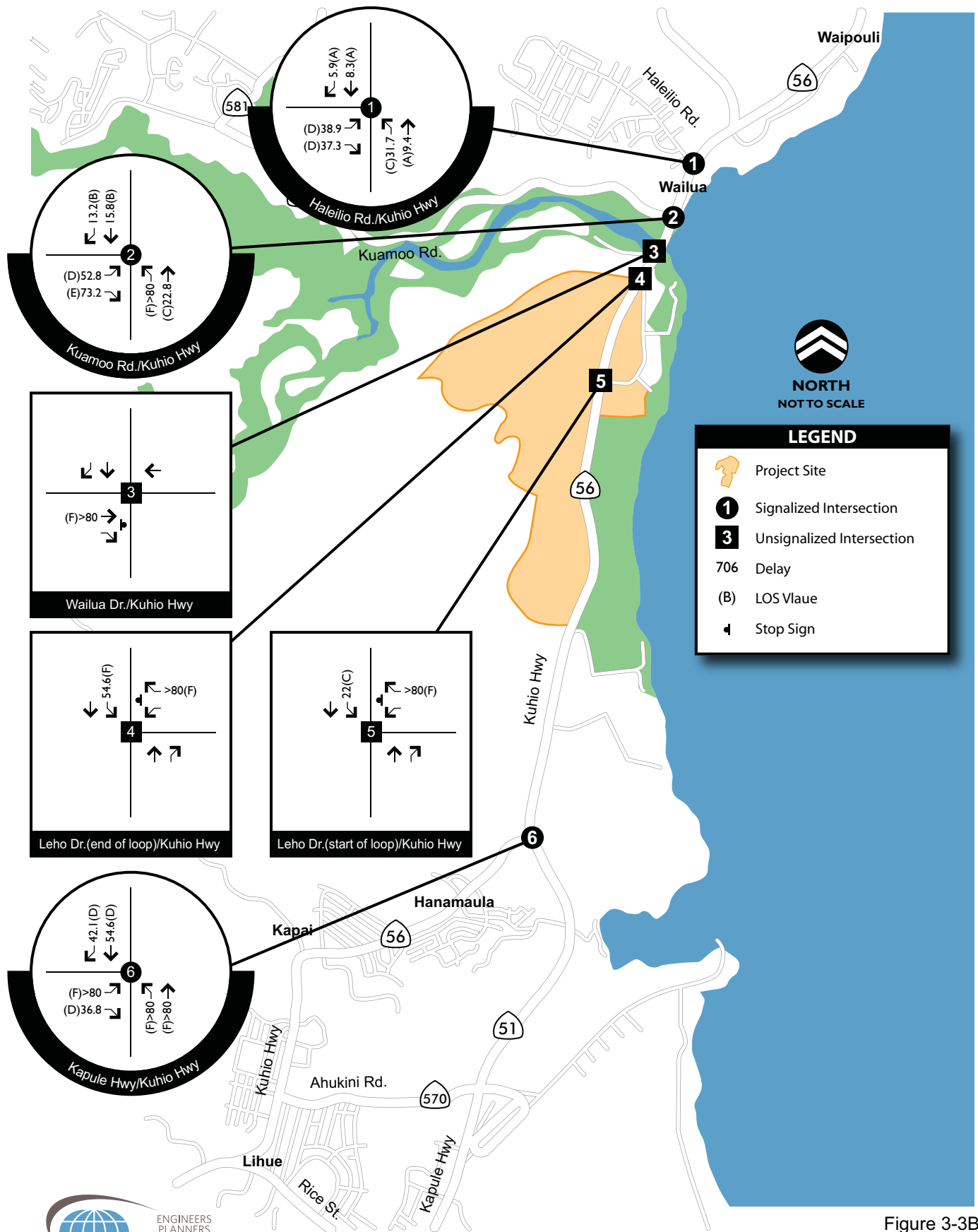


Figure 3-3B  
 PM PEAK HOUR LOS VALUES AND DELAYS  
 FUTURE YEAR 2015 CONDITIONS

# CHAPTER 4

## PROJECT TRAFFIC GENERATION

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This chapter discusses the methodology and assumptions used to estimate the traffic characteristics of the proposed Project. The initial process involves the estimation of trips that would be generated by the proposed Project, and the distribution and assignment of these trips on the area roadways.

This chapter presents the generation distribution, and assignment (routing) of trips to/from the proposed project.

**Future with Project Conditions (Year 2015)** – Under this scenario, it is assumed that the proposed Project is constructed.

The amount of traffic associated with a project is estimated using a three step process:

1. Trip Generation
2. Trip Distribution
3. Trip Assignment

### 4.1 PROJECT TRIP GENERATION

This section discusses the methodology involved in the estimation of the project traffic and provides an estimate of the total number of inbound and outbound trips generated by the project during weekday AM and PM peak hours. The methodologies involved in the estimation of project trips are discussed in the following sub-sections.

#### 4.1.1 ITE Based Trip Generation

This method involved using Institute of Transportation Engineers (ITE) *Trip Generation, 7<sup>th</sup> Edition* handbook to evaluate the total traffic generated by the project. The trip generation rates and equations provided in the *Trip Generation* handbook for the various land uses present in the project were used to calculate the trips generated/attracted by each of the components of the project. The trips generated by this methodology include only external trips (trips starting or ending at the project site boundary) and do not account for pass-by trips (trips attracted to the project whose neither origin nor destination is the project).

For certain land uses, the ITE trip generation rates might not be appropriate to use in this study. The trip generation rates provided by San Diego Association of Governments (SANDAG)<sup>1</sup> were used for identifying the trip generation for the following land uses:

- Neighborhood Park

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<sup>1</sup>San Diego Traffic Generators, April 2002, San Diego Association of Governments

- Multi-Purpose Recreational Facility

Park Uses: The park units for the Parks within the development include a neighborhood park and multi-purpose recreational facilities, for which the park trip generation rate (SANDAG code: Parks) was applied.

#### **4.1.2 Proposed Project Trip Generation Values**

The project would generate 11,467 daily weekday trips under Future with Project Conditions. Under this scenario, 233 inbound and 649 outbound trips are generated in the AM peak hour, and 625 inbound and 459 outbound trips are generated in PM peak hour.

Table 4-1 summarizes the trip generation values based on ITE trip generation rates.

**Table 4.1  
Project Trip Generation**

Land Use	ITE Code	Amount	Unit	Daily Trips	AM Peak Hour			PM Peak Hour		
					In	Out	Total	In	Out	Total
Single-Family Detached	210	700	DU	6,229	125	375	499	389	229	618
Residential Condominium/Townhouse	230	800	DU	3,240	47	214	261	158	129	287
Preschool <sup>1</sup>	565	80	Students	358	34	30	64	29	33	62
Neighborhood Park	SANDAG	4	Acres	20	10	10	20	10	10	20
Multipurpose Recreational Facility <sup>2</sup>	SANDAG	18	Acres	1,620	17	15	32	39	58	97
<b>TOTAL</b>				<b>11,467</b>	<b>233</b>	<b>644</b>	<b>877</b>	<b>625</b>	<b>459</b>	<b>1,084</b>

Source: Wilbur Smith Associates, August 2007.

NOTES:

DU Dwelling Units

ksf 1,000 square foot

1. The student population for the preschool was based on the Paukukalo Preschool in Waikiku District of Maui.
2. Trip generation rates for the Multipurpose Recreational Facility are based on ITE Rates that have been factored to match similar regional uses.



## 4.2 PROJECT TRIP DISTRIBUTION

This section provides a description of various travel patterns of the project trips from and to the project under Future with Project Conditions (Year 2015). In order to properly determine the impact of the traffic generated by the proposed Project, it is necessary to determine the distribution of traffic to and from the Project by analyzing the starting and end points of project oriented trips, and the percentage of total trips following each of the travel patterns. These percentages are based on the project generated traffic patterns and population and employment centers in the area. In addition, previous traffic reports conducted near the proposed Project were reviewed for these trips distribution estimates<sup>2</sup>. Professional judgment and local knowledge about the area were also exercised to determine the project trip distribution.

Primary access to the proposed Project in the Mauka Project Area would be via two driveways, off Kuhio Highway. Based upon the proposed internal roadway configuration, about 60 percent of residents were assumed to utilize (make right in/right out turns) the Mauka Project driveway off Kuhio Highway and about 40 percent of residents were assumed to utilize (make right in/ right out turns) the driveway at Leho Drive (Start of Loop) / Kuhio Highway. Additionally, 100 percent of residents were assumed to make left in/left out turns at Leho Drive (Start of Loop) / Kuhio Highway.

Primary access to the proposed Project in the Makai Project Area would be via two access points, off Kuhio Highway, Leho Drive (End of the Loop) and Leho Drive (Start of Loop).

Using this information it was determined that traffic generated by the proposed Project would be distributed as follows:

- 40 percent to/from north on Kuhio Highway
- 25 percent to/from the south on Kuhio Highway
- 35 percent to/from the south on Kapule Highway

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<sup>2</sup> Reports consulted for this report include the following: the Final Transportation Impact Analysis for the Koheha Loa, Hanamaulu Triangle, Kaua'i, Hawaii (Wilbur Smith Associates, March 2006); and the Traffic Impact Report for the Proposed Coco Palms Resort (Wilson Oakamoto Corporation, May 2004)

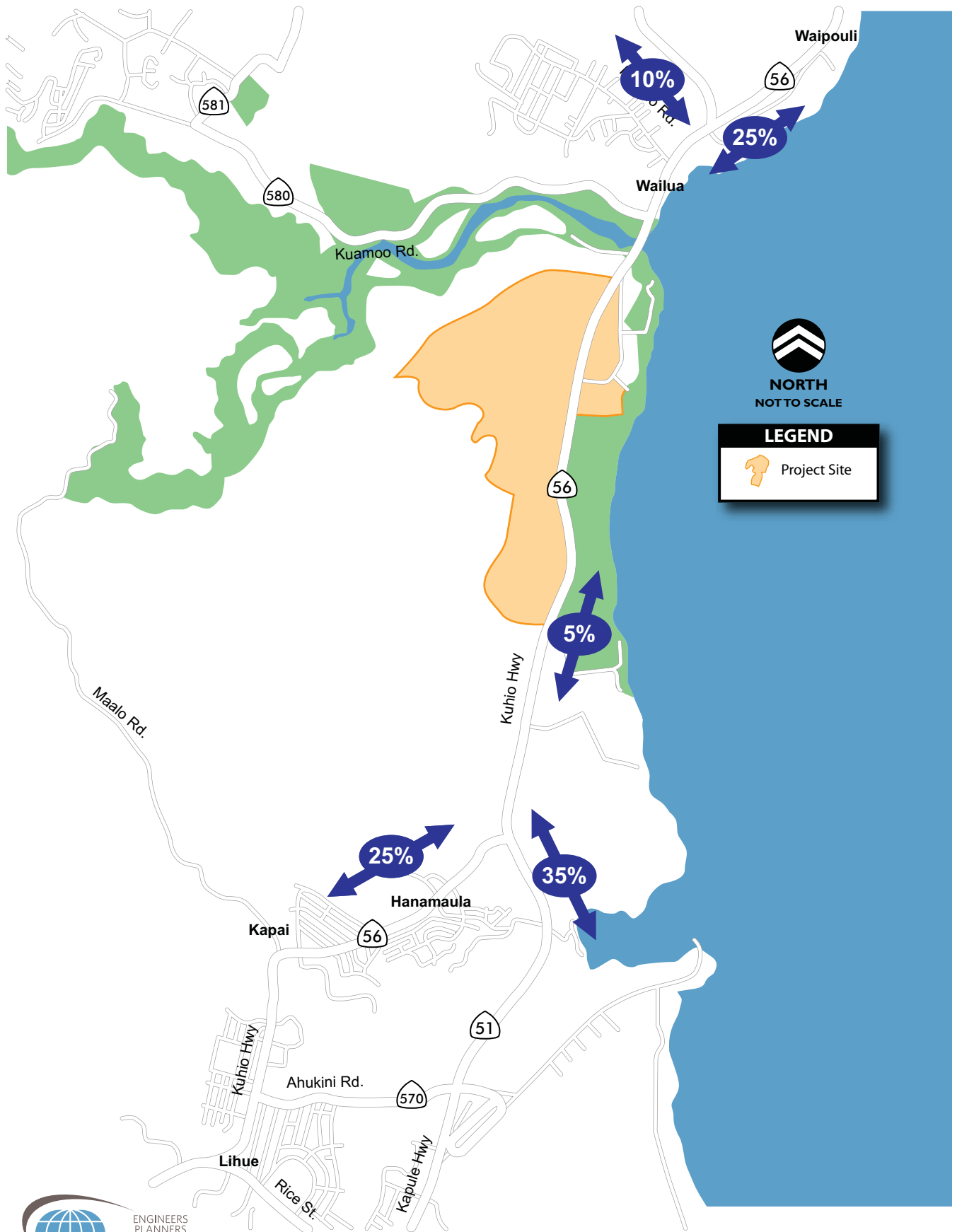


Figure 4  
YEAR 2015 PROJECT TRIP DISTRIBUTION

## **CHAPTER 5**

# **2015 WITH PROJECT CONDITIONS**

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This chapter describes the Year 2015 transportation conditions including intersection and highway operations as a result of the proposed Project. Additionally, the transportation impacts associated with the proposed Project were identified.

The operating conditions of the study intersections were studied under Year 2015 with Project Conditions as described in Chapter 3. Levels of Service of the study intersections were identified using the same methodologies as described in Chapter 2 for existing conditions.

### **5.1 THRESHOLDS OF SIGNIFICANCE**

Neither the County of Kaua'i nor the State of Hawaii have guidelines for identifying the transportation impacts caused by a project. As such, WSA followed the guidelines provided below to identify the transportation impacts at the study intersections.

#### **5.1.1 Intersections**

The thresholds of significance for the intersections are as follows:

1. A project would cause a transportation impact at an intersection if it degrades the LOS of the intersection to LOS E or worse.
2. A project would cause a transportation impact at an intersection operating at LOS E or F if it significantly increases the volume-to-capacity ratio of the intersection.

### **5.2 FUTURE WITH PROJECT CONDITIONS**

#### **5.2.1 Study Area**

As part of the Wailua Water Development Plan, a new study intersection would be created to assist in access to the project site. The new study intersection located within the project site would be Makai Project Driveway / Kuhio Highway. Figure 5-1 presents the study intersections under Future Year 2015 with Project Conditions. Figures 5-2A and 5-2B present the geometric configurations during the AM and PM peak hour under Year 2015 with Project Conditions.

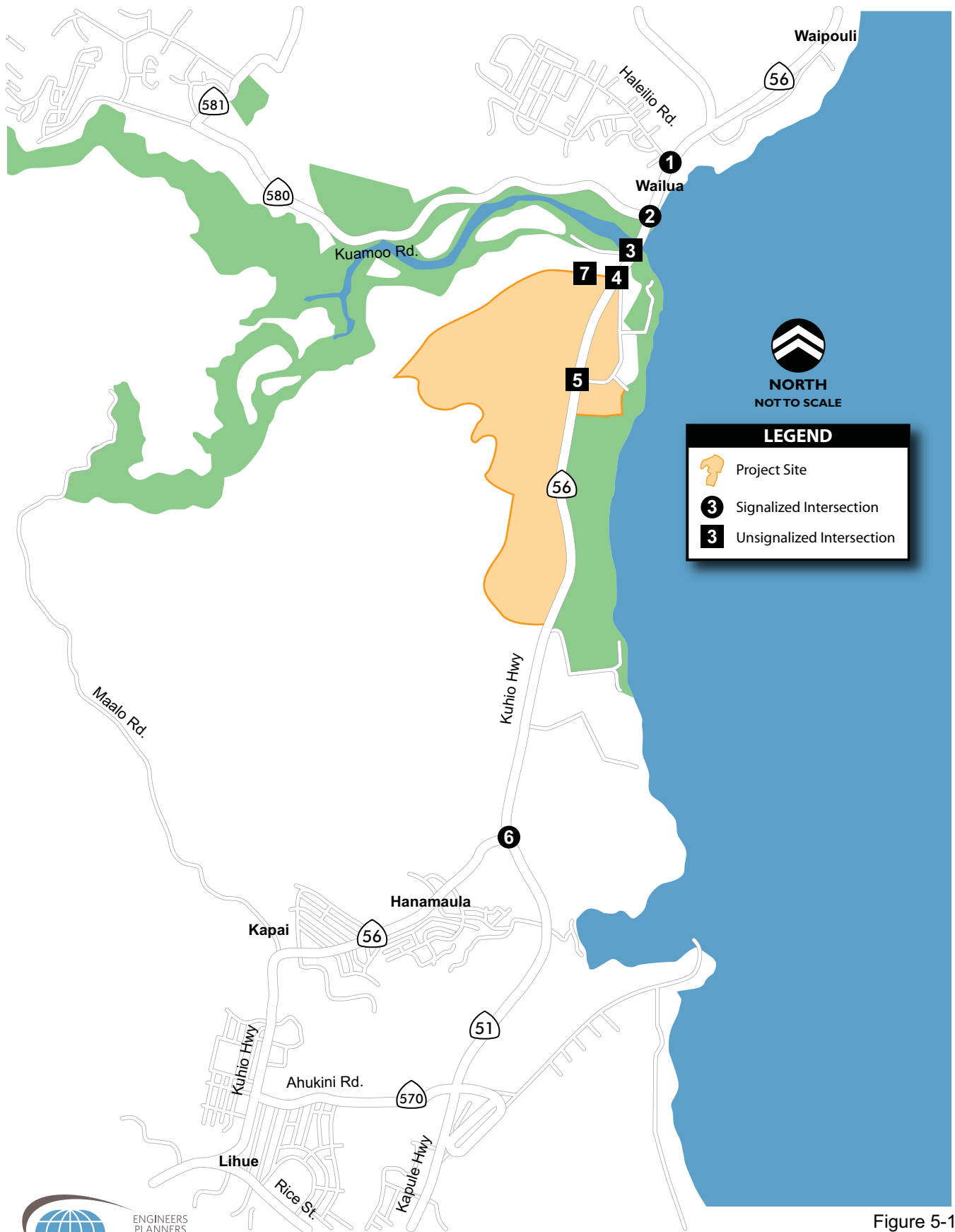


Figure 5-1  
STUDY INTERSECTIONS  
FUTURE YEAR 2015 WITH PROJECT CONDITIONS

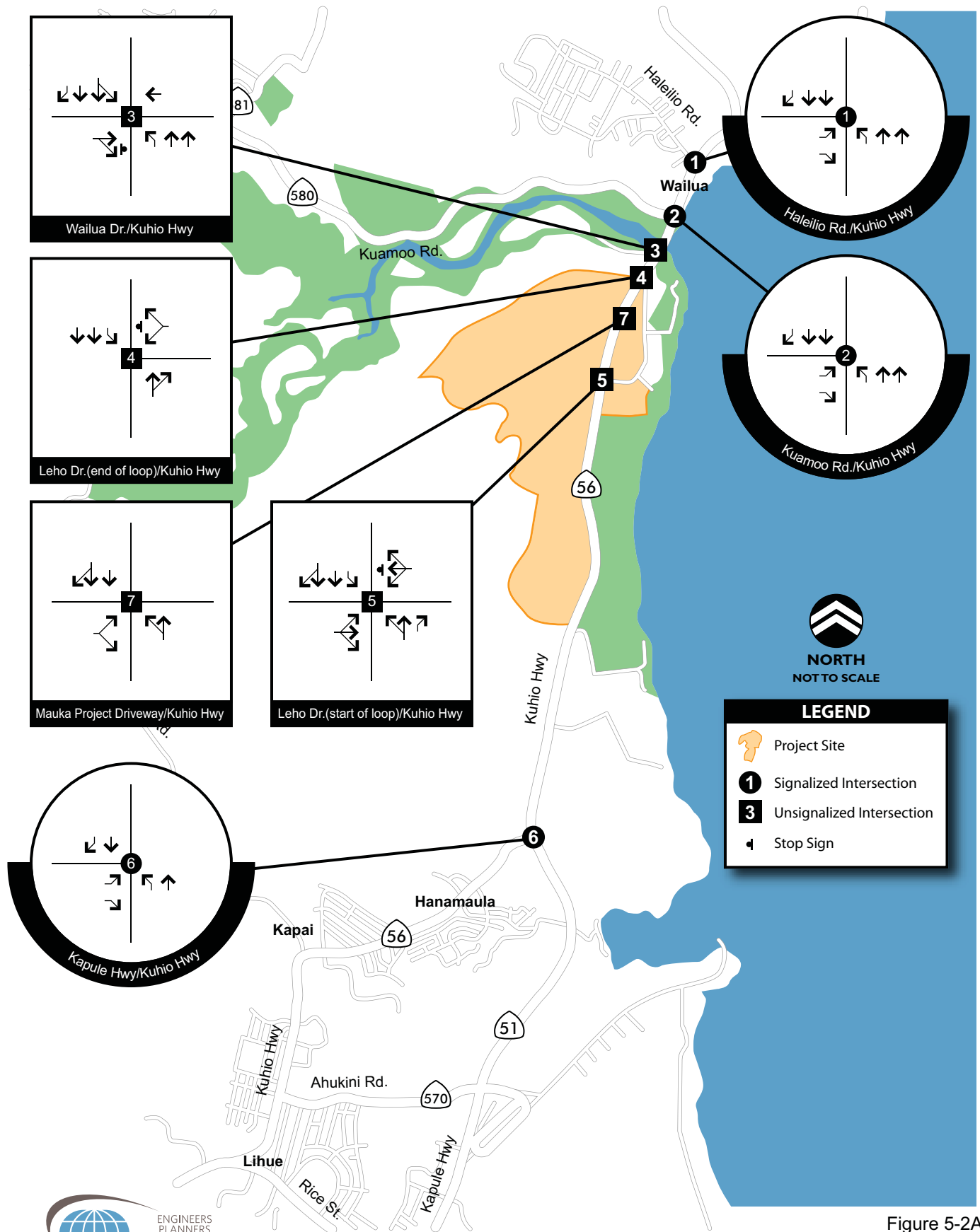


Figure 5-2A  
**INTERSECTION GEOMETRIC CONFIGURATIONS  
 FUTURE YEAR 2015 WITH PROJECT CONDITIONS AM**

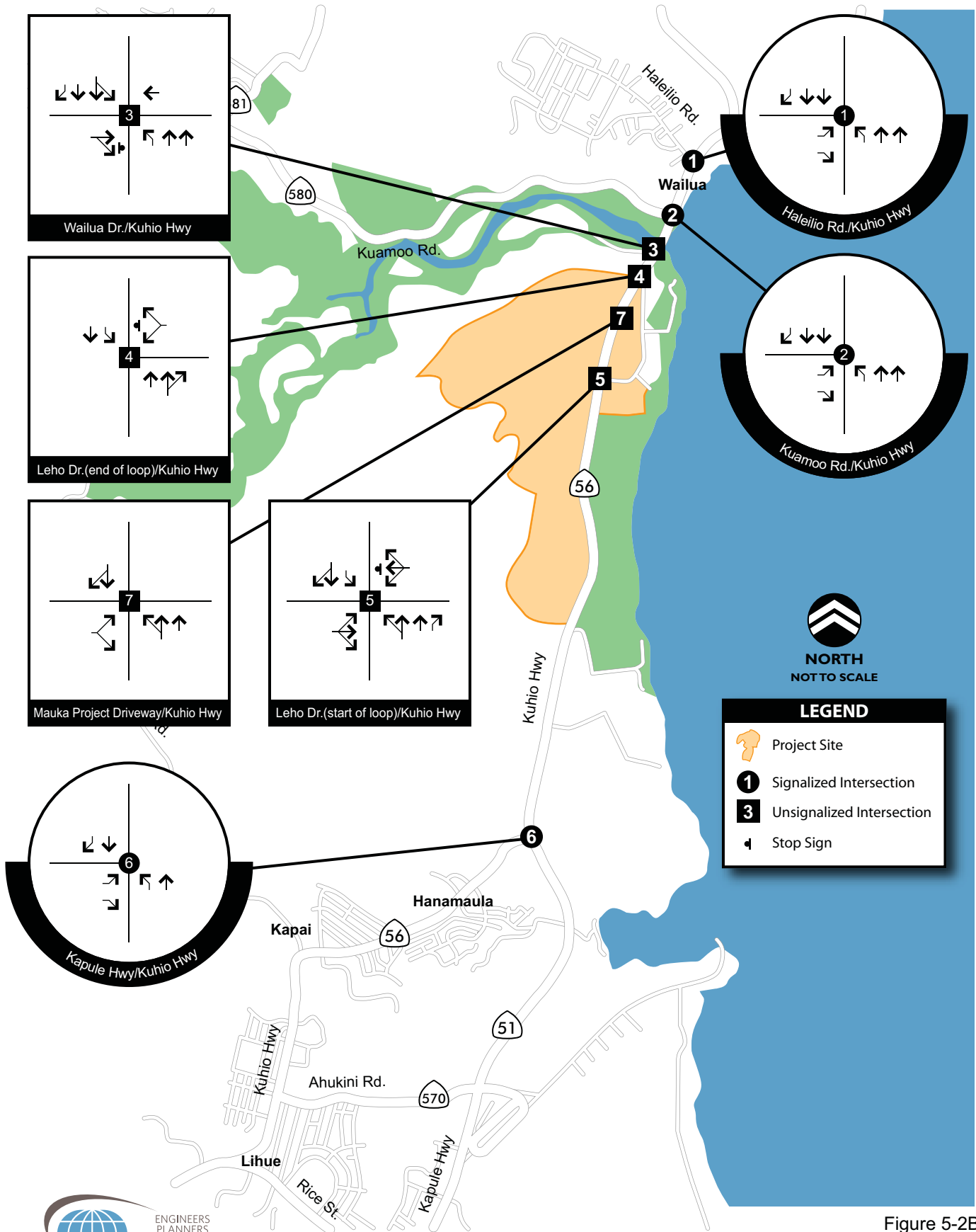


Figure 5-2B

**INTERSECTION GEOMETRIC CONFIGURATIONS  
FUTURE YEAR 2015 WITH PROJECT CONDITIONS PM**

### **5.2.2 Intersection Operating Conditions – With Project Conditions**

Using the trip distribution pattern described in Chapter 4, the project trips generated under Future Year 2015 with Project Conditions were distributed throughout the study area. The resulting turning movement volumes at the study intersections under Future Year 2015 with Project Conditions are exhibited in Figures 5-3 A and 5-3 B.

The LOS of the study intersections were calculated using the same methodologies described in Chapter 2. The study intersection operations under Future Year 2015 with Project Conditions are presented in Tables 5-1A and 5-1B.

Under Future Year 2015 with Project Conditions, for both the AM and PM peak hours, the proposed Project is expected to result in significant impacts that the following intersections:

- Leho Drive (End of Loop) / Kuhio Highway
- Leho Drive (Start of Loop) / Kuhio Highway
- Mauka Project Driveway / Kuhio Highway

In addition, it should be noted that the following intersections are also identified as operating at LOS F during the AM and PM conditions:

- Kuamoo Road / Kuhio Highway; and
- Kapule Highway / Kuhio Highway

Chapter 6 identifies the transportation impacts at the aforementioned intersection in further detail.

Synchro calculation worksheets under 2015 with Project conditions are included in Appendix B-3; Figures 5-3A and 5-3B present the intersection volumes, while Figures 5-4A and 5-4B present the LOS and delay values of all the turning movements at the study intersections under 2015 with Project AM and PM peak hour conditions.

**Table 5-1A**  
**AM Peak Hour Intersection Operations –2015 with Project Conditions**

#	Intersection	Control	Year 2015			Year 2015 plus Project			Impact?
			Delay	V/C Ratio	LOS	Delay	V/C Ratio	LOS	
			1	Haleililo Road / Kuhio Highway	Signal	19.4	0.72	B	
2	Kuamoo Road / Kuhio Highway	Signal	>80	1.23	F	>80	1.25	F	No
3	Marina Driveway / Kuhio Highway	SSSC	>50 (EB)	0.58	F	>50 (EB)	0.65	F	No
4	Leho Drive (End of Loop) / Kuhio Highway	SSSC	>50 (WB)	1.53	F	>50 (WB)	9.29	F	Yes
5	Leho Drive (Start of Loop) / Kuhio Highway	SSSC	>50 (WB)	1.68	F	>50 (WB)	117.7	F	Yes
6	Kapule Highway / Kuhio Highway	Signal	68.9	1.13	E	>80	1.31	F	No
7	Mauka Project Driveway / Kuhio Highway	SSSC	—	—	—	>50 (EB)	33.14	F	Yes

Source: Wilbur Smith Associates, August 2007

**Table 5-1B**  
**PM Peak Hour Intersection Operations –2015 with Project Conditions**

#	Intersection	Control	Year 2015			Year 2015 plus Project			Impact?
			Delay	V/C Ratio	LOS	Delay	V/C Ratio	LOS	
			1	Haleililo Road / Kuhio Highway	Signal	13.2	0.79	B	
2	Kuamoo Road / Kuhio Highway	Signal	37.2	0.87	D	43.2	0.93	D	No
3	Marina Driveway / Kuhio Highway	SSSC	>50 (EB)	0.76	F	>50 (EB)	1.02	F	No
4	Leho Drive (End of Loop) / Kuhio Highway	SSSC	>50 (WB)	10.59	F	>50 (WB)	1.51	F	Yes
5	Leho Drive (Start of Loop) / Kuhio Highway	SSSC	>50 (WB)	19.7	F	>50 (WB)	2769.59	F	Yes
6	Kapule Highway / Kuhio Highway	Signal	>80	1.33	F	>80	1.55	F	No
7	Mauka Project Driveway / Kuhio Highway	SSSC	—	—	—	>50 (EB)	7.67	F	Yes

Source: Wilbur Smith Associates, August 2007

**NOTES:** SSSC – Side-Street Stop-Control, Delay represents average delay presented in seconds per vehicle.Signal – Traffic Signal, Delay and LOS are presented for worst approach for side-street stop controlled intersections, **Bold** type indicates LOS E or F



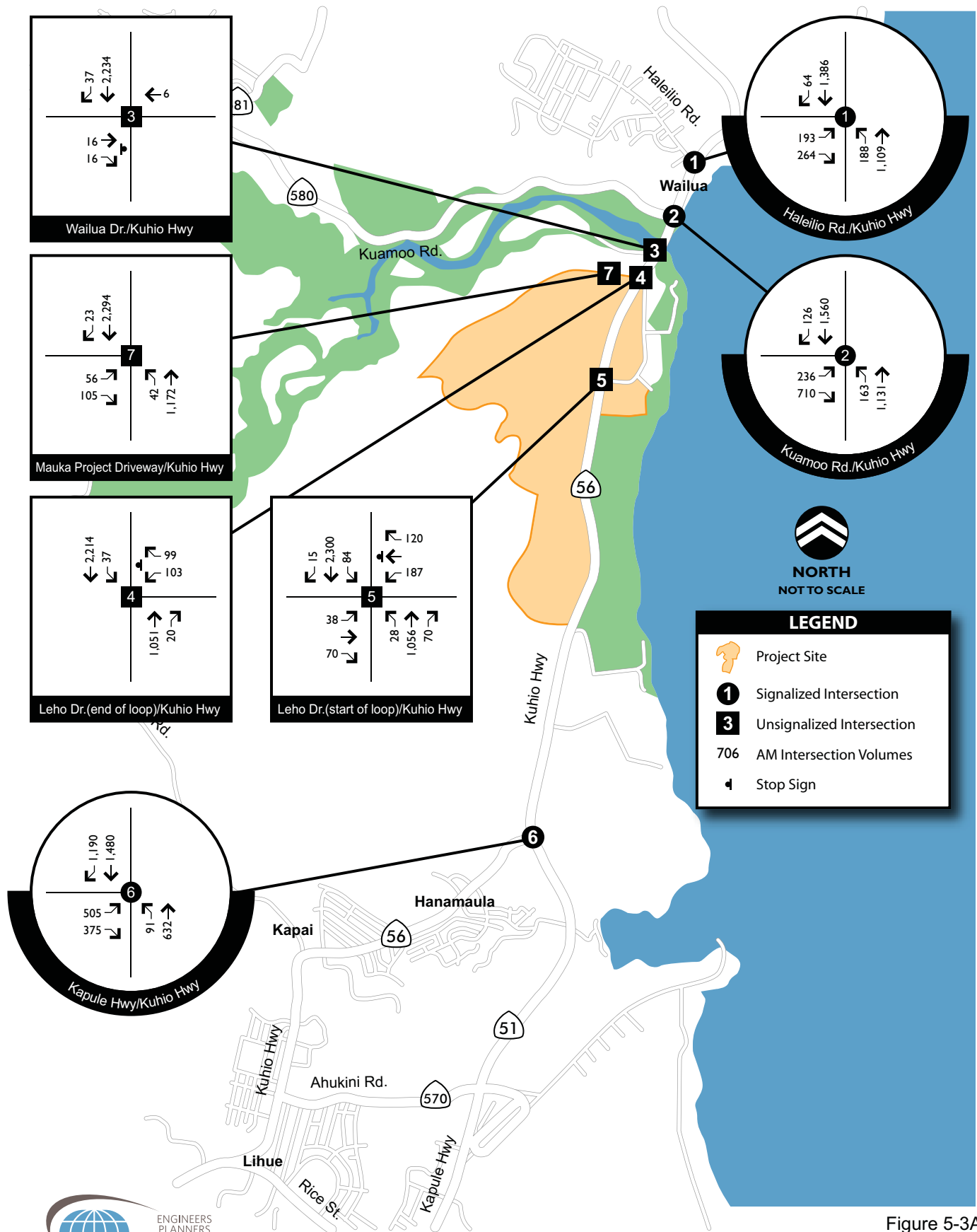


Figure 5-3A  
**AM PEAK HOUR INTERSECTION VOLUMES  
 FUTURE YEAR 2015 WITH PROJECT CONDITIONS**

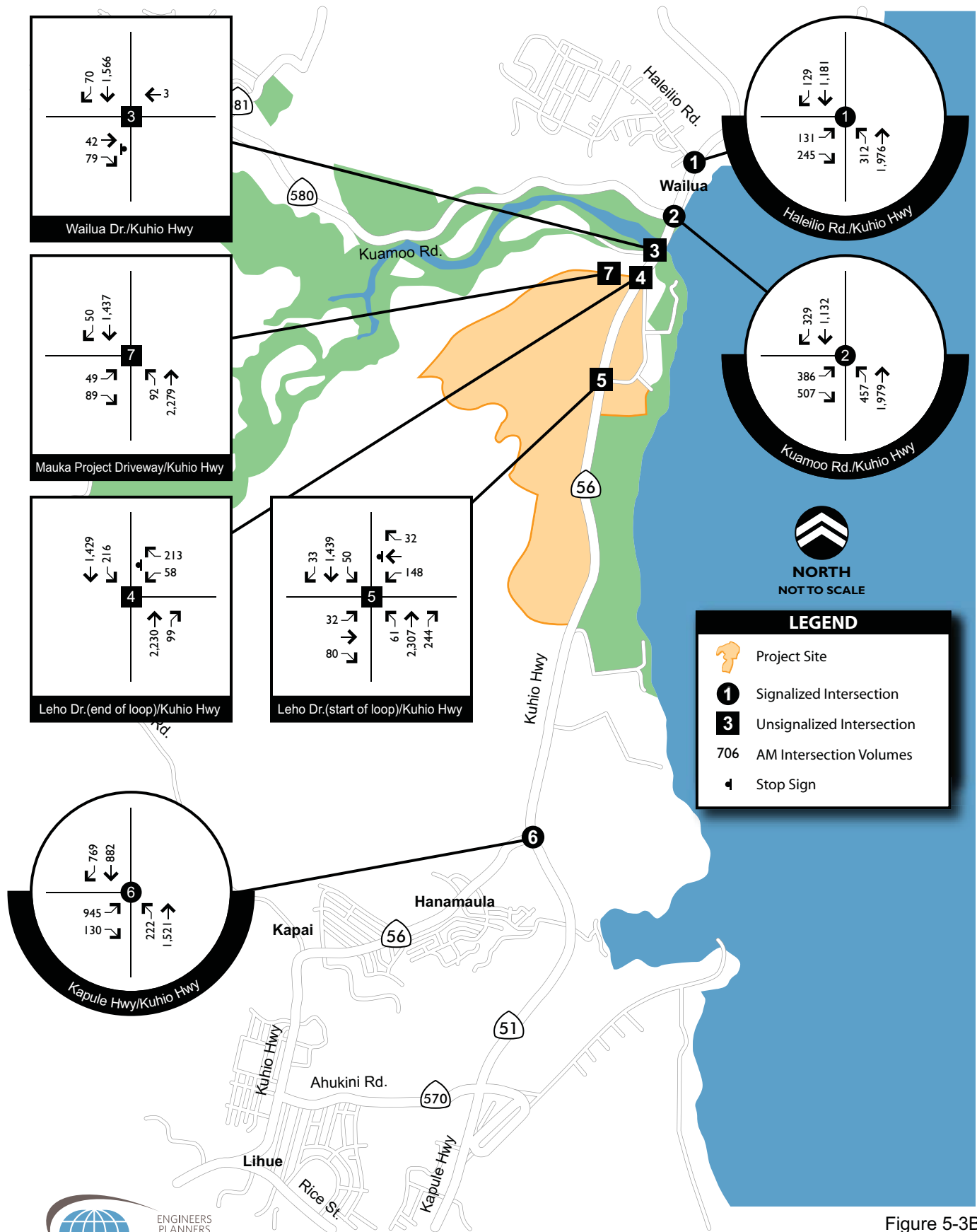


Figure 5-3B  
**PM PEAK HOUR INTERSECTION VOLUMES  
 FUTURE YEAR 2015 WITH PROJECT CONDITIONS**

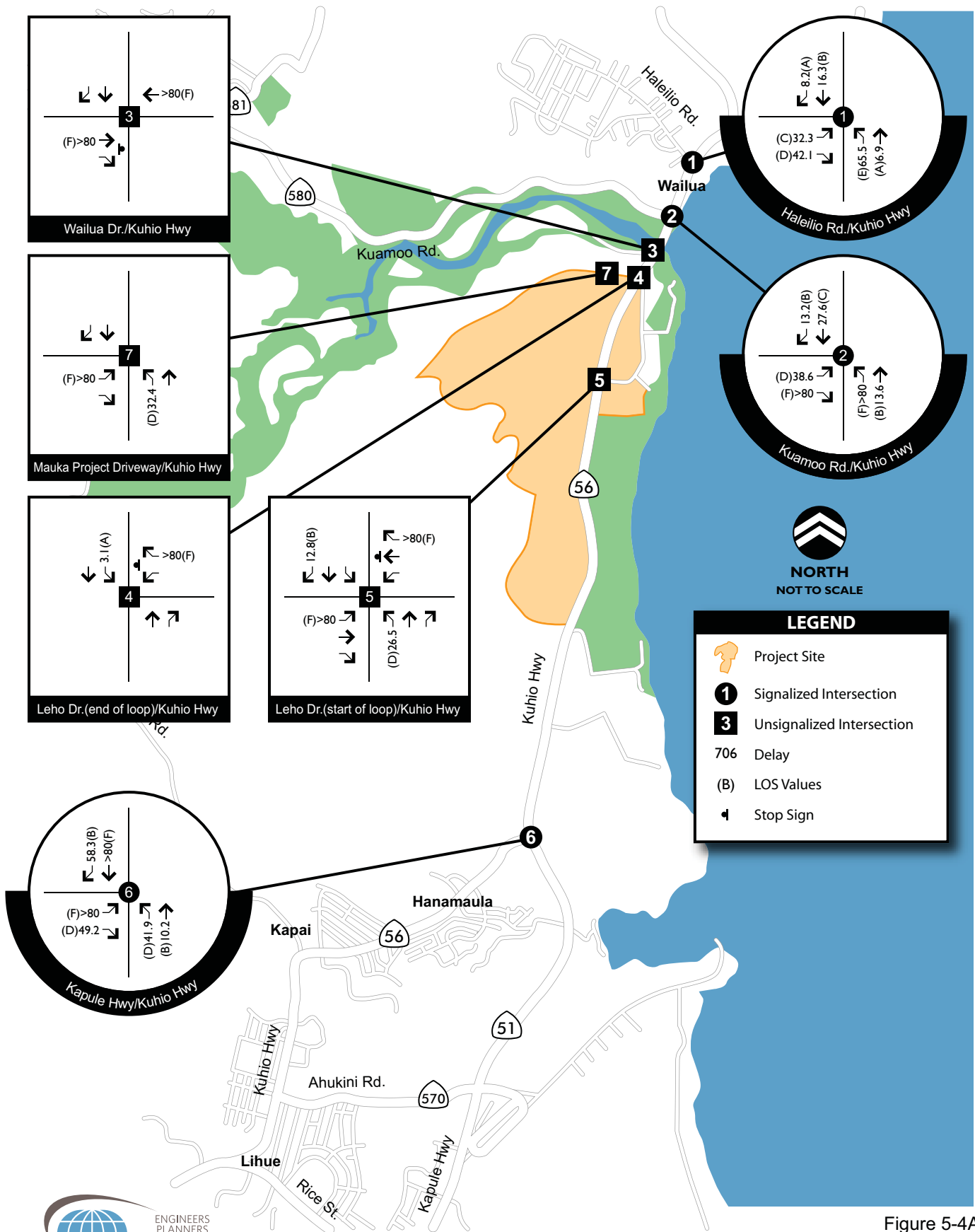
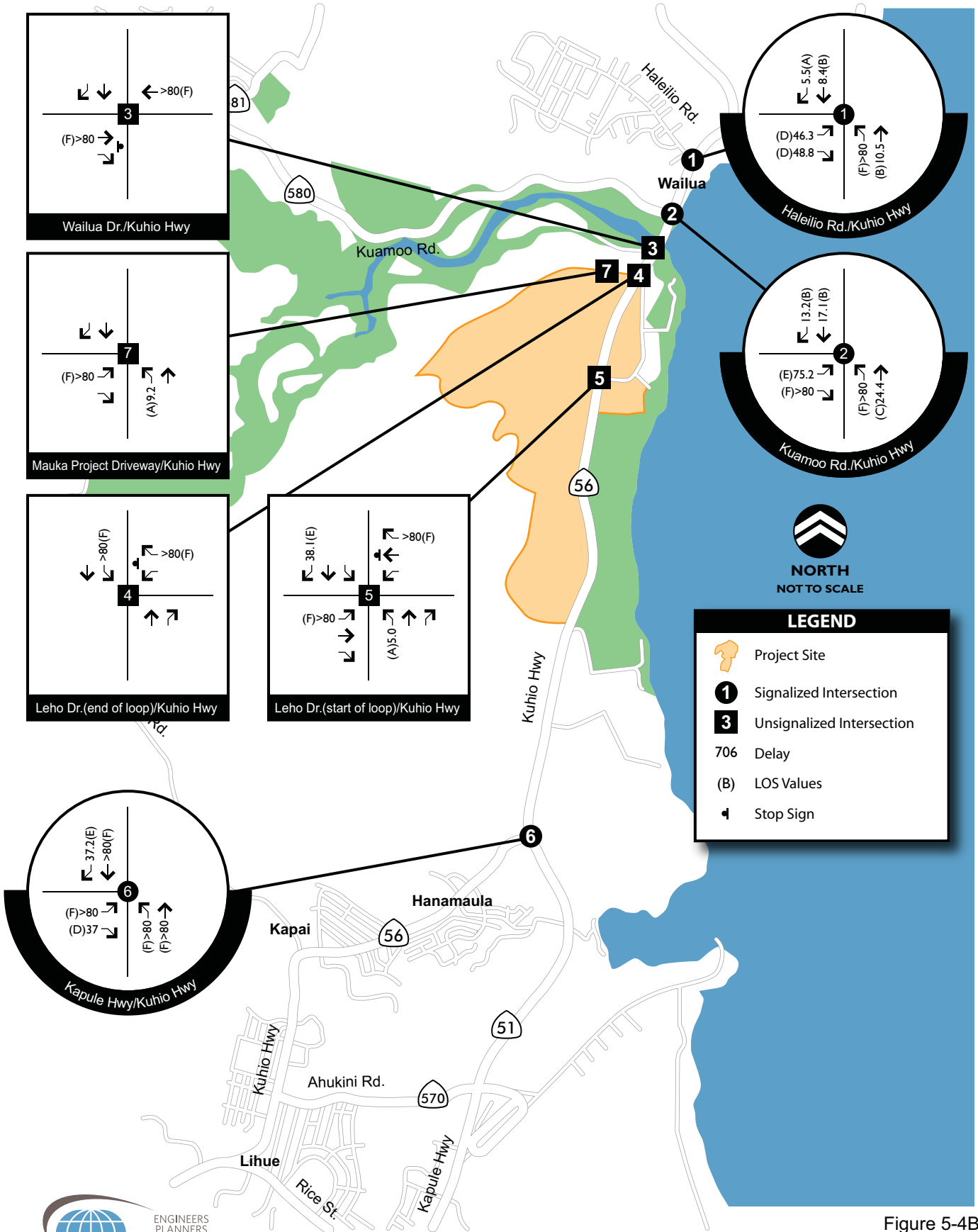


Figure 5-4A  
**AM PEAK HOUR LOS AND DELAY VALUES  
 FUTURE YEAR 2015 WITH PROJECT CONDITIONS**



**LEGEND**

- Project Site
- 1** Signalized Intersection
- 3** Unsignalized Intersection
- 706 Delay
- (B) LOS Values
- Stop Sign

Figure 5-4B  
PM PEAK HOUR LOS AND DELAY VALUES  
FUTURE YEAR 2015 WITH PROJECT CONDITIONS

# **CHAPTER 6**

## **PROJECT IMPACTS AND MITIGATION MEASURES**

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This chapter identifies potential transportation impacts on the roadway network due to travel demand generated by the proposed Project. Recommended improvements to the surrounding transportation system are proposed at the locations where significant impacts are identified. Refer to Appendix B-4 for Year 2015 with Project plus Mitigation Measures. In addition, descriptions pertaining to project site access, on-site circulation, and transit services as well as pedestrian facilities that would be located within the project site are provided. All planned intersection improvements resulting from implementation of the Wailua Development Project should be closely coordinated with the State DOT Highways Division and the County of Kauai.

### **6.1 2015 with Project Conditions**

#### **6.1.1 Project Impacts - Future 2015 with Project Conditions**

The proposed Project would cause transportation impacts during both AM and PM peak periods at the following 3 study intersections under Year 2015 Baseline with Project Conditions:

- Leho Drive (End of Loop) / Kuhio Highway
- Leho Drive (Start of Loop) / Kuhio Highway
- Mauka Project Driveway / Kuhio Highway

Descriptions of transportation impacts and the proposed improvements to mitigate them at each of the above identified intersections are discussed in Section 6.1.2. Appendix E presents the signal warrant worksheets for each of the study intersections for which a traffic signal is recommended.

#### **6.1.2 Mitigation Measures – Future 2015 with Project Conditions**

##### **Impact 1: Transportation Impact Leho Drive (End of Loop) / Kuhio Highway**

Under Future Year 2015 (Baseline) Conditions, intersection Leho Drive (End of Loop) / Kuhio Highway would operate at LOS F (V/C Ratio of 1.53) during the AM peak hour. Under Future Year with Project Conditions, the intersection would continue to operate at LOS F (V/C Ratio of 9.29) during the AM peak hour. Under Future Year 2015 (Baseline) Conditions, the intersection would operate at LOS F (V/C Ratio of 10.59) during the PM peak hour. Under Future Year with Project Conditions, the intersection would continue to operate at LOS F (V/C Ratio 1.51) during the PM peak hour. Since the proposed Project

would result in a V/C Ratio increase of 84 percent during the AM peak hour and a V/C Ratio increase of 86 percent during the PM peak hour, this would result in a significant impact at this intersection.

**Mitigation:** The following mitigation measure is proposed:

The unsignalized intersection would operate under unacceptable conditions in the Future year 2015 with Project. This condition could be improved by the use of traffic control devices. In addition, the two measures below are also suggested<sup>1</sup>:

1. Southbound Approach - Construct one exclusive left-turn lane to provide two through southbound lanes
2. Westbound Approach - Construct one exclusive left- turn lane to provide a dedicated right-turn and a dedicated left-turn lane.

**Impact after Mitigation:** Less-than-significant level.

With the proposed mitigation measures, this intersection's operating condition would improve from LOS F to LOS C during the AM and PM peak hours.

## **Impact 2: Transportation Impact Leho Drive (Start of Loop) / Kuhio Highway**

Under Future Year 2015 (Baseline) Conditions, intersection Leho Drive (Start of Loop) / Kuhio Highway would operate at LOS F (V/C Ratio 1.68) during the AM peak hour conditions. Under Future Year 2015 with Project Conditions, the LOS of the intersection would continue to operate at LOS F (V/C Ratio of 117.7) during the AM peak hour. Under Future Year 2015 (Baseline) Conditions, the intersection would operate at LOS F (V/C Ratio 19.7) during the PM peak hour. Under Future Year 2015 with Project Conditions, the intersection would continue to operate at LOS F (V/C 990.54) during the PM peak hour. Since the V/C Ratio would increase 99 percent during the AM peak hour and 98 percent during the PM peak hour, this would result in a significant impact at this intersection.

**Mitigation:** The following mitigation measure is proposed:

The unsignalized intersection would operate under unacceptable conditions in the Future year 2015 with Project. This condition could be improved by the use of traffic control devices. In addition, the two measures below are also suggested:

1. Northbound Approach - Construct one exclusive left-turn lane to provide northbound traffic an exclusive through lane.
2. Eastbound Approach - Construct one exclusive left-turn lane to provide a dedicated left-turn lane and shared through right lane

---

<sup>1</sup> This mitigation measure was based on the DOT Wailua Cane Bridge Widening Project under which no left turns were provided in the southbound approach. See Appendix B for project site plans.

3. Westbound Approach - Construct one exclusive left-turn lane to provide a dedicated left-turn lane and shared through right lane

**Impact after Mitigation:** Less-than-significant level.

With the proposed mitigation measures, this intersection's operating condition would improve from LOS F to LOS E during the AM and PM peak hours. Based on input from the Hawaii DOT, Kuhio Highway is proposed to be a four-lane roadway in the future. This will further improve the operations at this intersection.

### **Impact 3: Intersection Impact Mauka Project Driveway / Kuhio Highway**

Under Future Year 2015 Conditions, the intersection would operate at LOS F during the AM and PM peak hours. Based on the intersections proximity to the signalized intersection of Wailua Marina Driveway / Kuhio Highway, it is recommended that the proposed Mauka Project Driveway be restricted to right-in/right-out operations.

**Impact After Mitigation:** Less than significant

### **Additional Considerations**

As previously mentioned in Chapter 5, aside from the three (3) intersections described above, three (3) other intersections would operate at LOS F under Year 2015 with Project Conditions. These intersections include: Kuamoo Road / Kuhio Highway, Marina Driveway / Kuhio Highway, and Kapule Highway / Kuhio Highway. No additional improvements are required to mitigate the additional traffic generated by the proposed development, but some measures should be considered by the HDOT and/ or the County of Kaua'i to relieve existing traffic congestion that is expected to increase without the proposed development

### **Kuamoo Road /Kuhio Highway**

Under Future Year 2015 (Baseline) Conditions, during the AM peak hour the intersection would operate at LOS F (V/C Ratio of 1.23). Under Future Year 2015 with Project Conditions, the intersection would continue to operate at LOS F (V/C Ratio of 1.25). Under Future Year 2015 (Baseline Conditions), during the PM peak hour the intersection would operate at LOS F (V/C Ratio of 0.87) as compared to LOS F (V/C Ratio of 0.93) under with Project Conditions. As such, the intersection would only experience an increase of about 2 percent in the V/C Ratio under with Project Conditions during the AM peak hour and an increase of 6 percent during the PM peak hour. The proposed future widening of Kuhio Highway to a four-lane roadway will further improve the LOS at this intersection by relieving congestion.

### **Marina Driveway / Kuhio Highway**

Under Future Year 2015 (Baseline) Conditions, the intersection would operate at LOS F (V/C Ratio of 0.58) during the AM peak hour. Under Future Year 2015 with Project Conditions, the intersection would continue to operate at LOS F (V/C Ratio of 0.65) during the AM peak hour. Under Future Year 2015 (Baseline) Conditions, the intersection would operate at LOS F (V/C Ratio 0.76) during the PM peak hour as compared to LOS F (V/C ratio 1.02) under with Project Conditions. As such, the intersection would only experience an increase of 10 percent in the V/C Ratio under with Project Conditions during the AM and 25 percent in the PM peak hour.

Similar to the above intersection, the proposed widening of Kuhio Highway would also improve the operations at this intersection.

### **Kapule Highway / Kuhio Highway**

Under Future Year 2015 (Baseline) Conditions, the intersection would operate at LOS F (V/C Ratio of 1.13) during the AM peak hour. Under Future Year 2015 with Project Conditions, the intersection would continue to operate at LOS F (V/C Ratio of 1.31) during the AM peak hour. Under Future Year 2015 (Baseline) Conditions, the intersection would operate at LOS F (V/C Ratio 1.33) during the PM peak hour as compared to LOS F (V/C ratio 1.55) under with Project Conditions. As such, the intersection would only experience an increase of 14 percent in the V/C Ratio under with Project Conditions during both the AM and PM peak hour. Mitigation measures for this intersection have already been proposed as part of the Hanamaulu Triangle Project. As such, no further mitigations measures are proposed at this time.

Figures 6-1A and 6-1B exhibit the AM and PM peak hour intersection configurations according to the proposed mitigation measures above.



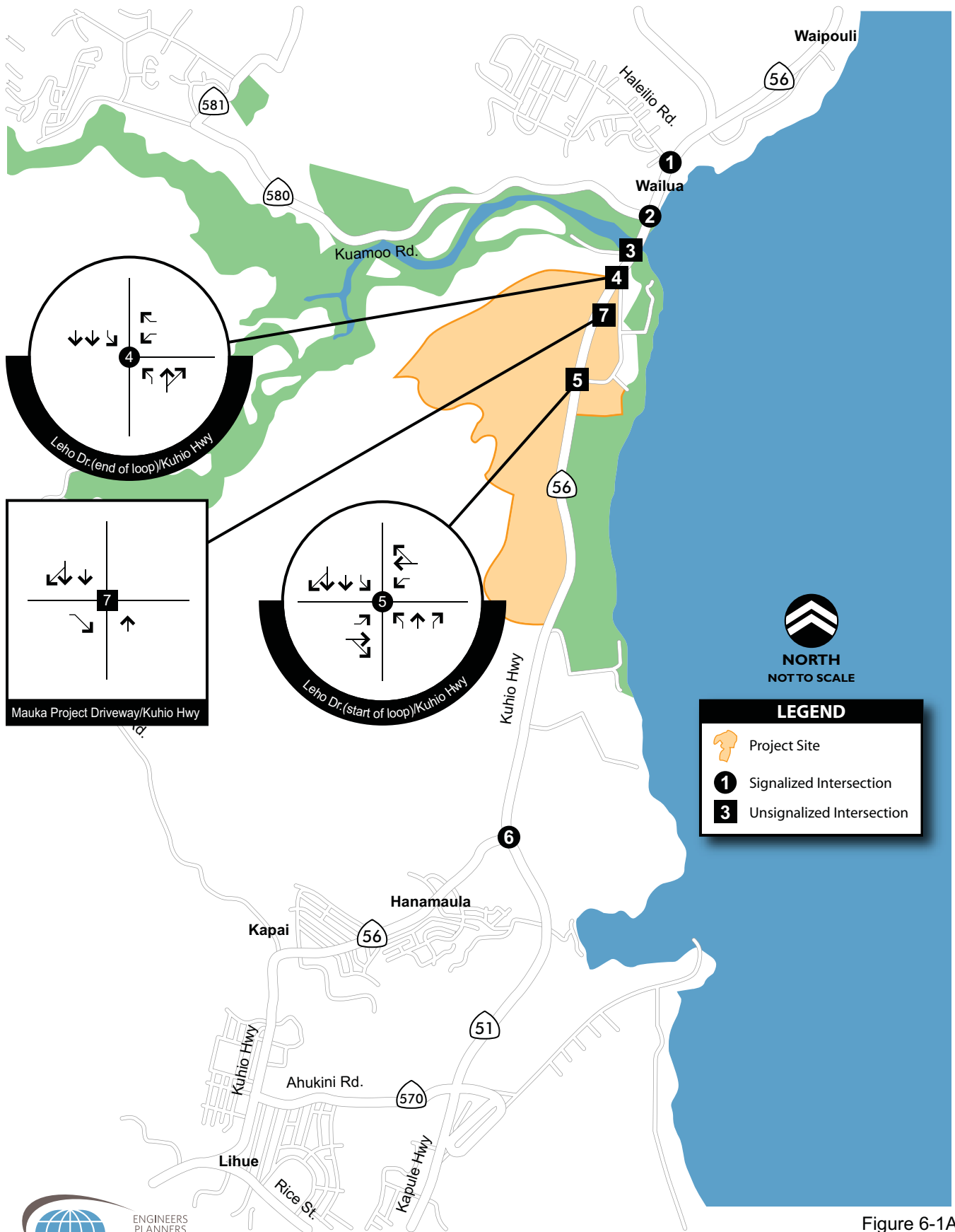
## **6.2 SITE ACCESS AND ON-SITE CIRCULATION**

The proposed Project would be primarily accessed along major defined roadways including, Kuhio Highway. Circulation within the proposed Project however would be made possible through a couple of access points, including, the Mauka Project Driveway, Leho Drive (End of Loop) and Leho Drive (Start of Loop).

**Maukai Project Driveway** will provide access to and from Kuhio Highway to the north edge of the Mauka project site. Due to the proximity of this driveway to the intersection of Wailua Marina Driveway, it is recommended that the proposed driveway be restricted to right-in/right-out operations.

**Leho Drive (End of Loop)** will provide access to and from the north edge of the Makai project site for traffic traveling on Kuhio Highway

**Leho Drive (Start of Loop)** will provide access to and from the south edge of the Makai project site for traffic traveling on Kuhio Highway.



**LEGEND**

- Project Site
- Signalized Intersection
- Unsignalized Intersection

Figure 6-1A  
**INTERSECTION CONFIGURATIONS  
PROPOSED MITIGATION MEASURES AM**

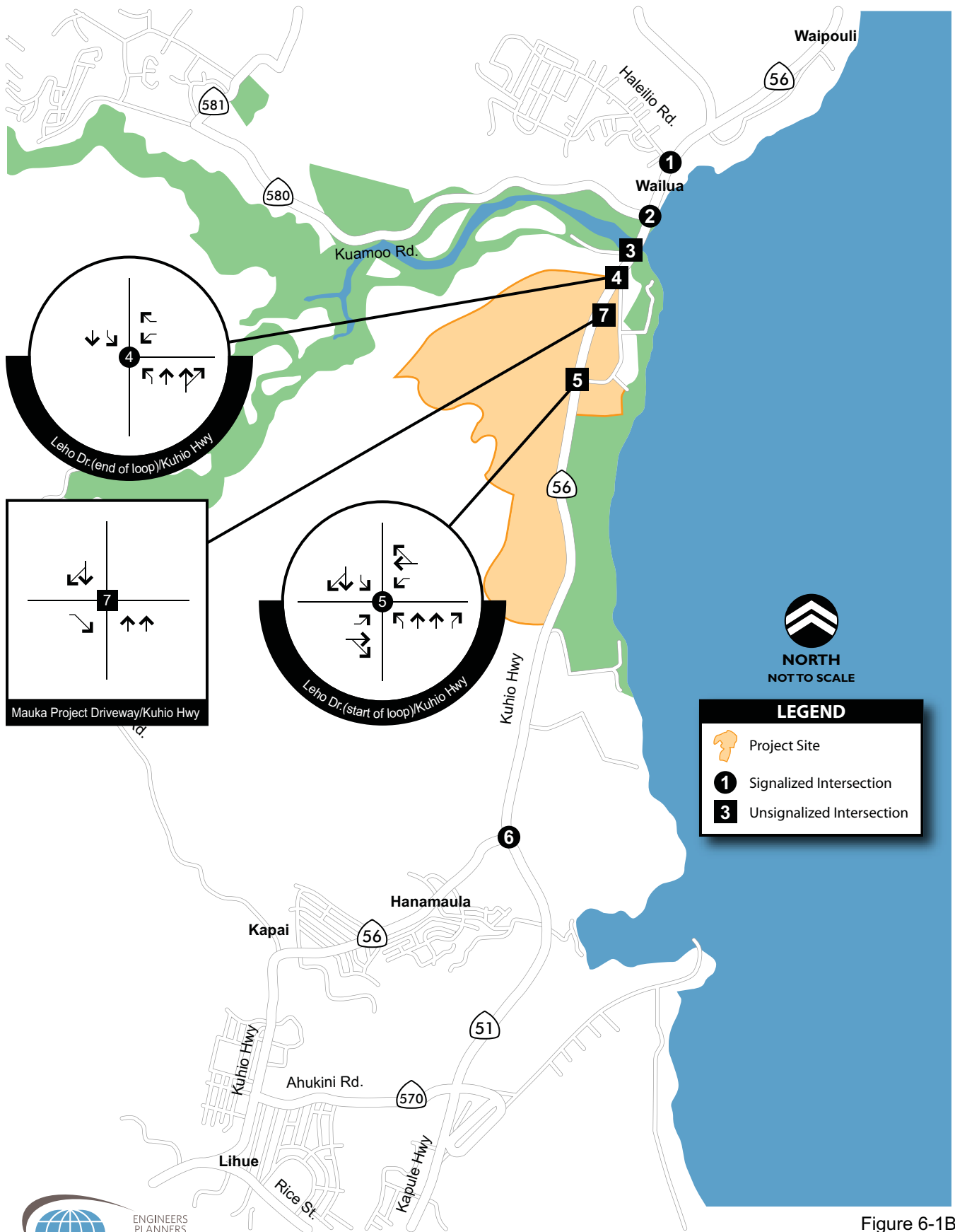


Figure 6-1B  
INTERSECTION CONFIGURATIONS  
PROPOSED MITIGATION MEASURES PM

**APPENDIX G**  
**PRECONSULTATION**



**APPENDIX G-1**

**PRECONSULTATION LETTER**





Environet, Inc.

PRESERVING EARTH'S RESOURCES FOR THE FUTURE

July 19, 2007

Addressee

**Subject:** Pre-Assessment Consultation to Prepare a Chapter 343 HRS Environmental Assessment for a Proposed Wailua Residential Subdivision, Wailua, Kauai, Hawaii  
TMK Nos. (4) 3-9-006:009 and 011; 3-9-002:012, 024, and 025 (portions)

Dear Consulted Party:

Environet, Inc. (EI) on behalf of the Department of Hawaiian Home Lands (DHHL) is in the process of preparing a Chapter 343 HRS Environmental Assessment for a proposed residential subdivision in Wailua on the island of Kauai, Hawaii. We are in the project scoping phase and are seeking your input in terms of issues that would identify potential environmental impacts associated with the proposed project.

The proposed Wailua Residential Subdivision involves 52 acres makai of Kuhio Highway and approximately 400 acres on the mauka side of the highway. The makai portion of the development will be offered for revenue-generating purposes with possibly up to 800 timeshare units. The mauka portion includes a residential community consisting of residential lots (700 lots of a minimum of 10,000 square feet each), revenue-generating lots, a school, parks, community center, and 120-foot wide by-pass road (Kapaa Relief Route). Site improvements will include roadways, water, drainage improvements, individual wastewater disposal systems, and electrical lines. Improvements will be designed in accordance with the applicable standards of DHHL, Kauai County, State of Hawaii, and the U.S. Government.

In conjunction with this work, we are requesting any written comments and/or information with respect to your area(s) of concern. Please send your written comments to the following by August 20, 2007:

Colette Sakoda  
Environet, Inc.  
2850 Pa`a Street, Suite 212  
Honolulu, Hawaii 96819

Thank you for participating in the planning stages of this important project. If you have any questions or need clarification, please contact me at 833-2225.



Pre-Assessment Consultation  
Proposed Wailua Residential Subdivision  
July 19, 2007  
Page 2

Sincerely,





Colette Sakoda  
Senior Project Manager

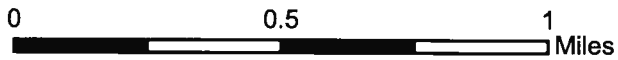
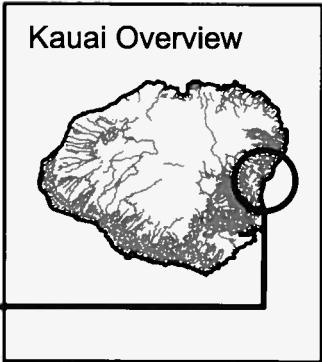
cc: Mr. Bernard Kea, Sr., Community Planning & Engineering  
Mr. Kamuela Cobb-Adams, Department of Hawaiian Home Lands

Attachment: Regional Location Map



### Legend

-  Makai Property
-  Mauka Property



Source: U.S. Geological Survey

DHHL Wailua

**GreenWave**  
Solutions, Inc.

Regional Location Map

Figure  
1



**APPENDIX G-2**  
**PRECONSULTATION LETTER RESPONSES**



AUG - 4 2007

LINDA LINGLE  
GOVERNOR OF HAWAII



CHIYOME L. FUKINO, M.D.  
DIRECTOR OF HEALTH

STATE OF HAWAII  
DEPARTMENT OF HEALTH  
P.O. BOX 3378  
HONOLULU, HAWAII 96801-3378

In reply, please refer to:  
EMD / CWB

08010PKP.07

August 1, 2007

Ms. Colette Sakoda  
Senior Project Manager  
Environet, Inc.  
2850 Paa Street, Suite 212  
Honolulu, Hawaii 96819

Dear Ms. Sakoda:

**Subject: Pre-Assessment Consultation to Prepare a Chapter 343 HRS Environmental Assessment for Proposed Wailua Residential Subdivision Wailua, Kauai, Hawaii**

The Department of Health, Clean Water Branch (CWB), has reviewed the subject document and offers these comments on your project. Please note that our review is based solely on the information provided in the subject document and its compliance with Hawaii Administrative Rules (HAR), Chapters 11-54 and 11-55. You may be responsible for fulfilling additional requirements related to our program. We recommend that you also read our standard comments on our website at

<http://www.hawaii.gov/health/environmental/env-planning/landuse/CWB-standardcomment.pdf>

1. Any project and its potential impacts to State waters must meet the following criteria:
  - a. Antidegradation policy (HAR, Section 11-54-1.1), which requires that the existing uses and the level of water quality necessary to protect the existing uses of the receiving State water be maintained and protected.
  - b. Designated uses (HAR, Section 11-54-3), as determined by the classification of the receiving State waters.
  - c. Water quality criteria (HAR, Sections 11-54-4 through 11-54-8).
2. Please call the Army Corps of Engineers at (808) 438-9258 to see if this project requires a Department of the Army (DA) permit. Permits may be required for work performed in, over, and under navigable waters of the United States. Projects requiring a DA permit also require a Section 401 Water Quality Certification (WQC) from our office.

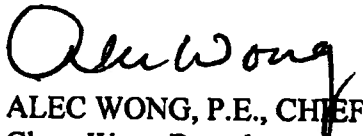
Ms. Colette Sakoda  
August 1, 2007  
Page 2

3. You are required to obtain a National Pollutant Discharge Elimination System (NPDES) permit for discharges of wastewater, including storm water runoff, into State surface waters (HAR, Chapter 11-55). For the following types of discharges into Class A or Class 2 State waters, you may apply for NPDES general permit coverage by submitting a Notice of Intent (NOI) form:
  - a. Storm water associated with construction activities, including clearing, grading, and excavation, that result in the disturbance of equal to or greater than one (1) acre of total land area. The total land area includes a contiguous area where multiple separate and distinct construction activities may be taking place at different times on different schedules under a larger common plan of development or sale. **An NPDES permit is required before the start of the construction activities.**
  - b. Treated effluent from leaking underground storage tank remedial activities.
  - c. Hydrotesting water.
  - d. Construction dewatering effluent.
4. You must submit a separate NOI form for each type of discharge at least 30 calendar days prior to the start of the discharge activity, except when applying for coverage for discharges of storm water associated with construction activity. For this type of discharge, the NOI must be submitted 30 calendar days before to the start of construction activities. The NOI forms may be picked up at our office or downloaded from our website at:  
<http://www.hawaii.gov/health/environmental/water/cleanwater/forms/genl-index.html>.
5. You must also submit a copy of the NOI or NPDES permit application to the State Department of Land and Natural Resources, State Historic Preservation Division (SHPD), or demonstrate to the satisfaction of the CWB that SHPD has or is in the process of evaluating your project. Please submit a copy of your request for review by SHPD or SHPD's determination letter for the project along with your NOI or NPDES permit application, as applicable.
6. Please note that all discharges related to the project construction or operation activities, whether or not NPDES permit coverage and/or Section 401 WQC are required, must comply with the State's Water Quality Standards. Noncompliance with water quality requirements contained in HAR, Chapter 11-54, and/or permitting requirements, specified in HAR, Chapter 11-55, may be subject to penalties of \$25,000 per day per violation.

Ms. Colette Sakoda  
August 1, 2007  
Page 3

If you have any questions, please visit our website at <http://www.hawaii.gov/health/environmental/water/cleanwater/index.html>, or contact the Engineering Section at 586-4309.

Sincerely,

  
ALEC WONG, P.E., CHIEF  
Clean Water Branch

KP:np







**AUG 24 2007**

## United States Department of the Interior



**FISH AND WILDLIFE SERVICE**  
Pacific Islands Fish and Wildlife Office  
300 Ala Moana Boulevard, Room 3-122, Box 50088  
Honolulu, Hawaii 96850

In Reply Refer To:  
2007-TA-0235

**AUG 22 2007**

Ms. Colette Sakoda  
Environet, Incorporated  
2850 Paa Street, Suite 212  
Honolulu, Hawaii 96819

**Subject: Pre-Assessment Consultation to Prepare a Chapter 343 HRS Environmental Assessment for Proposed Wailua Residential Subdivision on the Island of Kauai [TMK (4) 3-9-006:009 and 011; 3-9-002:012, 024, and 025]**

Dear Ms. Sakoda:

This is in response to your letter dated July 20, 2007, received on July 23, 2007, requesting information regarding environmental resources and potential impacts associated the development of a proposed subdivision in Wailua on the Island of Kauai, Hawaii. The subdivision includes 52 acres makai of Kuhio Highway and approximately 400 acres on the mauka side of the highway on undeveloped lands. The makai portion of the development will include up to 800 timeshare units and the mauka portion includes 700 lots, a school, parks, community center, and a 120-foot wide by-pass road (Kapaa Relief Route). The development will include roadways, water, drainage improvements, individual wastewater disposal systems, and electrical lines.

To assist you with this project we have reviewed the information in our files, including data compiled by the Hawaii Biodiversity and Mapping Program and the Hawaii GAP Program. Land cover information indicates that the proposed project area has multiple classifications that include: cultivated lands, grassland, scrub shrub, and wetland habitats. Our species database indicates the federally threatened Newell's shearwater (*Puffinus auricularis newelli*) and the federally endangered Hawaiian petrel (*Pterodroma phaeopygia sandwichensis*), Hawaiian hoary bat (*Lasirus cinereus semotus*), Hawaiian goose (*Branta sandvicensis*), Hawaiian duck (*Anas wyvilliana*), Hawaiian moorhen (*Gallinula chloropus sandvicensis*), Hawaiian Coot (*Fulica alai*) and Hawaiian stilt (*Himantopus mexicanus knudseni*) have been observed in the vicinity of the project.

We offer the following suggestions to assist you in the development of the draft Environmental Assessment (EA). We recommend complete biological surveys be conducted for the entire site to include detailed botanical, avian and Hawaiian hoary bat information. Because of the poor documentation of the distribution of the Hawaiian hoary bat on Kauai we recommend surveys be

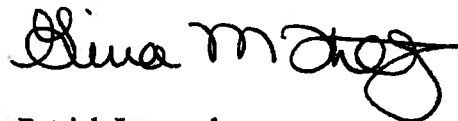
**TAKE PRIDE  
IN AMERICA** 

conducted by a knowledgeable biologist to determine if the bat is using habitat onsite or in the vicinity. The EA should address all potential direct and indirect project impacts for each species of waterbird that has been observed in the proposed project or in adjacent wetlands. These impacts should include construction impacts such as noise, night lighting, erosion, dust, and location of all equipment staging areas.

The EA should also address ongoing impacts from the proposed housing, infrastructure and roadways to listed species and the habitats utilized by these species. Edge effects (proximity of the development to natural habitats), should be considered during the planning phase of the development to assure the incorporation of an adequate buffer between man-made structures and natural or wetland habitats. Lighting should also be considered as it is an issue for the Hawaiian petrel and Newell's shearwater as these seabirds are known to transit this area and are prone to collisions with objects in artificially lighted areas. Early project planning should include eliminating or reducing structures higher than current existing vegetation and minimizing artificial lighting since seabirds end up circling light sources until they collide with structures or fall to the ground due to exhaustion.

We hope this information assists you in developing a comprehensive and thorough EA. If, as the project development progresses, it is determined that the proposed subdivision will adversely impact federally listed species, then we recommend you contact our office early in the process so that we may assist you in developing avoidance and minimization measures for these species. If you have questions, please contact Aaron Nadig, Consultation and Technical Assistance Program (phone: 808/792-9466; fax: 808/792-9581).


Sincerely,



 Patrick Leonard  
Field Supervisor

AUG 9 2007

Network Engineering & Planning

Hawaiian Telcom 

Hawaiian Telcom  
4040 Halau St.  
Lihue, HI 96766

Phone 808 241-5062

August 7, 2007

Colette Sakoda  
Environet, Inc.  
2850 Paa Street, Suite 212  
Honolulu, HI 96819-4431

Subject: **PROPOSED WAILUA RESIDENTIAL SUBDIVISION, WAILUA, KAUAI, HAWAII  
TMK Nos. (4) 3-9-006:009 and 011; 3-9-002:012, 024, and 025 (portions)**

Dear Ms. Sakoda:

Thank you for your July 23, 2007 letter regarding the Department of Hawaiian Homes Lands (DHHL) plan to prepare a Chapter 343 HRS Environmental Assessment for a proposed residential subdivision in Wailua on the island of Kauai, Hawaii. We understand that, on behalf of DHHL, you are seeking input to identify potential environmental impacts associated with the proposed project.

Hawaiian Telcom maintains aerial cable facilities along Kuhio Highway between Wailua and Hanamaulu. The poles along this corridor are jointly owned with KIUC. Hawaiain Telcom also maintains an underground conduit system along Leho Drive serving the Aloha Beach Resort Hotel, Lydate Park facilities, and Kaha Lani condominium. Finally, Hawaiain Telcom has an underground fiber optic facility on the makai side of Kuhio Highway.

While we do not anticipate any impacts to our facilities by the proposed project, we would appreciate being informed if there are any potential impacts that may affect the above-described facilities.

Should you have any questions, please call me at 808-241-5052 or email [jimmy.sone@hawaiiantel.com](mailto:jimmy.sone@hawaiiantel.com)

Sincerely,



James 'Jimmy' Sone P.E.  
Engineer

c: File



AUG 9 2007

LINDA LINGLE  
GOVERNOR OF HAWAII



STATE OF HAWAII  
DEPARTMENT OF LAND AND NATURAL RESOURCES

DIVISION OF STATE PARKS  
POST OFFICE BOX 621  
HONOLULU, HAWAII 96809

LAURA E. TRIBLEN  
INTERIM CHAIRPERSON  
BOARD OF LAND AND NATURAL RESOURCES  
COMMISSION ON WATER RESOURCE MANAGEMENT

ALLAN A. SMITH  
INTERIM DEPUTY DIRECTOR - LAND

KEN C. KAWAHARA  
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

August 8, 2007

Ms. Collette Sakoda  
Environet, Inc.  
2850 Pa'a Street, Suite 212  
Honolulu, Hawai'i 96819

Dear Ms. Sakoda:

SUBJECT: Pre-Assessment Consultation for Environmental Assessment  
Proposed Wailua Residential Subdivision, Wailua, Kaua'i  
TMK: 3-9-06: 9 and 3-9-02: 12, 24, 25

The proposed project by the Department of Hawaiian Home Lands abuts Wailua River State Park on the *mauka* side of Kūhiō Highway. Malae Heiau and the Marina portion of the park are situated between the project area and the Wailua River. Please note that the DHHL property is incorrectly shown at the intersection of the Marina Road and Kūhiō Highway on the map you provided. A detailed map of the property under the jurisdiction of the Department of Land and Natural Resources is enclosed with this correspondence.

Because of the proximity of the proposed development to the park, we have several concerns that should be addressed in your planning for this project:

- Malae Heiau is one of four *heiau* within Wailua River State Park and these *heiau* comprise the Wailua Complex of Heiau, a National Historic Landmark listed on both the National and Hawai'i Registers of Historic Places. There is a cultural and historical connection between these *heiau* and the proposed development has the potential to impact the culturally significant view plane between Malae Heiau and Poliahu Heiau. Poliahu Heiau is located on the bluff above the Wailua River by 'Ōpaeka'a Lookout and another map has been attached to show the connection. At present, there is only a 100-foot buffer on the *mauka* side of Malae Heiau which is not adequate for preserving the historical and cultural setting of this site. Therefore, it is strongly recommended that additional open space buffers be established between Malae Heiau and any modern development and that an effort be made to maintain the view corridors between Malae Heiau and Poliahu Heiau.
- Boating on the Wailua River is an important part of the visitor experience and development on the bluff along the southern riverbank has the potential to disrupt the natural setting for boating and recreational activities along the river. A setback from the edge of the bluff with a low vegetation or open space buffer would reduce the visibility of the modern structures from the river and preserve a more natural setting.

Ms. Collette Sakoda

August 8, 2007

Page 2

- If some consideration can be given for road access to the Malae Heiau parcel in the planning, this may reduce the need for multiple ingress/egress off Kūhiō Highway. Because DHHL has jurisdiction over the former canehaul road between Malae Heiau and Kūhiō Highway, park access is currently limited to the Marina Road.

Thank you for the opportunity to share our concerns about the proposed project. If you have any questions regarding these comments or the park, please feel free to contact Martha Yent (587-0287; [Martha.E.Yent@hawaii.gov](mailto:Martha.E.Yent@hawaii.gov)) or Wayne Souza, Kauai District Parks Superintendent (274-3446; [Wayne.H.Souza@hawaii.gov](mailto:Wayne.H.Souza@hawaii.gov)).

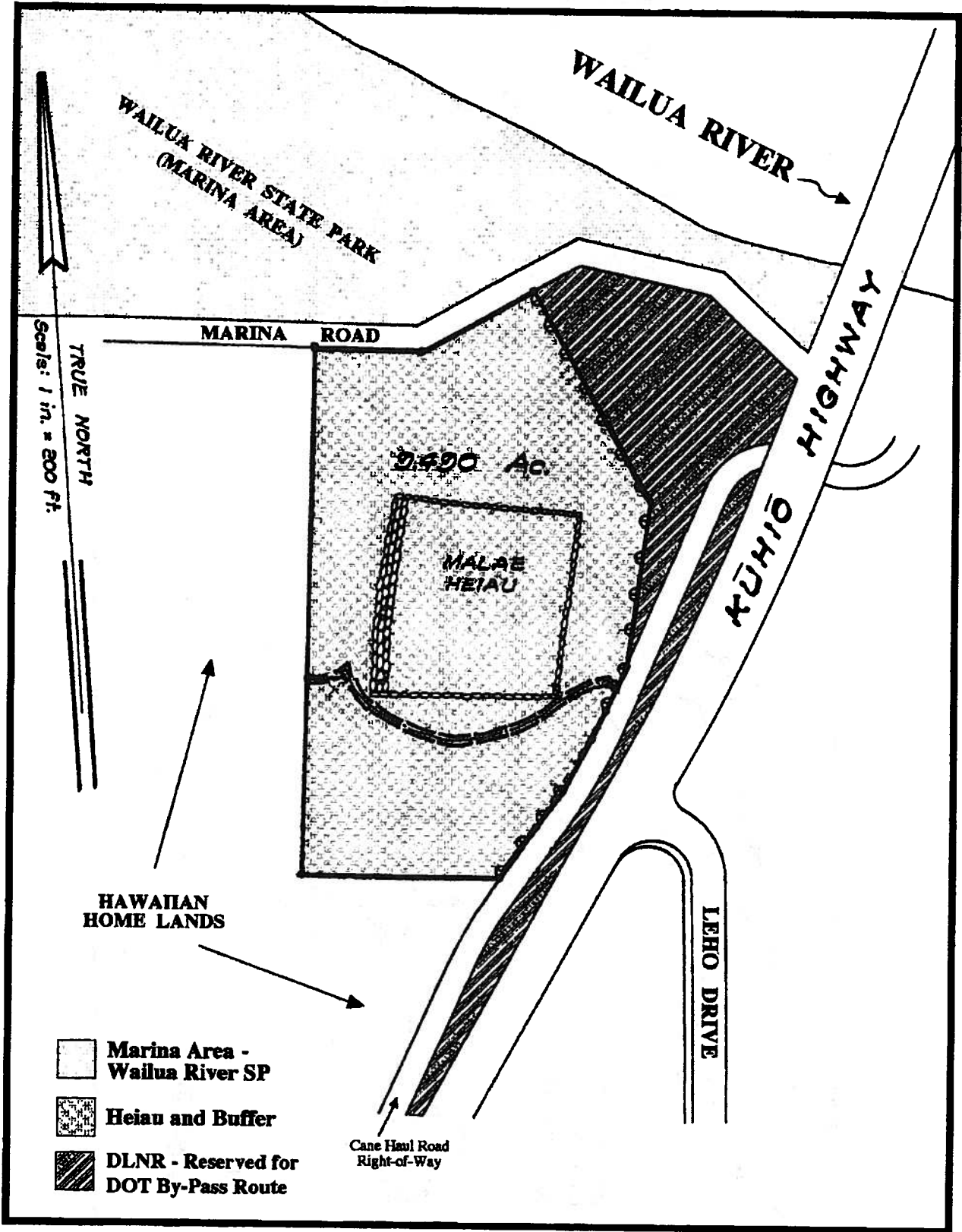
Very truly yours,



DANIEL S. QUINN  
State Parks Administrator

**Attachments**

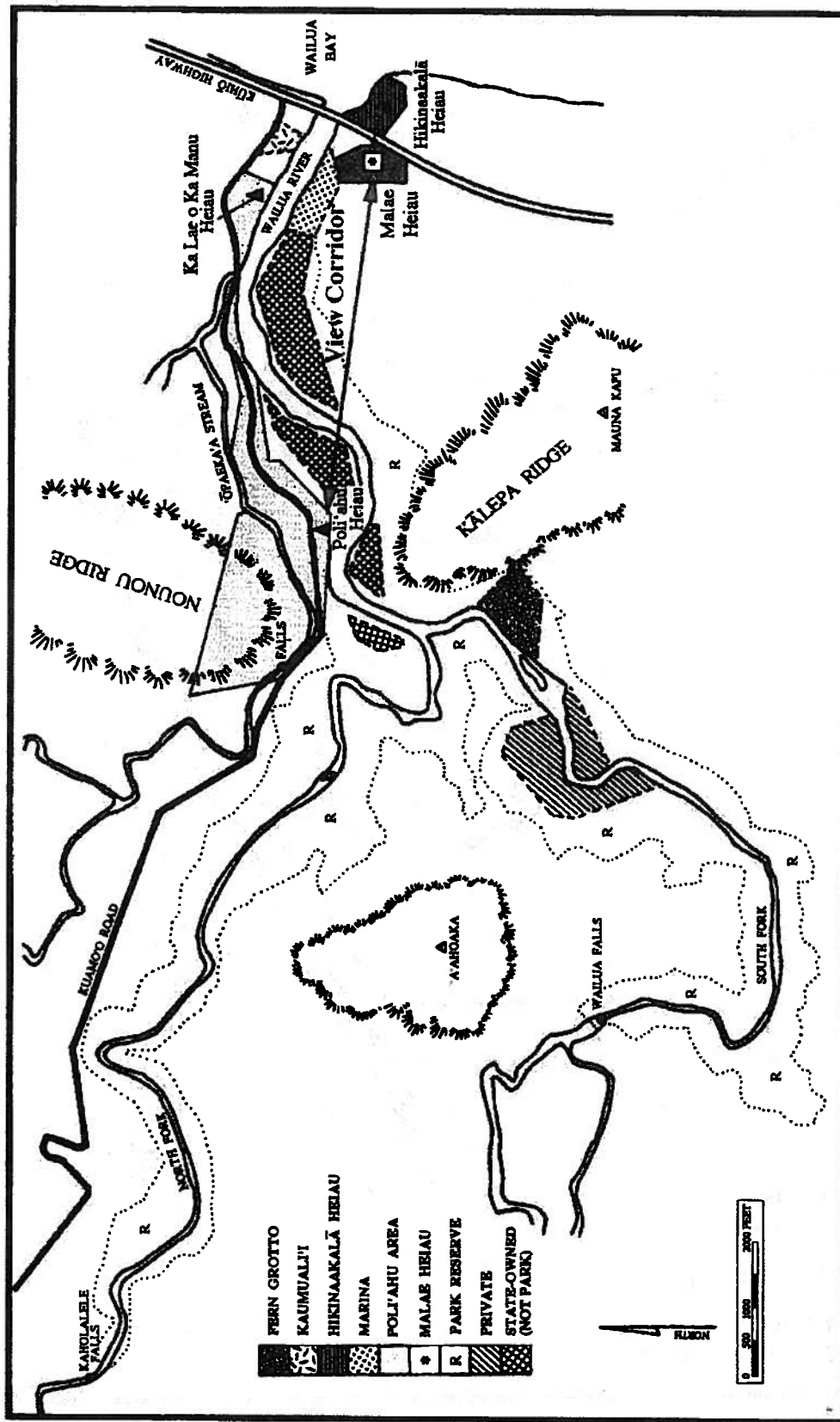
cc: Wayne Souza, Kaua'i District Parks Superintendent  
Land Division  
Nancy McMahon, Archaeologist, Historic Preservation Division  
Sabra Kauka, Nā Kahu Hikina A Ka Lā  
Julie Cachola, DHHL



MAP 1

Detail of DLNR property at intersection of Kūhiō Highway and the Marina Road.





MAP 2

View corridors between *heiau* within the Wailua Complex of Heiau and Wailua River State Park.

AUG 24 2007

LINDA LINGLE  
GOVERNOR OF HAWAII



LAURA H. THEILLEN  
INTERIM CHAIRPERSON  
BOARD OF LAND AND NATURAL RESOURCES  
COMMISSION ON WATER RESOURCE MANAGEMENT

KEN C. KAWAHARA  
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  
KAOHOLAWE ISLAND RESERVE COMMISSION  
LAND  
STATE PARKS

STATE OF HAWAII  
DEPARTMENT OF LAND AND NATURAL RESOURCES

DIVISION OF FORESTRY AND WILDLIFE  
KAUAI DISTRICT  
3060 EIWA STREET, ROOM 306  
LIHUE, KAUAI, HAWAII 96766

August 16, 2007

Colette Sakoda  
Environet, Inc.  
2850 Pa'a Street, Suite 212  
Honolulu, HI 96819

Re: Scoping Comments for the Proposed Wailua Residential Subdivision, Wailua, Kaua'i, Hawai'i

Dear Ms. Sakoda,

The Kaua'i Division of Forestry and Wildlife has received the Pre-assessment Consultation information regarding the proposed Wailua Residential Subdivision, Wailua, Kaua'i, Hawai'i.

We recommend that any and all outdoor lighting needed at any time during the lifetime of the project are fully shielded lights that achieve best possible protection against causing attraction of endangered and threatened seabirds such as Newell's shearwater (*Puffinus newelli*) and Hawaiian petrel (*Pterodroma phaeopygia*). The Environmental Assessment should analyze potential impacts to the aforementioned species in addition to the following endangered species Hawaiian goose (*Branta sandvicensis*), Hawaiian duck (*Anas wyvilliana*), and Hawaiian hoary bat (*Lasiurus cinereus semotus*). The aforementioned species are protected by one or more state and federal laws including the federal Migratory Bird Treaty Act (16 USC 703 et seq.), the federal Endangered Species Act (16 USC 1531 et seq.), and Hawaii Revised Statutes (HRS) 195D.

The project site according to the map provided is located in an area known for high levels of seabird migration as Newell's shearwater and Hawaiian petrel migrate to and from their mountain nesting grounds. In the fall, young seabirds are often attracted to existing lights in the area, although local companies are working to minimize these impacts.

It is important that the proposed project avoids adding additional light attraction risk to these species. As such, we recommend the following outdoor lighting specifications for the project:

1. All outdoor lights: parking lot lights, landscaping, security, path and deck lights should be fully shielded, full cut-off luminaires.
2. Complete avoidance of any and all tree-mounted lights unless they are fully shielded and pointing down toward the ground.
3. Complete avoidance of all and any outdoor up-lighting for any purposes.

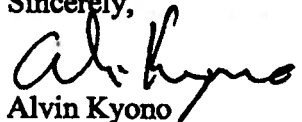
4. Complete avoidance of up-lighting and unshielded lighting in water features (fountain, ponds) and swimming pools.
5. Consultation with the Division of Forestry and Wildlife and U.S. Fish and Wildlife Service (contact can be provided upon request) are strongly recommended prior to finalizing lighting plans.
6. Attached are outdoor lighting guidelines for future reference.

The installation of underground utilities is also recommended as it would substantially assist the Proposed Action in minimizing the risk of incidental take (via collision) of listed seabirds as well as waterbirds and the Hawaiian hoary bat.

If the project cannot minimize or avoid incidental take of listed species, there are state and federal permits that would be appropriate. If you have questions please contact Ms. Andrea Erichsen, Kauai Seabird Habitat Conservation Planning Coordinator at 338-1361 or 346-3489 cellular.

Attached are outdoor lighting guidelines for future reference.

Sincerely,

  
Alvin Kyono  
Kauai Branch Manager

cc: Nelson Ayers, DOFAW Admin

attached.



www.hawaii.gov/dlnr/



www.dofaw.net

# ACCEPTABLE ONLY WITH PROPER BULB(S)

# UNACCEPTABLE

WALKWAY/PATH  
LIGHTING

STREET/PARKING  
LIGHTING

ARCHITECTURAL  
LIGHTING



Low Profile Bollards  
with Louvers



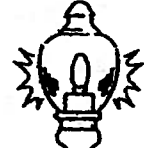
Unshielded  
Carriage



Globe  
Fixture



Wallpack



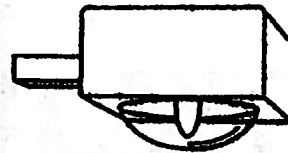
Acorn  
Fixture



Full Cutoff  
Low Pressure Sodium  
Streetlight



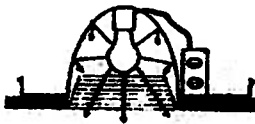
Fully Shilded  
NEMA Light



Drop-Lens/Sag-Lens  
w/ exposed bulb



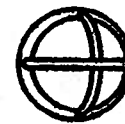
Unshielded  
Streetlight



Recessed Can  
w/ baffles



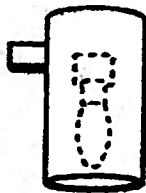
Glare Buster



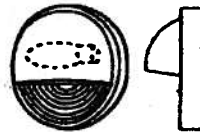
Nautical  
Wall Sconce



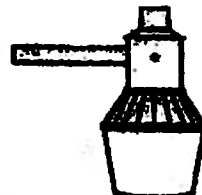
Floodlight



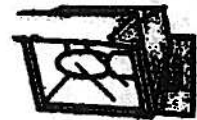
Canister  
Downlight



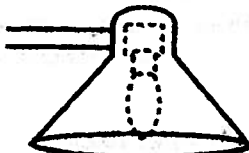
'Eyelid'  
Step  
Light



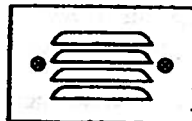
NEMA Security  
Light



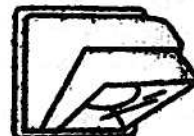
Partially Shilded  
Floodlight



Downlight



Louvered  
Step Light



Shielded Security  
Light



Drop-Lens  
Canopy Light

Bulbs for all fixtures should be of the Yellow 'Bug' Light variety incandescent or compact fluorescent.



# The Institution of Lighting Engineers

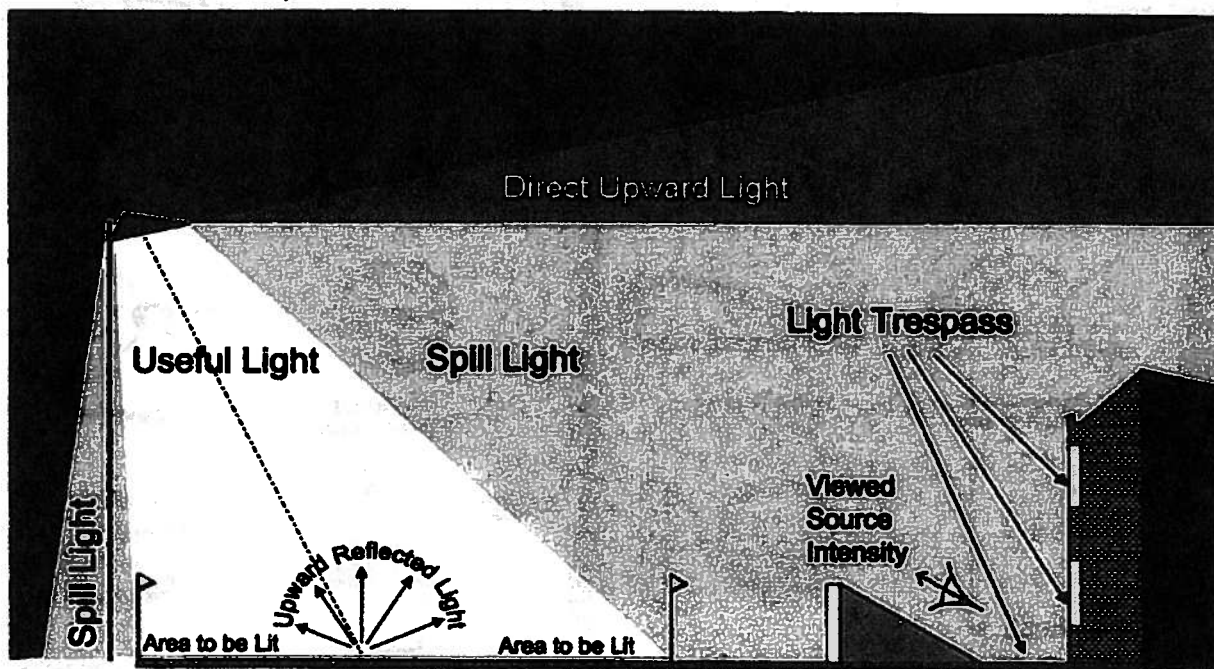
E-mail [ile@ile.org.uk](mailto:ile@ile.org.uk) Website [www.ile.org.uk](http://www.ile.org.uk)

## GUIDANCE NOTES FOR THE REDUCTION OF OBTRUSIVE LIGHT

**ALL LIVING THINGS** adjust their behaviour according to natural light. Man's invention of artificial light has done much to enhance our night-time environment but, if not properly controlled, obtrusive light (commonly referred to as light pollution) can present serious physiological and ecological problems.

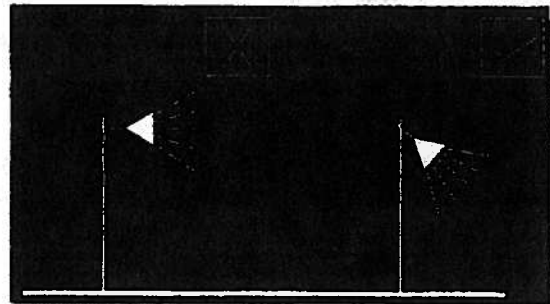
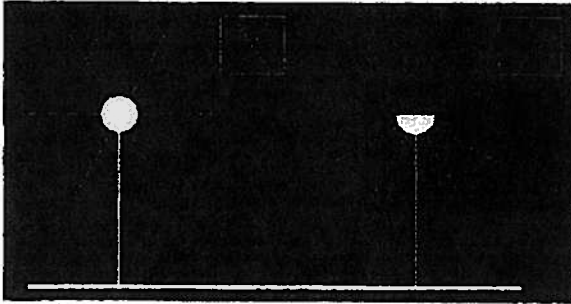
**Obtrusive Light**, whether it keeps you awake through a bedroom window or impedes your view of the night sky, is a form of pollution and can be substantially reduced without detriment to the lighting task.

**Sky glow**, the brightening of the night sky above our towns, cities and countryside, **Glare** the uncomfortable brightness of a light source when viewed against a dark background, and **Light Trespass**, the spilling of light beyond the boundary of the property or area being lit, are all forms of obtrusive light which may cause nuisance to others, waste money and electricity and result in the unnecessary emissions of greenhouse gases. Think before you light. Is it necessary? What effect will it have on others? Will it cause a nuisance? How can I minimise the problem?



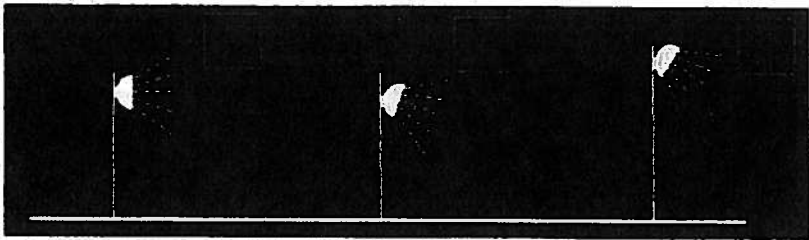
Do not "over" light. This is a major cause of obtrusive light and is a waste of energy. There are published standards for most lighting tasks, adherence to which will help minimise upward reflected light. Organisations from which full details of these standards can be obtained are given on the last page of this leaflet.

Dim or switch off lights when the task is finished. Generally a lower level of lighting will suffice to enhance the night time scene than that required for safety and security.



Use specifically designed lighting equipment that minimises the upward spread of light near to and above the horizontal. Care should be taken when selecting luminaires to ensure that appropriate units are chosen and that their location will reduce spill light and glare to a minimum. Remember that lamp light output in LUMENS is not the same as lamp wattage and that it is the former that is important in combating the problems of obtrusive light

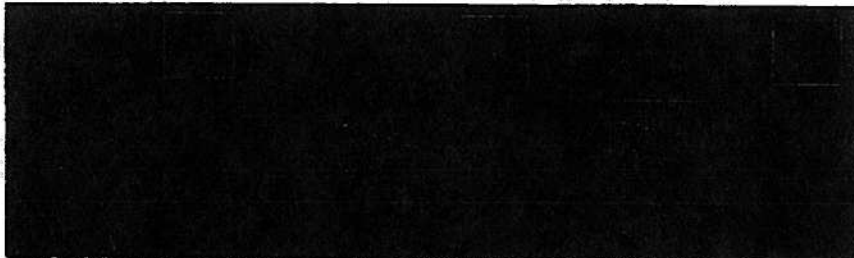
Keep glare to a minimum by ensuring that the main beam angle of all lights directed towards any potential observer is not more than 70°. Higher mounting heights allow lower main beam angles, which can assist in reducing glare. In areas with low ambient lighting levels, glare can be



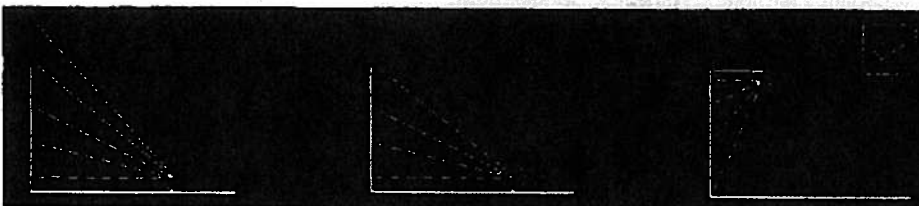
very obtrusive and extra care should be taken when positioning and aiming lighting equipment. With regard to domestic security lighting the ILE produces an information leaflet GNO2 that is freely available from its web site.

The UK Government will be providing an annex to PPS23 Planning and Pollution Control, specifically on obtrusive light. However many Local Planning Authorities (LPA's) have already produced, or are producing, policies that within the new planning system will become part of the local development framework. For new developments there is an opportunity for LPA's to impose planning conditions related to external lighting, including curfew hours.

For sports lighting installations (see also design standards listed on Page 4) the use of luminaires with double-asymmetric beams designed so that the front glazing is kept at or near parallel to the surface being lit should, if correctly aimed, ensure minimum obtrusive light. In most cases it



will also be beneficial to use as high a mounting height as possible, giving due regard to the daytime appearance of the installation. The requirements to control glare for the safety of road users are given in Table 2.



When lighting vertical structures such as advertising signs direct light downwards, wherever possible. If there is no alternative to up-lighting, as with much decorative

lighting of buildings, then the use of shields, baffles and louvres will help reduce spill light around and over the structure to a minimum.

For road and amenity lighting installations, (see also design standards listed on Page 4) light near to and above the horizontal should normally be minimised to reduce glare and sky glow (Note ULRs in Table 1). In sensitive rural areas the use of full horizontal cut off luminaires installed at 0° uplift will, in addition to reducing sky glow, also help to minimise visual intrusion within the open landscape. However in many urban locations, luminaires fitted with a more decorative bowl and good optical control of light should be acceptable and may be more appropriate.

**ENVIRONMENTAL ZONES:**

It is recommended that Local Planning Authorities specify the following environmental zones for exterior lighting control within their Development Plans.

Category	Examples
E1:	Intrinsically dark landscapes National Parks, Areas of Outstanding Natural Beauty, etc
E2:	Low district brightness areas Rural, small village, or relatively dark urban locations
E3:	Medium district brightness areas Small town centres or urban locations
E4:	High district brightness areas Town/city centres with high levels of night-time activity

Where an area to be lit lies on the boundary of two zones the obtrusive light limitation values used should be those applicable to the most rigorous zone.

**DESIGN GUIDANCE**

The following limitations may be supplemented or replaced by a LPA's own planning guidance for exterior lighting installations. As lighting design is not as simple as it may seem, you are advised to consult and/or work with a professional lighting designer before installing any exterior lighting.

**Table 1 – Obtrusive Light Limitations for Exterior Lighting Installations**

Environmental Zone	Sky Glow ULR [Max %] <sup>(1)</sup>	Light Trespass (Into Windows) Ev [Lux] <sup>(2)</sup>		Source Intensity I [kcd] <sup>(3)</sup>		Building Luminance Pre-curfew <sup>(4)</sup>
		Pre-curfew	Post-curfew	Pre-curfew	Post-curfew	Average, L <sub>(intend)</sub>
E1	0	2	1*	2.5	0	0
E2	2.5	5	1	7.5	0.5	5
E3	5.0	10	2	10	1.0	10
E4	15.0	25	5	25	2.5	25

ULR = Upward Light Ratio of the Installation is the maximum permitted percentage of luminaire flux for the total installation that goes directly into the sky.

Ev = Vertical Illuminance in Lux and is measured flat on the glazing at the centre of the window

I = Light Intensity in Cd

L = Luminance in Cd/m<sup>2</sup>

Curfew = The time after which stricter requirements (for the control of obtrusive light) will apply; often a condition of use of lighting applied by the local planning authority. If not otherwise stated - 23.00hrs is suggested.

\* = From Public road lighting installations only

- (1) Upward Light Ratio – Some lighting schemes will require the deliberate and careful use of upward light – e.g. ground recessed luminaires, ground mounted floodlights, festive lighting – to which these limits cannot apply. However, care should always be taken to minimise any upward waste light by the proper application of suitably directional luminaires and light controlling attachments.
- (2) Light Trespass (Into Windows) – These values are suggested maxima and need to take account of existing light trespass at the point of measurement. In the case of road lighting on public highways where building facades are adjacent to the lit highway, these levels may not be obtainable. In such cases where a specific complaint has been received, the Highway Authority should endeavour to reduce the light trespass into the window down to the after curfew value by fitting a shield, replacing the luminaire, or by varying the lighting level.
- (3) Source Intensity – This applies to each source in the potentially obtrusive direction, outside of the area being lit. The figures given are for general guidance only and for some sports lighting applications with limited mounting heights, may be difficult to achieve.
- (4) Building Luminance – This should be limited to avoid over lighting, and related to the general district brightness. In this reference building luminance is applicable to buildings directly illuminated as a night-time feature as against the illumination of a building caused by spill light from adjacent luminaires or luminaires fixed to the building but used to light an adjacent area.

Light Technical Parameter TI	Road Classification <sup>(5)</sup>			
	No road lighting	ME5	ME4/ ME3	ME2 / ME1
	15% based on adaptation luminance of 0.1cd/m <sup>2</sup>	15% based on adaptation luminance of 1cd/m <sup>2</sup>	15% based on adaptation luminance of 2 cd/m <sup>2</sup>	15% based on adaptation luminance of 5 cd/m <sup>2</sup>

TI = Threshold Increment is a measure of the loss of visibility caused by the disability glare from the obtrusive light installation

- (5) Road Classifications as given in BS EN 13201 - 2: 2003 Road lighting Performance requirements  
Limits apply where users of transport systems are subject to a reduction in the ability to see essential information. Values given are for relevant positions and for viewing directions in path of travel. See CIE Publication 150:2003, Section 5.4 for methods of determination. For a more detailed description and methods for calculating and measuring the above parameters see CIE Publication 150:2003.

**RELEVANT PUBLICATIONS AND STANDARDS:**

British Standards: <a href="http://www.bsi.org.uk">www.bsi.org.uk</a>	BS 5489-1: 2003 Code of practice for the design of road lighting – Part 1: Lighting of roads and public amenity areas BS EN 13201-2:2003 Road lighting – Part 2: Performance requirements BS EN 13201-3:2003 Road lighting – Part 3: Calculation of performance BS EN 13201-4:2003 Road lighting – Part 4: Methods of measuring lighting performance. BS EN 12193: 2003 Light and lighting – Sports lighting
Countryside Commission/DOE <a href="http://www.odpm.gov.uk">www.odpm.gov.uk</a>	Lighting in the Countryside: Towards good practice (1997) (Out of Print)
CIBSE/SLL Publications: <a href="http://www.cibse.org">www.cibse.org</a>	CoL Code for Lighting (2002) LG1 The Industrial Environment (1989) LG4 Sports (1990+Addendum 2000) LG6 The Exterior Environment (1992) FF7 Environmental Considerations for Exterior Lighting (2003)
CIE Publications: <a href="http://www.cie.co.at">www.cie.co.at</a>	01 Guide lines for minimizing Urban Sky Glow near Astronomical Observatories (1980) 83 Guide for the lighting of sports events for colour television and film systems (1989) 92 Guide for floodlighting (1992) 115 Recommendations for the lighting of roads for motor and pedestrian traffic (1995) 126 Guidelines for minimizing Sky glow (1997) 129 Guide for lighting exterior work areas (1998) 136 Guide to the lighting of urban areas (2000) 150 Guide on the limitations of the effect of obtrusive light from outdoor lighting installations (2003) 154 The Maintenance of outdoor lighting systems (2003)
Department of Transport <a href="http://www.defra.gov.uk">www.defra.gov.uk</a>	Road Lighting and the Environment (1993) (Out of Print)
ILE Publications: <a href="http://www.ile.org">www.ile.org</a>	TR 5 Brightness of Illuminated Advertisements (2001) TR24 A Practical Guide to the Development of a Public Lighting Policy for Local Authorities (1999) GN02 Domestic Security Lighting, Friend or Foe
ILE/CIBSE Joint Publications ILE/CSS Joint Publications	Lighting the Environment - A guide to good urban lighting (1995) Seasonal Decorations – Code of Practice (2005)
Campaign for Dark Skies (CFDS) <a href="http://www.dark-skies.org">www.dark-skies.org</a>	

**NB:** These notes are intended as guidance only and the application of the values given in Tables 1 & 2 should be given due consideration along with all other factors in the lighting design. Lighting is a complex subject with both objective and subjective criteria to be considered. The notes are therefore no substitute for professionally assessed and designed lighting, where the various and maybe conflicting visual requirements need to be balanced.

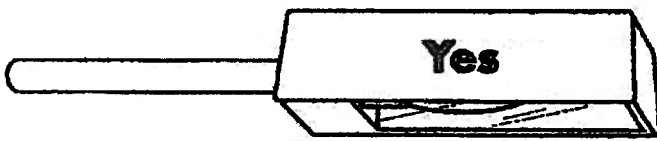
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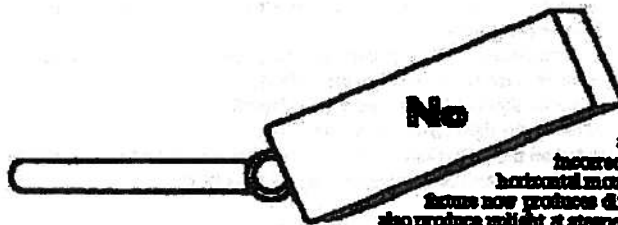
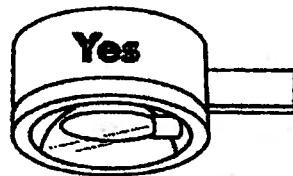
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International Dark-Sky Association – Information Sheet 143

# What is a True "Full Cutoff" Outdoor Lighting Fixture?



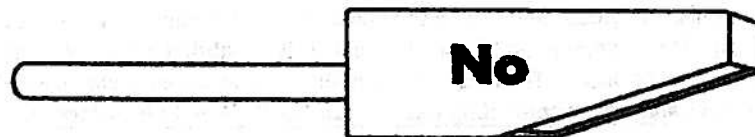
Flat glass lens, eliminates or minimizes direct glare, no upward throw of light. The housing for these fixtures is available in many styles.



Same fixture as above mounted incorrectly—defeating the horizontal mounting design. The fixture now produces direct glare and can also produce uplight at steep mounting angles.



Known as just "Cutoff". Center "drop" or "sag" lens with or without exposed bulb, produces direct glare.



## Security Lighting: Let's Have Real Security, Not Just Bad Lighting

One of the main goals for nighttime lighting is to have good safety and security at night, both at home and away from home, for ourselves, our families, our homes and property, and indeed for everyone. However, the task is to be safe, not just to feel safe. This means that we need effective and efficient lighting. Good visibility is the goal. We want to be able to see well, rather than just lighting the criminal's way. This goal exists for us at home, on the streets, in parking lots, at work, wherever. Good lighting can be a help; poor lighting always compromises safety.

Most crime actually occurs during the day, or inside buildings. However, we want the feeling and the reality of being safe outside at night. That does not mean putting in the brightest light we can find, blinding everyone in the area, creating light trespass, and lighting up the night sky. What we do need is effective lighting, lighting that puts light where we need it (and nowhere else) and where it will help visibility. That means: no glare, no light trespass, no direct uplight, no harsh shadows, no steep transitions from light to dark, etc. Lighting by itself does not insure safety. Is there more crime in the "well lit" centers of large cities or in smaller towns with much less lighting? A cynic might derive a positive correlation between crime and light: the more light, the more crime. Current and past studies by competent crime authorities can be summarized as follows: "The paucity of data preclude any definitive statement regarding the relationship of lighting and crime, but there is a strong indication that lighting decreases the fear of crime." Quality lighting rather than poor lighting is essential for any real security.

Here are some examples of bad security lighting—lighting that too often compromises safety. These poor quality fixtures can give the illusion of safety or the feeling of security, but in reality they don't add to safety at all; they often make things worse. They are beacons to the criminal: "Come and get me, my lighting will help you, not me." In essence, criminal friendly lighting.

**1. The 175-watt dusk-to-dawn "security light".** This fixture was designed in the old days when energy was cheap, when there were no good lighting fixture designs, and when the adverse effects of bad lighting were not

well appreciated. It sells for \$29.95 or less, but uses over 200 watts of power. That means it costs about \$70 per year to operate in most locations—much more in high electricity cost areas. A good deal of the light output is wasted, going up or sideways where it does no good at all. It has a great deal of glare, often blinding the homeowner and others. It splatters light everywhere, alienating neighbors. It casts harsh shadows behind trees and buildings, allowing criminals plenty of dark areas to hide in. It is a prime example of bad lighting. But it is in use by the millions throughout the country. Why? It's cheap, and bright. We see lots of glare so we think there is lots of light. But it is a most ineffective and inefficient light. (See IDA Information Sheets No. 3, 26, and 103 for more information.)

**2. Globes.** Again, light is splattered everywhere. Because it wastes so much light, one must put a high-wattage lamp inside to get any light on the ground. That means a great deal of glare is produced, so much that often one can't easily see the ground! Why are so many of these inefficient fixtures used? Mainly because they look good in the daytime! If one likes that look, then one should use only a very low wattage lamp (as in the days of gas lighting), preserving the daytime appearance and providing a nice nighttime "ambiance". One can install a separate, quality lighting system to light the ground. There is no glare or light trespass from this good system, so it doesn't detract from the looks of the globes. One gets the desired attractiveness and also good lighting and safety. It costs more initially, but there is now good lighting.

**3. Poorly shielded "wall packs" or similar fixtures.** These also splatter light everywhere, some of the light getting where needed but most being wasted. They also create lots of glare. Well-shielded wall packs can be excellent light sources, but one must be sure of what one is buying. Some wall packs have good light control, many nearly none.

**4. Poorly designed or installed flood lights.** Flood lights can be good, if they have good light control. But they must be well-designed and well installed to

*continued*

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take advantage of their pluses. Often they are poorly installed, aimed at what seems a random direction or, worse, right at the street (causing terrible glare for motorists) or at the neighbor's yard or bedroom window. We have all seen many examples of such bad lighting at night.

Enough of the bad, here now are some examples of good quality security lights:

1. A well-shielded low pressure sodium (LPS) fixture: well-controlled light, energy efficiency, no glare. A lack of color rendering is not a disadvantage for most security lighting. Visibility is excellent with LPS lighting.
2. A similar full-cutoff high pressure sodium (HPS) or metal halide (MH) fixture, or the new low-wattage compact fluorescent (PL) lamps used in good fixtures: no uplight and no glare.
3. Well-controlled and installed flood lights or spot lights. These need great care in design and installation to be in the "good" camp, for most all present installations are clearly not that way.
4. The infrared sensor spot lights that come on when someone walks into the field of view of the infrared (IR) detector. (They can activate an alarm too, if wanted.) These are very cost-effective and are effective security lights. They scare intruders away, they offer good visibility to the homeowner when needed (e.g. when taking out the garbage, or when there is an intruder). They must be installed so as to put the light only where it is needed, not shooting up into the sky or onto the neighbor's property. Under the house's eave is often a good location.

To see well, we need adequate light, but not too much. Too much can ruin our adaptation to darker areas at night, blinding us just when we need to see. When we go from too bright to too dark or vice versa, we have poor visibility for a while. This effect is called "transient adaptation", and good designs should minimize its adverse effect on visibility.

To see well, we need to minimize any glare. Glare never helps visibility. To see well, we need to minimize any dark areas near well-lit areas. This means good lighting design is required.

To see well, we must not allow the eye to be flooded with too much light when driving or walking at night. "Luminance overload" can easily compromise vision and dark adaptation.

Think, too, about energy savings. We should not waste light nor use inefficient light sources. We waste far too much energy and money (over a billion dollars annually in the U.S.A., much more throughout the world) due to poor lighting.

What else can we do to maximize safety at night? Here are some ideas (consult libraries, the local police, companies specializing in security equipment, and others for details and other ideas): Use good locks, use a peep hole in the door to see who is there before answering the door, have an effective alarm system, include motion sensors (such as are used in the IR spotlight mentioned above), have good phone sense (what you say when answering the phone or on your answering machine), play the radio when gone, put indoor lights on a time switch, put good labels on your property (and put security labels on your windows), have a dog, join or promote a neighborhood watch program (one of the best ideas: promote quality outdoor lighting through such a group, too!), and so forth.

Write IDA for a list of additional information sheets about outdoor lighting; we also have excellent slides that illustrate the differences between poor lighting and quality lighting.

AUG 21 2007

LINDA LINGLE  
GOVERNOR OF HAWAII



LAURA H. THIELEN  
INTERIM CHAIRPERSON  
BOARD OF LAND AND NATURAL RESOURCES  
COMMISSION ON WATER RESOURCE MANAGEMENT



**STATE OF HAWAII  
DEPARTMENT OF LAND AND NATURAL RESOURCES  
LAND DIVISION**

POST OFFICE BOX 621  
HONOLULU, HAWAII 96809

August 16, 2007

Environet, Inc.  
2850 Paa Street Suite 212  
Honolulu, Hawaii 96819

Attention: Ms. Colette Sakoda

Gentlemen:

Subject: Pre-Assessment Consultation for Environmental Assessment for DHHL  
Proposed Wailua Residential Subdivision, Wailua, Kauai, Tax Map Key:  
(4) 3-9-6:9, 11; 3-9-2:12, 24, portion 25

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

Other than the comments from Engineering Division, Division of Forestry & Wildlife, Land Division – Kauai District, the Department of Land and Natural Resources has no other comments to offer on the subject matter. Should you have any questions, please feel free to call our office at 587-0433. Thank you.

Sincerely,

  
Russell Y. Tsuji  
Administrator

LINDA LINGLE  
GOVERNOR OF HAWAII



ALLAN A. SMITH  
INTERIM CHAIRPERSON  
BOARD OF LAND AND NATURAL RESOURCES  
COMMISSION ON WATER RESOURCE MANAGEMENT



STATE OF HAWAII  
DEPARTMENT OF LAND AND NATURAL RESOURCES  
LAND DIVISION

POST OFFICE BOX 621  
HONOLULU, HAWAII 96809

July 25, 2007

MEMORANDUM

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

FROM: Russell Y. Tsuji  
SUBJECT: Pre-Assessment Consultation for Environmental Assessment for Proposed Wailua Residential Subdivision  
LOCATION: Wailua, Kauai, Tax Map Key: (4) 3-9-6:9, 11; 3-9-2:12, 24, portion 25  
APPLICANT: Environet, Inc. on behalf of Department of Hawaiian Home Lands

Transmitted for your review and comment on the above referenced document. We would appreciate your comments on this document. Please submit any comments by August 15, 2007.

If no response is received by this date, we will assume your agency has no comments. If you have any questions about this request, please contact my office at 587-0433. Thank you.

Attachments

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

Signed: *Craig Uferin*  
Date: 8/15/07

07 JUL 25 PM 02:26 ENGINEERING

**DEPARTMENT OF LAND AND NATURAL RESOURCES  
ENGINEERING DIVISION**

**LD/RYT**

**REF: PreconEAWailuaResSub  
Kauai.59**

**COMMENTS**

- ( ) We confirm that the project site, according to the Flood Insurance Rate Map (FIRM), is located in Flood Zone \_\_\_\_.
- (X) Please take note that based on the map that you provided the project site, according to the Flood Insurance Rate Map (FIRM), is located in Flood Zone X. The National Flood Insurance Program does not have any regulations for developments within Zone X.
- ( ) Please note that the correct Flood Zone Designation for the project site according to the Flood Insurance Rate Map (FIRM) is \_\_\_\_.
- ( ) Please note that the project must comply with the rules and regulations of the National Flood Insurance Program (NFIP) presented in Title 44 of the Code of Federal Regulations (44CFR), whenever development within a Special Flood Hazard Area is undertaken. If there are any questions, please contact the State NFIP Coordinator, Ms. Carol Tyau-Beam, of the Department of Land and Natural Resources, Engineering Division at (808) 587-0267.

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

- ( ) Mr. Robert Sumimoto at (808) 523-4254 or Mr. Mario Siu Li at (808) 523-4247 of the City and County of Honolulu, Department of Planning and Permitting.
  - ( ) Mr. Kelly Gomes at (808) 961-8327 (Hilo) or Mr. Kiran Emler at (808) 327-3530 (Kona) of the County of Hawaii, Department of Public Works.
  - ( ) Mr. Francis Cerizo at (808) 270-7771 of the County of Maui, Department of Planning.
  - ( ) Mr. Mario Antonio at (808) 241-6620 of the County of Kauai, Department of Public Works.
- 
- ( ) The applicant should include project water demands and infrastructure required to meet water demands. Please note that the implementation of any State-sponsored projects requiring water service from the Honolulu Board of Water Supply system must first obtain water allocation credits from the Engineering Division before it can receive a building permit and/or water meter.
  - (X) The applicant should provide the water demands and calculations to the Engineering Division so it can be included in the State Water Projects Plan Update.
  - ( ) Additional Comments: \_\_\_\_\_  
\_\_\_\_\_
  - ( ) Other: \_\_\_\_\_  
\_\_\_\_\_

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

Signed: \_\_\_\_\_

ERIC T. HIRANO, CHIEF ENGINEER

Date: \_\_\_\_\_

8/15/07

# Division of Forestry & Wildlife

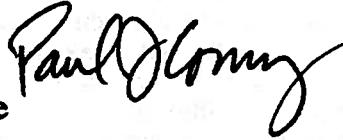
1151 Punchbowl Street, Rm. 325 • Honolulu, HI 96813 • (808) 587-0166 • Fax: (808) 587-0160

July 30, 2007

## MEMORANDUM

TO: Russell Y. Tsuji, Administrator  
Land Division

FROM: Paul J. Conry, Administrator  
Division of Forestry and Wildlife



SUBJECT: Request for Comments: Pre-consultation EA for proposed Wailua Residential Subdivision, Wailua, Kauai, Hawaii TMK: (4) 3-9-2: 12, 24 por. 25. Environet, Inc. for DHHL.

DOFAW is concerned with the potential fire threat to nearby Kalepa forest reserve located mauka and adjacent to this proposed subdivision. A buffer consisting of a firebreak along this boundary is recommended to prevent a fire prone area (proposed subdivision) to potentially burn into this forest reserve. Feral pigs are a potential problem with this subdivision's location to the forested area. Building a fence along this boundary would prevent residents of this subdivision from enduring feral pig activities on their properties. Thank you for the opportunity to review this project as it relates to DOFAW management responsibilities on the island of Kauai.

C: DOFAW Kauai Branch

DEPT. OF LAND &  
NATURAL RESOURCES  
STATE OF HAWAII

2007 JUL 31 PM 3 17

RECEIVED  
LAND DIVISION

LINDA LINGLE  
GOVERNOR OF HAWAII



ALLAN A. SMITH  
INTERIM CHAIRPERSON  
BOARD OF LAND AND NATURAL RESOURCES  
COMMISSION ON WATER RESOURCE MANAGEMENT



STATE OF HAWAII  
DEPARTMENT OF LAND AND NATURAL RESOURCES  
LAND DIVISION

POST OFFICE BOX 621  
HONOLULU, HAWAII 96809

July 25, 2007

MEMORANDUM

TO: DLNR Agencies:  
 Div. of Aquatic Resources  
 Div. of Boating & Ocean Recreation  
 Engineering Division  
 Div. of Forestry & Wildlife  
 Div. of State Parks  
 Commission on Water Resource Management  
~~Office of Conservation & Coastal Lands~~  
 Land Division – Kauai District Gary Martin

RECEIVED  
LAND DIVISION  
2007 AUG -9 A 10 29  
DEPT. OF LAND &  
NATURAL RESOURCES  
STATE OF HAWAII

FROM: Russell Y. Tsuji  
SUBJECT: Pre-Assessment Consultation for Environmental Assessment for Proposed Wailua Residential Subdivision  
LOCATION: Wailua, Kauai, Tax Map Key: (4) 3-9-6:9, 11; 3-9-2:12, 24, portion 25  
APPLICANT: Environet, Inc. on behalf of Department of Hawaiian Home Lands

Transmitted for your review and comment on the above referenced document. We would appreciate your comments on this document. Please submit any comments by August 15, 2007.

If no response is received by this date, we will assume your agency has no comments. If you have any questions about this request, please contact my office at 587-0433. Thank you.

Attachments

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

JUL 26 2007

Signed:   
Date: 8/3/2007

CLERK WOULD PRINT





Bryan J. Baptiste  
Mayor



AUG 07 2007

Beth Tokioka  
Director

COUNTY OF KAUAI  
OFFICE OF ECONOMIC DEVELOPMENT  
4444 RICE STREET, SUITE 200  
LIHU'E, KAUAI, HAWAII 96766

August 3, 2007

Ms. Collette Sakoda  
Senior Project Manager  
Environet, Inc.  
2850 Pa'a Street, Suite 212  
Honolulu, HI 96819

Dear Ms. Sakoda:

Per your letter of July 19, 2007, I have reviewed the proposed project area and offer the following brief comments on issues or areas of concern for the proposed project that may identify potential environmental impacts.

**Traffic:** The project is located in a very congested part of Kuhio Highway and the traffic heading towards Kapaa backs up to the project area due to the Kuamoo Road/Kuhio Highway traffic light. Another area of concern is the contra-flow lanes in the morning. Any cars accessing Kuhio Highway will have problems. Traffic signals may be required.

**Drainage:** The mauka project area topography slopes down towards Kuhio Highway and the Wailua River. This makes flooding and runoff during construction and after project completion very critical to see that this project does not make run-off pollution worse than it is now.

**Power:** It is important to consult with the Kauai Island Utility Cooperative to determine what infrastructure improvements are required in the immediate area to accommodate subdivision and timeshare electrical requirements. If possible, the electrical lines should be sited underground to minimize the visual impact to the surrounding areas as well as to minimize infrastructure damage from hurricanes.

**Wastewater:** Your pre-assessment consultation letter indicates that individual wastewater disposal systems will be used. Since Lydgate STP is very close by, there should be plans for a sewer line linking the residential subdivision to the treatment plant. The timeshare units should definitely be connected to the STP.

*An Equal Opportunity Employer*

Ms. Collette Sakoda  
August 3, 2007  
Page 2

**Archeological:** The nearby heiau must be protected during and after construction to minimize any damage. The contractor should work closely with responsible parties in mitigating any impacts during and after construction.

**Parks:** Any park lighting should be shielded to help protect shearwater deaths. This should be coordinated with the U.S. Fish and Wildlife Service and other state and federal agencies.

**Tsunami Inundation Zone:** Portions of the project area may be in the tsunami inundation zone and there should be a clear response plan for the subdivision. Evacuation routes should be clearly marked and transmitted to all project participants.

**Renewable Energy:** Solar hot water systems should be made mandatory or encouraged for all residential units. The life cycle cost savings will be substantial and the infrastructure burden on KIUC will be minimized. Wind and photovoltaic power systems may also be feasible and should be examined for applicability.

**Fire:** The project area and areas around the project area have experienced periodic brush fires ignited by careless smokers or other means. Even after the project has been completed, fire threat, especially during drought conditions are possible. Consideration should be given to a natural fire retention barrier consisting of landscaped buffer zones. Also, no open burning should be permitted.

**Energy Efficiency:** Energy Star appliances should be encouraged for all of the 700 residential units and the commercial units. Energy Star appliances are the most energy efficient appliances available and all makes and sizes are represented. This project should also look at appropriate roof insulation, building orientation and the use of compact fluorescent lighting to minimize electrical load impacts to KIUC's system. The project should NOT use incandescent lighting. The school should also be designed to LEED standards and the park should use energy efficient lighting including timers. Clotheslines should be encouraged instead of electric or gas dryers.

**Construction-related Impacts:** Kauai is currently experiencing drought-like conditions. In the Koloa area, neighboring residents to construction sites have endured dust and noise conditions for months. The Wailua project area is no different. Fugitive dust impacts, muddy water runoffs, noise, construction debris must be controlled, since residences, businesses and the Wailua River State Park is so close in proximity to the project area. Brush fires are also a serious concern and no open burning should be allowed at all times. The construction materials left over from the project should be recycled as much as possible. For useable materials, donations to the Habitat for Humanity re-use shop should be made.

**Evasive Species:** Any imported landscaping materials should be checked with the Dept. of Forestry and Dept. of Agriculture for clearance and appropriateness to the project. Coqui frogs

Ms. Collette Sakoda  
August 3, 2007  
Page 3

have been found in shipments of plants from the Big Island and Australian tree ferns have been imported and then found to be very evasive and detrimental to the Kauai ecosystem. Only local landscaping plants should be used, preferably native species.

Thank you for the opportunity to provide these comments. Please keep me updated as the project develops.

Sincerely,



Glenn Sato  
Energy Coordinator



AUG 21 2007



*Water has no substitute.....Conserve it*

August 16, 2007

Ms. Colette Sakoda  
Environet, Inc.  
2850 Pa`a Street, Suite 212  
Honolulu, HI 96819

Dear Ms. Sakoka:

**Subject:** Water Meter Service Inquiry: Pre-Assessment Consultation to Prepare a Chapter 343 HRS Environmental Assessment for a Proposed Wailua Residential Subdivision, Department of Hawaiian Home Lands, TMK: 3-9-02:012; 3-9-02:024; 3-9-02:025 por., 3-9-06:009; and TMK: 3-9-06:011, Wailua, Kauai, Hawaii

This letter is in response to your July 20, 2007 pre-assessment inquiry letter.

The following Department of Water (DOW) response is for informational purposes only and describes the present water system status. It is subject to change without further notice. It does not represent a commitment or approval by the Department of the proposed or future water meter requests and/or subdivision and building permit applications. The inquirer is responsible to request information on water system status in the future.

We understand that the project proposes to create a subdivision involving 452 acres. Preliminary plans include developing up to 800 timeshare units, residential lots, a school, parks, community center, revenue-generating lots, a by-pass road, and other site improvements.

The proposed development is located outside of the full growth service area of the DOW. The applicant will be required to prepare and receive DOW approval of a Water Master Plan for full development of the lots.

The applicant is made aware that the Department's source and storage facilities for the Lihue water system are operating at capacity.

If you have any questions, please contact Mr. Keith Aoki at (808) 245-5418.

Sincerely,

A handwritten signature in black ink, appearing to read "Gregg Fujikawa".

Gregg Fujikawa  
Chief of Water Resources and Planning

KA:ml  
W3-9-06-009,11 sakoda T-8886



SEP -7 2007

LINDA LINGLE  
GOVERNOR OF HAWAII



LAURA H. THIELEN  
INTERIM CHAIRPERSON  
BOARD OF LAND AND NATURAL RESOURCES  
COMMISSION ON WATER RESOURCE MANAGEMENT



STATE OF HAWAII  
DEPARTMENT OF LAND AND NATURAL RESOURCES  
LAND DIVISION

POST OFFICE BOX 621  
HONOLULU, HAWAII 96809

September 6, 2007

Environet, Inc.  
2850 Paa Street Suite 212  
Honolulu, Hawaii 96819

Attention: Ms. Colette Sakoda

Gentlemen:

Subject: Pre-Assessment Consultation for Environmental Assessment for DHHL  
Proposed Wailua Residential Subdivision, Wailua, Kauai, Tax Map Key:  
(4) 3-9-6:9, 11; 3-9-2:12, 24, portion 25

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

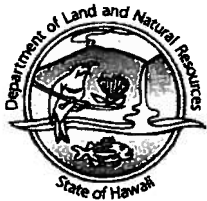
Other than the comments from Division of Aquatic Resources, the Department of Land and Natural Resources has no other comments to offer on the subject matter. Should you have any questions, please feel free to call our office at 587-0433. Thank you.

Sincerely,

A handwritten signature in cursive script that reads "Russell Y. Tsuji".  
Russell Y. Tsuji  
Administrator



LINDA LINGLE  
GOVERNOR OF HAWAII



2007 SEP -6 P 3:15  
STATE OF HAWAII  
DEPARTMENT OF LAND AND NATURAL RESOURCES  
LAND DIVISION  
POST OFFICE BOX 621  
HONOLULU, HAWAII 96809

ALLAN A. SMITH  
INTERIM CHAIRPERSON  
BOARD OF LAND AND NATURAL RESOURCES  
COMMISSION ON WATER RESOURCE MANAGEMENT

AM

AQUATIC RESOURCES: 1024

DIRECTOR	<input checked="" type="checkbox"/>
COMM. FISH.	<input type="checkbox"/>
AQ RES/ENV	<input type="checkbox"/>
AQ REC	<input type="checkbox"/>
PLANNER	<input type="checkbox"/>
STAFF SVCS	<input type="checkbox"/>
RCUH/UH	<input type="checkbox"/>
STATISTICS	<input type="checkbox"/>
AFRC/FED AID	<input type="checkbox"/>
EDUCATION	<input type="checkbox"/>
SECRETARY	<input type="checkbox"/>
OFFICE SVCS	<input type="checkbox"/>
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No. Copies	<input type="checkbox"/>
Copies to:	<input type="checkbox"/>
Due Date:	<input type="checkbox"/>

July 25, 2007

MEMORANDUM

TO:

DLNR Agencies:

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



FROM: Russell Y. Tsuji  
 SUBJECT: Pre-Assessment Consultation for Environmental Assessment for Proposed Wailua Residential Subdivision  
 LOCATION: Wailua, Kauai, Tax Map Key: (4) 3-9-6:9, 11; 3-9-2:12, 24, portion 25  
 APPLICANT: Environet, Inc. on behalf of Department of Hawaiian Home Lands

Transmitted for your review and comment on the above referenced document. We would appreciate your comments on this document. Please submit any comments by August 15, 2007.

If no response is received by this date, we will assume your agency has no comments. If you have any questions about this request, please contact my office at 587-0433. Thank you.

Attachments

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

Signed: *Russell Y. Tsuji*  
 Date: 8-31-07

**Department of Land & Natural Resources**  
**Division of Aquatic Resources**  
3060 Eiwa Street, Room 306  
Lihue, Kauai, Hawaii 96766  
Cell phone: 808-645-0532; Email: donheacock@midpac.net

Memorandum {WailuaUrbanImpactAssmtSept07}

3 September 2007

To: Dan Polhemus  
Thru: Alton Miyasaka  
Fm: Don Heacock

**Re: Review comments : Pre-assessment consultation to prepare a Chapt. 343 HRS Environmental Assessment for the proposed Wailua Residential and Commercial Subdivision, Wailua, Kauai (TMK:3-9-6:9 and 3-9-2:12, 24, and 25 (portions))**

**General Comments:**

The Wailua River watershed is being negatively impacted by urbanization in the mid and lower reaches. Several tributary streams are significantly dewatered, cattle grazing along riparian habitats have caused severe stream bank erosion and sedimentation of streams, introduced alien fishes are negatively impacting native biodiversity, and the overall effect of all of these on water quality is negative. Primary problems are unsustainable urban development that is negatively impacting riparian zones and water quality (increased impermeable surfaces= increased stormwater runoff=increased stream bank erosion and sedimentation of streams), cattle grazing allowed within riparian areas which are having the same negative impacts, and alien invasive aquatic species which are both preying on native amphidromous species and competing for food and habitat.

The proposed urban and commercial development, if it follows the Kauai County Stormwater/Drainage Ordinance and existing state DOH water quality laws and administrative rules will not adequately protect the water quality and/or water quantity, of receiving waters (i.e., the Wailua River and coastal marine waters) because these ordinances and laws do not adequately protect the quality or quantity of receiving waters where urban discharges occur.

**Specific Comments:**

The state of Hawaii and the County of Kauai need to adopt more scientifically proven and effective urban stormwater quality/quantity protection laws similar to those developed and adopted into law in Washington State, particularly Olympia County. Olympia County is a leader in sustainable urban development that protects the water quality and the biological integrity of receiving waters. Also, the proposed project should adopt and learn from the "Low Impact (urban) Development" (LID) guidelines and laws adopted by Washington State and recommended by the regional U.S. EPA office.

The existing sewage treatment plant (STP) in Wailua adjacent to Lydgate County Beach Park and to the proposed development is outdated and inefficient. More ecological sound, and economically viable systems like the "Living Systems" which use aquatic plants to

recovery nutrients, recycle freshwater, and to produce renewable energy that can reduce operation costs should be actively pursued in this project. For a holistic and sustainable urban development plan the project planners should contact Mr. Andy Haub<sup>1</sup> (360-753-8475; [ahaub@ci.olympia.wa.us](mailto:ahaub@ci.olympia.wa.us)) with the City of Olympia for guidance on developing a LID in this aquatic resource rich and environmentally sensitive area of Wailua .

Finally, the applicant should follow the guidelines of the Kauai General Plan (p. 1-7) and consider and include the cumulative impacts of urban stormwater runoff and flood assessment into their environmental assessment based upon the entire Wailua River watershed. Also, all telephone and power lines should be placed underground to protect endangered aquatic sea bird (e.g., Newell's shearwaters) that nest and fly in this watershed.

---

Donald E. Heacock, Kauai District Aquatic Biologist

---

<sup>1</sup> Low-Impact Development Strategy for Green Cove Basin: a case study in regulatory protection of aquatic habitat in urbanizing watersheds. City of Olympia, Thurston County, Washington, Oct. 2002

AUG 21 2007

LINDA LINGLE  
GOVERNOR OF HAWAII



STATE OF HAWAII  
DEPARTMENT OF LAND AND NATURAL RESOURCES

STATE HISTORIC PRESERVATION DIVISION  
601 KAMOKILA BOULEVARD, ROOM 555  
KAPOLEI, HAWAII 96707

LAURA H. THIRLEN  
INTERIM CHAIRPERSON  
BOARD OF LAND AND NATURAL RESOURCES  
COMMISSION ON WATER RESOURCE MANAGEMENT

ALLAN A. SMITH  
INTERIM DEPUTY DIRECTOR - LAND

KEN C. KAWAHARA  
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

August 20, 2007

Collette Sakoda  
Environet Inc  
2850 Paa Street, Suite 212  
Honolulu, Hawai'i 96819

LOG NO: 2007.2540  
DOC NO: 0708NM17  
Archaeology

Dear Ms. Sakoda:

**SUBJECT: Chapter 6E-42- Historic Preservation Review –  
Pre-Assessment Consultation for EA for Proposed Wailua Residential Subdivision  
Wailua, Lihue, Kauai  
TMK: (4) 3-9-006; 009 and 11; 3-9-002: 012, 024 and 025**

Thank you for your letter of July 20, 2007. The project area is near a National Historic Landmark and one of the largest *heiau* complexes that still remain on this island. We recommend you consult with State Parks, the Office of Hawaiian Affairs and Na Kahu Hikina A Ka La, the curator group for this area. Appropriate buffers and view corridors will be needed to help protect these area and historic properties. We must all agree on what are the appropriate buffers.

We recommend that an archaeological inventory survey by a qualified archaeologist be conducted on the parcels that will be developed. The archaeological inventory survey work is needed to ensure significant historic sites have been properly identified and treated. We look forward to working with you and the community on this project.

Should you have any questions, please contact SHPD at 742-7033.

Aloha,

A handwritten signature in cursive script that reads "Bryan J. Flower".

for Melanie A. Chinen, Administrator  
State Historic Preservation Division

NM:



SEP -4 2007

LINDA LINGLE  
GOVERNOR



BARRY FUKUNAGA  
DIRECTOR

Deputy Directors  
MICHAEL D. FORMBY  
FRANCIS PAUL KEENO  
BRENNON T. MORIOKA  
BRIAN H. SEKIGUCHI

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

IN REPLY REFER TO:  
HWY-PS  
2.5469

AUG 31 2007

Ms. Colette Sakoda  
Environet, Inc.  
2850 Pa'a Street, Suite 212  
Honolulu, Hawaii 96819

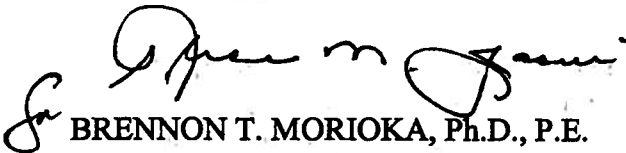
Dear Ms. Sakoda:

Subject: Pre-Assessment Consultation to Prepare a Chapter 343 HRS Environmental Assessment for a Proposed Wailua Residential Subdivision, Wailua, Kauai  
TMK Nos. (4) 3-9-006:009 and 011; 3-9-002:012, 024, and 025 (portions)

1. Applicant should prepare a Traffic Impact Analysis Report (TIAR) for our review and approval. The report should include an analysis and evaluation of the project impacts, but not limited to Kuhio Highway, and any roadway improvement mitigation measures.
2. This project should be coordinated with our proposed (a) Wailua-Kapaa Bypass Project (b) Kauai Commuter Bikeway Project and Coastal Shared Use Bikepath Project.
3. Required roadway mitigation measures (within our State highway rights of way) must be implemented by developer at his own cost.
4. Diverting surface water run-off onto Kuhio Highway is not permitted.
5. A Drainage/Grading Report should be prepared for our review and approval.
6. Construction plans must be submitted for our review and approval. A permit is required for all work done within our State Highway rights of way.

If you have any questions, please contact Ronald Tsuzuki, Head Planning Engineer, at 587-1830.

Very truly yours,

  
BRENNON T. MORIOKA, Ph.D., P.E.  
Deputy Director - Highways



SEP - 6 2007

LINDA LINGLE  
GOVERNOR OF HAWAII



LAURA H. THIELEN  
INTERIM CHAIRPERSON  
BOARD OF LAND AND NATURAL RESOURCES  
COMMISSION ON WATER RESOURCE MANAGEMENT



**STATE OF HAWAII**  
**DEPARTMENT OF LAND AND NATURAL RESOURCES**  
**LAND DIVISION**

POST OFFICE BOX 621  
HONOLULU, HAWAII 96809

September 4, 2007

Environet, Inc.  
2850 Paa Street Suite 212  
Honolulu, Hawaii 96819

Attention: Ms. Colette Sakoda

Gentlemen:

Subject: Pre-Assessment Consultation for Environmental Assessment for DHHL  
Proposed Wailua Residential Subdivision, Wailua, Kauai, Tax Map Key:  
(4) 3-9-6:9, 11; 3-9-2:12, 24, portion 25

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

Other than the comments from Engineering Division, Land Division, Commission on Water Resource Management, the Department of Land and Natural Resources has no other comments to offer on the subject matter. Should you have any questions, please feel free to call our office at 587-0433. Thank you.

Sincerely,

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


Russell Y. Tsuji  
Administrator



**DEPARTMENT OF LAND AND NATURAL RESOURCES  
LAND DIVISION**

**M E M O R A N D U M**

To: Russell Tsuji  
Administrator

From: Morris M. Atta   
Special Projects Coordinator

Date: August 31, 2007

Re: Pre-assessment Consultation for the Proposed Wailua Residential  
Subdivision for the Department of Hawaiian Home Lands (DHHL),  
Wailua, Kauai

---

The following recommendations should be included in any comments regarding the above-referenced project:

1. If any portion of the project includes hillsides or cliffs with a slope grade of 20% or greater, a slope study to determine the risks of rockfalls or landslides should be required as a condition of approval.
2. If a rockfall or landslide risk is determined or is suspected to exist, the developer should be required to create a hazard buffer zone in areas susceptible to such hazards that is of sufficient width to protect the health and safety of future homeowners in the vicinity of those risks.
3. If a rockfall or landslide risk is determined or is suspected to exist, the developer should be required to provide a written disclosure of those risks to all potential homeowners.
4. Given the past reported flooding problems due to the existence of a reservoir above the proposed subdivision, appropriate measures should be taken to minimize future flooding of the area and a disclosure of the risks posed by the existence of the reservoir should be provided to all potential homeowners.

Should you have any questions, please call me at extension 7-0410.

DEPARTMENT OF LAND AND NATURAL RESOURCES  
ENGINEERING DIVISION

**AUG 30 2007**

**TO:** Mr. Russel Tsuji-Land Administrator  
Mr. Morris Atta – Land Agent, Kauai

**FROM:** Eric T. Hirano, Chief Engineer



**SUBJECT: Pre-assessment Consultation for the Proposed Wailua Residential Subdivision for the Department of Hawaiian Home Lands (DHHL), Wailua, Kauai**

The following are our comments regarding the proposed Wailua Residential Subdivision for DHHL in Wailua, Kauai:

1. See attachment for comments on flood zone.
2. DHHL should evaluate and address the potential rockfall hazard onto the residential subdivision.

Should you have any questions, please call Ms. Suzie Agraan at extension 7-0258.

SA:ek  
Attachment

DEPT. OF LAND &  
NATURAL RESOURCES  
STATE OF HAWAII

2007 AUG 30 A 11:53

RECEIVED  
LAND DIVISION



STATE OF HAWAII  
DEPARTMENT OF LAND AND NATURAL RESOURCES  
LAND DIVISION

POST OFFICE BOX 621  
HONOLULU, HAWAII 96809

July 25, 2007

37 JUL 26 AM 8:33  
RECEIVED

MEMORANDUM

TO:

**DLNR Agencies:**

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

FROM:

Russell Y. Tsuji

SUBJECT:

Pre-Assessment Consultation for Environmental Assessment for Proposed Wailua Residential Subdivision

LOCATION: Wailua, Kauai, Tax Map Key: (4) 3-9-6:9, 11; 3-9-2:12, 24, portion 25

APPLICANT: Environet, Inc. on behalf of Department of Hawaiian Home Lands

Transmitted for your review and comment on the above referenced document. We would appreciate your comments on this document. Please submit any comments by August 15, 2007.

If no response is received by this date, we will assume your agency has no comments. If you have any questions about this request, please contact my office at 587-0433. Thank you.

Attachments

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

Signed: W. Poyphich  
Date: 8/29/07

LINDA LINGLE  
GOVERNOR OF HAWAII



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DEPUTY DIRECTOR

STATE OF HAWAII  
DEPARTMENT OF LAND AND NATURAL RESOURCES  
COMMISSION ON WATER RESOURCE MANAGEMENT  
P.O. BOX 621  
HONOLULU, HAWAII 96809

August 29, 2007

REF: Pre-Assessment EA Wailua Residential

RECEIVED  
LAND DIVISION  
2007 AUG 31 10:35  
DEPT. OF LAND &  
NATURAL RESOURCES  
STATE OF HAWAII

TO: Russell Tsuji, Administrator  
Land Division

FROM: Ken C. Kawahara, P.E., Deputy Director  
Commission on Water Resource Management

R

SUBJECT: Pre-Assessment Consultation for Environmental Assessment for Proposed Wailua Residential  
Subdivision, Wailua, Kauai TMK (4) 3-9-6:9, 11: 3-9-2:12, 24, portion 25

FILE NO.:

Thank you for the opportunity to review the subject document. The Commission on Water Resource Management (CWRM) is the agency responsible for administering the State Water Code (Code). Under the Code, all waters of the State are held in trust for the benefit of the citizens of the State, therefore, all water use is subject to legally protected water rights. CWRM strongly promotes the efficient use of Hawaii's water resources through conservation measures and appropriate resource management. For more information, please refer to the State Water Code, Chapter 174C, Hawaii Revised Statutes, and Hawaii Administrative Rules, Chapters 13-167 to 13-171. These documents are available via the Internet at <http://www.hawaii.gov/dlnr/cwrm>.

Our comments related to water resources are checked off below.

- 1. We recommend coordination with the county to incorporate this project into the county's Water Use and Development Plan. Please contact the respective Planning Department and/or Department of Water Supply for further information.
- 2. We recommend coordination with the Engineering Division of the State Department of Land and Natural Resources to incorporate this project into the State Water Projects Plan.
- 3. There may be the potential for ground or surface water degradation/contamination and recommend that approvals for this project be conditioned upon a review by the State Department of Health and the developer's acceptance of any resulting requirements related to water quality.

Permits required by CWRM: Additional information and forms are available at [www.hawaii.gov/dlnr/cwrm/forms.htm](http://www.hawaii.gov/dlnr/cwrm/forms.htm).

- 4. The proposed water supply source for the project is located in a designated ground-water management area, and a Water Use Permit is required prior to use of ground water.
- 5. A Well Construction Permit(s) is (are) required before the commencement of any well construction work.
- 6. A Pump Installation Permit(s) is (are) required before ground water is developed as a source of supply for the project.

DRF-IA 03/02/2006

August 29, 2007

- 7. There is (are) well(s) located on or adjacent to this project. If wells are not planned to be used and will be affected by any new construction, they must be properly abandoned and sealed. A permit for well abandonment must be obtained.
- 8. Ground-water withdrawals from this project may affect streamflows, which may require an instream flow standard amendment.
- 9. A Stream Channel Alteration Permit(s) is (are) required before any alteration can be made to the bed and/or banks of a stream channel.
- 10. A Stream Diversion Works Permit(s) is (are) required before any stream diversion works is constructed or altered.
- 11. A Petition to Amend the Interim Instream Flow Standard is required for any new or expanded diversion(s) of surface water.
- 12. The planned source of water for this project has not been identified in this report. Therefore, we cannot determine what permits or petitions are required from our office, or whether there are potential impacts to water resources.
- 13. We recommend that the report identify feasible alternative non-potable water resources, including reclaimed wastewater.
- OTHER:

If there are any questions, please contact Edwin Sakoda at 587-0234.



# HUI KAKOO'AINA HO'OPULAPULA

*"Let the people flourish on the land."*

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Kaipo Kincaid

September 4, 2007

Ms. Colette Sakoda  
Environet, Inc.  
2850 Pa'a St #212  
Honolulu, HI 96819

Subject: Pre-Assessment Consultation to Prepare a Chapter 343 HRS Environmental Assessment for a Proposed Wailua Residential Subdivision, Wailua, Kauai, Hawaii  
TMK Nos. (4) 3-9-006:009 and 011; 3-9-002:012, 024, and 025 (portions)

Hui Kako'o is a non-profit organization whose purpose is to serve the interests of applicants for Hawaiian Home Lands homestead leases. Thank you for the opportunity to comment on concerns regarding the above reference subject.

We have reviewed the comments dated September 2, 2007 offered by Mr. Kipukai Kualii, Hui Kako'o director for Kauai, and wish to inform you that Hui Kako'o concurs with the concerns expressed. These are:

- 1) Wailua is an area of extremely high cultural significance and all the **heiau and cultural sites** need to be protected, restored and perhaps even highlighted.
- 2) The **area water distribution system** is in disrepair (supposedly including a collapsing tunnel) and needs to be addressed immediately.
- 3) Any **new highway** built has to be sensitive to the area as well as the new community of homesteaders; there also needs to be **traffic calming measures** so folks aren't speeding through the new homestead the way they now speed through the Anahola homestead.
- 4) The **sewage treatment plant** has to be modernized to ensure no spillage to our coastal areas.
- 5) There may be **chemicals in the soil such as DDT** that would be harmful to future residents of the subdivision if not properly eliminated.
- 6) Timeshare/resort development is not an acceptable use of our trust lands and compromises the intent of the trust purpose.

Sincerely,

  
KAIPO KINCAID  
Executive Director



KipuKai Kualii  
4210 Rice St #A2  
Lihu'e, HI 96766

September 1, 2007

Colette Sakoda  
Environet, Inc.  
2850 Pa'a St #212  
Honolulu, HI 96819

Subject: Pre-Assessment Consultation to Prepare a Chapter 343 HRS Environmental Assessment for a Proposed Wailua Residential Subdivision, Wailua, Kauai, Hawaii  
TMK Nos. (4) 3-9-006:009 and 011; 3-9-002:012, 024, and 025 (portions)

Dear Colette;

Aloha! I'm writing this as a follow-up to my recent telephone call and to provide my written comments. Although it's past your August 23, 2007 date, I was happy to hear you will still be able to insert my letter into your draft EA document.

These are my comments and concerns:

- 1) Wailua is an area of extremely high cultural significance and all the **heiau and cultural sites** need to be protected, restored and perhaps even highlighted.
- 2) The **area water distribution system** is in disrepair (supposedly including a collapsing tunnel) and needs to be addressed immediately.
- 3) Any **new highway** built has to be sensitive to the area as well as the new community of homesteaders; there also needs to be traffic-calming measures so folks aren't speeding through the new homestead the way they now speed through the Anahola homestead.
- 4) The **sewage treatment plant** has to be modernized to ensure no spillage to our coastal areas.
- 5) There may be **chemicals in the soil such as DDT** that would be harmful to future residents of the subdivision if not properly eliminated.

Finally, while I believe strongly that DHHL has an obligation to get more native Hawaiians off the waitlists and onto the lands, I don't believe timeshare/resort development is the "best use" of the commercial lands for the income needed to do that. And, I don't believe it will be acceptable to the majority of Hawaiians or Kauaians.

Mahalo nui loa,



KipuKai Kualii





AUG 30 2007

PHONE (808) 594-1888

FAX (808) 594-1865



**STATE OF HAWAII**  
**OFFICE OF HAWAIIAN AFFAIRS**  
711 KAPI'OLANI BOULEVARD, SUITE 500  
HONOLULU, HAWAII 96813

August 24, 2007

HRD07\_3133

Colette Sakoda  
Environet, Inc.  
2850 Pa'a Street, Suite 212  
Honolulu, Hawai'i 96819

Dear Ms. Sakoda:

**Re: Pre-Assessment Consultation to Prepare a Chapter 343 HRS Environmental Assessment for a Proposed Wailua Residential Subdivision Wailua, Kaua'i, Hawai'i Tax Map Key (4) 3-9-006:009 and 011 and 3-9-002: 012, 024 and por. 025**

The Office of Hawaiian Affairs (OHA) is in receipt of your July 23, 2007 letter initiating consultation ahead of a draft Environmental Assessment (EA) for the proposed Wailua Residential Subdivision project.

OHA requests that a comprehensive archaeological inventory survey for the 452-acre project area be conducted and submitted to the Department of Land and Natural Resources- Historic Preservation Division for review and approval. OHA should be allowed the opportunity to comment on the criteria assigned to any cultural or archaeological sites identified within the archaeological inventory survey. Consideration should also be afforded to any individuals accessing the project area for constitutionally protected traditional and customary purposes.

Thank you for the opportunity to provide comments at this early stage of the draft EA process and we look forward to the opportunity to review the completed draft EA and provide additional comments at that time. Should you have any questions please contact Keola Lindsey, Lead Advocate-Culture at 594-1904 or [keolal@oha.org](mailto:keolal@oha.org).

'O wau iho nō,

A handwritten signature in black ink, appearing to read "Clyde W. Nāmu'o".  
Clyde W. Nāmu'o  
Administrator

C: Kanani Kagawa, OHA- Community Resource Coordinator, Kaua'i

